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

Prepared by:

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with advice from

Rick Boelens

The expert group

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- Chair of IC ES Working Group on Introductions and Transfers of Marine Organisms (WGITMO)
- Member of ICES SCICOM
- Chair od ICES Science Steering Group on Ecosystem Impacts and Pressures.
- Former chair of ICES Strategic Initiative on Biodiversity Advice and Science (SIBAS)
- National responsibility on

Estonia

Sergej Olenin

- 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)
- Coordinator of national projects on implementation of MSFD and IMO BWMC in Lithuania

Lithuania

Dan Minchin

- Member of ICES WGITMO (since 1989)
- Scientific advisor to Food and Agriculture Organisation on precautionary approach to Fisheries and Introductions
- Founder of the International Pectinid Workshop (since 1976)
- Member of the ballast water treatment techniques verification team

Lithuania / Ireland

Rick Boelens

- Chairman of Irish Sea Study Group
- Irish delegate to the OSPAR Convention
- Member of ICES Advisory Committee on Marine Pollution
- Member of IMO Environmental Division
- Chairman of the Scientific Group of the London Dumping Convention
- Member of GESAMP

Ireland

Published: > 150 research articles, advisory documents, technical reports on non-indigenous species (incl. ballast water issues, pathway analysis, impacts and risk assessment)
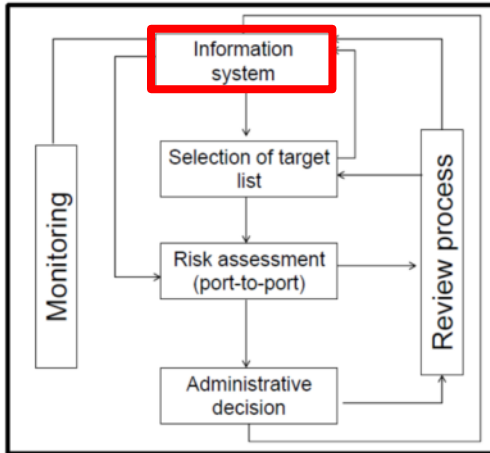
Aim of the document

- 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
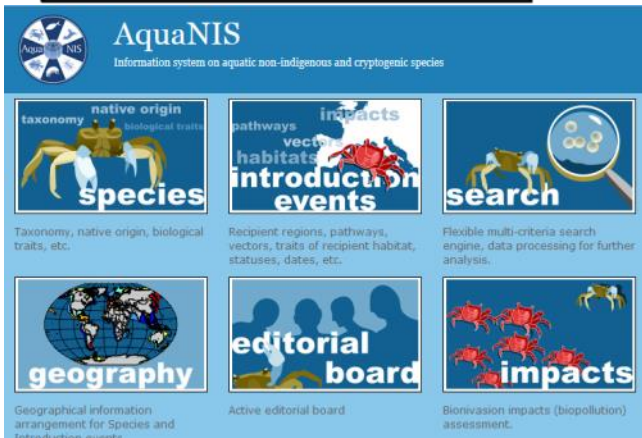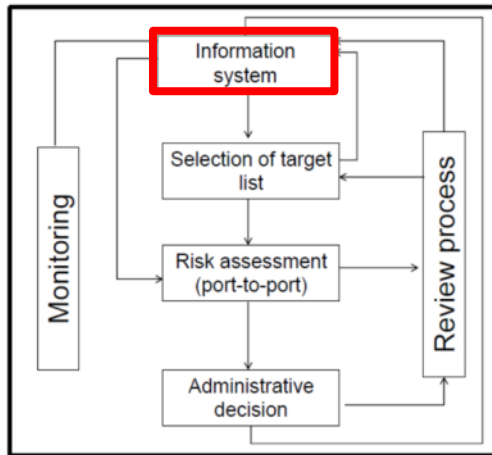
Framework of the adaptive system on granting A-4 exemptions for the BWMC

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 <u>crucial importance</u>.
  - Such programmes are heavily dependent on <u>reliable, up-to-date information on the status of NIS</u> in different regions, in order to assess the risks associated with different routes and vectors…"

Source: Olenin et al. (in prep.)

The information system

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.)

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.**

The information system

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

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).

Monitoring

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

Review process

Source: Olenin et al. (in prep.)

- 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)

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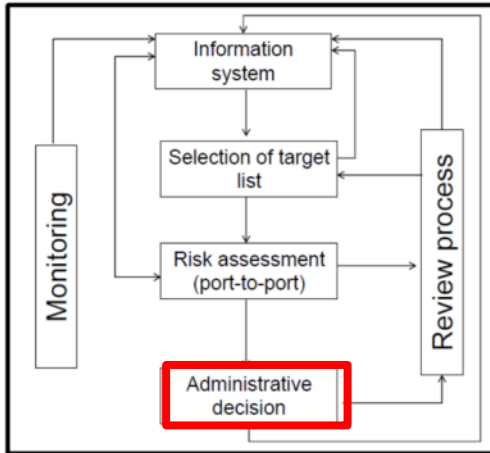
- The executive part of the adaptive system
- Performed by the relevant management body, based on the scientific advice generated for management through application of the risk assessment procedure.
- Provides feedback into the system (information system component) on how the advice has been used, i.e.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

Framework of the adaptive system on granting A-4 exemptions for the BWMC

# Selection of Target Species

Source: Olenin et al. (in prep.)
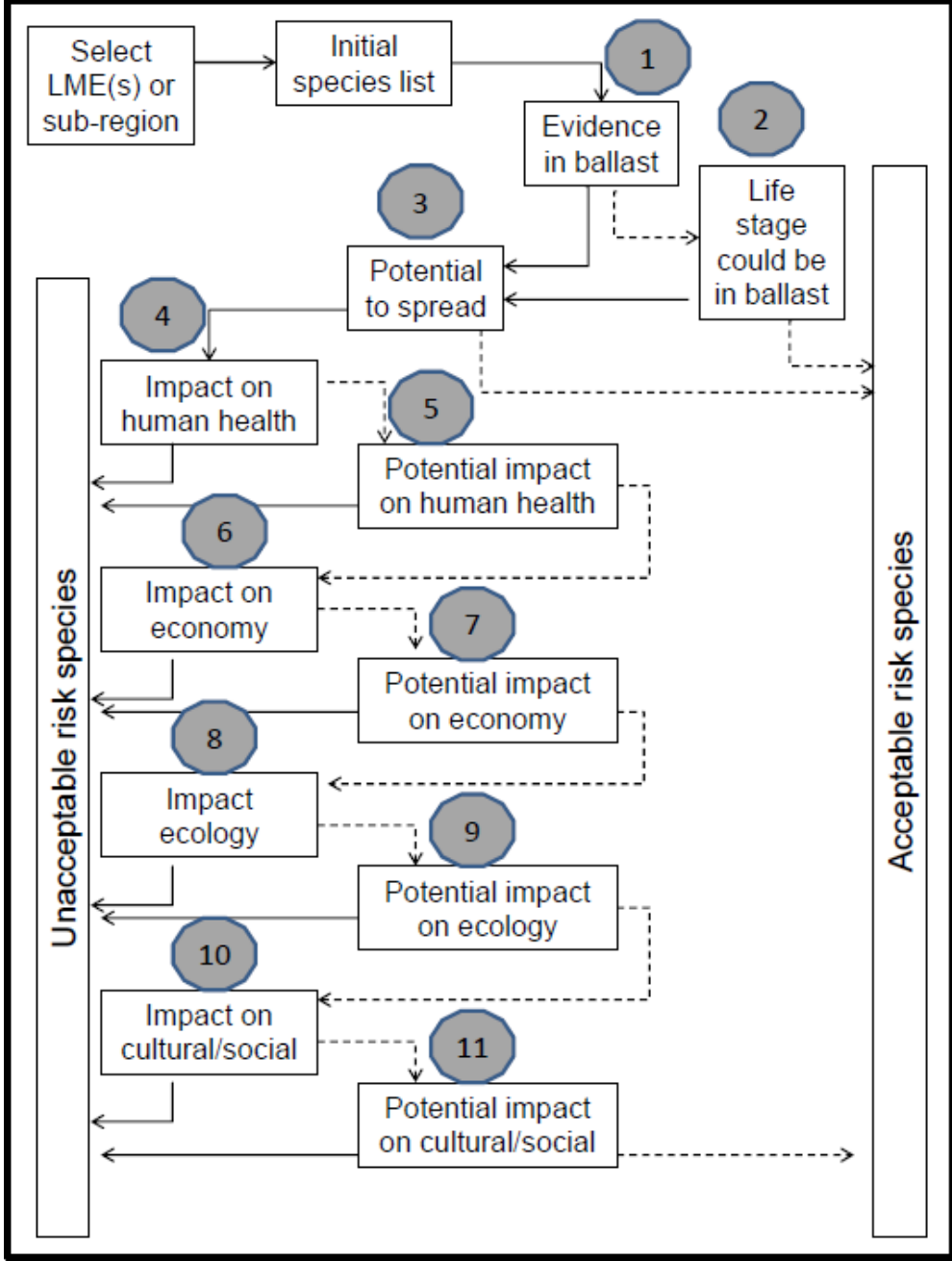
THREE MAJOR BLOCKS

