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Background

This revision document includes new maps for harbour, grey and ringed seal as well as for harbour porpoise.

Work to produce Baltic Sea wide maps of ecosystem components, i.e. maps of benthic species and habitats, as well as maps of fish, seabirds and marine mammals, is currently being carried out under a HELCOM coordinated and an EU co-financed TAPAS project. The maps will be used in the Baltic Sea Impact Index (BSII). In the BSII, the effects of various human pressures on the ecosystem will be evaluated and it will form a part of the second HELCOM holistic assessment on the Baltic Sea ecosystem health (HOLAS II). Regarding marine mammals, the aim is to produce maps for grey seal, harbour seal, ringed seal and harbour porpoise.

In the following, the state of the art of the marine mammal maps is presented, including the data and the methods used for their production. The maps have been/are being produced in communication with experts.

Action requested

The Meeting is invited to review the maps for marine mammals produced under the TAPAS project.

Maps of marine mammals

Harbour seal

For harbour seal, two different maps have been produced: a map of harbour seal abundance across the Baltic Sea, and a map of harbour seal haul-outs.

The harbour seal abundance map (number of seals) is an interpolation based on seal count data points collated in the BALSAM project (Figure 1). Counts are reported per HELCOM sub-basin and per country. Interpolation was made using the count values (average of 2011-2014), that were set to the center of each country's part of HELCOM sub-basin (e.g. Danish part of Kattegat). Swedish Western Gotland Basin value was moved from sub-basin center to Kalmar Sound where harbour seal haul-outs exist, to avoid extending the harbor seal distribution northwards. Zero values were added to the eastern distribution limit using expert consultation.

The harbour seal haul-out map presents the number of harbour seal haul-out sites within 10km x 10km grid cells (Figure 2).The map highlights areas with high densities of harbour seal haul-out sites. The point data on haul-outs was converted into 10km x 10km grid cells, assigning the count of points within the cell as the cell value (variation from 0 to 26 sites).

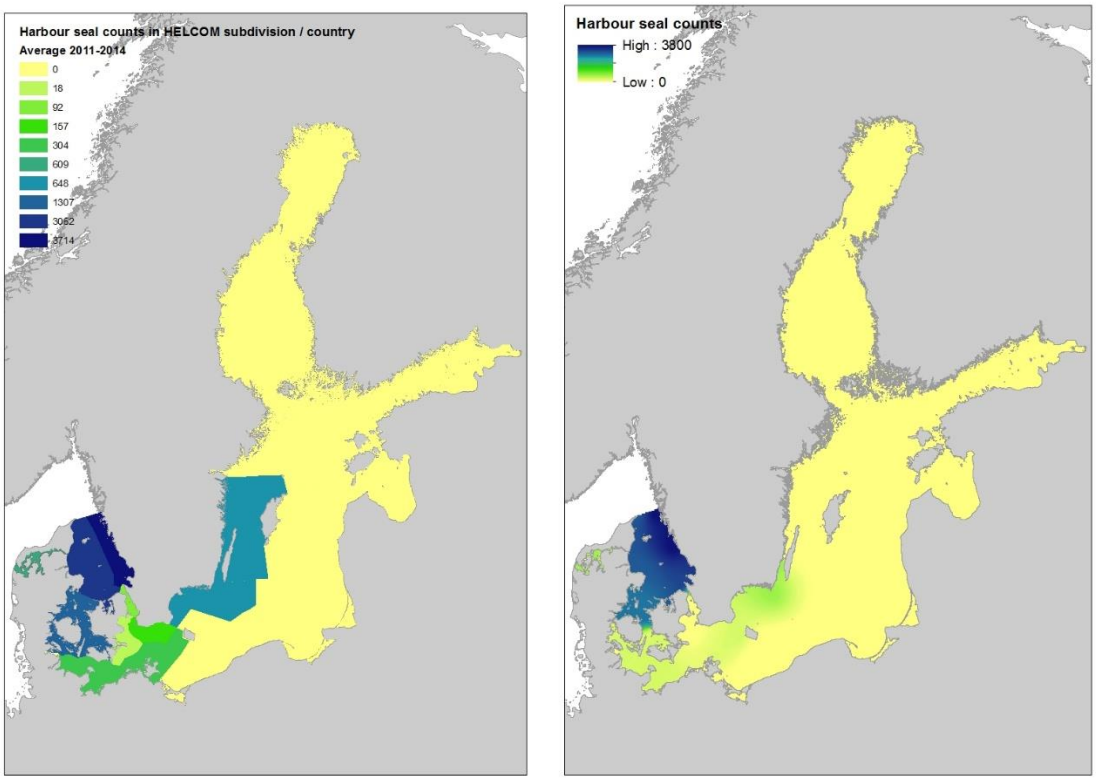

Figure 1. Maps representing harbour seal abundance per HELCOM sub-basin and per country (left), the interpolation derived from the data (right).

