PROGRESS REPORT

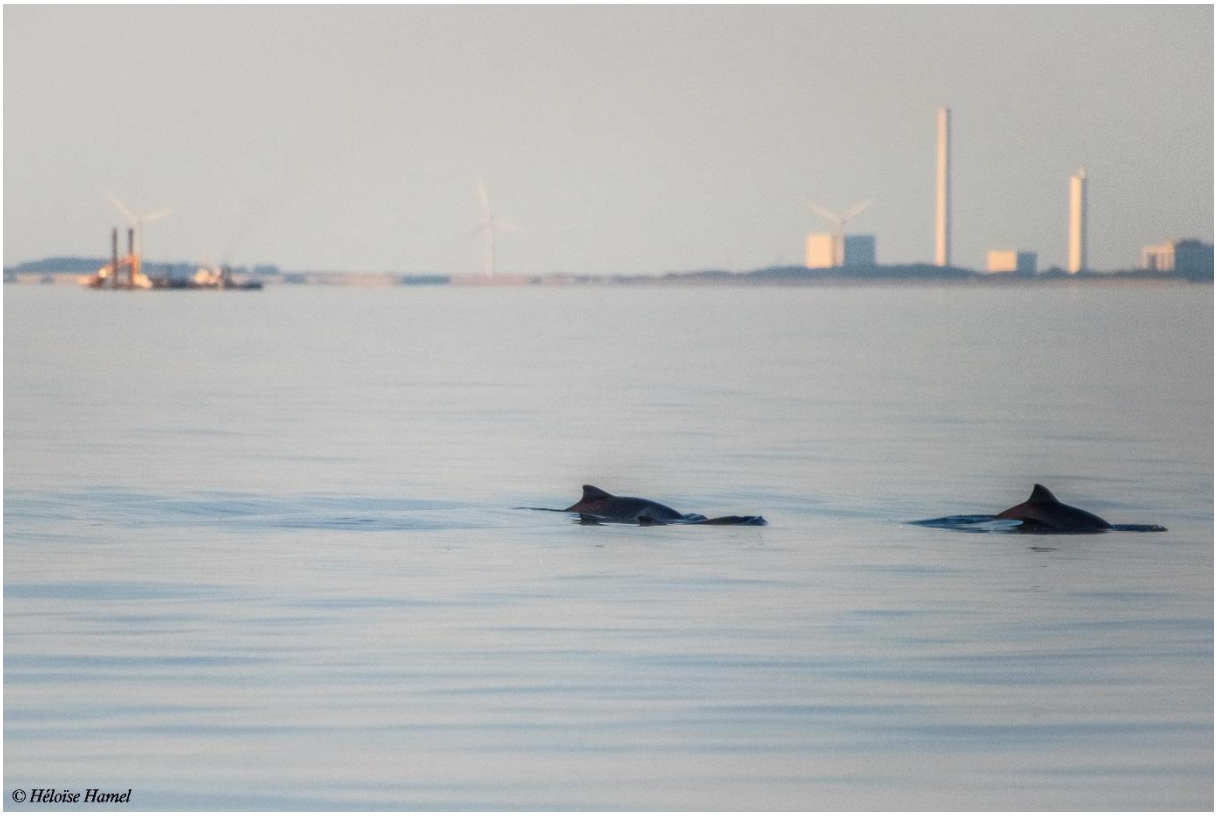
on

THE JASTARNIA PLAN:

THE RECOVERY PLAN FOR THE HARBOUR PORPOISE

IN THE BALTIC PROPER

2022



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The views and recommendations expressed in this report are the authors' own

Background & History

The ASCOBANS Jastarnia Plan is a recovery plan for harbour porpoises inhabiting the Baltic Proper. The harbour porpoise is the only cetacean species occurring throughout the year in the Baltic Sea. Genetic (Lah et al., 2016; Wiemann et al., 2010), morphometric (Galatius et al., 2012), and distributional studies (Carlén et al., 2018; Sveegaard et al., 2015) all indicate a separate harbour porpoise population in the Baltic Proper (Evans and Teilmann, 2009; Lockyer, 2003; Sveegaard et al., 2015).

Figure 1. Map of geographical terms used in the Jastarnia Plan

Since the mid-twentieth century, harbour porpoise numbers have declined drastically. This decline has probably been caused by a combination of factors: commercial hunting up to the end of the nineteenth century which was resumed during the two world wars (Lockyer and Kinze, 2003; Skora and Kuklik, 2003), severe ice conditions during the first half of the twentieth century (Svärdson, 1955), environmental contaminants (Beineke et al., 2005; Berggren et al., 1999) probably causing

immunosuppression, increased disease risk and reproductive failure (Jepson et al., 2016, 2005; Murphy et al., 2015), and, perhaps most importantly during the last decades, the use of synthetic gillnets (Hammond et al., 2016; HELCOM, 2013). The population is currently listed as Critically Endangered (CR) by IUCN (Hammond et al., 2016), and in Annexes II and IV of the Habitats Directive.

During the Second Meeting of the Parties to ASCOBANS, held in Bonn, Germany in November 1997, a Resolution was adopted inviting Parties and Range States to develop, by 2000, a recovery plan for harbour porpoises in the Baltic Sea. The following year, an ASCOBANS Baltic Discussion Group was formed, comprising a number of porpoise specialists from the region, chaired by Finn Larsen. However, by the time of the Third Meeting of the Parties in Bristol, UK, in July 2000, a recovery plan had still not been established. The Baltic Discussion Group then held a meeting in January 2001, hosted by the Danish Institute for Fisheries Research in Charlottenlund, Denmark. And in October of that year, a preparatory meeting of environment and fishery agencies and fishermen's organisations from the various Nordic Parties to ASCOBANS, was organised in Sweden, with funding from Sweden and the Nordic Council.

In January 2002, a workshop was held in the Polish coastal town of Jastarnia, in order to draft a recovery plan. Hosted by the Foundation for the Development of the University of Gdańsk and the University of Gdańsk's Hel Marine Station, and funded by the Danish government, the workshop was attended by representatives of ministries, NGOs, fishermen's organisations, and public and private institutions from six Baltic Sea countries, as well as regional international organizations. Based on the outcome of this workshop and in cooperation with the Secretariat, Dr Randall Reeves, the facilitator of the workshop, produced the draft Baltic Harbour Porpoise Recovery Plan (ASCOBANS, 2002) that was presented to the Fourth Meeting of the Parties in Esbjerg, Denmark in August 2003. This became known as the Jastarnia Plan.

Although not formally adopted in 2003 due to concerns about competency issues raised by the European Commission, a revised version of the Plan, produced by the ASCOBANS Baltic Sea Steering Group (Jastarnia Group), was finally adopted in Bonn, Germany, in October 2009, at the Sixth Meeting of the Parties (ASCOBANS, 2009). A further revision, compiled by Julia Carlström, was adopted at the Eighth Meeting of the Parties in Helsinki, Finland in 2016 (ASCOBANS, 2016).

Since 2005, the ASCOBANS steering group for the Baltic Sea region, known as the Jastarnia Group, has met annually, the latest (18th) meeting was held in Gothenburg in March 2022. Six main action points are identified, based upon the 2016 revision of the Jastarnia Plan. Each will be considered below, with a summary of progress by country.

Actions

1. Increase involvement, awareness and cooperation

Public awareness

The rarity of harbour porpoises in the Baltic Proper has meant that over large parts of the region, the public remains unaware of its existence. This applies particularly to the eastern Baltic States of Russia, Lithuania, Latvia, and Estonia, but also for example in Sweden many are unaware of the Baltic cetacean.

Therefore, there is a strong need for an awareness-raising programme. This could be championed by both international and national non-governmental organisations that have direct connections to the public, such as CCB, WWF, and WDC. Museums and aquaria also have an educational role to play. However, basic information on the Baltic Sea harbour porpoise as well as information on how to report strandings and/or live observations should also be available on governmental agencies' or ministries' websites in all countries.

In **Poland**, Hel Marine Station, University of Gdańsk (HMS UG), has had a long history of raising awareness about harbour porpoises, led by initiatives from Krzysztof Skóra and Iwona Pawliczka, later in collaboration with WWF Poland. First activities took place in late 1980. as the public campaign aimed at mobilizing the public to gather information on opportunistic sightings, bycatch and strandings. Cooperation of fishermen resulted in wide reporting of bycatch in 1990 which helped to recognize the threat for Baltic harbour porpoises. HMS UG became a national centre for collecting reports and holding the database for opportunistic sightings and strandings. Since 2010 the voluntary network Blue Patrol established and financed by the joint projects of WWF and HMS UG and HMS UG support Hel Marine Station in stranding scheme through data and carcasses reporting. Dead animals which can be used for post-mortem analysis are collected by HMS UG. Each year several public educational events take place where special attention is dedicated to harbour porpoises. The ASCOBANS International Day of the Baltic Harbour Porpoise event has been organized in the area around the statue of harbour porpoise founded in 2006 and unveiled at the occasion of 20th Annual Conference of the European Cetacean Society (https://hel.ug.edu.pl/2016/05/17/xiv-miedzynarodowy-dzien-baltyckiego-morswina). In 2013 special exhibition dedicated to harbour porpoise was open in a building called "Hause of Harbour Porpoise" which is open for a public as well as the programme called Blue School run in HMS educating young people about this endangered Baltic species and its environment. All those efforts should continue.

Figure 2. Harbour porpoise statue in Gdynia, Poland.

In **Sweden**, authorities are having dialogue meetings with fishermen concerning the regulation of fisheries in protected areas, both for specific areas and more generally, the latter in conjunction with the Swedish Agency for Marine & Water Management (SwAM). During 2021, SwAM issued a press release on the updated species action program for porpoises, and the Swedish Board of Agriculture did a press release on the availability of financing for pingers for fishermen. A sightings programme where the public can report harbour porpoise observations and strandings is run by the Swedish Museum of Natural History (SMNH) and collection of dead animals is carried out by SMNH in collaboration with the Swedish National Veterinary Institute and the Gothenburg Natural History Museum. Sightings can also be reported to the Swedish Species Information Center at the Swedish University of Agricultural Sciences. In 2020, a new Swedish red list was published where the Baltic Proper harbour porpoise was listed as Critically Endangered. Dissemination from the Swedish Species Information Centre rendered some interest and resulted in several interviews in radio and TV, as well as spread in social media.

SMNH has also done quite a few radio/TV interviews in later years as well as written several popular science articles. A press release on the increase in detection rate between SAMBAH and the national monitoring program resulted in a lot of interest from the press. The SMNH teachers' educational activities now have information about harbour porpoises and how they are affected by underwater noise, and there is online teaching material available. In a youth project revolving around the global sustainable development goals the harbour porpoise has been brought up as an example of how SMNH works with biodiversity.

WWF Sweden and the Swedish Society for Nature Conservation (SSNC) has during the last years been active by including the plight of the harbour porpoise in their campaigns. WWF Sweden made a video and a website (https://www.wwf.se/djur/tumlare-i-ostersjon/#artdata) on the Baltic Proper harbour porpoise and threats towards their conservation. In cooperation with SSNC, in a project to raise awareness on threatened species in Sweden, Google made a 3D image/video of a harbour porpoise which can be accessed if searching for "Tumlare i Östersjön" on a mobile device (Figure 3).

CCB has a Facebook page and an Instagram account aimed at the Swedish general public (but posts are in both Swedish and English) informing about the Baltic harbour porpoise, and an EU-wide petition for the protection of the Baltic Proper harbour porpoise was launched in March 2022 (https://you.wemove.eu/campaigns/save-the-baltic-harbour-porpoise). Also, models of porpoises have been placed in Sweden's largest zoo, Kolmården, where Mats Amundin has done much to raise awareness of the species. Also, the Swedish National Veterinary Institute has been active in disseminating harbour porpoise information through interviews and social media.

Figure 3. The 3D porpoise created by Google, shown in the environment using a mobile phone.

In **Denmark** since 2017 in the town of Middelfart there is an active listening station where the public can visit, both "IRL" and online (https://www.youtube.com/watch?v=aPOlRi9Ouls), to listen in real time to any porpoises present around the hydrophone in Middelfart harbour. There is currently no public sightings programme in operation but Fjord&Bælt in Kerteminde has developed the "Marine Tracker" app which can be used to report sightings. Although there is no comprehensive stranding scheme, reporting to the Maritime Museum in Esbjerg (https://fimus.dk) is encouraged, and the Facebook group hvaler.dk is very active with people posting sightings of marine mammals.

In **Germany**, sightings and strandings programmes involving the public are ongoing. For Schleswig-Holstein, they are coordinated by the Terrestrial and Aquatic Wildlife Research (ITAW) in Büsum; for Mecklenburg-West Pomerania, they are administered by the German Oceanographic Museum in Stralsund, who have also produced an app "OstSeeTiere" (Baltic Sea Animals) (https://www.deutsches-meeresmuseum.de/wissenschaft/infothek/sichtungskarte/).

In 2021 the Friends of the Earth Germany BUND carried out an information camapign and petition on underwater noise, gathering over 35 000 signatures demanding a reduction in underwater noise harmful for the marine environment including the harbour porpoise (https://aktion.bund.net/mensch-mach-leise-unterwasserl%C3%A4rm-t%C3%B6tet).

The German Oceanographic Museum has done much to raise awareness in the German sector of the Baltic. Every year, the museum participates in the International Day of the Baltic Harbour Porpoise coordinated by ASCOBANS, with specific activities and information for the public. The museum has a marine mammal science education project (http://dev.marine-mammals.com/), and focuses mainly on school activities and educating teachers. In 2017, it produced an app ("Be the Whale") depicting a humpback whale, and in 2018 did the same using the beluga. Although not focused upon the harbour porpoise, these are designed to make children aware of dangers to cetaceans in general. Noise, pollution and bycatch are all included as threats as well as shipping in general (ship strikes) and prey depletion.

The Ministry of the Environment in **Finland** has had a public reporting scheme for porpoise sightings since 2001 (https://www.ymparisto.fi/sv-FI/Natur/Arter/Skydd_av_arter/Skydd_av_enskilda_arter/Skyddet_av_tumlaren/Tumlarobservationer). There are also more information in English on harbour porpoise at

https://www.marinefinland.fi/en-US/Nature_and_how_it_changes/Species/Marine_mammals/Porpoise. Annual press releases are made in early summer on the reporting programme along with information on the current situation of harbour porpoise. Additionally, the Tampere Dolphinarium in Finland had an education programme championed by Kai Mattsson over a number of years until its closure in 2015. Cooperation with other actors will increase with the Finnish LIFE IP BIODIVERSEA project which will include for example a holistic assessment on marine protection status and protected areas network.

In **Lithuania**, a harbour porpoise protection plan was initiated in 2014, with flyers and a short documentary made to raise public awareness (https://www.youtube.com/watch?v=WQYP5T0SCbs). The International Baltic Harbour Porpoise Day is celebrated each year at the Lithuanian Sea Museum, and in 2021 an interactive event "Searching for Harbour Porpoise" was arranged. In conjunction to the Sea Museum, a Baltic Sea Animals Rehabilitation Center will open during the second quarter of 2022.

None of the countries Russia, Latvia, and Estonia appear to have campaigns to raise public awareness about porpoises in the Baltic, their conservation status, and need for conservation action. Porpoises are simply not recognised as part of the native fauna. This is going to be challenging but there is an important need to make people aware that the porpoise does occur in their waters albeit at low numbers, and that efforts to create the conditions favourable for the species will go a long way to enhancing the possibility of porpoises returning in greater numbers to their waters.

There has been an increase in public awareness work in the Baltic Sea region in the last few years, although more effort is still needed. There is a need now to sustain those efforts in all the countries bordering the Baltic Sea, and to develop new awareness campaigns especially in those countries in the eastern Baltic where promoting conditions favourable for the recovery of porpoises would constitute an important first step. Also, in relation to the ICES special request advice on emergency measures to prevent bycatch of common dolphin (*Delphinus delphis*) and Baltic Proper harbour porpoise (*Phocoena phocoena*) in the Northeast Atlantic (ICES, 2020) and EU Commission steps to take measures to minimise bycatch, public awareness may become even more important, to support these efforts.

Involvement and cooperation

In **Germany**, project STELLA (November 2016 – December 2019) and STELLA II (ongoing) are two other projects involving close cooperation with fishers to develop of alternative management approaches and fishing gear. In **Denmark** and **Sweden** similar efforts are ongoing in testing and developing alternative gear and new monitoring methods in cooperation with fishermen. These efforts should be expanded to encompass more fishermen in new areas, and countries should ensure that resources are made available.

Table 1. Summary of sightings and strandings programmes and websites for reporting

Country	Organisation	Website	Comment
Denmark	Maritime Museum in Esbjerg	Strandings: https://fimus.dk	For sightings there is an app: Marine Tracker by University of Southern Denmark
Estonia	Nature Observations Database	http://loodus.keskkonnainfo.ee/lva/	
Finland	Finnish Ministry of the Environment	https://www.ymparisto.fi/fi-FI/Luonto/Lajit/Lajiensuojelutyo/Yksittaisten_lajien_suojelu/Pyoriaisen_suojelu/Pyoriaishavainnot	
Germany	German Oceanographic Museum	Info on sightings and strandings reporting: https://www.deutsches-meeresmuseum.de/wissenschaft/sichtungen/sichtung-melden/	App OstSeeTiere
Latvia	Dabas Dati, Nature Protection Agency, Latvian Museum of Natural History	live: www.dabasdati.lv dead: www.daba.gov.lv dead: www.dabasmuzejs.gov.lv	
Lithuania	State food and veterinary service, Lithuanian Marine Museum	dead: http://vmvt.lt/ live or dead: http://www.muziejus.lt/	
Poland	Hel Marine Station, University of Gdansk	www.morswin.pl	hel@ug.edu.pl Tel. +48 601 88 99 40.
Russia	Baltic Fund for Nature Kaliningrad zoo	www.bfn.org.ru	bfn@bfn.org.ru
Sweden	Swedish Museum of Natural History Artportalen (Species Observation System) SwAM, Rappen	Sightings and strandings should be reported to https://marinadaggdjur.nrm.se/rapportera-tumlare Sightings can also be reported to: https://www.artportalen.se/ Sightings and strandings can also be reported to: https://rapportera.artfakta.se/eftersokta/rappen/skapa	

Ghost nets have been identified as a conservation issue. In 2016 the international project MARELITT BALTIC (https://www.marelittbaltic.eu/) started, involving organisations from Estonia, Germany, Poland and Sweden. Swedish and Polish fishermen were engaged in this project, dragging parts of the Baltic for ghost nets. The aim of the project was to develop simple, cost-effective and environmentally safe methods of reducing the fishing ghost nets from the Baltic Sea floor and to find a practical solution to the environmental problem associated with derelict fishing gear (DFG) through marking and identification of the nets. This is a very positive effort and could be expanded to other countries in the Baltic. It would not only improve the situation for the harbour porpoise but also for other marine wildlife such as seabirds and waterfowl.

