Joint Harmonised Procedure for the Contracting Parties of HELCOM and OSPAR on the granting of exemptions under International Convention for the Control and Management of Ships' Ballast Water and Sediments, Regulation A-4

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Overview

The "Joint HELCOM/OSPAR Harmonised Procedure for the Contracting Parties of OSPAR and HELCOM on the granting of exemptions under the International Convention for the Control and Management of Ship's Ballast Water and Sediments, Regulation A-4" (JHP) is based on the Guidelines for Risk Assessment under Regulation A-4 of the BWM Convention (G7) (Resolution MEPC.289(71) and was originally agreed by HELCOM and OSPAR Contracting Parties in 2013.

The JHP procedure aims to ensure that exemptions are granted in a coherent manner that does not impair or damage the environment, human health, property or resources. The background is further elaborated in Chapter 1 Introduction. Main users of this procedure include shipowners/operators, port State administrations and relevant experts and researchers.

Based on the Regulation A-4 of the Ballast Water Management Convention (the Convention), exemptions from ballast water management requirements described in the JHP can be issued to a ship on voyages between specified ports or locations for a maximum of five years. A port State may grant such an exemption if the risk is acceptable low, based on results of a risk assessment that is carried out in two steps (chapter 4, Risk Assessment). An automated Ballast Water Exemptions Decision Support Tool is available to facilitate uniform application of the risk assessment in step 1. In step 2, the risk assessment includes specific conditions of each case (e.g. additional information on target species, natural dispersal and eradication measures.

It is the responsibility of the ship owner/operator to apply for exemptions to the port State(s) directly. Contact information of the designated administration of the Contracting Parties can be found in the Decision Support Tool.

The minimum data and information required for an application, and to undertake a risk assessment, includes data on environmental conditions, and on non-indigenous species (chapter 2, Port Survey Protocol), species of concern (chapter 3, Target Species) and shipping information as set out in the appendix of Guidelines (G7) (chapter 6, Administrative Procedures). If this data is not available for the ports of interest, the applicant is responsible for carrying out port surveys to collect data.

Exemptions are envisaged when ships will be required to meet the D-2 standard of the Ballast Water Management Convention. Ship owners/operators that consider applying are urged to contact the relevant port State administrations well in advance (years) before the exemption is needed, for consultation and to make certain to get a decision in due time. If an exemption is not granted, the ship owner/operator must ensure to have enough time to secure that the ship is in compliance with the D-2 standard, e.g. by installation of a type approved ballast water management system.

The Convention entered into force on 8 September 2017. In the initial transitional period (2017-2024, see Chapter 1.17 (i) and Annex 1) the JHP is to be implemented in a flexible and practicable way in order to gain experience and to enable further development and improvements. The transitional period will end by 2024 when the D-2 ballast water standard applies in full according to regulation B-3 of the Convention.

Port State administrations	Applicants
- Target species selection (cooperation within HELCOM and OSPAR bodies) - Consult with other port State administrations regarding any case specific requirements e.g. for port survey - Guide and advise applicant on the case specific application of the JHP, e.g. data collection, performance of port survey, risk assessment, application requirements including risk assessment report - Inform applicant of the national administrative procedures and any conditions for the granting of exemptions as well as any conditions for withdrawal, intermediate review and validity of port surveys - Submit port survey data to the HELCOM Secretariat to be uploaded to the decision support tool - Review the application, the submitted data, the risk assessment report and make decision if exemption can be granted or not - Issuing exemption including specification of any conditions	- Consult with the appointed port State administrations at early stage - Collection of data including port survey according to the JHP, taking in to account any guidance or directions from port State administrations - Submission of port survey data to the port State administration - Performance of risk assessment in line with the JHP including step 1 and 2, taking into account any guidance or directions from port State administrations - Submit application, including all information and data required along with a risk assessment report

Figure 1. Distribution of responsibilities between port State administrations and applicants according to the JHP.

Contents

Definitions / Glossary

“Ballast Water“ means water with its suspended matter taken on board a ship to control trim, list, draught, stability or stresses of the ship.

“Ballast Water Management“ means mechanical, physical, chemical, and biological processes, either singularly or in combination, to remove, render harmless, or avoid the uptake or discharge of Harmful Aquatic Organisms and Pathogens within Ballast Water and Sediments.

“Convention“ means the International Convention for the Control and Management of Ships‘ Ballast Water and Sediments.

“Harmful Aquatic Organisms and Pathogens (HAOPs)“ means aquatic organisms or pathogens which, if introduced into the sea including estuaries, or into fresh water courses, may create hazards to the environment, human health, property or resources, impair biological diversity or interfere with other legitimate uses of such areas.

“Non-indigenous species” (NIS) means any species outside its native range, whether transported intentionally or accidentally by humans or transported through natural processes.

“Sediments“ means matter settled out of Ballast Water within a ship.

“Ship“ means a vessel of any type whatsoever operating in the aquatic environment and includes submersibles, floating craft, floating platforms, Floating Storage Units (FSU) and Floating Production Storage Offloading (FPSOs).

“Risk assessment” means the methods outlined in the Guidelines for Risk Assessment under Regulation A-4 of the BWM Convention (G7) and further elaborated in chapter 3 of this Joint Harmonised Procedure.

“Target species” means species identified that meet the specific criteria indicating that they may impair or damage the environment, human health, property or resources, as further elaborated in chapter 2 of this Joint Harmonised Procedure.

1. Introduction

1.1 Loading and discharging ballast water is an essential part of a ship operation, with ships requiring ballast water to maintain their stability, draft and manoeuvrability. Contained within this ballast water are numerous microscopic organisms of species that will be carried by the ship to new destinations outside their natural range. The vast majority of these organisms will not survive the journey; however, those that do survive may establish populations in a new environment if the biological and physical conditions are favourable. There are numerous well documented examples, from all parts of the world, of the negative effects of non-indigenous species (NIS) introduced through ballast water. Such NIS may cause serious ecological, economic and public health impacts, when they become invasive.

1.2 In response to this, the International Maritime Organization (IMO) through its Marine Environment Protection Committee (MEPC) has, over many years, been developing international legislation to prevent the harmful effects of transporting aquatic organisms in ship's ballast water. HELCOM and OSPAR have followed these global developments and provided regional input.

IMO Ballast Water Management Convention

1.3 In February 2004, a Diplomatic Conference convened by IMO adopted the "International Convention for the Control and Management of Ships' Ballast Water and Sediments" (the Convention)[1]. This Convention put in place international legislation on Ballast Water Management for the first time and entered into force on 8 September 2017.

1.4 The Convention aims to prevent the spread of Harmful Aquatic Organisms and Pathogens (HAOPs) from one region to another by establishing standards and procedures for the management and control of ships' ballast water and sediments. Under the Convention, all ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan. All ships also have to carry a ballast water record book and an International Ballast Water Management Certificate. The ballast water management standards are phased in over a period of time and it is expected that most ships will need to install an on-board ballast water treatment system. As an intermediate solution, ships should exchange ballast water mid-ocean.

1.5 Article 3 (1) of the Convention outlines its applicability and states:

> *"Except as expressly provided otherwise in this Convention, this Convention shall apply to:*
>
> *(a) ships entitled to fly the flag of a Party; and*
>
> *(b) ships not entitled to fly the flag of a Party but which operate under the authority of a Party."*

However, the Annex to the Convention provides for Parties, under Regulation A-4, the scope to issue exemptions from Regulation B-3 (Ballast Water Management for Ships) and Regulation C-1 (Additional Measures). Regulation A-4 states:

[1] http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships'-Ballast-Water-and-Sediments-(BWM).aspx

"1 A Party or Parties, in waters under their jurisdiction, may grant exemptions to any requirements to apply regulations B-3 or C-1, in addition to those exemptions contained elsewhere in this Convention, but only when they are:

.1 granted to a ship or ships on a voyage or voyages between specified ports or locations; or to a ship which operates exclusively between specified ports or locations;

.2 effective for a period of no more than five years subject to intermediate review;

.3 granted to ships that do not mix Ballast Water or Sediments other than between the ports or locations specified in paragraph 1.1; and

.4 granted based on the Guidelines on risk assessment developed by the Organization.

2 Exemptions granted pursuant to paragraph 1 shall not be effective until after communication to the Organization and circulation of relevant information to the Parties;

3 Any exemptions granted under this regulation shall not impair or damage the environment, human health, property or resources of adjacent or other States. Any State that the Party determines may be adversely affected shall be consulted, with a view to resolving any identified concerns;

4 Any exemptions granted under this regulation shall be recorded in the Ballast Water record book."

1.6 Article 13 (3) of the Convention also states that:

"In order to progress further the objectives of the Convention, Parties with common interests to protect the environment, human health, property and resources in a given geographical area, in particular, those parties bordering enclosed and semi-enclosed seas, shall endeavour, taking into account characteristic regional features, to enhance regional co-operation, including through the conclusion of regional arrangements consistent with this Convention. Parties shall seek to co-operate with the Parties to regional agreements to develop harmonized procedures".

1.7 Therefore, Contracting Parties of the Helsinki and OSPAR Conventions have jointly developed this Joint Harmonised Procedure (JHP) to ensure that exemptions are granted in a consistent and transparent manner that prevents damage to the environment, human health, property or resources.

Joint Harmonised Procedurefor the Contracting Parties of OSPAR and HELCOM on the Granting of Exemptions from the Convention under Regulation A-4

1.8 The purpose of the JHP is to provide a harmonized procedure in accordance with Article 13 (3) of the Convention for the issue of granting exemptions according to Regulation A-4 of the Convention to be used by OSPAR and HELCOM Contracting Parties. This document is not a Guideline in the sense of Regulation A-4 or any other part of the Convention.

1.9 Exemptions under regulation A-4 of the Convention may only be granted by Parties to the Convention.

1.10 Whilst Regulation A-4 gives Parties the right to grant exemptions it also sets out the requirements for doing so, *e.g*.

- exemptions can be only granted for vessels operating between specified ports and locations;
- exemptions shall not be effective for more than 5 years and subject to intermediate review; and
- exemptions must be granted based on the guidelines on risk assessment developed by the IMO (*Guidelines for Risk Assessment under Regulation A-4 of the BWM Convention (G7)*)[2].

The IMO Guidelines outline three risk assessment methods that will enable Parties to identify unacceptable high risk scenarios and acceptable low risk scenarios and advise Parties on procedures for granting and withdrawing exemptions in accordance with Regulation A-4. They provide for the basis of the following HELCOM / OSPAR JHP, which has been developed specifically for the Baltic and North-East Atlantic regions.

1.11 There are three risk assessment methods outlined in the Guidelines (G7) for assessing the risks in relation to granting an exemption in accordance with Regulation A-4 of the Convention:

- environmental matching risk assessment;
- species' biogeographical risk assessment;
- species-specific risk assessment.

