HELCOM-VASAB Maritime Spatial Planning Working Group
16th Meeting
Helsinki, Finland, 8–9 May 2018

Document title	Implementation of the Baltic Sea Action Plan 2018 – three years left to reach good environmental status
Code	4-2
Category	INF
Agenda Item	4 – Follow-up on implementation and planning for future
Submission date	17.4.2018
Submitted by	HELCOM Secretariat
Reference	

Background

HOD 53-2017 approved the report on implementation of HELCOM agreements and agreed that it would be included as a background report to the 2018 HELCOM Ministerial Meeting, as well as utilized in further HELCOM work.

Furthermore, HELCOM 38-2019 decided that the report will serve as the annual report on the activities of the Helsinki Commission during 2017, complemented with a general overview of HELCOM activities (will be published as Baltic Sea Environment Proceedings at a later stage). The report 'Implementation of the Baltic Sea Action Plan 2018 – three years left to reach good environmental status' is contained in Annex 2 to this document.

In addition, the document contains a list of regional and national actions of relevance for HELCOM-VASAB MSP WG 16-2018 included into the Report, see Annex 1.

Action requested

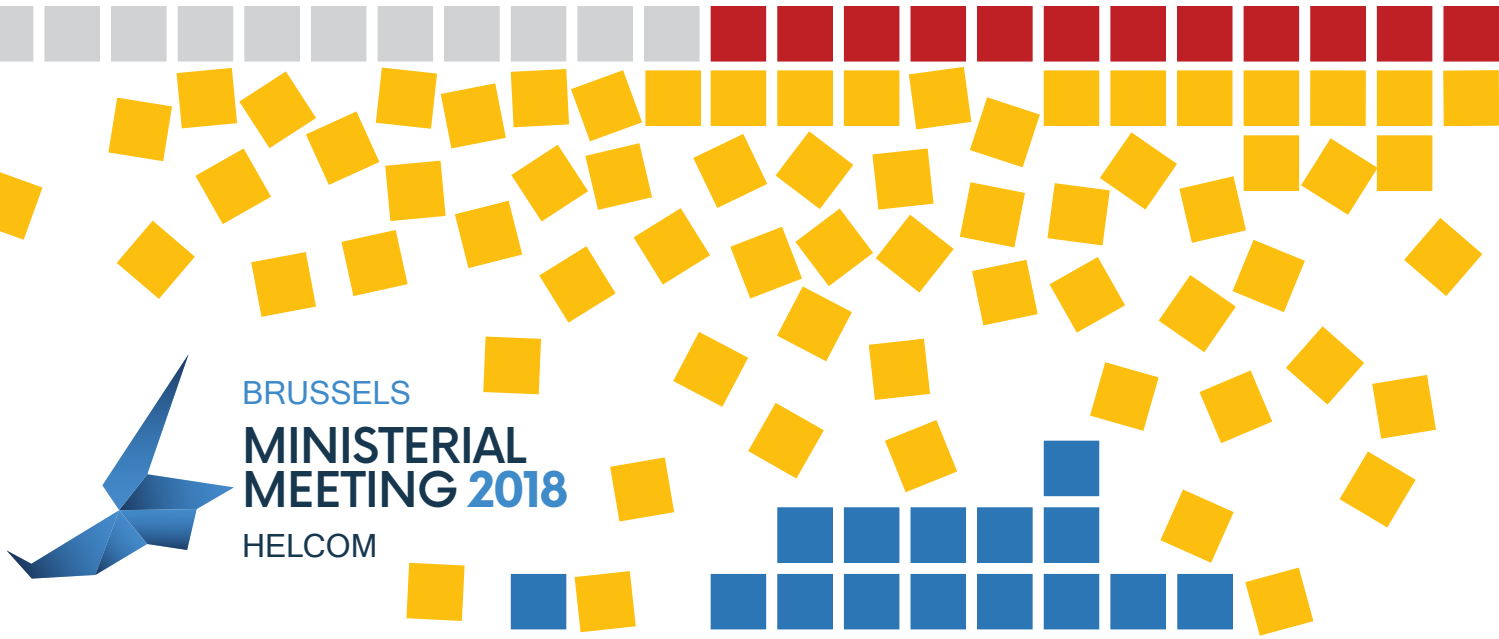
The Meeting is invited to:

- take note of the report, and in particular of the status of the implementation of regional and national actions related to the work of HELCOM-VASAB MSP WG 16-2018;
- discuss how to carry out the work on the remaining regional actions so they could be implemented by 2021;
- discuss possible support to the implementation of national actions. The Contracting Parties may share their views on existing challenges and prospects for implementing the national actions.

Baltic Marine Environment Protection Commission

Implementation of the Baltic Sea Action Plan 2018

Three years left to reach good environmental status



BRUSSELS
MINISTERIAL MEETING 2018
HELCOM

This is a background document to the 2018 HELCOM Ministerial Meeting

Implementation of the Baltic Sea Action Plan 2018

Three years left to reach good environmental status

Baltic Marine Environment Protection Commission

Table of Contents

1 INTRODUCTION[1]

One of the duties of the Helsinki Commission is to keep the implementation of the Helsinki Convention under continuous observation. Implementation of the Baltic Sea Action Plan (BSAP) has been followed up on a number of occasions and reporting on the implementation of HELCOM Recommendations is carried out regularly.

In 2016 the HELCOM Explorer was launched, a web-based platform that provides information on the implementation of agreements under BSAP and HELCOM Ministerial Declarations in 2010 and 2013. The HELCOM Explorer covers currently also a limited number of HELCOM Recommendations with the aim to fully develop the follow-up system also for Recommendations in the future.

The overarching aim of the BSAP is to reach good environmental status by 2021 and the more specific goals of the BSAP are to reach:

- Baltic Sea unaffected by eutrophication
- Baltic Sea undisturbed by hazardous substances
- Environmentally friendly maritime activities
- Favourable status of Baltic Sea biodiversity

For each goal a number of more specific objectives and actions are agreed through the BSAP and supplemented by HELCOM Ministerial Declarations. The level of accomplishment of 177 actions with concrete targets have been reported and assessed. For an explanation to how the assessment is done see Box 1.

A majority of the actions are linked to the biodiversity segment[2] of the BSAP, including both conservation and management measures. Of the actions carried out jointly in HELCOM, 54% of the actions related to biodiversity have been accomplished and 68% on average across all BSAP segments (Figure 1.1).

Biodiversity is also dominating the HELCOM actions that are implemented nationally. Currently 23% of national actions have been accomplished, meaning that they have been implemented by all HELCOM countries. An additional 62% have been partly accomplished, meaning that one or more countries have implemented the action (Figure 1.1).

[1] This version (19 March 2018) with correction to p. 2 (% of partly accomplished national actions), p. 15 (box 2), p. 52 (fig. 3.3.), p. 79–81 (voluntary commitments).

[2] In the sorting of actions according to the BSAP and Ministerial Declarations, note that the biodiversity segment also includes actions related e.g. to marine litter, underwater sound, and management of fish stocks.

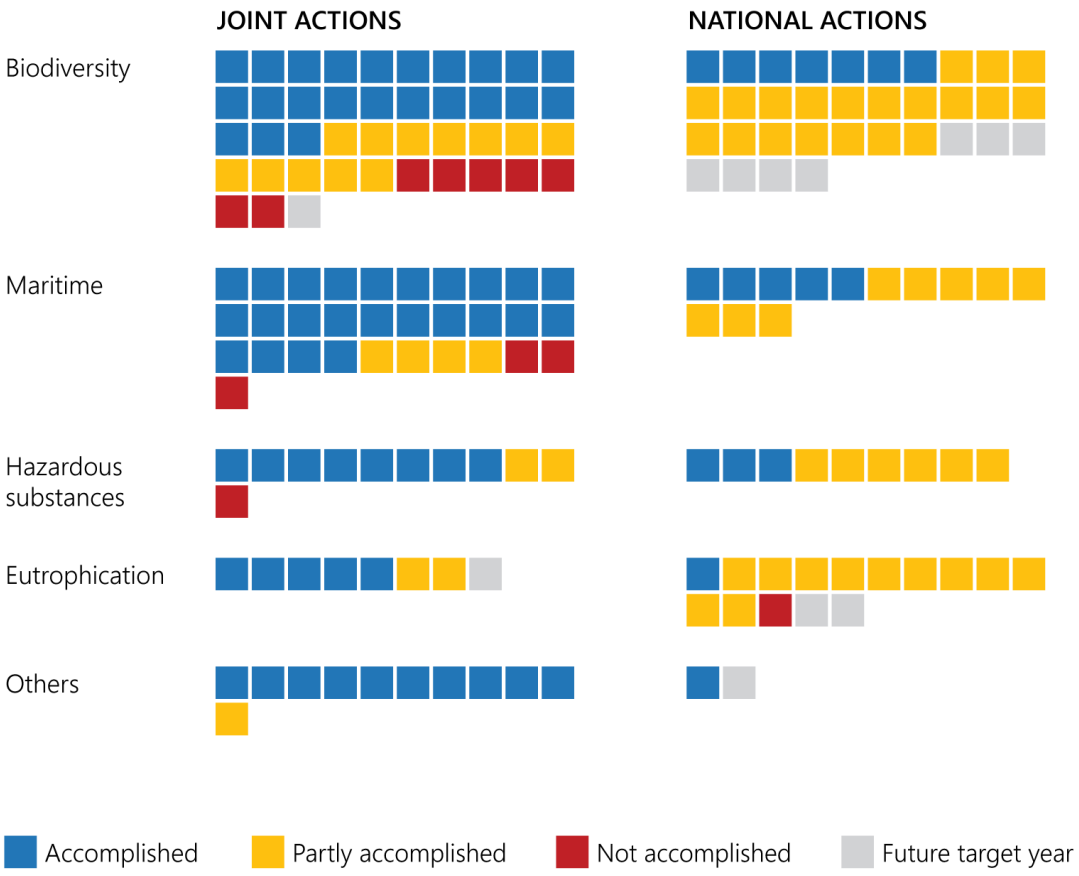


Figure 1.1 Accomplishment of joint and national actions agreed under the Baltic Sea Action Plan and HELCOM Ministerial Declarations. Each block represents one action. The categorization of actions is based on the main segments of the BSAP. The category 'Others' refers to actions in the areas of financing, awareness, and monitoring and assessment. Note that the categorization and number of actions according to the BSAP, as reflected in this figure, may deviate from the categorization made in the remainder of the report which follows the structure of the HELCOM 'State of the Baltic Sea' report. For example, actions under the BSAP Maritime segment are presented separately in this figure while in Chapter 2 on Pressures they are split between sections 2.1 and 2.2 on Eutrophication and Hazardous substances. Actions related to management of fish are in this figure included under the Biodiversity segment while presented separately in section 2.6 on Species removal by fishing. For explanation to how the assessment is done see Box 1.

This report

This report focuses on the implementation of agreements in HELCOM and covers the actions agreed in the Baltic Sea Action Plan (BSAP) and HELCOM Ministerial Declarations in 2010 and 2013 and a selection of HELCOM Recommendations that have been recently assessed. This only represents a part of the actions taken to mitigate pressures on the Baltic Sea. In addition, numerous additional measures are taken to implement the general and specific requirements of the Helsinki Convention including the in total 126 valid HELCOM Recommendations out of which 40 have been agreed after the adoption of the BSAP in 2007. Measures to improve the state of the Baltic Sea also take place through additional national and legal and policy requirements. For EU Member States, HELCOM acts as the coordination platform for the regional implementation of the EU Marine Strategy Framework Directive (MSFD). The programmes of measures under the Marine Strategy Framework Directive (MSFD) as well as the Water Framework Directive (WFD) contribute directly to the implementation of HELCOM agreements, while HELCOM work can also be used by the Contracting Parties being EU Members towards these obligations. In Russia the Maritime Doctrine includes environmental policy of Russia up to 2020 in the field of maritime activities. Moreover, national commitments taken under international agreements on biodiversity, such as ASCOBANS and the 'Convention on Biological Diversity (CBD)', or pollutants, such a 'Minamata Convention on Mercury' and 'Stockholm Convention of POPs', contribute to protection at the regional level. The report should thus be read keeping in mind that HELCOM actions only comprise a part of the measures taken to improve the state of the Baltic Sea. The overview is intended as a support to identify issues that may warrant special attention in HELCOM in the future.

The report is structured according to the topics addressed in the HELCOM report 'State of the Baltic Sea, First version June 2017', i.e. according to topics which are assessed in terms of status of and pressures on the Baltic Sea environment. For each topic the status is summarized based on the results of the first version of the 'State of the Baltic Sea' report which reflects the situation in the period 2011-2015. An overview of the implementation of actions corresponding to the pressures and ecosystem components is presented as reported by countries in 2016 and with minor updates carried out in 2017 as found relevant due to recent developments. Up to date reporting on HELCOM Recommendations is also reflected when available. The focus of this report is on actions involving concrete measures to improve the environmental status or regional coordination of management of the Baltic Sea.

In 2017, the Contracting Parties agreed to use HELCOM as coordinating platform for the regional implementation of UN Sustainable Development Goals (SDG) that are related to oceans, in particular SDG 14 to 'Conserve and sustainably use the oceans, seas and marine resources for sustainable development'. HELCOM has a published report that describes how HELCOM contributes to reaching this goal (HELCOM 2017r). In this report the SDGs that are directly linked to the different sections are highlighted and Annex 1 lists the national voluntary commitments made by the Contracting Parties at the UN Conference "Our oceans, our future: partnering for the implementation of Sustainable Development Goal 14" that was held in June 2017.

Box 1. Explanatory note to the assessment system

Assessment of status of the environment

The assessment of status of the environment, in terms of pressures as well as ecosystem components, is based on HELCOM core indicators. For each indicator, good status is defined by setting a threshold value against which the current status is assessed. The status of an indicator is expressed as failing or achieving the threshold value. HELCOM core indicators and associated threshold values have been developed and agreed in HELCOM over the last decade (see e.g. HELCOM core indicators, or overview of threshold values used in the 'State of the Baltic Sea' report).

For biodiversity, eutrophication, and hazardous substances, integrated assessments are carried out. In this case the indicators are combined in a systematic way to provide an overall status assessment for the respective theme. The integrated assessment tools have been agreed for use in the 'State of the Baltic Sea" report (HELCOM 2016c).

For some topics, there is not yet any agreement on core indicators, for example for marine litter, underwater sound, and loss and disturbance of benthic habitats, and thus, no quantitative status assessment is available.

Assessment of accomplishment of HELCOM actions

HELCOM actions are specified as 'joint' or 'national' depending on their mode of implementation.

- Joint actions are implemented in cooperation through HELCOM subsidiary bodies and HELCOM projects.
- National actions are implemented by the respective Contracting Party.

For each action HELCOM Working Groups have developed criteria for assessing when the individual action should be considered as accomplished. The criteria represents three levels of achievement: accomplished, partly accomplished, and not accomplished. 'Partly accomplished' is in general assigned when there is an ongoing activity to achieve the action while 'Not accomplished' means that there is no ongoing activity.

Also national actions are assessed in terms of accomplishment on the regional level. In this case the number of countries that have implemented the action is considered, in the simplest case according to the following:

- Accomplished: All Contracting Parties have implemented the action,
- Partly accomplished: Some Contracting Parties have implemented the action,
- Not accomplished: No Contracting Party has implemented the action.

Thus, a national action is only assessed as 'Accomplished' when implemented by all Contracting Parties while 'Partly accomplished' means that at least one Contracting Party has implemented the action. The national reporting is based on a self-evaluation made in 2016. In the preparation of this report HELCOM Working Groups have deliberated on some actions where the interpretation of the HELCOM action was ambiguous. This has resulted in an update of some actions in the HELCOM Explorer based on a common understanding on when to consider the action as accomplished.

All HELCOM actions have been categorized according to five different types: measures, management coordination, monitoring and assessment, data and information, and knowledge (for full description see Annex 2). The report focuses on implementation of measures and management coordination while the implementation of other types of actions are presented in Annex 3.

2. PRESSURES

The pressure on the Baltic Sea marine environment is assessed according to seven pressure types; eutrophication, hazardous substances, marine litter, underwater sound, non-indigenous species, species removal by fishing, and loss and disturbance of benthic habitats (HELCOM 2017n). The seven pressure types integrate the Baltic Sea Action Plan (BSAP) segments on eutrophication, hazardous substances and maritime traffic and also include components that were originally agreed under the BSAP biodiversity segment, i.e. marine litter and management of fish. An overview of the potential cumulative impact of pressures is included in this chapter as well as actions related to Maritime Spatial Planning (MSP) as an approach for ecosystem based management.

Figure 2.1 shows the distribution of joint and national HELCOM actions over the different pressure types. The focus of this report is on concrete measures and management actions to improve the state of the Baltic Sea (dark grey colour in figure 2.1), which also comprise the majority of HELCOM actions. The implementation of other types of actions, e.g. those related to data, knowledge, and assessments, are listed in Annex 3.

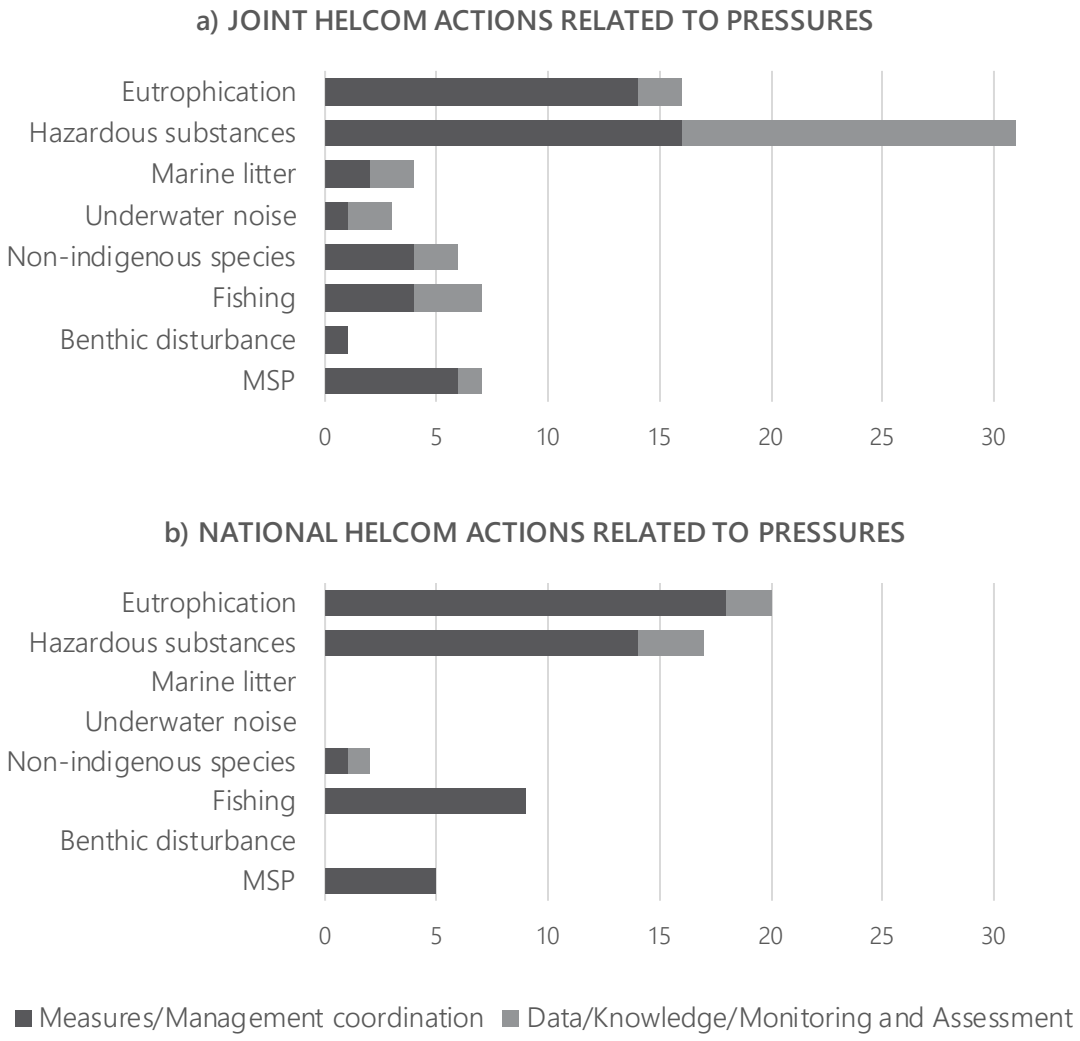


Figure 2.1. Number of HELCOM actions related to different pressure types and separated by a) joint, and b) national actions. The type of action is further indicated according to colour legend. Abbreviations used: MSP=Maritime Spatial Planning.

2.1 EUTROPHICATION

HELCOM agreements

Safeguarding the Baltic Sea from excess input of nutrients is established in the Helsinki Convention in Annex III '**Criteria and measures concerning the prevention of pollution from land-based sources**' and Annex IV '**Prevention of pollution from ships**'.

In the Baltic Sea Action Plan (BSAP) eutrophication is addressed in a dedicated segment with the goal to reach a '**Baltic Sea unaffected by eutrophication**' as well as through the goal to reach 'Environmentally friendly maritime activities', with particular relevance of the objectives to achieve minimum sewage and air pollution from ships.

A key commitment in the BSAP is the agreement on reduction targets for input of nutrients. The latest figures on maximum allowable input of nutrients (MAI) and country allocated reduction targets (CART) are included in the 2013 HELCOM Ministerial Declaration.

Many actions agreed through the BSAP and Ministerial Declarations are aimed at reducing the input of nutrients from different sources (Figure 2.1.1). In relation to measures and management coordination, 86% of joint actions have been accomplished while only one action implemented at the national level has been achieved by all HELCOM countries (Figure 2.1.2).

Selected HELCOM Recommendations related to mitigating eutrophication are listed in Table 2.1.1.

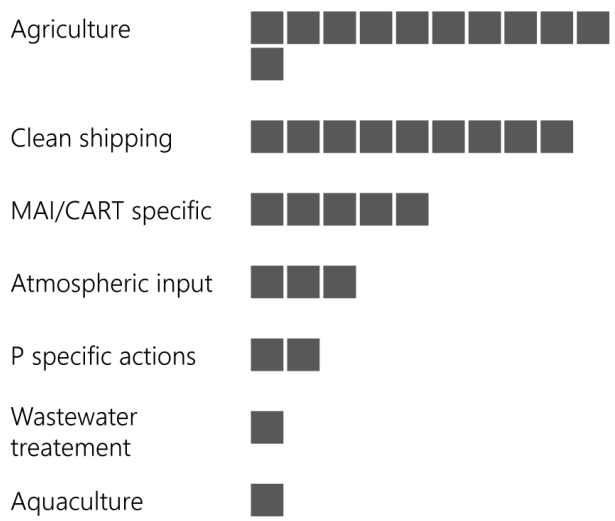


Figure 2.1.1. Number of HELCOM actions to mitigate eutrophication, joint and national, related to specific topics and sources of nutrient.

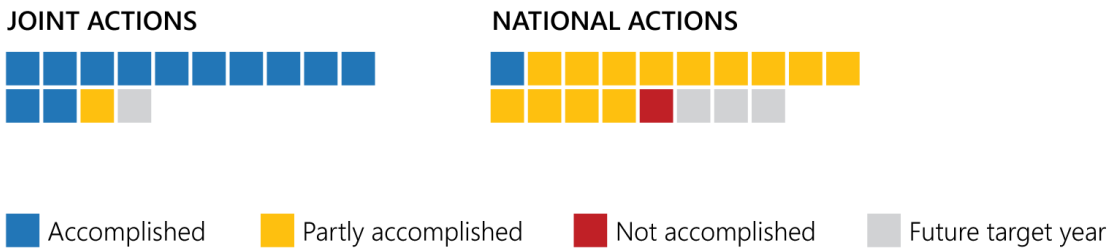


Figure 2.1.2. Accomplishment of HELCOM actions to mitigate eutrophication related to measures and management coordination. Each block represents one action. For explanation to how the assessment is done see Introduction, Box 1.

Table 2.1.1. HELCOM Recommendations contributing to reduction of input of nutrients, agreed or amended by HELCOM after 2007.

28E-4 Amendments to Annex III "Criteria and measures concerning the prevention of pollution from land-based sources" of the 1992 Helsinki Convention
28E-5 Municipal wastewater treatment
28E-6, On-site wastewater treatment of single family homes, small businesses and settlements up to 300 person equivalents
28E-7 Measures aimed at the substitution of polyphosphates (phosphorus) in detergents
37-3 Sustainable aquaculture in the Baltic Sea Region
38-1 Sewage sludge handling

Link to SDG targets

14.1: By 2025 prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystem, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disaster and that progressively improve land and soil quality

Status and trends

The eutrophication status is assessed based on a set of indicators representing nutrient levels and direct and indirect effects of eutrophication. For the years 2011-2015, threshold values for individual eutrophication indicators were only achieved in a few offshore sub-basins (Figure 2.1.3). In terms of integrated eutrophication status, none of the 17 offshore sub-basins achieved good status. Seventeen out of 247 coastal assessment units in the Baltic Sea achieved good status, corresponding to 3% of the surface area (HELCOM 2017n).

Compared to the previous five-year period (2007–2011), the integrated eutrophication status has deteriorated in seven sub-basins and improved in two sub-basins.