Key Conclusions and Recommendations

Public awareness initiatives and collaborations with stakeholders have shown very variable progress between countries. They have been particularly weak for countries in the eastern Baltic where porpoises are not really considered as part of the national fauna. Efforts to improve awareness of the presence of the species, its conservation status and threats should be made as a priority across the region, and a minimum should be to have some sort of information available on governmental websites in all countries. An effort should also be made to actively involve stakeholders, notably both small-scale and industrial fishers, in processes aiming to mitigate bycatch.

2. *Monitor and estimate abundance and distribution*

Large scale (including modelling)

The international collaborative LIFE+ project SAMBAH (Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise) (www.sambah.org) was undertaken in order to estimate harbour porpoise abundance and map its distribution in the Baltic Sea. Based on an acoustic survey using harbour porpoise click loggers deployed at 304 locations from May 2011 to April 2013 (Figure 4), the abundance of the Baltic harbour porpoise population was estimated at 491 individuals (95% CI 71–1105) (Amundin et al., 2022).

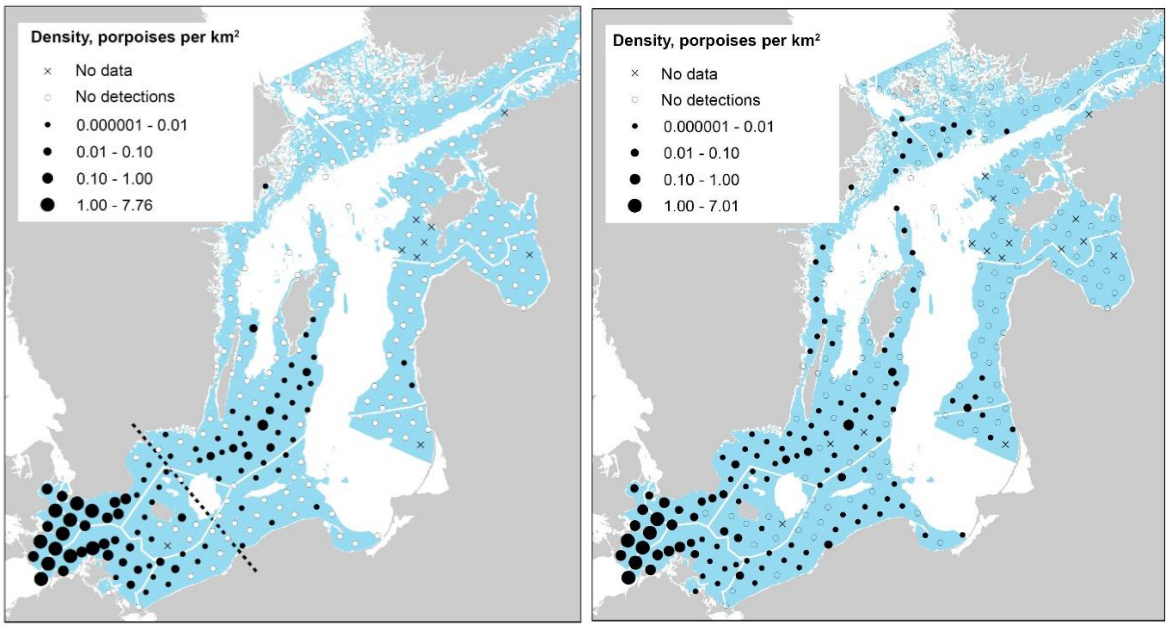


Figure 4. Estimated densities of harbour porpoises derived from SAMBAH Project in summer, May-Oct (left) and winter, Nov-Apr (right). The legend shows estimated porpoise density per km^2. Crosses indicate no data and white circles no detections (Source: SAMBAH, 2016)

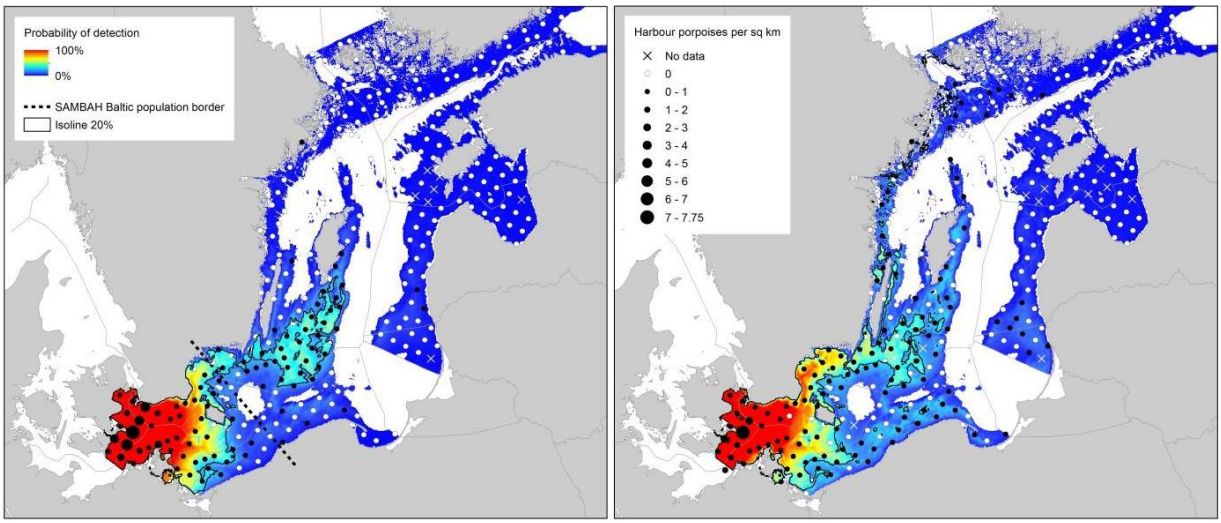


Figure 5. Predicted probability of detection of harbour porpoises per month in the SAMBAH project area during May – October (left) and November – April (right). The black line indicates 20% probability of detection, approximately equivalent to the area encompassing 30% of the population, often used to define high-density areas. The dots or crosses show the probability of detection at the SAMBAH survey stations. The border

indicates the spatial separation between the Belt Sea and Baltic harbour porpoise populations during May – October, according to Carlén *et al*., 2018.

Modelled maps of the probability of detecting harbour porpoises show a spatial separation between the Belt Sea and Baltic populations during the summer season (Carlén et al., 2018). Particularly between May and August, i.e. when calving and mating take place (Börjesson and Read, 2003; Lockyer, 2003), Baltic harbour porpoises aggregate at and around the Hoburg's and Northern and Southern Mid-sea banks in the Baltic Proper (Figure 5). During the winter season, especially between January and March, the animals are more spread out across the study area, and they overlap spatially with the Belt Sea population (Figure 5). The area around the Hoburg's and Northern and Southern Mid-sea banks in the Baltic Proper should be considered essential for summer distribution and probably the main breeding area for the Baltic harbour porpoise population (Figures 4, 5). In the winter, other areas, such as the Polish and Swedish coasts and an area south of the Åland Islands, are important.

The SAMBAH Project provided important new information on the abundance and distribution of porpoises in Baltic Proper. However, there were constraints. The project aimed for large-scale data collection, thus some more detailed information in coastal areas may be missing. Also, there was no sampling in areas of >80m depth; notably Russia were not included; and because of the difficulty of applying a robust detection function, the resultant estimates had very large confidence intervals. In February 2021 a SAMBAH II proposal was submitted to the EU LIFE funding programme, with partners in Denmark, Estonia, Finland, Poland, Lithuania and Sweden and coordinated by Germany. However, this proposal was unsuccessful and there currently does not seem to be a suitable funding programme for this type of project.

HELCOM

No harbour porpoise indicators on abundance and distribution will be developed in time for the third HELCOM Holistic Assessment of the Baltic Sea Ecosystem (HOLAS 3). However, a qualitative assessment of the distribution and abundance of the Baltic Proper population will be completed by the Swedish Museum of Natural History for HOLAS 3 by summer 2022, including a review of all historic records of the population where many previously unknown records have been found to date. There is additional ongoing work towards the development of all indicators, and two reports were submitted to the HELCOM State & Conservation expert group meeting for spring 2022 on needs to develop the abundance and distribution indicators.

Regional/national surveys

Since SAMBAH, some countries have continued acoustic monitoring (Figure 6). In **Denmark,** the Nature Agency has initiated monitoring of the Baltic population under MSFD, with C-PODs rotating between SACs every three years. Between June 2018 and June 2019 C-PODs were deployed at ten stations around Bornholm (Figure 6). This is planned to be repeated in 2023-2024, and the hope is that this will be part of the national co-funding for the SAMBAH II project, if that can somehow go ahead. The data from 2018-2019 indicate an increase in detections in the area compared to the SAMBAH data. Additionally, an environmental impact assessment study will be carried out for the "Energi Island Bornholm" with passive acoustic monitoring and aerial surveys being conducted in 2021-2023.

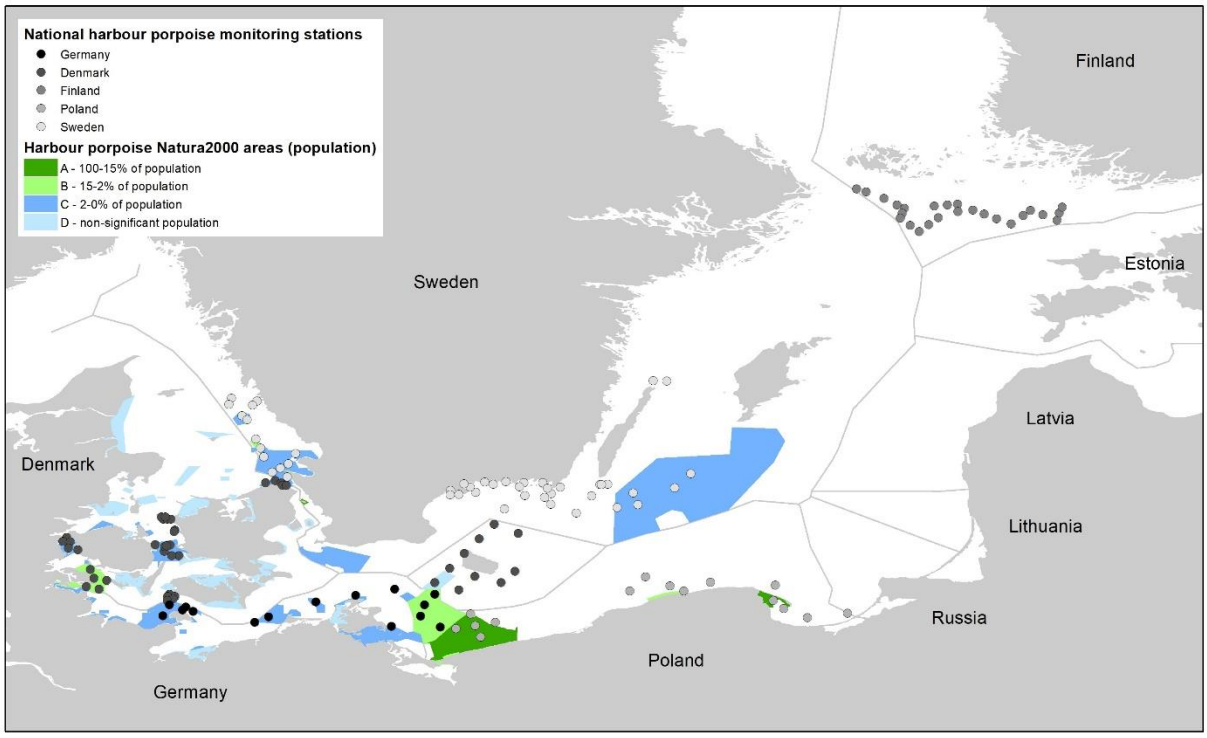


Figure 6. National harbour porpoise monitoring stations in the Baltic Sea Region. In Swedish waters, both national and regional monitoring stations are shown.

In **Finnish** waters, acoustic monitoring has been ongoing from October 2016 at 11-25 stations (11 SAMBAH stations and then more depending on available gear) in the offshore area south of Åland and the Archipelago Sea, see Figure 7 for detections per station in 2016-2019. Some data gaps in 2020-2021 were caused by a combination of unfavourable weather conditions and the covid pandemic, delaying field work. The methods applied are the same as in the SAMBAH Project using C-PODs, but recently some F-PODs have been added to provide data to compare detection rates between the two devices. The monitoring programme is undertaken by Turku University of Applied Sciences, funded by the Finnish Ministry of the Environment and Åland Government and is now part of the national monitoring programme related to the MSFD, together with monitoring of underwater noise.

The results of harbour porpoise monitoring indicate a similar pattern and rates of detection as was obtained in the SAMBAH project and show that the harbour porpoise is regular in low numbers in the southwestern offshore waters of Finland, mainly during the cold-water season. Opportunistic sightings also show occasional presence in coastal waters, including Gulf of Finland and the Bothnian Sea.

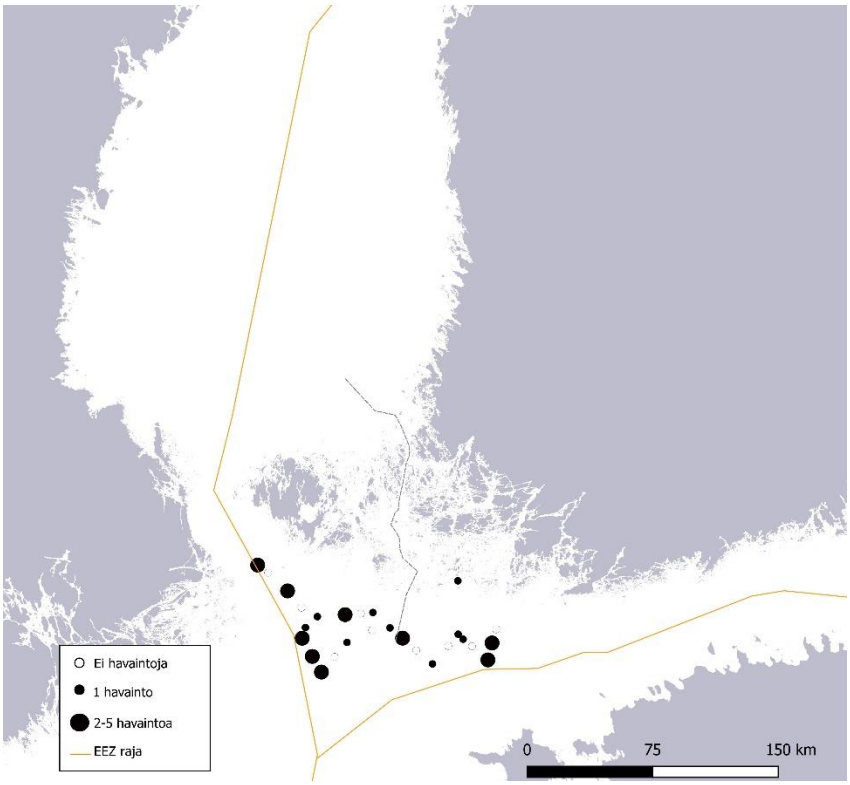


Figure 7. Passive acoustic monitoring stations in Finnish waters within SAMBAH between 2011-2013 and within national monitoring programme between 2016-2019. Empty circles denote stations without detections, black circles with size depending on number of detections.

In 2014, the Finnish Ministry of Environment established an expert group for harbour porpoise conservation and management, to update information on the status of harbour porpoises in Finnish waters, and to make recommendations for actions to be taken for better protection of the species (O. (editor) Loisa and Pyöriäistyöryhmä, 2016).

It is clear that the numbers of harbour porpoises have decreased drastically in Finnish waters, as elsewhere in the Baltic Proper, since around the mid-20th century. Visual observations, strandings and bycatch of harbour porpoises were still common in the 1960`s, but today are more rare (Figure 8). In 2016, since mother-calf pairs are no longer observed in Finnish waters, the species was considered as regionally extinct (Liukko et al., 2015), but in the latest red list update it was not assessed (Hyvärinen et al., 2019), see table 9. In the years 2000-2020, a total of 75 sightings have been reported with a total of approximately 130 animals.

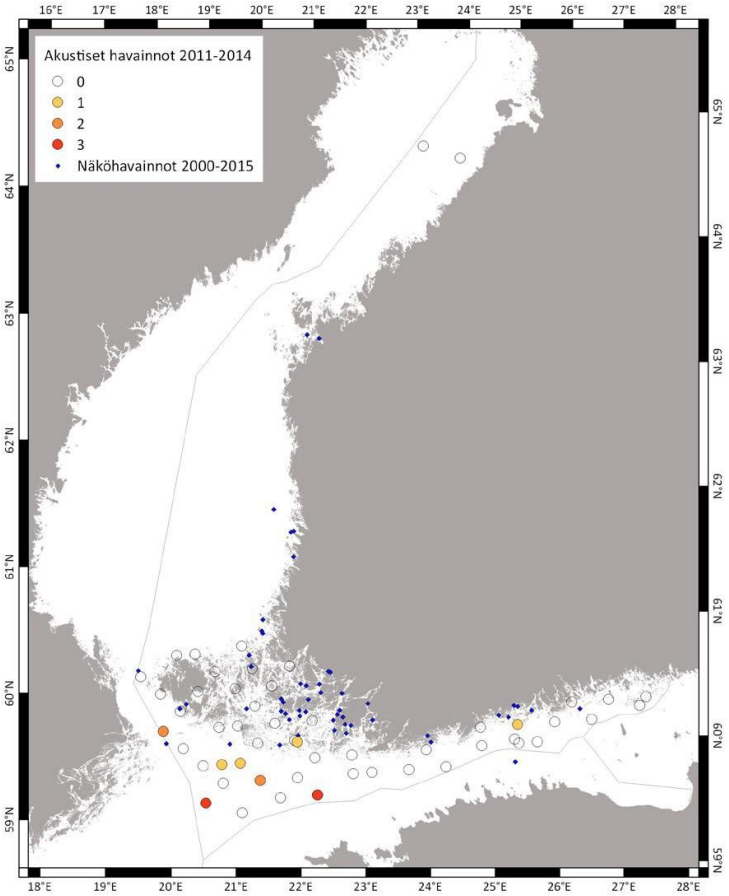


Figure 8. Acoustic and visual observations of harbour porpoises in Finnish waters. The blue dots represent visual observations (in total 53) in 2000-2015. The circles represent passive acoustic monitoring stations and the number of detections recorded at the stations between 2011-2014. (Source: Loisa and Pyöriäistyöryhmä, 2016).