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)

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.)
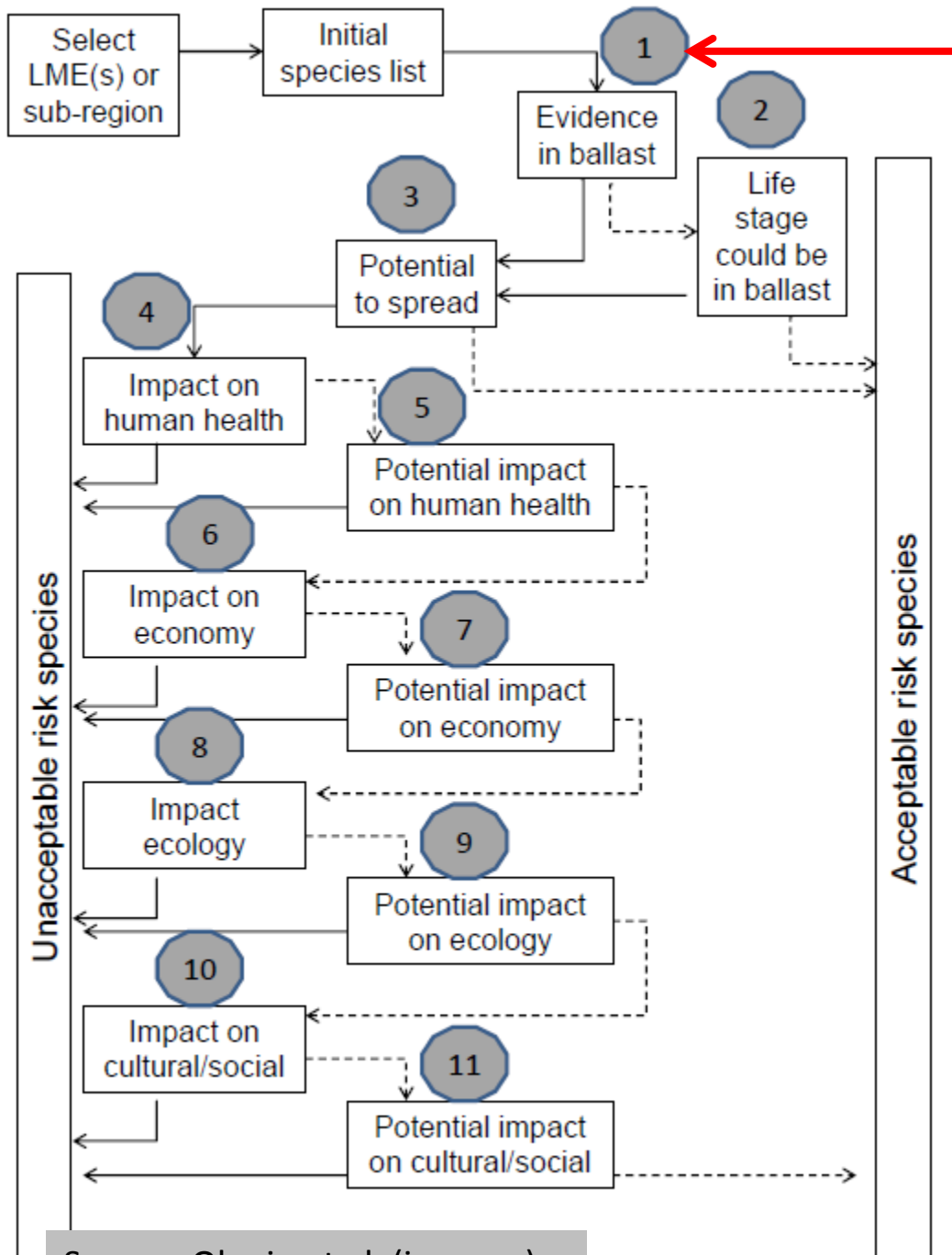
Is there actual evidence of the species being found in ballast water and/or sediments?

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
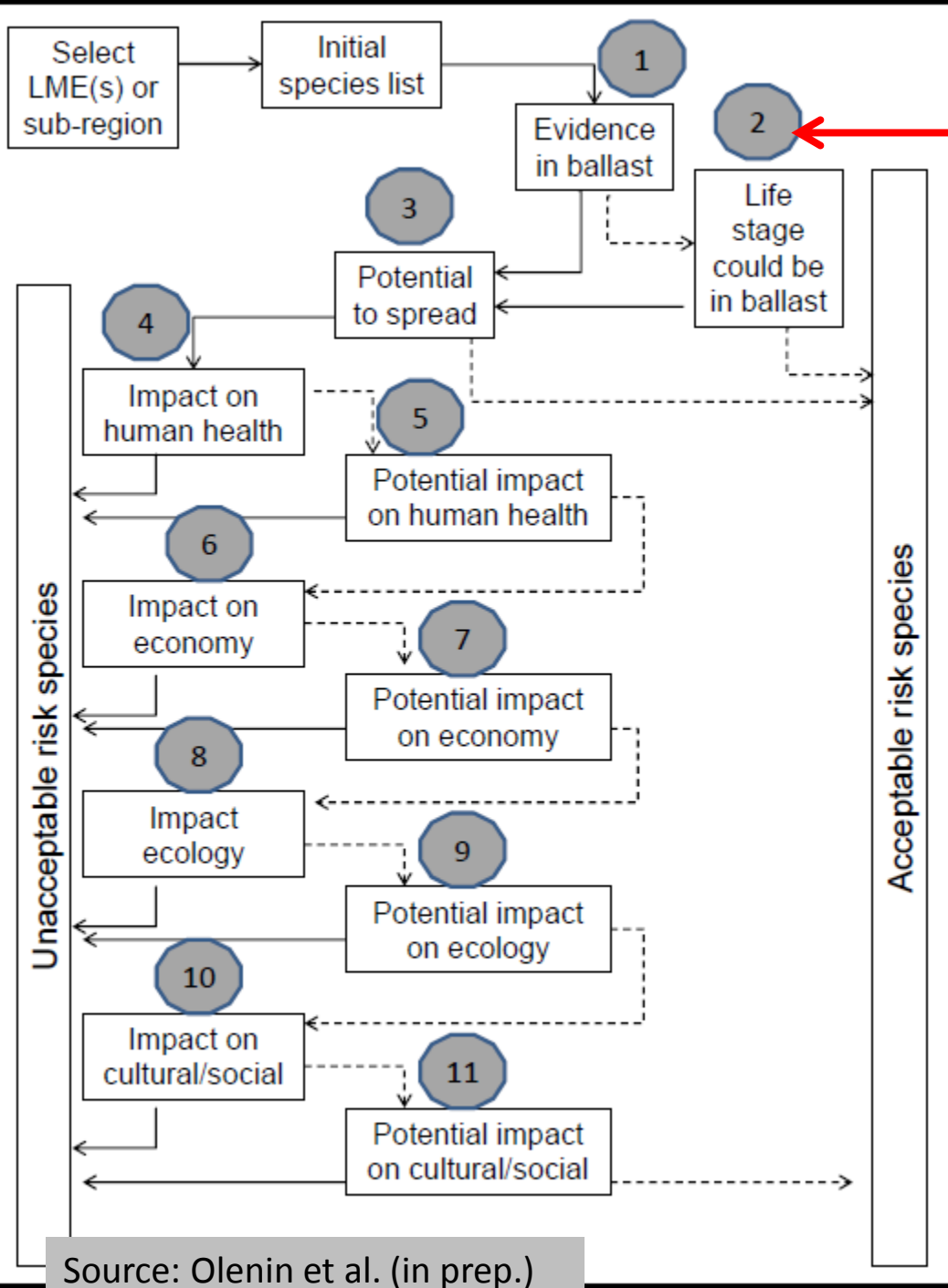
4. Unknown

