

Joint HELCOM/OSPAR Task Group on
Ballast Water Management Convention (BWMC) and Biofouling
Online, 2-3 December 2021

Document title	Proposal for amendments on the target species selection criteria and update of the Baltic Sea target species list
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Category	DEC
Agenda Item	6 - Target Species
Submission date	16.11.2021
Submitted by	Estonia, Finland, Latvia and Lithuania
Reference	Outcome of TG BALLAST 11-2020, para. 6.1; Outcome of TG BALLAST 10-2019, para. 6.1-6.8

Background

TG BALLAST 11-2020 took note of the information provided by Finland on the funding granted to COMPLETE-PLUS and that within its framework the Target Species (TS) list in the Baltic Sea will be updated with the criteria previously agreed by TG Ballast. The Meeting noted that the work will be undertaken from April 2021 to November 2021, further noting that the aim is to submit the updated TS list to the next Meeting for consideration (Outcome of TG BALLAST 11-2020, para. 6.1).

This document contains proposal for amendments on the target species selection criteria. The document proposes to add a new element to the Annex 2 of the HELCOM-OSPAR Joint Harmonized Procedure where the distribution of the NIS within the Baltic Sea is considered. In addition, a more precise definition for the term 'widespread in the Baltic Sea' is proposed. Proposed amendments are attached to this document as an Annex 1.

This document contains also an update of the TS list for the Baltic Sea according to slightly adjusted criteria in comparison to the previously agreed criteria by TG Ballast ([Outcome of TG BALLAST 10-2019](#), para. 6.1-6.8).

Task 2.2 of the COMPLETE PLUS project (Practical Implementation of the Complete Project Outputs and Tools, Interreg Baltic Sea Region Programme, <https://plus.balticcomplete.com/>) aimed to update the TS list for the Baltic Sea Region. The TS list is intended to be used for exemption applications from ballast water management according to species-specific risk assessments that rely on the identification and selection of TS while assessing the risk of transporting harmful aquatic organisms and pathogens (HAOP) in ships' ballast tanks between the locations of interest. This is a continuation of the COMPLETE project (Completing Management Options in the Baltic Sea Region to reduce risk of invasive species introduction by shipping) that included a recommendation for improved and updated TS selection criteria (Gollasch et al., 2020). The selection criteria agreed by TG BALLAST 10-2019 are based on the publication by Gollasch et al. (2020).

Action required

The Meeting is invited to:

- take note of the information provided in the document,
- discuss and agree on the proposed modifications of the target species (TS) selection criteria (Annex 1);
- discuss and agree on the TS list to be used in risk assessments concerning exemptions from ballast water management within the Baltic Sea; and
- discuss and agree on the procedure to continuously update the TS list.

Update of the Baltic Sea target species list

The assessment

The TS selection process applied here followed slightly adjusted selection criteria in comparison to the previously agreed criteria by TG Ballast ([Outcome of TG BALLAST 10-2019](#), para. 6.1). The TS selection process is described and justified below.

- 1) *Relationship with ballast water as the vector of transport.* To fully follow the precautionary principle, all non-indigenous species (NIS) that can be pumped into ballast tanks (e.g., all the species which have a relationship with ballast water or sediments) are considered as potential TS. These are pelagic organisms, species inhabiting sediment surface and macroalgae. This criterion must be met by the species to become a potential TS. If the criterion is fulfilled, evidence of impacts of a given NIS (criterion 2) is evaluated. **This criterion was precisely followed by the accepted TS selection criteria within the JHP procedure ([Outcome of TG BALLAST 10-2019](#), para. 6.1).**
- 2) *Impact and its severity.* NIS with evidence of either impact on human health or economy (including property and resources) were automatically qualified as TS, regardless of the impact severity. In case of no evidence of threat to human health or economy, environmental impact was assessed as described in Gollasch et al. (2020). In case of evidence on an unacceptable level of environmental impact, a NIS was qualified as TS. **This criterion was precisely followed by the accepted TS selection criteria within the JHP procedure ([Outcome of TG BALLAST 10-2019](#), para. 6.1).**
- 3) *Evidence of prior introduction(s) elsewhere (documentation of the species' ability to spread outside its native area).* **This criterion was assessed for all NIS that were evaluated, but not used as a decisive criterion for the TS selection.**
- 4) *Current distribution in its native biogeographic and in other biogeographic regions (Species with a wide biogeographical or habitat distribution are categorized as potential TS).* Biogeographical distribution was assessed during the selection process, but **this criterion was not used in our assessment, as it was not agreed among the task partners what is a measure for wide or narrow biogeographical and habitat distribution.**
- 5) *NIS that are considered widespread in the Baltic Sea (are to be excluded from the TS list).* **This criterion was added to the agreed criteria as being not described in HELCOM and OSPAR ([Outcome of TG BALLAST 10-2019](#), para. 6.1) (see details below).** The species that were excluded based on this criterion are documented in the evaluation template (Table 1).

