Proposal for IMO Ballast Water Management Convention A-4 Target Species selection criteria

Prepared by:
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with advice from
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The expert group

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- Chair of the EC JRC/ICES Task Group on MSFD D2 “Non-indigenous species” (2009-2010)
- Member of ICES WGITMO
- Co-founder of the Baltic Marine Biologists WG on Non-indigenous Marine and Estuarine Organisms (since 1994)
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- Irish delegate to the OSPAR Convention
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**Published:** > 150 research articles, advisory documents, technical reports on non-indigenous species (incl. ballast water issues, pathway analysis, impacts and risk assessment)
Aim of the document

• to contribute to the control of the spread of harmful aquatic organisms and pathogens into the Baltic Sea.
• The document defines the criteria for granting exemptions for ballast water management in accordance with the Regulation A-4 Exemptions of the International convention for the control and management of ships’ ballast water and sediments (BWMC; IMO 2004).
• exemptions can only be granted when they are:
  – “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;
  – effective for a period of no more than five years subject to intermediate review;
  – granted to ships that do not mix Ballast Water or Sediments other than between the ports or locations specified in paragraph 1.1.”.

Why this document:

The 48th meeting of the Heads of Delegation: welcomed the offer by Lithuania and Estonia to contribute to the next round of HELCOM-OSPAR JHP revisions with new proposals regarding BWMC A-4 Risk assessment Target Species criteria and the Baltic Sea Target Species list
Framework of the adaptive system on granting A-4 exemptions for the BWMC

The key principles (IMO, 2007):

1. **Effectiveness** - That risk assessments accurately measures the risks to... to achieve an appropriate level of protection.

2. **Transparency** – That the reasoning and evidence supporting the action recommended by risk assessments...are clearly documented and made available to decision-makers.

3. **Consistency** – That risk assessments achieve a uniform high level of performance, using a common process and methodology.

4. **Comprehensiveness** – That the full range of values, including economic, environmental, social and cultural, are considered...

5. **Risk Management** – ... risk should be managed by determining the acceptable level of risk in each instance.

6. **Precautionary** – That risk assessments incorporate a level of precaution... to account for uncertainty and inadequacy of information. The absence of, or uncertainty in, any information should therefore be considered an indicator of potential risk.

7. **Science based** – That risk assessments are based on the best available information that has been collected and analysed using scientific methods.

8. **Continuous improvement** – Any risk model should be periodically reviewed and updated to account for improved understanding.

Source: Olenin et al. (in prep.)
The information system

• Ensures that the key principles (IMO 2007) are met especially - Transparency, Consistency, Comprehensiveness, Science based, Continuous improvement.

• GloBallast 2014:
  - “the systematic archiving of biological records...for the benefit of the international community engaged in preventative NIS programmes is of crucial importance.
  - Such programmes are heavily dependent on reliable, up-to-date information on the status of NIS in different regions, in order to assess the risks associated with different routes and vectors...”

Source: Olenin et al. (in prep.)
The information system

Basic information:
- valid taxonomy of NIS and CS, including notes on availability of molecular data;
- biological traits and environmental tolerance limits of NIS and CS;
- documented evidences of species being found in ballast water, on ship hulls and other vessel vectors of introduction;
- standardized impacts on human health, economy, biodiversity, ecosystem functioning, and socio-cultural values;
- introduction event records at the level of particular countries, country regions and ports;
- information on species labelled as unacceptable risk species world-wide.

Baltic Sea component update by:
Henn Ojaveer (EE), Sergej Olenin (LT), Elena Ezhova (RU), Kathe Rose Jensen (DK), Stephan Gollasch (DE), Maiju Lehtiniemi (FI), Monika Normant (PL), Ann-Britt Florin (SE)

Source: Olenin et al. (in prep.)
The information system

Constant update from:
- port biological surveys;
- specialized national and regional (e.g. HELCOM) NIS monitoring;
- other sources of information on NIS/CS and HAOP, e.g. regular national reports to expert groups (e.g. ICES WGITMO, WGBOSV), scientifically validated public science findings;
- outcomes of the TS selection process worldwide (i.e. all species which at least once were identified as posing unacceptable risk should be recorded);
- results of administrative decisions on granted / rejected / withdrawn exemptions on port-to-port basis, including all background information (e.g. why such decision was made).