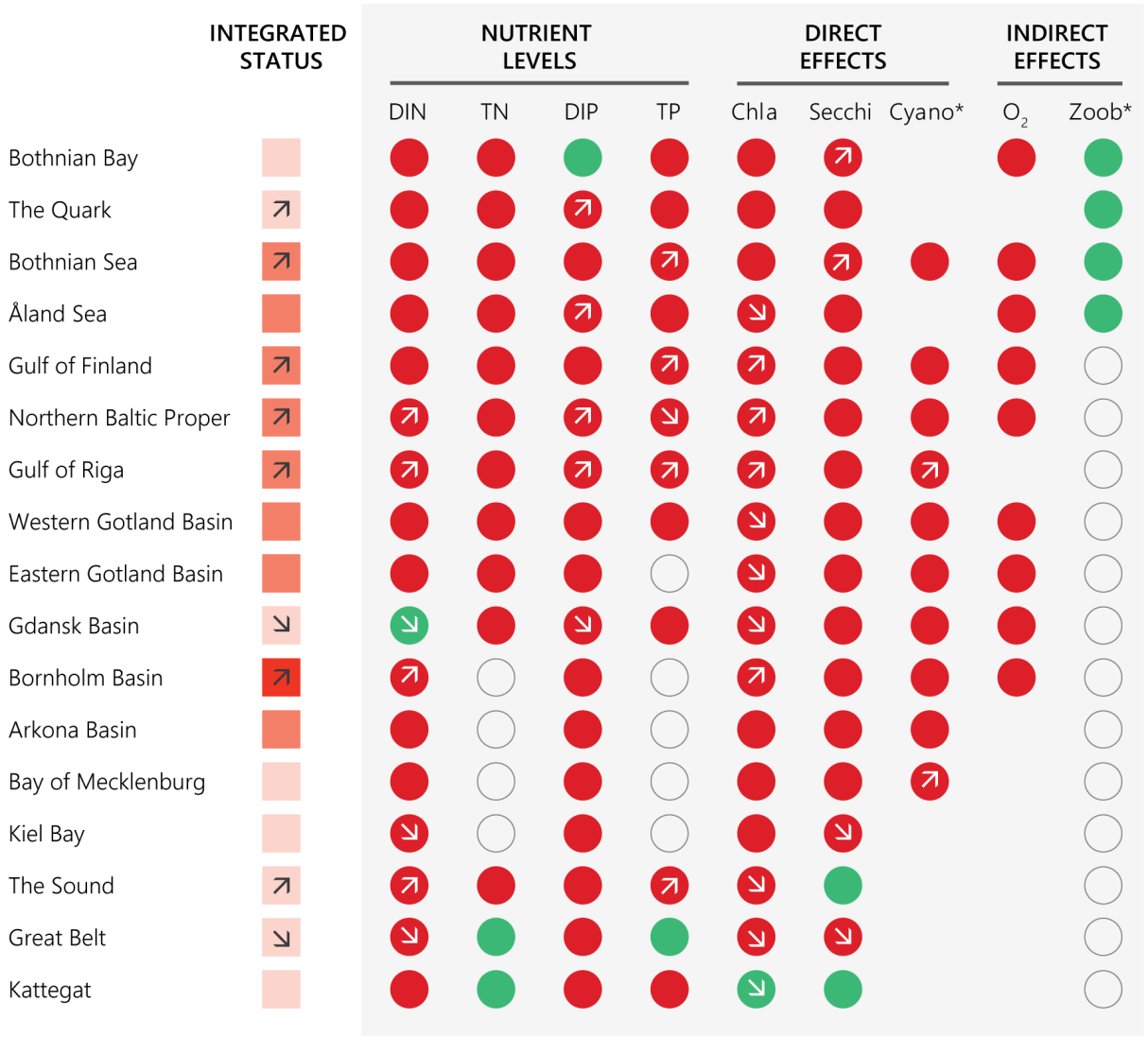


Figure 2.1.3. Results of the integrated assessment of eutrophication and of individual eutrophication core indicators. The integrated status is given in three shades of red that all represent an inadequate status. The lightest shade of red is closest to good status. Core indicator results are given as achieving the threshold value (green) or failing the threshold value (red). An empty circle represents areas where the assessment was not carried out due to lack of data or lack of agreement on a threshold value. No circle represents areas where the indicator is not applicable. The indicator 'State of the soft-bottom macrofauna community' was agreed only to be included in the Gulf of Bothnia. The arrows reflect if the eutrophication ratio, of the integrated status or individual indicator, has changed equal or more than 15% between the years 2007–2011 (last eutrophication assessment) compared with 2011–2015. Upward arrows ↗ indicate an increased eutrophication ratio between the two periods (deteriorating condition), downward arrows ↘ indicate a decreased ratio (improving condition). If no arrows are shown the difference is less than 15 % between the two periods.

Abbreviated indicators: DIN and DIP=Dissolved inorganic nitrogen and phosphorus, TN and TP=Total nitrogen and phosphorus, Chla=Chlorophyll a, Secchi=Water transparency, Cyano=Cyanobacterial bloom index, 0_2=Oxygen debt, Zoob=State of soft-bottom macrofauna, *=the indicators are tested in the HOLAS II project.

Sources and trends in input of nutrients

The major sources of both nitrogen and phosphorus in the year 2014 stem from waterborne input, corresponding to on average 69% of the nitrogen and 95% of the phosphorus input. The relative importance of inputs via water and air, however, differs between basins with airborne input contributing up to 40% of the nitrogen input to the Danish Straits (HELCOM 2017p). The natural background load from rivers is about one third of the total loads of nitrogen and phosphorus with comparatively larger proportion of background load to the Gulf of Finland and Bothnian Bay. Among anthropogenic sources, diffuse sources mainly stemming from agricultural activities contribute with the largest riverine nutrient loads to the Baltic Sea while point sources also contribute significantly (Figure 2.1.4, HELCOM 2017h).

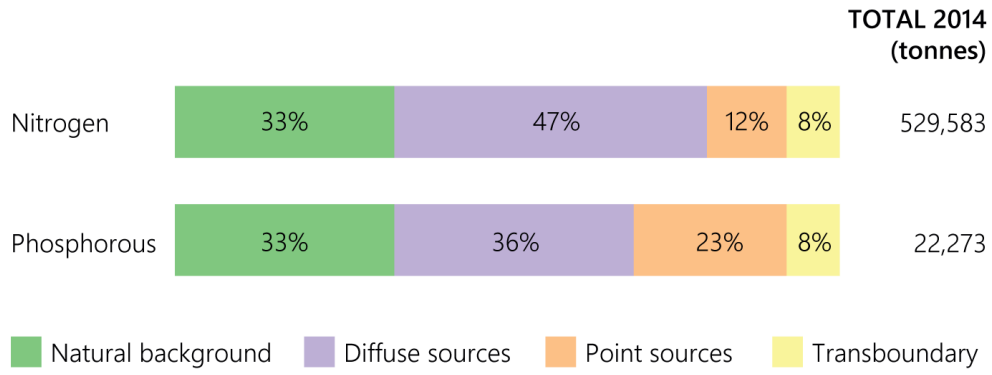


Figure 2.1.4. Total load and major sources of riverine input of nitrogen and phosphorus to the Baltic Sea.

In the period 1995-2014 the total input of nitrogen to the Baltic Sea decreased with 22% and total input of phosphorus with 24%[3]. A statistically significant reduction of input of nitrogen is established for the Bothnian Bay, Bothnian Sea, Baltic Proper, Danish Straits and Kattegat and for the input of total phosphorus for the Gulf of Finland and Kattegat (HELCOM 2017p). The reduction is for both nitrogen and phosphorus mainly due to a reduction of direct point sources (HELCOM 2017h). A national evaluation of load reductions between 1995 and 2015 indicates that reduction of both nutrients mainly stems from reduced output from wastewater treatment plants and industry. In some countries reduced diffuse loads from agriculture are also significant (HELCOM 2017i).

The Maximum Allowable Inputs (MAI) of nutrients indicates the maximal level of inputs of nitrogen and phosphorus to Baltic Sea sub-basins that still allow achieving the threshold values defined for the eutrophication indicators. In the period 2012-2014, MAI for nitrogen is assessed as achieved for the Bothnian Sea, Danish Straits and Kattegat and the input was also below MAI for Bothnian Bay and Gulf of Riga albeit with an uncertainty that precludes a conclusion as to whether MAI has been achieved. For phosphorus, MAI is assessed as achieved only for Kattegat although inputs are below or close to MAI also for Bothnian Bay, Bothnian Sea and Danish Straits (HELCOM 2017p) (Figure 2.1.5).

[3] Normalized values to reduce impact of interannual variation in weather conditions

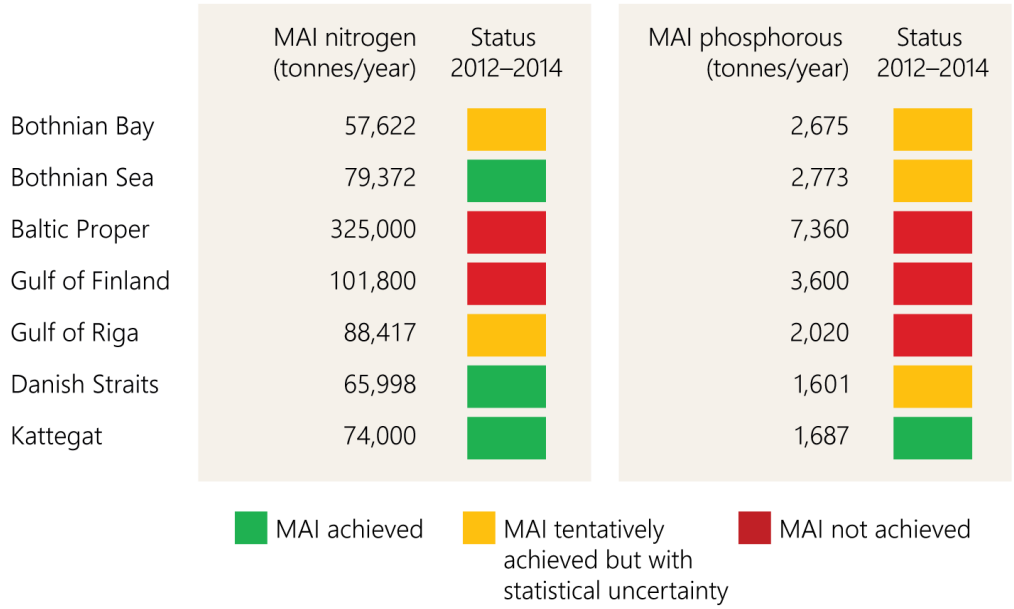


Figure 2.1.5. Achievement of Maximum Allowable Inputs (MAI) of nitrogen and phosphorus in 2012-2014.

Implementation of HELCOM actions to reduce input of nutrients to the Baltic Sea

Joint actions

HELCOM has achieved a majority of agreed actions to reduce input of nutrients that are implemented jointly (Table 2.1.2). This includes the **adoption of the Baltic Sea as a MARPOL Annex VI NECA area** in 2016/17. New ships, built 2021 or later, and sailing in the Baltic Sea NECA, have to meet the Tier III standards of MARPOL Annex VI. This corresponds to approximately 80% reduction in NOx emissions compared to current levels and can be achieved by technologies such as selective catalytic reduction (SCR) or using liquefied natural gas (LNG) as a fuel. Efficient implementation of the NECA by the green technology platform was also submitted as a HELCOM commitment to implement SDG 14 to the UN Oceans Conference in 2017.

The adoption of a similar measure to **ban discharges of sewage from passenger ships before advanced treatment to reduce nutrients, MARPOL Annex IV**, was finalised in 2016.

In 2016, HELCOM also adopted **HELCOM Recommendation 37/2 on 'Sustainable Aquaculture in the Baltic Sea Region'**, including commitments to minimize emissions and discharges and foster development towards ecologically sustainable farms and aquaculture technologies.

The 2013 HELCOM Ministerial Meeting agreed to '**Review and update part II of Annex III of the Helsinki Convention, in order to better serve the purposes of reaching good environmental status (GES)'**. This joint action has been initiated through the HELCOM AGRI Group with the view to prepare a suggestion on which parts of Annex III part 2 should be revised.

Table 2.1.2. Accomplishment of joint eutrophication actions related to measures and management coordination. Blue=accomplished, Orange=partly accomplished (activity ongoing), Grey=future target year.

Agriculture

- Joint input on EU CAP Health Check (2008-2009)
- Establish a HELCOM Agricultural/Environmental Forum
- Review and update part II of Annex III of the Helsinki Convention
- Aim for elimination of remaining Hot Spots under the HELCOM JCP* (Target year: 2018)

Aquaculture

- New HELCOM Recommendation on sustainable aquaculture

Atmospheric input

- Update information on the atmospheric nitrogen deposition into review of the HELCOM BSAP MAI/CART scheme
- Develop principles for fair burden sharing of the country-wise reduction needs for atmospheric nitrogen deposition inputs for inclusion in MAI/CART
- Joint input to strengthen the emission targets for nitrogen under the EU NEC Directive and the Gothenburg protocol under CLRTAP

Clean shipping

- Joint proposal by the Baltic Sea countries to the IMO applying for a NOx Emission Control Area (NECA) status for the Baltic Sea
- Create a joint "Green Technology and Alternative Fuels Platform for Shipping"
- Joint submission to IMO in order to amend Annex IV to MARPOL 73/78 with requirements on nutrient discharges in sewage
- HELCOM countries to report to IMO, that adequate [port reception] facilities are available for the regulation** to enter into force by 1 January 2016 for new ships
- Update the "HELCOM Clean Seas Guide"
- HELCOM Interim Guidance on technical and operational aspects of delivery of sewage by passenger ships to port reception facilities

* 16 hot spots related to release of nutrients, both from agriculture and industry, remain to be fully mitigated.

** Baltic Sea as special area for sewage

National actions

Among the eutrophication actions implemented at the national level, only one action has been achieved by all Contracting Parties while most actions have been accomplished by one or more countries (Table 2.1.3).

Table 2.1.3 Accomplishment of national actions to mitigate eutrophication related to measures and management coordination. Blue=accomplished by all countries, Orange=partly accomplished, Red=not accomplished. Grey=future target year. 'Status' indicates the number of countries that have implemented the action.

HELCOM MAI/CART scheme	Status
National programmes to achieve nutrient reductions	*
Achieving Country Allocated Nutrient Reduction Targets: Nitrogen	1 / 9**
Achieving Country Allocated Nutrient Reduction Targets: Phosphorous	
Evaluation of effectiveness of national programmes for reduction of nutrients and need for additional measures, in order to reach the country-wise reduction targets	4 / 9
Initiate joint activities to address transboundary nutrient inputs from non-Contracting Parties according to the HELCOM nutrient reduction scheme	3 / 8*** Target year: 2020
Specific actions to reduction phosphorus	
Target the elimination of phosphorus in laundry detergents for consumer use as soon as possible but not later than by 2015	8 / 9
Enhance the recycling of phosphorus (especially in agriculture and wastewater treatment) and to promote development of appropriate methodology	3 / 9
Agriculture	
Implement and enforce the provisions of part 2 of Annex III "Prevention of pollution from agriculture" of the 1992 Helsinki Convention	4 / 9
Measures to bring all installations for the intensive rearing of cattle, poultry and pigs as well as other agricultural activities in compliance with part 2, Annex III of the Helsinki Convention	4 / 9
Apply as a minimum the updated EU's BREF document and Conclusions on BAT for intensive rearing of poultry and pigs, especially for the facilities located within areas critical to nutrient losses	7 / 9
Revised palette of measures for reducing phosphorus and nitrogen losses from agriculture. Optional agro-environmental measures to be implemented through corresponding international and national instruments	3 / 9
Establish national guidelines or standards for nutrient content in manure with the view to fully utilize nutrient content of manure in fertilization practices and to avoid overfertilization	5 / 9
Agreement on national level on measures to reduce nutrient surplus in fertilization practices to reach nutrient balanced fertilization	5 / 9 Target year: 2018
Promote and advance towards applying annual nutrient accounting at farm level, taking into account soil and climate conditions, in areas critical to nutrient losses as a first step and with an aim to apply it region-wise	4 / 9 Target year: 2018
Waste water treatment	
Advanced municipal waste water treatment under HELCOM Recommendation 28E/5	3 / 9

Clean shipping	
Ratification of Annex VI of MARPOL 73/78 Convention	
Implement the [HELCOM] Roadmap for upgrading port reception facilities for sewage in passenger ports in the Baltic Sea Area	Priority ports: 4 / 5****
Implement the [HELCOM] Roadmap for upgrading port reception facilities for sewage in passenger ports in the Baltic Sea Area	Secondary ports: 1 / 4****

*All countries have some form of nutrient reduction programmes but it has not been clarified by all countries if they are sufficient to reach HELCOM CART.
** Only one country has achieved CART for nitrogen to all sub-basins.
***Estonia does not share borders with non-Contracting parties, thus the action is only relevant for eight countries.
****Priority ports: Tallinn, Rostock, Copenhagen, Riga, Gdynia, Helsingör, Rödby ferry terminal, Swinoujscie/Szczecin, Secondary ports: Helsingborg, Lubeck, Fredrikshavn, Gedser, Turku, Mariehamn, Kiel, Ystad, Gothenburg, Trelleborg. The assessment is made for each country concerned by the action.

HELCOM nutrient reduction scheme

All HELCOM countries have developed **programmes for reduction of nutrients**. For EU Member States the programmes are integrated with other obligations such as Programmes of Measures (PoMs) under the Water Framework Directive (WFD) and Marine Strategy Framework Directive (MSFD), contributing directly to the implementation of the HELCOM nutrient reduction scheme. Implementation of other EU Directives, e.g. the Nitrate Directive (91/676/EEC), also contributes. In Russia nutrient reduction activities are carried out under several different Federal and regional programmes. Since it could not be clarified if the national programmes and activities are sufficient to reach the Country Allocated Reduction Targets (CART) for all countries, the action is currently assessed as partly accomplished (Table 2.1.3, Box 2).

The **HELCOM CART** indicates how much nutrient inputs the HELCOM countries need to reduce compared to a reference period (1997-2003) to reach the agreed MAI and agreed threshold values for eutrophication indicators. Based on an evaluation of data on input of nutrients in the years 2012-2014 only one country has fulfilled CART for nitrogen for all HELCOM sub-basins while no country has fulfilled CART for phosphorus for all HELCOM sub-basins.

There are several ongoing **initiatives between HELCOM countries and non-Contracting Parties to address transboundary nutrient inputs**, mainly concerning monitoring, information sharing and capacity building. Regarding river Odra Germany and Poland cooperate with the Czech Republic through the International Commission for the Protection of the Odra River against Pollution (ICPO). Lithuania and Belarus cooperate in the field of environment, including water, for example through scientific projects as well as the development of a technical protocol on cooperation in the management of the Neman River basins. Poland cooperates with the Slovak Republic and Ukraine on the quality of border waters on the basis of bilateral agreements. Although there is no formal agreement on the cooperation on Polish-Belarussian border waters[4], the Polish National Fund for Environmental Protection and Water Management has financed modernisation of Brzesc municipality wastewater treatment plant.

[4] negotiations are on-going

Box 2 Evaluation of effectiveness of national programmes for reduction of nutrients

Only a few countries have made quantitative estimates of the inferred **effectiveness of the national programmes for reduction of nutrients**. In Finland, the measures taken to reduce the input of nutrients are estimated to already meet the HELCOM CART in open sub-basins in terms of nitrogen but not for phosphorus (Ministry of the Environment, Finland, 2016). Since the Finnish PoMs under the WFD have stricter nutrient reduction requirements than HELCOM CART, additional measures to reduce both nitrogen and phosphorus have been proposed nationally including, e.g., to further develop and implement compensation for agri-environment measures, promote use of fish fodder produced in the Baltic Sea area and increased human consumption of cyprinids, evaluate possibilities to reduce effects of internal nutrient loads, and to promote LNG as ship fuel. With the current and proposed national measures it is estimated that the Finnish share of HELCOM CART can be reached for both nutrients by 2020. In Sweden, measures taken to reduce the input of nitrogen and phosphorus have been evaluated to meet the HELCOM CART, with the exception of the Baltic Proper (Swedish Agency for Marine and Water Management, 2015). Sweden has proposed to explore a number of additional measures to reduce nutrient inputs including to compensate activities that contribute to net uptake of nutrients (e.g. blue catch crops), explore possibilities to influence internal nutrient loads, and to stimulate aquaculture techniques with no net nutrient input.

In Germany, a modelling exercise was undertaken to derive national target values for total nitrogen concentrations in the river outlet (freshwater/marine border) which aim at meeting the nutrient reduction requirements and reaching good status according to the BSAP as well as the WFD and MSFD. For German rivers bordering the Baltic Sea, a target concentration of maximum 2.6 mg/l was derived for total nitrogen and taken up in national law (Ordinance on the protection of surface waters). For total phosphorous, the type-specific target values established for water bodies in freshwater under WFD and set down in the Ordinance on the protection of surface waters (max 0.1-0.15 mg/l) were judged to be adequate and a good basis for deriving measures to reach the BSAP reduction goal for phosphorous.

P-specific actions

Phosphorus in laundry detergents for consumer use has been limited according to HELCOM Recommendation 28E-7 (adopted 2007) by the majority of countries.

HELCOM countries have also agreed to **enhance the recycling of phosphorus, especially in agriculture and wastewater treatment, and to promote development of appropriate methodology.** Finland has since 2010 implemented a programme for recycling of nutrients, especially in the catchment area of the Archipelago Sea but also in other coastal areas. Nutrient recycling is also a priority area and part of the national strategic programme of the current Finnish government. Sweden developed in 2013 a guidance document on sustainable recycling of phosphorus that forms the basis for government decision-making and initiatives on this topic. Germany has adopted a national sewage sludge ordinance to promote recycling of phosphorus and options for recycling are intensively researched. An overview of nutrient recycling in HELCOM countries, also for nitrogen, is available (HELCOM 2017x).

Agriculture

Based on information provided by the countries, four countries have '**implemented and enforced the provisions of part 2 of Annex III "Prevention of pollution from agriculture**' of the 1992 Helsinki

Convention. The accomplishment has been judged positive for these countries as either amendments have been implemented to national law or the requirements have been otherwise covered in the national legislation or both. Other countries have not implemented the Annex to national law yet and the requirements of the Annex are only partly covered by the existing national legislation. Several countries have a permit system in place related to intensive rearing of cattle, poultry and pigs while for some others intensive rearing of cattle has not been covered by permitting systems yet.

Areas critical for nitrogen and phosphorus losses have been identified by all countries as a means to support and optimize the designation of measures (see Annex 3).

A number of additional agri-related actions, implemented at national level, have been accomplished by some but not all HELCOM countries (Table 2.1.3):

- The **updated EU BREF document**[5] **and BAT for intensive farming is applied as a minimum** in most countries.
- In 2013 HELCOM revised the '**Palette of measures for reducing phosphorus and nitrogen losses from agriculture**' which contains guidance on technical, managerial and legislative measures. These agri-environmental measures have been fully implemented by some and partly implemented by all countries. Detailed information on the national implementation of specific measures from the palette is available (HELCOM 2017o).
- Several countries have **agreed on national level on measures to reduce nutrient surplus in fertilization practices to reach nutrient balanced fertilization.** For example, with the new Water Law Poland has decided to cover the whole territory of the country with the programme of measures to reduce water pollution of nitrate from agricultural sources, instead of establishing individual nitrate vulnerable zones with individual programmes of measures.
- **Nutrient accounting at farm level** is applied in many countries either on voluntary basis or regulated by law. In Germany, nutrient bookkeeping is compulsory for all farms above a certain size and the upper limit for acceptable nutrient balances will be tightened in the future. In Denmark, a 'Fertilizer accounting system' has been in place for several years for nitrogen and in 2017 it will be expanded to cover also phosphorus.

To support the advancement of national standards for nutrient content in manure and develop guidelines and recommendations for their use, a new regional project "Advanced manure standards for sustainable nutrient management and reduced emissions" (MANURE STANDARD) has been launched. All Baltic Sea countries and HELCOM are involved as project partners in the project that is running 2017-2019.

Waste water treatment

HELCOM Recommendation 28E/5 on Municipal Waste Water Treatment was revised and agreed in 2007. The 2013 HELCOM Ministerial Meeting agreed to prioritize further upgrading of waste water treatment to fully implement this HELCOM Recommendation and to reduce waterborne input of nutrients.

Denmark, Germany and Sweden have reported as fully compliant with the Recommendation. Progress is reported for Latvia where WWTPs of the three largest cities meet the requirements of the Recommendation and in Estonia 80 % of the total population was connected to public urban sewage system in 2010.

[5] Best Available Techniques (BAT) Reference Document

HELCOM Recommendation 28E/6 on 'On-site wastewater treatment of single family homes, small businesses and settlements up to 300 Person Equivalents (P.E.)' was followed-up in HELCOM in 2017 indicating full implementation by three countries (HELCOM 2017y).

At the 2017 UN SDG Ocean conference Russia made a voluntary commitment referred to as the 'St Petersburg initiative' which includes, among several other topics, the improvement of waste water treatment (Annex 1, Voluntary commitments SDG14).