Refining the definition on the widespread status of NIS in the Baltic Sea

There are no scientifically justifiable arguments to include NIS in the TS list if they are already widespread and shipping would not contribute to the further spread of the species in the Baltic Sea. As information in AquaNIS database is available only at a country level, such a spatial resolution of evidence is not sufficient for deciding a widespread status of a certain NIS. Therefore, a more precise definition of the term 'widespread', to ensure clarity, is proposed: **'Species is already widespread in the Baltic Sea (present in all level 2 HELCOM sub-basins (17), where suitable habitats and environmental conditions occur)**. This criterion is also in line with the JHP (page 12, section 3.4b, HELCOM and OSPAR, 2020), which states the following question as one of the main questions to consider before a species is considered to the TS list; **'is the species present only in part(s) of the region but not the entire region?'**. However, this criterion is not included in the agreed TS selection criteria (page 25, HELCOM and OSPAR, 2020).

The updated TS list

The adjusted selection criteria is based on the Joint Harmonised Procedure for the Contracting Parties of OSPAR and HELCOM on the granting of exemptions under the BWM Convention, Regulation A-4 (JHP). However, not all the criteria needed to be considered according to the JHP are addressed, with the understanding that criteria 3 and 4 are supporting criteria to the impact assessment (criterion 2) (HELCOM and OSPAR, 2020).

The adjusted TS selection criteria were used to identify ballast water-related TS for the Baltic Sea Region. The process included a pre-screening procedure, where 101 species were tested against the updated TS criteria. The 101 species selected for the pre-screening procedure included all 62 species from the current TS list of the JHP (HELCOM and OSPAR areas), all 11 species from the current JHP watch list, 25 additional species that have been introduced to the Baltic Sea (2012-2021) since the last TS list update according to AquaNIS database, as well as three expert-added species (*Marenzelleria arctica*, *Proterorhinus marmoratus* and *Proterorhinus nasalis*). The results of the selection process are indicated in Table 1.

Table 1. The 101 pre-screened NIS and their inclusion (x) or exclusion (-) to the TS list using the TS selection criteria (HELCOM and OSPAR, 2020), and the adjusted criteria. A brief justification is provided for the species excluded from the TS list.

Species selected for pre-screening	Included in the TS list using initial HELCOM and OSPAR (2020) criteria	Included in the TS list using the adjusted criteria	Justification for excluding the species
<i>Acartia tonsa</i>	X	-	Widespread in the Baltic Sea
<i>Agarophyton vermiculophyllum</i>	X	x	
<i>Alexandrium acatenella</i>	X	x	
<i>Alexandrium monilatum</i>	X	x	
<i>Alexandrium ostenfeldii</i>	x	x	
<i>Amphibalanus eburneus</i>	x	x	
<i>Anadara inaequalis</i>	x	x	
<i>Anadara transversa</i>	x	x	
<i>Antithamnionella ternifolia</i>	x	x	
<i>Arcuatula senhousia</i>	x	x	
<i>Asterias amurensis</i>	x	x	
<i>Austrominius modestus</i>	x	x	
<i>Babka gymnotrachelus</i>	x	x	
<i>Blackfordia virginica</i>	x	x	
<i>Boccardiella ligerica</i>	x	x	