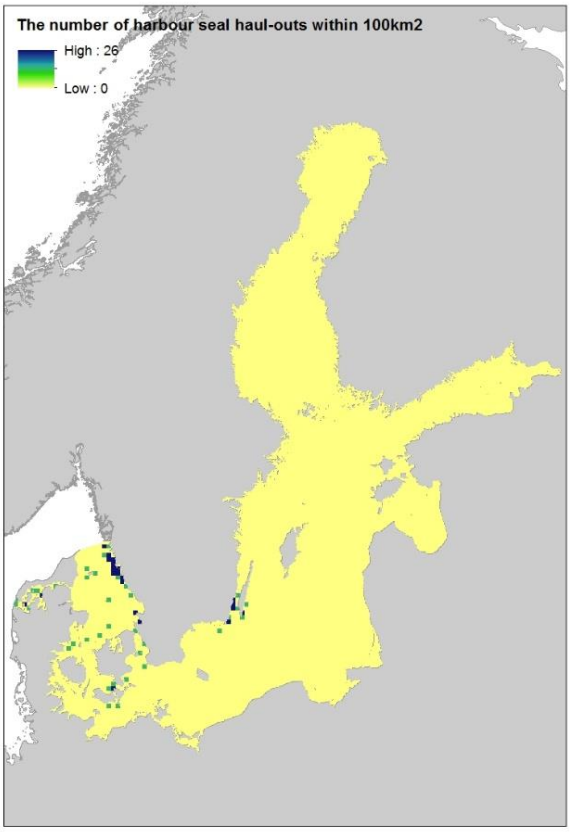

Figure 2. The “density” of harbour seal haul-out sites.

Grey seal

For grey seal, two different maps have been produced: a map of grey seal abundance across the Baltic Sea, and a map of grey seal haul-outs.

For the grey seal abundance map, counts per haul-out site were collated (average of 2011-2016, for Finland only 2011-2015, for Poland 2014-2015). To make the data better suited for interpolation, the data were generalized to HELCOM sub-basin / country (Figure 3). Also some modifications to the data were necessary before interpolation, e.g. the values around the west Estonian islands, originally divided between 3 sub-basins were combined together. Further, to avoid areas with zero values (as grey seal is known to occur across the Baltic Sea), a value of 10 was given to areas outside the main distribution area.

The grey seal haul-out map presents the number of grey seal haul-out sites within 10km x 10km grid cells (Figure 4). The map highlights areas with high densities of grey seal haul-out sites. The point data was converted into 10km x 10km grid cells assigning the count of points within the cell as the cell value (variation from 0 to 24).