Clean Shipping

By 2011, all HELCOM countries had ratified **Annex VI of MARPOL 73/78** Convention, i.e. regulations for the Prevention of Air Pollution from Ships. Under Annex VI of MARPOL 73/78, the Baltic Sea is identified as a "SOx emission control area" (SECA) and recently also a "NOx emission control area" (NECA) was established under the same Annex for new ships built 2021 and after. To lead by example the German Federal Government has decided to equip the new survey, wreck-search and research vessel ATAIR with LNG propulsion (Annex 1, Voluntary commitments SDG14).

In addition to decreasing the airborne input of nutrients from ships, HELCOM work to prevent release of sewage from ships is progressing. To follow up on the **Joint submissions to IMO to establish Baltic Sea as a special area for sewage** under Annex IV to MARPOL (Table 2.1.3), the 2010 HELCOM Ministerial Meeting agreed on a '**Roadmap for upgrading port reception facilities for sewage in passenger ports of the Baltic Sea area**'. The Roadmap identifies priority and secondary ports where appropriate measures to upgrade port reception facilities to a standard sufficient for large passenger ships should be taken. In 2011, Annex IV of the IMO MARPOL Convention was amended by designating the Baltic Sea as a 'special area for sewage', to be implemented when adequate sewage port reception facilities are available. Many of the priority ports were reported as upgraded as of 2016 while one secondary port has been upgraded. In 2016 the Baltic Sea coastal countries reported to IMO that they consider the PRF facilities to be adequate and the MARPOL Annex IV special area Baltic Sea will enter into force by 2021.

Reflection on actions

The evaluation of nutrient input to the Baltic Sea in 2012-2014 shows a significant decrease in input of nitrogen in the majority of sub-basins[6] and significant decrease in input of phosphorus to some sub-basins compared with the reference period. Still, in the same period, MAI for nitrogen was only achieved in three sub-basins and for phosphorus only in one sub-basin. The 'State of the Baltic Sea' report, furthermore, shows that the Baltic Sea is still substantially affected by eutrophication, with concentrations of nutrients even increasing in some sub-basins compared with the period 2007-2011.

The continued poor eutrophication status can partly be explained by a time lag between the reduction of nutrient input and response in eutrophication indicators; predictions shows that it can take up to 100 years to reach the threshold values for dissolved inorganic nitrogen and phosphorus after the MAI has been reached. Improvements in water quality are however expected much earlier. Already ten years after reaching the targets the risk for cyanobacterial blooms is predicted to decrease (HELCOM 2013g).

The release of phosphorus from anoxic sediments to the water column also influences the availability of nutrients in the water column. Over time the excess input of phosphorus from land has become 'buried' in sediments, mainly in the form of organic phosphorus. If surface sediments are

[6] Note that PLC and MAI are based on 7 larger sub-basins: Bothnian Bay, Bothnian Sea, Baltic Proper, Gulf of Finland, Gulf of Riga, Danish Straits, Kattegat

oxygenated, the organic phosphorus is remineralized by microbes and a significant amount of phosphorus is stored with insoluble iron oxides. When there is little or no oxygen, these compounds become dissolved and phosphorus is released into the water column (Carstensen et al. 2014).

However, albeit the expected time-lag in reaching good status in terms of eutrophication and possible counteracting effects of internal load of phosphorus, it remains that MAI is not yet achieved for several sub-basins. As not all HELCOM actions to mitigate eutrophication have been implemented by all countries there is still reduction potential for input of nutrients, for example from agriculture and wastewater treatment plants, for several countries.

The recent advancement on HELCOM actions related to maritime activities will also contribute to reduced nutrient input to some extent. In regard to the recent establishment of the Baltic Sea as NECA area, estimates by the European Monitoring and Evaluation Programme (EMEP), compared to a non-NECA scenario, show that the reduction in annual total nitrogen deposition to the Baltic Sea region will be 22,000 tonnes as a combined effect of the Baltic Sea and North Sea NECAs. Out of this total anticipated reduction in nitrogen deposition, 7,000 tonnes annually is estimated to be reduced from direct deposition to the Baltic Sea surface and the remaining 15,000 tonnes is estimated to be decreased from deposition to the terrestrial areas draining to the Baltic Sea. An undetermined share of the latter will end up to the Baltic Sea. Various aspects of implementation of the Baltic NECA should be followed up such as if the expected reduction is achieved and not counteracted by any other additional discharges of nutrients from ships. The adoption of the ban on discharges of sewage from passenger ships is expected to reduce nutrient inputs in the order of 30 tonnes phosphorus and 100 tonnes nitrogen annually by implementing this measure for cruise ships alone.

In the preparation of programme of measures (PoMs) under the MSFD Finland and Sweden, as presented in this section, evaluated the impact of current measures and need for additional measures to reach the HELCOM CART and good status in terms of eutrophication by 2020/2021. Such quantitative analyses of effectiveness of nutrient reduction programmes are, however, missing for most countries.

2.2 HAZARDOUS SUBSTANCES

HELCOM agreements

Hazardous substances are addressed in the Helsinki Convention through its Article 5 and Annex I on '**Harmful Substances**', Part I of Annex III '**Criteria and measures concerning the prevention of pollution from land-based sources**', Annex VI '**Prevention of Pollution from offshore activities**', and Annex VII Regulation 3 on **surveillance of illegal oil spills**.

The goal of the Baltic Sea Action Plan (BSAP) segment on Hazardous substances is to reach a '**Baltic Sea undisturbed by hazardous substances'**. HELCOM countries have also agreed on an 'Action Plan for the protection of the environment from offshore platforms'.

The actions to reduce input of hazardous substances reflected in this section stem from the BSAP and HELCOM Ministerial Declarations 2010 and 2013 (Figure 2.2.1). The majority of joint actions have been accomplished, both related to accidental pollution by shipping and input of hazardous substances, while half of the actions that are implemented nationally have been accomplished by all countries (Figure 2.2.2).

Hazardous substances are also addressed through the many HELCOM Recommendations on this topic (Table 2.2.1). The implementation of some of these Recommendations that have been recently reported is presented in this section (see Table 2.2.4).

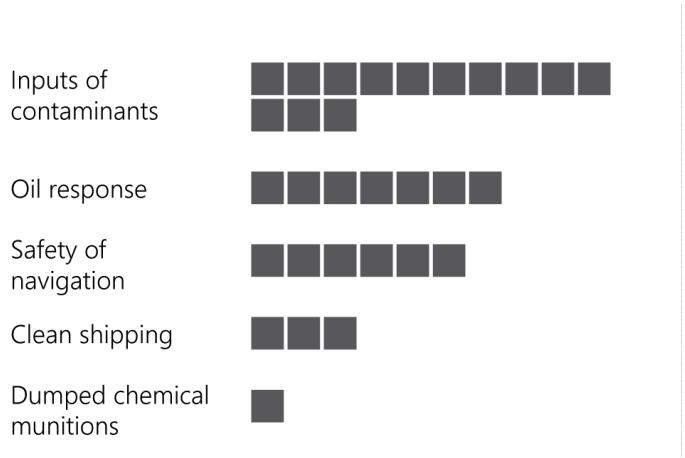


Figure 2.2.1. Number of HELCOM actions to reduce contamination by hazardous substances, joint and national, related to specific topics and sources of pollution.

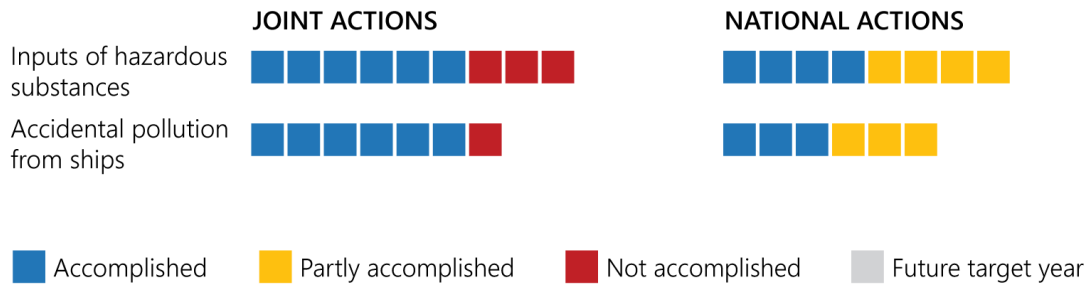


Figure 2.2.2. Accomplishment of HELCOM actions on hazardous substances related to measures and management coordination. Each block represents one action. For explanation to how the assessment is done see Introduction, Box 1.

Link to SDG targets

14.1: By 2025 prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international framework, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
6.3: By 2030 improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and material, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

Table 2.2.1. HELCOM Recommendations contributing to reduction of input of hazardous substances and accidental pollution from ships, agreed or amended by HELCOM after 2007.

Reducing the input of hazardous substances
18-2, Offshore activities
26/3, Monitoring of radioactive substances
28E-8, Environmentally friendly practices for the reduction and prevention of emissions of dioxins and other hazardous substances from small-scale combustion
29-1, Reduction of emissions from crematoria
31E-1, Implementing HELCOM's objective for hazardous substances
31E-2, Batteries and accumulators and waste batteries and accumulators containing mercury, cadmium or lead
31E-3, Cadmium in fertilizers
31E-4, Proper handling of waste/landfilling
36-2, Management of dredged material
Prevention of accidental pollution from ships
25-5, Assessment of the need for escort towing in tanker transport routes to prevent accidents in the Baltic Sea area
28-2, Recording of fuel oil bunkering operations in the oil record book and documentation for the use of reception facilities
28-3, Guidelines on bunkering operations and ship to ship cargo transfer of oils, subject to Annex I of MARPOL 73/78, in the Baltic Sea area
28-11, Further measures to improve the safety of navigation in ice conditions in the Baltic Sea
31E-5, Mutual plan for places of refuge in the Baltic Sea area
33-1, Unified interpretation in relation to access to and use of HELCOM AIS
34E-2, Further testing and developing the concept of pro-active route planning as well as other e-navigation solutions to enhance safety of navigation and protection of the marine environment in the Baltic Sea Region
Response to pollution incidents
36-3, Marine pollution incident reporting and requests for assistance between Contracting Parties in the Baltic Sea area
34E-4, Airborne surveillance with remote sensing equipment in the Baltic Sea Area

31E-6, Integrated wildlife response planning in the Baltic Sea area
33-3, Reporting on incidents involving harmful substances and emergency dumping
33-2, Co-operation in response to spillages of oil and other harmful substances on the shore
31-1, Development of national ability to respond to spillages of oil and other harmful substances
28-2, Recommendation concerning recording of fuel oil bunkering operations in the oil record book and documentation for the use of reception facilities
24-9, Ensuring adequate emergency capacity
31E-5, Mutual plan for places of refuge in the Baltic Sea area
28E-12, Strengthening of sub-regional cooperation in response field
23-2, Co-operation and assistance to Estonia, Latvia, Lithuania and Russia in the field of combatting marine pollution incidents actions, Restricted use of chemical agents and other non-mechanical means in oil combatting operations in the Baltic Sea
20-5, Minimum ability to respond to oil spillages in oil terminals
19-17, Measures in order to combat pollution from offshore units
17-12, Measures to abate pollution by oil and other harmful substances in cases of grounding, collision, sinking of a ship or other maritime casualty
12-7, Special cooperation in case of a chemical tanker accident in the Baltic Sea

Status and trends

The HELCOM core indicators on hazardous substances cover a subset of 12 substance groups that have been identified of specific concern to the Baltic Sea (HELCOM 2007) and that are regularly monitored. The integrated assessment of hazardous substances indicates that the pressure from contaminants is high in all parts of the Baltic Sea, mainly because the concentrations of polybrominated diphenyl ethers (PBDE) and mercury in fish fail to achieve the threshold values, as well as cesium-137 in seawater (Figure 2.2.3) (HELCOM 2017n).

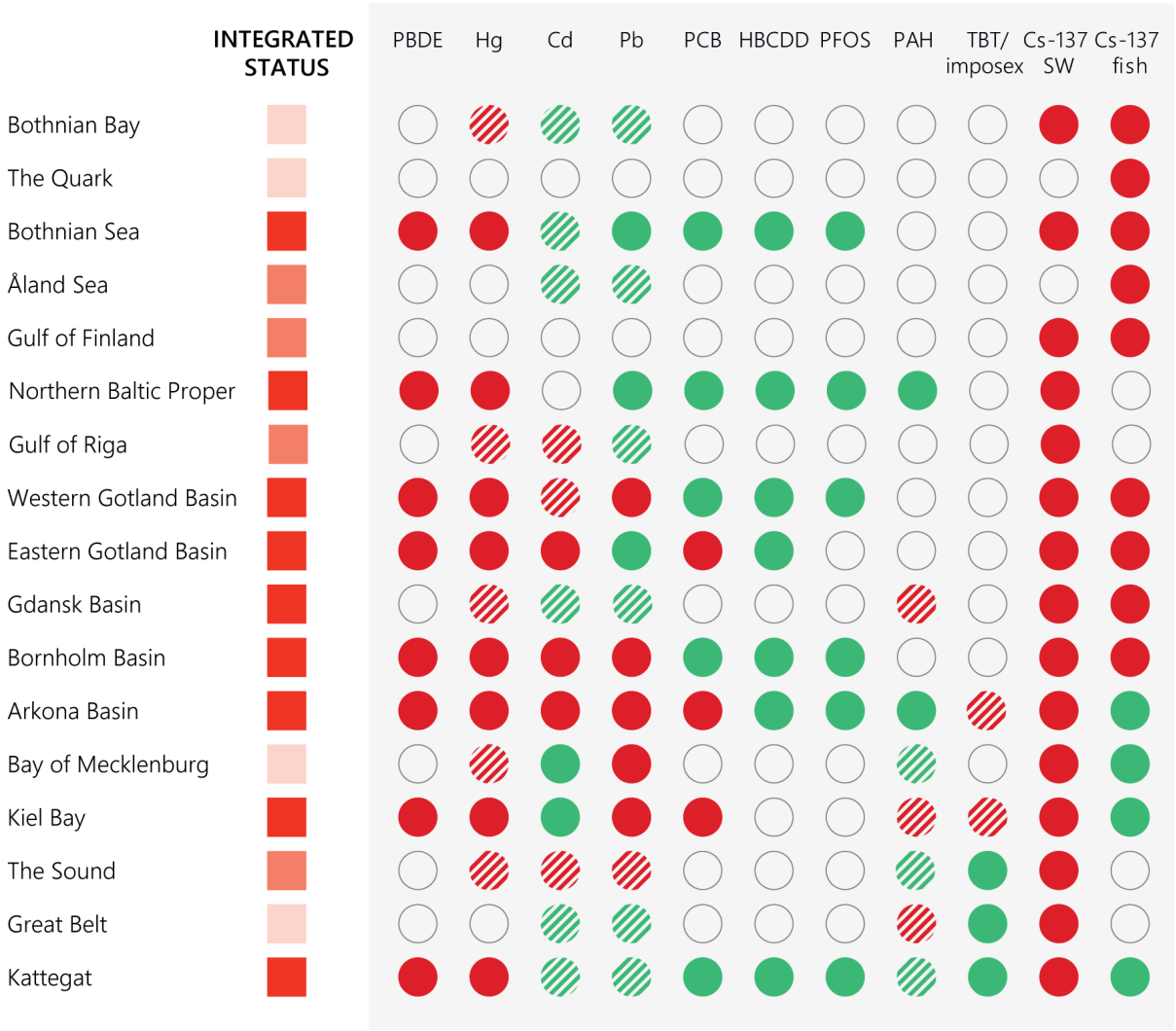


Figure 2.2.3. Results of the integrated assessment of contamination status and of individual hazardous substance core indicators. The integrated status is given in three shades of red that all represent an inadequate contamination status. The lightest shade of red is closest to good status. Core indicator results are given as achieving the threshold value (green) or failing the threshold value (red). Filled circles represent data series of 3 years or more and are considered as representative of a 'full' indicator assessment. Striped circles represent data series of 1-2 years and are only used in the assessment of integrated contamination status. An empty circle represents areas where the assessment was not carried out due to lack of data.

Abbreviations: PBDE= polybrominated diphenyl ethers, Hg=Mercury, Cd=Cadmium, Pb=Lead, PCB= polychlorinated biphenyls, HBCDD=hexabromocyclododecane, PFOS=Perfluorooctane sulphonate, PAH=polyaromatic hydrocarbons, TBT=tributyltin, Cs-137=Cesium 137, SW=seawater

Assessment of trends for the more than 400 sampling time series shows an upward trend (deteriorating condition) in 11 instances, and a downward trend (improving condition) in 62 instances across the substances included in the assessment. In the remaining areas the concentrations show no significant trends (see Figure 2.2.4).

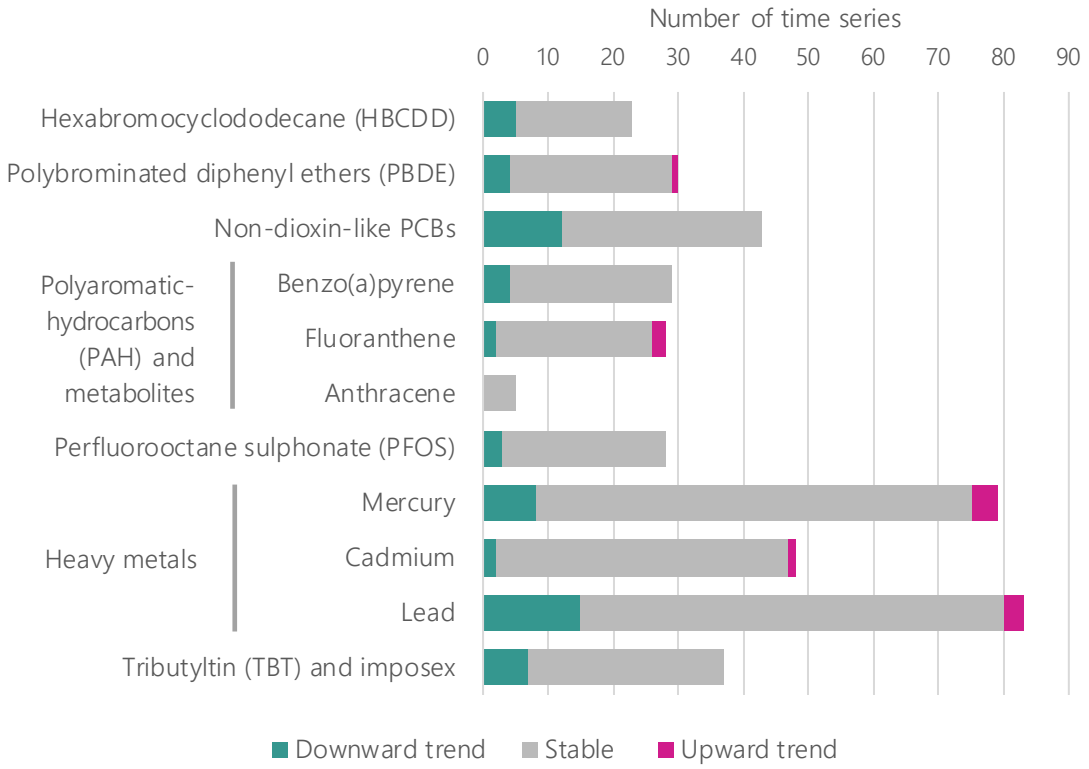


Figure 2.2.4. Trends in the hazardous substances groups, shown as counts of time series assessed at the monitoring stations. Trend analyses are not available for Cs-137.

The concentrations of radionuclides are achieving the threshold value when measured in fish in the Arkona Basin, Bay of Mecklenburg, Kiel Bay and the Kattegat, but are failing to meet the threshold value in all sub-basins when measured in seawater. Due to the steady half-life of radioactive decay it is, however, expected that concentrations will drop below the threshold value in biota and water in all sub-basins of the Baltic Sea by 2020 (HELCOM 2017ab).

In addition to the core indicators on hazardous substances, illegal oil spills have been monitored using aerial surveillance since 1988 in the Baltic Sea area. The threshold values for oil spills are set based on the volumes of oil spills into each sub-basin during the reference period 2008–2013, when the estimated volume of oil spills was at a historically low level. In the period 2011-2015 oil spills failed to achieve the threshold value in the Bothnian Bay, the Quark, Bothnian Sea, Åland Sea, Eastern Gotland Basin, Kiel Bay and the Great Belt. The estimated volume of detected oil spills in the Baltic Sea has, however, decreased from peak observation of more than 1000 m^3 in late 1980s to less than 10 m^3 per year in recent years (HELCOM 2017u). The size of single spills is also showing a decreasing trend.

The main pathway of pharmaceuticals into the marine environment is via Municipal Waste Water Treatment Plant (MWWTP) effluents with roughly 1.8 thousand tons of pharmaceutical residues being released to the Baltic Sea per year. There is no core indicator or regular monitoring of pharmaceuticals on a Baltic-wide scale. A recent HELCOM report that summarizes information on

pharmaceuticals in the Baltic Sea showed that in the period 2002 to 2013, pharmaceuticals were detected in about 14 % of the tested water, sediment and biota samples. Diclofenac was one of the most frequently detected substances and it failed the preliminary maximum acceptable detection limit proposed by the EU[7] in 2% of the samples. However, measurements of pharmaceuticals in the Baltic Sea so far have in many cases been made with analytical methods that are not sensitive enough to detect the substance at levels that may have a negative impact and thus, the problem may be underestimated (UNESCO and HELCOM 2017).

Trends in input of hazardous substances

Annual total atmospheric deposition fluxes of heavy metals[8] to the surface of the Baltic Sea decreased in the period 1990-2015 by 63% for cadmium, 34% for mercury, and 80% for lead. The highest level of deposition fluxes over the Baltic Sea in 2015 were noted over the Belt Sea, the Kattegat, and the Sound. The contribution from HELCOM countries to the deposition over the Baltic Sea in 2015 was 36% for cadmium, 14% for mercury, and 30% for lead (2017g).

Annual atmospheric deposition fluxes of Polychlorinated dibenzodioxins and dibenzofurans (PCDD/Fs) over the Baltic Sea have decreased in the period from 1990 to 2015 by 67%. The most significant decrease of PCDD/F atmospheric deposition was noted for the Sound (76%) and the Western Baltic sub-basins (74%). Atmospheric deposition of Benzo(a)pyrene, PBDE and polychlorinated biphenyl (PCB) is available from 1990-2014. Both PBDE and PCB show a steady decrease, while benzo(a)pyrene shows a decrease during the first ten years of the time series and has thereafter remained at stable levels (HELCOM 2017f).

Information on waterborne input of heavy metals will become available in 2018 as part of HELCOM Sixth Baltic Sea Pollution Load Compilation (PLC-6).

Implementation of HELCOM actions on the prevention of input of hazardous substances

Joint actions

HELCOM work on hazardous substances is guided by the many HELCOM Recommendations related to practices and management to minimize the negative impacts of handling of hazardous substances. Several of the agreements in the BSAP and Ministerial Declarations in 2010 and 2013 are also focused on keeping the HELCOM Recommendations on hazardous substances up to date (Table 2.2.2). In 2010 HELCOM adopted an updated Recommendation on "**Implementing HELCOM's Objective for Hazardous Substances**" superseding Recommendation 19/5. It is on the work plan for the HELCOM Pressure Working Group to once more review and revise this Recommendation as well as HELCOM Recommendation 24/4 on 'Reduction of Emissions and Discharges from the Iron and Steel Industry'.

Micropollutants have been identified as an emerging problem and in 2016 a new HELCOM action was agreed for consideration on 'Micropollutants in effluents from wastewater treatment plants' (HELCOM 2016b). The implementation of the action is ongoing and includes a compilation of the information on micropollutants of high concern and advanced waste water treatment techniques, and preparation of a summary report on treatment techniques. Collation and compilation of data on

[7] Pharmaceuticals considered to be of special concern to the aquatic environment have been included on a 'watch list' under the EU Directive regarding priority substances in the field of water policy, and maximum acceptable detection limits have been proposed (European Commission2013).

[8] Annual atmospheric deposition fluxes of PCDD/Fs were obtained using the latest version of MSCE-POP model developed at EMEP/MSC-E (Gusev et al., 2005).

concentrations of these substances in MWWTP effluents as well as on advanced waste water treatment techniques has been initiated and will be ongoing through 2018.

Table 2.2.2. Accomplishment of joint actions to reduce input of hazardous substances related to measures and management coordination. Blue=accomplished, Red= not accomplished. Target year is indicated for actions that are not accomplished.

Action
Update of requirements of HELCOM Strategy for hazardous substances (HELCOM Recommendation 19/5)
Update of HELCOM requirements concerning proper handling of waste/landfilling (HELCOM Recommendation 24/5)
To assess the possibility of introducing restrictions on cadmium content in fertilisers*
Strictly control the dredging and disposal of sediments when revising the HELCOM Guidelines for disposal of dredged spoils
Establish an ad hoc HELCOM Expert Group on dumped chemical munitions in the Baltic Sea
Joint submissions to IMO to tighten regulations concerning SOx emissions from ships within the revision of Annex VI to MARPOL 73/78
Update of HELCOM requirements for iron/steel industry (HELCOM Recommendation 24/4) (Target year: not specified)
Enhance co-operation between Paris MoU (Memorandum of Understanding) and HELCOM by applying for advisor status of HELCOM to Paris MoU on Port State Control (Target year: not specified)
Update the Action Plan for the protection of the environment from offshore platforms; put into practice the “zero-discharge” principle for all chemicals and substances used and produced during the operation of offshore platforms (Target year: 2013)

*Assessed as accomplished in 2013. Results of a more recent follow-up of Recommendation 31E/3 ‘Cadmium in fertilizers’ is presented below.