Occurrence of a given NIS cannot be clearly explained

(Minchin et al. 2009, AquaNIS 2013)

How well do we know introduction pathways?
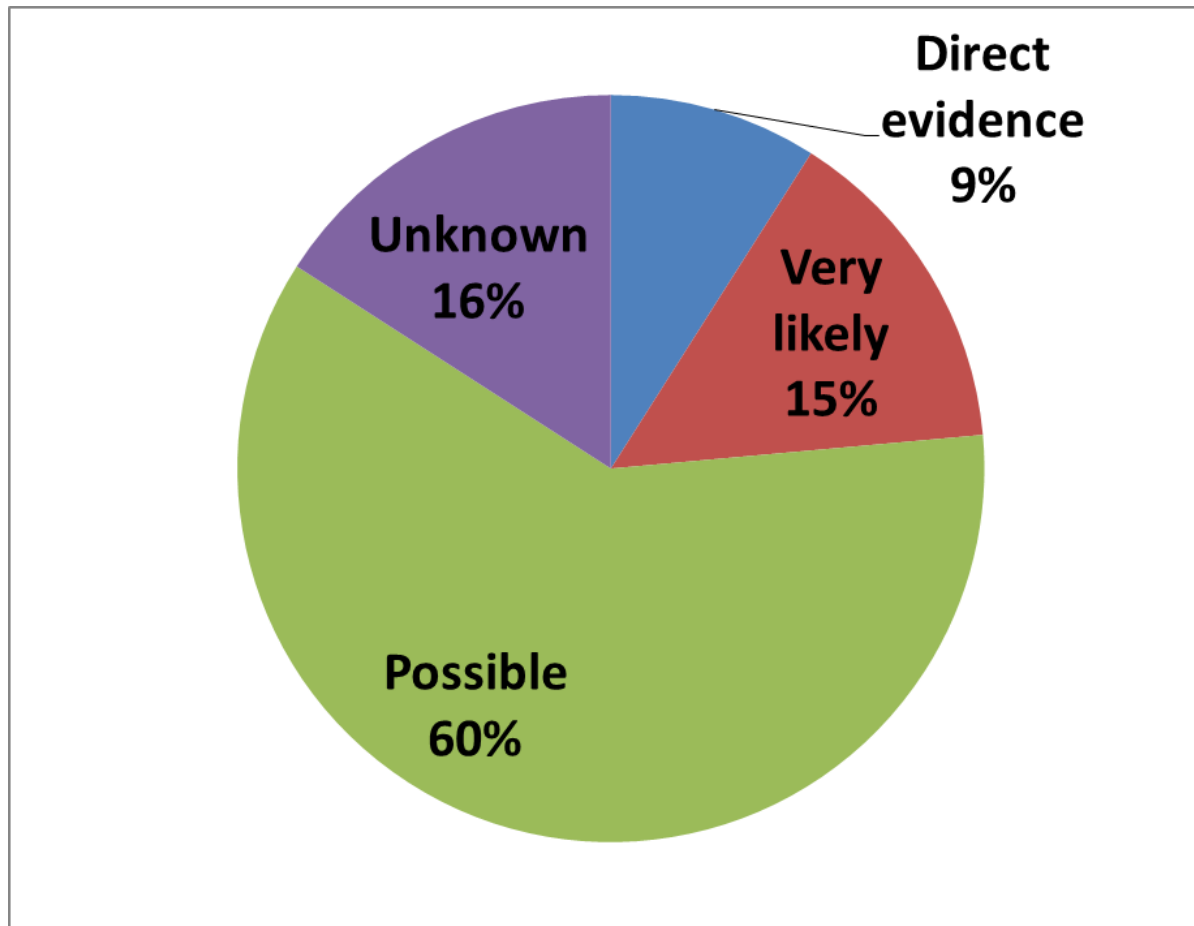
Is there a potential for an unacceptable risk for the species to become entrained in ballast tanks?
a) Species has pelagic life-history stage;
b) Species performs diurnal vertical migrations;
c) Species has a pelagic host;
d) Species is present in sediments in shallow water ports (BW uptake areas).

UNCERTAINTY OF EVIDENCE

PARASITES AND MACROALGAE SHOULD BE INCLUDED!

Source: Olenin et al. (in prep.)
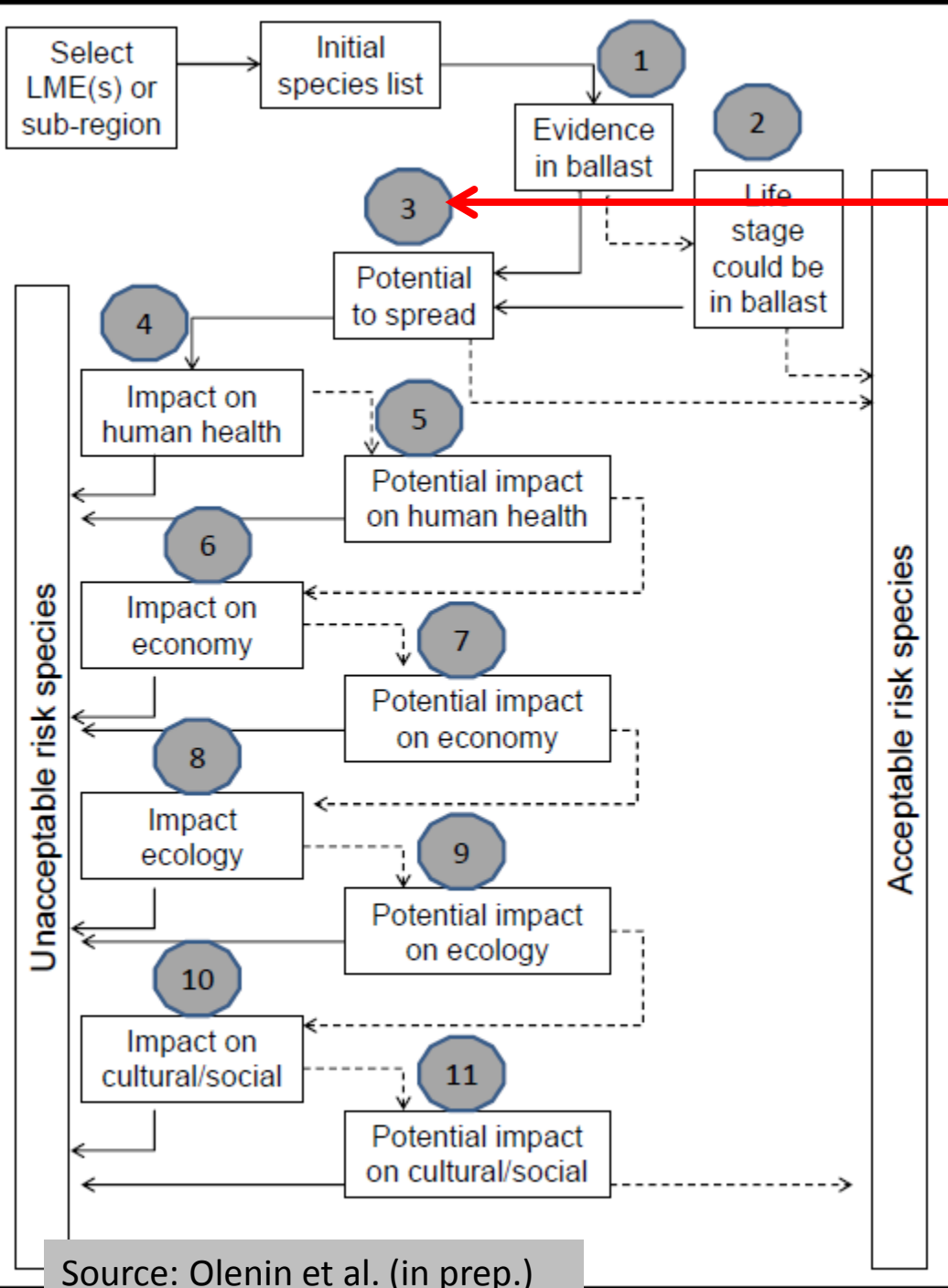
Is there a potential for unacceptable risk for the species to be spread further within the selected assessment area?
a) The species is already established in all colonisable regions/countries in particular LME;
b) The species is unable to colonise further areas based on the known physiological tolerance limits.