The decision support tool - an interface to a risk assessment for translocation of TS in ballast water between two ports.

The background data - readily available from the information system

Source: Olenin et al. (in prep.)
Monitoring

- Both national and regional (e.g. HELCOM) specialized NIS monitoring systems are needed
Review process

- Emergency situation in HAB’s and HAOP’s: in case of arrival/development and/or bloom events;
- Relationship with hull fouling and other vectors (incl. aquaculture);
- Climate variability and change: potentially effective within the period of two exemptions;
- Extreme weather events: short-term rapid changes in hydrological conditions altering the risk assessment conditions;
- Port alteration: port reconstructions and potential changes in location of BW discharge/uptake areas;
- Updates of monitoring: new findings/evidences of native and non-native species of concern;
- Horizon scanning.

As a result of the review process, the TS list should be updated (link to the Information System)

Source: Olenin et al. (in prep.)
Administrative decision

- The executive part of the adaptive system
- Performed by the relevant management body, based on the scientific advice generated for management through application of the risk assessment procedure.
- Provides feedback into the system (information system component) on how the advice has been used, i.e. exemptions granted and justifications/argumentation in case of departure from the advice)

Source: Olenin et al. (in prep.)
Framework of the adaptive system on granting A-4 exemptions for the BWMC

Source: Olenin et al. (in prep.)
Selection of Target Species
THREE MAJOR BLOCKS

1. Pathway of spread (questions 1-2)

2. Ecology/physiological tolerance of the species in the given LME (question 3)

3. Impacts (questions 4-11)

Source: Olenin et al. (in prep.)
Initial species list

• Data
  – Non-indigenous species
  – Native species (HAOP’s, HAB’s etc.)

• Depends on data certainty/reliability
  – Sub-regional approach (sub-system/sea area)
  – One or more LME’s involved (depends on shipping routes)

• As soon as all defined, proceed with the questionnaire

Source: Olenin et al. (in prep.)
Is there actual evidence of the species being found in ballast water and/or sediments?

PATHWAY THE FIRST THING TO CONSIDER

Source: Olenin et al. (in prep.)
Pathway and vector analysis: level of certainty

1. Direct evidence
   - Pathway: Aquaculture
   - Vector: Intercontinental stock movement
   - The species actually found associated with the specific vector of a pathway at the time of introduction

2. Very likely
   - Pathway: Vessels
   - Vector: Ballast water
   - The species appears for the first time in a locality where a single vector is known to operate and where there is no other explanation.

3. Possible
   - Pathways: Leisure activities, Vessels, Natural spread from neighbouring countries
   - Vectors: several
   - The species cannot be convincingly ascribed to a single pathway, but is known to be introduced by this pathway(s) elsewhere

4. Unknown
   - Occurrence of a given NIS cannot be clearly explained

(Minchin et al. 2009, AquaNIS 2013)
How well do we know introduction pathways?

Source: Ojaveer et al. (in prep.)
Is there a potential for an unacceptable risk for the species to become entrained in ballast tanks?

a) Species has pelagic life-history stage; 
b) Species performs diurnal vertical migrations; 
c) Species has a pelagic host; 
d) Species is present in sediments in shallow water ports (BW uptake areas).

**UNCERTAINTY OF EVIDENCE**

**PARASITES AND MACROALGAE SHOULD BE INCLUDED!**

Source: Olenin et al. (in prep.)
Is there a potential for unacceptable risk for the species to be spread further within the selected assessment area?

a) The species is already established in all colonisable regions/countries in particular LME;
b) The species is unable to colonise further areas based on the known physiological tolerance limits.