National actions

The majority of countries have developed **National programmes to eliminate hazardous substances.** The programmes are linked to national legislation and international agreements and for EU Member States to the implementation of the WFD and other EU Directives related to the reduction of hazardous substances (Table 2.2.3).

Table 2.2.3. Accomplishment of national actions to reduce input of hazardous substances related to measures and management coordination. Blue=accomplished by all countries, Orange=partly accomplished. 'Status' indicates the number of countries that have implemented the action.

Action	Status
Introduction of ban on the use, production and marketing of endosulfan, pentabromodiphenylether (pentaBDE) and octabromodiphenylether (octaBDE)	
Implementation of the Globally Harmonised System (GHS) on classification and labelling of chemicals and to take into account guidelines for preparing safety data sheets	
Ratification of the Stockholm POPs Convention	
Ratification of the AFS Convention (International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2009)	
National programmes to eliminate hazardous substances	6 / 9
Evaluation of effectiveness of national programmes to eliminate hazardous substance	5 / 9
Ratification of the UNEP 2013 Minamata Convention on Mercury	7 / 9
Develop specific efficiency requirements and emission limit values for small scale combustion appliances in relation to HELCOM Recommendation 28E-8	3 / 9

The **UNEP Minamata Convention on mercury** entered into force in August 2017 and has so far been ratified by seven HELCOM countries.

While joint **development of specific efficiency requirements and emission limit values for small scale combustion appliances** has not taken place in HELCOM, measures in this regard have been taken by several countries. Denmark has a number of regulations covering air quality including emission limit values from small scale combustion appliances. National regulations on emission limit for small scale combustion appliances are also in place in Germany, Latvia and Sweden. In Poland an amendment to the Environmental Protection Law Act allows local governments to adopt their own local air quality regulations. In addition, several measures to mitigate emission from combustion appliances have been taken. In Finland low-emission combustion appliances have been introduced to the market and several information campaigns have been conducted regarding small scale wood combustion. In Germany, a market incentive program for renewable energies has been launched, including subsidies for low emission wood pellet boilers and pellet stoves.

The follow-up of HELCOM Recommendations carried out in 2017 shows that the implementation of a number of HELCOM Recommendations on hazardous substances is partly accomplished (Table 2.2.4) (HELCOM 2017y).

Table 2.2.4. Country reporting on the implementation of HELCOM Recommendations related to reducing the input of hazardous substances. 'Status' indicates the number of countries that have implemented the Recommendation. More detailed information on the implementation of specific paragraphs is available in HELCOM 2017y.

Recommendation	Status
29-1, Reduction of emissions from crematoria	3 / 9
31E-1, Implementing HELCOM's objective for hazardous substances	6 / 9
31E-2, Batteries and accumulators and waste batteries and accumulators containing mercury, cadmium or lead	3 / 9
31E-3, Cadmium in fertilizers	7 / 9
31E-4, Proper handling of waste/landfilling	4 / 9

Implementation of HELCOM actions related to accidental pollution from maritime activities

Joint actions

Joint actions to minimize accidental pollution from maritime activities have focused on promoting safe navigation systems for ships entering the Baltic Sea and the majority of these joint actions have been accomplished (Table 2.2.5).

The need to **revise the HELCOM RESPONSE Manual Volume II on HNS spills** dating from 2001 was highlighted at the HELCOM Ministerial Meeting 2013 in Copenhagen. Work has been initiated in 2014 but due to the challenging topic, in combination with lack of dedicated resources, the activity was put on hold by the HELCOM RESPONSE WG in June 2017 until substantial project funding is secured. During the cooperation between European regional spill response organisations the revision has also been recently highlighted as an activity which should preferably be carried out as a joint initiative by all the regional response organisations in Europe – all of which have faced the same challenges as HELCOM with this issue (Table 2.2.5).

Table 2.2.5. Accomplishment of joint actions on accidental pollution from maritime activities related to measures and management coordination. Blue=accomplished. Red=not accomplished. Target year is indicated for actions that are not accomplished.

Action
Strengthen the work on OWR (Oiled Wildlife Response) through a targeted expert working group and by enhancing co-operation with NGOs and the private sector
Develop and agree on a decision support system for use of dispersants
Consider joint submission to IMO to introduce the necessary modification of Automatic Identification System (AIS)
Agree on amended HELCOM Agreement on Access to AIS (Automatic Identification System) Information
Cooperation in investigation of the potential for DGNSS (Differential Global Navigation Satellite Systems) broadcast via AIS (Automatic Identification System) base stations
Further develop the online Mariners' Routeing Guide Baltic Sea
Update HELCOM Manual on Co-operation in Combatting Marine Pollution Volume II, focusing on response to accidents at sea involving spills of hazardous substances and loss of packaged dangerous goods (Target year: 2016)

National actions

HELCOM has already cooperated in response at sea activities for four decades. Response on shore and oiled wildlife response are newer topics first introduced in HELCOM BSAP in 2007. Already agreed HELCOM actions have helped to promote response on shore and oiled wildlife response in the Baltic Sea region. Some HELCOM Contracting Parties have **integrated both shoreline and oiled wildlife response into national, regional or local contingency plans**. For example in Germany, shoreline response is part of contingency planning and there are regional plans for oiled wildlife response. Also Denmark has integrated shoreline and oiled wildlife response into contingency planning. In some countries, the work is still ongoing, for example Poland is currently preparing the national oiled wildlife response plan (Table 2.2.6).

Table 2.2.6. Accomplishment of national actions related to accidental pollution from maritime activities related to measures and management coordination. Blue=accomplished by all countries. Orange=partly accomplished. 'Status' indicates the number of countries that have implemented the action.

Action	Status
Develop and implement a mutual plan for places of refuge (PoR) and further investigate issues of liability and compensation related to a mutual plan on PoR	
Measures to improve safety of navigation (HELCOM Recommendation 28E/11): trained crew in ice navigation- voluntary pilotage	
Revise the Baltic Sea Re-survey Scheme and extend its scope to cover all routes and other areas used for navigation according to the 2009 Baltic Sea Hydrographic Commission Vision; present the national re-survey plans	
Based upon sensitivity mapping, to identify the need for and to finalise the quantification of countermeasures for shoreline response, and to prepare concrete plans/programmes for fulfilling them by 2013	5 / 9
Integrate shoreline response into national contingency plans and conduct trainings and organize exchange programmes	5 / 9
Integrate the subject of oiled wildlife response into oil pollution contingency plans either on a national or sub-national/local level	5 / 9

Reflection on actions

The high contamination score in the Baltic Sea, reflected in the results of the integrated assessment of core indicators on hazardous substances, is mainly caused by the concentrations of polybrominated diphenyl ethers (PBDE) and mercury in fish, and Cesium-137 in seawater. In all cases there are, however, positive signs of decreasing input of hazardous substances or improvement in the Baltic Sea.

PBDEs have mainly been used as flame retardants in plastic materials and polyurethane foams and enter the Baltic Sea through waste water treatment plants and diffuse sources. The use of polybrominated diphenyl ethers as a flame retardant has been banned in most products in Europe since 2004 and the atmospheric deposition of PBDE has decreased since the beginning of the 1990s.

A main source of heavy metals is burning of fossil fuels, which enter the Baltic Sea through atmospheric deposition. The atmospheric deposition of cadmium, mercury and lead to the Baltic Sea has decreased since the 1990s and also waterborne input is decreasing. Still, mercury fails to reach the threshold values and in some areas also cadmium and lead. In this context it can be noted that the UNEP Minamata Convention on mercury has not been ratified by all HELCOM countries yet.

The concentration of Cesium-137 in seawater and fish is expected to reach pre-Chernobyl levels by 2020. Overall, the concentration of many hazardous substances shows no significant trend in the Baltic Sea.

As for all indicators, the outcome of the hazardous substance assessment is dependent on the agreed threshold values for core indicators. For hazardous substances it can be noted that the agreed threshold values deviate from the initial proposals made by HELCOM experts, in some cases substantially (HELCOM 2015b). The initial proposals by experts were based on the view that for environmental assessments, threshold values based on secondary poisoning in the marine environment would be the most suitable. However, HELCOM agreed to use limit values derived from the EU EQS directive (2013/39/EU), although some of these values have been defined from the point of view of protection of human health and not for ecosystem components. In particular the EQS for PBDE[9] is considered as very low (HELCOM 2017z).

After the ban of TBT as an active antifouling agent, replacement antifouling paints have been identified as an important source of copper in the marine environment. However, the trends are difficult to follow as copper is not a priority substance for HELCOM regional monitoring and assessment.

Several countries have reported that the effectiveness of national programmes to eliminate hazardous substances has been evaluated. There is, however, no translation or regional compilation of these national evaluations.

[9] defined for biota and from human health perspective

2.3 MARINE LITTER

HELCOM agreements

Marine litter is implicitly covered by Articles 6 on '**Prevention of pollution from land-based sources**' and 8 on '**Prevention of pollution from ships**' of the Helsinki Convention.

The marine litter topic was introduced in the Baltic Sea Action Plan (BSAP) (HELCOM 2007) and was addressed already a decade ago by two HELCOM recommendations: Recommendation 29/2 'Marine Litter within the Baltic Sea Region' (adopted 2008) and Recommendation 28E/10 on the 'Application of the no-special-fee system to Ship-Generated Wastes and Marine Litter Caught in Fishing Nets in the Baltic Sea Area' (adopted 2007). Recommendation 29/2 concerns the monitoring of beach litter while 28 E/10 includes the recommendation that marine litter caught in fishing nets should be considered under the "no-special-fee" system, meaning that no extra fee is charged for delivering such litter to port reception facilities.

There are only two HELCOM actions related to measures and management coordination of marine litter, one of which has been achieved. In 2016, HELCOM agreed on a Regional Action Plan on Marine Litter (RAP ML), adopted as HELCOM Recommendation 36/1. The current implementation of the RAP ML is briefly presented here.

Link to SDG targets

14.1: By 2025 prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

Status and trends

Indicators to assess the presence of beach litter, litter on the seafloor, and microlitter in the water column are under development in HELCOM but not yet operational or approved as HELCOM core indicators.

The 'State of the Baltic Sea' report presents information on the amounts of marine litter found on beaches in the Baltic Sea region. The information stems from regular monitoring activities which are carried out by most HELCOM countries. Available data shows that in the most contaminated beaches, up to 160 litter items can be found per 100 m beach with plastics being the overwhelmingly most common litter material (HELCOM 2017n).

Implementation of HELCOM actions to reduce input of marine litter

At the 2013 HELCOM Ministerial Meeting work on marine litter was stepped up through the agreement to develop a **Regional Action Plan on Marine Litter (RAP ML)** (Table 2.3.1). The RAP ML was jointly developed and agreed in 2015 as HELCOM Recommendation 36/1. The action plan commits the Contracting Parties, i.a., to achieve a significant reduction of marine litter by 2025 compared to 2015.

To meet the goal of a significant reduction of the input of and existing marine litter in the Baltic Sea, 30 joint actions were agreed as part of the RAP ML as well as a number of voluntary national actions. The joint actions are to be developed by the Contracting Parties through a lead country approach and

assisted by relevant HELCOM subsidiary bodies. To date, two actions related to land-based sources have been achieved (see Table 2.3.2), six have been initiated, while for seven there is yet no identified lead country or process to implement the action. The joint actions related to land-based sources that have been initiated include, e.g., to make an inventory of techniques to reduce the release of micro particles from waste water treatment plants.

Table 2.3.1. Accomplishment of joint actions to coordinate measures and management of marine litter. Blue=accomplished, Orange=partly accomplished (ongoing activity).

Action
Develop a regional action plan on marine litter
Develop common indicators and associated targets related to quantities, composition, of marine litter, including riverine inputs

Table 2.3.2. Joint actions achieved related to land-based sources of marine litter agreed through RAP ML (Outcome HELCOM WS RAP ML 2-2017).

Action	RAP ML code
An inventory of refund systems for bottles, containers and cans (glass, plastic, aluminium) – refund systems are currently in place in six HELCOM countries.	11
An inventory of landfills which may pose a tentative risk of release of litter to the Baltic Sea indicates that landfills are under control in the region and cannot be considered as sources of marine litter	14

As regards joint actions related to sea-based sources, seven have been initiated, including to identify best practices to remove and reduce input of abandoned, lost or otherwise discarded fishing gear (ALDFG), while for five actions there is no lead country or process to implement the action. In the field of education and outreach, none of the three joint actions from the RAP ML have been initiated.

At the 2017 UN SDG Ocean Conference several HELCOM countries made voluntary commitments that will contribute to reduction of marine litter in the Baltic Sea, including through information campaigns (Denmark), improving waste management system for litter in ports (Estonia) and banning microbeads in cosmetics (Finland and Sweden) (see Annex 1, Voluntary commitments SDG14).

Other HELCOM activities related to marine litter

To support the follow-up of indicators under development and the implementation of actions, HELCOM is currently revising the monitoring guidelines on beach litter and defining a preliminary baseline for beach litter from which the reduction target agreed in the RAP ML can be evaluated. Data available covering the time period either 2012 to 2016 or 2015 to 2016 for eight countries has been compiled as an outcome of the HELCOM coordinated, EU co-funded, SPICE project (2017) giving an indication of the spatial distribution of marine beach litter along the Baltic Sea coastlines (HELCOM 2017ac). This project has also provided an analysis of amounts of marine litter recorded in trawl hauls under the Baltic international trawl surveys (BITS) monitoring programme, during the years 2012-2016, including an analysis of trends at sub-basins level (HELCOM 2017q). An overview of the present activities on microlitter in the Baltic Sea has, furthermore, been prepared (HELCOM 2017ad).

There are several HELCOM Recommendations related to waste water management that are relevant to revise so that they also consider microlitter, e.g. Recommendations 23/5 on 'Reduction of

discharges from urban areas by the proper management of storm water systems', 28E/5 on 'Municipal wastewater treatment' and 28E/6 on 'On-site wastewater treatment of single family homes, small businesses and settlements up to 300 person equivalents (P.E.)'. Such revisions, however, need to await more knowledge on measures to reduce microlitter in storm water and wastewater discharges.

2.4 UNDERWATER SOUND

HELCOM agreements

Underwater sound is a relatively new focal area in HELCOM and there are no HELCOM actions related to mitigation measures or management of underwater sound. At the 2013 HELCOM Ministerial Meeting it was agreed on the objective that "**the level of ambient and distribution of impulsive sounds in the Baltic Sea should not have negative impact on marine life and that human activities that are assessed to result in negative impacts on marine life should be carried out only if relevant mitigation measures are in place**".

Shipping is one source of human introduction of underwater sounds and thus, the BSAP goal on "Environmentally friendly maritime activities' is applicable. Other examples of sources of human introduced sound are underwater construction work and explosions, as well as deliberate use of echo-sounders, sonars and seismic airguns, which are not directly covered by specific HELCOM agreements.

The 2013 HELCOM Ministerial Declaration agreed on a number of steps to enhance the knowledge on extent and impacts of underwater sound in the Baltic Sea that were to be implemented through the HELCOM 'Regional Baltic Underwater Noise Roadmap' in 2015-2017. The current status of implementation of the knowledge and data related actions is briefly presented here (see also Annex 3).

Status and trends

Two indicators on underwater sound are under development but not yet operational or agreed as HELCOM core indicators: 'Continuous low frequency anthropogenic sound' and 'Distribution in time and space of loud low- and mid-frequency impulsive sound'.

Harbour porpoise and seals are species that are likely to be especially affected by human generated sound and Baltic fish species also hear and produce sound at low frequencies (i.e. sprat, cod and herring). There is, however, no indicator based assessment on how underwater sound in the Baltic Sea may affect the noise sensitive populations.

Implementation of HELCOM actions related to knowledge and data on underwater sound

Joint actions

Mapping the levels of ambient underwater sound across the Baltic Sea was accomplished in 2014 through the Life+ project 'Baltic Sea Information on the Acoustic Soundscape' (BIAS) (Folegot et al. 2016). The data were used to develop modelled soundscape maps which show the spatial and temporal distribution of continuous sound in different frequency bands across the Baltic Sea (Annex 3).

In 2016, HELCOM and OSPAR established a joint **register for the occurrence of impulsive sound**s. Countries have agreed to report the occurrence of activities associated with loud impulsive sounds, such as sonar events, airguns and underwater explosions and pile driving.

The agreement from the 2013 Ministerial Declaration to **establish a set of indicators including technical standards which may be used for monitoring ambient and impulsive underwater noise in the Baltic Sea** is in progress. The indicators are currently being developed with the aim to define threshold levels for underwater sound that are consistent with good status for the species that are affected by noise. A proposal for HELCOM monitoring guidelines for continuous noise, based on the technical standards developed by the BIAS project, as well as a proposal for a regional programme

for monitoring have been presented to and is under discussion by the HELCOM State and Conservation Working Group.

Other HELCOM activities related to underwater sound

In recent years HELCOM has established a knowledge base for further work on underwater sound in the Baltic Sea region. A priority list of noise sensitive species in the Baltic Sea[10] has been developed and a map of noise sensitive areas derived from biological data on noise sensitive species has been developed. The results will be published as a HELCOM BSEP in 2018.

An inventory of noise mitigating measures already used in the Baltic Sea region has been compiled (HELCOM 2017l). The inventory shows that at least three countries are already implementing measures to reduce the impact of noise on the marine environment, i.a. exclusion of noise generating activities for a certain time period or from certain areas, restriction of anthropogenic underwater noise to a certain level, and use of noise reducing techniques.

[10] Harbour porpoise, harbour seal, ringed seal, grey seal, cod, herring and sprat.

2.5 NON-INDIGENOUS SPECIES

HELCOM agreements

Non-indigenous species are addressed through Article 15 of the Helsinki Convention, i.e. to take measures to conserve natural habitats and species. Measures to minimize the introduction of non-indigenous species from maritime activities is founded in Article 8 of the Convention, Annex VI '**Prevention of pollution from ships**'.

In the Baltic Sea Action Plan (BSAP) non-indigenous species are considered through the Biodiversity segment and the goal to reach a '**Favourable conservation status of Baltic Sea biodiversity**' as well as through the goal to reach '**Environmentally friendly maritime activities**', particularly the objective of 'no introductions of alien species from ships'.

HELCOM Recommendation 37/3 on 'Sustainable Aquaculture in the Baltic Sea region' (2016) highlights that management of marine and fresh water aquaculture should take into account the potential risks and impacts on the environment arising from the introduction of non-indigenous species.

Status and trends

The HELCOM core indicator 'Trends in arrival of non-indigenous species' assesses the number of new introductions to the Baltic Sea region during a six-year assessment period. For good status to be achieved there should be no primary introductions of non-indigenous species due to human activities during that period. Between the years 2011-2015 fourteen new non-indigenous species were reported in the Baltic Sea and thus, good status was not achieved (HELCOM 2017n).

A reconstruction of previous observations suggests that the rate of introduction of non-indigenous species has increased in recent decades (Ojaveer et al. 2016). The results may, however, be biased by an increasing monitoring effort.

Implementation of HELCOM actions to minimize introduction of non-indigenous species

Joint actions

HELCOM activities to reduce the number of introductions of non-indigenous species is aligned with the implementation of the International Convention for the Control and Management of Ships' Ballast Water and Sediments (IMO Ballast Water Management Convention, BWM Convention). Already accomplished joint actions include the **implementation of the HELCOM Ballast Water Road Map** (Table 2.5.1). A joint harmonised procedure for the Contracting Parties of OSPAR and HELCOM on the granting of exemptions under the BWM Convention was agreed in 2013 (HELCOM 2013c). In 2016 HELCOM, furthermore, agreed on a Regional Baltic Sea plan for harmonized ratification and implementation for the 2004 BWM Convention.

Table 2.5.1. Accomplishment of joint actions to reduce the introduction on non-indigenous species related to measures and management coordination. Blue=accomplished.

Action
Implementation of HELCOM Ballast Water Road Map - joining OSPAR to request vessels to conduct on a voluntary basis ballast water exchange before arriving at the OSPAR or HELCOM area and to undertake a similar initiative for vessels leaving the Baltic and transiting through the OSPAR area
Implementation of the HELCOM Ballast Water Road Map - develop criteria for unacceptable high risk scenarios and acceptable low risk scenarios to consider ballast water management options for Baltic Sea voyages
Apply the Guidance to distinguish between unacceptable high risk scenarios and acceptable low risk scenarios
Develop, based on an overview of the situation, a comprehensive regional Baltic Sea implementation plan for the IMO Ballast Water Management Convention

National actions

HELCOM countries have agreed to ratify the BWM Convention. The Convention entered into force 8 September 2017. The Convention is currently ratified by five HELCOM countries (Table 2.5.2).

Table 2.5.2. Accomplishment of national actions to reduce the introduction on non-indigenous species related to measures and management coordination. Orange=partly accomplished. 'Status' indicates the number of countries that have implemented the action.

Action	Status
Ratification of the Ballast Water Management Convention	5 / 9

Reflection on HELCOM actions

The HELCOM core indicator evaluates the successfulness of management to prevent new introductions through human activities. The assessment for the years 2011-2015 shows that non-indigenous species keep entering the Baltic Sea. The main vectors for introduction are shipping and aquaculture (HELCOM 2017n).

A new INTERREG Baltic Sea Region project COMPLETE (Completing management options in the Baltic Sea Region to reduce risk of invasive species introduction by shipping) will in 2017-2020 provide support to the implementation of the Regional Baltic Sea plan for harmonized ratification and implementation for the 2004 BWM Convention. The project also addresses biofouling as a source of ship-mediated introductions of alien species. A proposal for a common Baltic Sea Region biofouling management strategy will be developed. HELCOM participates in the project.

2.6 SPECIES REMOVAL BY FISHING

HELCOM agreements

The status of fish stocks and impacts from fishing on the marine ecosystem are addressed by Article 15 of the Helsinki Convention, i.e. the conservation of natural habitats and biological diversity, and through the commitment of the Baltic Sea Action Plan (BSAP) to reach a **'Favourable conservation status of Baltic Sea biodiversity'**. HELCOM Ministerial Declarations, furthermore, specify a number of actions related to fishing, including development of management plans for fish, mitigating incidental by-catch in fishing, and improving data collection related to fishing. One joint HELCOM action related to the management of fish and by-catch has been achieved while three of the actions implemented at the national level have been achieved by all HELCOM countries (Figure 2.6.1).

This section addresses HELCOM actions related to management measures for commercial fish stocks and measures to mitigate incidental by-catch of mammals and birds. Status of and conservation measures for migratory and coastal fish species are addressed in section 3.2, Fish.

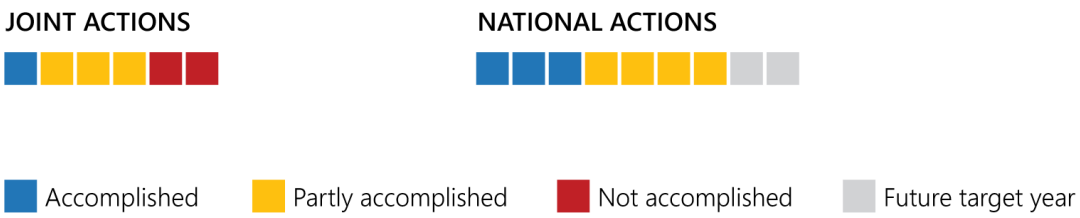


Figure 2.6.1. Accomplishment of HELCOM actions related to measures and management coordination of fish stocks, including by-catch. Each block represents one action. For explanation to how the assessment is done see Introduction, Box 1.

Link to SDG targets

14.4: By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stock in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics

14.6: By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported an unregulated fishing and refrain from introduction new such subsidies, recognizing that appropriate and effective species and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation

Status and trends of commercial fish stocks

The assessment of commercial fish stocks included in the 'State of the Baltic Sea' report is based on fishing mortality (F) and spawning stock biomass (SSB) in relation to reference points for maximum sustainable yield[11], and it is based on data available to the International Council for the Exploration of the Sea (ICES). For good status to be achieved, both parameters need to reach the reference points.

The assessment for the years 2011-2015 was carried out for eight out of twenty-two internationally managed stocks representing cod, plaice, sole, herring and sprat (Table 2.6.1).

Eastern Baltic cod was not assessed due to lack of quantitative biomass estimates and reference points in later years, but ICES advice from 2017 shows that the stock size indicator[12] decreased between 2011 and 2014, increased in 2015–2016, followed by a 45% decline in 2017 (ICES 2017c). The SSB for the Western cod has been below the reference and predominantly declining since 2008. The recruitment in 2017 is, however, estimated to be the highest since 2005 (ICES 2017b). There is currently no quantitative assessment for the age and size distribution of cod, however, the proportion of larger individuals of Eastern Baltic cod has declined sharply since 2013 (HELCOM 2017n).

For Baltic Sea sprat the stock size is above the reference point and the SSB has increased in recent years due to a strong year class in 2014 (ICES 2017d). Fishing mortality (F) has declined in recent years and was in 2016 assessed as below F_{MSY}.

The status of salmon and seatrout, based on HELCOM core indicators, and the status of eel are presented in section 3.2 on Fish.

Table 2.6.1. Status of commercial fish stocks. The assessment of mortality (F) and spawning stock biomass (SSB) is presented as achieving the reference points (green) or failing the reference points (red). Empty cells represent areas where the assessment was not carried out.