<i>Brachidontes pharaonis</i>	x	x	
<i>Callinectes sapidus</i>	-	-	Lack of evidence of impacts
<i>Calyptospadix cerulea</i>	x	x	
<i>Caprella mutica</i>	x	x	
<i>Caulerpa cylindracea</i>	x	x	
<i>Caulerpa taxifolia</i>	x	x	
<i>Cercopagis pengoi</i>	x	-	Widespread in the Baltic Sea
<i>Chama pacifica</i>	x	x	
<i>Chelicorophium robustum</i>	x	x	
<i>Chionoecetes opilio</i>	x	x	
<i>Corbicula fluminea</i>	x	x	
<i>Coscinodiscus wailesii</i>	x	x	
<i>Crepidula fornicata</i>	x	x	
<i>Didemnum vexillum</i>	x	x	
<i>Dikerogammarus villosus</i>	x	x	
<i>Dinophysis caudata</i>	x	x	
<i>Dinophysis sacculus</i>	x	x	
<i>Dreissena bugensis</i>	x	x	
<i>Dreissena polymorpha</i>	x	x	
<i>Echinogammarus ischnus</i>	x	x	
<i>Echinogammarus trichiatus</i>	x	x	
<i>Ensis leei</i>	x	x	
<i>Eriocheir japonica</i>	-	-	Lack of evidence of impact
<i>Eriocheir sinensis</i>	x	-	Widespread in the Baltic Sea
<i>Eurytemora carolleeae</i>	-	-	Lack of evidence of impact
<i>Fenestrulina malusii</i>	x	x	
<i>Fibrocapsa japonica</i>	x	x	
<i>Ficopomatus enigmaticus</i>	x	x	

<i>Gammarus tigrinus</i>	x	x	
<i>Grandidierella japonica</i>	x	x	
<i>Grateloupia doryphora</i>	-	-	Lack of evidence of impact
<i>Grateloupia subpectinata</i>	x	x	
<i>Grateloupia turuturu</i>	x	x	
<i>Halophila stipulacea</i>	x	x	
<i>Haminella solitaria</i>	x	x	
<i>Hemigrapsus sanguineus</i>	x	x	
<i>Hemigrapsus takanoi</i>	x	x	
<i>Hemimysis anomala</i>	x	x	
<i>Homarus americanus</i>	x	x	
<i>Hydroides dianthus</i>	x	x	
<i>Hydroides elegans</i>	x	x	
<i>Karenia mikimotoi</i>	x	x	
<i>Laonome xeprovala</i> sp. nov.	x	x	
<i>Lophocladia lallemandii</i>	x	x	
<i>Maeotias marginata</i>	-	-	Lack of evidence of impacts
<i>Magallana gigas</i>	x	x	
<i>Marenzelleria neglecta</i>	x	-	Widespread in the Baltic Sea
<i>Marenzelleria viridis</i>	x	-	
<i>Marenzelleria arctia</i>	x	-	
<i>Melanothamnus harveyi</i>	x	x	
<i>Melita nitida</i>	-	-	Lack of evidence of impacts
<i>Microcosmus squamiger</i>	x	x	
<i>Mnemiopsis leidyi</i>	x	x	
<i>Moerisia inkermanica</i>	x	x	
<i>Mytilicola orientalis</i>	x	x	
<i>Mytilopsis leucophaeata</i>	x	x	

<i>Mytilus galloprovincialis</i>	-	-	Lack of evidence of impacts
<i>Neogobius fluviatilis</i>	x	x	
<i>Neogobius melanostomus</i>	x	-	Widespread in the Baltic Sea
<i>Nippoleucon hinumensis</i>	x	x	
<i>Pacifastacus leniusculus</i>	x	x	
<i>Palaemon elegans</i>	x	x	
<i>Palaemon longirostris</i>	-	-	Lack of evidence of impacts
<i>Palaemon macrodactylus</i>	-	-	
<i>Paralithodes camtschatica</i>	x	x	
<i>Paramysis (Serrapalpis) lacustris</i>	-	-	Lack of evidence of impacts
<i>Pfiesteria piscicida</i>	x	x	
<i>Phaeocystis pouchetii</i>	x	x	
<i>Piaractus brachypomus</i>	-	-	Species is associated with aquarium releases (not ballast)
<i>Polydora aggregata</i>	x	x	
<i>Polysiphonia marrowii</i>	x	x	
<i>Ponticola kessleri</i>	x	x	
<i>Potamocorbula amurensis</i>	x	x	
<i>Potamothenia vejovskyi</i>	x	x	
<i>Proterorhinus nasalis</i>	x	x	
<i>Proterorhinus marmoratus</i>	x	x	
<i>Pseudochattonella verruculosa</i>	x	x	
<i>Rangia cuneata</i>	x	x	
<i>Rapana venosa</i>	x	x	
<i>Rhithropanopeus harrisi</i>	x	x	
<i>Sinelobus vanhaareni</i>	-	-	Lack of evidence of impacts
<i>Spondylus spinosus</i>	x	x	
<i>Styela clava</i>	x	x	
<i>Styopodium schimperi</i>	x	x	
<i>Tharyx killariensis</i>	x	x	