1.12 Environmental matching risk assessment relies on comparing environmental conditions between locations; species' biogeographical risk assessment compares the environmental similarity and species composition in source and destination ports/areas to identify high risk invaders, while species-specific risk assessment evaluates the distribution and characteristics of identified target species. Dependent on the scope of the assessment being performed, the three approaches could be used either individually or in any combination, recognizing that each approach has its limitations.

1.13 Environment matching and species' biogeographical risk assessment may be best suited to assessments between biogeographic regions. Species-specific risk assessment may be best suited to situations where the assessment can be conducted on a limited number of harmful species within a biogeographic region.

1.14 The three main approaches to risk assessment provided under the IMO Guidelines (G7) have been considered in several reports, including: the HELCOM Guidance for High and Low Risk voyages[3], adopted by HELCOM Contracting Parties in 2010 together with the Baltic Sea Ballast Water Risk Assessment[4] in the Baltic Sea, the North Sea Ballast Water Consultation Group Concept Issue of Exemption[5], as well as work undertaken as part of the North Sea Ballast Water Management

[2] http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Marine-Environment-Protection-Committee-%28MEPC%29/Documents/MEPC.289%2871%29.pdf

[3] HELCOM. 2010. HELCOM Guidance for High and Low Risk voyages. Adopted at the HELCOM Moscow Ministerial Meeting 2010 as part of the Declaration.

[4] HELCOM. 2011. Pilot risk assessments of alien species transfer on intra-Baltic ship voyages

[5] OSPAR (EIHA 12/3/4) - Ballast Water Exemptions in the North Sea

Opportunity Project[6]. The reports identified that the key risk criteria for issuing exemptions within the North Sea and Baltic Sea were limited to:

a. difference in water salinity between ports/locations being visited; and

b. presence of NIS fulfilling certain criteria in either port/location being visited, that is, target species (TS).

1.15 The HELCOM ALIENS 2 and 3 projects further developed a harmonized method for granting exemptions from ballast water management for ships navigating the Baltic Sea. The initiatives developed a detailed port survey protocol for sampling Baltic Sea ports for the presence of NIS, taking into account the need for and benefits of having a consistent approach with the North-East Atlantic (OSPAR) region. The projects also considered the procedure for selecting TS and how to structure and use the collected data to support regionally coherent and transparent decision-making on exemptions.

1.16 The COMPLETE project ("Completing management options in the Baltic Sea region to reduce risk of invasive species introduction by shipping", October 2017 – September 2020) reviewed the existing TS selection criteria and risk assessments for granting exemptions under the 2015 version of the JHP and also advanced the decision support tool under the JHP. Results of the project fed into the revision process of the JHP and are the basis for the revised TS selection criteria, the current risk assessment approach, as well as the updated decision support tool.

Common understanding on application

1.17 This HELCOM – OSPAR JHP is based on the following common understanding:

a. results from the common HELCOM - OSPAR framework are a guide for bi- or multi-national evaluations of applications for exemptions under Regulation A-4;

b. results are non-binding. The decision on an application for exemption rests with the national authorities concerned;

c. if national administrations do not use, or deviate from, the results of the common HELCOM- OSPAR framework, reasons should be communicated to HELCOM and OSPAR, so that they may inform the review process of the JHP;

d. data needed under the common HELCOM – OSPAR framework should be collected according to the sampling protocol (chapter 2);

e. data should be collected by applicants to the exemptions;

f. if no data for a risk assessment under the common HELCOM - OSPAR framework is available from official or other sources, the applicant should collect the data according to the sampling protocol;

g. the collected data from port surveys and on target species should be stored centrally under HELCOM – OSPAR supervision;

h. data should be evaluated using the common HELCOM - OSPAR framework, as a first step by an automated decision support tool, to facilitate uniform application across the regions;

[6] http://www.northseaballast.eu/northseaballast/

i. further aspects and evaluation will be carried out in a second step as outlined in the relevant chapter 4 of the JHP; and

j. in an initial transitional period the JHP is to be implemented in a flexible and practicable way by authorities in cooperation with the ship owners, the harbours and other stakeholders, taking Regulations A-4.3 of the Convention into account, as outlined in Annex 1. This should be done in order to gain experience and to enable further development and improvement of the JHP.

1.18 JHP is split into 6 chapters including:

1. Introduction;
2. Port Survey Protocol;
3. Target Species;
4. Risk Assessment;
5. Data Storage and Decision Support Tool: the technical implementation of step1; and
6. Administrative Procedures.

2. Port Survey Protocol

Background

2.1 This chapter introduces the HELCOM-OSPAR protocol for comprehensive sampling of TS in ports. All applications aiming for a Convention A-4 exemption in the combined HELCOM and OSPAR area must be supported by port surveys following this port survey protocol and include the results to the exemption application. This information should cover each stopover port on the route for which the exemption is applied.

2.2 A port survey is to be regarded valid for granting an exemption for applicants during a maximum period of 5 years from the date of the first of the two sampling visits (spring bloom). A Party may decide on a shorter validity for a port survey *e.g.* 36 months due to changes in *e.g.* sensitivity of the area, intensity of traffic or due to the need to update port survey data on TS.

2.3 Port surveys for detecting NIS require sampling of several different habitats, their respective groups of organisms and life stages thereof: hard substrate (fouling) organisms, soft bottom benthos, plankton and mobile epifauna (*e.g*. fish and crustaceans).

2.4 The following is a description of the general features of the Port Survey Protocol. Annex 6 includes the complete protocol with all details and recommended equipment.

General port characteristics and available species data

2.5 Information about general characteristics, such as typical variation of abiotic conditions and patterns of port traffic, should be collected for each port to be sampled in accordance with Appendix 3 of Annex 6.

2.6 A port could consist of one or several contiguous areas, depending on the local physical and biological characteristics such as water exchange by currents or depending on land masses, like peninsulas or artificial harbour constructions. The division of a port in contiguous areas is independent

of the distance between these areas and should be specified from case to case in close cooperation with the responsible administration. Within a port area there should be a minimum of 3 sampling sites. A site is a separate spatial unit within a port area, such as a specific dock or a wharf. Within a site a number of replicate samples of different groups of organisms will be taken.

2.7 Ports often have weather stations recording *e.g.* wind, temperature and hydrological data and, provided they are situated in relevant locations, this data can be used. If additional measurements of temperature and salinity are needed the suggestion is to use data loggers or CTDs.

2.8 If available, existing information from national monitoring programmes or projects should also be used when planning a port survey.

2.9 A port information data sheet summarising all above mentioned information should be filled in together with the port authorities.

2.10 Detailed information on:

- number of sampling sites per port and their selection;
- timing of sampling;
- physical and biological parameters;
- sampling methods;
- sample processing; and
- analysis and data reporting

is appended as Annex 6 containing a detailed description of the survey protocol to be followed, including suggested equipment for field sampling and a note on quality assurance (QA).

3. Target Species Selection Criteria

3.1 In order to conduct a risk assessment for the transport of species with ballast water between harbours, all organisms present, as observed through port sampling conducted as described in Chapter 2, have to be taken into account.

3.2 To minimize the effort and to make the risk assessment procedure practicable, a pre-selection of species that have to be assessed for their risk is necessary. The selected species are called TS. With the determined TS, the risk assessment model (Chapter 4) can be run.

3.3 The selection of the TS is based on the criteria outlined in paragraph 6.4.3 of the *Guidelines for Risk Assessment under Regulation A-4 of the BWM Convention (G7)*.

3.4 There are two main general questions which should be considered before a species is considered for inclusion in the TS list:

a. is there a potential for a species to be primarily introduced or secondarily spread via ballast water or sediments as the major vector, i.e. is there any evidence that the species has been primarily introduced or secondarily spread somewhere via ballast water or sediments before; and
b. is the species present only in part(s) of the region but not the entire region?

3.5 In addition to the above mentioned two main general aspects, the following TS selection criteria specified in the table below are to be used within the HELCOM and OSPAR areas to define TS status.

Any impact on one of the protected goods and interests listed below triggers the inclusion of the species into the TS list in Annex 2.

Impact on	Target species
Human health: Has it been demonstrated that the species has an impact on human health (”human health understood as freedom from pain and sickness”)?	No target species/target species
Environment: Has it been demonstrated that the species has an impact on the environment (e.g. native communities, habitats and/or ecosystem functioning, strength and type of ecological interactions)?	No target species/target species
Economy: Has it been demonstrated that the species has an impact on the economy (including property and resources)?	No target species/target species

Table 1 Target species selection criteria to be used within the HELCOM and OSPAR area.

3.6 In case of uncertainty of information on the impact and/or eco-physiological tolerance limits of a species the species in question should be included in the TS list.

3.7 The TS list should be compiled, and regularly updated by expert groups established under HELCOM Maritime Working Group and OSPAR Biodiversity Committee (BDC) using the selection criteria defined in this chapter, by taking new scientific and technical knowledge into consideration.

3.8 The decision on whether a species should be included in or removed from the TSlist has to be based on the above-mentioned selection criteria supported by scientific data and/or expert judgement and should be documented.

3.9 For further guidance, please refer to Annex 2, in which a step wise process of applying the TS selection criteria is described in detail and reference to an additional document gives more background information on the selection process.

3.10 The TS lists of OSPAR and HELCOM are to be regarded as living documents under continuous updating by HELCOM Maritime and OSPAR BDC, which means that other species can be included or species can be deleted, if further knowledge is available.

3.11 The TS lists will be updated regularly by both HELCOM and OSPAR. Please check https://maps.helcom.fi/website/RA_tool/ for the latest edition (see also Annex 2).

4. Risk Assessment

4.1 Based on previous work within HELCOM[7] and OSPAR[8] a specific two-step approach, described in this chapter, is recommended for risk assessments under regulation A-4 of the Convention for routes with one or several ports in the application area of the OSPAR or Helsinki Conventions.

4.2 The eight key principles of risk assessment in the IMO Guidelines (G7) are effectiveness, transparency, consistency, comprehensiveness, risk management, precautionary, science based and continuous improvement.

4.3 The information required to undertake an A-4 risk assessment should be supplied in line with other chapters of this harmonised procedure, *i.e*. environmental conditions and presence of non-indigenous species - Chapter 2 Port Surveys, species to be included in the risk assessment - Chapter 3 Target Species and shipping information (*e.g*. for ballast water discharge volumes) - Chapter 6 Administrative Procedures. The absence of, or uncertainty in, any information should be considered an indicator of potential risk and the level of uncertainty should be recorded in a transparent way.

4.4 According to the terminology of the IMO Guidelines (G7), a combination of environmental matching and species-specific risk assessment (combined risk assessment) supported by information on shipping activities is to be applied.

4.5 Based on one of the key principles of IMO Guidelines (G7), "continuous improvement", the risk assessment framework and components described in this chapter should be kept under continuous review by the two organisations.

