Baltic Marine Environment Protection Commission

Working Group on the State of the Environment and Nature Conservation

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Background

The indicator 'Trends in arrival of new non-indigenous species' was adopted at HELCOM HOD 48-2015 (para 3.63 of the outcome) taking note of the study reservations of Germany and Denmark. At HELCOM HOD 49-2015 it was clarified that the German study reservation is of a general nature and not specific for this indicator, and Denmark clarified the underlying issues for their specific study reservation on the indicator (as described in a HOD 48-2015 4-33 meeting document).

The HOD 48-2016 meeting agreed on a Lead Country approach for the further development of the core indicators (para 3.64 of the outcome). For the NIS indicator Finland has been the Lead Country supported by Co-lead Countries Germany, Latvia, Sweden and Denmark. Indicator development through a Lead Country approach should be communicated with relevant HELCOM expert groups/networks/projects, which for the NIS indicator is the HELCOM experts participating in TG Ballast.

The main part of the development work for the indicator has centered on clarifying the remaining study reservations and identifying regionally relevant data for calculating and assessing the indicator.

The global database AquaNIS has been identified as a relevant source for data to use in the indicator. AquaNIS has data for aquatic non-indigenous species, it is regularly updated with new observations and the Baltic Sea data is recently updated (spring 2016) and checked by national experts from every Baltic Sea coastal country (see below in document). AquaNIS data comes from national experts and covers all types of habitats (incl. offshore pelagic to coastal phytobenthic etc.) and all taxonomic groups. Thus it fully covers the indicator data needs while for example COMBINE programme only delivers data for certain taxonomic groups in certain habitats (e.g. plankton, soft bottom benthos). The observation data in the AquaNIS database however requires inclusion of spatial data before the data can be used for the indicator evaluations per assessment unit.

Discussions with Denmark on clarifying the remaining study reservation on the indicator is described in a separate information meeting document on remaining study reservations.

This document presents the progress made on the 'Trends in arrival of new non-indigenous species' indicator and the work to develop the data needed for the indicator evaluation.

The CORESET II version of the indicator report is made available as reference material on the STATE & CONSERVATION 5-2016 meeting site.

Action requested

The Meeting is invited to:
- take note of the progress made,
- consider and agree to use AquaNIS database to update the NIS core indicator,
- take note that the indicator evaluation and the data to be used for the calculation will be discussed at TG Ballast meeting in November 2016 where the dataset can be complemented if needed.

'Trends in arrival of new non-indigenous species- core indicator progress report

Background

The trend in new introductions has been increasing since the beginning of the 1900's, indicating a sub-GES status in the entire Baltic Sea in the period leading up to 2012, however, there has been a decreased number of new arrivals in recent years (HELCOM, 2014a).

The ultimate goal of the NIS indicator is to minimize anthropogenic introductions of non-indigenous organisms to zero. The boundary between GES and sub-GES is 'no new introductions of NIS per assessment unit through human activities during a six year assessment period'. As a mid-term goal a decrease in the rate of new introductions should be considered. The evaluation against the GES-boundary is carried out by summing all new primary introductions per assessment unit over a six year period, and comparing the introductions to the year at the beginning of the assessment period which is used to define the baseline. The focus should be on human-mediated introductions and not secondary spread by natural means (migration, water currents etc.). Indicator covers both non-indigenous and cryptogenic species (species which origin is not known). As far as possible the assessment should be divided into two areas: off-shore and coastal areas.

Indicator work in progress

The 'trends in arrival of new non-indigenous species'-indicator work has been progressing.

Proposed source of data - AquaNIS

The biggest problem with the indicator has been data availability as there is no specific monitoring programme targeting NIS in the Baltic Sea. COMBINE program delivers data on new introductions in pelagic plankton communities, soft bottom benthos and certain fish communities. However, e.g. shallow water hard bottom habitats and ports, which act often as the first areas for new primary introductions are without routine monitoring in most of the Baltic countries. Further, COMBINE data does currently not have a tag 'NIS/native' in the species counts, which means that an expert has to check the data to be picked for the indicator. Thus, reliable indicator updates need data search done by national experts in all countries using COMBINE data as well as data from other national monitoring and research projects.

The best option for NIS data has been identified as the AquaNIS database (database for aquatic non-indigenous species, http://www.corpi.ku.lt/databases/index.php/aquanis), which is regularly updated and hosted by the Klaipeda University, Lithuania. The updates are done by national NIS experts coordinated by committed database editors (http://www.corpi.ku.lt/databases/index.php/aquanis/editorial_board). Importantly, the yearly updates stem from data reported by the members of the ICES working group on Introductions and Transfers of Marine Organisms (WGITMO). This procedure ensures that the data is quality assured and that all relevant new observations throughout e.g. the Baltic Sea, also outside regular monitoring programmes, are taken into account.