Source: Olenin et al. (in prep.)

NOT ONLY SALINITY, BUT OTHER KEY PARAMETRES AS WELL!
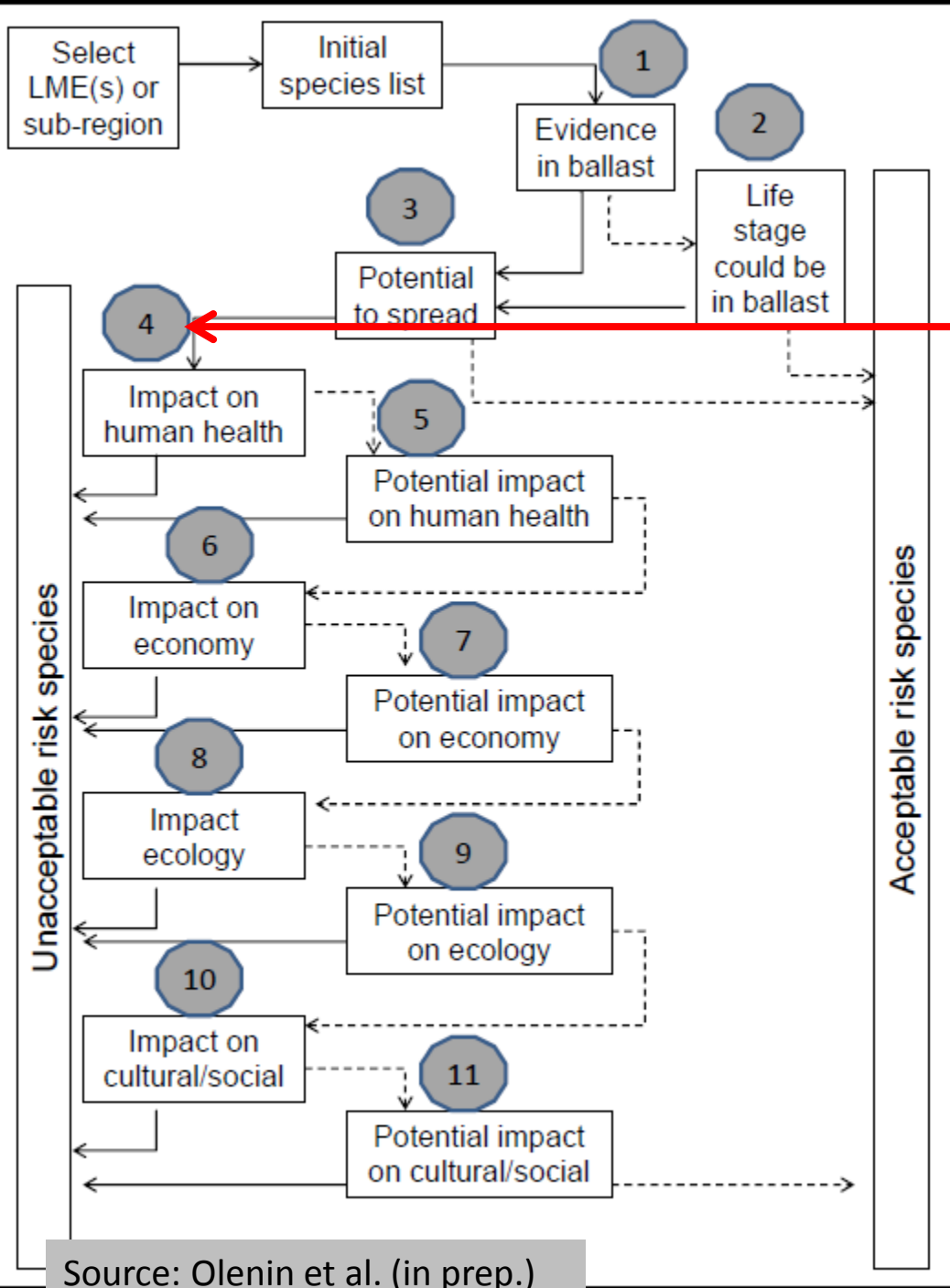
Has the species been documented as having an impact upon human health in the selected LME?
a) Mortality;
b) Illness;
c) Pain;
d) Irritation.

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

Hydrobiologia (2015) 750:171–185
DOI 10.1007/s10750-014-2080-5

TRENDS IN AQUATIC ECOLOGY

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

Henn Ojaveer · Jonne Kotta

IMO 2007
MEPC.162(56)