Considerations for the two-step Risk Assessment approach

4.6 Step one of the risk assessment will give an indication on high or low risk based on two key risk criteria, water salinity in the concerned ports and presence of TS (see Chapter 1.14). However, case specific conditions might be complex and in a second step these criteria and other factors can be further considered in a more detailed assessment.

4.7 After step one, it is important that applicants consult administrations on how to proceed with the assessment according to step 2.

Step 1: Risk Assessment Algorithm (basis for Decision Support Tool)

4.8 As a first step, two key risk criteria to distinguish between unacceptable (high) risk and acceptable (low) risk are:

a. difference in water salinity between ports/locations being visited; and
b. presence of target species in either port/location being visited by the vessel.

Based on these two criteria, a risk assessment algorithm is a way to formalise a risk assessment procedure through a set of binary yes/no questions. This risk assessment algorithm, outlined below

[7] HELCOM Guidance on high and low risk voyages – 2010 Ministerial Declaration, Pilot Risk Assessments of alien species transfer on intra-Baltic ship voyages. HELCOM Aliens Final Report. COMPLETE project.

[8] OSPAR (EIHA 12/3/4) - Ballast Water Exemptions in the North Sea.

and explained in more detail in Annex 3, includes two possible assessment results described in Chapter 4.9.

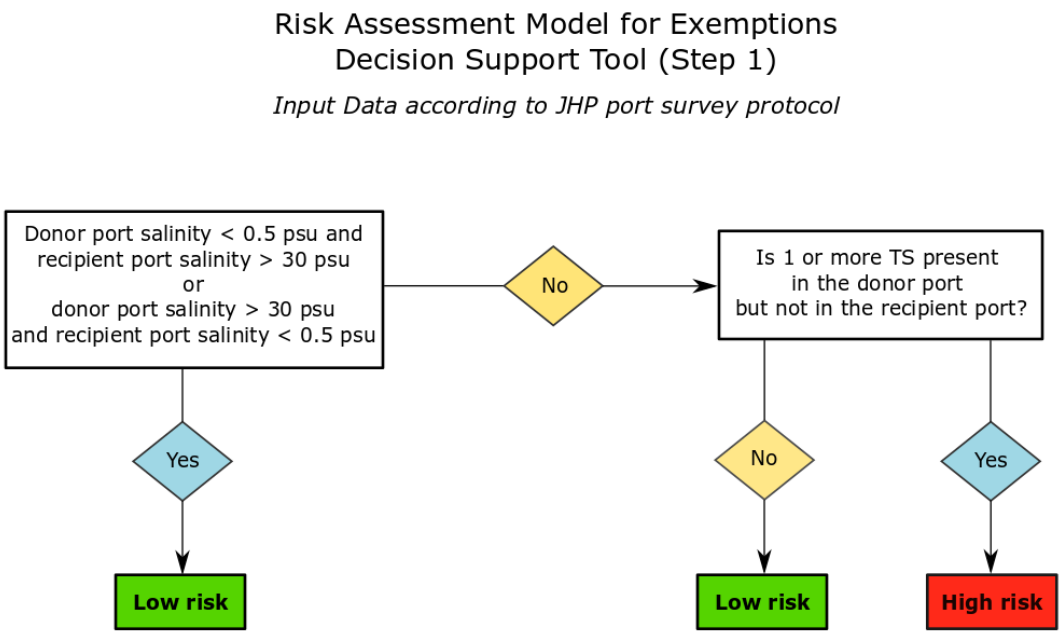

Figure 2. Step 1 of the risk assessment approach.

4.9 The joint A-4 risk assessment algorithm outlined in Chapter 4.8 includes two possible risk assessment outcomes (high risk and low risk) which give a first indication of the final decision for exemption applications in accordance with Regulation A-4 of the Convention:

High risk	It is highly likely that TS are distributed with ballast water and will occupy a new habitat. The risk is unacceptable and **an exemption cannot be granted**, unless further information and evaluation in step 2 indicates an acceptable risk
Low risk	It is not very likely that TS are distributed with ballast water and will occupy a new habitat. The risk is acceptable and **an exemption can be granted**, unless further information and evaluation in step 2 indicates an unacceptable risk.

Table 2. Possible risk assessment outcomes from the joint A-4 risk assessment algorithm.

Step 2: Final detailed risk assessment, including additional aspects

4.10 It should be noted that the use of the risk assessment algorithm as step 1 is to aid regionally harmonised decision making and gives only a first indication for the final decision. In a second step full consideration should be given to the specific conditions and different aspects in each case.

4.11 The final risk assessment may, therefore, also include additional information on NIS, species specifics (*e.g*. dispersal capacity), natural dispersal, and mitigation measures (*e.g*. volume of ballast water, position of discharge and uptake).

4.12 In the second step, the additional data, information and assessments need to be justified and references to data and literature used should be specified. Find below a non-exhaustive list of

important aspects to be considered:

Use of additional species data

4.13 When the second step is performed all available data can be used. This could for example be data on TS occurrences in the surrounding area or information on abundance. Examples of data sources are national monitoring, EU Marine Strategy Framework Directive (MSFD) monitoring or regional monitoring programs (COMBINE etc.) and data from databases such as AquaNIS. It is important that data used for the risk assessment is verified and validated, especially if it comes from citizen science investigations or observations.

Case specific target species evaluation

4.14 In appropriate cases, further assessment may be conducted on the TS which are identified in the first step of the risk assessment. Parameters that may be taken into account could be but are not limited to natural dispersal potential (see paragraph "Natural dispersal and Same Risk Area" underneath) and abundance.

Natural dispersal and Same Risk Area

4.15 In the risk assessment, prerequisites for natural dispersal of species can be taken into account. Natural dispersal can be assessed for specific TS that have been identified as high risk in the initial risk assessment. If an assessment shows high probability for natural dispersal this can overrule a high risk of introductions by ballast water discharge.

4.16 The Same Risk Area (SRA) approach described in the *Guidelines for Risk Assessment under Regulation A-4 of the BWM Convention (G7, MEPC.289 (71))* can be used to assess natural dispersal of TS between ports/locations for the purpose of risk assessment according to the JHP. A SRA assessment will typically take the form of a species-specific assessment that takes into account the hydrodynamic, environmental and meteorological conditions of the area in question. The extent and directionality of natural dispersal of TS should be modelled for the relevant water bodies within the agreed time window.

4.17 It should also be noted that SRA in the Guidelines (G7) is a concept that can be used to define a geographical area where ships can be exempted, which is not the purpose of the JHP approach.

Port specifics

4.18 Environmental conditions can vary in large port areas and the specifics of different terminals where uptake or discharge of ballast water takes place may be considered in relation to the TS.

Human pathogens

4.19 Information on pathogens in donor port and risk related to human health should be taken into account in the risk assessment, as far as possible.

Mitigation and control measures and conditions linked to the granting of exemption

4.20 Mitigation measures may be proposed to decrease high risk scenarios and can be added as conditions by the administration linked to an exemption decision. Such mitigation measures might be

restrictions or terms for uptake and discharge, *e.g.* regarding ballast water volumes, locations and seasonal or periodical adaptions. It could also be conditions related to the length of the period for which the exemption is granted (maximum five years), the terms for withdrawal (see paragraphs 6.21-6.23 below), the validity of monitoring (monitoring programs and interval), control programs and intermediate review.

Ongoing control or eradication measures

4.21 In case of ongoing control or eradication measures in a recipient port, the presence of TS in both ports cannot be the basis for a decision to grant an exemption.

5. Data Storage and Decision Support Tool: the technical implementation of step1

5.1 The data collected according to the sampling protocol (Chapter 2 and Annex 6), is stored centrally in an electronic format as a database. The database is maintained by the HELCOM Secretariat as part of the online decision support tool.

5.2 The port State administration is to ensure that the port survey data is delivered in the correct format to the database maintained by the HELCOM Secretariat.

5.3 The system[9] enables the storage of data, including:

- ports information (information about environmental characteristics, port size and business parameters); and
- surveys carried out in the harbours.

5.4 The lists of TS, defined by using the criteria outlined in Chapter 3, as a basis for a risk assessment, are also included in the database and regularly updated.

5.5 The database connects to existing relevant databases, *e.g.* AquaNIS, in order to access additional information to be used for step 2 of the risk assessment. However, data used for the risk assessment algorithm and decision support tool is to remain under the supervision of the OSPAR/HELCOM Secretariats.

5.6 In order to facilitate uniform application of the risk assessment algorithm in step 1 of the risk assessment, an automated decision support tool was developed and is available at https://maps.helcom.fi/website/RA_tool/.

5.7 The decision support tool is managed by the HELCOM Secretariat.

5.8 More information on the implementation of the tool can be found in Annex 4.

6. Administrative Procedures

6.1 The IMO Guidelines (G7) identify the basic procedure and minimum information required for granting an exemption under regulation A-4 of the Convention.

[9] Accessible through the following link: https://maps.helcom.fi/website/RA_tool/

6.2 These Administrative Procedures are to be considered as supplementary to the Guidelines (G7) and have been agreed upon by the Contracting Parties of OSPAR and HELCOM.

Application Process

6.3 To enable a Contracting Party or Parties to consider granting an exemption for a ship from the Convention under this JHP, it will be the responsibility of the ship owner/operator seeking the exemption to apply to the port State(s) directly (see appointed authorities in the Risk Assessment tool and in IMO GISIS), copying in the flag administration. A ship-owner/operator seeking an exemption should consider specifically that the procedure for seeking an exemption may take several months to conclude. An overview of the application process is described in the flowchart below.

6.4 Before submitting an application, ship owners/operators should at an early stage approach the appointed authority in the port State(s) where they wish to apply for an exemption to inform themselves of the conditions for submitting an application for exemption.

6.5 The appointed authority will then consult with other concerned states and consider the specific conditions for the route and examine any specific requirements for data (*e.g.* for the port survey) or for the risk assessment, and then notify the applicant on the terms for the application.

6.6 If a ship owner/operator applies for an exemption applicable for a route where valid information is available in the database, the Party or Parties may grant the exemption without requiring new port surveys to be undertaken. If exemptions have been granted on the route before, the Party should still consider the specifics for other ships applying for exemption on the same route. For validity of exemptions granted under these conditions see paragraph 6.12.