NOT ONLY SALINITY, BUT OTHER KEY PARAMETRES AS WELL!

Source: Olenin et al. (in prep.)
Has the species been documented as having an impact upon human health in the selected LME?

a) Mortality;

b) Illness;

c) Pain;

d) Irritation.

IMPACT UPON HUMAN HEALTH (DIRECT EVIDENCE FROM A GIVEN LME OR ELSEWHERE) SHOULD BE THE ABSOLUTE PRIORITY #1 ISSUE

Source: Olenin et al. (in prep.)
Poor evidence on impact

Ecosystem impacts of the widespread non-indigenous species in the Baltic Sea: literature survey evidences major limitations in knowledge

Henn Ojaveer · Jonne Kotta

Classification of Non-Indigenous Species Based on Their Impacts: Considerations for Application in Marine Management

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LACK OF EVIDENCE SHOULD BE CONSIDERED AS OF HIGH RISK
Is there a potential for unacceptable risk for the species to impact upon human health in the selected LME?

a) Based on global evidence [follow the structure from previous point];

b) Insufficient evidence to rule out unacceptable risk - see point 6.5.7 in IMO (2007).

Source: Olenin et al. (in prep.)
Has the species been documented as having an impact upon economy in the selected LME?

a) Damage to property;
b) Decline of employment;
c) Decline of income.

IMPACT UPON ECONOMY/ECOLOGY PRIORITY #2

PARASITES INCLUDED

Source: Olenin et al. (in prep.)
Is there a potential for unacceptable risk for the species to impact upon economy in the selected LME?

a) Based on global evidence [follow the structure from previous point];

b) Insufficient evidence to rule out unacceptable risk - see point 6.5.7 in IMO 2007b.

Source: Olenin et al. (in prep.)
Has the species been documented as having an impact upon ecology in the selected LME?

a) Biodiversity
   i) Genetic
   ii) Species (incl. protected and rare species)
   iii) Habitats (incl. protected and rare habitats);

b) Ecosystem functioning.

Source: Olenin et al. (in prep.)
Is there a potential for unacceptable risk for the species to impact upon ecology in the given LME?

a) Based on global evidence [follow the structure from previous point];

b) Insufficient evidence to rule out unacceptable risk - see point 6.5.7 in IMO 2007b.

Source: Olenin et al. (in prep.)
Has the species been documented as having an impact upon cultural and social values in the given LME?

a) Degradation of culturally and nationally important places, incl. change in seascape;
b) Decline of nationally/culturally important individuals;
c) Degradation of amenity;
d) Impact on human activities (diving, swimming, sailing, fishing).

Source: Olenin et al. (in prep.)
Is there a potential for unacceptable risk for the species to impact upon cultural and social values in the selected LME?

a) Based on global evidence [follow the structure from previous point];

b) Insufficient evidence to rule out unacceptable risk - see point 6.5.7 in IMO 2007b.

IMPACT UPON CULTURAL/SOCIAL PRIORITY #3

Source: Olenin et al. (in prep.)
Further work needed

• Ranking/prioritizing impacts to be included into the species selection criteria process:
  1. Human health
  2. Economy/ecology
  3. Social/cultural

• Can species end up being not selected in case of some level of impact on economy/ecology and social/cultural values? (what are criteria for the acceptable risk?)
Degree of risk

Source: Olenin et al. (in prep.)
Conclusions

• The Target Species selection criteria is an integral part of the overall adaptive system for the BWMC A-4 exemptions.
• There cannot be one and ‘the only’ Target Species list per LME, as it depends on shipping routes.
• Initial ‘reservoir list’ depends on data certainty/reliability. This also determines the amount of work to perform the analysis (i.e. questions 1-11);
• Further work needed to weight/rank the impact.

Source: Olenin et al. (in prep.)
THANK YOU FOR YOUR ATTENTION!