Point 6.5.7

PLOS | BIOLOGY

ESSAY

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

Henn Ojaveer[1]*, Bella S. Galil[2], Marnie L. Campbell[3], James T. Carlton[4], João Canning-Clode[5,6,7], Elizabeth J. Cook[8], Alisha D. Davidson[9], Chad L. Hewitt[10], Anders Jelmert[11], Agnese Marchini[12], Cynthia H. McKenzie[13], Dan Minchin[14], Anna Occhipinti-Ambrogi[12], Sergej Olenin[14], Gregory Ruiz[7]
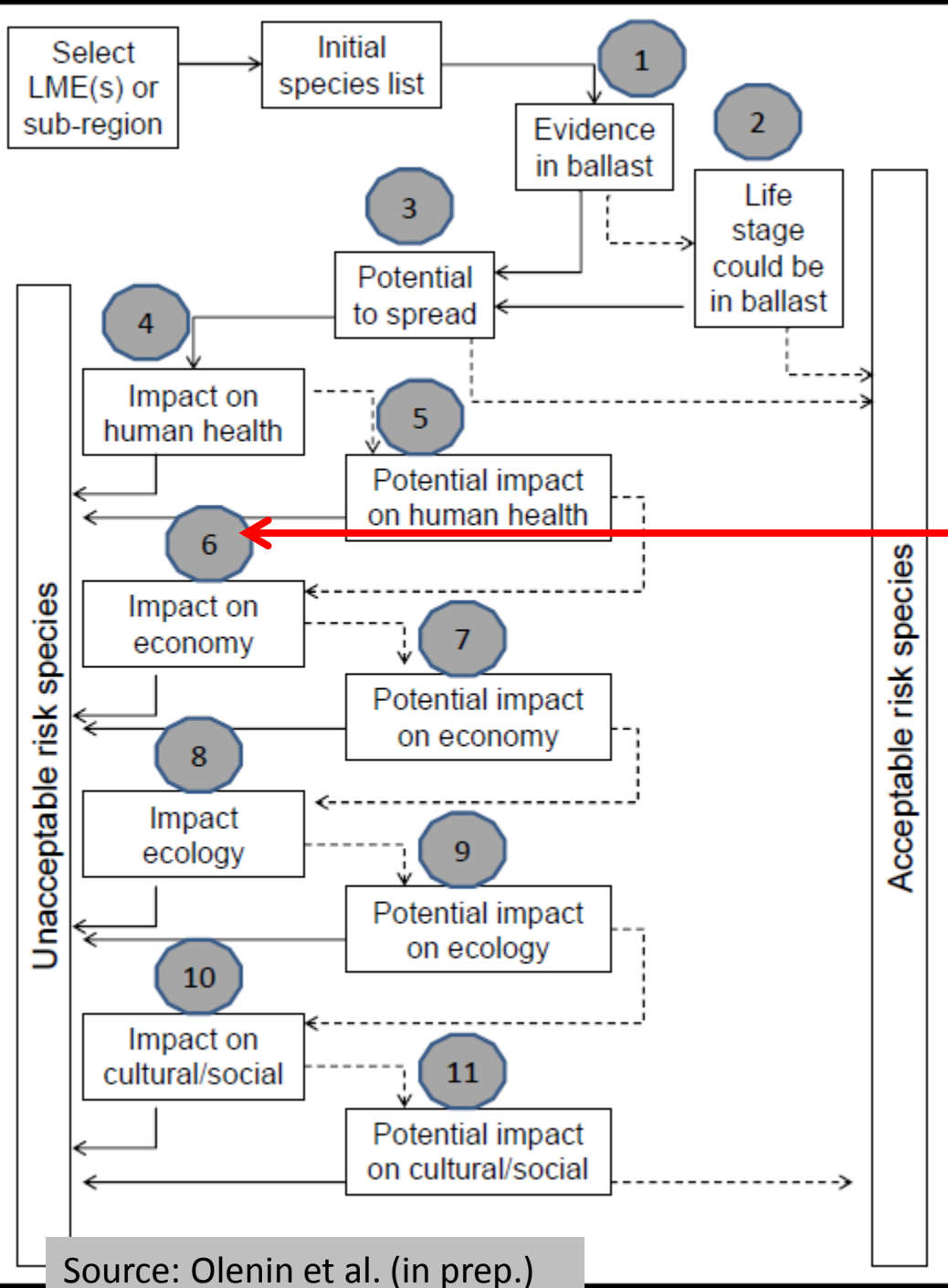
LACK OF EVIDENCE SHOULD BE CONSIDERED AS OF HIGH RISK
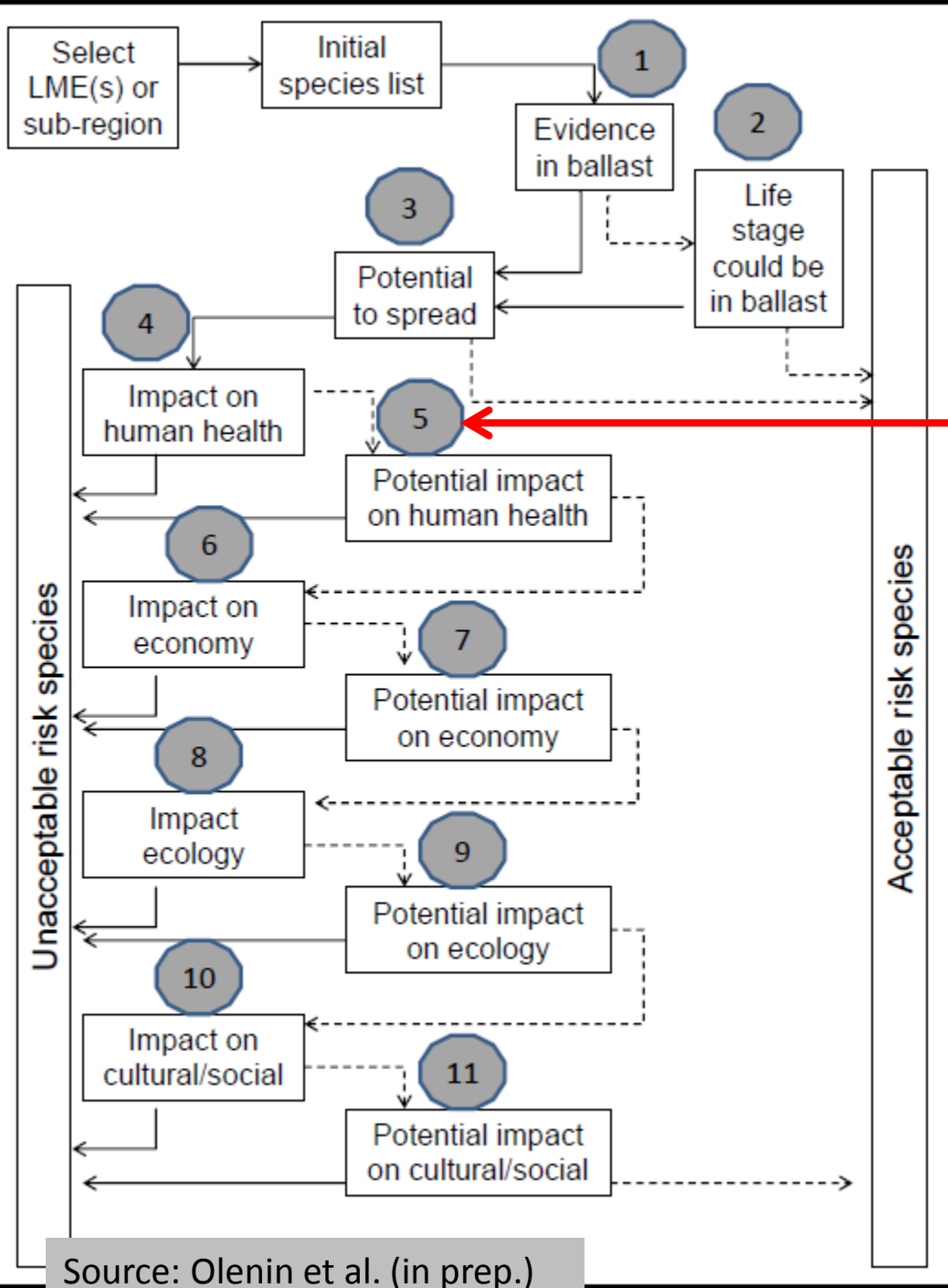
Is there a potential for unacceptable risk for the species to impact upon human health in the selected LME?
a) Based on global evidence [follow the structure from previous point];
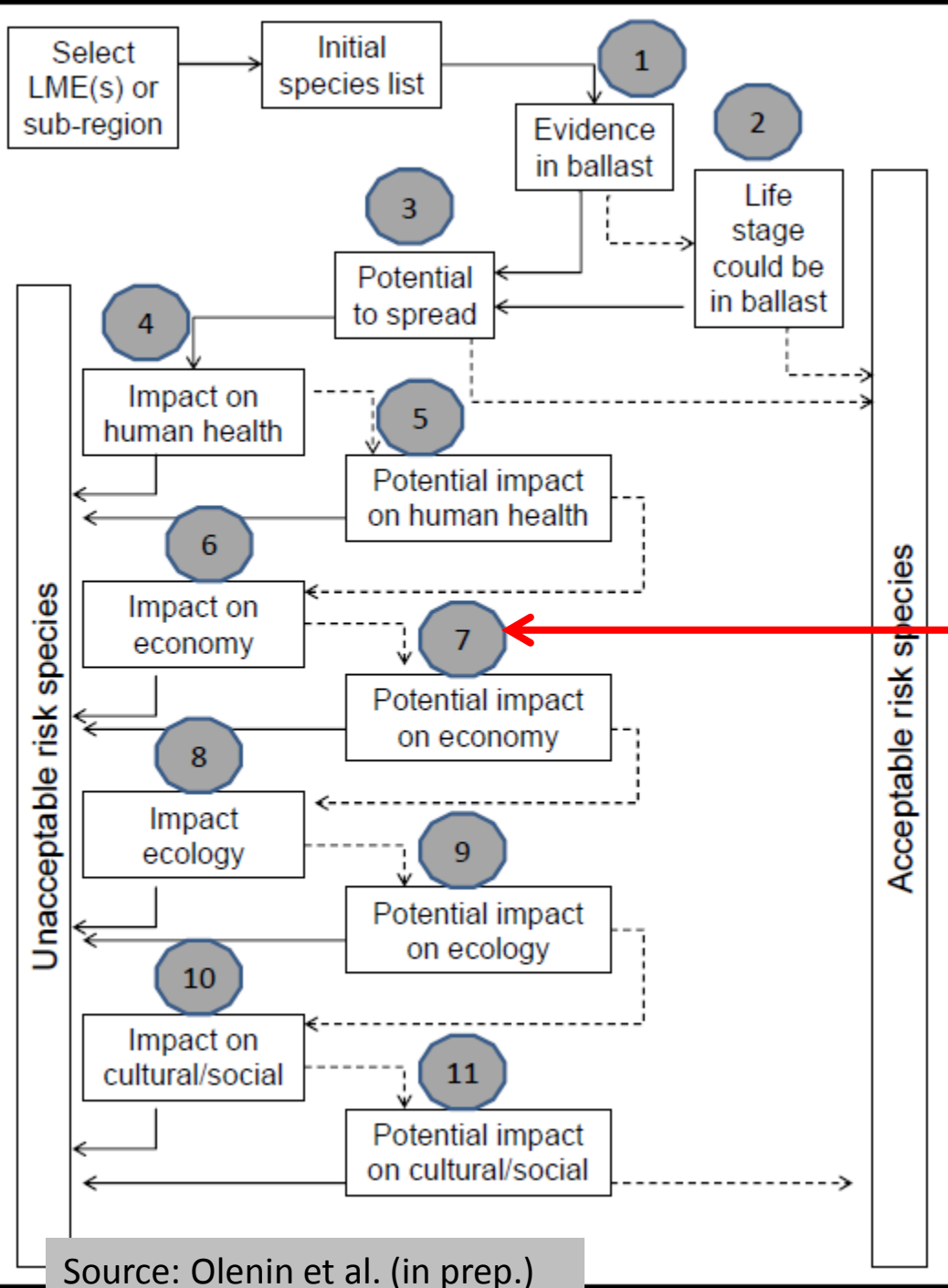b) Insufficient evidence to rule out unacceptable risk - see point 6.5.7 in IMO (2007).

