



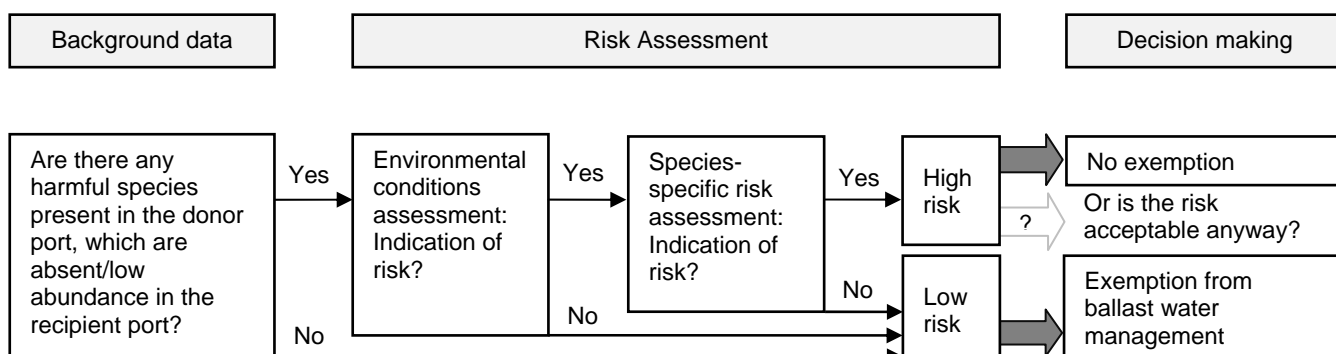
HELCOM Guidance to distinguish between unacceptable high risk scenarios and acceptable low risk scenarios – a risk of spreading of alien species by ships on Intra-Baltic voyages

These recommendations are to be viewed in the light of Ballast Water Management Convention (BWM Convention) Regulation A-4 and the IMO “Guidelines for risk assessment under regulation A-4 of the BWM Convention (G7)”¹. These recommendations are open for review, with the possibility to apply modifications based on gained experience and improved knowledge base.

The Baltic Sea is recognised as a one Biogeographical Region² in the context of Ballast Water Management Convention, defined as; “a large natural region defined by physiographic and biologic characteristics within which the animal and plant species show a high degree of similarity. There are no sharp and absolute boundaries but rather more or less clearly expressed transition zones”.

No specific aspects of how to assess risks within, instead of between, biogeographic regions are proposed in the IMO Guidelines G7. Hence the specific guidance has been developed bearing in mind Baltic Sea regional specifics.

The Guidance gives step-by-step approach to the aspects of selecting the appropriate scale for the risk assessment, species and what aspects in regards of environmental conditions and species-specific information, are to be taken into account. The step-by-step risk assessment procedure is illustrated by the chart below.



This is a product of the HELCOM HOLAS project co-funded by the European Commission (EU HOLAS; 21.0401/2008/513749/SUB/D2)



¹ IMO Resolution MEPC.162(56) “Guidelines for Risk Assessment under regulation A-4 of the BWM

² Large Marine Ecosystems (LME) scheme, used in the IMO BWM Convention Guideline G7

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 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 Organisation 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.*

Recommendation 1. A risk assessment must be sufficiently robust

- 1.1 in order to distinguish between high and low risk scenarios where the discharge of ballast water or sediments not meeting requirements of ballast water treatment, is unlikely to impair or damage the environment, human health, property or resources of the granting Party and of adjacent or other States, and;
- 1.2 should follow the risk assessment 8 key principles as defined in IMO Guidelines G7; effectiveness, transparency, consistency, comprehensiveness, risk management, precautionary, science based and continuous improvement.

For decision-making it is important to recognise that;

- 1.3 low risk scenarios may exist, but zero risk is not obtainable, and as such risk should be identified by determining the acceptable levels of risk in each instance. The absence of, or uncertainty in, any information should be considered an indicator of potential risk.
- 1.4 level of uncertainty is recorded in a transparent way.

Recommendation 2. Species-specific Risk Assessment (G7)

- 2.1 is recognised as the most effective assessment method, describing risk within a Biogeographical area most sophisticatedly;
- 2.2 and should be used with supportive information from environmental conditions and shipping activities.