In **Germany**, there is an established acoustic monitoring programme with C-PODs deployed at 15 stations in five areas (Figure 8). German aerial surveys do not extend east of Rügen. A seasonal pattern in the waters around and east of Rügen was interpreted as Belt Sea animals utilising the area during summer, and animals from the Baltic Proper population being present in the area in winter (Benke et al., 2014).

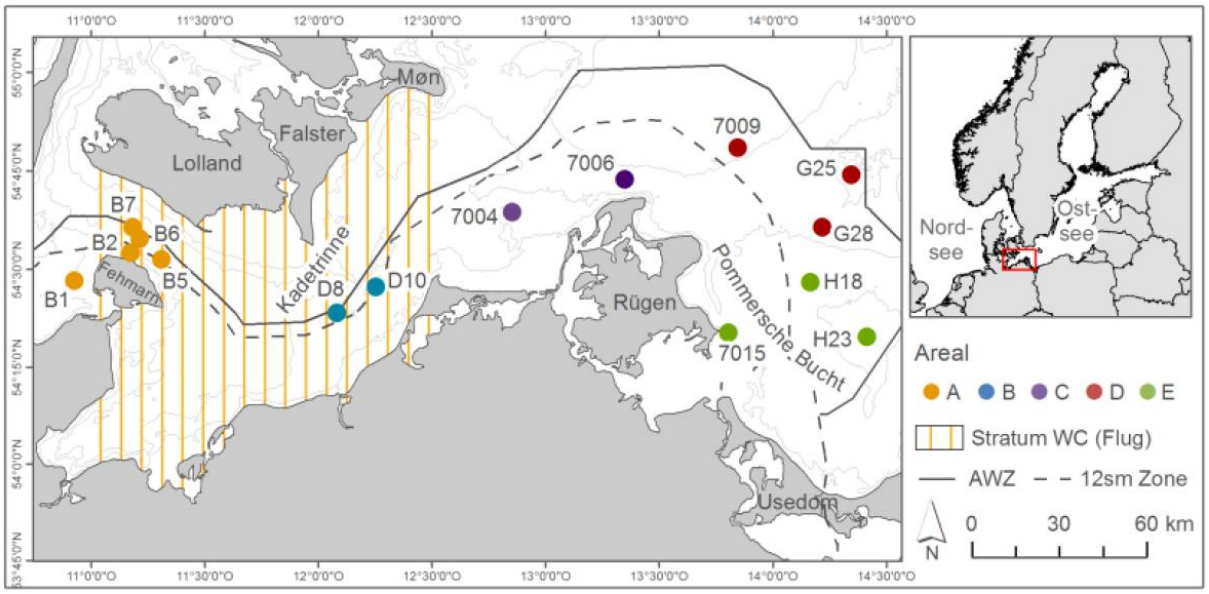


Figure 9. Monitoring Programme to determine abundance and distribution of harbour porpoises in German waters of the Baltic, with aerial survey tracks & C-POD deployments (Source: German Oceanographic Museum).

The three-year project "Pilot monitoring of marine species and habitats" was completed between 2015-2018 on request by Chief Inspectorate for Environmental Protection – institution responsible for the monitoring of the environment in Poland. Monitoring of harbour porpoises was carried out at two sites: in the Pomeranian Bay and the Stilo Sandbank (Figure 10). The choice of location of acoustic detection devices was dictated by the possibility of comparing the results with the SAMBAH project. The results showed that ten times more positive detection days (4.56 DPD on average) were stated at the Pomeranian Bay site compared to the Stilo Sandbank site (0.32 DPD on average). The presence of porpoises in both areas is characterized by seasonality - in the Pomeranian Bay the maximum DPD values were recorded in summer months, while on Stilo Sandbank in spring (Opioła et al., 2018). Comparing to SAMBAH project, higher porpoise density (N/km^2) was detected during the "Pilot monitoring of marine species and habitats" (Table 2). The higher observed density in the Pomeranian bay compared to the Stilo Bank is in line with SAMBAH results.

Table 2. Average density (N/km^2) and detection positive days (DPD) of harbour porpoise at SAMBAH stations within the SAMBAH project and within the Polish pilot project that ran from 2015-2018.

Project	Mean density (N/km^2)		Mean detection positive days (DPD)	
	Pomeranian Bay	Stilo Bank	Pomeranian Bay	Stilo Bank
SAMBAH	0.0017	0.0003	0.43	0.08
Polish pilot	0.03776	0.00109	4.56	0.32

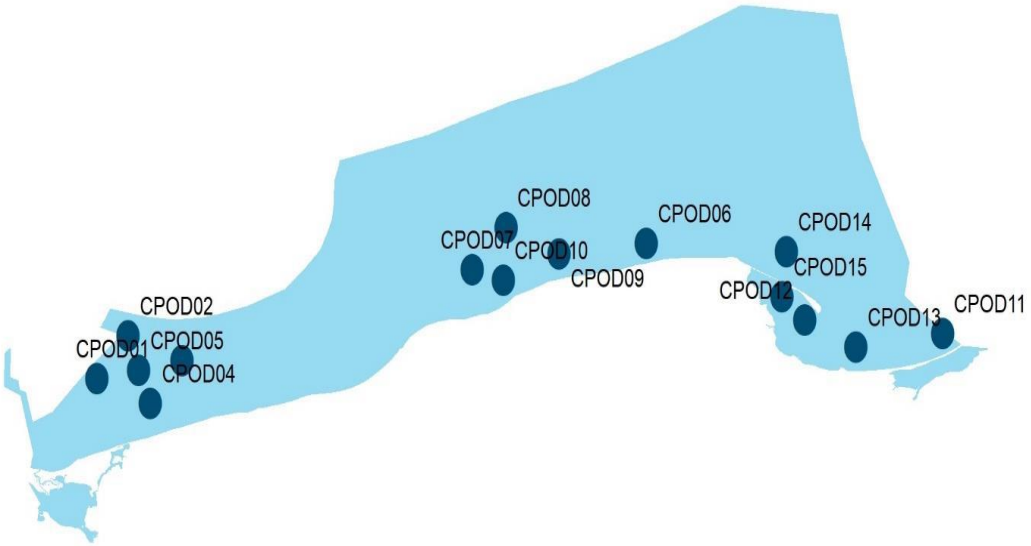


Figure 10. Location of monitoring stations in the Polish Marine Waters under the "Pilot monitoring of marine species and habitats" project (Pomeranian Bay – west coast, Stilo Bank – middle coast, and Gdansk and Puck Bays – east coast).

Since 2018, there has been national monitoring of harbour porpoise included in the Polish "Monitoring of marine habitats and species programme". This is carried out using static acoustic methods, in three sites: Pomeranian Bay, Stilo Bank and, since 2021, Gulf of Gdansk including Puck Bay. Monitoring will be carried out two years out of 6 years. The monitoring period from March 2021 to March 2022 will probably continue to October 2022. Public procurement is planned to secure monitoring from November 2022 to March 2023.

Several static acoustic research projects on the distribution of harbur porpoises in the coastal Polish waters were undertaken by Hel Marine Station University of Gdansk in **Poland.** Projects in the southern part of the Gulf of Gdańsk was conducted between 2013 and 2014, and at 25 stations in Puck Bay between 2017 and 2018, built upon earlier acoustic monitoring there between 2009-2013. For Puck Bay in particular, the data show a seasonal influx of animals during the winter period (November-April) (Figure 11 and 12).

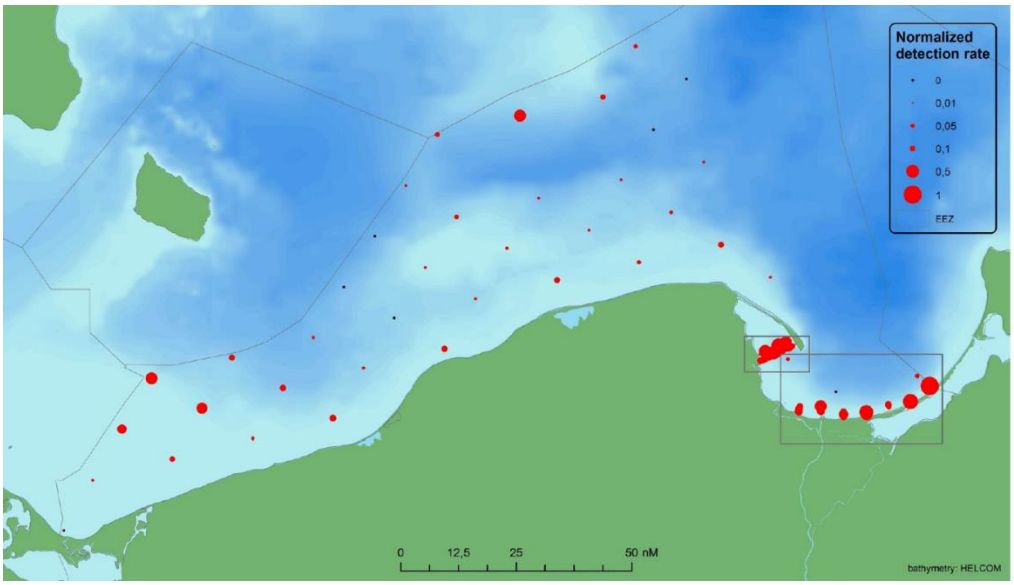
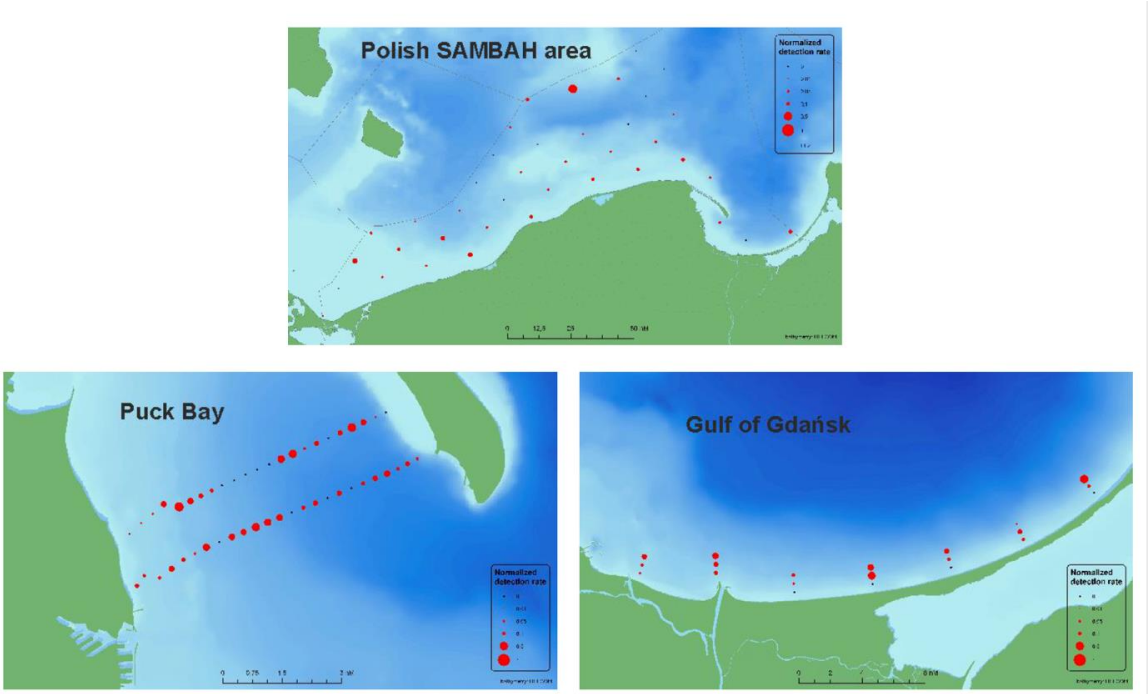


Figure 11. Detection rates in Polish waters from SAMBAH (mostly offshore) and HMS UG (in Puck Bay and Gulf of

Gdansk) projects to compare detection rates from the different projects and locations. (Source: Hel Marine Station UG).

a) Winter period (November to April)



b) Summer period (May to October)

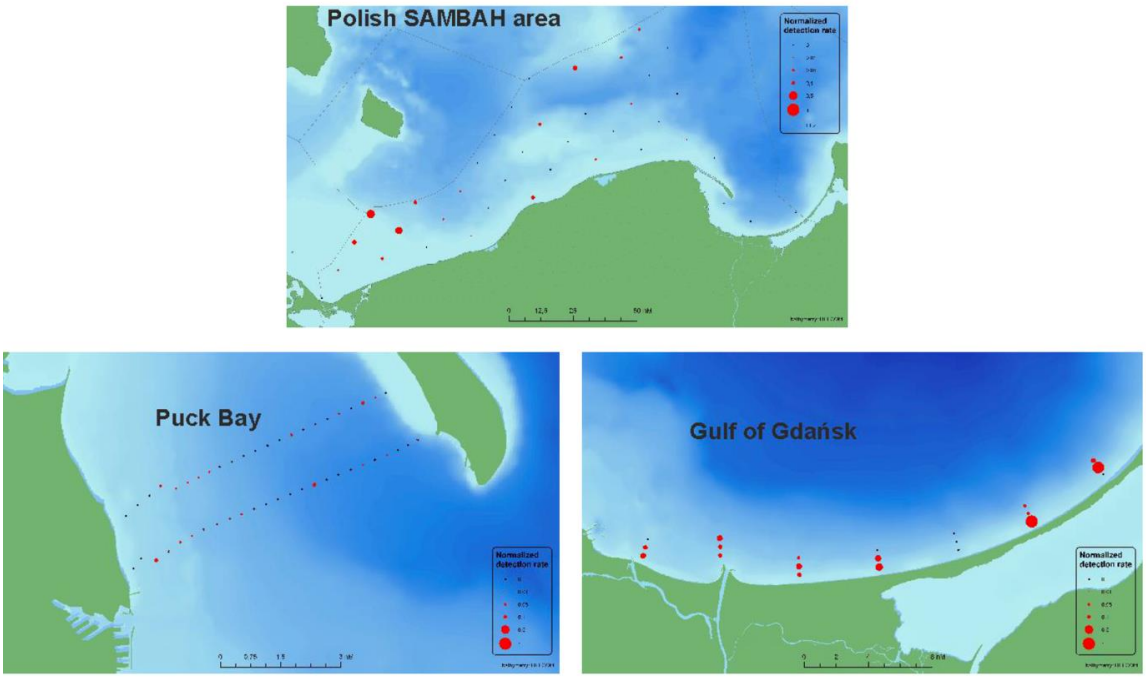


Figure 12. Seasonal Variation in Harbour Porpoise Acoustic Detection Rates (PPM) in coastal waters of the Polish Baltic: the Puck Bay (2009-2011), and the Gulf of Gdańsk , 2013-14 (Source: Hel Marine Station).

In 2017-18 an acoustic study of harbour porpoise distribution in the Puck Bay was carried on. Porpoises were detected in all seasons mainly in the outer part of the Bay, both within and outside the NATURA2000 site Zatoka Pucka I Półwysep Helski (Figure 13).

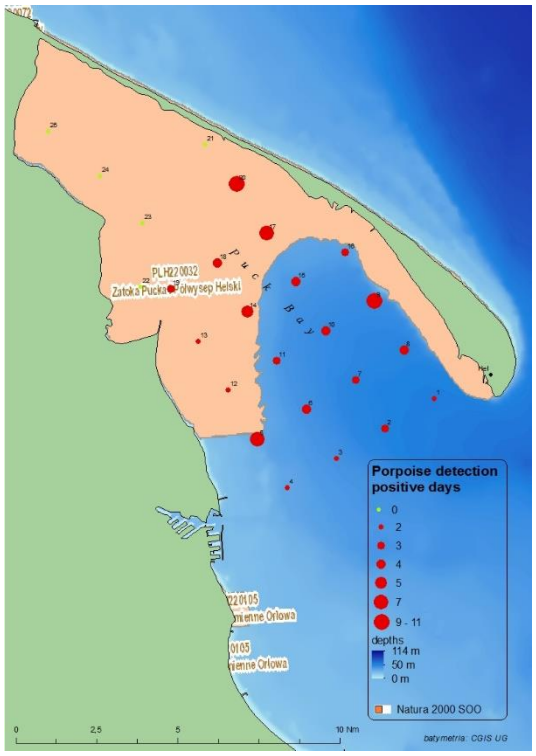


Figure 13. Distribution of harbour porpoise in the Puck Bay in 2017-18. (Source: Hel Marine Station)

In November 2020, 60 C-PODs were deployed 1-3 nm from the shoreline along the Polish coast and will record harbour porpoise presence for 12 months. The results will allow for determining the temporal and spatial variability of harbour porpoise presence in the coastal zone, which will provide a basis for developing recommendations on conservation and management of the population in Poland.

Sweden has also continued acoustic monitoring after the end of the SAMBAH Project. Since 2017 there are eleven stations operated by the Swedish Museum of Natural History off southeastern Sweden (Figure 14). Four of these stations are within the Hoburgs bank and Midsjöbankarna Natura 2000 site. There is also a station for porpoise & underwater noise monitoring within this SAC. In May 2019 stations were added to the national acoustic monitoring programme, within Natura 2000 sites on the Swedish west coast, i.e. in the WBBK area. In addition, there is a regional monitoring programme with stations in Blekinge and Kalmar, and more counties have expressed interest to start monitoring, however many of the new stations have not been allowed by the Swedish Military Forces due to national security concerns (Fig. 15). This is worrying given the importance of continuous monitoring of this population, and effort should be put into resolving this issue.