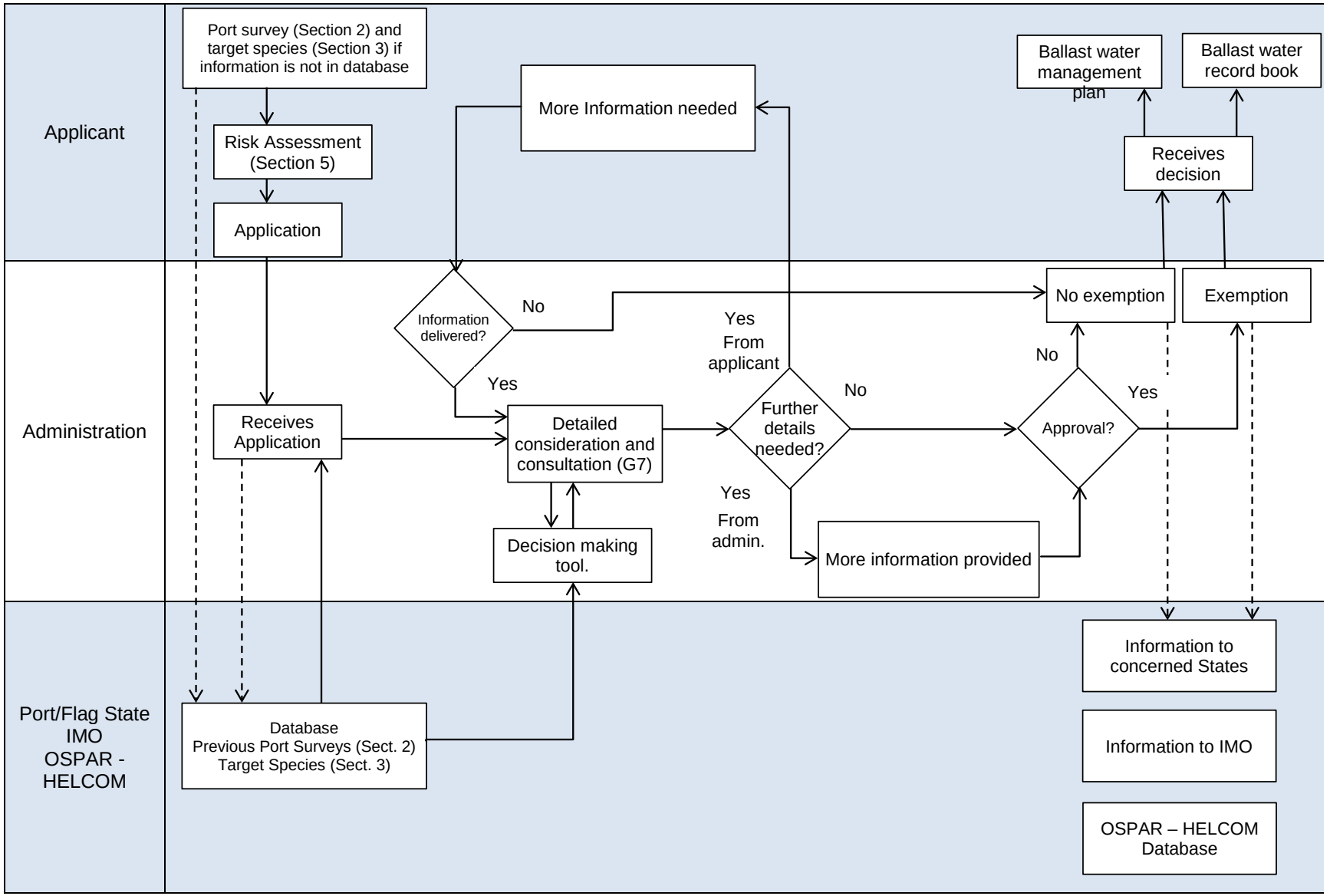

Figure 3. Scheme representing the application process for an exemption for a ship from the BWMC under the JHP.

Information to be provided

6.7 Information should be provided as set forth in the appendix to the Guidelines (G7) of the Convention. In addition, the ship-owners/operators should provide information as specified below, upon application within the OSPAR and HELCOM regions.

6.8 Port Information:

a. the applicant should provide at least the information required in Chapter 2, either by submitting data or by using data already available in the database, subject to a burden sharing mechanism. Information on the characteristics of ports which the ship will be visiting should be provided in line with Chapter 2 of the JHP on Port Surveys and be submitted in the agreed format as included in Appendix 4 of Annex 6.

6.9 Species Information:

a. information on the presence of TS should be collected in line with Chapter 2 of the JHP on Port Surveys and be submitted in the agreed format as included in Appendix 4 of Annex 6 or if available use valid data already in the database;

b. depending on national legislation, submitted information becomes public and will be made available through the decision support tool. For EU countries, Directive 2003/4/EC on public access to environmental information, applies; and

c. given the cost implications of undertaking port surveys it is recommended that all stakeholders in a particular port cooperate to develop and use a burden sharing mechanism if the information is to be used by several other applicants.

Risk Assessment report

6.10 The application should include a report describing the risk assessment performed, according to JHP Chapter 4 and Guidelines (G7) that verifies and supports an acceptable low risk scenario.

6.11 It is recommended that the report clearly sets out the considerations and the reasoning behind the RA so that others can see the weight attached to different factors and can understand the rationale of the assessment. Some of the main characteristics of a good RA report are:

- a clear structure with a logical sequence that describes the risk assessment;
- a table of contents at the beginning of the document;
- a presentation of the minimum information required in paragraphs 6.7-6.9;
- a description of the risk assessment performed according to chapter 4, and the conclusions made;
- reads as a single document with appropriate cross-referencing;
- is concise, comprehensive and objective;
- is written in an impartial manner without bias;
- makes effective use of diagrams, illustrations, photographs and other graphics to support the text;
- uses consistent terminology with a glossary;
- references all information sources used;
- has a clear explanation of complex issues;
- contains a good description of the methods used;

- contains a Non-Technical Summary which does not contain technical jargon; and
- contains, where relevant, a reference list detailing the sources used for the description and assessments included in the report.

Granting of the exemption

6.12 An exemption shall be granted for a maximum of 5 years but no longer than the time period specified by the administration when the port surveys are regarded valid. The approval may contain seasonal and time-specific or other restriction within the time of validity.

6.13 According to the Guidelines (G7) the information used in the risk assessment should be reviewed as data and assumptions used in the assessment can become outdated. Requirements related to the intermediate review may be specified in the exemption granted.

6.14 The intermediate review should be based on any new information on the basis of the exemption granted including but not limited to: presence of TS, introduction pathways for NIS and changes in physical conditions in the port. To check that the requirements of the exemption have been followed, the intermediate review may also include a review of the ship´s voyages *(e.g.* on the basis of log book records) after the exemption was granted.

6.15 Where the Party or Parties in receipt of the application decide on the exemption, the ship-owner /operator should be notified as soon as possible.

6.16 A checklist of elements for a recommended model for an exemption to ensure the uniformity throughout the HELCOM and OSPAR regions can be found in Annex 5.

6.17 Exemptions have to be recorded in the Ballast Water Record Book and the Ballast Water Management Plan has to be considered for re-approval by the flag state after an exemption has been granted.

Communication of Information

6.18 Relevant contact details for receipt of applications should be submitted to the HELCOM and OSPAR Secretariats by the Party/Parties for publication on their respective websites.

6.19 The decision of the recipient Party should, in addition to the recipients outlined in G7, be communicated to HELCOM and/or OSPAR as soon as possible before the effective date of the exemption.

6.20 If national administrations do not use, or deviate from, the results of the common OSPAR/HELCOM framework, reasons should be communicated to OSPAR/HELCOM, so that they may inform the review process of the JHP.

Withdrawal of an exemption

6.21 An exemption granted under Regulation A-4 of the Convention may be temporarily or permanently withdrawn if the requirements of the exemption have not been followed or due to the circumstances outlined in Guidelines (G7) (para. 10.4, 10.5 and 10.6):

> *"An exemption granted under regulation A-4 of the Convention may need to be withdrawn where the actual risk associated with a voyage has increased substantially since the risk assessment was conducted. This would include emergency situations such as outbreaks, incursions,*

infestations, or proliferations of populations of HAOPs (e.g., harmful algal blooms) which are likely to be taken up in ballast water (regulation C-2 of the Convention).

When a port State notifies mariners of areas under its jurisdiction where ships should not uptake ballast water due to an emergency or other high risk situation, all exemptions should be withdrawn from ships that take up ballast water in the defined area. In such circumstances the shipowners or operators should be notified of the decision to withdraw the exemption as soon as possible.

Guidelines for additional measures regarding ballast water management including emergency situations (G13) adopted by resolution MEPC.161(56) provide guidance to rapidly identify appropriate additional measures whenever emergency situations occur in relation to ballast water operations."

6.22 Administrations should decide on the terms for withdrawal of exemptions and inform the applicants at an early stage of the exemption procedure.

6.23 Issues that may be considered when deciding on conditions for withdrawal:

- route and ship specifics;
- acceptance for increased risk during the exemptions period; and
- possible mitigation and contingency measures to be applied in accordance with BWM.2/Circ.62 (*e.g.* restrictions on ballast water up take/discharge in certain areas, limitations of ballast water volumes, use of permanent ballast water).

Temporary deviation from the exemption route and temporary replacement

6.24 A ship that operates on the conditions of an exemption might temporarily need to deviate from the exemption route, *e.g*. for dry-docking, maintenance or repair. The ship operator should contact all concerned port states on exempted routes and on the temporary route, well in advance before the deviation, to obtain approval for the deviation and to ensure that precautionary measures can be taken to the satisfaction of the involved states. The same procedure is to be applied for ships temporary replacing another ship that operates on the conditions of an exemption. The following options can be considered as suitable measures:

- use of sediment and/or ballast water reception facility;
- use of temporary/mobile BWMS;
- use of permanent or temporary BWMS installed aboard another vessel;
- D-1 exchange in designated exchange area; and
- use of potable or technical water.

6.25 IMO guidelines and guidance documents should be considered, such as: *BWM.2/Circ.52 Guidance on Entry or Re-entry of Ships into Exclusive Operation within Waters under the Jurisdiction of a Single Party*.

Annex 1 – Transitional period for the implementation of the Joint HELCOM/OSPAR Harmonised Procedure for the Contracting Parties of OSPAR and HELCOM on the granting of exemptions under International Convention for the Control and Management of Ships' Ballast Water and Sediments, Regulation A-4

Introduction

By the adoption of the JHP HELCOM and OSPAR contracting parties agreed on implementation through a transitional period established by Chapter 1.16 of the procedure:

"In an initial transitional period the guidelines are to be implemented in a flexible and practicable way by authorities in cooperation with the ship owners, the harbours and other stakeholders, taking the regulations A-4.3 of the Convention into account. This should be done in order to gain experience and to enable further development and improvement of the guidelines."

The joint HELCOM/OSPAR Task Group on Ballast Water Management Convention Exemptions was tasked, through its terms of reference, to conclude upon transitional schemes for the implementation of the harmonized procedure.

Duration of the transitional period

The transitional period was originally dependent on its adoption by HELCOM and OSPAR and on the entry into force of the Convention. It became applicable on 8 September 2016, one year before the Convention entered into force, i.e. from the date on which the formal requirements according to Article 18 of the Convention were fulfilled. Administrations of the Contracting Parties of OSPAR and HELCOM are urged to begin with the necessary preparations for smooth implementation in time, *e.g*. provide ship owners with the information that will be needed for applications in order to make sure that they do not lose valuable time when preparing their application. The transitional period will end in 2024 when the D-2 ballast water standard applies in full, taking the application of regulation B-3 by the IMO Resolution A.1088(28) into account.