Recommendation 3. Scale of risk assessments

- 3.1 It is recommended that the Parties responsible for carrying out risk assessments employ individual ports and their surrounding area with similar environmental conditions as the primary units of the assessments. These are the starting and end point of ships' voyages. If two or more ports are close to one another (similar species communities and environmental conditions), a joint risk assessment may be carried out.

- 3.2 The environmental conditions and the presence of any potentially or truly harmful non-indigenous and cryptogenic species in the areas close to the ports are urged to be taken into account.

Recommendation 4. Species to be included in the risk assessments

- 4.1 Taking note that not all non-indigenous species pose a similar level of invasion, only harmful non-indigenous and cryptogenic species can contribute to unacceptable high risk voyages. For this, parties taking the risk assessment should initially identify all non-indigenous and cryptogenic species that are present in the donor and recipient ports and their surrounding areas.
- 4.2 The authority responsible for granting exemptions should be in the position to determine, whether all potentially harmful non-indigenous and cryptogenic species, should be included in the risk assessments or only species which have been reported to use ballast water or sediment as a vector. However, decision to leave some harmful non-indigenous and cryptogenic species outside a risk assessment should be made with great caution and based on real evidence of these species not being able to deploy ballast water or sediments as a vector.
- 4.3 The IMO Guidelines (G7) for risk assessment allow removal of a harmful non-indigenous and cryptogenic species - present both in the donor and the recipient port in high abundance - from the overall risk assessment. However, potentially harmful non-indigenous and cryptogenic species present in the recipient port and its surrounding area only in low abundance should not be excluded from the risk assessment. In low abundance such a species might have a lower potential to become harmful but its continual introduction increases the probability that it will become established and/or invasive.
- 4.4 If a harmful species is under active control or eradication in the recipient port, actions to prevent its further introductions should be taken.
- 4.5 Specific lists of species to be taken into account in the risk assessments should be made available regionally.

Recommendation 5. Environmental conditions in donor and recipient ports in the Baltic Sea

- 5.1 A starting point of a successful intra-Baltic risk assessment should be collection of data on the seasonal variation of environmental conditions throughout the water column from surface to bottom.
- 5.2 All environmental conditions, that might be predictive of ability of the harmful non-indigenous and cryptogenic species (Recommendations 4 & 6) to successfully establish and cause harm in the new locations, in particular salinity and temperature, but also other parameters e.g. nutrients, habitats available and oxygen should be taken into account.
- 5.3 In the lack of information on how non-indigenous and cryptogenic species' respond to these variations in environmental conditions, the best available expert judgement should be used to compare species' success to disperse from donor to the recipient port and their surrounding areas, and to become established in the recipient environment and spread.
- 5.4 Data on average, maximum and minimum salinity and temperature in water column, within ports and surrounding areas, throughout the year should be the minimum requirement for risk assessments. Both the temperature and salinity have direct impacts on the development and reproductive success of any individuals. Conditions in a larger water body must be taken into account, since this will affect the dispersal ability of mobile species (active or passive dispersal).

Recommendation 6. Species-specific risk assessment data requirements

- 6.1 Data to be included in species-specific risk assessments (G7) – as far as available - should include, but is not limited to;
- Life history information on the harmful non-indigenous and cryptogenic species and physiological tolerances, in particular salinity and temperature, of each life stage;
 - a. The ability of the adults to survive would be indicated by the physiological limits for both temperature and salinity that fall within the environmental ranges observed in the recipient port and larger water body. As a check, a comparison could be made with the native and/or introduced ranges of the species to determine if the predicted tolerances (based on laboratory or field studies) reflect actual distributions.
 - b. For other life stages the physiological requirements of each stage in the life cycle should be compared against the environmental conditions during the season(s) of reproduction, noting that these stage(s) may live in different habitats to complete their life cycle (e.g. coastal pelagic larvae of estuarine benthic invertebrates).
 - c. Comparisons of known physiological tolerances for other conditions should be conducted if the data are available and relevant.
 - Habitat type required by the harmful species and availability of such in the recipient port.
- 6.2 The risk assessments should have great emphasis on reproductive potential of harmful non-indigenous and cryptogenic species. The young stages' survival is also important to assess.
- 6.3 Comparisons of known physiological tolerances from the Baltic Sea especially, but also from other regions, should be taken into consideration.