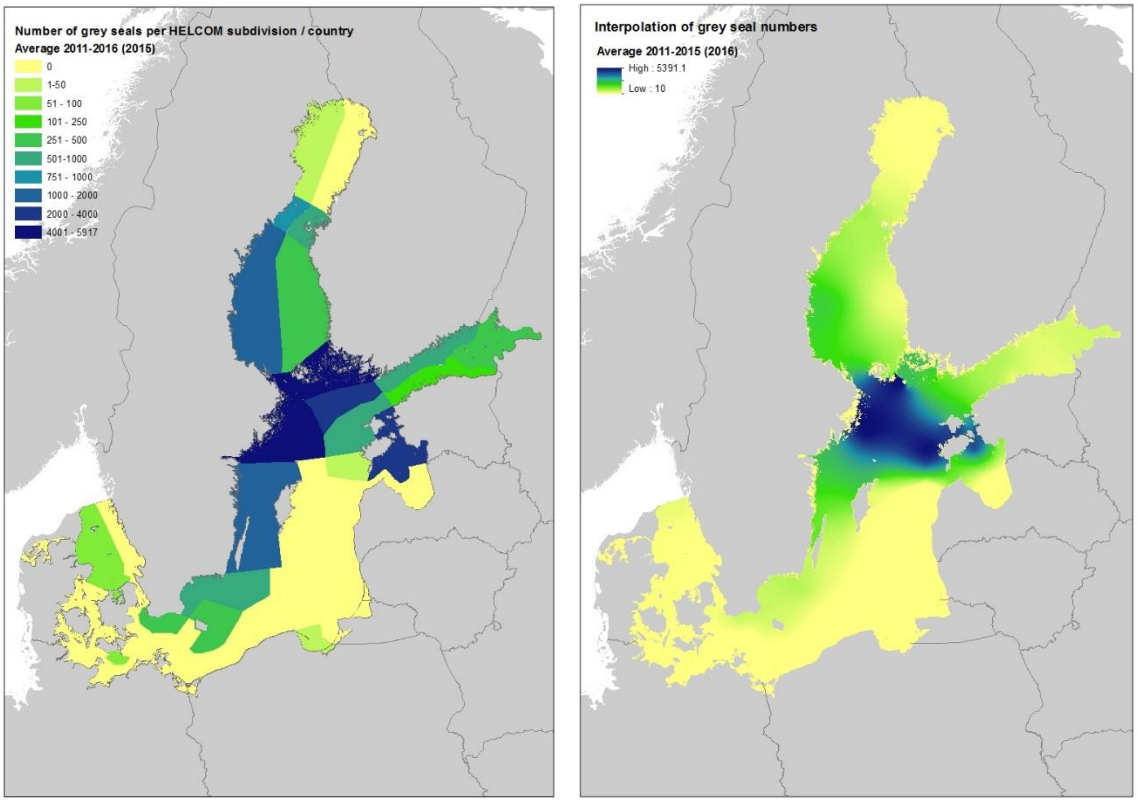

Figure 3. Maps presenting grey seal abundance per HELCOM sub-basin and per country (left) and the interpolation derived from the data (right).

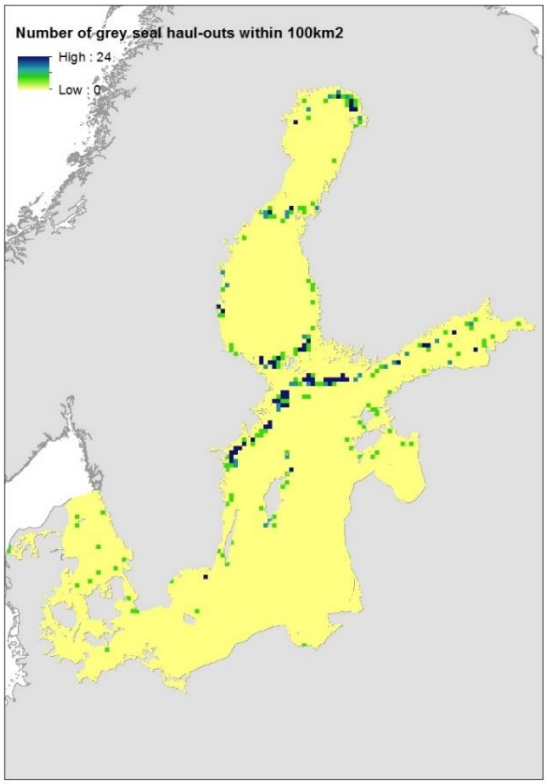

Figure 4. The “density” of grey seal haul-outs.

Ringed seal

For ringed seals, there is limited data available for the production of abundance maps. However, a map showing the general distribution area and "core areas" was prepared based on GPS tracking data collected during BALSAM project and literature sources (Strandman 2015[1], Ministry of Argiculture and Forestry 2007[2]). (Figure 5).