Validity of exemptions during the transitional period

Exemptions issued before or during the transitional period shall be valid for the whole transitional period, but not longer than 5 years from when the exemption is issued, regardless of the date of application or port survey. This applies provided that no major new occurrences of TS are identified. Moreover, the exemption may contain seasonal and time-specific or other restriction within the time of validity.

Validity for port survey data and exemptions as stipulated in Chapters 2.2 and 6.12 of the procedure will then apply once the transitional period has ended.

Annex 2 – Target Species Lists

TS lists were agreed at the time of the adoption of the first version of the JHP. The TS lists, however, are living documents and are always under review by HELCOM and OSPAR and will be regularly updated if new information becomes available.

In this annex further guidance for the application of the TS selection criteria can be found in Chapter 3. A step wise process of applying the TS selection criteria is described in detail and more background information on the selection process is also available.

This annex is based on the project output 3.1 "Advanced target species (TS) selection criteria" of the COMPLETE project (Completing management options in the Baltic Sea Region to reduce risk of invasive species introduction by shipping, 2017-2020), funded by the Interreg Baltic Sea Region Programme, with partners from Estonia, Finland, Germany, Latvia, Lithuania, Poland, and Sweden, which addresses with its WP3 on "Ballast water risk assessment and management systems" issues with relevance for HELCOM/OSPAR TG Ballast.

The output presents a review and update of the TS selection criteria based on international expertise. The selection of TS is based on all pertinent prioritized and ranked values (potential to pose threat to human health, impact on economy, and environment) and on the *IMO Guidelines G7 (2007) on risk assessment under regulation A-4*. Transparency (expert judgments are open for public scrutiny), consistency (universal applicability of the TS selection criteria and procedure) and precautionary approach (taking into account that information on aquatic organisms ecophysiology, pathways of introduction, environmental and economic impacts is often uncertain and incomplete) are considered.

The process of applying the TS selection criteria for risk assessment based exemptions of ballast water management requirements in the HELCOM and OSPAR area is based on the TS selection criteria background document[10]. For practical application, a step-wise approach was chosen to explain how species are evaluated whether or not they are considered TS for the JHP risk assessment.

The species to be considered here are species already included in the TS list and species detected in port surveys according to the JHP in the ports for which the exemption may apply.

Step 1

Species already on the HELCOM and OSPAR TS lists need to be checked against the updated TS selection criteria for the purpose of the risk assessment (RA) for Ballast Water Management (BWM) exemptions. Only those species which meet the criteria as listed below in Step 3 and more detailed in the TS selection criteria background report should remain on this list. The HELCOM TS list is periodically re-evaluated by the expert group established under HELCOM Maritime.

Step 2

[10] See: Target species selection criteria for risk assessment based exemptions of ballast water management requirements. Ocean & Coastal Management Volume 183, 1 January 2020, 105021. Gollasch et al, 2020. Available here: https://www.sciencedirect.com/science/article/pii/S0964569119306829#!

List all species found during the current JHP port surveys and if available additional data from other surveys in the same port or adjacent habitats *e.g.* by using data from AquaNIS of both/all ports involved in an exemption application. All species which are on the HELCOM and OSPAR TS lists, when found in the ports to be considered, are identified as TS for the risk assessment for exemptions.

Step 3

Species found during the port surveys which have not been documented before should be evaluated based on the TS selection criteria. At least **all** following criteria need to be considered:

1. relationship with ballast water as a transport vector, i.e., when the species was already found in a ballast tank or if the life cycle of the species includes a larval phase or planktonic adult which makes a ballast water transport likely;
2. impact on human health, economy and/or environment and its severeness, i.e., does the species may cause unacceptable high impact (TS selection criteria background document); in case the impact is not known, the species will automatically appear as TS;
3. evidence of prior introduction(s), i.e., the species showed its capability to become introduced outside its native range; and
4. current distribution within the native biogeographic region and in other biogeographic regions.

It is recommended performing the evaluation in a transparent format, i.e., develop a species evaluation sheet that the reader can see which criterion applies and which not. This may be done in table format and with references where available.

In summary, TS are species that

- Criterion 1
    - have a relationship with ballast water; and
- Criterion 2
    - have been assessed to cause human health impact; and/or
    - have been assessed of having potential to cause measurable economic impact; and/or
    - have been assessed having potential to cause unacceptable environmental impact.

Criteria 3 and 4 are supporting criteria for the impact assessment in 2.

Further detailed information can be found in the TS selection criteria background document.

Annex 3 – Detailed explanations for Risk Analysis Algorithm

Definitions:

EM Environmental matching risk analysis component

SpS Species-specific risk analysis component

1.1 1st level question (EM): Is the salinity in the donor port < 0.5 psu and the salinity in the recipient port > 30 psu or is the salinity in the donor port > 30 psu and < 0.5 psu in the recipient port?

For the majority of organisms it would not be possible for all life stages to survive from fresh waters (< 0.5 psu) to full marine waters (> 30 psu) or vice-versa, and therefore the answer **yes** means low risk.

Yes Low Risk

No Next level

1.2 2nd level question: Is one or more target species present in the donor port but not in the recipient port?

The answers to this question lead to a species-specific **(SpS)** examination:

- If the answer is **yes** the risk is regarded as high;
- If the answer is **no**, then, the risk is regarded as low.

Classification of salinity according to the EU Water Framework Directive (Directive 2000/60/EC)		**PSU**	**PSU**	**Classification for risk assessment**
Euhalin	Marine, salinity is equal to the salinity in the ocean	> 30	> 18	Saline water
Polyhalin	Salinity is not much lower than salinity in the ocean	18 to < 30		
Mesohalin		5 to < 18	0.5 – 18	Brackish water
Oligohalin	Very low salinity, mainly in the inner coastal waters with a high amount of freshwater intake, like in lagoons	0.5 to < 5		
Fresh water		< 0.5	0 – 0.5	Fresh water

Table 1. Classification of salinity.

Annex 4 – Decision Support Tool

Introduction

The goal of the Decision Support Tool is to provide a simple interface to a risk assessment for translocation of target species in ballast water between harbours. It bases on a risk assessment algorithm, which uses the information about occurrence of target species and their characteristics for assessing the riskiness that they will survive and spread in the recipient harbour. Therefore, a well-structured organization of the port sampling data and the species information is required.

User interface

The decision support tool is a web application that uses a start (donor) and a destination (recipient) port as input and calculates two level of risk (low and high) for a transfer of target species between them as output. Different levels of explanations for the resulting risk assessment are provided.

The design is flexible and scalable. This means it is possible to integrate changes with little effort in the data structure and in the web application. It is possible to import data from the field measurements with standard database tools.

Contents of the database and respective data

The Risk Assessment Tool includes the following information components:

- port profiles (statistical information about environmental characteristics, size and some business parameters of ports);
- in situ measurements (on the species detected in the ports);
- lists of TS (pre-defined for different regions, i.e. HELCOM, OSPAR and Kattegat (HELCOM + OSPAR); and
- Risk Assessment Algorithm.

All parameters that should be sampled and that are saved in the database for species, ports and field measurements are listed in Annex 6. For this purpose, an on-line database is available (https://maps.helcom.fi/website/RA_tool/)

System summary

The system is hosted on Windows Server 2012. It uses ArcGIS Server and data are stored in ESRI File Geodatabases. Data processing is done using Python programming language. The application is built using ArcGIS API for Javascript and Dojo toolkit.

The web application is hosted by HELCOM and is available under address:
https://maps.helcom.fi/website/ra_tool/

The Risk Assessment Tool provides two different levels of access:

- Read only access – For all end users to view data and perform Risk Assessment; and
- Read, Write and Load Data access – This is available for the advanced users like Data Managers & Data Administrators, who will Load new Data or Modify data when needed.

Once the application is accessed the information is available for consultation, starting with the main webpage which provides background information on the tool and gives access to six tabs where information is structured as follows:

- **Information**: introduction on the tool, its purpose as well as background on ballast water regulations;
- **Exemptions**: administrative process to proceed with when asking for an exemption under the Joint HELCOM/OSPAR Harmonised Procedure;
- **Routes**: access to running A-4 risk assessment on spreading of non-indigenous species when travelling from port A to port B;
- **Target Species**: target non- indigenous species selected and agreed by Parties to HELCOM and OSPAR;
- **Data**: additionally, to the list of the species found in the different samples taken, information on the port characteristics, sampling environmental conditions and sampling methodology can also be viewed; in addition, data can be explored with a search function and displayed by GIS functionalities; and
- **Help**: containing a user guide to help understand the tool, the data model behind the tool, two documents: the BWM Convention and the Joint HELCOM/OSPAR Harmonised Procedure, as well as the data sheets for field recording and the format suitable for transferring the collected information to the Risk Assessment Tool.

Annex 5 – Checklist of elements for a recommended model for an exemption

The following elements are proposed for inclusion:

1. Details of the granting/issuing administration(s)

- country
- name of administrative entity and contact information

2. Details of the applicant or Country

- name of business entity (contact person)
- address

3. Details of ship

- name of ship
- distinctive number or letters /call sign
- port of registry
- gross tonnage
- company
- IMO number
- date of construction

4. Ballast information according to the Ballast Water Management Certificate

5. Details on the exempted route between specific ports

- list of relevant ports/locations, including direction of voyages (identify recipient and donor ports)
- if single voyage: Date and time of departure and arrival
- if multiple voyages: voyage frequency regularity and estimated amount of ballast water discharged during the exemption period
- information on any specific required additional measures (e.g. in case of emergency, if applicable)

6. Statement that the vessel will not mix ballast water or sediments other than between the ports or locations specified under number 5

7. Validity of exemption

- max. 5 years
- dates for intermediate review
    - Also depending on validity of port surveys
- conditions linked to the exemption

8. Information on and conditions for withdrawal

Annex 6 – Detailed description of the Port Survey Protocol

Introduction

This protocol is developed based on CRIMP sampling protocol (Hewitt & Martin, 2001), rapid assessment protocols (Pederson *et al*., 2003; Cohen *et al*., 2005; Buschbaum *et al*., 2010) and aligned with HELCOM and OSPAR monitoring protocols (HELCOM COMBINE manual, 2015; OSPAR CEMP Monitoring Manual) where applicable. Sampling methods were tested over late summer and fall 2012, 2013, and 2014 in Estonia, Finland, Latvia, Netherlands, Poland, Spain and Sweden. The final survey protocol has been modified based on experiences from the field testing.

The aim of the protocol is to describe procedures to provide the required data to conduct the risk assessment according to the Joint Harmonized Procedure.