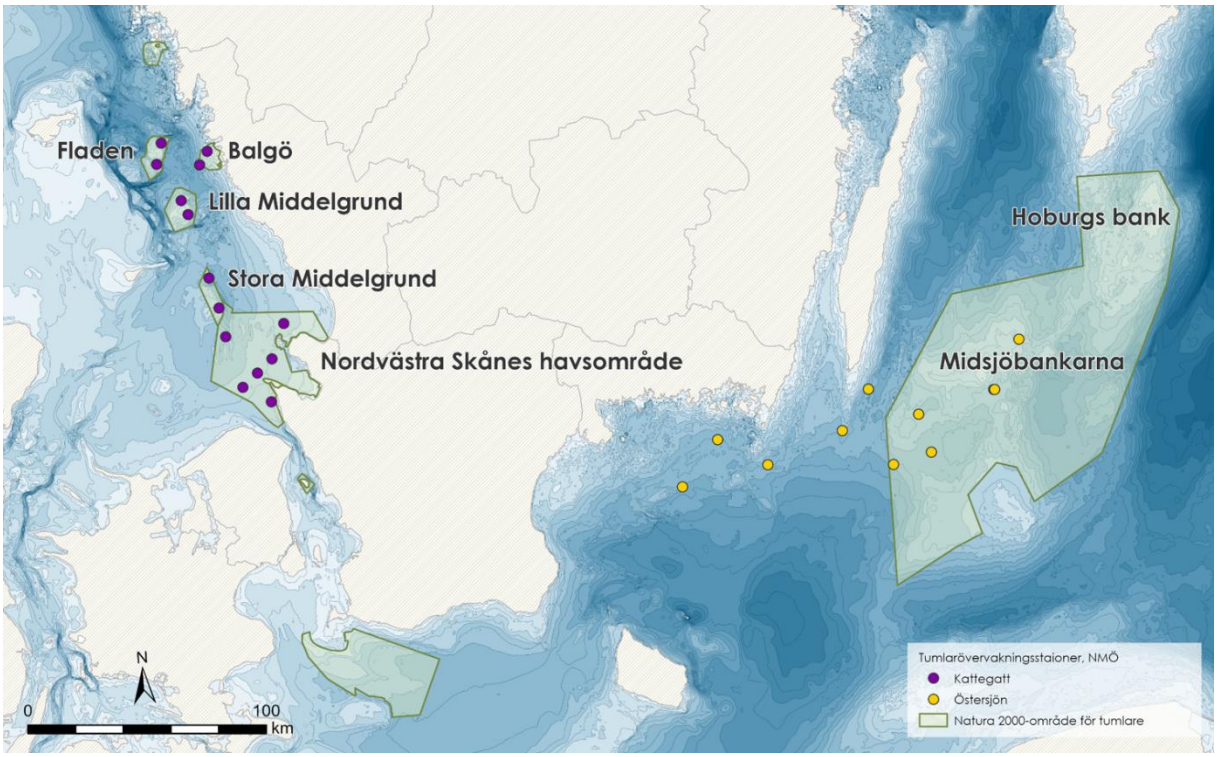


Figure 14. Stations in the Swedish national monitoring programme, including Natura 2000 areas designated for harbour porpoise. Yellow marks Baltic Proper monitoring stations and purple marks Kattegat monitoring stations (Source: Swedish Museum of Natural History)

In a temporal trends analysis by the Swedish Museum of Natural History, data from the SAMBAH project in 2011-2013 were compared to data from the same stations in the national monitoring programme in 2017-2020 (Owen et al., 2021). A total of 12 stations from Hanö Bay, south of Öland and within the Swedish Natura2000 area Hoburgs Bank och Midsjöbankarna and to the west of this area were included in the analysis. Results show that on average, there were 29% more detection-positive hours per day, and there was an increase at 10 out of 12 stations (5-479% higher). Additionally, a trend analysis was carried out for three stations within the Natura2000 area (SAMBAH stations 1032, 1036 and 1041). The combined trend for those three stations shows a 2.4% increase per year. Together, these stations had >80% power to detect a 5% change over 10 years of data while individually over 15 years of data may be needed for the same power. This supports the need for continuous acoustic harbour porpoise monitoring in the Baltic Proper. The results are also supported by similar results that were seen in the Polish “Pilot monitoring of marine species and habitats” (Table 2).

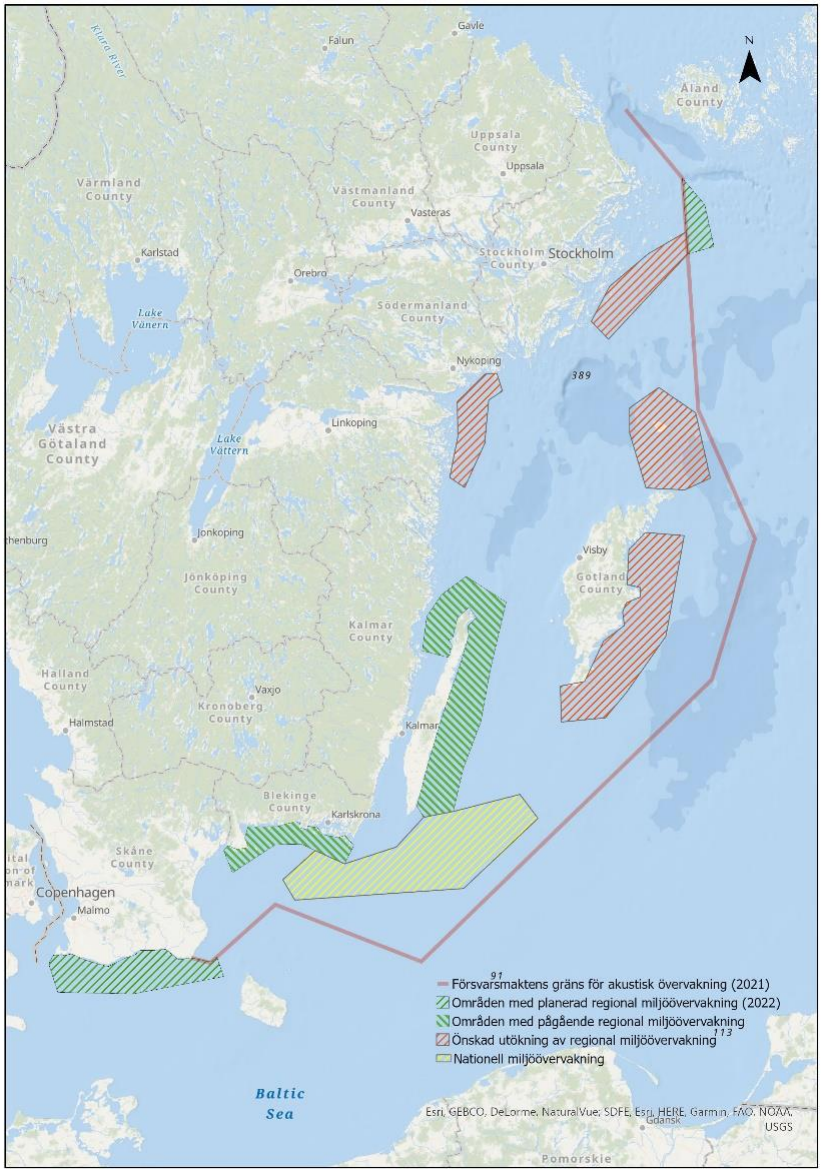


Figure 15.
Areas of harbour porpoise monitoring in Swedish waters of the Baltic Proper. Light green shows the national monitoring program (see fig. 14) and dark green shows areas where regional monitoring is currently ongoing. Red shows areas of intended future regional monitoring once permission granted. West of the red line, the Swedish Military forces will currently not allow acoustic monitoring.

These results are a potential indication that the population decline may have stalled, or even that the population is slowly increasing. However, detection rates are only available for part of the population range and the trend is much lower than the potential increase for harbour porpoises. Also, detection rates are not directly relatable to an abundance estimate. Therefore, there is a strong need for a population wide abundance survey such as SAMBAH II to achieve an updated absolute estimate of abundance.

The presence of porpoises in Finnish waters, together with SAMBAH results, suggests that they also occur in the other **eastern Baltic states**, even if only intermittently or in small numbers. In **Lithuania**, there is not yet a national monitoring programme, but an environmental impact assessment for the installation and operation of an offshore windfarm of up to 700 MW, is being carried out using 8 porpoise click detectors (F-PODs). The monitoring started in May 2022 and will continue for 12 -15 months. Unfortunately, no formal monitoring programmes exist in other eastern Baltic states. The deployment of porpoise click detectors in this part of the Baltic would provide a useful assessment of the occurrence of porpoises in the region, and could potentially be linked to already ongoing monitoring of underwater noise where stations are already maintained.

Opportunistic records

In addition to regular monitoring using for example passive acoustics, the collection of opportunistic records can also be informative of the distribution of harbour porpoises in the Baltic Proper, particularly in those areas where it is rare.

There is no official sighting scheme currently in operation in **Danish** waters, however, there is an app called Marine Tracker developed by the University of Southern Denmark. The primary focus of this app has been the waters around Funen, but during 2020 was also expanded to the island of Bornholm in the Baltic Proper.

A review of Danish strandings (see Table 3) was made by Kinze and colleagues (Kinze et al., 2018). Another harbour porpoise was found on Bornholm in 2018, but only two animals from the Wadden Sea was necropsied in 2018 (Jensen et al., 2018).

Table 3. Summary of harbour porpoise strandings for the period 2008-2017 divided by zoo-geographical region Outer Danish Waters (ODW), Inner Danish Waters (IDW) and the Waters Around Bornholm (WAB)

	Zoo-geographical region			
Year	**ODW**	**IDW**	**WAB**	**Total**
2008	149	75	0	**224**
2009	49	84	1	**134**
2010	73	46	0	**119**
2011	97	50	1	**148**
2012	66	52	3	**121**
2013	102	34	0	**136**
2014	78	43	0	**121**
2015	9	13	1	**23**
2016	57	19	1	**77**
2017	55	19	0	**74**
Total	**735**	**435**	**7**	**1177**

In **Finland**, opportunistic sightings are collected by the Finnish Ministry of Environment and the sightings campaign is promoted annually in the media. From 2000–2020, there has been approximately 75 sightings of 130 animals, with an average group size of 1.7 (range 1-6).

Germany has a well organised sighting scheme, and sightings are being logged annually. Figure 16 shows a map of the 785 harbour porpoise sightings reported in 2021.

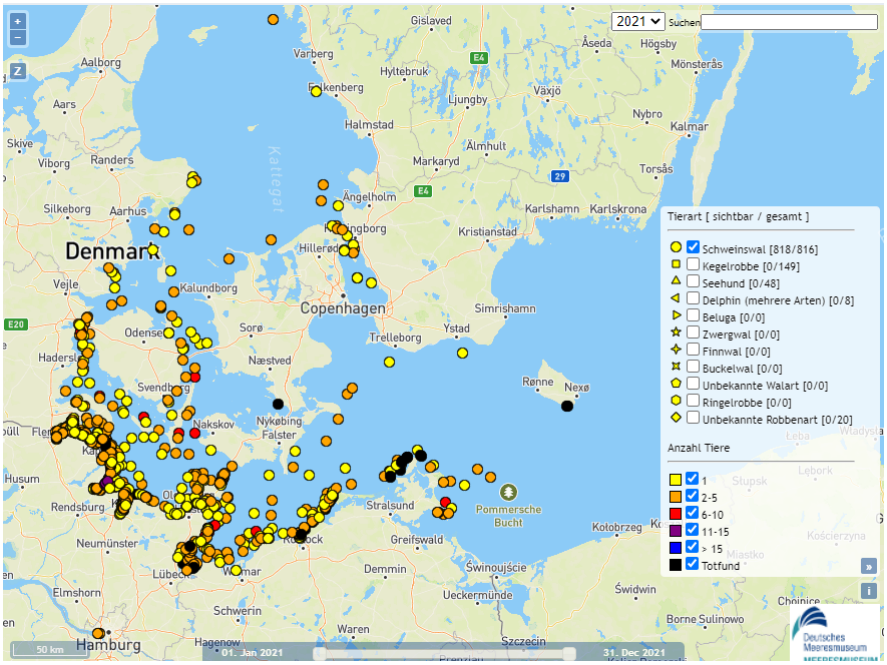


Figure 16. 785 opportunistic sightings of harbour porpoise were reported in Germany during 2021 (Source: German Oceanographic Museum).

In **Poland**, voluntary reports of sightings, strandings, and bycaught animals have been collected by Hel Marine Station UG since 1986. Locations of reports collected until 2021 are presented in Figure 17.

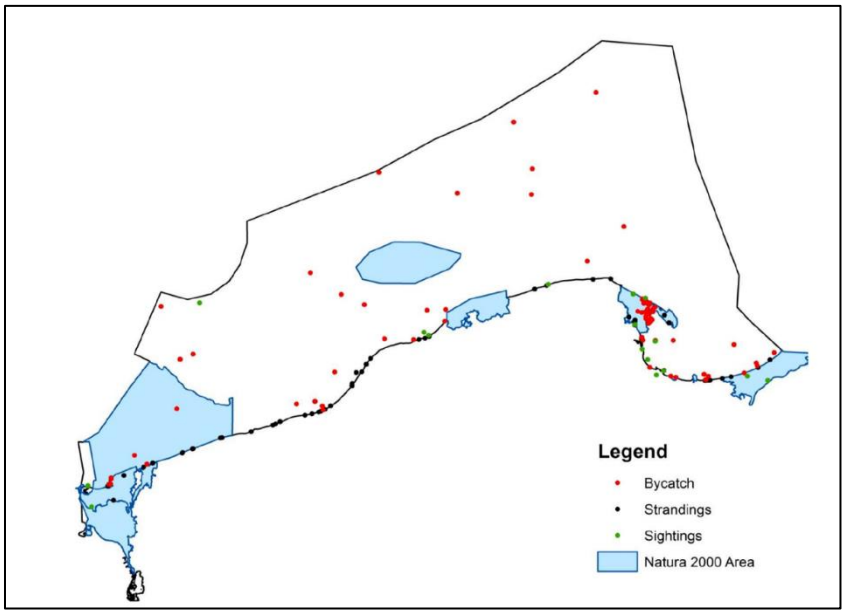


Figure 17. Occasional voluntary reports of harbour porpoises in the Polish EEZ between 1986 and 2021 (Source: Hel Marine Station UG).The Natura 2000 areas of Słupsk Bank and Vistula lagoon do not have the harbour porpoise listed on the Standard Data Form.

In **Sweden**, the Swedish Museum of Natural History and Swedish Species Information Centre collates records from live sightings, and dead animals (strandings) in Swedish waters, and a new web reporting form was launched by SMNH in 2021. Due to technical problems, validation of submitted reports have not been possible since then, but this has been fixed in spring 2022 and all reported observations since 2021 are now to be validated. In 2020 there were 8 live observation of porpoises reported east of the SAMBAH summer management border out of a total of 235 live observations reported to SMNH (Figure 18).

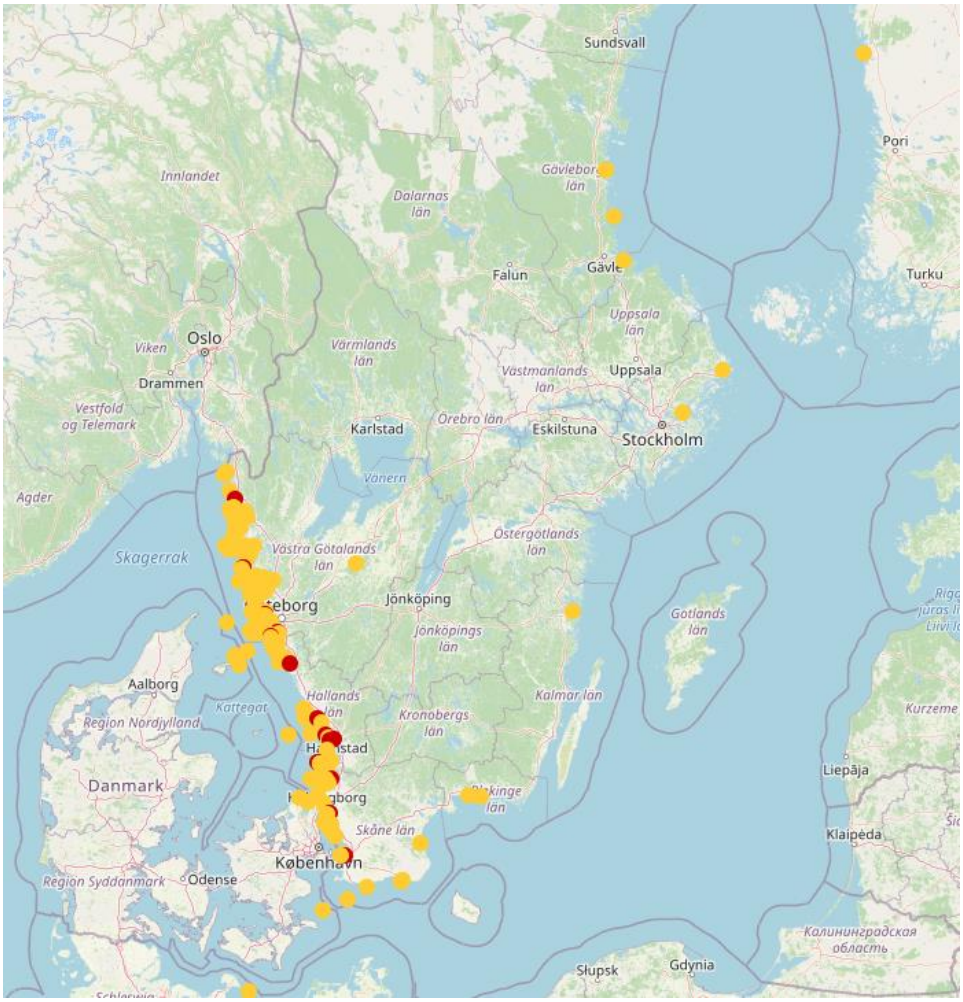


Figure 18. Harbour porpoise sightings reported to the Swedish Museum of Natural History during 2020. Yellow dots are live sightings and red dots are animals found dead.

In **Lithuania**, opportunistic records are logged, and this has yielded official reports of just 13 strandings between 1903 and 2017, and three sightings at sea. No sightings or strandings have been reported since.

HELCOM has been collaborating with ASCOBANS to produce an online database of records of harbour porpoise from the Baltic Proper. This data now available on the HELCOM biodiversity database (https://maps.helcom.fi/website/biodiversity/). The reporting form for countries to report data to the database is being updated. A plot of records of harbour porpoises from 1800-2015 is presented in Figure 19.