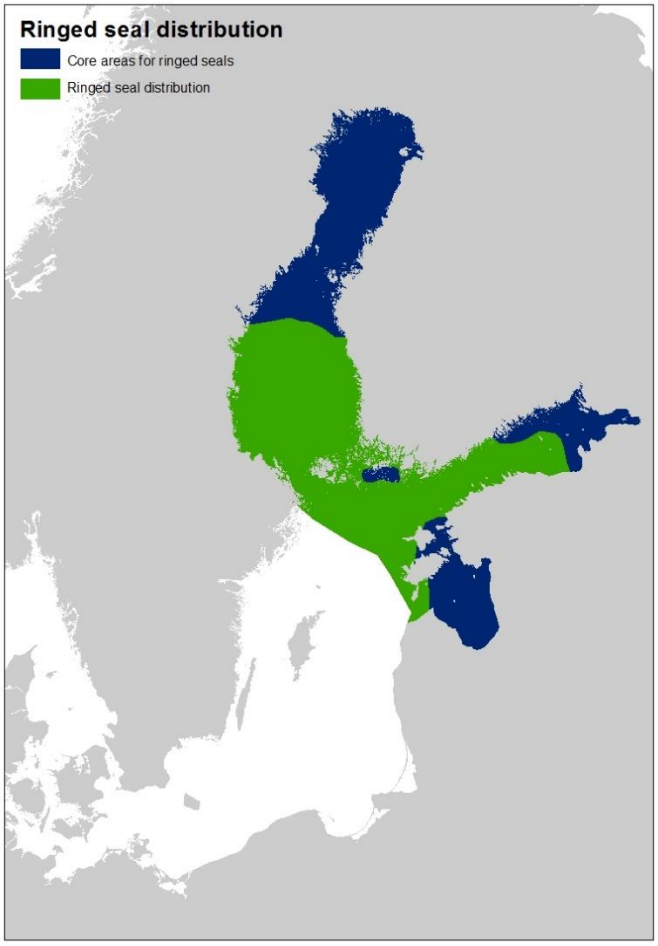

Figure 5. Distribution of ringed seals, including core-areas.

Harbour porpoise

Data on harbour porpoise for the eastern Baltic Sea has been received from the SAMBAH project[3], and for the western Baltic Sea from Signe Sveegaard, Aarhus University, published in Sveegard et al. 2011[4]. Both datasets show important areas for harbour porpoise, but due to differences in methodologies for identifying the areas, there are problems in map comparability across the HELCOM area. Improving the comparability of the datasets is still work in progress. The draft map is presented in Figure 6.

[1] Strandman, E., 2015: The distribution and haul-out site selection of ringed seal (Phoca hispida botnica) in the Archipelago Sea (In Finnish). Pro Gradu thesis, Department of Geography, University of Turku, Finland.
[2] Ministry of Agriculture and Forestry 2007: Management plan for Baltic Sea seals (In Finnish). Available at http://mmm.fi/documents/1410837/1721042/4_2007_Itameren_hyljekantojen_hoitosuunnitelma.pdf/
[3] Anonymous 2016: Heard but not seen: Sea-scale passive acoustic survey reveals a remnant Baltic Sea harbour porpoise population that needs urgent protection. SAMBAH non-technical report. Available at http://www.sambah.org/Docs/General/Non-technical-report-v.-1.8.2.pdf
[4] Sveegaard, S., Teilmann, J., Tougaard, J., Dietz, R., Mouritsen, K., Desportes, G., Siebert, U., 2011: High-density areas for harbour porpoise (*Phocoena phocoena*) identified by satellite tracking. Marine Mammal Science 27(1): 230-246.

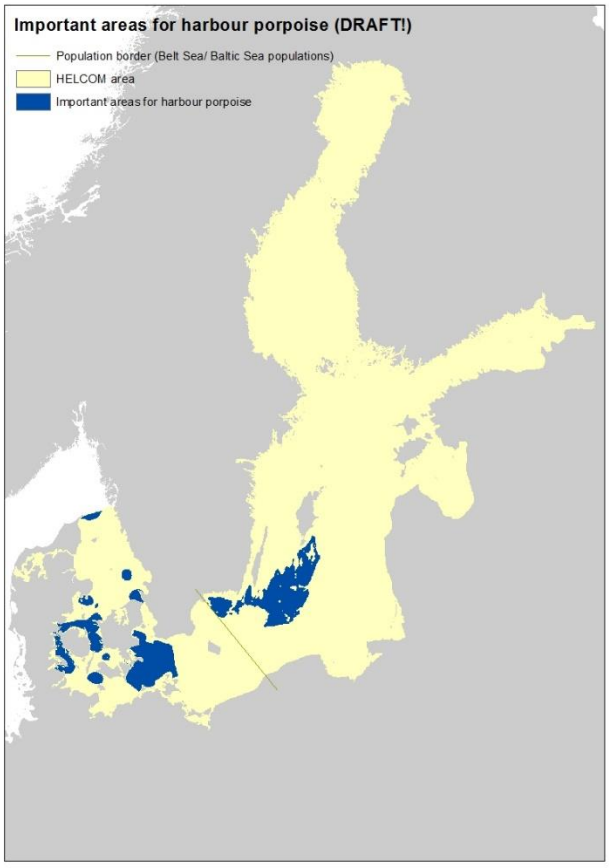

Figure 6. Draft map of important areas for harbour porpoise. Note, that there is still ongoing work to improve the comparability of the SAMBAH data, and data from the Belt Sea.