Surveys of biota include sampling of different groups of organisms: hard substrate organisms, soft bottom benthos, plankton and mobile epifauna, and fish. All these species groups should be surveyed following comprehensive sampling protocol. Depending on the local conditions and circumstances, sampling can be carried out either from the quays, on pontoons or by boat. The national authorities may agree to accept other methodologies to supplement or replace the methodologies described in this annex. These methodologies may include conventional methodologies and biomolecular methodologies, e.g. species specific environmental-DNA (eDNA), methodologies performed in accordance with a quality assured protocol.

All the epifaunal and infaunal species have to be identified in the field when possible or in the laboratory. Visual observations of additional species including mobile epibenthic species encountered in the transects between the square locations should be noted.

Sampling of mobile epifauna is performed with three types of traps: Chinese crab trap, Gee's minnow trap and optionally artificial habitat collectors (either Crab Condo or Oyster Crate).

Three underground pipes for water supplies are to be monitored in those ports where they are installed. For that purpose a mesh bag can be attached to a hydranth to take a sample of the species inside the water system when possible.

It is voluntary to estimate the content of the soft substrate (sand, gravel, mud, clay, etc.) in the port area If this is done. three benthic samples should be taken at each site.

Detailed list of materials and equipment needed for the field sampling is included in Appendix 1.

Sampling/monitoring frequency

Survey for mobile epifauna and fish (traps), fouling organisms, and benthic infauna should be conducted with the requirement to identify all collected organisms to the lowest taxonomic level possible.

Plankton samples should be taken during spring bloom and summer maximum, which can be combined with other sampling.

When taking the spring sample, settlement plates should also be deployed simultaneously. Plates should be retrieved when conducting the summer survey (see Table 1).

Table 1. Minimum number of samples at each site.

Sample type	Spring	Summer	Total

Phytoplankton	1 x 10 µm net,	1 x water	1 x 10 µm net,	1 x water	4
Zooplankton	1 x 100 µm net, net	1 x 500 µm	1 x 100 µm net, net	1 x 500 µm	4
Zoobenthos			3 x benthic grab		3
Settlement plates			3 x unit (3 plates, 15x15 cm)		9
Fouling, scrape			3-6		3-6
Traps			9 traps (3 crab traps, 3 minnow traps, optionally 3 artificial-habitat collectors)		6, 3 optional
Total	**4**		**28-31**		**29-35**

Site selection

Spatial distribution of the sites is to be designed carefully prior to sampling. Survey should be conducted without disturbing port activities. Port and local environmental authorities can often provide useful information on the port characteristics such as ballast release locations and most frequently visited berths. Sites should be selected to represent a range of abiotic conditions and aimed to cover high priority areas (Table 2).

Table 2. Priority of sampling location types based on Hewitt & Martin (2001).

Port area	**Priority**
Commercial shipping facilities in port	
active berths	**1**
inactive/disused wharves	**1**
channel markers	**1**
tug and pilot vessel berths	**1**
slipways	**1**
floating pontoons	1
dredge disposal and spoil grounds	2
breakwaters, groynes, etc.	3

Conducting the survey

Port characteristics

Information about port characteristics, such as abiotic conditions and port traffic, should also be collected. Port information data sheet (Field data sheet 1 in Appendix 3) should be filled out in cooperation with the port and local environmental authorities and by using available data.

Ports often have weather stations recording wind and temperature patterns. Temperature and salinity loggers would be an easy and cost effective addition for recording water properties in the port area and ports are encouraged to install such devices.

Environmental data

At each site temperature, salinity and oxygen content on the bottom should be recorded using a submersible data logger, and water transparency by a Secchi disc, or turbidity by electronic sensor.

Environmental data will be collected during both sampling visits (spring bloom and summer maximum) (Field data sheet 2 in Appendix 3).

Field sampling

Environmental data should be recorded using Field data sheet 2. GPS location of each of the sampling sites should be recorded using WGS84 coordinate system. Water salinity and temperature should be measured at the same depth as samples are taken, taking into account the potential effect of tides and characteristics of the port. Wind speed and direction, air temperature and cloud cover should also be noted. Sediment type and fractions should be assessed visually from the benthic grab samples.

Plankton

Samples for phytoplankton and zooplankton species composition and abundance should be taken at each sampling site. Plankton sampling should be performed before sediment sampling to avoid sampling being affected by sediments suspension. Nets suggested in the protocol are hand held and have been selected to be operable from the dock if possible. One pooled phytoplankton sample, one concentrated phytoplankton sample and two vertical zooplankton samples (see below for explanation) using nets with different mesh sizes, at each site are required. Both zooplankton and phytoplankton samples are to be taken during both sampling visits (spring bloom and summer maximum).

Field sampling

Sample of *phytoplankton* should be collected by obtaining a 250 ml water sample pooled from three locations at least 15 m apart at each site. Samples (0.5 – 1.0 l) should be taken at each location at the surface and 5 m depth (or 1 m from the seabed if shallower) (HELCOM COMBINE manual, 2015, Annex 6: Guidelines concerning phytoplankton species composition, abundance and biomass, Section 2 on sampling, including preservation and storage of samples).

Additionally, a concentrated vertical sample using a small hand held 10 µm plankton net should be taken. The specific dimensions of the net used as well as a comprehensive description of the sampling procedure should be recorded in the field data sheet 3 with other relevant information.

Three tows (pooled to one sample), 10 to 15 m apart should be conducted to ensure for adequate sample. Haul and tow rates should not exceed 0.25 – 0.30 m/s. Clear glass iodine-proof bottles with tightly fitting screw caps should be used for preserving the samples. Samples should be preserved in acid Lugol solution (0.25 – 0.5 cm^3/ 100 cm^3 sample) and placed in a cooler for transport to the analysing laboratory.

A vertical z*ooplankton* sample should be collected with a standard 100 µm mesh free-fall dropnet or a similar net at each site. Three tows (pooled to one sample), 10 to 15 m apart should be conducted to ensure for adequate sample. Mesh size depends on the size range of zooplankton in the area and needs to be reported with the data. In addition, a net with mesh size 500 µm may be required depending on the local existing biota, e.g. larger zooplankton organisms including gelatinous species. In this case three tows 10 to 15 m apart (pooled to one sample) should be conducted. The specific dimensions and mesh size of the net used as well as a comprehensive description of the sampling procedure should be recorded in the Field data sheet 3 with relevant abiotic information. Tow rate should be adjusted to approximately 1 m/s and net stopped 1 m before the bottom. A flow meter can be mounted on the mouth of the web for quantification of the water volume sampled. Details of the sampling procedure, gear used and number of tows in addition to any other relevant information should be noted on the field data sheet and reported in the provided excel sheet. Samples should be placed in sample jars or bottles and in a cooler. Samples should be preserved in 4 % formaldehyde solution prior to transport to the analyzing laboratory or follow the instructions given by the analyzing laboratory. Gelatinous species should be examined immediately after collection without preservation. If the species identification is not possible, a digital photo should be taken (HELCOM COMBINE manual, 2015, Annex C-7: Mesozooplankton, Section 3 on sampling).

Mobile epifauna and fish

Mobile epifauna, such as crabs, shrimps and certain fish should be sampled at each site using *light weight baited traps* and optionally *artificial habitat collectors* tethered to existing structures (pilings, buoys, docks). Sampling may occur only on the second sampling visit (summer maximum) for the baited traps and on the first sampling visit (spring) for the artificial habitat collectors. Habitat collectors may be deployed during the spring sampling. Traps are selective in nature and therefore provide only relative measures of species abundances. However, the range of methods that can be used to sample epifauna in the port area is very limited and for example it is in most cases not possible to use trawls and gillnets. Attention should be given to place traps on all available substrate types (mud, sand, rocky) and to report the catch accordingly.

Field sampling

Two types of baited traps should be used when sampling mobile epifauna, crab traps (for example Fukui-designed crab traps 63 cm x 42 cm x 20 cm, with 1.3 cm mesh netting, sold in many countries under various names, Figure 1A) and minnow traps (for example Gee-minnow trap, 42 cm long and 23 cm wide with 6.4 mm netting and 2.5 cm mouth, Figure 1B). In addition to the mandatory baited traps it is suggested to use artificial habitat collector, like for example plastic crates 30 x 30 x 30 cm filled with dead, autoclaved oyster shells (Fowler et al., 2013) or alternative content which will provide shelter for mobile fauna (e.g. broken ceramic flowerpots or rubber tubes (Outinen et al. 2019), Figure 1C-E).

Crab traps catch larger invertebrates such as *Eriocheir sinensis* and some larger fish such as *Neogobius melanostomus* more effectively. Minnow traps are more effective for catching small fish and have proven also effective for catching small crabs (such as mud crabs) and shrimps (Pitkänen, 2012). Artificial habitat collectors are successful in sampling of smaller mobile fauna which require shelters such as amphipods, isopods, mysids, decapods (Hewitt & McDonald, 2013; Marszewska & Normant-Saremba, 2016, Outinen et al. 2019).

Crab and minnow traps should be baited using locally available fish. Both baited traps and artificial habitat collectors should be weighted either by placing rocks or weights (approx. 1 kg) inside (minnow traps) or attaching a 1-2 kg lead weight on their frame (crab traps, artificial habitat collector). Traps should be tethered securely to wharves and/or dolphins or other structures. Three traps of each trap type (crab and minnow traps, artificial habitat collector) should be deployed at each site, however baited traps for at least 48 h, whereas artificial habitat collectors for 4-6 weeks. Dimensions of the trap type, bait species and type of filling used as well as the soak time should be reported with the catch. It should be noted that if non-baited traps have been used previously the new results are not comparable to the results from the baited traps.

After retrieving the baited traps or conducting other similar sampling, the catch should be identified and placed in zipper storage bags in a cooler. Artificial habitat collectors should be pulled on the dock as carefully as possible to prevent losing any mobile epifauna species. Each trap should be placed in a cool box filled with some ambient water and transported to laboratory. Depth and location (GPS coordinates) of the sampling as well as gear and deployment duration and substrate type should be recorded (Field data sheet 3). Later in the laboratory, identification of species collected with baited traps should be verified (or samples prepared for identification by a quality assured laboratory), they have to be then measured, weighed, prepared and preserved. Fish and larger invertebrates can be frozen, smaller invertebrates preserved in 4 % formaldehyde solution or 98% ethanol.

Material used as a filling in artificial habitat collectors (*i.e.* oyster shells, broken flowerpots, pieces of rubber tubing) should be carefully washed in a bucket filled with water, which should be then filtered through 0.5 mm sieve. Collected organisms should be preserved in 4% formaldehyde solution and identified to the species level.