<i>Undaria pinnatifida</i>	x	x	
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The proposed Baltic Sea TS list now includes 82 species and would have included 89 species, if the adopted criteria ([Outcome of TG BALLAST 10-2019](#), para. 6.1) were precisely followed. Differences between the adopted criteria ([Outcome of TG BALLAST 10-2019](#), para. 6.1) and the adjusted criteria are summarized in Table 2. The present HELCOM TS list (adopted in 2013) has 41 species. Thus, the adjusted selection criteria resulted in twice as many TS as in the initial, 2013 TS list (in use now). This indicates better inclusion of the precautionary approach to the risk assessment procedure. The salinity difference between donor and recipient ports or locations is being considered by the JHP online tool in the first step of the risk assessment algorithm. Therefore, the salinity tolerances of the proposed TS were not assessed during the selection process. By including them in the TS list, possible future changes in the abiotic environment due to climate change are being considered and the precautionary principle is being followed in this respect.

Table 2. The adopted TS selection criteria ([Outcome of TG BALLAST 10-2019](#), para. 6.1), and the adjusted criteria.

	Selection using the initial HELCOM and OSPAR (2020) criteria	Selection using the adjusted criteria
Preliminary criteria	1. TS are species that have a relationship with ballast water; and	1. Have a relationship with ballast water; and 2. TS are species that are not already widespread in the Baltic Sea in all level 2 HELCOM sub-basins (17) where suitable habitats and environmental conditions occur; and
Impact assessment	2. <ul style="list-style-type: none"> 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. 	3. <ul style="list-style-type: none"> 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.
Supporting criteria	3. Have evidence of prior introduction(s), i.e., the species showed its capability to become introduced outside its native range; or 4. Have wide distribution within the native biogeographic region and in other biogeographic regions (wide biogeographical and/or habitat distribution).	4. Have evidence of prior introduction(s), i.e., the species showed its capability to become introduced outside its native range; or 5. Have wide distribution within the native biogeographic region and in other biogeographic regions (wide biogeographical and/or habitat distribution).

Procedure to continuously update the TS list

Further, it is proposed that HELCOM Contracting Parties may utilise the adjusted criteria and conduct the pre-screening procedure for a species they wish to be added to the TS list. The pre-screened species can be proposed to be added to the Baltic Sea TS list in the annual meeting of The Joint HELCOM/OSPAR Task Group on Ballast Water Management Convention (BWMC) and Biofouling (JTG BALLAST & BIOFOULING). It remains to be discussed, whether the criteria and template for the assessment can be integrated into the AquaNIS database (<http://www.corpi.ku.lt/databases/index.php/aquanis/>).

References

Gollasch, S., David, M., Broeg, K., Heitmüller, S., Karjalainen, M., Lehtiniemi, M., Normant-Saremba, M., Ojaveer, H., Olenin, S., Ruiz, M., Helavuori, M., Sala-Pérez, M., Strake, S., 2020. Target species selection criteria for risk assessment based exemptions of ballast water management requirements. *Ocean Coast Manag.* 183, 105021.

HELCOM and OSPAR, 2020. HELCOM/OSPAR Joint Ballast Water Exemptions Decision Support Tool: https://helcom.fi/wp-content/uploads/2021/01/HELCOM-OSPAR-Joint-Harmonized-Procedure-for-BWMC-A-4-exemptions_2020.pdf

ANNEX 1

Proposal for amendments on the target species selection criteria in the Annex 2 of the HELCOM-OSPAR JHP

ANNEX 2

Target species evaluation template

ANNEX 3

Bibliography

Annex 1 Proposal for amendments on the target species selection criteria in the Annex 2 of the HELCOM-OSPAR JHP

Added text underlined and deleted text marked with strikethrough.