Name	Assessment area (ICES Sub-division)	F	SSB
Cod	Western Baltic Sea (22–24)		
	Eastern Baltic Sea (25–32)		
Plaice	Kattegat, Belt Sea, Sound (21–23)		
	Baltic Sea excl. Sound and Belt Sea (24–32)		
Sole	Skagerrak and Kattegat, W Baltic Sea (3a, 22–24)		
Herring	Central Baltic Sea, excl. Gulf of Riga (25–29, 32)		
	Gulf of Riga (28.1)		
	Bothnian Sea (30)		
	Bothnian Bay (31)		
	Spring spawners, Skagerrak, Kattegat, W Baltic (20-24)		
Sprat	Baltic Sea (22-32)		

[11] the reference points are F_{MSY} and MSY B-trigger respectively. F_{MSY} represents the level of fishing mortality estimated to deliver the long-term maximum sustainable yield

[12] Stock size indicator: combined biomass index, in kg per hour, of cod ≥ 30 cm, from the Baltic International Trawl Survey (BITS) in quarters 1 and 4 in subdivisions 25–28.

Implementation of HELCOM actions related to management of exploited populations

Joint actions

HELCOM joint actions in relation to fishing are mainly aimed at supporting management coordination. Through data calls for VMS data and advice developed by ICES **aggregated data on fishing activities** have been made available for use in HELCOM in the assessment of human activities in MPAs, maritime spatial planning, as well as for use in the assessment of impact of pressure in the 'State of the Baltic Sea' report. In 2017 new datasets for the years 2009-2016 were made available, including additional map products with more detailed grouping by gear type compared to the previous information (HELCOM Data and Map service) (Table 2.6.2).

A **tool for mapping negative impacts from fishing** gear was developed in 2016 through the HELCOM coordinated, EU co-financed BalticBOOST project (HELCOM 2017k). The tool calculates the pressure arising from fishing activities with bottom-contacting gear and assesses the impact on the seafloor based on the longevity (life-span) distribution of benthic communities. Test cases using the tool were prepared as part of the project.

Testing and use of tools for implementing sustainable fishing methods and practices into MPA management plans are on the work plan for the HELCOM Fish Group.

Table 2.6.2. Accomplishment of joint actions related to fishing management coordination.
Blue=accomplished, Orange=partly accomplished (the action has been initiated), Red=not accomplished (no activity ongoing).

Action
A joint submission by EU Member States to the 2012 review of EU Common Fisheries Policy
Continue to work to develop common procedures to facilitate the sharing of aggregated data on fisheries activities in the Baltic Sea in an applicable format for the purpose of assessing pressures on marine and coastal ecosystems
The further development and testing of the HELCOM generic decision-support tool to map possible negative impacts of specific gear types on threatened or declining species and habitats
Development and implementation of fisheries management measures for fisheries inside marine protected areas
Further development and implementation of comparable methodology for data collection (salmon and sea trout) through surveys, especially on recreational fisheries

National actions

The national actions related to commercial fish stocks are mainly related to the development of long-term management plans for exploited fish stocks, through the competent authorities. Three national actions have been accomplished by all countries; the development of **long-term management plans for herring and sprat, flatfish, and cod** (Table 2.6.3).

All EU Member States have also developed and implemented **management plans for the conservation of eel stocks** as required by EU Regulation 1100/2007 and the development of a national programme is ongoing in Russia. The ICES advice published in May 2017 indicates that the measures taken so far have not been sufficient and the stock is still in a critical state (ICES 2017a).

Table 2.6.3. Accomplishment of national actions related to measures and management coordination of fish stocks. Blue=accomplished by all countries. Orange=partly accomplished. 'Status' indicates the number of countries that have implemented the action.

Action	Status
Develop long-term management plans by 2012 for protecting, monitoring and sustainably managing coastal fish species	2 / 9
Competent authorities to take immediate action for development of long-term management plans for commercially exploited fish stocks so that they are within safe biological limits:	
Salmon	2 / 9
Sea trout	2 / 9
Sprat and herring (beyond the proposed EU multiannual plan for the stocks of cod, herring and sprat for the EU countries)	
Flatfish	
Competent authorities to take action to implement existing long-term management plans for cod to improve their distribution size/age range:	
Implementation of existing plans	
Improvement of size/age range	Target year: 2020
Competent authorities to take action to implement existing long-term management plans for eel to improve their distribution size/age-range:	
Implementation of existing plans	Ongoing
Improvement of size/age range	Target year: 2021

There is only one HELCOM action related to coastal fish that falls under the categories 'measures' or 'management coordination'**: develop long-term management plans by 2012 for protecting, monitoring and sustainably managing coastal fish species, including the most threatened and/or declining, including anadromous ones, according to BSEP 109**. This action is only partly accomplished with a few countries having national management plans for coastal fish besides tentative plans related to seatrout, salmon and eel.

Status and trends of by-catch of mammals and birds

A HELCOM core indicator on 'Number of drowned mammals and waterbirds in fishing gear' is under development but not yet operational.

Drowning in fishing gear is believed to be the greatest source of mortality for harbour porpoise populations in the Baltic Sea, and is also a concern for seals (HELCOM 2017s). Incidental by-catches of harbour porpoise in the Kattegat and Belt Sea were calculated at 165 to 263 animals in 2014, based primarily on information from CCTV cameras on commercial vessels in combination with data on fishing effort. Documentation of incidental by-catch of harbour porpoise in the Baltic Proper is limited, typically amounting to a few animals per year based on information from the countries that are reporting.

Based on interviews with fishermen from Sweden, Finland and Estonia, the annual incidental by-catch of grey seals in trap nets and gill nets in these countries were estimated at around 2180 to 2380 individuals in 2012[13]. There are no estimates of the incidental by-catch of ringed seals or harbour seals.

Drowning in fishing gear is likewise believed to be a strong pressure on the population of wintering birds in high density areas (HELCOM 2017s).

Current estimates of by-catch of birds and mammals are fragmented and associated with high uncertainties. A main hindrance for operationalization of the indicator is the lack of systematic and enforced collection of data on drowning in fishing gear.

Implementation of HELCOM actions to reduce by-catch

Joint actions

One joint HELCOM action, agreed through the 2013 Ministerial Declaration, specifically highlights the problem of by-catch of harbour porpoise: **take decisive action to work towards a favourable conservation status of the harbour porpoise** based on implementation of the CMS (Convention on Migratory Species), ASCOBANS (Agreement on the Conservation of Small Cetaceans in the Baltic, North East Atlantic, Irish and North Seas) Jastarnia Plan for the harbour porpoise in the Baltic Sea, **in particular by addressing the pressing problem of by-catch**.

Table 2.6.4. Accomplishment of joint actions to reduce the by-catch of harbour porpoise. Red=not accomplished.

Action
Take decisive action to work towards a favourable conservation status of the harbour porpoise […], in particular by addressing the pressing problem of by-catch. (Target year: not specified)

HELCOM is continuously exchanging information with ASCOBANS and has recently developed new reporting guidelines to follow-up HELCOM Recommendation 17/2 on 'Protection of Harbour Porpoise in the Baltic Sea Area' including the reporting on by-catch of harbour porpoise and activities to minimize by-catch in accordance with ASCOBANS requirements. To provide background information to this aim, HELCOM is since 2010 hosting a database on harbour porpoise sightings, by-catches and strandings. Three ASCOBANS resolutions with a direct link to HELCOM work on monitoring, assessment and protection of harbour porpoise in the Baltic Sea were adopted in 2016 at the 8th Meeting of the Parties to ASCOBANS, i.e. on the risk to cetaceans from marine renewable energy production, including effects of underwater noise, monitoring and mitigation of small cetacean by-catch, and impacts of Polychlorinated Biphenyls (PCBs).

Reflection on HELCOM actions on by-catch

The HELCOM Fish Group has collected an overview on ongoing national testing of alternative fishing gear, including gear aimed at reducing by-catch of mammals and birds. It is, furthermore, included in the work plan for the HELCOM Fish Group 2017-2018 to 'Provide tools for sustainable fishing practices, including to address by-catch of fish, birds and mammals'.

It can be noted that three joint HELCOM actions related to data and monitoring of by-caught mammals and birds and increasing knowledge on measures to reduce by-catch of harbour porpoise, have not been accomplished (see also Annex 3):

[13] accounting for the variability in seal abundance and fishing effort, and also for underreporting.

- Development and implementation of effective monitoring for by-caught birds and mammals
- Development and implementation of effective reporting systems for by-caught birds and mammals
- Evaluation of the effectiveness of existing technical measures to minimise by-catch of harbour porpoises

Achieving regular monitoring and reporting by-catch is a prerequisite for accurate estimates of by-catch and for finalizing the core indicator 'Number of drowned mammals and waterbirds in fishing gear'. Through the HELCOM Fish Group the needs for data to support the indicator have been identified (Outcome of FISH 6-2017, Annex 2, Working Paper 2).

2.7 SEABED LOSS AND DISTURBANCE

HELCOM agreements

Impacts from human activities on the seabed are primarily addressed through Article 15 of the Helsinki Convention, i.e. to take measures to conserve natural habitats and biological diversity. Also Article 11 and Annex V are relevant by setting forth requirements on special permits when dumping or placing dredged material.

The Biodiversity segment of the Baltic Sea Action Plan (BSAP), furthermore, includes the ecological objective of "**restoring and maintaining seafloor integrity at a level that safeguards the functions of the ecosystems**". A number of HELCOM Recommendations concern human activities that have an impact on the seafloor (Table 2.7.1) and HELCOM Marine Protected Areas is a tool for regulating human activities affecting the seabed within the MPAs (see section 3.6).

There is no specific HELCOM action from the BSAP or Ministerial Declarations that addresses measures that would reduce seabed loss and disturbance. The 2013 HELCOM Ministerial Declaration, however, stipulates that assessment of impacts from pressures, including on the seabed, should be carried out.

Table 2.7.1. HELCOM Recommendations related to activities that are having an impact on seabed habitats.

19-1, Marine Sediment Extraction in the Baltic Sea Area (including guidelines for sediment extraction)
17-3, Information and Consultation with regard to Construction of New Installations Affecting the Baltic Sea
36-2, Management of Dredged Material including Guidelines for management of dredged material at sea

Status and trends

There is currently no regionally agreed method for assessing adverse effects on the marine environment caused by seabed loss and disturbance. The development of an indicator on "Cumulative impacts on seabed habitats" is ongoing but the indicator is not yet adopted or operational.

In the 'State of the Baltic Sea' report, the potential loss and disturbance is evaluated based on spatial distribution of human activities that have been preliminarily identified as causing loss and disturbance of the seabed. Since no threshold values are defined for physical loss and disturbance, no judgement of status is placed on the results.

The long-term physical loss of seabed in the Baltic Sea until the year 2015 is estimated to be less than 1 % on the regional scale. Highest estimates of potential loss are found in sub-basins of the southern Baltic Sea. The human activities mainly connected with seabed loss are sand extraction, dredging and disposal of dredged matter and, to a lesser extent, offshore and coastal installations, and mariculture (HELCOM 2017n).

Around half of the Baltic seabed (236 000 km^2) is estimated to have been disturbed during 2011–2015. The spatial extent of potential physical disturbance to the seabed varied between 20 and almost 100 % per sub-basin. The activities connected to the widest physical disturbance are bottom-trawling fishing and shipping. The sub-basins with highest proportion of potential disturbed seabed are also found in the southern Baltic Sea (HELCOM 2017n).

No assessment of trends in loss and disturbance has been carried out.

Implementation of HELCOM actions to manage disturbance to the seafloor

One HELCOM action agreed through the 2013 HELCOM Ministerial Declaration is partly related to the assessment of impacts on the seabed: '**the further development and testing of the HELCOM generic decision-support tool to map possible negative impacts of specific gear types on threatened or declining species and habitats, and which helps to develop and/or recommend measures to address these'**.

A tool to map the impacts of bottom touching fishing gear on benthic communities was developed in 2016 under the EU coordinated BalticBOOST project (see also section on 2.6 on Species removal by fishing). This far the tool has been applied in a number of case studies. One test case illustrates how the approach can be used to predict how areas may differ in their sensitivity to disturbance from bottom trawl fishing and thereby serve as a decision support for management measures (HELCOM 2017m). The tool does not provide for an assessment of the impacts from other types of fishing gear or other ecosystem components than benthos.

Regarding the BSAP objective "restoring and maintaining seafloor integrity at a level that safeguards the functions of the ecosystems", it is not possible to assess this objective until 'good status' in terms of the seafloor has been defined and agreed.

Other HELCOM activities related to seabed loss and disturbance

Although the number of specific HELCOM actions related to the seafloor is limited, several activities in recent years have improved the background information required to assess the impact on seabed habitats. Through the HELCOM HOLAS II and associated projects there are currently data sets representing the distribution of 23 human activities having an impact on the seafloor that have been further processed into two aggregated pressure layers representing physical loss and physical disturbance, respectively. The data stems partly from regular reporting to HELCOM such as on dredged material. Many data layers have, however, been collected *ad hoc* for the purpose of the 'State of the Baltic Sea' report. Thus, only part of the required data is systematically updated.

The EU co-financed BalticBOOST project has carried out a literature review of studies that provide quantitative data on the extent of pressures and on impacts on benthic species and habitats (HELCOM 2017k). HELCOM GEAR has supported the publication of the project report as a HELCOM BSEP in 2018 (HELCOM 2017v).

Baltic wide distribution maps of species, biotopes and habitat complexes have also been developed as part of the HELCOM HOLAS II and the EU co-financed project TAPAS. These data layers are improved as part of the 2018 update of the 'State of the Baltic Sea' report. Benthic distribution maps are currently available for five key habitat forming species, eight broad-scale habitats, and nine habitat complexes. The maps representing benthic habitats vary considerably in resolution between countries and there are also gaps in the information. Some countries have carried out mapping and/or modelling of benthic habitats based on the HELCOM HUB[14] classification of benthic biotopes (HELCOM 2013b). When available, this information has been integrated as part of the broad-scale habitat maps. However, for a majority of countries broad-scale habitat maps at EUNIS level 2 have been used.

[14] HELCOM Underwater Biotope and habitat classification

2.8 CUMULATIVE IMPACTS

HELCOM agreements

Cumulative impacts are the collective burden on the Baltic Sea ecosystem from human activities and can thus be considered as reflected by all articles of the Helsinki Convention that concern pressures on the environment. Similarly, there are no HELCOM actions that specifically address cumulative impacts, while the majority of HELCOM actions related to measures are aimed at mitigating pressures, albeit from the perspective of individual activities. Information on cumulative impacts is essential for implementing cross-sectoral approaches and ecosystem based management and may also inform Maritime Spatial Planning, e.g., by identifying areas of special concern.

Status and trends

In the 'State of the Baltic Sea' report, the Baltic Sea Impact Index (BSII) is used to identify areas where human induced pressures have relatively high or low cumulative impacts on the marine environment. The evaluation is based on spatial information on human activities, pressures and ecosystem components. In total, the distribution of 54 human activities and pressures in the Baltic Sea during 2011–2015 was compiled into 19 pressure layers and combined with information on 42 data layers representing the distribution of species and habitats. The evaluation of impact on the ecosystem is based on estimating the sensitivity of species and habitats to the different pressures. The estimates of these so called 'sensitivity scores' were established through an expert survey (HELCOM 2017af).

The southwest areas of the Baltic Sea and many coastal areas experience higher potential cumulative impacts than the northern areas and many open sea areas (Figure 2.8.1) (HELCOM 2017af). This reflects that human activities are more concentrated in coastal areas and close to urban populations but also that sensitive species and habitats are more common in shallow areas.

Other HELCOM activities related to cumulative impacts

There are no HELCOM actions that directly address cumulative impacts on the environment. There are several steps ongoing to improve the quality of the assessment of cumulative impacts, including for the update of the 'State of the Baltic Sea' report in 2018 (see Chapter 8 of mentioned report). An inherent problem is that gaps in underlying datasets, both pressures and ecosystem components, may result in an apparent low impact.

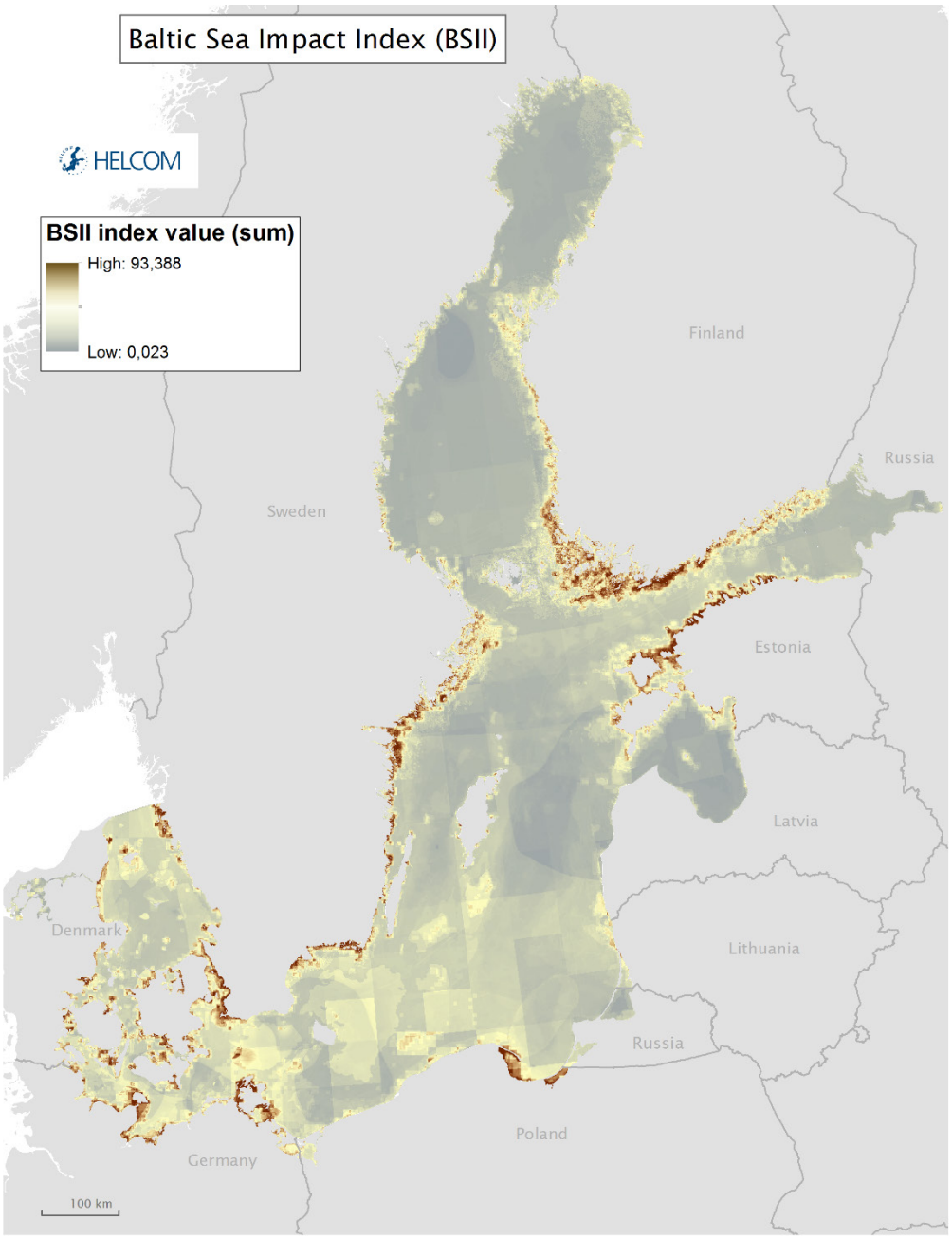


Figure 2.8.1. Map of the cumulative impacts of anthropogenic pressures based on the Baltic Sea Impact Index. The cumulative impacts are calculated based on the method of the Baltic Sea Impact Index as the 'sum of impact'. The method for assessment is given in the supplementary material (HELCOM 2017ae). The Baltic Sea Impact Index is an estimation of cumulative impacts based on currently best available regional data, but spatial and temporal gaps may occur in underlying datasets.

2.9 MARITIME SPATIAL PLANNING

HELCOM agreements

Maritime spatial planning is an inherent component of the biodiversity segment of the Baltic Sea Action Plan (BSAP), based on Article 15 of the Helsinki Convention requiring the Contracting Parties to conserve natural habitats and biological diversity and to protect ecological processes. Such measures should be taken in order to ensure the sustainable use of natural resources within the Baltic Sea Area.

HELCOM together with VASAB have been working on coherent regional maritime spatial planning processes in the Baltic Sea since 2010, according to jointly agreed policies, including Horizontal Action Spatial Planning of the EU Strategy for the Baltic Sea Region.

A majority of joint actions have been accomplished and work is ongoing on the actions that are implemented nationally (Figure 2.9.1).

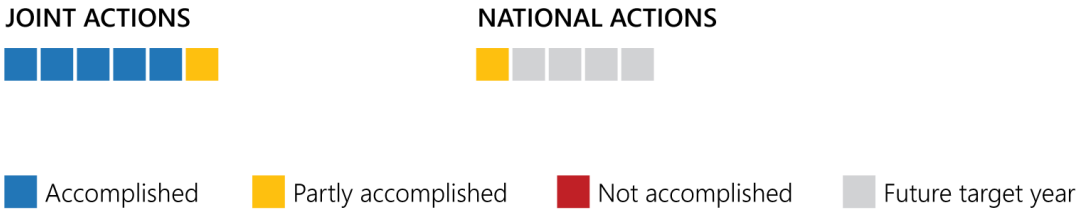


Figure 2.9.1 Accomplishment of HELCOM actions in the field of Maritime Spatial Planning related to measures and management coordination. Each block represents one action. For explanation to how the assessment is done see Introduction, Box 1.

Joint actions

Joint HELCOM-VASAB principles (HELCOM 2010) were adopted in 2010 (Table 2.9.1). The Contracting Parties made a commitment (HELCOM Recommendation 28E-9) to jointly develop, apply and evaluate broad-scale, cross-sectoral, MSP principles applying the 'ecosystem approach' by 2012. The ecosystem-based approach, calling for a cross-sectoral and sustainable management of human activities, is an overarching principle for maritime spatial planning which aims at achieving a Baltic Sea ecosystem in good status.

The Regional Baltic Maritime Spatial Planning Roadmap (2013-2020) provides a common framework for the countries to work to achieve the goal of drawing up and applying maritime spatial plans throughout the Baltic Sea region by 2020 which are coherent across borders and apply the ecosystem approach (HELCOM 2013f). Through joint actions HELCOM and VASAB have since agreed on several guiding documents for the application of transboundary marine spatial planning principles (Table 2.9.1). These guidelines are currently being implemented at a national level.

Table 2.9.1. Accomplishment of joint actions to develop maritime spatial planning related to measures and management coordination. Blue= accomplished. Orange=Partly accomplished.

Action
Develop, test, apply and evaluate broad-scale, cross-sectoral, marine spatial planning principles based on the Ecosystem Approach
Establish a joint, co-chaired HELCOM-VASAB Working Group on Maritime Spatial Planning (MSP)
Adopt a set of joint HELCOM-VASAB broad-scale transboundary Maritime Spatial Planning principle
Adopt "Guidelines on transboundary consultations and cooperation in the field of MSP" and the "Guidelines on public participation for MSP with transboundary dimensions"
Adopt "Guidelines on the application of Ecosystem Approach in transnationally coherent MSP
Update the Roadmap for Maritime Spatial Planning (MSP) in 2014 after HELCOM and VASAB ministerial meetings

HELCOM also agreed in 2016 on an action labelled "How to consider MPAs in Maritime Spatial Planning and vice versa" (HELCOM 2016b). The aim of the action is to provide guidance on how MPAs should be properly taken into account in MSP and how MPAs can contribute to the application of HELCOM-VASAB Regional broad-scale MSP principles.

National actions

The agreed national actions related to MSP have been implemented to various degrees. **National frameworks for coherent MSP,** with the target year 2017, are in place or under development in most HELCOM countries (Table 2.9.2).

Several of the MSP actions are still to be implemented in the future. By 2018 it has been agreed to apply the jointly developed guidelines on "transboundary consultations and cooperation in the field of MSP", "public participation for MSP with transboundary dimensions" and "the application of Ecosystem Approach in transnationally coherent MSP".

Maritime spatial plans, which are coherent across the borders and apply the ecosystem approach, have been agreed to be in place by 2020 but have already been developed by some countries.

Table 2.9.2. Accomplishment of national actions to implement maritime spatial planning related to measures and management coordination. Orange=partly accomplished, Grey=future target year. 'Status' indicates the number of countries that have implemented the action.

Action	Status
Develop national frameworks for coherent MSP	5 / 9
Identify contact points for MSP for the purpose of transboundary consultation and joint planning	7 / 9
Apply HELCOM guidelines on "transboundary consultations and cooperation in the field of MSP"[15] and Apply HELCOM guidelines on "public participation for MSP with transboundary dimensions"	Target year: 2018
Apply HELCOM guidelines on "the application of Ecosystem Approach in transnationally coherent MSP"	4 / 9 Target year: 2018
Apply maritime spatial plans, which are coherent across the borders and apply the ecosystem approach	2 / 9 Target year: 2020

Reflection on HELCOM actions

Follow-up on the application of the guidelines on MSP by the countries is a continuous task of the HELCOM-VASAB MSP WG. Another task, to identify minimum requirements for preparing and implementing MSP across the borders and to follow up how they are met to ensure coherence of the plans, has not been initiated yet.