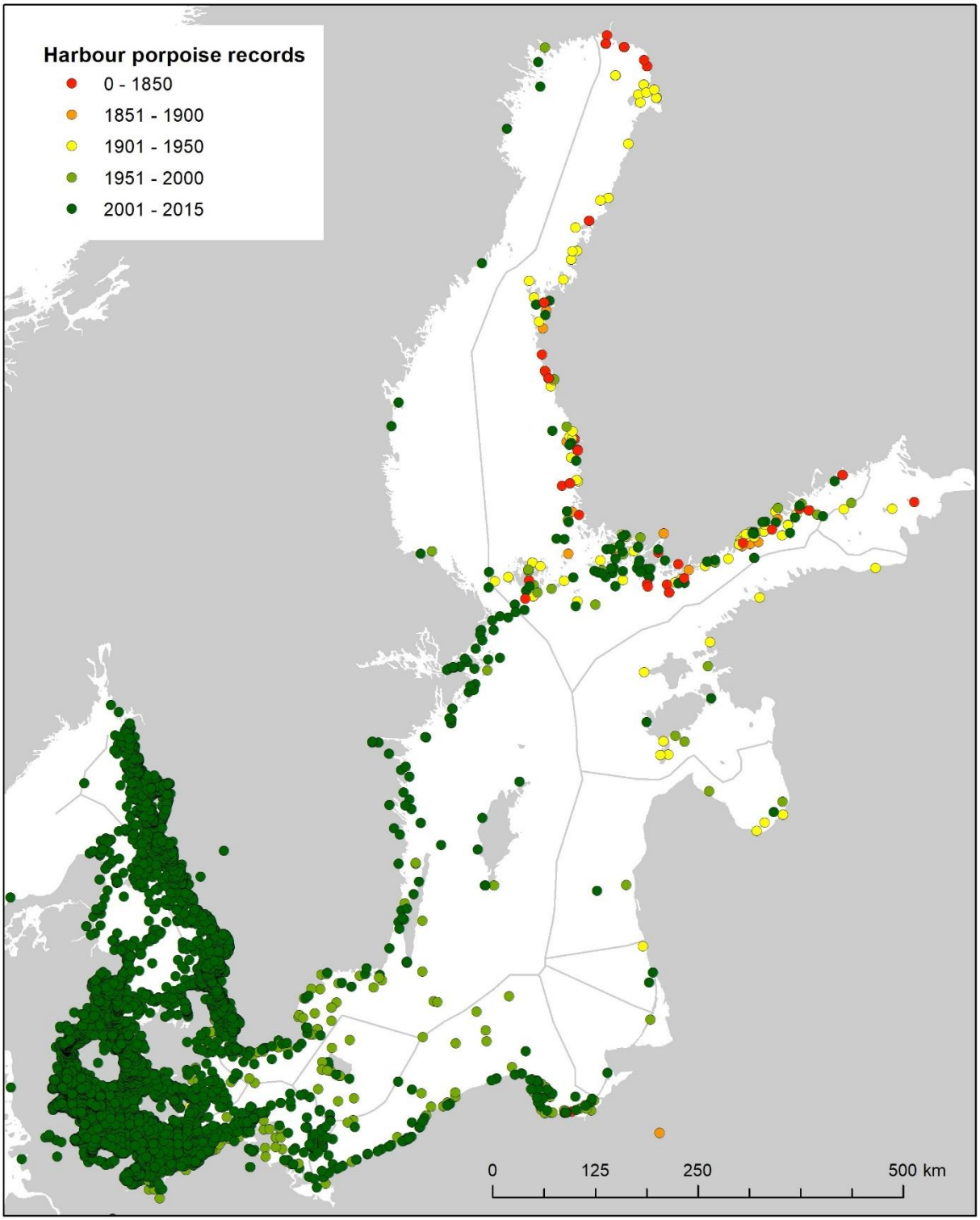


Figure 19. HELCOM Map of Harbour Porpoise Records from the Kattegat, Belt Seas and Baltic Proper, 1800-2015 (Source: HELCOM Database).

Population Structure & Management Units

The Jastarnia Plan took the management area for porpoises in the Baltic proper as all waters east of the Darss and Limhamn Ridges, with the new Conservation Plan for the Western Baltic, the Belt Sea and the Kattegat filling the gap between the Baltic Proper and the North Sea (see Figure 20).

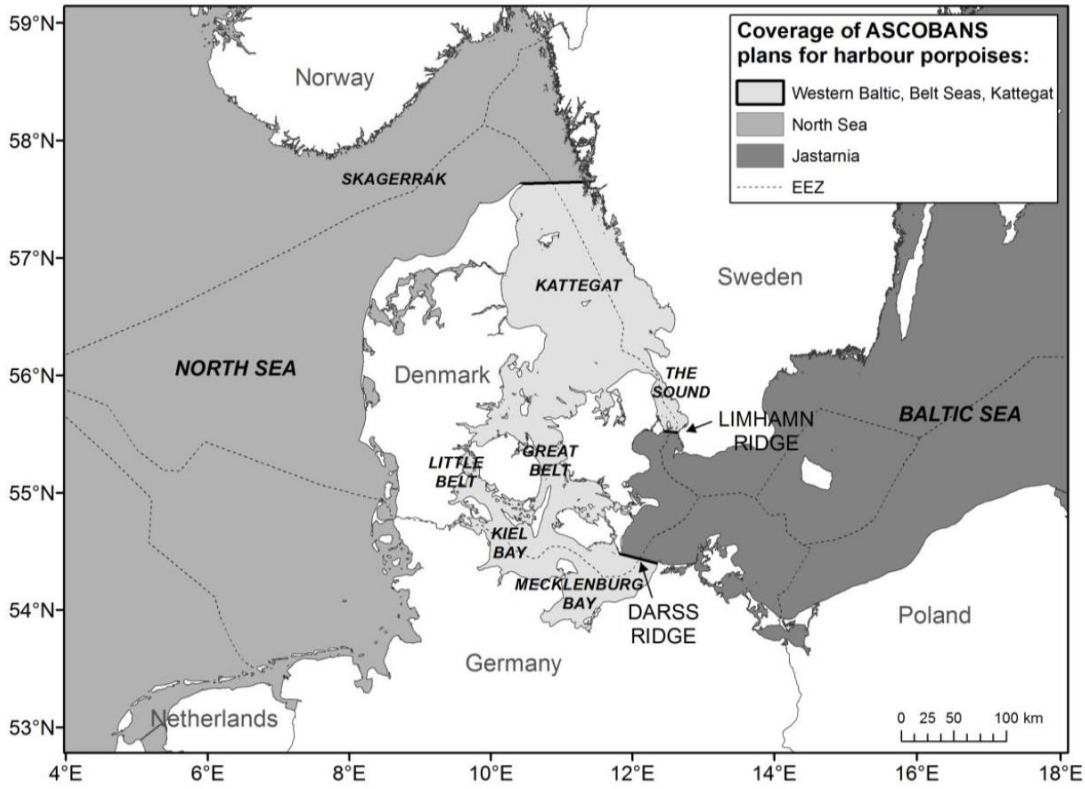


Figure 20. Map of the North Sea and the Baltic indicating where the geographical area covered by the Plan for the population in the Western Baltic, the Belt Sea and the Kattegat adjoins that of the ASCOBANS North Sea Plan and the ASCOBANS Jastarnia Plan. The dashed line indicates the national borders of the Exclusive Economic Zone (EEZ) (Source: ASCOBANS, 2012).

For the purpose of estimating the size of the Baltic Proper population, the SAMBAH Project treated this as everywhere east of the hatched line indicated in Figure 4, in the summer months May-October (Amundin et al., 2022; Carlén et al., 2018). Sveegaard *et al*. (2015), on the basis of genetics, morphology, acoustics and satellite tracking, proposed a slightly different set of boundaries, the North Sea population management area having its southern boundary extending into the Kattegat (the east-west line drawn at 56.95°N), and the Belt Sea population management area having its eastern boundary around 13.5°E (Figure 21). They recommend that ASCOBANS reconsider the boundaries for each of the plans taking account of these findings.

The ICES special request advice on emergency measures to prevent bycatch of common dolphin (*Delphinus delphis*) and Baltic Proper harbour porpoise (*Phocoena phocoena*) in the Northeast Atlantic (ICES, 2020) proposes to use 13.0°E as the western management border for the Baltic Proper harbour porpoise during November – April, and the "SAMBAH border" during May – October. The basis for using 13.0°E is the seasonal porpoise distribution patterns at Rügen (Gallus et al., 2012), the morphological difference between the populations (Galatius et al., 2012), and the bathymetry of the southern Baltic, showing that the deep waters of the Arkona Basin north of Rügen reach approximately longitude 13°E).

It was agreed in 2021 that the Jastarnia and WBBK areas will be adjusted as plans are updated, so that the WBBK plan will include waters from 56.95°N to 13.5°E, and the Jastarnia plan will include the Baltic from 13.0°E.

The fact that summer and winter distributions appear to vary with movement across boundaries complicates issues, and there is no definite answer to exactly how far west the Baltic Proper harbour

porpoises migrate during winter. However, a decision should be taken on the boundaries for implementing all three porpoise conservation plans, and adopted by those countries with EEZs spanning more than one conservation plan. This applies in particular to the countries of Germany, Denmark, and Sweden. Also, in the future the reports from countries should apportion information to the appropriate management areas. At present, information is mostly given per country, not per management area.

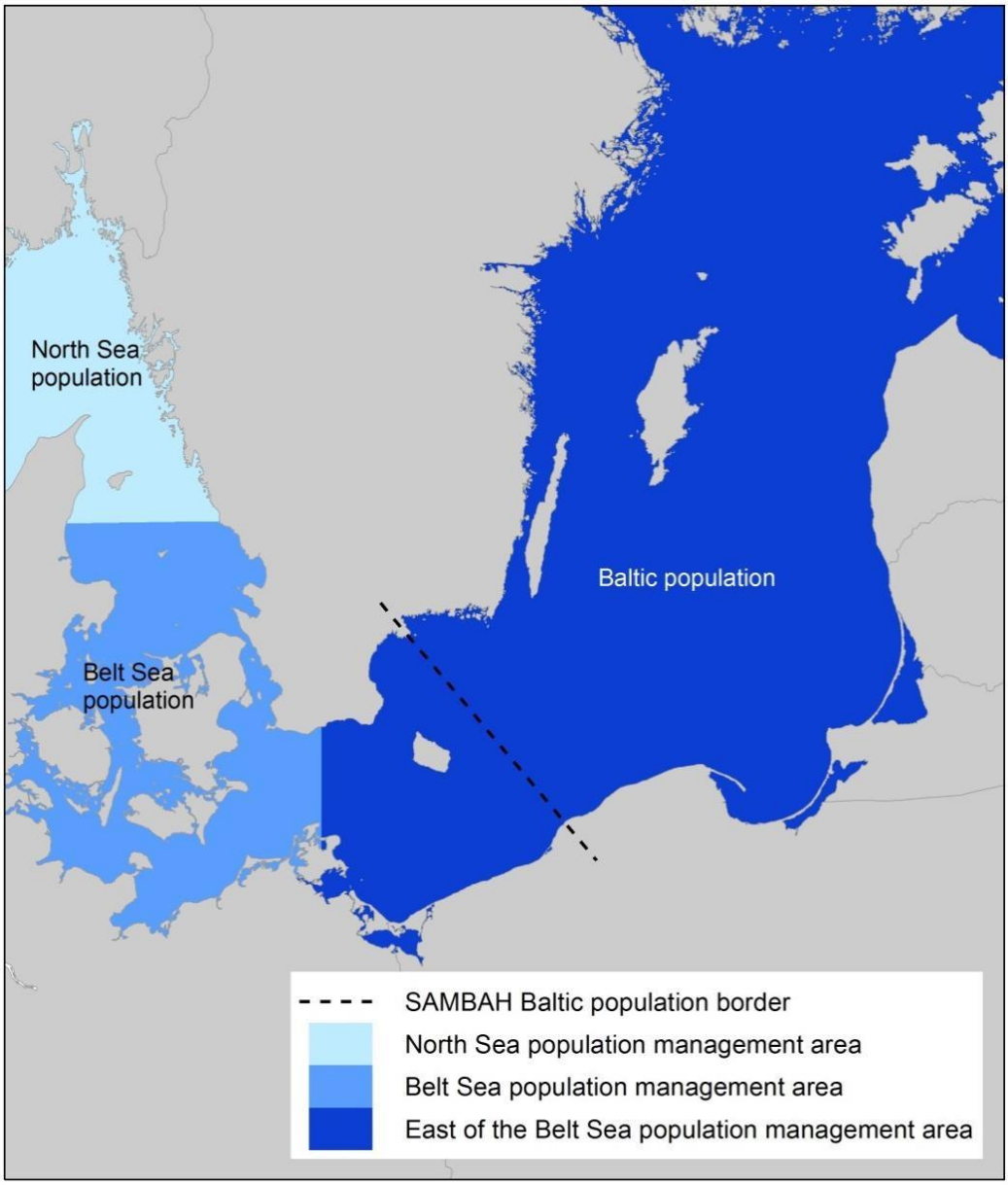


Figure 21. Harbour porpoise populations in the Baltic region. Blue shading indicates the borders proposed for the management unit of the Belt Sea population by Sveegaard *et al.* (2015), the dotted black line the spatial separation during May-Oct of the Belt & Baltic populations by SAMBAH (2016a). All borders are for the summer half-year only.

Conservation action clearly should be the priority for the harbour porpoise in the Baltic Proper. Notwithstanding that, some more work on population structure in the region would be beneficial. The conclusions reached by Sveegaard et al. (2015) apply to summer month distributions, and the SAMBAH results are also more clear for the period from May - October. It would be useful to explore potential differences at other seasons, bearing in mind that animals from the German Belt Sea appear to move

eastwards seasonally into the Baltic Proper. There remains debate as to whether there is indeed a distinct population inhabiting only the Baltic Proper, as highlighted by the Powerpoint presentations of Ralph Tiedemann and Per Palsbøll at the 14th Jastarnia Group meeting in 2018. Palsbøll reanalysed the samples used by Lah et al. (2016), again using single nucleotide polymorphisms (SNPs) on the same 37 porpoise samples from the North Sea (n=6), Skagerrak (n=5), Kattegat (n=6), Belt Seas (n=10) and Baltic Proper (n=10) used by Lah et al., obtaining the same plots but by using a likelihood-based analytical approach to identify the most likely number of genetic clusters present in the data, and a larger sample (n=73), found no evidence for a distinct population in the Baltic Proper. Tiedemann, on the other hand, also using SNPs but with a sample of 109 from the different regions (North Sea, n=20; Skagerrak, n=10, Kattegat, n=19; Belt Seas, n=39; Baltic Proper, n=21), and a variety of analytical approaches, considered they discriminated between a Baltic Proper population and one in the Belt Seas. Another presentation by Enrique Celemín Amaro, a PhD student with Ralph Tiedemann, at the 18th meeting of the Jastarnia group in March 2022 concludes based on SNP analysis that there are indeed three distinct genetic clusters of harbour porpoise in the Baltic Sea Region whereof one can be considered as the Baltic Proper population, although the geographic separation is not clear, probably due to migration.

In all these studies, the sample sizes from the Baltic Proper remain very small, and very large from the western end. There needs to be more sampling of animals in the eastern sector of the Baltic Proper for comparison with animals in the west, and a comparison between extant populations and museum specimens from historical times to establish whether the original population of the Baltic remains intact after the declines of the middle of the last century. Now that the SNP population assignment panel is almost ready, it would be very interesting to run samples from for example the seven Danish specimen from Bornholm (see table 3), to see if animals in this area mainly belongs to the Baltic Proper population or to the Belt Sea population.

Key Conclusions and Recommendations *The first abundance estimate (2011-13, SAMBAH) for the entire Baltic Proper indicates a population of around 500 porpoises, although with wide confidence limits. The greatest concentration appears to be off SE Sweden around Hoburgs and Northern and Southern Mid-sea banks although it is clear that the species also occurs up to Finnish waters in the northern Baltic Proper. There are indications from Swedish and Polish national monitoring of slightly increased detection rates at a few SAMBAH stations used in national monitoring.*

The SAMBAH II project should be supported to gain further knowledge on distribution and to achieve a new abundance estimate, hopefully with narrower confidence intervals.

The existing monitoring programs should continue and similar monitoring should be put in place in the remaining countries as well. The issue with the Swedish military banning the use of porpoise click detectors in expanding regional monitoring and EIA investigations needs to be resolved. Regular analysis of monitoring data from ongoing national programs should be carried out to ensure for example that no decreases in detection rates or significant changes in distribution patterns are missed.

Countries should make genetic samples available to the German team developing the SNP panel for population assignment. It is a problem that bycaught animals are not reported and delivered to the authorities by fishermen since these are important samples. Efforts should be taken to improve this situation.

Polish national monitoring programme should be extended to also include the Polish part of the Southern Midsea Bank, since this area is part of the potential breeding area for the Baltic Proper porpoise.

3. Monitor, estimate and reduce bycatch

Reporting of fishing effort and any associated bycatch is done within ICES Areas, with subdivisions as indicated in Figure 22. In 2019, no bycatch of harbour porpoises was recorded in the Baltic Proper east of ICES Area 3.d.24; six porpoises were reported bycaught in the Sound (27.3.b.23)(ICES, 2022).

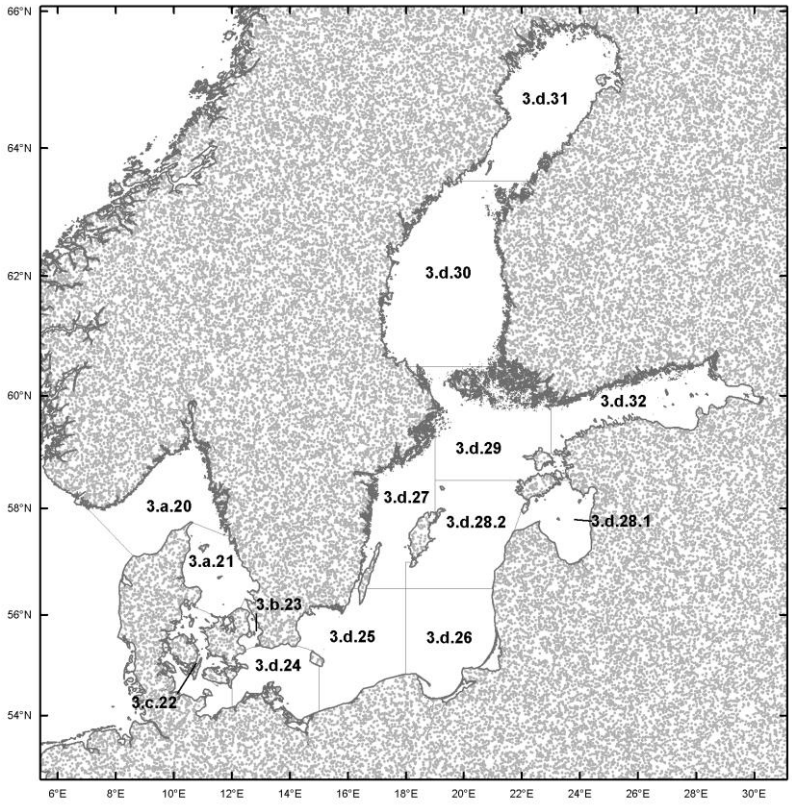


Figure 22. Map of the ICES Area subdivisions of the Skagerrak, Kattegat, Belt Seas and Baltic Proper, for the reporting of catch statistics (Source: ICES).