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

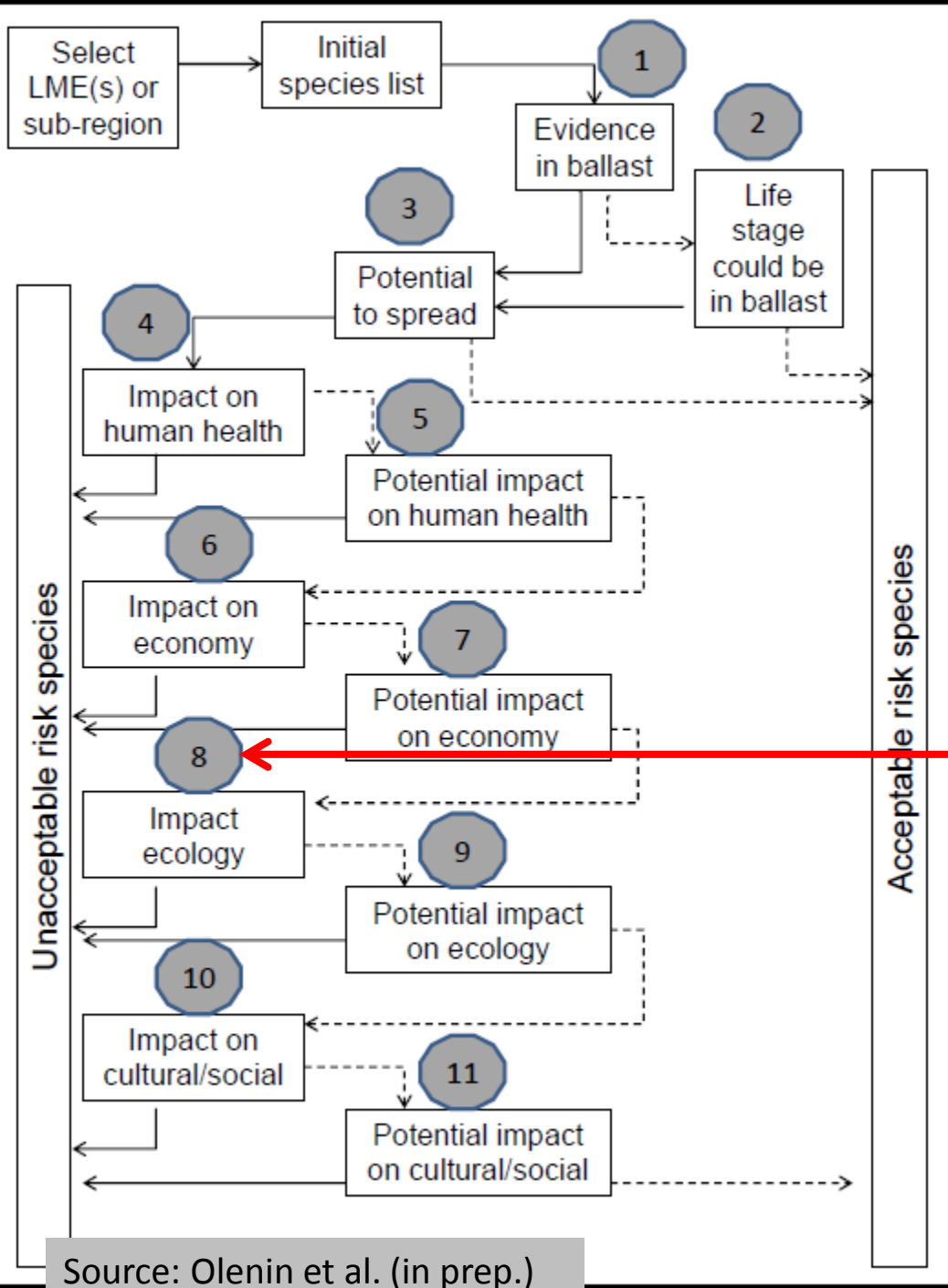Source: Olenin et al. (in prep.)