HELCOM-VASAB Expert Subgroup on Data has been overseeing and guiding the work related to data sharing and data needs of cross-border MSP process in the Baltic Sea. The focus of the work has been on defining data needs and harmonisation requirements for MSP input data. The future outputs will be common format for output data resulting from Maritime Spatial Plans and development of regional environmental datasets. The use of cumulative impact assessment tools combined with precise and essential environmental datasets in MSP process will further support the ecosystem approach in MSP in the Baltic Sea region.

The future implementation of the work plan is to take into account identified needs and recommendations on maritime spatial planning across borders by the Baltic SCOPE project. The recommendations cover general aspects as well as shipping, fisheries, energy and environment.

[15] The planned guidelines on transboundary consultations and cooperation in the field of MSP and guidelines on public participation for MSP with transboundary dimensions were merged into one set of guidelines "Guidelines on transboundary consultations, public participation and co-operation"

Some of the identified needs are covered to a certain extent by the agreed plans for future work on a regional level, such as the need for common knowledge of the values of ecosystems in the Baltic Sea usable in MSP, for example green infrastructure/blue corridors, and the need for process integration between MSP and the management of the marine environment including the development of the marine protected areas network. Some of the recommendations are already being addressed in HELCOM work, such as to apply and develop common approaches to assess cumulative pressures and impacts of human activities on the marine environment (HELCOM 2017n, see also section 2.8), and provide continuous access to and build a base for comprehensive and reliable data and information, knowledge and expertise, on cross-border protected areas.

A new project called 'PanBaltic SCOPE will advance tools to support implementation of ecosystem approach in MSP by developing harmonized, cross-border approaches for cumulative impact assessments and methods on how to integrate social and economic analysis in MSP (activities led by HELCOM) and by facilitating data sharing (HELCOM participating in the activity).

3 BIODIVERSITY

The status of the Baltic Sea biodiversity is assessed according to five ecosystem components: benthic habitats, pelagic habitats, fish, mammals, and birds (HELCOM 2017n). The five ecosystem components are represented in the biodiversity segment of the Baltic Sea Action Plan (BSAP). Actions that are related to red listed species and habitats in general are presented separately in this report (section 3.5) and Marine Protected Areas are addressed as a special measure to conserve and protect biodiversity (section 3.6).

Figure 3.1 shows the distribution of joint and national HELCOM actions according to the topics addressed in this chapter. The focus of this report is on the concrete measures and management actions to improve the state of the Baltic Sea (dark grey colour in figure 3.1), which also comprise the majority of HELCOM actions. The implementation of other types of actions, e.g. data, knowledge, and assessments, are listed in Annex 3. This chapter, furthermore, focuses on actions related to the conservation of biodiversity while actions related to the management of commercially exploited populations are addressed in section 2.6.

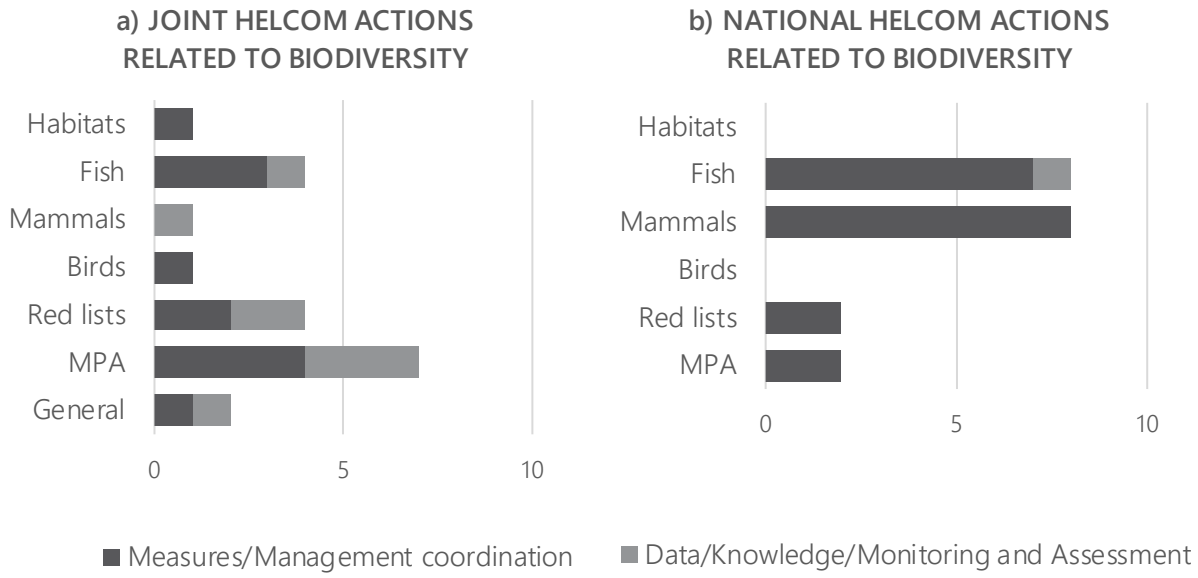


Figure 3.1. Number of HELCOM actions related to conservation of biodiversity separated by a) joint, and b) national actions. Type of action is further indicated according to the colour legend. Abbreviations used: MPA=Marine Protected Areas, RED LISTS=action related to HELCOM red listed species, biotopes and habitats, HABITATS=pelagic and benthic habitats.

HELCOM agreements

Biodiversity is addressed through Article 15 of the Helsinki Convention, which commits the Contracting Parties to "**individually and jointly take all appropriate measures with respect to the Baltic Sea Area and its coastal ecosystems influenced by the Baltic Sea to conserve natural habitats and biological diversity and to protect ecological processes**".

More specific HELCOM agreements on biodiversity have been formulated through HELCOM Ministerial Declarations, and through the commitments under the Biodiversity segment of the BSAP with the goal to reach a **'Favourable conservation status of Baltic Sea biodiversity'**. The majority of biodiversity actions are related to migratory fish species and seals (Figure 3.2). Currently, 42% of the actions that are implemented jointly and 21% of actions that are implemented nationally have been achieved (Figure 3.3).

Selected HELCOM Recommendations aimed at the conservation and protection of biodiversity are listed in Table 3.1.

This chapter addresses the actions taken to protect and conserve species and habitats that are also assessed in the 'State of the Baltic Sea' report (HELCOM 2017n).

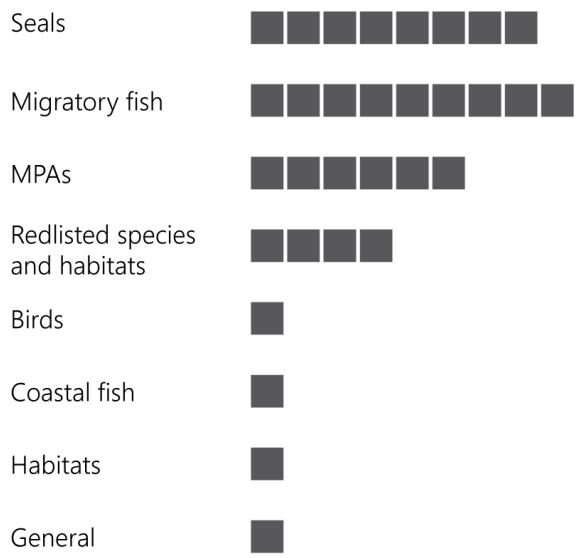


Figure 3.2. Number of HELCOM actions, joint and national, covering different biodiversity topics related to conservation of species and habitats.

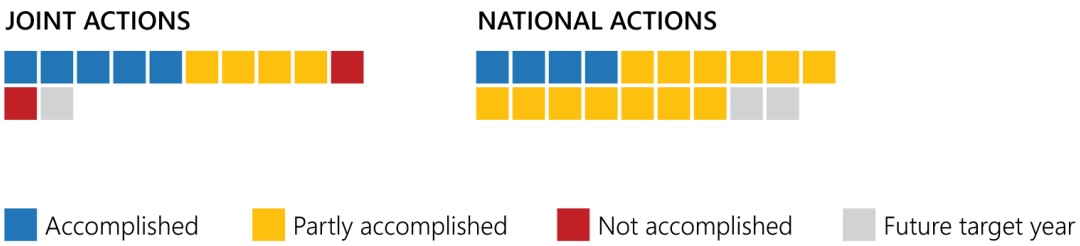


Figure 3.3. Accomplishment of HELCOM actions on biodiversity conservation and protection related to measures and management coordination. Each block represents one action. For explanation to how the assessment is done see Introduction, Box 1.

Table 3.1. HELCOM Recommendations related to the conservation and protection of biodiversity, agreed or amended by HELCOM after 2007.

34E-1, Safeguarding important bird habitats and migration routes in the Baltic Sea from negative effects of wind and wave energy production at sea
32–33-1 Conservation of Baltic salmon (*Salmo salar*) and sea trout (*Salmo trutta*) populations by the restoration of their river habitats and management of river fisheries
19-2, Protection and improvement of the wild salmon *) (*Salmo salar l.*) populations in the Baltic Sea area
27-28-2, Conservation of seals in the Baltic Sea area
21-4, Protection of heavily endangered or immediately threatened marine and coastal biotopes in the Baltic Sea area
17-2, Protection of harbour porpoise in the Baltic Sea area

37-2, Conservation of the Baltic Sea species categorized as threatened according to the 2013 HELCOM Red List
35-1, System of Coastal and Marine Baltic Sea Protected Area

Link to SDG targets

14.2: By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans

14.5: By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information

13.2: Integrate climate change measure into national policies, strategies and planning

3.1 BENTHIC AND PELAGIC HABITATS

Status and trends

The benthic and pelagic habitats are assessed in terms of abiotic features as well as associated biological communities. There are still only a limited number of operational core indicators to assess benthic and pelagic communities and those currently agreed are not operational on a Baltic wide scale. Thus, the integrated assessment results should be cautiously interpreted.

Benthic habitats

The assessment of benthic habitats in the open sea is based on an indicator representing the status of the soft-bottom macrofauna community and the indicator 'Oxygen debt' which gives information on the living conditions for macrofauna in deeper areas. In areas suffering from permanent hypoxia the soft-bottom macrofauna indicator is only applied in areas above the halocline. Oxygen debt was originally developed as an indicator of eutrophication.

The benthic community was assessed in the north and central Baltic Sea as well as in the Bay of Mecklenburg. Good status is achieved in all areas except the Bay of Mecklenburg. Oxygen debt is failing to reach the threshold value in all areas where it was assessed, i.e. in the Gulf of Finland and Baltic Proper (Figure 3.1.1). Oxygen debt in deeper areas thereby determines the integrated status in the sub-basins where it was assessed and good integrated status was only achieved in the Gulf of Riga and in the Åland Sea and north thereof (HELCOM 2017n).

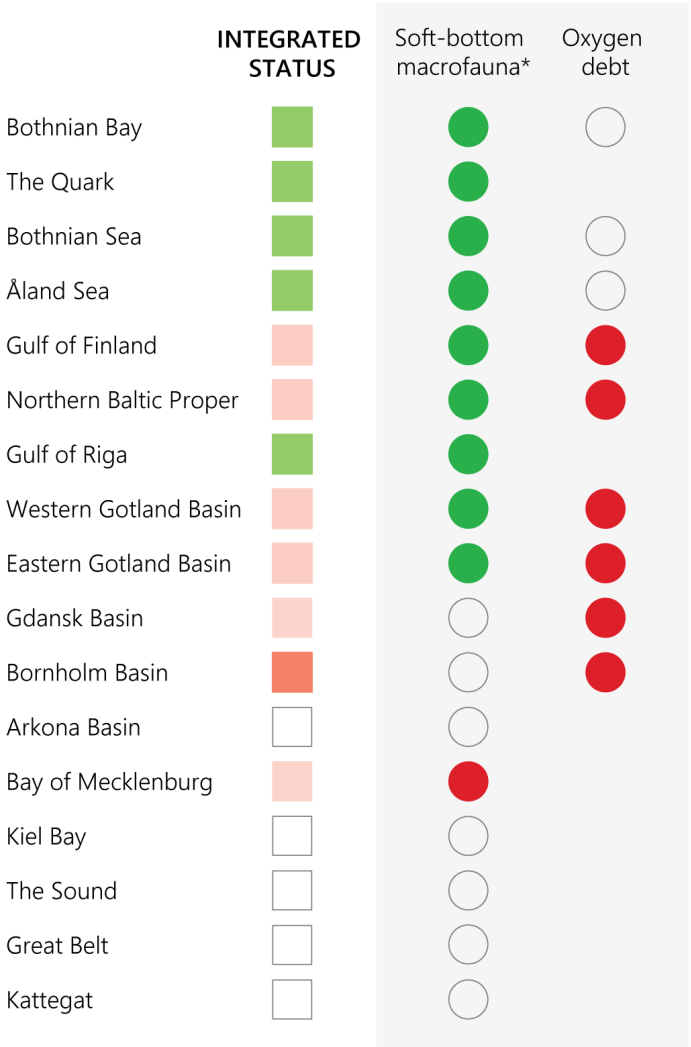


Figure 3.1.1. Results of the integrated assessment of benthic habitats and of individual core indicators used in the assessment. The shades of green and red in the integrated status represent distance from good status with the lighter colour being closest to good status. Core indicator results are given as achieving the threshold value (green) or failing the threshold value (red). No circle represents areas where the indicator is not applicable. Empty cells represent areas where the assessment was not carried out due to lack of data or lack of agreement on a threshold value. The oxygen debt indicator was agreed not to be used in the Gulf of Bothnia.

* only assessed above the halocline in Gulf of Finland, Northern Baltic Proper and Western and Eastern Gotland Basins.

Pelagic habitats

The status of pelagic habitats is assessed using the core indicator 'Zooplankton mean size and total stock' in the Gulf of Bothnia, Gulf of Finland and the Northern Baltic Proper, and the two indicators 'Cyanobacterial bloom index' and 'Chlorophyll-a' that have been developed as eutrophication indicators.

The zooplankton community indicator achieved the threshold value in the Bothnian Bay and Bothnian Sea, but not in other assessed areas (Figure 3.1.2). The indicator 'Cyanobacterial bloom index' did not achieve the threshold value in any of the open sea sub-basins where it was assessed. The core indicator 'Chlorophyll-a' achieved the threshold value only in the Kattegat. Good integrated status was not achieved in any open sea sub-basin, with the exception of Kattegat.

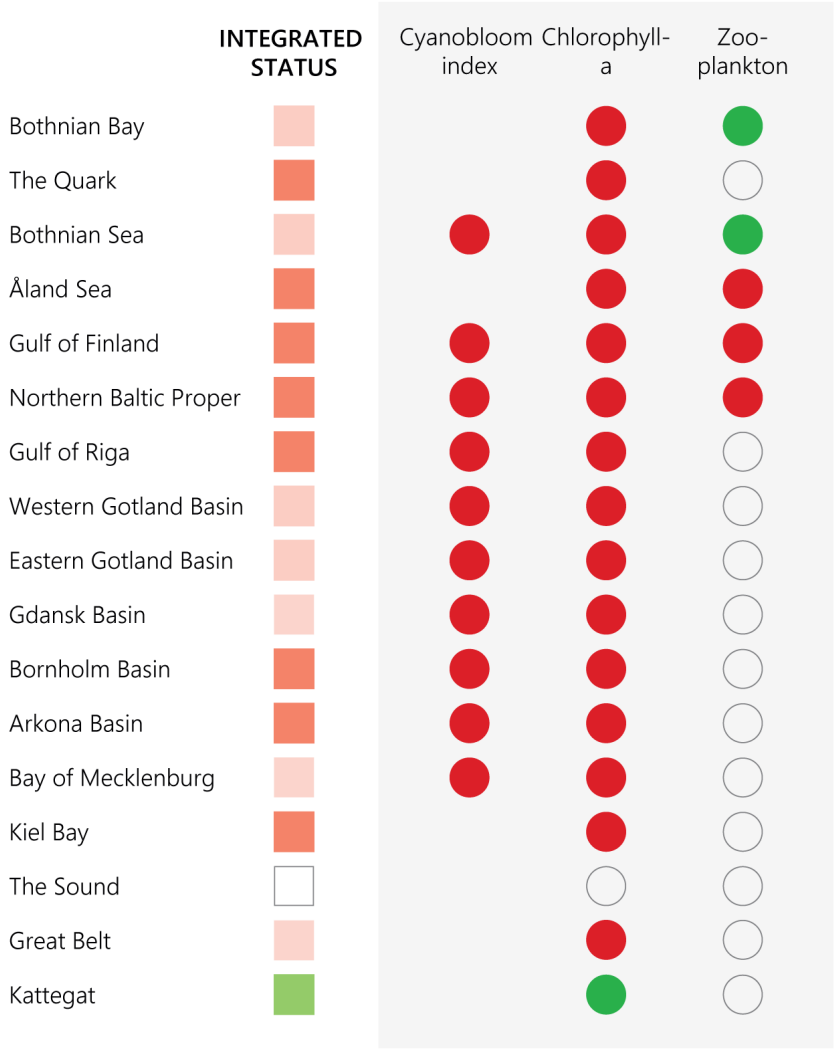


Figure 3.1.2. Results of the integrated assessment of pelagic habitats and of individual core indicators used in the assessment. The shades of green and red in the integrated status represent distance from good status with the lighter colour being closest to good status. Core indicator results are given as achieving the threshold value (green) or failing the threshold value (red). No circle represents areas where the indicator is not applicable. Empty cells represent areas where the assessment was not carried out due to lack of data or lack of agreement on a threshold value.

Reflection on HELCOM actions

With the exception of red listed features, there are no HELCOM actions that specifically mention the protection of pelagic or benthic habitats. However, many actions related to pressures on the Baltic Sea serve to improve the state of pelagic and benthic habitats including those directed towards reducing input of nutrients, hazardous substances and marine litter, introduction of non-indigenous species, and underwater sound.

The pristine pelagic habitat is characterized by its chemical and physical properties, including, i.a., nutrient concentrations, naturally occurring chemical compounds, water transparency, availability of light and oxygen, pH, salinity, temperature, and water movements. Several of the characteristics of the pelagic habitat are thus covered by the assessment of eutrophication. There are, however, yet no HELCOM indicators reflecting changes in salinity, temperature and pH, i.e. parameters that are affected by climate change and that are projected to be even more so in the future (HELCOM 2013a). Changes in these characteristics of the pelagic habitats will affect the distribution range of species and may eventually even exclude species from the Baltic Sea.

The benthic habitat is characterized by the same properties as pelagic habitats but also by the structure and perturbation of sediments. Measures to decrease human induced disturbance on the seafloor contributes directly to the conservation of benthic habitats but also to localized improvement of pelagic habitats since in the vicinity of activities that disturb the seafloor the overlaying watermass is also affected through increased turbidity. Measures to reduce pressures on the seafloor have so far not been agreed in HELCOM (see section 2.7 Seabed loss and disturbance).

3.2 FISH

HELCOM actions related to conservation and restoration measures for fish are addressed in this section, including for salmon, sea trout, and eel. The status of additional commercial fish species and HELCOM actions related to the management of commercial fish species are addressed in section 2.6.

The BSAP includes a number of actions directed towards improving the status of salmon and sea trout rivers. Further commitments are made through HELCOM Recommendation 32-33/1 on the 'Conservation of Baltic salmon (*Salmo salar*) and sea trout (*Salmo trutta*) populations by the restoration of their river habitats and management of river fisheries' (adopted 2011). The national reporting of accomplishment of actions under the BSAP is presented here, complemented with information from the reporting of Recommendation 32-33/1 in 2017 (HELCOM 2017af).

Eel is also addressed in the BSAP and the 2013 HELCOM Ministerial Declaration. In addition to actions related to the management of eel (section 2.6), Baltic Sea countries have agreed to consider measures beyond the management plans and to coordinate the conservation of eel stocks.

HELCOM is also supporting activities in reintroducing sturgeon to potential spawning rivers in Germany and Poland.

Status and trends – salmon and seatrout

The core indicator 'Abundance of salmon spawners and smolt' is based on the smolt production in rivers with wild salmon stocks. It is applicable for all HELCOM countries except Denmark, Germany, Poland and Russia. The estimated smolt production is compared to an estimated potential smolt production capacity (PSPC) of rivers[16]. Based on data from 2011-2015 the indicator was assessed for rivers entering the Gulf of Bothnia, Gulf of Finland, Gulf or Riga, and the Gotland Basin, indicating that good status is only achieved in the area of the northern Quark (HELCOM 2017c). New ICES assessment results based on data from 2017 suggest that the development has been positive compared to the previous assessment; according to new results the stock status is good in all assessment areas except the Eastern Baltic and the Gulf of Finland (ICES 2017e). These new assessment results will be reflected in an update of the HELCOM core indicator report in 2018.

The core indicator 'Abundance of sea trout spawners and parr' is based on a comparison of the observed parr densities in rearing habitats with reference potential parr densities in the specified habitats[17]. The indicator is applicable in all HELCOM countries and was last updated in 2014. Of the 629 sea trout river populations in the Baltic Sea, 29% were evaluated as having good status, 23% were evaluated as not achieving good status and the remaining rivers were not evaluated. In some areas, only 26% wild and mixed sea trout river populations had estimated smolt production achieving the threshold value in 2014 (ICES 2015). The status of sea trout stocks is better in the south-western sub-basins where the majority of stocks reach production levels reflecting good status (HELCOM 2015a). A positive development in sea trout parr densities since 2012 has been observed in some rivers entering the Gulf of Finland and the Bothnian Sea.

[16] The threshold value is defined as 75% of the PSPC

[17] Good status is achieved when the moving parr densities average over 4-5 years remains above 50% of the reference parr density.

Implementation of HELCOM actions related to the conservation of salmon and sea trout

Joint actions

HELCOM has agreed to develop an **overview of common practices** and **recommendations for restoration of salmon and sea trout rivers** (Table 3.2.1). The development of recommendations on management and conservation measures have not started but will be implemented through the RETROUT project (start October 2017), with HELCOM as a partner.

Table 3.2.1. Accomplishment of joint HELCOM actions related to the conservation and coordinated management of salmon and sea trout populations. Target year is indicated for actions that are not accomplished.

Action
Common practices for breeding, rearing and releasing salmon and sea trout as reintroductions in potential salmonid rivers (Target year: 2015)
Recommendations for riverine and estuarine management and conservation measures, such as fish ways for up and down migration, restoration and protection of spawning grounds, concerning fisheries within rivers and estuaries (Target year: 2015)

National actions

National restoration plans to reinstate migratory fish have been developed or are under development in the majority of countries (Table 3.2.2). Several countries however noted in their national reporting that restoration plans may still be missing for suitable rivers. For Germany the restoration plan refers to sturgeon; Germany together with Poland are carrying out a sturgeon reintroduction programme in the Odra River and Vistula basin.

Table 3.2.2. Accomplishment of national actions related to the conservation of salmon and seatrout populations. Blue= accomplished at the regional level, Orange=partly accomplished. 'Status' indicates the number of countries that have implemented the action.

Action	Status
National restoration plans to reinstate migratory fish	7 / 9
Conserve at least ten wild salmon river populations	
Reintroduce native salmon in at least four potential salmon rivers	

The agreement of the BSAP to **Conserve at least ten wild salmon river populations** has been accomplished at the regional level (Table 3.2.3) as well as to **Reintroduce native salmon in at least four potential salmon rivers** (Table 3.2.4).

It can be noted that restoration activities are ongoing in numerous additional rivers, also in sea trout rivers in Denmark, Estonia, Finland and Sweden (HELCOM 2017ag). In Latvia, there are no nation-wide measures to restore salmon rivers, however, local projects have been carried out, e.g., in river Venta and as part of Latvian-Lithuanian cooperation. In Germany a sea trout management programme has been launched and measures are taken to improve habitat quality or rivers and to remove migration obstacles.

Table 3.2.3. Reported wild salmon rivers with conservation measures.

Country	Rivers
Estonia	Kunda, Keila, Vasalemma
Finland	Tornionjoki, Simojoki
Lithuania	Neris, Vilnia, Vokė, Siesartis, Šventoji, Kena, Minija, Dubysa, Jūra (salmon stocking)
Sweden	In parts of all rivers during 2010-2014 except in Nissan tributary Sennan, Löftaån and Tvåkersån.

Table 3.2.4. Reported rivers with reintroduction of native salmon in potential salmon rivers.

Country	Rivers
Estonia	Pirita, Loobu, Selja, Valgejõgi, Jägala, Purtse, Narva (not anymore), Pärnu (since 2013)
Sweden	Plans developed for Ångermanälven
Finland	Iijoki salmon has been restocked in Iijoki and Kiiminkijoki. The Finnish Neva salmon strain has been restocked in Kymijoki

Status and trends - eel

There is no HELCOM indicator for eel but the species is categorized as critically endangered in the HELCOM Red List (HELCOM 2013d). The main concern regarding eel is its sharply decreased recruitment since the 1980s.

The 2016 ICES report from the Working Group on Eel (WGEEL) concludes the following: "In 2016, the WGEEL glass eel recruitment indices remain low at 2.7% of the 1960–1979 reference level in the 'North Sea' series, and 10.7% in the 'Elsewhere' series. The 'recruiting yellow eel' index was 21% of the level during the reference period. The Eel Management Plan silver eel biomass and mortality rate estimates (reported in 2015) indicate the stock in the EU-assessed area is not within the biomass limits of the Eel Regulation and in most management units, anthropogenic mortality exceeds a level that can be expected to lead to recovery" (ICES 2016).