At present the Baltic Sea NIS data is updated, checked and available per country. As the core indicator needs data on sub basin scale the work to add georeferences for observations during the assessment period has been started by Lithuania and Finland. Including the georeferenced information to the observations will allow assigning the observations to the HELCOM assessment units. Adding georeferenced data to the NIS observations will also enable the use of this data for other HELCOM purposes, such as the spatial analysis of pressures and impacts in HOLAS II using the Baltic Sea Pressure and Impact Index.

No status evaluation of the NIS indicator based on data from AquaNIS has been carried out yet but the data scanning has been done and discussions between HELCOM and AquaNIS datamanager (Klaipeda University, Lithuania, Prof. S. Olenin) have been held.

Update of the NIS indicator evaluation for HOLAS II

In the current COREST II version of the indicator report, the baseline study is available and made for the year 2012. The GES-boundary is defined as no new introductions during a six-year period which implies that the next evaluation would be made in 2018. However, HOLAS II will need updated core indicator results which need to be ready by the end of 2016 and represent the situation in 2011-2015. Therefore, NIS indicator (situation 2012) will be updated using available data on years 2013, 2014 and 2015, and also including data from the countries (e.g. Denmark) that were not available during the baseline assessment of 2012. Also the detections in 2011 need to be taken into account for HOLAS II purposes, however the current aim is not to include them in the indicator result. This dual approach will ensure a consistent dataset for NIS in comparison with other components included in HOLAS II for the assessment period 2011-2016, and will also ensure that the indicator results serve the reporting needs of the contracting parties of HELCOM that are also EU member states.

The data for new NIS observations are available in AquaNIS. **There are 26 species that have arrived as new species in the Baltic Sea region countries since 2010. At present adding georeferences to the observation points has been completed for nine species, and the work is continuing on the remaining species (See Annex 1 for details).**

The developed indicator evaluation and results for the assessment period of 2011-2015 will be presented to nominated experts of the HELCOM-OSPAR TG Ballast (meeting 29-30 November) for review. This will allow Contracting Parties to complement the results in case some relevant observations are found to be missing. Results will be provided as input to HOLAS II by the latest by the end of January 2017. The approval of the indicator evaluations by Contracting Parties will take place through the process as outlined in document 4J-26.

Annex 1. Progress on including georeferences to NIS observations

Work is currently ongoing to develop the dataset to be used in the HELCOM core indicator 'Trends in arrival of new non-indigenous species' which requires adding georeferences to the NIS observations. Georeferenced data is included to the observations in the global AquaNIS database. The indicator will evaluate new arrivals in the HOLAS II assessment period 2011-2016 (new arrivals since 2010).

Table 1. Progress on including georeferenced information to the AquaNIS database on NIS observations of relevance to the HELCOM core indicator 'Trends in arrival of new non-indigenous species' for the HOLAS II assessment period, the table includes information on whether the species has become established in the Baltic Sea or if only single observations have been made (reproduced from Olenin et al. in press[1]).

Species	Established	Not established	Unknown	New arrival since 2010 in one or more countries	Exact coordinates available
Acartia (Acanthacartia) tonsa	1				X
Acipenser baeri		1			
Acipenser gueldenstaedtii		1		X	
Acipenser oxyrinchus		1			
Acipenser ruthenus		1			
Acipenser stellatus		1			
Alitta succinea	1				X
Alitta virens	1				X
Alkmaria romijni	1	1			
Ameira divagans divagans	1				
Amphibalanus improvisus	1				X
Anguillicoloides crassus	1				
Aristichthys nobilis		1			
Beroe ovata		1		X	
Boccardiella ligerica	1		1		
Bonnemaisonia hamifera	1				X
Bowerbankia gracilis			1		
Branchiura sowerbyi		1			
Callinectes sapidus		1			
Carassius gibelio	1				
Catostomus catostomus		1			

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[1] Sergej Olenin, Aleksas Narščius, Stephan Gollasch, Maiju Lehtiniemi, Agnese Marchini, Dan Minchin, Greta Srėbalienė: New arrivals: an indicator for non-indigenous species introductions at different geographical scales. Frontiers in Marine Science, in press