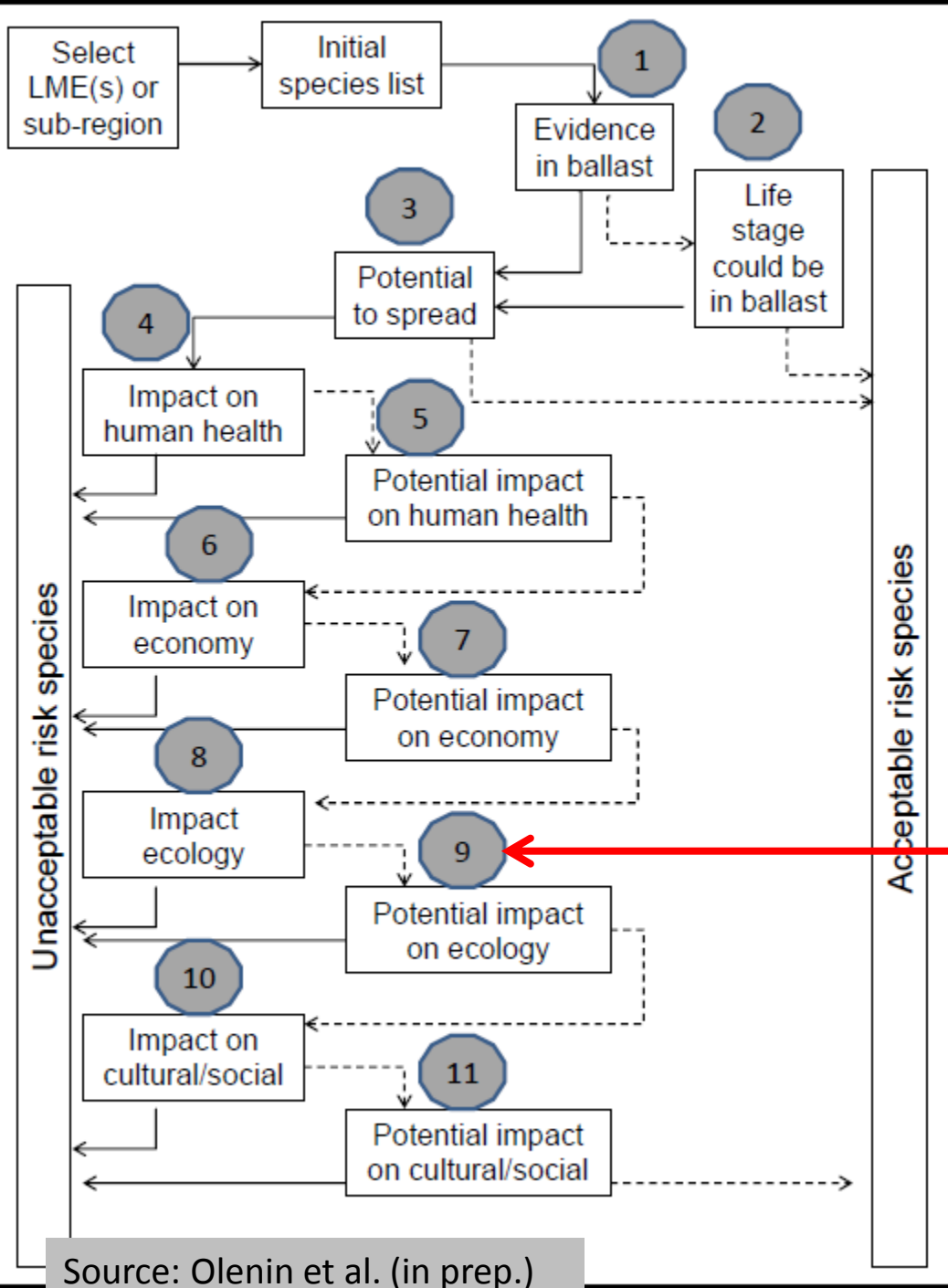Is there a potential for unacceptable risk for the species to impact upon economy in the selected LME?
a) Based on global evidence [follow the structure from previous point];
b) Insufficient evidence to rule out unacceptable risk - see point 6.5.7 in IMO 2007b.

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.)

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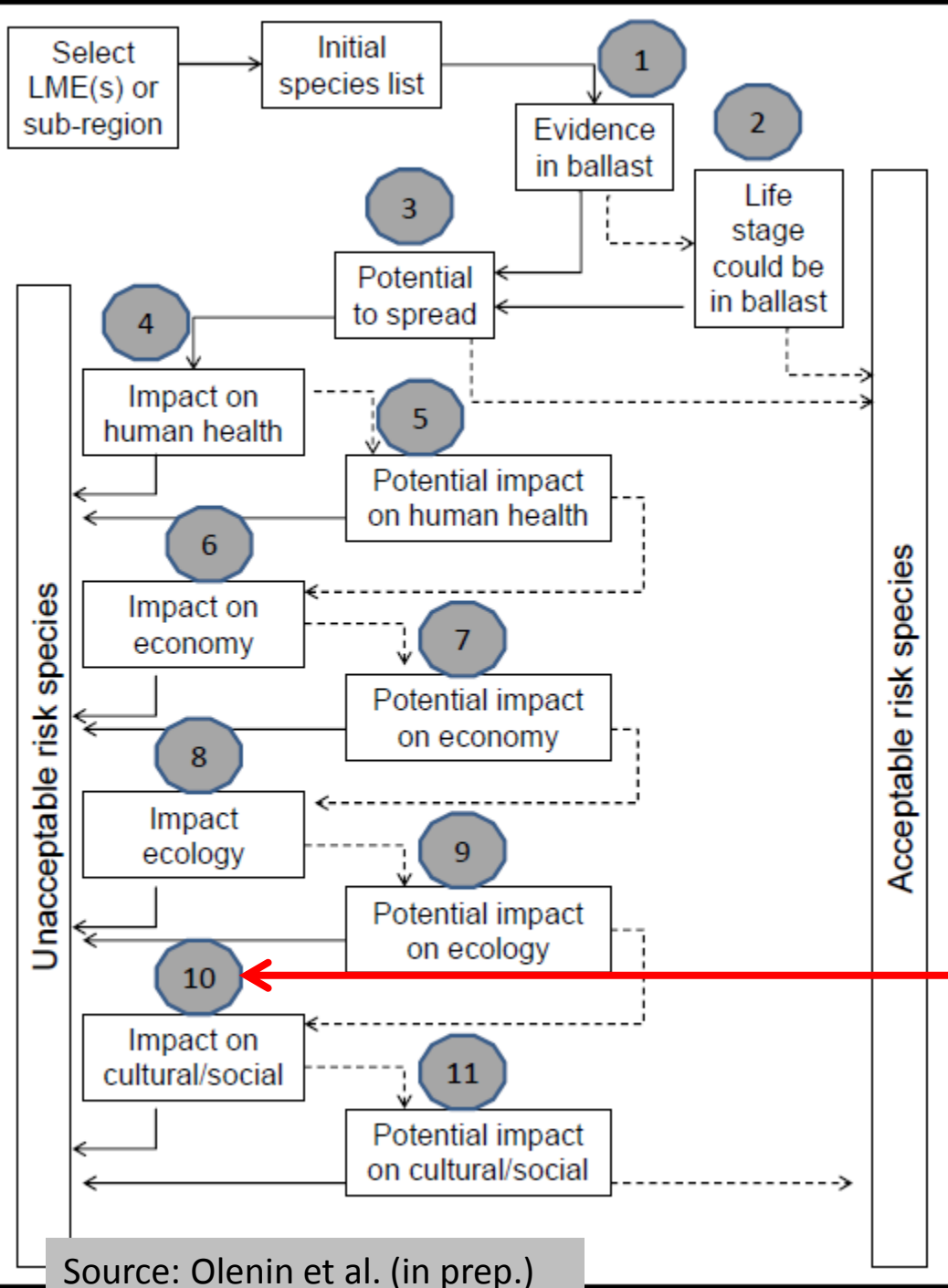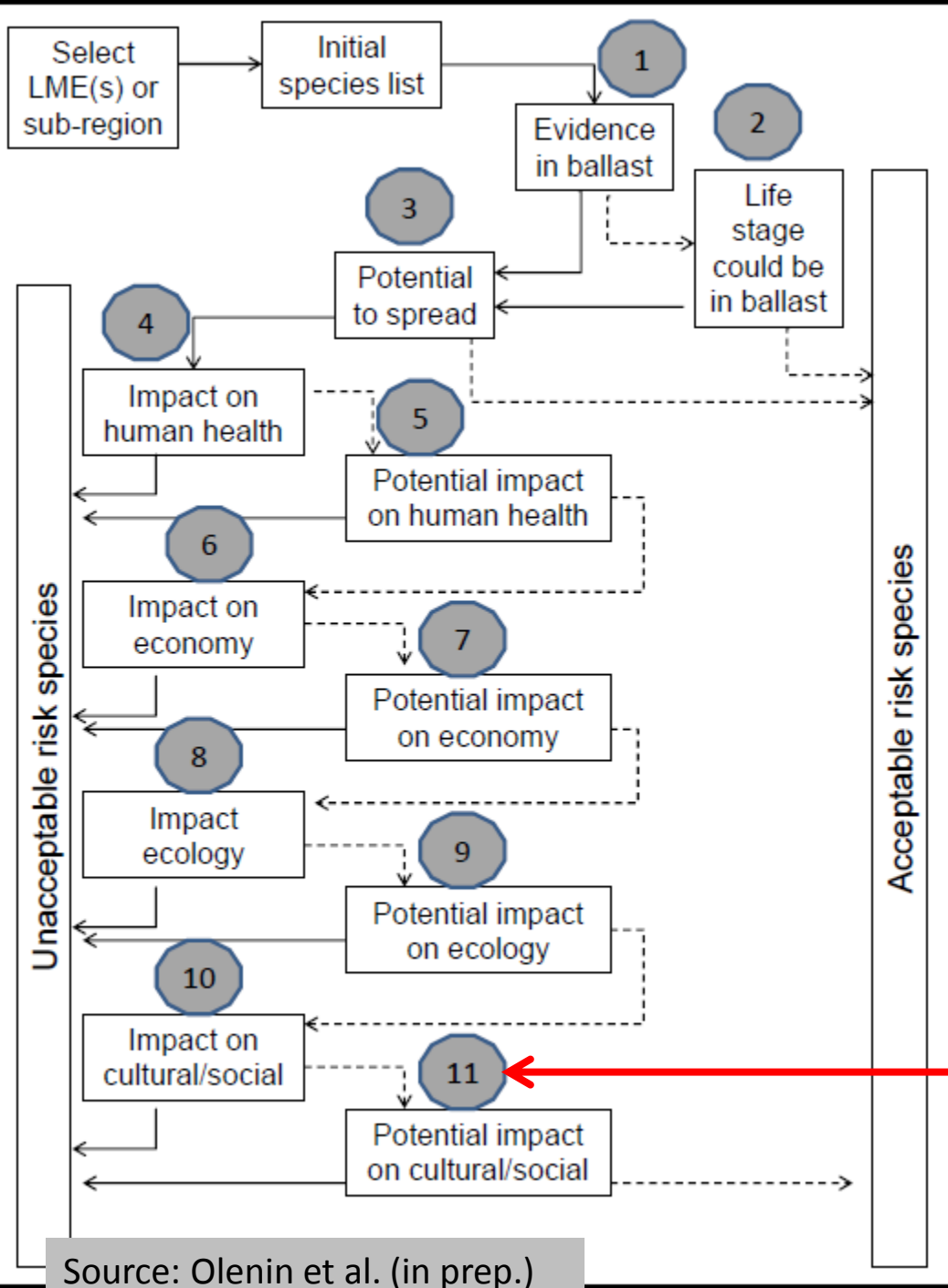
Source: Olenin et al. (in prep.)