The distribution of fishing effort for static gear is shown in Figure 23. Gillnet fishing effort across ICES subdivisions 22-28 has generally declined over the period 2004-16 (ICES, 2019). To properly assess the impact of bycatch, focus should be placed on monitoring gillnetting effort and any mitigation measures (pingers, alternative fishing methods) should be applied to the appropriate area and gear type.

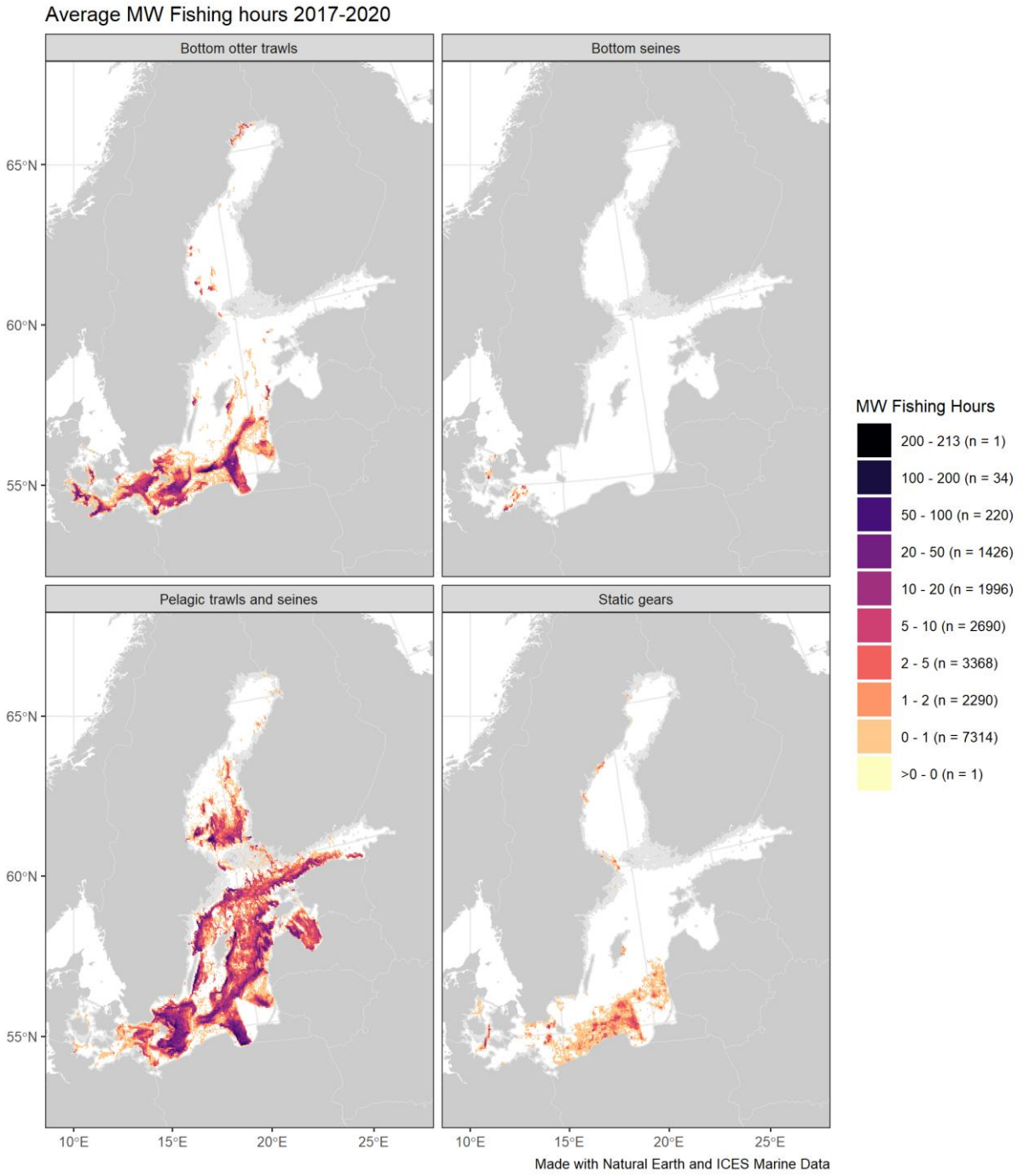


Figure 23. Spatial distribution of average fishing effort (mW fishing hours) in the Baltic Sea during 2017-2020 for static gear. Fishing effort data are only shown for vessels >12 m carrying VMS. Russian data are absent (ICES, 2021).

In August 2019, a ban on directed catches of cod in parts of the Baltic came into effect. At the start of 2022, there is a ban in place on directed catches of both eastern and western cod stocks in the entire Baltic Proper. This ban on cod fisheries has caused a considerable decrease in gillnet fishing effort in the Baltic Proper, as exemplified by Poland in figure 24.

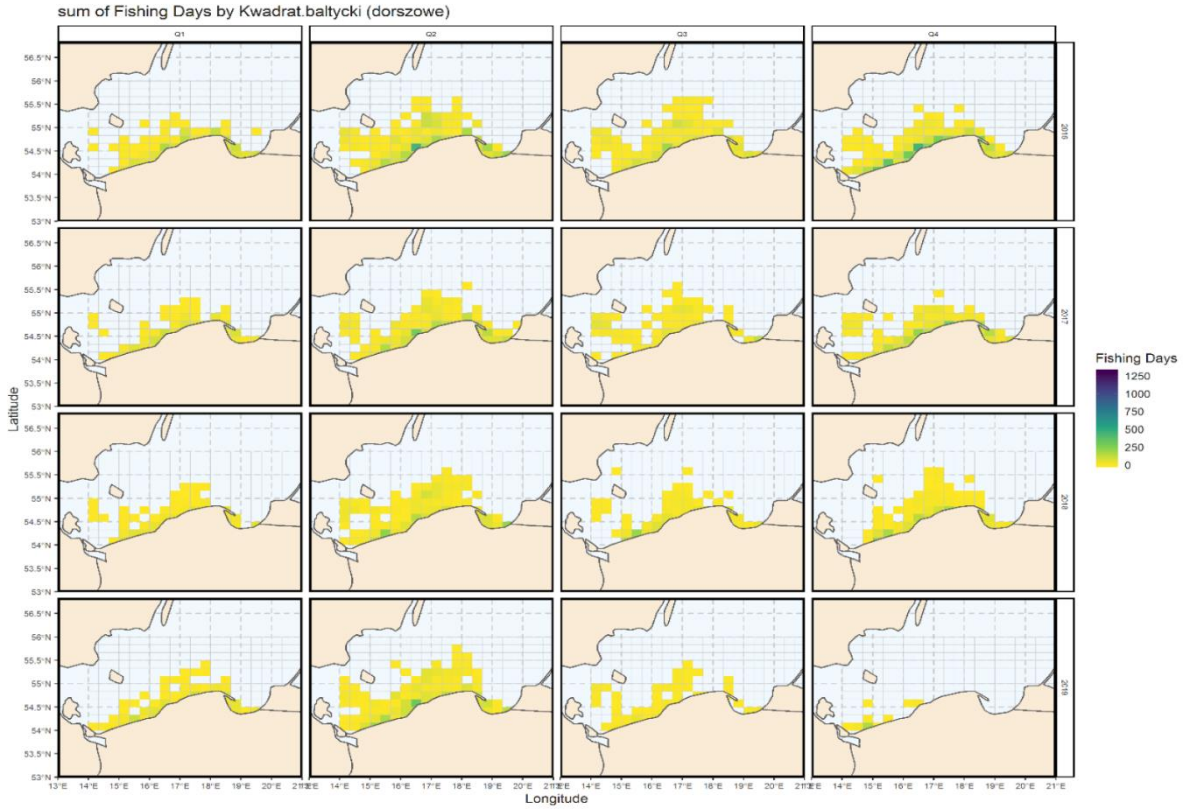


Figure 24. Fishing days with gillnets in Polish waters per quarter from 2016 to 2019. Map prepared by the Polish NMFRI (National Marine Fisheries Research Institute) for the report of ICES WKEMBYC (2020).

In the HELCOM ACTION project, relative bycatch risk has been calculated for the Swedish and Polish EEZ based on data from the SAMBAH project (Carlén et al., 2018) and data on gillnet fishing effort from national authorities (Figures 25 and 26). There are plans within SAMBAH II to evaluate methods for monitoring fisheries efforts and assessing bycatch risk zones for the entire Baltic Proper harbour porpoise population range.

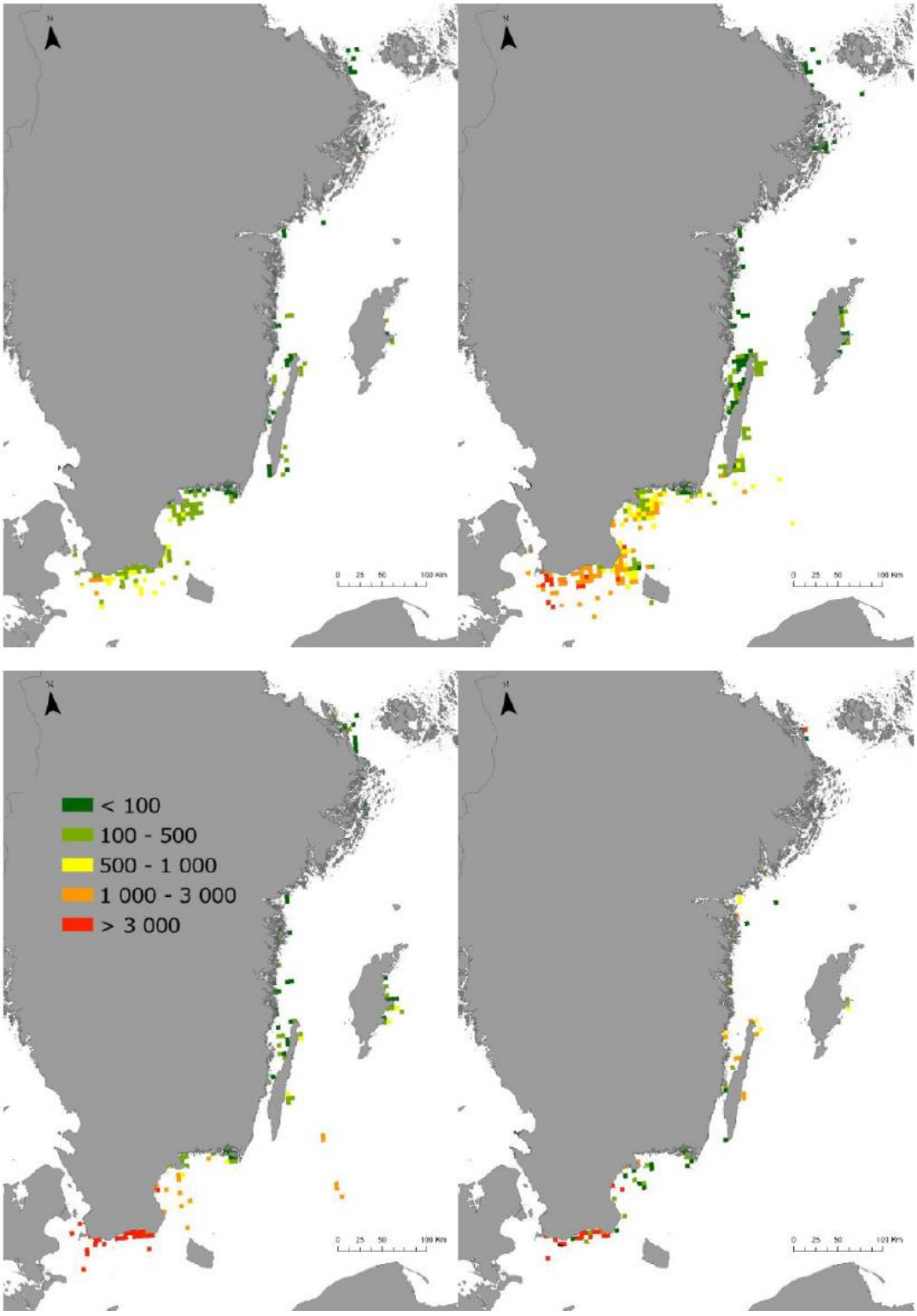


Figure 25. Relative bycatch risk for harbour porpoise in Swedish waters, estimated as the probability of harbour porpoise detection during May 2011-April 2013 (data from Carlén et al. (2018)) multiplied by gillnet fishing effort reported to the Swedish Agency for Marine and Water Management for 2019. Top left: Feb-Apr 2019; top right: May-July 2019; lower left: Aug-Oct 2019 (gillnet effort data after implementation of cod fishing ban); lower right: Jan 2019 (gillnet effort data before the cod fishing ban) and Nov-Dec 2019 (gillnet effort data after the cod fishing ban) (HELCOM ACTION, 2021).

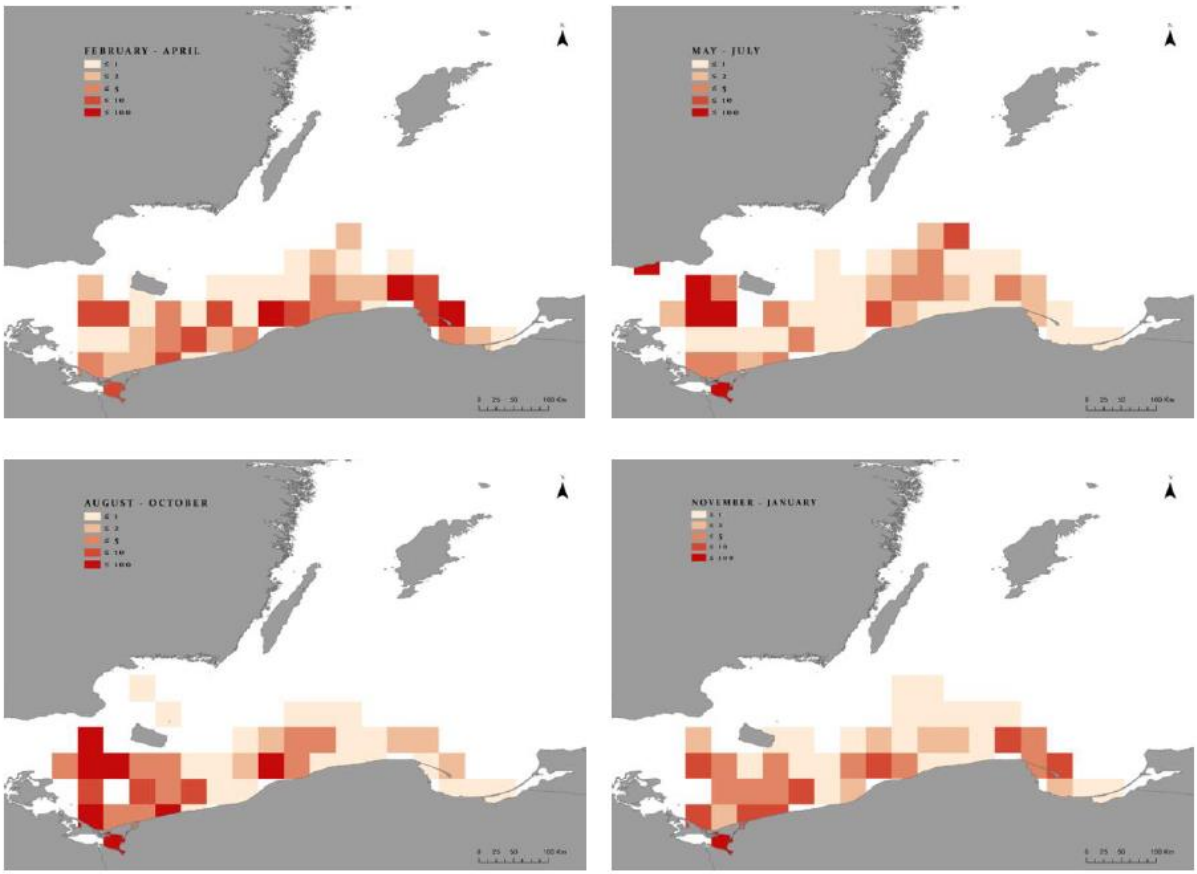


Figure 26. Relative bycatch risk for harbour porpoise, estimated as the probability of harbour porpoise detection during May 2011-April 2013 (data from Carlén et al. (2018)) multiplied by gillnet fishing effort reported by the National Fisheries Monitoring Centre database in Poland; top left: Feb-Apr 2018; top right: May-July 2018; lower left: Aug-Oct 2018 ; lower right: Jan 2018 and Nov-Dec 2018 (HELCOM ACTION, 2021).

In 2019, Regulation 812/2004 was repealed and replaced by regulation 2019/1241 on technical conservation measures. On the positive side, this regulation includes

- an obligation to ensure bycatch of sensitive species is minimised and where possible eliminated (Art. 3), which is consistent with ASCOBANS aspiration to reduce bycatch towards zero.
- a requirement for technical measures to be applied at the regional level to high risk fisheries, and the obligation for Member States to submit joint recommendations for new or updated measures within a clear timeframe (Article 18), as well as additional criteria to be met by such measures (Articles 20-26).
- a requirement for Member States to provide information on the effectiveness of existing mitigation measures and monitoring arrangements with respect to bycatch of sensitive species, including cetaceans, and to submit joint recommendations for additional mitigation measures for the reduction of incidental catches of these species (Annex XIII).

However, there are also some distinct drawbacks to the new regulation. For example, it still has the requirements for use of acoustic deterrent devices on any bottom-set gillnet or entangling net in the same areas of the Baltic Sea as Regulation 812/2004 (Figure 27), which are mostly not relevant for the Baltic Proper harbour porpoise, and in those areas, the demand for pingers is only valid for vessels ≥ 12 m, which excludes most gillnet vessels in the Baltic. Also, the agreed process for adopting new or updated measures through regionalisation still depends on Member States reaching unanimous agreement when submitting a joint recommendation. This means that if no such agreement is reached or Member States do not take the initiative to propose effective measures, nothing will

change, or at least it will take very long to do so through for example the involvement of the European Commission. This means that success will depend on the level of ambition of Member States.