Implementation of HELCOM actions related to the conservation of eel

National actions

In addition to the development of management plans for eel (see section 2.6 on Species removal by fishing), HELCOM has agreed on four additional actions related to the conservation of the eel population (Table 3.2.5).

Three countries have reported that **additional measures to reduce fishing mortality of eel beyond the management plans** have been taken. This concerns for example the regulation of fishing gear and development of common management plans with neighbouring countries.

Efforts to enhance co-ordination of measures to conserve eel stocks within the Baltic Sea, as well as with other European countries, have been reported to take place for example through the development of a joint management plan for the Polish–Russian zone of the Pregola drainage basin and Vistula Lagoon, and in the Curonian Lagoon.

The majority of countries have developed and implemented **national programs for the conservation of eel stocks**.

Table 3.2.5. Accomplishment of national actions related to the conservation of eel. Orange=partly accomplished. 'Status' indicates the number of countries that have implemented the action.

Action	Status
Consider additional measures if necessary, such as reducing fishing mortality in accordance with the ICES advice, removing migration barriers, and re-stocking in eel-safe river systems	3 / 9
Enhance co-ordination of measures to conserve eel stocks within the Baltic Sea, as well as with other European countries	5 / 9
Develop national programs for the conservation of eel stocks as a contribution to a Baltic coordinated programme to ensure successful eel migrations from the Baltic Sea drainage basin to national spawning grounds	7 / 9
Implement national programs for the conservation of eel stocks as a contribution to a Baltic co-ordinated programme to ensure successful eel migrations from the Baltic Sea drainage basin to national spawning grounds	8 / 9

Coastal fish

Status and trends – coastal fish

The status of coastal fish is assessed by two HELCOM core indicators: 'Abundance of key coastal fish species' and 'Abundance of key coastal fish functional groups'.

'Abundance of key coastal fish species' is based on changes over time in perch or flounder, with the species chosen depending on the natural distribution of these species. The indicator is assessed in the northern, eastern and western parts of the Baltic Sea. Thirteen out of 21 assessed coastal areas achieved the threshold value based on data from 2011-2015. In general the status is better in the northern parts of the Baltic Sea (HELCOM 2017b).

The core indicator 'Abundance of key coastal fish functional groups' combines information on the abundance of predatory fish (piscivores) and of fish feeding at lower trophic levels (represented by cyprinids). The indicator is assessed in coastal areas of the Eastern and Gotland Basins and north and east thereof. Piscivores achieved good status in 13 out of 16 coastal assessment units, mainly in the coastal areas of the northernmost sub-basins. Cyprinids achieved good status in 7 out of the 16 assessed units, mainly in the coastal areas of the western Gulf of Bothnia and Baltic Proper. Where good status is not achieved this is mainly due to too high abundance of cyprinids, indicative of eutrophication (HELCOM 2017a).

Implementation of HELCOM actions related to coastal fish

There is only one HELCOM action related to coastal fish that falls under the categories 'measures' or 'management coordination', **i.e. the development of a suite of indicators for coastal fish species**. This action is accomplished (Table 3.2.6).

Table 3.2.6. Accomplishment of joint actions related to coastal fish related to management coordination. Blue= accomplished.

Action
Development of a suite of indicators for coastal fish species

Reflection on HELCOM actions to conserve salmon and sea trout

Salmon and sea trout are included on the HELCOM Red list where they are categorized as 'vulnerable'. A preliminary overview of national measures taken to protect red-listed fish (HELCOM 2016e) indicates that specific conservation measures for salmon and sea trout have been taken by Finland, Lithuania, Poland, Sweden and all countries responding to the survey[18] have conservation measures in place for eel.

The 2017 follow-up of Recommendation 32/33-1 provides detailed information on for which rivers measures have been taken to conserve salmon and sea trout. The measures carried out can be divided into three broad types: measures restoring water quality and habitats (e.g. improving spawning areas through restoring gravel beds, meander restoration), measures to improve accessibility to rivers (e.g. introduction of fish ladders/fishways, removal of migration barriers), and management of river fishery (e.g. temporal and spatial closures, regulation of gear, minimum size of catch).

The most recent HELCOM core indicator report on salmon spawners and smolt, based on data from 2011-2015, shows that the status was not good in the majority of assessment areas. Assessments by ICES based on more recent data, however, shows that the status is improving.

A dedicated regional project on sea trout – RETROUT - with HELCOM involvement as a partner, started its work in October 2017 with the aims to update the regional overview and assessment of sea trout populations and to recommend river habitat restoration measures and other management options by 2020.

[18] Estonia and Russia have not responded to the survey carried out through the State and Conservation Working Group.

3.3 MAMMALS

HELCOM activities related to seals are guided by HELCOM Recommendation 27/28-2 on the '**Conservation of Seals in the Baltic Sea Area**' (adopted 2006). Several paragraphs of the recommendation are also reiterated in the BSAP. In accordance with the Recommendation, HELCOM has established monitoring programmes for grey seal, harbour seal and ringed seal and defined reference levels for their abundance and distribution, and for grey seal also for the population condition. The implementation of HELCOM actions presented in this section stems from national reporting on the implementation of the BSAP and the latest evaluation of the Recommendation, which was carried out by the HELCOM SEAL expert group (SEAL EG) in 2016.

HELCOM Recommendation 17/2 on '**Protection of Harbour Porpoise in the Baltic Sea Area'** (adopted 1996/amended 2013) identifies, e.g., the reduction of by-catch as a priority for improving the status of harbour porpoise and recommends the Contracting Parties to consider the establishment of marine protected areas for harbour porpoises. The State and Conservation Working Group has recently developed guidelines for the reporting on the Recommendation, including how to harmonize reporting with the requirements under ASCOBANS. The first reporting using the new guidelines will be available in 2018-2019. combined

Status and trends

The status of grey seal, harbour seal and ringed seal is assessed according to management units for seal populations as agreed in HELCOM. The current assessment considers the abundance of the population as well as the distribution. For grey seals the population condition is also assessed in terms of nutritional and reproductive status. The indicator on 'trends and abundance' considers both the abundance and growth rate of the population, and threshold values need to be met for both parameters. For a population to be in good status threshold values need to be reached for all indicators. These conditions are currently only met for harbour seals in the Kattegat (Figure 3.3.1) (HELCOM 2017aa). Some of the indicators and parameters are, however, close to achieving the threshold values such as reproductive and nutritional status of grey seals (HELCOM 2017ae, HELCOM 2017t).

While the threshold values for growth rate are not always met, the growth rate is positive for all management units accept the ringed seal in the Gulf of Finland, where the population is decreasing (Figure 3.3.1). In the eastern part of the Gulf of Finland only around 100 animals remain. Notably, the distribution of ringed seals is restricted due to the declining ice coverage in the Baltic Sea.

The growth rate for the Kalmarsund population of harbour seal is not achieving the threshold value but is close to doing so (HELCOM 2017aa), while the abundance is low with only about 1 100 seals in 2015. The population is, furthermore, categorized as vulnerable according to the HELCOM Red List (HELCOM 2013d).

The growth rate for grey seal and harbour seal in the Kattegat is levelling off indicating that the populations are approaching carrying capacity.

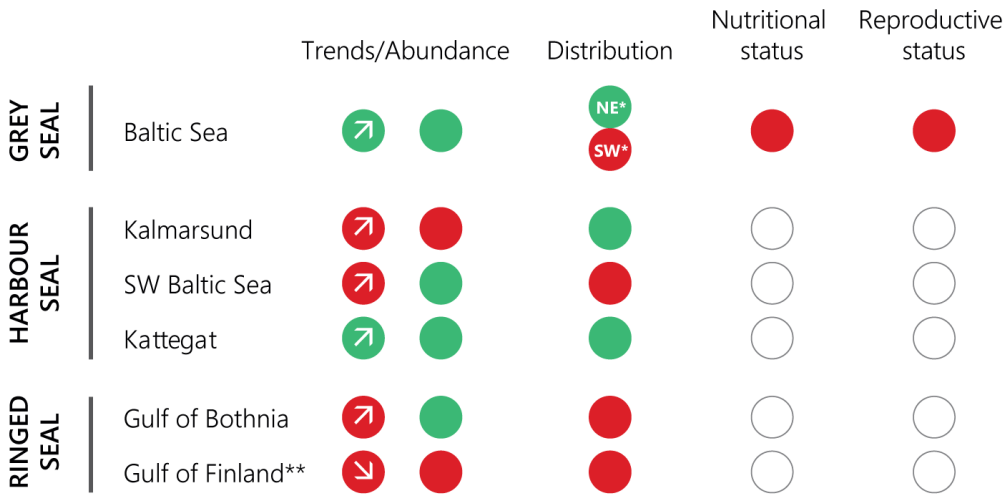


Figure 3.3.1. Status of seal populations in the Baltic Sea according to management units.
An empty circle represents areas where the assessment was not carried out due to lack of data or lack of agreement on a threshold value. Green: threshold value achieved. Red: Threshold value not achieved. The assessment results for trends (growth rate) and abundance are here shown separately while 'good status' for the indicator is reached only when threshold values are achieved for both parameters. The arrows for 'trends' indicate the direction of change.

*Grey seals belong to one management unit representing the entire Baltic Sea. The distribution indicator is however assessed separately in the Southwest Baltic Sea (SW), were the distribution fails to achieve good status, and in the area North and East of Bornholm (NE), where the distribution achieves good status.
**The assessment also includes ringed seals in the Gulf of Riga, Archipelago Sea and Estonian coastal waters.

A HELCOM core indicator on abundance of harbour porpoise is under development but not yet operational. There are two sub-populations of harbour porpoise in the Baltic Sea: one mainly occurring east of Bornholm in the Baltic Proper and the other one occurring in southern Kattegat, the Belt Sea, and the southwestern parts of the Baltic Sea (HELCOM 2017a).

The number of animals in the Baltic Proper sub-population is estimated to be around 500 animals[19] and this sub-population was categorised as 'critically endangered' in the HELCOM Red List (HELCOM 2013c).

The Kattegat-Belt Sea-Western Baltic sub-population was recently estimated at around 40 500 animals[20]. Based on a survey of small cetaceans in European Atlantic waters and the North Sea (SCANS) the population has been stable over the past twenty-two years (Hammond *et al.* 2016). This sub-population was assessed as 'vulnerable' in the HELCOM Red List.

Implementation of HELCOM actions to improve the status of mammals

National actions

The development and implementation of national management plans for seals have been accomplished for harbour seals, but for grey seals and ringed seals they are not yet developed by all countries concerned (Table 3.3.1). Harmonization of the national management plans is an ongoing process through HELCOM SEAL EG.

[19] 95 % confidence range 80 to 1091
[20] 95 % confidence range 25 614 to 65 041

Table 3.3.1. Accomplishment of national actions to improve the status of seals. Blue=accomplished, Orange=partly accomplished. 'Status' indicates the number of countries that have implemented the action.

Action	Countries concerned*	Status
National management plans for grey seals	DK, EE, FI, PL, RU, SE	4 / 6
Implementation of national management plans for grey seals	DK, EE, FI, PL, RU, SE	4 / 6
National management plans for harbour seals	DK, SE	2 / 2
Implementation of national management plans for harbour seals	DK, SE	2 / 2
National management plans for ringed seals	EE, FI, RU, SE	2 / 4
Implementation of national management plans for ringed seals	EE, FI, RU, SE	1 / 4
Protect ringed seal in the Gulf of Finland	EE, FI, RU	1 / 3
Implementation of non-lethal mitigation measures for seals-fisheries interactions	ALL	2 / 9

*Countries for which it is relevant to develop management plans for the respective species

HELCOM agreed at the 2013 Ministerial Meeting to pay particular attention to **protect the ringed seal in the Gulf of Finland**. Transboundary cooperation between Estonia, Finland and Russia towards a joint conservation plan for ringed seal was initiated through the project 'Gulf of Finland year 2014' and a joint project application to improve the knowledge of the situation of the ringed seal in the Gulf of Finland has recently been submitted.

The implementation of **non-lethal mitigation measures for seals-fisheries interactions** is considered as partly accomplished based on the follow-up of Recommendation 27-28/2, as well as based on national reporting on the implementation of the BSAP. Development of "seal safe" fishing gear is ongoing in Denmark, Finland, Latvia and Sweden (HELCOM 2016d). The main purpose of seal safe gear is to hinder seals from entering the trap or damage the catch and it is used to mitigate conflicts between fisheries and seals. In Estonia, Lithuania and Sweden fishermen can apply for funding of seal safe gear and compensation schemes are also under consideration by other countries (HELCOM 2017w). The use of pingers to deter seals from fishing gear has been tested by several countries but results are only partly successful.

In 2016 HELCOM Recommendation 27/28-2 was evaluated by HELCOM SEAL EG (HELCOM 2016d). The Recommendation includes additional commitments related to the protection of Baltic seals, including common principles for the allowance of licences for deliberate killing of seals, to prevent illegal killing, and to establish a network of protected areas for seal habitats across the Baltic Sea area.

The evaluation concluded that, in accordance with the Recommendation, there is no hunting on seal populations below the agreed Limit Reference Level (LRL)[21] and that when the population size exceeds the LRL, hunting only occurs in populations with positive growth rates.

[21] the Safe Biological Level. This level has been set at 10.000 for genetically isolated populations. For harbour seals and LRL at 10 000 harbour seals has been set for the combined management unit "Kattegat (including the Danish Straits)" and "Southwestern Baltic" – see further conditions for this LRL in document 6-21 to HOD 51-2016.

The SEAL EG evaluation points out that protective hunting at fishing gear is used as a mitigation of fisheries conflicts with seals. The evaluation suggests that the possibility to hunt seals specializing on gear has likely reduced illegal killing, but there is no assessment of the size of illegal kills.

In Denmark, Estonia, and Russia all major haul-out sites for seals are protected and in Finland and Sweden the majority of haul-out sites are protected. The agreement to establish a network of MPAs for seal habitats in the Baltic Sea is assessed as being partly accomplished.

There is only one HELCOM action that specifically address the protection of harbour porpoise and this action, which is related to reduction of by-catch, is covered in section 2.6 of this report.

Reflection on HELCOM actions on the conservation of mammals

While the majority of seal populations are still not achieving good status, the population trends show increasing abundance of most populations. The development and implementation of management plans for seals, as agreed to be fulfilled by 2012 in the BSAP, is however, only partly accomplished. The SEAL EG was invited to consider the sufficiency of HELCOM actions to achieve good status for seals in the Baltic Sea. The group was of the view that the existing HELCOM actions should be sufficient to reach good status for seals, provided that they are fully implemented. An exception is the ringed seal considering that the ice extent and number of ice days is decreasing in the Baltic Sea and that this species is dependent on sea ice for breeding (HELCOM 2017w).

The Baltic Proper sub-population of harbour porpoise was categorized as 'critically endangered' in the HELCOM 2013 Red List and the population in the western Baltic Sea as 'vulnerable' (HELCOM 2013d). A preliminary overview of national measures taken to protect red-listed mammals, shows that some form of conservation measures to protect harbour porpoise have been taken by all countries in which waters the harbour porpoise resides (HELCOM 2016d).

In 2016, Sweden designated four new Natura 2000 sites, aimed at the protection of harbour porpoise. One of the new areas (including Hoburgs bank and Midsjöbankarna) has been identified as a main breeding area for harbour porpoise in the Baltic Proper. The new Swedish Natura 2000 sites cover 1.3 million hectares.

3.4 BIRDS

Status and trends

The status of birds is assessed based on two HELCOM core indicators: 'Abundance of waterbirds in the wintering season' and 'Abundance of waterbirds in the breeding season'. Good status is achieved when the abundance of 75% of the considered species does not decline by more than 30%[22] compared to a reference period. The two indicators, which are assessed at the level of the whole Baltic Sea region, did not achieve good status in the period 2011-2015 (HELCOM 2017n).

Of the individual species included in the wintering bird indicator, 74% did not achieve good status and the indicator was thus very close to achieving the threshold value (HELCOM2017e). When considering species groups, surface feeders and pelagic feeders achieved the threshold value whereas benthic feeders and grazing feeders did not reach the threshold value. Trends for the period 1991-2015 shows that nine species included in the wintering bird indicator have significant positive trends and 16 significant negative trends, while two species appear to be stable.

For breeding birds, 17 of the 26 species included in the indicator are in good status representing 65% of the species assessed. When considering species groups, pelagic feeders and grazing feeders achieved the threshold value while surface feeders, benthic feeders and wading feeders failed to achieve the threshold value. Trends for breeding birds in the period 1991-2015 show seven species with significant positive and 12 significant negative trends, while six species appear to be stable and for one species the result is uncertain (HELCOM2017d).

Implementation of HELCOM actions related to the conservation of birds

HELCOM has agreed to **protect seabirds in the Baltic Sea, taking into consideration migratory species** (Table 3.4.1). This action is evaluated as partly accomplished through the agreement of HELCOM Recommendation 34/1 on "Safeguarding important bird habitats and migration routes in the Baltic Sea from negative effects of wind and wave energy production at sea". The Recommendation which was adopted in 2013 has not been followed-up as of to date. Mapping of migration routes and staging areas for birds in the Baltic Sea region to support the implementation of the Recommendation is planned for 2018.

Table 3.4.1. Accomplishment of joint HELCOM actions to conserve birds in the Baltic Sea. Orange=partly accomplished.

Action
Protect seabirds in the Baltic Sea, taking into consideration migratory species

Reflection on HELCOM actions

Some of the species included in the core indicators on birds have also been listed as threatened according to the HELCOM Red List. A preliminary overview of national measures taken to protect red-listed birds shows that specific conservation measures are in place for only four of 23 threatened bird species while most threatened species are subject to some form of general protection of the species or its habitat, for example through national action plans or legislation (HELCOM 2016d). Examples of implemented measures to protect birds in the Baltic Sea region are prohibition of hunting and collection of eggs, protection of nesting areas from disturbance, restoration of degraded breeding habitats and predator management.

[22] 20% in species laying only one egg per year.

HELCOM has also recognized that the protection of seabirds, due to their mobile and transboundary nature, needs to take place through cooperation with other regions through Conventions and institutions such as the Agreement on Conservation of African Eurasian Migratory Waterbirds (AEWA) under the Convention on Migratory Species (CMS), and particularly in the North Sea (OSPAR) and Arctic (Arctic Council) areas (HELCOM Ministerial Declaration 2013).

3.5 RED LISTED SPECIES AND HABITATS

Red-listed species and habitats are found among all ecosystem components addressed in the 'State of the Baltic Sea' report. In this section, HELCOM actions addressing red listed species and habitats in general are addressed.

Status of red listed species and habitats

In 2013, HELCOM published two comprehensive Red Lists based on criteria developed by the International Union for Conservation of Nature (IUCN); 'Red List of Baltic Sea underwater biotopes, habitats and biotope complexes' (HELCOM 2013e) and 'Red List of Baltic Sea species in danger of becoming extinct' (HELCOM 2013d). The assessments revealed a critical situation for many Baltic Sea species and biotopes (Figure 3.5.1).

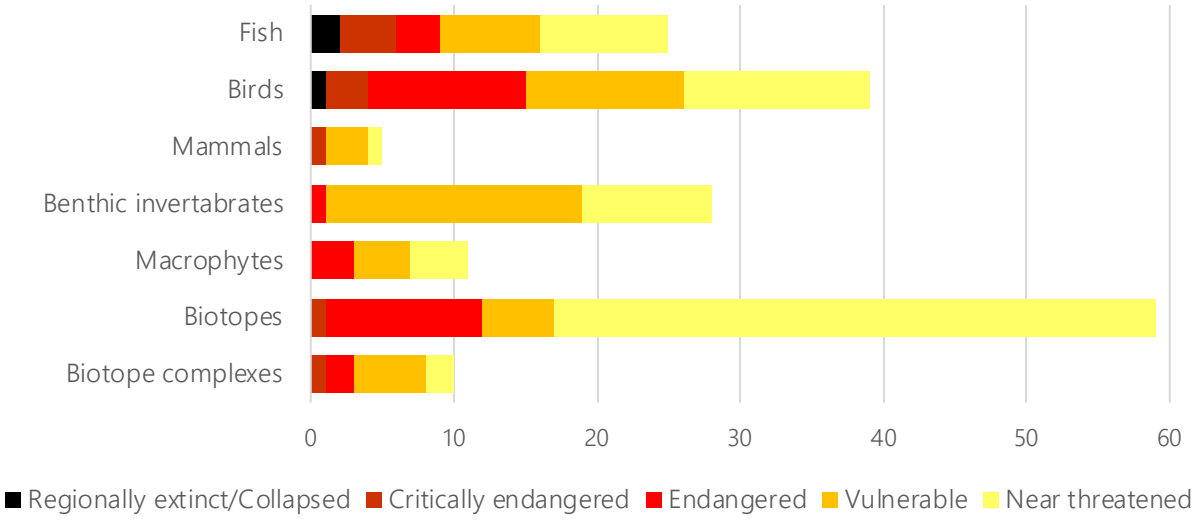


Figure 3.5.1. Number of red listed species, biotopes and biotope complexes in the Baltic Sea (HELCOM 2913d and 2013e). For information on the different categories see Box 3.

Implementation of HELCOM actions on red listed species and habitats

Joint actions

The HELCOM Red List on underwater features published in 2013 was based on the joint development of a **new classification system for Baltic Sea underwater biotopes and habitats** (HELCOM 2013b) (Table 3.5.1).

As a result of the critical outcome of the two Red List assessments, HELCOM agreed at the 2013 Ministerial Declaration to develop two recommendations: one on conservation plans for threatened species, and another on conservation plans for threatened habitats and biotopes. A new HELCOM Recommendation on the **'Conservation of Baltic Sea Species Categorized as Threatened According to the 2013 HELCOM Red List'** was adopted in 2016 (Rec 37/2, ') while a recommendation on threatened habitats and biotopes has been drafted but not reached adoption.

In 2016 HELCOM agreed on a set of new actions for consideration including 'Activities to support conservation of Baltic Sea species and biotopes/habitats categorized as threatened according to the HELCOM Red List' (HELCOM 2016b). As a follow-up to this action a list of national conservation measures is being compiled under the State and Conservation Working Group (HELCOM 2016d).

Table 3.5.1. Accomplishment of joint HELCOM actions to conserve red listed species and habitats in the Baltic Sea. Blue=accomplished, Orange=partly accomplished.

Action
Develop a new classification system for Baltic Sea underwater biotopes and habitats
Develop by 2015 regional targets for the implementation of the Strategic Plan for Biodiversity, including the development of a set of HELCOM core indicators for biodiversity and their monitoring
Develop by 2015 a new HELCOM Recommendation on conservation plans for species which are at risk of extinction
Develop by 2015 a new HELCOM Recommendation on conservation plans for habitats and biotopes which are at risk of extinction

National actions

Through HELCOM Recommendation 37/2 a number of national actions have been agreed, for example to develop new or amend existing conservation -, recovery - or action plans for HELCOM threatened species as needed and with the aim to implement the plans by 2021 at the latest. The link to HELCOM Marine Protected Areas (MPAs) is highlighted in the Recommendation by requesting countries to consider new or expanded MPAs for the conservation of HELCOM threatened species, in particular to improve connectivity between populations and key areas along migration routes. Implementation of Recommendation 37/2 will be reported for the first time in 2018.

Two HELCOM actions related to improving the status of red-listed biotopes and habitats have future target years (Table 3.5.2).

Table 3.5.2. Accomplishment of national HELCOM actions to conserve red-listed species and habitats in the Baltic Sea. Grey=future target year.

Action	Status
Take measures so that by 2020, regionally, a) the loss of all red-listed marine habitats and biotopes in the Baltic Sea will be halted	Target year: 2020
Take measures so that by 2020, regionally b) red-listed marine habitats and biotopes have largely recovered, and that degradation and fragmentation have been significantly reduced, the progress of which will be measured with a core indicator to be produced	Target year: 2020

Reflection on HELCOM actions

The development of a HELCOM Recommendation on the conservation of red listed biotopes, agreed through the 2013 Ministerial Declaration, has not been realized. It was, furthermore, agreed that measures should be taken to restore and halt the loss of red listed marine habitat and biotopes by 2020. When this commitment was made it had been tentatively agreed to update the HELCOM Red List assessment by 2019. The next update of the Red List assessment should optimally be timed so HELCOM could follow up on the targets for biotopes and habitats set for 2020.

Box 3. Background to the Red List categories

The HELCOM Red List is based on IUCN criteria and categories. Critically Endangered, Vulnerable and Endangered species and biotopes are described as "threatened". The threatened and near threatened species and biotopes are jointly labelled as Red Listed. The definition of categories found in the Baltic Sea can be briefly described according to the following (for full description see IUCN (2017).

Species:

REGIONALLY EXTINCT (RE): when there is no reasonable doubt that the last individual potentially capable of reproduction within the region has died or disappeared from the region or, in the case of a former visiting taxon, individuals no longer visit the region.

CRITICALLY ENDANGERED (CR): when the best available evidence indicates that the species meets the IUCN criteria 'Critically Endangered" and therefore is considered as facing an extremely high risk of extinction in the wild.