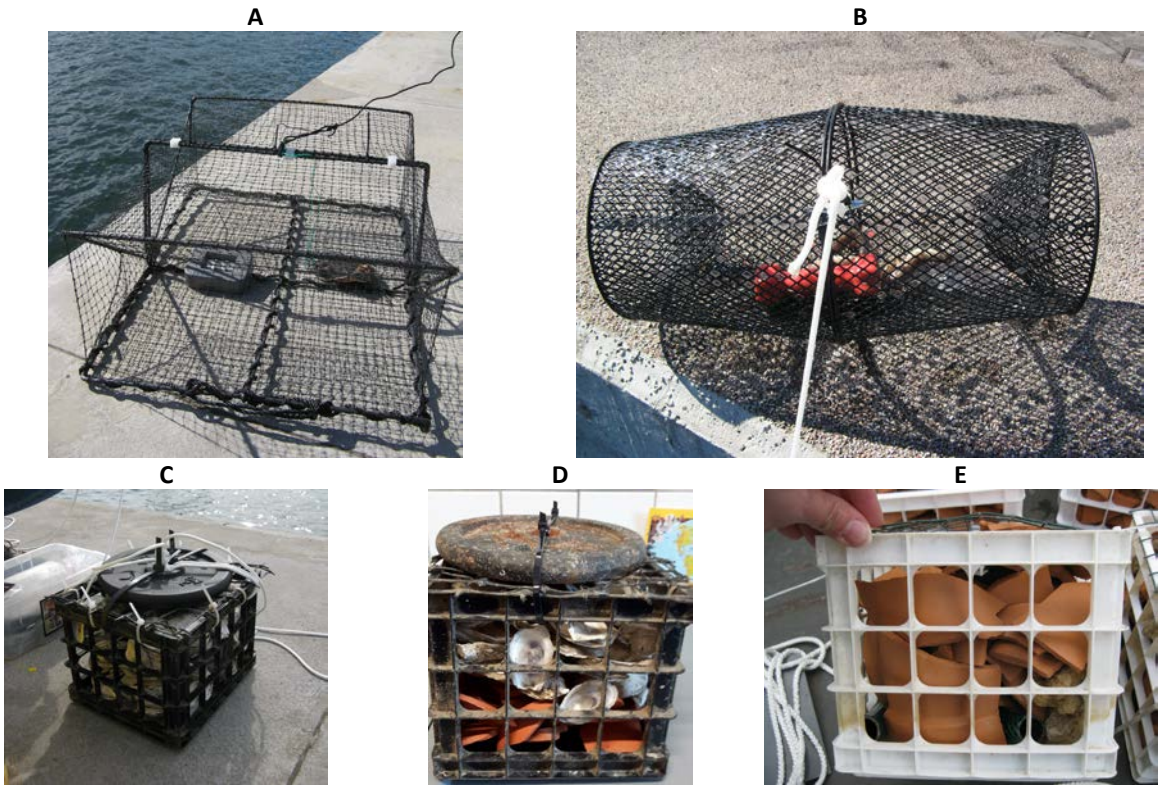

Figure 1. *Traps suggested to be used in sampling of epifauna. Baited traps with weights and baits inside: Chinese crab trap (A), Gee's minnow trap (B); optionally artificial habitat collectors filled with: oyster shells (C), oyster shells and broken flowerpots (D), broken flowerpots, decorative stones and pieces of rubber tubing (E).* Photos A-B-C-D: Monika Normant-Saremba, photo E: Maiju Lehtiniemi.

Fouling organisms

Rapid assessment sampling protocol may be a suitable qualitative sampling method for hard substrate organisms at sites of low visibility, such as Baltic ports where diving is not always an option. Existing structures within the port area will be targeted and the aim is to identify the species attached to ropes, chains, pilings and hard surfaces using hand held scraping tools and estimate the species coverage, if possible. Sampling of fouling organisms by scraping should be conducted on the second sampling visit only (summer maximum) in order to catch as many fouling species as possible. *Settlement plates* or settlement collectors (Marshall & Cribb, 2004) should be used to improve the survey of fouling organisms (Figure 3). Fouling plates should be deployed during the first sampling visit and retrieved during the second sampling visit.

Figure 2. *Scraping tool used in sampling of fouling community. Photo Riikka Puntila-Dodd.*

Field sampling

Scraping

Pilings or projecting steel projections of *wharfs, berths, piers and dolphins* are given a high priority in the CRIMP protocol (Table 2). At least three pilings or similar structures should be sampled from these abovementioned locations at each site. The pilings should be located at equal distance (10 – 15 m) from each other. On *breakwaters, groynes, rockwall facings and natural rocky reefs* three sampling sites should similarly be placed 10 – 15 m apart. *Hulks (wrecks)* are often hotspots for NIS and therefore should be included in the sampling in a similar manner.

Three pilings should be scrape-sampled in the sublittoral zone. An area of 0.1 m^2 should be scraped of the piling surface using a hand-held scraper tool with a long handle enabling scraping from the quay. The samples should be put straight into pre-labeled zipper bags.

Additionally, on rocky shores or breakwaters three vertical transects could be inspected and sampled as described above. While conducting the sampling, qualitative visual surveys for detecting non-indigenous species should be conducted in the area. For that purpose, if possible, a 30 min search by one person is to be conducted for as many species as possible (Rapid assessment).

From ropes, samples at depths of 1 m within photic zone, 3.0 m, 7.0 m and the bottom should be digitally photographed, and scrape samples should be taken if possible. In addition, a hand net equipped with a scraping blade (Figure. 2) can be used when obtaining scrape samples from the dock. When scraping, sample falls into the mesh bag and it can be rinsed into a bucket filled with water. When finished with scraping, sample can be sieved with 0,5 mm sieve and transferred into a zipper bag. Sampled area should be estimated and reported in the Field data sheet 3.

Samples are to be placed in cooler and transported to the quality assured laboratory for analysis. Prior to transport, samples should be preserved in 4 % formaldehyde solution or 98% ethanol, frozen or follow specific instructions from the analyzing laboratory. However, the use of formaldehyde precludes

the identification of some species *e.g*. nudribranchs, so the analysis of live communities is recommended whenever possible.

Settlement plates

Each fouling plate unit should be constructed of polypropylene rope (ø 0.5 cm) of sufficient length, three gray 15 cm x 15 cm, or 14 cm x 14 cm, PVC plates and a brick (Figure 3 A). Each plate should be sanded briefly (few seconds, sanding paper 80) prior to the deployment to provide more hospitable settling substrate for the organisms. Hole (ø 0.5 cm) should be drilled at the center of each plate for the rope, and a tube should be placed between the rope and the plate to prevent the rope from breaking. Plates should be secured on the rope at set distances using knots secured with zipties on both sides of the plate. The plates should be secured in the rope in such a way that they will be deployed at app.1 m in the photic zone, 3 m and 7 m depths. A brick should be tied at the end of the rope for weight when deploying the unit in the port.

Fouling plate units (three replicates per one site) should be deployed in locations where they will not be disturbed by for example port traffic. Units should be tied securely to the dock structures so that the first plate is submerged at approximately 1 m depth. The unit should always remain in a vertical position and the rope should be tight.

Fouling plate units should be retrieved simultaneously with the summer maximum sampling. However, based on the test survey, minimum of six weeks of deployment was adequate to acquire a representative fouling community on the plates (Figure 3 B).

When retrieving the units, they should be pulled on the dock as carefully as possible to prevent losing any organisms such as mobile epifauna. Each plate should be placed in a plastic sheet (or an opened plastic bag) and rope and brick separated from the plates. The plates should be photographed and placed in individual labeled re-sealable plastic bags prior to transport. The brick and the rope should be packed to a separate bag and checked through if some further information would be needed. The plates should be kept moist by adding some ambient water to the bags. All detached organisms should be collected. All fouling plate unit's parts should be placed into a cooler and transported to the laboratory as soon as possible.

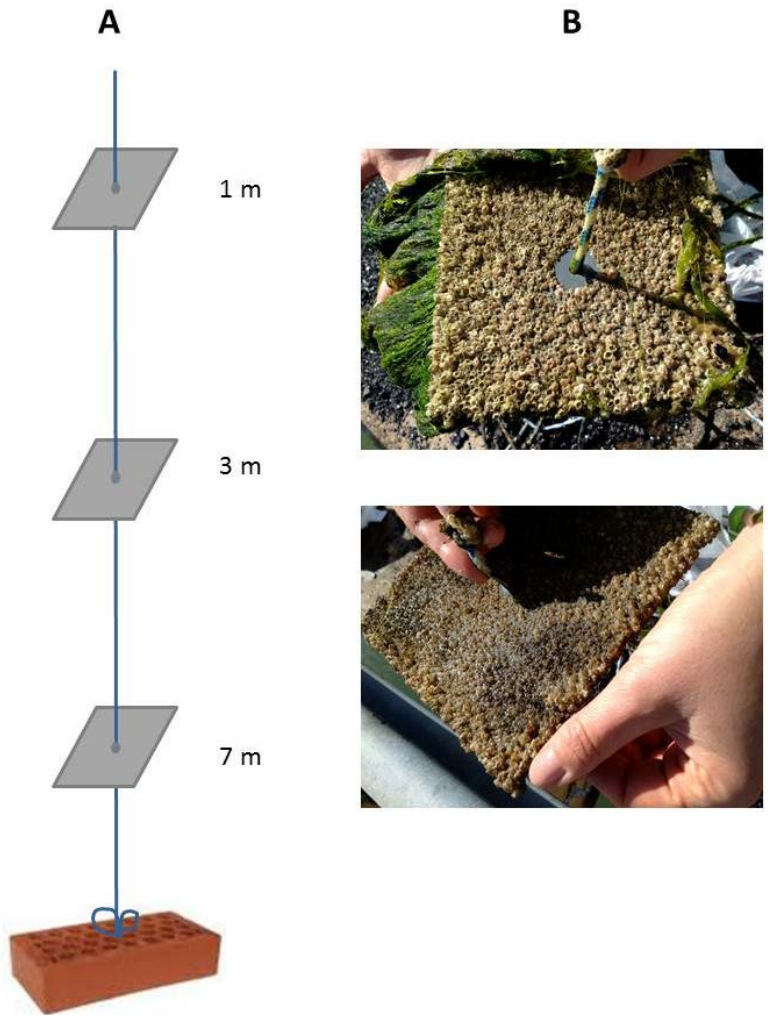

Figure 3. *Suggested setup for fouling plates (A) and retrieved fouling plates (B) after six weeks of deployment Photo: Riikka Puntila-Dodd.*

Benthic infauna

At least three grab samples should be taken at each site located in at least 15 m distance from each other using a benthic grab preferably operable from a dock. Grab sampling is often easier to conduct from a boat if that is possible to use in the port. Petersen and Ponar grabs have proved to be more appropriate for soft substrate sampling and to be used from a dock. Sediment quality of these samples can either be visually assessed or a separate sample may be taken for sediment quality analysis. In case of known ballast water discharge at site, additional benthic samples may be taken. Bottom quality may dominate the possibility to obtain samples from certain sites and acquiring a satisfactory sample may require several attempts. In many locations, a concrete slab or other structures have been built underneath the docks to prevent erosion. Mooring berths (walking bridges) or a boat should therefore be utilized, when possible, to reach further from the shore and obtain satisfactory grab samples. Satisfactory samples require penetration to approximately 10 cm into the sediment.