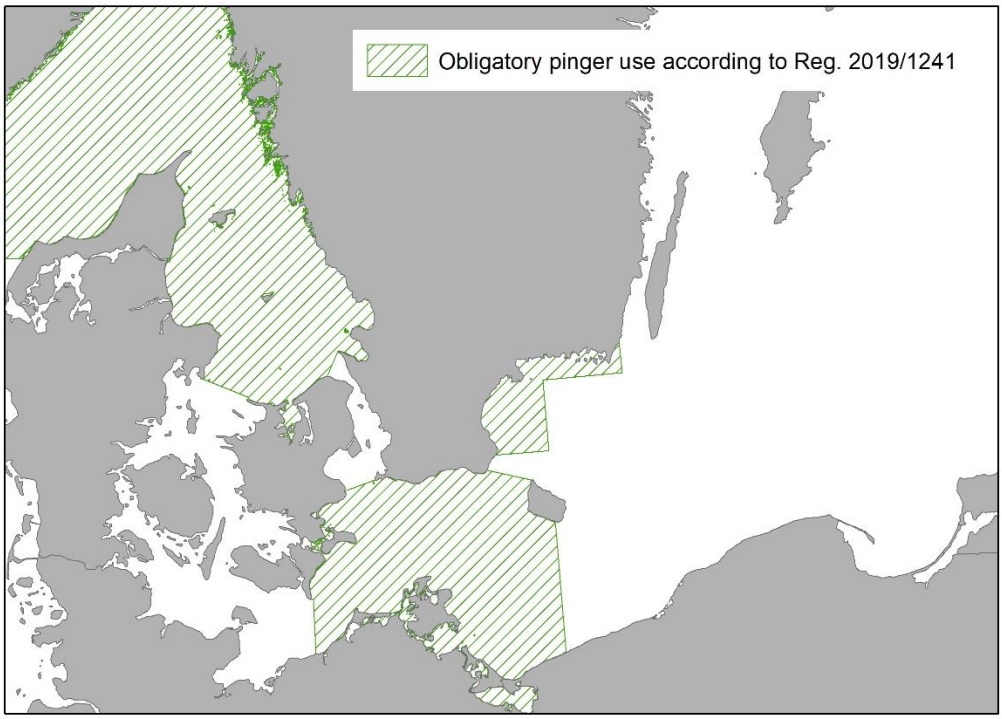


Figure 27. Areas where pinger use is obligatory on any bottom-set gillnet or entangling net for vessels over 12 m, according to Regulation 2019/1241.

When it comes to monitoring of cetacean bycatch, it is stated in 1941/2019 that within the Baltic Sea Region, regular monitoring shall be established for vessels ≥15 m using pelagic trawls in ICES divisions 3a, 3b, 3c and 3d south of 59°N all year, and division 3d north of 59°N only from 1 June to 30 September, and in bottom-set gillnet or entangling nets using mesh sizes equal to or greater than 80 mm in ICES divisions 3b, 3c and 3d. Unfortunately, the 15 m limit on vessel size means that basically all gillnet vessels in the Baltic will be excluded from the monitoring obligation, and that we have to rely on point 2 of Annex XIII where it says that "Member States shall take the necessary steps to collect scientific data on incidental catches of sensitive species". To date, little is done regarding this matter in the Baltic Proper.

There has been some discussion about the legal obligation for fishermen to report bycaught harbour porpoises, and what legislation is in place on the EU level and in the different countries. An attempt to clarify the regulations for each country can be found in table 4. For many countries, it is actually obligatory to report bycatch, although we do know that compliance is usually quite poor. In Sweden this was clarified in 2021 and it is now obligatory to report harbour porpoise bycatch. For Russia, Denmark and Germany Mecklenburg-Vorpommern and waters outside 12 nm in Schleswig-Holstein, we would suggest that reporting of cetacean bycatch is also made obligatory. The next step in Estonia, Latvia, Lithuania, Poland and Schleswig-Holstein would be to enforce the existing obligation and ensure that bycatch is in fact reported by fishermen.

Table 4. Legal obligation for fishermen to report bycaught harbour porpoises in EU legislation and in national legislation of the different countries of the Baltic Sea Region.

Country	Legal obligation for fishermen to report bycatch	Legislation
European Union	No (EU legislation directed at Member States, not at individual fishermen)	Commission Delegated Decision (EU) 2019/910, which implements part of the EU Data Collection Framework Regulation (EU) 2017/1004. Section 3(a): "For all types of fisheries, incidental by-catch of all birds, mammals and reptiles and fish protected under Union legislation and international agreements, including the species listed in Table 1D, including absence in the catch, during scientific observer trips on fishing ships or by the fishers themselves through logbooks."
Denmark	No	
Estonia	Yes	Fishing act § 61
Finland	Yes	Fisheries legislation § 62
Germany Schleswig-Holstein	Yes, within <12 nm	KüFischV §9(3)
Germany Mecklenburg-Vorpommern	No	
Poland	Yes	National regulation from the Ministry of Marine Economy and Inland Navigation § 20
Latvia	Yes	Cabinet Regulation No. 296, Regulations Regarding Commercial Fishing in Territorial Waters and Economic Zone Waters §8.10
Lithuania	Yes	
Russia	No	
Sweden	Yes	Havs- och vattenmyndighetens föreskrifter (HVMFS 2018:11), annex 2

In May 2020, as a response to a request from the European commission, ICES released special request advice on emergency measures to prevent bycatch of common dolphin (*Delphinus delphis*) and Baltic Proper harbour porpoise (*Phocoena phocoena*) in the Northeast Atlantic (ICES, 2020). For the Baltic

Proper harbour porpoise population, the advice lists a set of five bycatch mitigation measures that, if implemented as a whole, is expected to reduce the bycatch risk for the Baltic Proper harbour porpoise population.

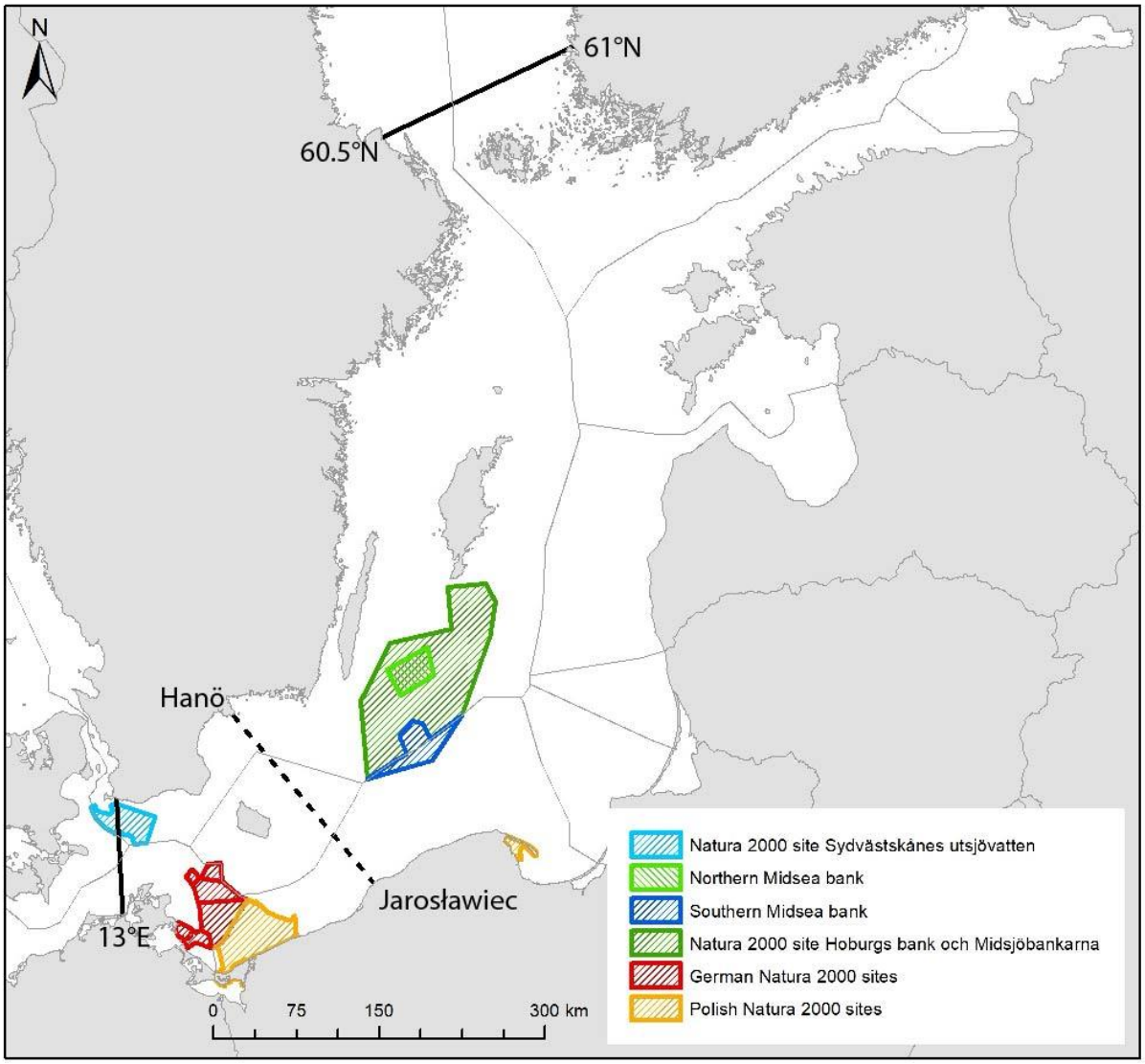


Figure 28. Map showing the Baltic Sea region with sites and areas referred to in the ICES advice (ICES, 2020).

The measures, together with some reasoning behind them, are:

1. **Closure of the Northern Midsea Bank to all fisheries, with the exception of passive gears proven not to bycatch harbour porpoise (this includes pots, traps, and longlines, but excludes static nets equipped with pingers or other acoustic devices).**
   The Northern Midsea Bank is defined here as the area delimited within the following coordinates:
   NW: 56.241°N, 17.042°E
   SW: 56.022°N, 17.202°E
   NE: 56.380°N, 17.675°E
   SE: 56.145°N, 17.710°E
   The northern Midsea bank is a core area for the Baltic Proper harbour porpoise during breeding season and also used to a high extent during winter. It is therefore considered especially important.

2. **a. Closure of the Natura 2000 site "Hoburgs bank och Midsjöbankarna" (SE0330308) for fishing with static nets.**
   This is a high-density area for Baltic Proper harbour porpoise and a designated site for their protection. The site encompasses a large proportion of the population in summer (May–October) and is used to a high extent during winter (November–April). The measure is intended to ensure that fishing effort from métiers of concern is removed.
2. **b. Closure of the Southern Midsea Bank for fishing with static nets.**
   The Southern Midsea Bank (here Figure 28) is defined here as the Swedish part of the Southern Midsea Bank, covering all waters between the Natura 2000 site "Hoburgs bank och Midsjöbankarna" (SE0330308) and the Swedish–Polish border. Polish waters are delimited as the area within the following coordinates (here Figure 28):
   SW: 55.377°N, 16.589°E
   SE: 55.466°N, 17.538°E
   NE: 55.797°N, 18.037°E
   This is an important habitat to the Baltic Proper harbour porpoise in May–October, especially during the breeding season, and is used to a high extent during winter (November–April). The measure is intended to ensure that fishing effort from métiers of concern is removed.
3. **Closure of the Natura 2000 sites Adlergrund (DE1251301), Westliche Rönnebank (DE1249301), Pommersche Bucht mit Oderbank (DE1652301), Greifswalder Boddenrandschwelle und Teile der Pommerschen Bucht (DE1749302), Ostoja na Zatoce Pomorskiej (PLH990002), Wolin i Uznam (PLH320019), and the SPA site Pommersche Bucht (DE1552401) for fishing with static nets during November–January.**
   Together, these smaller sites form a larger cluster (approximately 5,000 km2) of designated Natura 2000 site with Baltic Proper harbour porpoises being (occasionally) present during some winter months.
4. **Obligatory use of pingers on static nets in the area west of the sandbank Ryf Mew within the Zatoka Pucka i Półwysep Helski Natura 2000 site (PLH220032), with the concurrent closure of static net fisheries in the area east of the sandbank Ryf Mew within the Zatoka Pucka i Półwysep Helski Natura 2000 site.**
   This area had 18 bycatches of harbour porpoise between 1990 and 1999, and is only used by Baltic Proper harbour porpoise that are regularly present in the area. It is important that both measures are implemented simultaneously.
5. **Prohibit the use of static nets without the simultaneous use of pingers during May–October in EU waters between the southwestern management border, proposed by Carlén et al. (2018) (a line drawn between the island of Hanö, Sweden, and Jarosławiec near Słupsk, Poland) and a line drawn between 60.5°N at the Swedish coast and 61°N at the Finnish coast; and during November–April in EU waters between a line drawn along east of longitude 13°E between the Swedish and German coasts, and a line drawn between 60.5°N at the Swedish coast and 61°N at the Finnish coast, with the exception of Natura 2000 sites and other areas, where static net fisheries have been closed.**
   The seasonal areas reflect the current best knowledge of the seasonal distribution of the Baltic Proper harbour porpoise, and static nets are the gear type with the highest bycatch numbers in these areas and represent a large proportion of the fleet.

These recommendations were supported by the 16th meeting of the ASCOBANS Jastarnia group in June 2020, but the group made a comment (available at https://www.ascobans.org/en/document/technical-and-scientific-comments-ices-special-request-advice-emergency-measures-prevent) based on scientific studies that measure 3 on closing static net

fisheries in the cluster of Polish and German Natura 2000 sites should be valid from November – April, and not only November – January, as stated in the advice.

The ICES special request advice also included recommendations on monitoring measures for the Baltic Proper harbour porpoise, which are all seen as highly relevant:

1. **Accurate spatio-temporal recording of fishing effort (in appropriate metrics on métiers used by all vessels)**
   Detailed information on fishing effort is necessary to estimate bycatch, evaluate the temporal and spatial distribution risk of bycatch for different métiers, and to evaluate the effectiveness of implemented bycatch mitigation measures.
2. **Increased dedicated monitoring of bycatch of PETS**
   It is important to ensure representative recording of bycatch events.
3. **Monitoring of harbour porpoise occurrence**
   Ensuring operational data availability on detection rates of harbour porpoise in key habitats in response to the implementation of pinger use is necessary to be able to follow up possible effects of implemented measures.
4. **Compliance control of mitigation measures (pinger use)**
   Ensure the use and functionality of acoustic deterrence devices is very important for the measure to be efficient in mitigating bycatch.

In December 2020, the Baltic regional fisheries body BALTFISH submitted to the European Commission a first joint recommendation (JR) based on the ICES advice (see Annex I). This JR contained closures of harbour porpoise Natura2000 areas in the Baltic Sea in line with the advice measures 1-3, adding a Danish area (DK00VA261) but disregarding the comment from the Jastarnia group on prolonging closures in German and Polish areas to extend through to April. Measure 4 on partial closure and partial pinger use in the Natura2000 area Zatoka Pucka i Półwysep Helski (PLH220032) was not followed and instead BALTFISH proposed pinger use year-round in the entire Natura2000 area and also outside the Natura2000 area in the entire Puck Bay. The JR was reviewed by STECF during spring 2021 and was found satisfactory with the exception of missing measures to reduce bycatch in the entire population range. However, BALTFISH had promised such measures were to come in a second JR in June 2021.

During spring 2021, the military forces of some Member States suddenly raised concerns that large-scale use of pingers could interfere with military underwater acoustic activities using sonars. Being an issue of national security, this effectively put a stop to plans to implement pingers to minimise bycatch in the Baltic. Despite efforts from the EC, scientists and NGOs to resolve the issue, the second BALTFISH JR does not contain any proposals for pingers in the population range of the Baltic Proper harbour porpoise. Instead, the only measure added with the second JR is closure of static net fisheries in the Swedish area Sydvästskånes utsjövatten (SE0430187) between November-April, and use of pingers in the same area in May-October.

In autumn 2021 the European Commission transposed the two JRs into a delegated act which after the scrutiny by the European Parliament was published on 25 February 2022. The delegated act contains measures to reduce harbour porpoise bycatch in marine protected areas designated for the harbour porpoise, and a couple of other areas important for harbour porpoises. Some areas will be closed for fisheries with static nets all year round, some areas only for part of the year, and in a couple of areas pingers will be used on static nets instead of closing the fishery (Fig. 29). The closures came into effect on the day after the publication of the delegated act, and the pinger measures will come into effect on 1 June 2022. The act also contains a short sentence stating that Member States need to be able to monitor and control fishing activities in relation to these measures. There are still no measures in the rest of the population range.

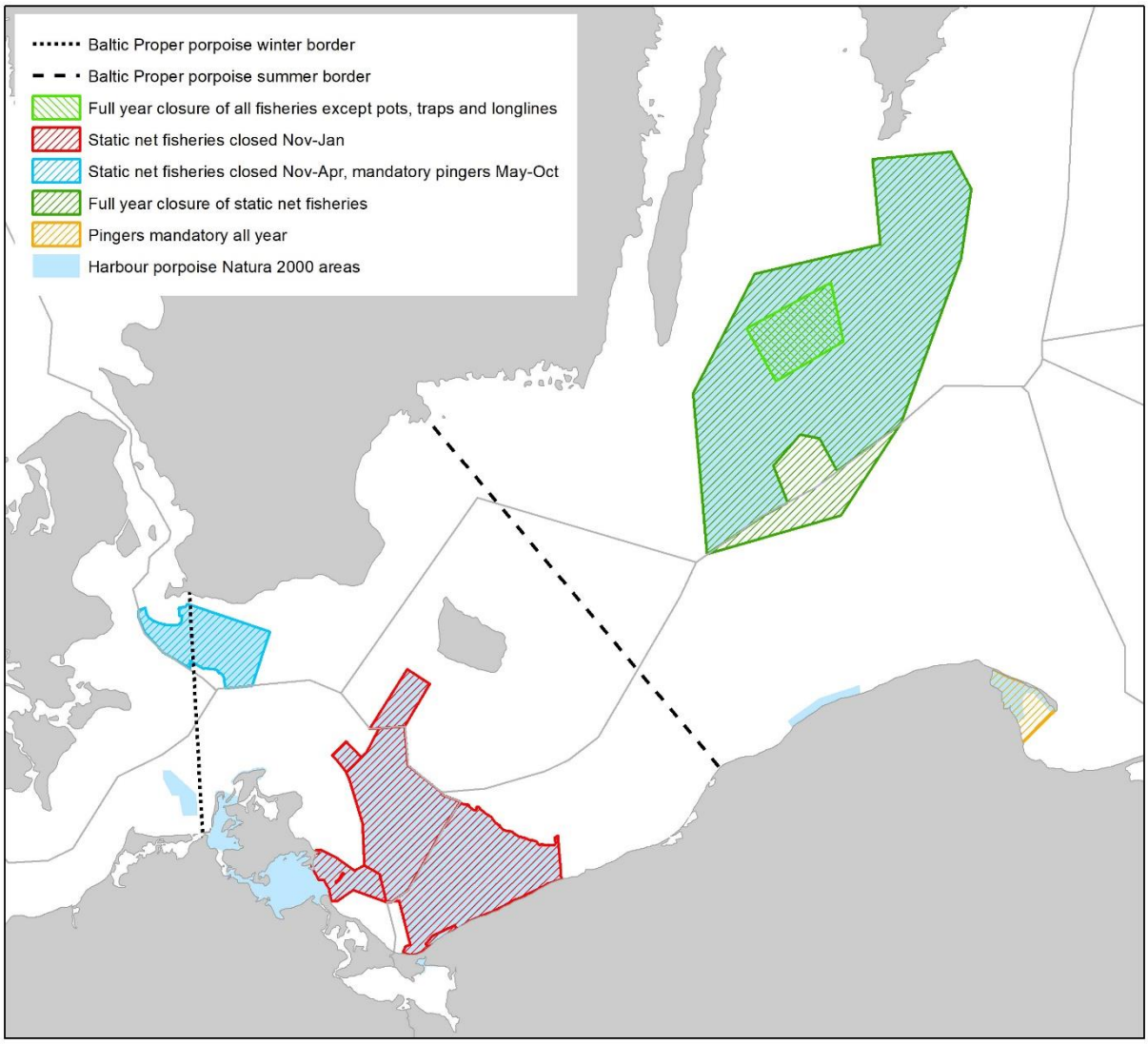


Figure 29. The measures specified in the delegated act amending EU regulation 2019/1241. The black dotted line between Sweden and Germany is the approximate western winter distribution limit for the Baltic Proper harbour porpoise, and the slanted hatched line between Hanö Bay in Sweden and the Polish coast marks the approximate western limit of the summer distribution. In the winter Baltic Proper porpoises may be present anywhere to the east of the winter border, while in summer the main distribution is east of the summer border.