Recommendation 7. Background information on shipping activities

- 7.1 The overall probability of a successful invasion also depends in part on the number of organisms and the frequency with which they are introduced over the entire period of the exemption. Therefore, it is recommended that a risk assessment should consider estimates of the following factors:
- the total volume of water discharged
 - the volume of water discharged in any event (voyage)
 - the total number of discharge events
 - the temporal distribution of discharge events.

Recommendation 8. Species' ability to disperse between ports without human introduced vector

- 8.1 Some harmful species in the Baltic Sea might have an ability to spread from one port to another across larger water bodies without human introduced vector, 'naturally' by means of active swimming or passively with water currents e.g. the species having a small maximum diameter, floating ability or buoyant offspring.
- 8.2 If a harmful species has an ability to spread by these 'natural' means between the ports in question - taken that there are no natural barriers (environmental or distance related) preventing such - ballast water management might not grant additional protection from such species.
- 8.3 Only if this ability to disperse from donor to a recipient port 'naturally' can be based on information of high quality (scientifically proven or reliable expert judgement), the

authorities responsible for granting exemptions, may reserve a right to exempt ships on specific voyages (See *Decision making*). This is only valid if no other species poses a further threat.

- 8.4 In the case of having even one harmful species in the donor port, for which the only vector of dispersal and means of overcoming a natural barrier is the ballast water or sediment, and for which environmental conditions and species-specific risk assessment indicate high risk of dispersal, an exemption should not be granted.

Decision making

For a species-specific risk assessment, an assessment should be deemed high risk if it identifies at least one harmful non-indigenous or cryptogenic species that satisfies all of the following:

- likely to cause harm (potential to become invasive in the recipient port)
- present in the donor port or surrounding area
- likely to be transferred to the recipient port through ballast water; and
- likely to survive in the recipient port.

Ships engaged in high risk regional voyages should apply onboard ballast water treatment or discharge and dispose ballast water and sediments to reception facilities. Assessment of the risk based on available information on life history on the identified harmful non-indigenous and cryptogenic species and physiological tolerances, in particular salinity and temperature, habitat type required of each life stage and activities contributing to introductions to the recipient port (follow Recommendations 1-7) should ultimately lead to conclusion if a voyage(s) is of low or high risk. Clear indication of information, which might be relevant to the risk assessment but cannot be obtained, should be made. An independent peer review (by independent third party) of the risk assessment method, data and assumptions is recommended to be undertaken.

According to the IMO Guidelines G7 a Party(s) may decide on the level of acceptable and unacceptable risks. For the sake of harmonized implementation of the BWM Convention in the Baltic Sea region, HELCOM countries should jointly determine and arrive at the common understanding regarding such a level of acceptable and unacceptable risks. Once the level of risk and the uncertainty have been assessed, the result can be compared to the levels a Party(s) is willing to accept in order to determine whether an exemption can be granted (G7, paragraph 6.5.8). The assessment has to be put in the relevant context to determine whether the risk level is acceptable or not. For example Parties of the Convention may want to take into account species' natural dispersal ability (Recommendation 8) on short voyages and consider whether ballast water management would add for the minimising the risk of species dispersal. If the dispersal is likely to occur with or without ballast water management, the feasibility of requiring installation of treatment systems according to the BWM Convention should be evaluated. This process should be transparent.

Any exemptions from applying ballast water management to be granted should be consulted accordingly with any Affected States.

Explanatory notes

Some additional information to the specific recommendations is given below.

1. IMO MEPC 53/24/Add. 1 document, Annex 2. Resolution MEPC.124(53) “*Guidelines for Ballast Water Exchange (G6)*”
2. Generally there are three risk assessment methods (G7) for assessing the risk 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

Environmental matching risk assessment relies on comparing environmental conditions including temperature and salinity between the donor and recipient regions. The degree of similarity between the locations provides an indication of the likelihood of survival and the establishment of any species transferred between those locations. Since species are normally widely distributed in a region, and are rarely restricted to a single port, the environmental conditions of the source region should be considered.