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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

Page 25, Annex 2 – Target Species Lists

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;
- ~~1-2.~~ the species is present only in part(s) of the region but not in the entire region;
- ~~2-3.~~ 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;
- ~~3-4.~~ evidence of prior introduction(s), i.e., the species showed its capability to become introduced outside its native range; and
- ~~4-5.~~ 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

- Criteria 1 and 2~~1 and 2~~
 - have a relationship with ballast water; and
 - are not already widespread in the Baltic Sea in all level 2 HELCOM sub-basins (17) where suitable habitats and environmental conditions occur.
- Criterion 3~~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 4~~3~~ and 5~~4~~ are supporting criteria for the impact assessment in 3~~2~~.

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

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Annex 2. Target species evaluation template.

Species	Criterion 1, Relationship with ballast water (Y/N)?	Criterion 2 (Impact) Human health impact (Y/N)?	Criterion 2 (Impact) Economic impact? (Y/N)?	Criterion 2 (Impact) Unacceptable environmental impact? (Y/N)?	Criterion 3, Evidence of earlier introduction (s) elsewhere (Y/N)?	Criterion 4, Species has wide biogeographical or habitat distribution? (Y/N)?	Added criterion: Widespread in the Baltic? (Y/N)?	Included in the final TS list (Y/N)
<i>Acartia tonsa</i>	Yes	No	No	No	Yes	Yes	Yes	No
<i>Agarophyton vermiculophyllum</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Alexandrium acatenella</i>	Yes	Yes	NA	NA	NA	Yes	No	Yes
<i>Alexandrium monilatum</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Alexandrium ostenfeldii</i>	Yes	Yes	NA	NA	NA	Yes	No	Yes
<i>Amphibalanus eburneus</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Anadara inaequalis</i>	Yes	No	Yes	Yes	Yes	No	No	Yes
<i>Anadara transversa</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Antithamnionella ternifolia</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Arcuatula senhousia</i>	Yes	No	Yes	Yes	Yes	No	No	Yes
<i>Asterias amurensis</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Austrominius modestus</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Babka gymnotrachelus</i>	Yes	No	No	Yes	Yes	No	No	Yes
<i>Blackfordia virginica</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Boccardiella ligerica</i>	Yes	No	No	Yes	Yes	NA	No	Yes
<i>Brachidontes pharaonis</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Callinectes sapidus</i>	Yes	No	No	No	Yes	Yes	No	No
<i>Calyptospadix cerulea</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Caprella mutica</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Caulerpa cylindracea</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Caulerpa taxifolia</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Cercopagis pengoi</i>	Yes	No	Yes	NA	NA	Yes	Yes	No
<i>Chama pacifica</i>	Yes	No	No	Yes	Yes	NA	No	Yes

<i>Chelicorophium robustum</i>	Yes	No	No	Yes	Yes	No	No	Yes
<i>Chionoecetes opilio</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Corbicula fluminea</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Coscinodiscus wailesii</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Crassostrea (Magallana) gigas</i>	Yes	No	Yes	Yes	Yes	NA	NA	Yes
<i>Crepidula fornicata</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Didemnum vexillum</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Dikerogammarus villosus</i>	Yes	No	No	Yes	NA	NA	No	Yes
<i>Dinophysis caudata</i>	Yes	Yes	NA	NA	NA	Yes	No	Yes
<i>Dinophysis sacculus</i>	Yes	Yes	NA	NA	NA	Yes	No	Yes
<i>Dreissena bugensis</i>	Yes	No	Yes	NA	NA	NA	No	Yes
<i>Dreissena polymorpha</i>	Yes	No	Yes	NA	NA	NA	No	Yes
<i>Echinogammarus ischnus</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Echinogammarus trichiatus</i>	Yes	No	No	No	Yes	No	No	Yes
<i>Ensis leei</i>	Yes	No	No	Yes	NA	Yes	No	Yes
<i>Eriocheir japonica</i>	Yes	No	No	No	Yes	Yes	No	No
<i>Eriocheir sinensis</i>	Yes	No	Yes	NA	Yes	Yes	Yes	No
<i>Eurytemora carolleeae</i>	Yes	No	No	No	Yes	Yes	No	No
<i>Fenestrulina malusii</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Fibrocapsa japonica</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Ficopomatus enigmaticus</i>	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
<i>Gammarus tigrinus</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Grandidierella japonica</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Grateloupia doryphora</i>	Yes	No	No	No	NA	NA	No	No