Field sampling

Grab samples should be taken using a hand operated benthic grab, operable from a dock. Sampling of benthic infauna should occur during the second sampling visit (summer maximum).

Relevant information such as description of the site as well as name and specific dimensions of the grab used should be recorded on the Field data sheet 3.

Samples should be sieved with a 0.5 mm sieve, transferred to sample jars, preserved in buffered 4% formaldehyde solution (1 part 40% formaldehyde solution and 9 parts water) or ethanol (98%), or follow specific instructions by the analysing laboratory and placed in a cooler for transport to the analysing laboratory as soon as possible. In the laboratory, samples may be stained using Rose Bengal (1 g/dm^3 of 40% formaldehyde) (HELCOM COMBINE manual, 2015, Annex C-8 Soft bottom Macrozoobenthos, Section 4.1 on Sampling and JAMP Eutrophication Monitoring Guidelines: Benthos Technical Annexes 1 and 2).

Specimen handling

All sampled materials should be placed in a cooler and transported to the laboratory for sorting as soon as possible. Preservation or narcotization should take place immediately, never later than 8 h from collection.

Preservation guidance may be given by the analyzing laboratory and may include:

- Hexamine buffered formalin, diluted to 10 %; Ethanol (98 % for genetic analyses);
- Formaldehyde solution and 9 parts water and stained with Rose Bengal (1 g/l of 40 % formaldehyde) for benthic samples.

Sample processing, analysis and data reporting

All samples are to be analysed by experts with good knowledge and experience of local species identification or quality assured laboratory (Appendix 2) to account for adequate taxonomic expertise. In case of finding a species unknown for the area of the survey it should first be photographed and then preserved for further analyses (for example in 96% ethanol for genetic analyses). The executing party should contact the local laboratories prior to the sampling to obtain any specific instructions, equipment and/or materials concerning sample preservation and handling.

All organisms are to be identified to the species level. Data should be reported using the agreed format suitable for transferring to the database as available through http://jointbwmexemptions.org/ballast_water_RA (data sheets for field data recording and Excel tables for recording of data for entry into the database; Appendix 3 and 4).

Plankton

Phytoplankton

Sample processing and species identification should be conducted by a quality assured laboratory according to their best practices and should follow the HELCOM COMBINE manual Annex C-6: Guidelines concerning phytoplankton species composition, abundance and biomass, Section 2.2 qualitative determination. All non-indigenous species should be identified. Phytoplankton species composition should be reported using the provided excel sheet. Data should be reported using the agreed data format suitable for transferring to the database.

Zooplankton

All non-indigenous species should be identified. Zooplankton species composition should be reported using the agreed format suitable for transferring to the database.

Mobile epifauna

Quality assured laboratories or local authorities should confirm species identification from the preserved samples and/or photographs. Otherwise, data can be reported by the executing party. Catch per time interval per trap (CPUE) should be reported using the agreed data format suitable for transferring to the database.

Hard substrates

Scrape samples and settlement plate samples should be qualitatively analysed by experts with good knowledge and experience of species identification from the Baltic and the North Sea. or by a quality assured laboratory. Identifying the organisms is easiest when the plates are fresh. If the analysis is delayed, possible preservation methods include 4% formaldehyde, freezing or ethanol (98%). Ethanol tends to deteriorate the coloring of the organisms and therefore the other two are preferred. Observed species should be reported using the agreed format suitable for transferring to the database.

All non-indigenous species should be identified to species level (and photographed, if possible). The rope and brick may be analysed for further information first visually and all organisms identified. Both should also be rinsed thoroughly above a 0,5 mm sieve. All organisms from the sieve should also be identified. Similarly, settlement plates should be analysed. Observed species should be reported using the agreed data format suitable for transferring to the database.

Benthic animals in soft substrates

Samples should be analysed and processed by a quality assured laboratory. All non-indigenous species in the samples should be identified. Results should be reported using the agreed data format suitable for transferring to the database.

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Appendix 1: Field Sampling Equipment

Suggested equipment for field sampling

- Water sampler
- Plankton nets
  - Small hand hauled 10 µm net for phytoplankton
  - 100 µm free fall drop net for zooplankton
  - 500 µm dropnet for larger zooplankton
- 500 ml glass bottles for zooplankton samples
- 250 ml clear glass bottles for phytoplankton samples
  - Lugol solution
- Clean funnel and a bail (for water samples)
- Scrapers for fouling communities (handheld, mesh bag attached or hand held scrapers)
  - 1 – 2 l ziplock bags for the obtained samples
- Traps
  - 9 x Collapsible Chinese crab trap
    - 9 x 2 kg lead weights
    - Cable ties (for attaching the lead weights to the traps)
  - 9 x Shrimp trap (Box or cylinder, 2 mm plastic mesh, 150-200 mm high, 400-500 mm long)
    - Rocks (approx. 1 kg) inside the traps for weight
  - 9 x artificial habitat collectors
    - 9 x 2 kg weight
    - Cable ties (for attaching the lead weights to the traps)
  - Approximately 400 m of rope for tethering the traps
  - 1 l ziplock bags for the catch
  - Bait fish
- Petersen, Ponar or similar hand-operated benthic grab
  - 0.5 mm sieve
- Jars (1 l) for benthic samples
- Alcohol and/or 4% formaldehyde solution (at minimum 2 l per 3 sites)
- Buckets (rope attached to one for obtaining rinsing water)
- 3 large coolers with cold blocks
- Submersible data loggers (e.g. YSI or CTD)
- Secchi disc or turbidity meter
- Digital camera and a GPS device
- Permanent markers
- Labelling tape for the sample containers
- Mesh bags (0.5 mm)
- 50 m transect line, labelled at 1 m intervals
- 0.10 m^2 quadrate frame(s)
- Camera in an UW housing

Appendix 2: Criteria for quality assured laboratories

Quality assured laboratories may include any laboratory qualified with ISO/IEC 17025 standard or its predecessors (ISO 9000, EN-45001). Laboratories that are involved in HELCOM Quality Assurance Programs for phytoplankton (PEG) and zooplankton (ZEN) or meet the requirements of the OSPAR JAMP guidelines on quality assurance for biological monitoring[11] are also considered quality assured. In addition, any laboratory approved by national administrations can be considered quality assured.

[11] JAMP guidelines on quality assurance for biological monitoring in the OSPAR area Ref. No. 2002-15

Port characteristics (Field data sheet 1)

Port name and ID		**Date (day, month, year)**	
Established (year)		**Location (Lat., Long. in WGS84)**	
Assessor(s) (name, surname)			

General description (General info about the port: size, area, what kind of transport cargo or people etc.)	
Recent construction (Description of any recent construction activities)	
Main shipping routes	

Habitat description		**Salinity max. (psu)**	
Existing monitoring		**Salinity min. (psu)**	
Adjacent waters		**Sea surface T^a min. (°C)**	
		Sea surface T^a max. (°C)	
		Sea floor T^a min. (°C)	
		Sea floor T^a max. (°C)	
		Tidal range (m)	

Comments

Provide a map of the area as an attachment

Sampling site & environmental data (Field data sheet 2)

Port name and ID		**Date (day, month, year)**	
Site ID		**Time ([hh]:[mm])**	
Location (Lat., Long. in WGS84)		**Originator (name, surname)**	

Environmental data

Air T^a (°C)	
Cloud cover (%)	
Sea state (m)	
Wind speed (m/s)	
Wind direction (Grad)	
Water T^a at surface(°C)	
Water T^a at 1 m (°C)	
Water T^a at 3 m (°C)	
Water T^a at 5 m (°C)	
Water T^a at 75 m (°C)	
Water T^a at bottom (°C)	
Salinity at surface (psu)	
Salinity at 1 m (psu)	
Salinity at 3 m (psu)	
Salinity at5 m (psu)	
Salinity at 7 m (psu)	
Salinity at bottom (psu)	
Dissolved oxygen at bottom (mg/l)	
Water transparency (m)	

Comments

Sediment sample (Y/N)	
Method	

Fractions and grain size

Sediment analysis, organic content (g)	
Sediment analysis, median (µm)	
Sediment analysis >1mm (% dry weight)	
Sediment analysis <1-0.5mm (% dry weight)	
Sediment analysis <0.5-0.25mm (% dry weight)	
Sediment analysis <0.25-0.125mm (% dry weight)	
Sediment analysis <0.125-0.063mm (% dry weight)	
Sediment analysis <0.063mm (% dry weight)	

Visual assessment

Material	**%**

Sample data sheet (Field data sheet 3)

Port name and ID		**Date (day, month, year)**		**Originator (name, surname)**	
Site ID		**Time ([hh]:[mm])**		**Water depth (m)**	

Sample type	**Phytoplankton**		**Mobile epifauna**	**Fouling**		**Zooplankton**		**Benthos**		
	Net	**Water**		**Scraping sample**	**Plate sample**	**100 µm net**	**500 µm net**	**1**	**2**	**3**
Sampling start (dd.mm.yyyy) or hh.mm)										
Sampling finish (dd.mm.yyyy) or (hh.mm)										
Total area covered (m^2) or water volume filtered (m^3)										
Depth penetration (cm)										
Total number of samples										
Parallel sample per site										
Transect										
Sampling method										
Pretreat method										
Storage method										
Method of measurements										

Sample data sheet (Field data sheet 3, continuation)

Port name and ID		**Date (day, month, year)**	
Site ID		**Time ([hh]:[mm])**	
Ballast water discharge at site (Y/N)		**Originator (name, surname)**	
Location (Lat., Long. in WGS84)		**Water depth (m)**	

Fouling sampling

Scrape sample	**1**	**2**	**3**
Depth (m)			
Type of substrate			

Plate sample	**1**	**2**	**3**
Depth (m)			
Type of substrate			

Trap type	**Deployed**	**Retrieved**	**Catch**	**Comments**

Appendix 4: Format suitable for transferring to the database

Environment data collected:

To transfer data to the Decision support tool for Ballast water exemptions a template can be downloaded here: https://maps.helcom.fi/website/RA_tool/ under the Data tab and subsequently sent by e-mail to data@helcom.fi.

To transfer the complete port survey data (including additional environmental and biological data not considered for the risk assessment step 1) a template can be downloaded from a Workspace habilitated for that purpose here: https://portal.helcom.fi/workspaces/HELCOM-OSPAR%20Port%20survey%20data-165/default.aspx and subsequently sent by e-mail to data@helcom.fi. Compiled data will then be accessible through the above-mentioned Workspace.