Species’ biogeographical risk assessment compares the overlap of native and non-indigenous species to evaluate environmental similarity between the donor and recipient ports and biogeographic regions and to identify high risk invaders. Overlapping species in the donor and recipient ports and regions are a direct indication (G7, paragraph 6.3.1) that environmental conditions are sufficiently similar to allow a shared fauna and flora.

Species-specific risk assessment use information on life history and physiological tolerances to define a species’ physiological limits and thereby estimate its potential to survive or complete its life cycle in the recipient environment. In order to undertake a species-specific risk assessment, species of concern that may impair or damage the environment, human health, property or resources need to be identified and selected.

The IMO Risk Assessment Guidelines G7 suggest that the three approaches could be used either individually or in any combination. Information from risk assessments carried out for oceanic voyages (Leppäkoski & Gollasch 2006³, GloBallast Risk assessments⁴) are recommended to be used as a supportive material for Intra-Baltic assessments.

The difficulty of using environmental matching risk assessments and biogeographical risk assessments in the Baltic Sea is identifying the environmental conditions that are predictive of the ability of the harmful species to successfully establish and cause harm in the new locations. As the variability of general environmental conditions (temperature and salinity) have gradual shifts from South-West to North-East parts of the Baltic, the overlap of conditions makes it harder to distinguish areas different enough from one another. Especially on the coastal areas the temperature and salinity resemblance between ports in the Baltic is higher, than on the open sea areas. These difficulties, as recognized by the Convention, become pronounced when considering voyages within biogeographical areas.

To attain a realistic level of risks involved on Intra-Baltic voyages, the species-specific risk assessment is recommended to be used. The environmental conditions assessed in Ports can be used as background information for risk assessments, although alone are too rough to assess the real level of risk. This recommendation is supported by the IMO Guidelines (G7) suggesting that species-specific risk assessment should be used if there are species in the donor regions that can tolerate extreme environmental differences (eurythermal and euryhaline species). Most species in the Baltic have high tolerance to changes in salinity for example.

³ [Risk Assessment of Ballast Water Mediated Species Introductions – a Baltic Sea Approach](http://www.helcom.fi/environment2/biodiv/alien/en_GB/alienspecies/) [available online: http://www.helcom.fi/environment2/biodiv/alien/en_GB/alienspecies/]

⁴ [available online: <http://globallast.imo.org/index.asp?page=monograph.htm>]

3. The Ballast Water Management Convention doesn't give specific definition for the extent of an area that can be used as a basic areal unit 'ports' or 'locations', which are the start and end points of the ships' voyages.

The surrounding areas are important to assess, since changes in environmental conditions might even occur on small scale when moving away from the port, allowing potentially more suitable sites around the port than within it.

Ships might in some cases also start emptying/filling their ballast water tanks away from the ports.

4.2. If there is any reason to doubt that a species might survive in ballast tanks, either in water or sediments, or if this is unknown, it should be assumed that the answer to the question above is yes. Guidelines (G7) suggest that consideration on the probability of survival of viable stages could be assessed for following stages of the voyage: uptake, transfer and discharge of the ballast water and sediments. This kind of information might be hard to obtain, but scientific literature offers examples of species having dispersed via ships and these reports should serve as an indication for successful transportation.

5. Results of documented HELCOM Port Baseline Survey questionnaires serve as background information.⁵

6. As the ability to assess the adult survival is quite demanding, due to adults often having protective behavioural or physiological adaptations (burrowing, closing shells, changes in metabolism), the assessments should focus especially on evaluating the survival of young ones. Young stages' survival will ultimately determine the ability of the species to become established and invasive. The environmental requirements during species reproductive stage are important to note.

If any laboratory or field surveys are available, they should serve as background information. Comparisons of known physiological tolerances from other regions in comparison to possible reported adaptations in the Baltic, should be taken into consideration.

⁵ Annex 1 to the document:

http://meeting.helcom.fi/c/document_library/get_file?p_l_id=18816&folderId=668711&name=DLFE-39758.pdf