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).

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

DEGREE OF OVERALL RISK

MANAGEABILITY

HEALTH

ECONOMY/ECOLOGY

SOCIO-CULTURAL

ACCEPTABLE?
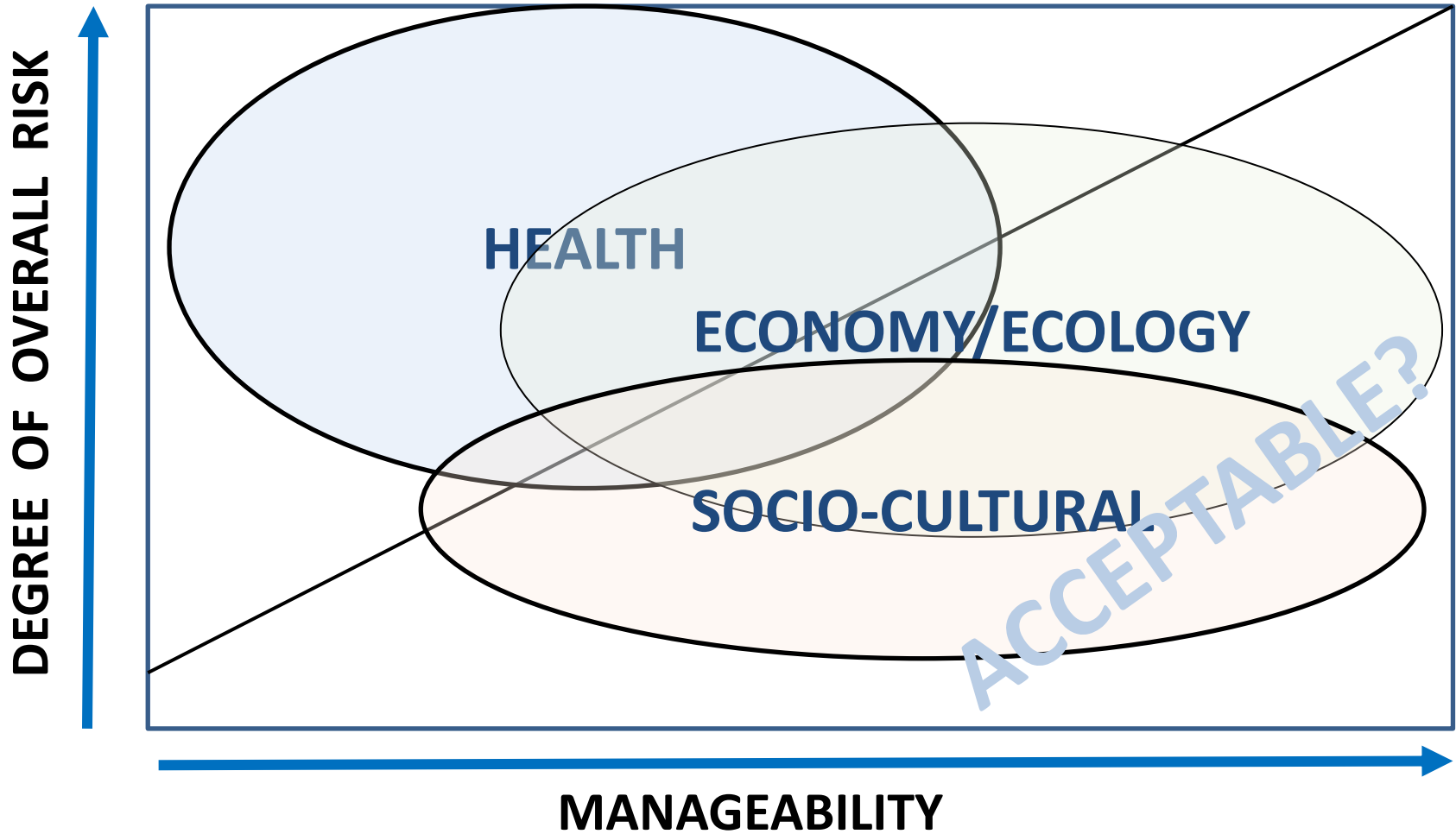
Conclusions

- 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.

THANK YOU FOR YOUR ATTENTION!