<i>Grateloupia subpectinata</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Grateloupia turuturu</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Halophila stipulacea</i>	Yes	No	No	Yes	NA	No	No	Yes
<i>Haminella solitaria</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Hemigrapsus sanguineus</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Hemigrapsus takanoi</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Hemimysis anomala</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Homarus americanus</i>	Yes	No	Yes	NA	Yes	NA	No	Yes
<i>Hydroides dianthus</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Hydroides elegans</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Karenia mikimotoi</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Laonome xeprovala sp. nov.</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Lophocladia lallemandii</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Maeotias marginata</i>	Yes	No	No	No	Yes	Yes	No	No
<i>Marenzelleria neglecta</i>	Yes	No	No	Yes	Yes	Yes	Yes	No
<i>Marenzelleria viridis</i>	Yes	No	No	Yes	Yes	Yes	Yes	No
<i>Marenzelleria arctia</i>	Yes	No	No	Yes	Yes	Yes	Yes	No
<i>Melanothamnus harveyi</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Melita nitida</i>	Yes	No	No	No	Yes	Yes	No	No
<i>Microcosmus squamiger</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Mnemiopsis leidyi</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Moerisia inkermanica</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Mytilicola orientalis</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Mytilopsis leucophaeata</i>	Yes	No	Yes	No	Yes	Yes	No	Yes
<i>Mytilus galloprovincialis</i>	Yes	No	No	Yes	Yes	Yes	No	No

<i>Neogobius fluviatilis</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Neogobius melanostomus</i>	Yes	No	No	Yes	Yes	Yes	Yes	No
<i>Nippoleucon hinumensis</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Pacifastacus leniusculus</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Palaemon elegans</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Palaemon longirostris</i>	Yes	No	No	No	Yes		No	No
<i>Palaemon macrodactylus</i>	Yes	No	No	No	Yes	Yes	No	No
<i>Paralithodes camtschatica</i>	Yes	No	No	Yes	Yes	No	No	Yes
<i>Paramysis (Serrapalpis) lacustris</i>	Yes	No	No	No	Yes	Yes	No	No
<i>Pfiesteria piscicida</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Phaeocystis pouchetii</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Piaractus brachypomus</i>	No	NA	NA	NA	NA	NA	NA	No
<i>Polydora aggregata</i>	Yes	No	Yes	No	Yes	Yes	No	Yes
<i>Polysiphonia marrowii</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Ponticola kessleri</i>	Yes	No	No	Yes	No	No	No	Yes
<i>Potamocorbula amurensis</i>	Yes	No	Yes		Yes		No	Yes
<i>Potamothenix vejdoskyi</i>	Yes	No	No	Yes	Yes	Yes	Yes	Yes
<i>Proterorhinus nasalis</i>	Yes	No	No	No	No	No	No	Yes
<i>Proterorhinus marmoratus</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Pseudochattonella verruculosa</i>	Yes	No	Yes	NA	NA	Yes	No	Yes
<i>Rangia cuneata</i>	Yes	No	No	Yes	Yes	Yes	Yes	Yes
<i>Rapana venosa</i>	Yes	No	Yes	NA	NA	Yes	No	Yes

<i>Rhithropanopeus harrisii</i>	Yes	No	No	Yes	Yes	Yes	No	Yes
<i>Sinelobus vanhaareni</i>	No	No	No	No	Yes	No	No	No
<i>Spondylus spinosus</i>	Yes	No	No	No	Yes	No	No	Yes
<i>Styela clava</i>	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
<i>Styopodium schimperi</i>	Yes	No	Yes	Yes	Yes	Yes	No	Yes
<i>Tharyx killariensis</i>	Yes	No	No	No	Yes	Yes	No	Yes
<i>Undaria pinnatifida</i>	Yes	No	No	Yes	Yes	Yes	No	Yes

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