Species	Established	Not established	Unknown	New arrival since 2010 in one or more countries	Exact coordinates available
Cercopagis (Cercopagis) pengoi	1		1		X
Chaetoceros cf. lorenzianus	1		1		
Chaetoceros peruvianus		1			
Chaetogammarus ischnus		1			
Chaetogammarus warpachowskyi	1		1		
Chara connivens	1	1	1		
Chelicorophium curvispinum	1				X
Cordylophora caspia	1				
Coregonus autumnalis		1			
Coregonus muksun		1			
Coregonus nasus		1			
Coregonus peled		1			
Cornigerius maeoticus		1			
Coscinodiscus wailesii			1		
Crassostrea gigas		1			
Crassostrea virginica		1			
Ctenopharyngodon idella		1			
Cyprinus carpio	1	1			
Dasya baillouviana	1				
Diadumene lineata			1	X	
Dikerogammarus haemobaphes	1				
Dikerogammarus villosus	1				
Dreissena bugensis	1	1	1	X	
Dreissena polymorpha	1		1	X	X
Echinogammarus trichiatus	1			X	
Elodea canadensis	1	1			X
Elodea nuttallii	1				
Ensis directus	1				X
Eriocheir sinensis		1			
Evadne anonyx	1	1		X	X

Species	Established	Not established	Unknown	New arrival since 2010 in one or more countries	Exact coordinates available
Ficopomatus enigmaticus	1	1	1	X	
Fucus evanescens	1		1		
Gammarus tigrinus	1			X	X
Gmelinoides fasciatus	1				
Gracilaria vermiculophylla	1				X
Grandidierella japonica			1	X	
Hemigrapsus sanguineus	1				
Hemigrapsus takanoi	1			X	X
Hemimysis anomala	1	1	1		X
Homarus americanus		1			
Huso huso		1			
Hypania invalida			1	X	
Hypophthalmichthys molitrix		1			
Hypophthalmichthys nobilis		1			
Jassa marmorata	1				
Karenia mikimotoi	1		1		X
Laonome sp.	1			X	
Lennoxia faveolata			1		
Lepomis gibbosus		1			
Limnodrilus cervix			1	X	
Limnomysis benedeni	1	1		X	
Lithoglyphus naticoides	1		1		
Maeotias marginata		1	1	X	
Marenzelleria arctia	1				
Marenzelleria neglecta	1				X
Marenzelleria viridis	1			X	X
Melita nitida			1	X	
Micropterus dolomieu		1			
Micropterus salmoides		1			
Mnemiopsis leidyi	1		1		X

Species	Established	Not established	Unknown	New arrival since 2010 in one or more countries	Exact coordinates available
Mya arenaria	1				X
Mytilopsis leucophaeata	1		1	X	X
Neogobius fluviatilis		1			
Neogobius melanostomus	1	1		X	X
Obesogammarus crassus	1				
Odontella sinensis			1		
Oncorhynchus gorbuscha		1			
Oncorhynchus keta		1			
Oncorhynchus kisutch		1			
Oncorhynchus mykiss	1	1			
Oncorhynchus nerka		1			
Oncorhynchus tshawytscha		1			
Orchestia cavimana	1				
Orconectes limosus	1	1			
Pachycordyle navis		1			
Palaemon elegans	1				
Palaemon macrodactylus		1	1	X	
Paramysis (Mesomysis) intermedia	1		1		
Paramysis (Serrapalpisis) lacustris	1		1	X	
Paranais frici	1				
Paratenuisentis ambiguus	1		1		
Penilia avirostris	1		1		X
Perccottus glenii	1	1			
Peridinium quinquecorne	1				X
Petricolaria pholadiformis	1		1		
Platorchestia platensis	1				
Pontogammarus robustoides	1				
Potamopyrgus antipodarum	1				X
Potamothrix bavaricus			1		
Potamothrix bedoti	1				

Species	Established	Not established	Unknown	New arrival since 2010 in one or more countries	Exact coordinates available
Potamothrix heuscheri	1		1		
Potamothrix moldaviensis	1		1		
Potamothrix vejdovskyi	1				
Proasellus coxalis	1			X	
Prorocentrum cordatum	1				X
Proterorhinus marmoratus		1			
Pseudocuma (Stenocuma) graciloides			1		
Pseudodactylogyrus anguillae	1	1			
Pseudodactylogyrus bini	1				
Rangia cuneata	1		1	X	X
Rhithropanopeus harrisii	1	1		X	X
Salvelinus fontinalis		1			
Salvelinus namaycush		1			
Sargassum muticum			1		
Sinelobus stanfordi	1			X	
Spartina townsendii var. anglica			1		
Telmatogeton japonicus	1		1		
Teredo navalis	1				
Thalassiosira punctigera	1				X
Tubificoides pseudogaster	1		1		X
Victorella pavida	1	1			
	79	56	39	26	30