ENDANGERED (EN): when the best available evidence indicates that the species meets IUCN the criteria "Endangered" and therefore is considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU): when the best available evidence indicates that the species meets IUCN the criteria "Vulnerable" and therefore is considered to be facing a high risk of extinction in the wild.

NEAR THREATENED (NT): when the species has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Biotopes:

CRITICALLY ENDANGERED (CR): when the best available evidence indicates that the biotope meets any of the Red List criteria for 'Critically Endangered' and it is therefore considered to be facing a very severe risk of collapse throughout its distribution

ENDANGERED (EN): when the best available evidence indicates that the biotope meets any of the Red List criteria for 'Endangered' and it is therefore considered to be facing a severe risk of collapse throughout its distribution.

VULNERABLE (VU): when the best available evidence indicates that the biotope meets any of the Red List criteria for 'Vulnerable' and it is therefore considered to be facing a moderately severe risk of collapse throughout its distribution.

NEAR THREATENED (NT): when the best available evidence indicates that the biotope meets any of the Red List criteria for 'Near Threatened' and it is therefore considered to be facing a moderate risk of collapse throughout its distribution.

3.6 MARINE PROTECTED AREAS

HELCOM agreements

The designation of marine protected areas (MPAs) is a measure aimed at protecting valuable habitats and biological and genetic diversity, i.a., through spatial and temporal regulation of human activities, implementation of conservation measures, and by raising public awareness.

The designation of MPAs has been an instrument for protection in the Baltic Sea for more than 30 years with the overarching HELCOM target to achieve a coherent and effectively managed network of MPAs in the Baltic Sea. This target refers not only to the network of HELCOM MPAs, but also to other protection programmes such as Natura 2000 and Ramsar sites.

Specific HELCOM objectives for MPAs are addressed in HELCOM Recommendation 35/1 on 'System of Coastal and Marine Baltic Sea Protected Areas (HELCOM MPAs[23]) (adopted in 2014) which was followed-up in 2016 together with an assessment of the ecological coherence of the MPA network (HELCOM 2016a). Results from the 2016 evaluation related to measures and management co-ordination are summarized here.

Implementation of HELCOM actions on marine protected areas

Joint actions

When evaluated in 2016, 11.8% (54 367 km^2) of the Baltic Sea area was covered by MPAs and thus, the CBD Aichi target of conserving at least 10% of coastal and marine areas has been reached at the level of the regional sea. The majority of the sites are, however, located in the coastal areas and Recommendation 35/1 therefore stipulates the further aim of reaching the **10% target in all sub-basins and including the EEZ beyond territorial waters,** when scientifically justified. This aim was partly accomplished when evaluated in 2016 (Table 3.6.1. see also HELCOM 2016a, e.g. Table 14).

The **HELCOM MPAs should provide protection to Red listed species in the Baltic Sea**. This objective is only partly accomplished since based on the latest evaluation only 36% of threatened species and 12% of threatened biotopes are protected within at least one MPA. This estimate is based on reporting of protected features to the HELCOM MPA database and may underestimate the actual protection of red listed features.

A specific aim of the network of HELCOM MPAs is that it should be **ecologically coherent**, i.e. that the network of protected sites should deliver more benefits than individual MPAs. Ecological coherence of the network was evaluated in 2016 based on four aspects: representativity, replication, adequacy and connectivity. Areal representation of different types of geographical features and broad scale habitats, and the replication of a set of indicative species, biotope complexes and broad-scale habitats, was assessed at an acceptable level. However, evaluations of adequacy, which considers the quality of the network, and connectivity, which measures how well the network supports the migration and dispersal of species, indicate that the network is not yet ecologically coherent.

In 2016 HELCOM agreed on a set of new actions for consideration including 'Coordination of management measures of pressures and impacts on MPAs, in particular for adjacent transnational MPAs' which is being taken forward under the regular work of the State and Conservation Working Group (HELCOM 2016b).

[23] Former HELCOM BSPAs

Table 3.6.1. Accomplishment of joint actions on marine protected areas related to measures and management coordination. Blue=accomplished, Orange=partly accomplished. Grey=future target year.

Action
Revise by 2014 HELCOM Recommendation 15/5 "System of coastal and marine Baltic Sea protected areas (BSPAs)"
A least 10% of the marine area in all sub-basins of the Baltic Sea including the EEZ areas beyond territorial waters is covered by MPAs where scientifically justified
HELCOM MPAs, inter alia, provide specific protection to those species, habitats, biotopes and biotope complexes included in the HELCOM Red Lists, by considering these in the site selection procedure
When selecting new areas, ensure that the network of HELCOM MPAs is ecologically coherent and takes into account connectivity between sites including for example migration routes, species mobility and areas of special ecological significance such as spawning areas (Target year: 2020)

National actions

To reach the target of protecting 10% of the marine area in all sub-basins, HELCOM Recommendation 35/1 stipulates that countries should **designate new sites as HELCOM MPAs especially in offshore area beyond territorial waters,** where ecologically meaningful. When the Recommendation was evaluated in 2016, only Finland had designated new sites since the adoption of the Recommendation in 2014 (Table 3.6.2). The 11 new Finnish sites increase the total area of HELCOM MPAs in the Baltic Sea by 725 km^2 and the EEZ area covered by HELCOM MPAs by 82km^2. Since then Lithuania has also designated MPAs extending in total 411,5 km^2 beyond territorial waters. In 2016 Sweden also designated four new Natura 2000 areas. The new Swedish sites, which cover 1.3 million hectares, are currently not reported as HELCOM MPAs. At the 2017 UN SDG Ocean Conference, Denmark, Estonia and Sweden made voluntary commitments to designate new marine protected areas, including in the EEZ (see Annex 1, Voluntary commitments SDG14).

Management plans, which define the objectives of the MPAs and the restrictions to human activities within the sites, are an integral part of the application of MPAs. The objective of HELCOM is that **all existing MPAs should have implemented management plans or measures by 2015**. In 2016, the percentage of MPAs with management plans was 67%.

Table 3.6.2. Accomplishment of national actions on marine protected areas related to measures and management coordination. Orange=partly accomplished. 'Status' indicates the number of countries that have implemented the action

Action	Status
Designate new sites as HELCOM MPAs where ecologically meaningful, especially in offshore area beyond territorial waters	2 / 9
Develop and apply by 2015 management plans or measures for all existing HELCOM MPAs	67%*

*Percent implemented management plans in 2016.

The Recommendation further specifies that management plans, when necessary and in accordance with other legal requirements, should be updated with a maximum of 12 years interval. In 2016 this was not the case for about 5% of the implemented plans.

Reflection on HELCOM actions

HELCOM Recommendation 35/1 combines several commitments on MPAs from the BSAP and HELCOM Ministerial Declarations in 2010 and 2013. The 2016 evaluation concluded that none of the paragraphs of the Recommendation related to measures and management coordination were fully accomplished.

The Recommendation, furthermore, lays down that HELCOM MPAs should be assessed in regard of "**the effectiveness of the management plans or measures of HELCOM MPAs by conducting monitoring, and where feasible scientific research programmes, which are directly connected to the conservation interests of HELCOM MPAs, including the placement of monitoring stations inside the MPAs**". Such an evaluation is needed to corroborate if HELCOM MPAs are meeting their objectives and is a successful measure to protect biological and genetic diversity. At this time HELCOM, however, lacks a common methodology for carrying out such an evaluation.

The use of site selection tools is promoted in the Recommendation to ensure that the designation of MPAs contributes to the creation of a coherent network of HELCOM MPAs. In this regard it can be noted that the BONUS project BAMBI (Baltic Sea Marine Biodiversity) has recently developed a methodology for such an analysis based on models of connectivity between a set of type organism.

Proposals for next steps for improving the HELCOM MPA network and its assessment have been outlined in HELCOM 2016a, chapter 6.

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Annex 1. Voluntary commitments by HELCOM and Contracting Parties at the UN Conference 'Our oceans, our future: partnering for the implementation of Sustainable Development Goal 14' held in June 2017

HELCOM

- Designation and enhancement of implementation of the Baltic Sea as NOx Emission Control Area for ships and public-private partnership
- Strengthening the implementation of the HELCOM Baltic Sea Action Plan to support ocean-related SDGs
- Identification of Ecologically or Biologically Significant Marine Areas (EBSA) in the Baltic Sea
- Regional Seas Programme for ocean-related SDGs

Denmark

- Marine Protected Areas in Kattegat
- Reducing marine litter
- Support Sustainable Coastal Fisheries in Myanmar
- Reducing plastic marine debris in Indonesia

Estonia

- Establishing marine protected areas in Estonian EEZ
- Establishing regional plans for aquaculture in Estonian marine areas
- Creating the regulatory system to allow for and promote the use of LNG as an alternative fuel
- Improving the stormwater discharge systems to decrease the load of nutrients, hazardous substances and litter to the sea
- Identifying impacts of climate change on Estonian marine environment and the assessment of cumulative effects of human activities on marine ecosystems
- Increasing knowledge and awareness on alien species
- Building up the national infrastructure to ensure the effective implementation of the Ballast Water Convention
- Establishing electronic notification systems for the effective use of fishing gear
- Establishing integrated nitrogen management systems for the Gulf of Riga
- Public awareness and information campaign on marine litter and prevention of plastics in the sea
- Marine litter action plan for ports and harbours

European Union

- Strengthening regional cooperation to support implementation of SDG 14
- Preventing and significantly reducing marine litter in EU Member States' waters
- Achieve the good environmental status of EU Member States' marine waters by 2020
- Full deployment of European Marine Observation and Data Network (EMODnet) by 2020
- Promoting a structured dialogue on cruise tourism between cruise operators, ports and port cities
- The EU, together with its Mediterranean partners, has endorsed MedFish4Ever Declaration
- First State of the Ocean status report, delivered through EU's Copernicus Marine Environment Monitoring Service (CMEMS)
- Modernization project to update the European Fisheries Control Agency application

- Additional funds to a number of SDG14 related research and innovation projects
- European Commission and IOC/UNESCO accelerating Maritime/Marine Spatial Planning processes worldwide
- Protecting fisheries livelihoods in Ghana and Somalia
- Series of studies on biodiversity conservation in Africa, Asia and Latin America
- Support for management of protected areas, including MPAs, in ACP Countries
- Conservation and sustainable use of marine and coastal biodiversity in the Carribean Sea Basin
- Enhancing the capacity of developing countries to implement their obligations under CITES for marine species
- Fostering biodiversity action in the outermost regions and overseas countries and territories of EU Member States (BEST)
- Launch of twinned marine protected areas in Europe and Africa, North America, and South America
- Improvement of regional fisheries governance in Western Africa
- Support for RFMOs for strengthened governance, science, capacity building and increased compliance

Finland

- Marine Information and Data for Users - www.MarineFinland.fi
- Arctic Marine Protected Area Network Toolbox Project (2017-2019, with Sweden and Canada)

Germany

- Installation of a German air monitoring network to support MARPOL Annex-VI compliance monitoring
- Reducing air pollution from vessels serving the German Federal Administration
- Partnership for Regional Ocean Governance: International Forum for Advancing Regional Ocean Governance
- Scoping Processs: Blue Ocean
- Fostering the conservation and sustainable use of marine Biological Diversity through the International Climate Initiative (IKI)
- Implementation of Ten-point Plan of Action for Marine Conservation and Sustainable Fisheries of German Development Cooperation
- Blue Action Fund (Africa, Latin America, Asia and Pacific region)
- Support of the research project: Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC)
- Support of environmental regulatory measures for Deep Sea Mining: Project
- Marine Protected Area in the Weddell-Sea, Antarctica

Russia

- St. Petersburg Initiative (SPbI). Focus of the activities of SPbI is on: Green technologies, Waste water treatment, Waste management, Environmental monitoring, Environmental education and outreach

Sweden

- Meeting Sweden's MPA target
- Cross-boundary and inter-sectorial solutions for ecosystem-based marine spatial planning: the Symphony method
- Responsible plastic management

- Securing social-, economic- and environmental sustainability in the Swedish Maritime Strategy
- Development of ecosystem-based management of fish and fisheries in Sweden
- The Swedish Government intends to implement appropriate and relevant conservation measures regarding fisheries in order to reach conservation objectives in all marine protected areas by 2020
- Support development of a Source to Sea Approach to land based pollution including marine litter
- Connecting and Protecting Our Seas: Initiatives in the Baltic and the Mediterranean
- Industry and research driven development and introduction of selective and low impact fishing gears
- Environmental monitoring with one of the world's most modern research vessels
- Ban plastic microbeads in cosmetics
- Contribution to the Blue Action Fund
- Swedish strategy for global action on the environment, climate, oceans and natural resources 2018–2022
- Swedish support to FAO for developing countries implementation of Port State Measures Agreement, the Global Registry and technical consultations for the marking of fishing gear
- Arctic Marine Protected Area Network Toolbox Project (2017-2019, with Finland and Canada)
- Strengthening capacity on ocean acidification monitoring, ecosystem resilience, MPA networks in a changing climate, coral reef protection and marine spatial planning
- Contribution to the CBD Special Voluntary Trust Fund to support work on EBSAs, Marine Spatial Planning and the Sustainable Ocean Initiative
- Desktop Study on Marine Litter including Microplastics in the Arctic (Phase I)

Annex 2. Categorization of type of actions

This report focuses on the actions that have been categorized as 'measures' and 'management' coordination according to the definition presented here. Accomplishment of actions related to the categories 'monitoring and assessment', 'data and information' and 'knowledge' are presented in Annex 3.

Measures - directly aimed at reducing pressures or improving the state of the environment

i. Reduction of pressures
ii. Spatial protection
iii. Restoration/Reintroductions of habitats and species
iv. HELCOM Recommendations that require implementation through measures
v. Joint actions with the aim of influencing international regulations

b. Management coordination - aimed at establishing joint HELCOM principles for management of the marine environment

i. HELCOM Recommendations not included under Measures
ii. Plans, guidelines and manuals
iii. Assessment tools
iv. Classification systems, reporting systems
v. Follow-up/assessments of agreed actions and plans

c. Monitoring and assessment i.e. the implementation of

i. Monitoring and surveillance
ii. Assessments

d. Data and information

i. Data
ii. Databases

e. Knowledge

i. Promotion of research
ii. Reviews and evaluations
iii. Development of supporting information [e.g. modelling]

Annex 3. Achievement of HELCOM agreements related to knowledge, monitoring and assessment, and data

This Annex lists the accomplishment of HELCOM actions that have been categorized as related to data and information, monitoring and assessment, or enhancing knowledge. The column 'Level of implementation' differentiates between a) joint actions i.e. actions that are implemented in cooperation through HELCOM subsidiary bodies and HELCOM projects b) national actions i.e. actions that are implemented by the respective Contracting Party. For actions implemented at a national level the number within parenthesis refers to number of Contracting Parties that have accomplished the action. Colour codes: Blue=accomplished, Orange=partly accomplished, Red=not accomplished Grey=future target year.

Eutrophication, including clean shipping

Action	Target year	Implementation Level	Type of action
Estimate the contribution of NOx emissions from shipping to eutrophication	Not specified	Joint	Monitoring and assessment
Initiate activity to identify/verify areas critical to N and P losses, utilizing the available data and as a starting point, to enable directing targeted and cost-effective measures where they can bring the greatest environment effect, e.g. compulsory measures on manure handling (storage and application) for installations of intensive rearing of cattle, poultry and pigs	Not specified	National	Knowledge
Establishment of a list of hot spots concerning animal farms for extensive rearing of cattle, poultry and pigs not in compliance with part 2, Annex III of the Helsinki Convention	2009	Joint	Knowledge
Investigate feasible and effective economic incentives for reducing emissions from ships (HELCOM Recommendation 28E/13)	2009	National (2/9)	Knowledge
Governments of the HELCOM Contracting Parties shall make use of the assessments of the inputs and effects of airborne nitrogen to the Baltic Sea in the revision of the emission targets for nitrogen under CLRTAP	2009	Joint	Knowledge

Hazardous substances, including accidental pollution from maritime activities

Action	Target year	Implementation level	Type of action
Evaluation of the need to develop further requirements for reduction of heavy metals and other hazardous substances emissions from energy production and industrial combustion plants	2008	Joint	Knowledge
Screening of the occurrence of selected hazardous substances (2008-2009)	2009	Joint	Knowledge
Screening of sources of selected hazardous substances (2009)	2009	Joint	Knowledge
Testing and possible introduction of Whole Effluent Approach (2009)	2010	Joint	Knowledge

■	Further assess the environmentally negative impacts of pharmaceuticals and other substances that are not monitored regularly, with the aim as a first step to assess in a coordinated manner their occurrence in the Baltic Sea and evaluate their impacts on the Baltic biota	Not specified	Joint	Monitoring and assessment
■	Collect more information and assess the state of contamination with pharmaceuticals and their degradation products of the aquatic environment and to develop measures, as appropriate, to prevent pharmaceuticals from reaching the Baltic Sea	Not specified	Joint	Monitoring and assessment
■	Monitoring and assessment of airborne inputs of hazardous substances	Not specified	Joint	Monitoring and assessment
■	Establishment of chemical product registers to be built upon e.g. the EU REACH (EC1907/2006) framework (2010)	2010	National (6/9)	Data and information
■	Take actions to ensure the completion of the re-surveys for areas used by navigation (CAT I and II) within the time schedules estimated in the 2013	2013	Joint	Knowledge
■	Further develop regional preparedness and response related services including HELCOM SeaTrackWeb, HELCOM Automatic Identification System, HELCOM Pollution Reporting System (POLREP), HELCOM GIS and links to relevant EU systems towards a second generation of HELCOM oil response information system covering the whole Baltic Sea on an equal basis	2015	Joint	Data and information
■	Produce a one-off HELCOM thematic assessment on environmental risks of hazardous submerged objects covering contaminated wrecks, lost or dumped dangerous goods (e.g. containers), and other objects, also utilizing the 2013 report on dumped chemical munitions	2015	Joint	Monitoring and assessment
■	Comprehensively assess the status, environmental risks and opportunities of maritime activities in the Baltic Sea region within HELCOM, contributing to the HELCOM Holistic Assessment planned for 2016, as well as to safety measures including routeing and those on winter navigation	2016	Joint	Monitoring and assessment
■	Promote wider use of accurate and reliable depth information by e.g. developing existing and/or new products including an enhanced and freely accessible Baltic Sea Depth Model	Not specified	Joint	Knowledge
■	Foster CAT III (CATEGORY III) re-surveys of other areas not primarily for safety of navigation purposes, e.g. for environmental protection	Not specified	Joint	Monitoring and assessment
■	Make full use of satellite surveillance to assit response to accidental oil spills in the Baltic Sea	Not specified	Joint	Monitoring and assessment
■	Extend monitoring of non-compliant ships entering the HELCOM area using Automatic Identification System (e.g. for enforcement of the International Convention on the Control of Harmful Anti-fouling Systems on Ships - AFS Convention)	Not specified	Joint	Monitoring and assessment

	Continued monitoring of radioactive substances in accordance with HELCOM Recommendation 26/3 and making assessments of the impacts of radioactivity on the marine environment and on humans	Not specified	National	Monitoring and assessment
	Develop biological effects monitoring to facilitate a reliable ecosystem health assessment	2008	National (7/9)	Monitoring and assessment

Marine litter

Action	Target year	Implementation level	Type of action
Carry out the monitoring of the progress towards achieving the agreed goals and to gain an inventory of marine litter in the Baltic Sea as well as scientific sound evaluation of its sources	Not specified	Joint	Monitoring and assessment
Identify the socio-economic and biological impacts of marine litter, also in terms of toxicity of litter	Not specified	Joint	Knowledge

Underwater sound

Action	Target year	Implementation level	Type of action
Map the levels of ambient underwater noise across the Baltic Sea	2016	Joint	Data and information
Set up a register of the occurrence of impulsive sounds	2016	Joint	Data and information

Non-indigenous species

Action	Target year	Implementation level	Type of action
Implementation of HELCOM Ballast Water Road Map - compilation of a list of non-indigenous, cryptogenic and harmful native species and a list of HELCOM Target Species that may impair or damage the environment, human health, property or resources in the Baltic Sea	2008	Joint	Knowledge
Implementation of the HELCOM Ballast Water Road Map - conducting of baseline surveys of prevailing environmental conditions in major ports	2008	National	Monitoring and assessment
Implementation of the HELCOM Ballast Water Road Map – adjust HELCOM monitoring programme to obtain reliable data on non-indigenous species/ to link the port surveys and monitoring to shore-ship communication systems	2010	Joint	Monitoring and assessment

Species removal by fishing

Action	Target year	Implementation level	Type of action
Evaluation of the effectiveness of existing technical measures to minimise by-catch of harbour porpoises	2008	Joint	Knowledge
Development and implementation of effective monitoring for by-caught birds and mammals	Not specified	Joint	Monitoring and assessment
Development and implementation of effective reporting systems for by-caught birds and mammals	Not specified	Joint	Monitoring and assessment

Biodiversity

Action	Target year	Implementation level	Type of action
Assessment of ecological coherence of the BSPA/MPA network (Joint HELCOM/OSPAR working programme to the 2003 Ministerial Declaration)	2010	Joint	Monitoring and assessment
Modernize by 2014 the HELCOM BSPA (former Baltic Sea Protected Areas, currently MPA – Marine Protected Areas) database to make it publicly available	2014	Joint	Data and information
Update by 2015 the assessment of ecological coherence of the network of protected areas in the Baltic Sea, with an evaluation of marine areas in need of further protection	2015	Joint	Monitoring and assessment
Further development of a coordinated reporting system and database on harbour porpoise sightings, by-catches and strandings	2010	Joint	Data and information
Production of an assessment of the conservation status of non-commercial fish species	2011	Joint	Monitoring and assessment
Updating of HELCOM Red lists of Baltic habitats/biotopes and biotope complexes	2013	Joint	Monitoring and assessment
Producing a comprehensive HELCOM Red List of Baltic Sea species	2013	Joint	Monitoring and assessment
Further develop common HELCOM approach and assessment tools for assessing the status of biodiversity and nature conservation and to continuously monitor the conservation status and to periodically evaluate whether the targets of this Action Plan have been met using indicator-based assessments	2010	Joint	Monitoring and assessment
Classify and make inventories of rivers with European eel	Not specified	National (2/9)	Data and information

Other types of actions

Action	Target year	Implementation level	Type of action
Assess the effectiveness of the implementation of the HELCOM Baltic Sea Joint Comprehensive Environmental Action Programme to be accomplished by 2012 and the need for its prolongation, including also the extension of the List of HELCOM Hot Spots, at the 2013 HELCOM Ministerial Meeting	2012	Joint	Monitoring and assessment
Newly applied tools and methods for the assessment of the environmental status and ecosystem health of the Baltic Sea, such as those used in the HELCOM Initial Holistic Assessment are further developed and updated by 2013 according to improved data availability and scientific knowledge	2013	Joint	Monitoring and assessment
Core set of indicators with quantitative targets shall be developed for each of the segments of the HELCOM Baltic Sea Action Plan, while ensuring that the indicators can also be used for the other international monitoring and reporting requirements inter alia the EU Marine Strategy Framework Directive, and that a full indicator-based follow-up system for the implementation of the HELCOM Baltic Sea Action Plan be further developed and placed on the HELCOM website by 2013	2013	Joint	Monitoring and assessment
Arrange in 2013 a HELCOM ministerial meeting to evaluate the effectiveness of the national programmes and to review the progress towards the ecological objectives describing a Baltic Sea in good ecological status. Based on this review the Action Plan will be adjusted and the set of indicators with associated targets will be updated to ensure their relevance for achieving the objectives	2013	Joint	Monitoring and assessment
Taking into account existing studies, agree to further assess the economic and social consequences of the use of the Baltic Sea, including the costs of degradation of the Baltic marine environment	Not specified	Joint	Monitoring and assessment

Annex 1

Implementation of regional actions to develop maritime spatial planning related actions and management coordination

No	Action	Assessment of accomplishment
1	Develop, test, apply and evaluate broad-scale, cross-sectoral, marine spatial planning principles based on the Ecosystem Approach	Accomplished
2	Establish a joint, co-chaired HELCOM-VASAB Working Group on Maritime Spatial Planning (MSP)	Accomplished
3	Adopt a set of joint HELCOM-VASAB broad-scale transboundary Maritime Spatial Planning principle	Accomplished
4	Adopt "Guidelines on transboundary consultations and cooperation in the field of MSP" and the "Guidelines on public participation for MSP with transboundary dimensions"	Accomplished
5	Adopt "Guidelines on the application of Ecosystem Approach in transnationally coherent MSP	Accomplished

Implementation of national actions to develop maritime spatial planning related actions and management coordination

No	Action	Assessment of accomplishment	Amount of countries implementing
7	Update the Roadmap for Maritime Spatial Planning (MSP) in 2014 after HELCOM and VASAB ministerial meetings	Partly Accomplished	5/9
8	Develop national frameworks for coherent MSP	Partly Accomplished	7/9
9	Apply HELCOM guidelines on "transboundary consultations and cooperation in the field of MSP"15 and Apply HELCOM guidelines on "public participation for MSP with transboundary dimensions"	Future target year (2018)	
10	Apply HELCOM guidelines on "the application of Ecosystem Approach in transnationally coherent MSP"	Future target year (2018)	4/9
11	Apply maritime spatial plans, which are coherent across the borders and apply the ecosystem approach	Future target year (2020)	2/9