Denmark

The Danish fleet comprises around 350 vessels divided into offshore fisheries (approximately 100 vessels 8–12 m and 80 vessels >12 m) and coastal fisheries (approximately 150 vessels)(ICES, 2021). It is unclear how many of these vessels operate within the Jastarnia area. There is no specific monitoring of bycatch, instead bycatch monitoring is included as part of the Data Collection Regulation scheme.

Denmark (through DTU Aqua Research) has been using REM, in some voluntary fishing vessels, successfully for a number of years. Recently further improvements have been made, switching from Canadian to Danish equipment as it was easier to influence developments. Bycatch data are currently being collected from 8 vessels all of which operate in the WBBK area, and this data is used to extrapolate to the amount of bycatch in the fleet. However, these are all operating in the Western Baltic, Belt Seas, Kattegat and Skagerrak; none are operating in the Jastarnia area.

Studies are ongoing to better understand the factors affecting bycatch rates, and a recent comprehensive report (Larsen et al., 2021) from the Danish North Sea, Skagerrak, Öresund and Belt Sea found that the most important factors are mesh size, fishing depth, distance to shore and time of the year, and calculated bycatch numbers for the Danish North Sea, Skagerrak, Øresund and Belt Seas (table 5). No data is available for the Jastarnia area.

Table 5. Mean and 95% CI quarterly fleet-wide harbour porpoise bycatch estimates in the North Sea, Skagerrak, Öresund and the Belt Sea in the Danish commercial gillnet fleet between 2010-2018. (Larsen et al., 2021)

HARBOUR PORPOISE					
Area	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Year**
North Sea	123 (0-337)	515 (246-822)	984 (492-1,644)	0 (0-0)	**1,622** (739-2,804)
Skagerrak	64 (28-106)	134 (56-223)	211 (105-344)	96 (48-154)	**505** (238-827)
Øresund	19 (10-30)	10 (5-18)	30 (15-46)	43 (23-69)	**102** (52-163)
Belt Seas	57 (21-100)	145 (95-199)	201 (130-282)	90 (48-144)	**493** (294-752)
All areas	**263** (59-573)	**804** (402-1,262)	**1,426** (743-2,317)	**229** (119-366)	**2,722** (1,323-4,518)

With regard to mitigation, a large project on pingers is ongoing where distance effects are examined, different types of pingers are tested in active fisheries, and drones are used to look at behaviour and reactions to pingers. Currently, DTU Aqua is focusing on developing pots, seine nets, low nets, pearl nets and rattle pingers. Trials on pots are ongoing to achieve satisfactory efficiency across the year, for example different baits are being tested. Pearl net trials will begin in 2022. For the testing of mitigation measures, the cod ban is causing problems because measures cannot be tested in cod fisheries.

Estonia

In Estonia, the active offshore fleet comprises around 25-30 fishing vessels (18–42 m), while the coastal fishery consists of several hundred small vessels of < 12 m. The pelagic fleet target mainly herring and sprat using stern trawlers. Herring is also caught by the coastal fisheries in the Gulf of Finland and the Gulf of Riga using trapnets and poundnets. Gillnets are allowed in recreational fisheries, with a limitation of max 3 nets ≤70 m at any given time, and mostly target perch, pikeperch, flounder and whitefish, mainly in the Gulf of Riga. No bycatch mitigation is currently in place.

Finland

In Finland there are 3352 vessels, but only around 1300 vessels are actively used in professional fisheries. Most of these vessels are below 10 m and operate in coastal fisheries. This number does not include the several thousand vessels involved in recreational fisheries in Finnish waters. The vast majority of the vessels are < 12 m and operate using static nets in coastal fisheries. Gillnet fisheries in Finnish waters is completely dominated by the recreational fishery which is entirely unrecorded and not included in this estimate. Finland has no bycatch monitoring but it is obligatory to report any bycatch in the logbook.

There is some effort towards alternative gear in Finland, mostly to avoid seal depredation and bycatch. For example push-up traps are being used, which is beneficial also in relation to reduce bycatch of harbour porpoises. One case of harbour porpoise bycatch has been recorded since 1999; a harbour porpoise was bycaught in a gillnet in December 2018 but could, miraculously be released alive. There have been no strandings reported since 1999. In the management plan (O. (editor) Loisa and Pyöriäistyöryhmä, 2016), it is stated that Finnish authorities are able to do relevant mitigation measures in short notice if harbour porpoises show more than occasional presence in certain areas. This was tested in 2020 when dolphins showed up in Finnish waters and the Ministries launched a press release on temporary ceasing of static net fisheries in certain areas. Another positive change is that fishing with the most harmful type of gillnets for harbour porpoises, large mesh sized nets made of thick material, have become less common.

Germany

The German commercial fleet in the Baltic Sea consists of about 60 trawlers and larger (>10 m total length) polyvalent vessels, and about 650 vessels using exclusively passive gear (< 12 m total length). There is no specific monitoring of bycatch, instead bycatch monitoring is included as part of the Data Collection Regulation scheme.

In Schleswig-Holstein, there has been a voluntary agreement with fishers since 2013, for the conservation of harbour porpoises and sea ducks in the Baltic Sea. This has involved the Fishery Association and Fishery Protection Union of Schleswig-Holstein, the Baltic Sea Information Centre (OIC), and Ministry of Energy transition, Agriculture, Environment and Rural Areas Schleswig-Holstein (MELUR). This has resulted in a reduction in the total length of gillnets in the months of July and August to 4km for boats > 8m, to 3km for boats between 6 and 8m, and to 1.5km for boats < 6m. In addition, almost 1,700 alternative acoustic deterrence devices, Porpoise Alerting Devices or PALs, has been handed out to fishers through the OIC in Eckernförde since 2017. PALs operate by replicating the sounds of porpoises (synthesising supposedly aggressive click trains at 133 kHz) and were designed to serve as an alerting device rather than as a deterrent, by increasing their rate of echolocation (B. Culik et al., 2015). Trials in a Danish fishery in the Western Baltic and the sound using REM to monitor bycatch rates had indicated a 70% reduction when PALs were deployed (Culik et al., 2017), although the size of the effect was much smaller than with pingers. The device has also been tested in a Danish North Sea fishery but was found to have no effect there (B. M. Culik et al., 2015). Reasons for the different results are unclear but it is possible the two different porpoise populations are responding differently to the signals. To date, there is no clear evidence that PAL operates as an alerting device. A monitoring project for effects of the PALs used in German waters started during autumn 2021.

Germany has also been investigating alternative management approaches and the use of alternative fishing gear. The STELLA Project (November 2016 – December 2019) and the now ongoing STELLA II has a number of strands: building data, modifying gillnets, investigating the feasibility of alternative gear, creating incentives for data collection, synthesizing the results, and promoting social responsibility within the German Baltic EEZ. This inter-disciplinary project is funded by the Federal Agency for Nature Conservation (BfN), and conducted by the Thünen Institute of Baltic Sea Fisheries. It engages fishermen of the Baltic Sea, and amongst other tasks, will synthesise the results of the various disciplines - fisheries biology, fishing technology and social sciences, and derive policy advice for decision makers, considering also the interest of nature conservation. Within the Stella project, Thünen Institute of Baltic Sea Fisheries have been carrying out trials on developing acoustically

reflective gillnets. The first step was to find the optimal size and material of a small sphere that would resonate at 130kHz. Acrylic glass spheres were found to be the best available option, of 9.6 or 6.4 mm diameter, and echograms of pearl nets show significantly increased reflectivity at 120 kHz. In the a next step, field trials with pearl nets were carried out in the Black Sea turbot fishery, where harbour porpoise bycatch rates are higher than in the Baltic Sea. Over a total of ten hauls, 5 porpoises were bycaught in standard gillnets, and 2 in pearl gillnets. These results are not statistically significant, and the mechanisms behind bycatch in modified nets have to be looked more closely into. Next steps will continue in 2022 and include behavioural experiments to look at porpoise behaviour around standard and modified nets, further trials in commercial fisheries and development of an automated process to put pearls on nets.

Latvia

In Latvia, the fleet comprises around 55 registered offshore vessels (12–40 m) and 610 coastal vessels (< 12 m). Most vessels in the coastal fleet are < 5 m and target herring, smelt, round goby, salmon, sea trout, vimba bream, turbot, eelpout, flounder, and cod using fykenets, trapnets, and gillnets. Recreational fisheries occur on all coasts and target flounder, cod, perch, and round goby, and gillnets are permitted in recreational fisheries but limited to one net of ≤100 m at any given time.

Lithuania

In 2020, the Lithuanian fishing fleet comprised 21 offshore vessels (>18 m) and 58 coastal vessels (< 12 m). The coastal fisheries target herring, smelt, flounder, turbot, and cod using gillnets and trapnets within the Lithuanian coastal area of Subdivision 26. Recreational fisheries also occur in these waters and focus on cod, herring, salmon, and sea trout using hooks and trolls, but gillnets are not permitted in recreational fisheries. The institution responsible for collecting data on bycatch is the Fisheries service under the Ministry of Agriculture, but no directed monitoring has been done since 2011-2013 and no system for registering bycatch seem to be in place.

Due to the increasing number of grey seals, Lithuanian fishers are trying to change their gear into more sustainable alternative gear like open traps and longlines. At least ten companies are using alternative gear as a result. New projects evaluating the use of pontoon traps on the Lithuanian coast, and information exchange concerning alternative gear with local fishers are being implemented.

Poland

Poland currently has 151 offshore vessels (12-35 m) and 610 coastal vessels (> 12 m). Most of the smaller coastal vessels use gillnets, but fishing effort with gillnets have decreased significantly since the introduction of the cod ban in 2019 (see Figure 30). Gillnets are not allowed in recreational fisheries. No vessels are using alternative gear like cod pots (that are used on Swedish coast). The testing of alternative gear is conducted on a minor scale, with a focus on selectivity of the gear.

There is no specific monitoring of bycatch, instead bycatch monitoring is included as part of the Data Collection Regulation scheme since 2015. The observation scheme includes possible catches or entanglements of cetaceans and other marine mammals, as well as seabirds and protected fish species. No observations of cetacean bycatch were made during the observer program carried out according to EU Council Regulation 812/2004 in 2016-2017. Also, no cetacean bycatch was documented during the pilot program in 2006-2009 or during the follow-up of the monitoring program in the years 2010-2016. However, there were 3 bycatches of harbour porpoises from small boat fishery reported in 2009, 2014 and 2018. This voluntary report was recorded outside and independently of the monitoring of bycatch of cetaceans carried out according to the EU Council Regulation 812/2004. It has not been

possible to obtain a coefficient of variation not exceeding 0.3 as provided for in Annex III of Regulation EC 812/2004 as it would require monitoring about 80% of the fishing effort.

In Polish waters, the breakdown of different gear types in Puck Bay between the years of 2004 and 2017 is shown in Table 6, with a spatial comparison of fishing effort for the years 2009 and 2017 in Figure 30. It is important to notice that the classification of semi-driftnets changed with the banning of driftnets in regulation 812/2004. Before the ban, semi-driftnets were reported as driftnets and after the ban the same nets were reported as static nets. Today, information on bycatch in Polish waters comes entirely from strandings as fishermen do not report and do not deliver the carcasses.

Table 6. Number of fishing gears used in Puck Bay, 2004-2017 (GNS = Set gillnet, GND = Driftnet, GTR = Trammel nets, LLS = Set longlines, LLD = Drifting longlines, FPO = Pots & Traps) (Source: Centre of Fishery Monitoring, Poland).

	Number of fishing gears used in Puck Bay		
	GNS, GND, GTR	LLS, LLD	Trap nets FPO
2004	493218	1324530	37746
2005	429082	1168108	40028
2006	338206	630325	54052
2007	270961	1155300	34197
2008	232897	650300	36741
2009	278 884	661 300	36438
2010	320907	677650	23110
2011	267925	363766	12284
2012	319215	563300	6362
2013	376091	531046	16477
2014	449408	527812	23797
2015	348546	765850	33984
2016	199031	708400	39281
2017	161 202	417 550	56044

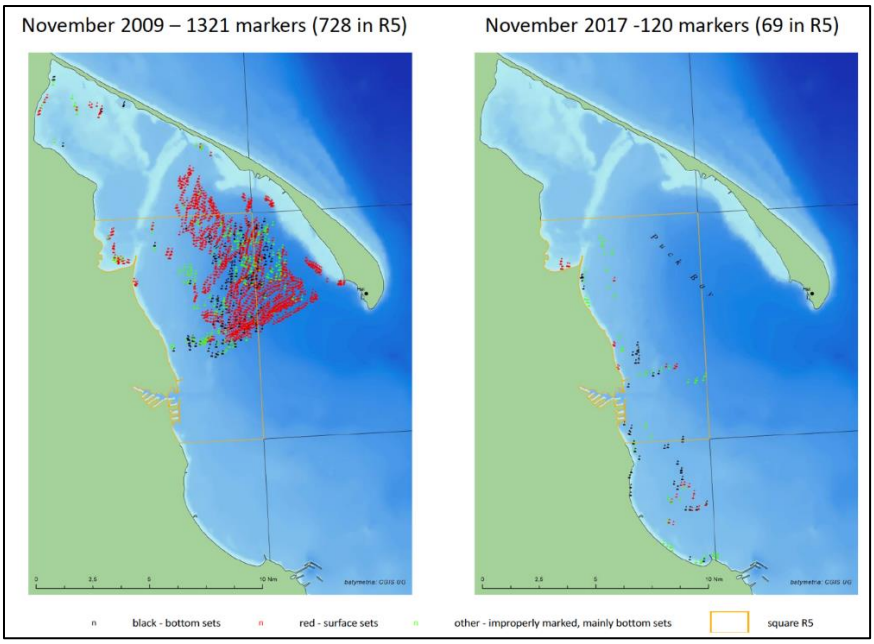


Figure 30. Changes in fishing effort (number and distribution of nets monitored *in-situ*) in Puck Bay, Nov 2009 & Nov 2017 (Source: Hel Marine Station UG).

Some tests of pinger use is ongoing in the Polish coastal fishery. In 2018-2020 Banana pingers were given to 25 gillnet fishermen who operate vessels below 12 m in length. Fishermen are supposed to deliver data on catches and bycatches as well as pros and cons of the technical aspects of pingers use. Data collection is still ongoing.

Vessels equipped with pingers are from Świnoujście, Międzyzdroje, Dziwnów, Rewal, Jarosławiec, Darłowo, Rowy, Łeba, Hel, Jastarnia, Swarzewo and Puck harbours. Also, one boat from the western Polish coast has been equipped with CCTV monitoring system. However, since the cod ban many fishermen has ceased their activity and the feedback from them is rather meager.

Sweden

In Sweden, there are approximately 20 offshore vessels, whereof 10 vessels > 40 m, and around 450 coastal vessels, most < 12 m. The offshore fleet mainly target herring and sprat using pelagic trawls in the Baltic Proper basin, while coastal vessels use gillnets, traps and longlines to catch cod, flatfish and, in archipelago areas, freshwater species. Recreational fisheries are allowed to use gillnets.

Like Poland, Sweden has no dedicated at-sea observer scheme focusing on the bycatch of marine mammals under Regulation 2019/1241 (or previously 812/2004). The monitoring effort conducted and provided by Sweden for example for the work of ICES WGBYC is part of the EU Data Collection Framework where on-board observer data are mainly from trawl fisheries but also pot fisheries for crayfish. However, work in ongoing in the Department of Aquatic Resources at the Swedish University of Agricultural Sciences (SLU Aqua) to develop bycatch monitoring using remote electronic monitoring (REM) and a new camera system has been developed. At present 10-15 fishermen are engaged and collecting data. Development of a machine learning program for analysing video material is underway. A paper submitted and currently in review show that soak time, string length and water depth have the strongest impact on bycatch rates. Between 1995-1997 bycatch was estimated to be 4.6% of the population size.

The implementation of pingers as previously laid down in Reg. 812/2004 and now in the Technical Conservation Measures regulation 2019/1241, is most likely not being fully implemented in Sweden, but in 2015, SLU Aqua started a project in ICES SubDivisions 21 and 23 with the purpose of implementing pingers in the lumpfish and cod fishery on a voluntary basis. After discussions with

fishermen, Banana pingers were chosen for the project. The fishers consider the Banana pinger to be practical to use and that it decreases bycatch of harbour porpoises. They report their catch, effort and bycatch. This project ended at the end of 2020. There is no funding to buy more pingers within the project but fishermen can apply for EMFAF funding to buy pingers.

In the area where pingers have been used in the commercial lumpfish fisheries in southern Sweden, a study looking at the distribution of harbour porpoises in relation to commercial fisheries with pingers has recently ended. Results show that harbour porpoise detections in the area are low when fisheries with pingers are carried out. However, when the pingers were switched off, the harbour porpoise detections increase and are at the same levels as areas where no fishing with pingers has been carried out. Studies on effects of pingers on harbour porpoise bycatch and abundance are continuing, using seal-safe Banana pingers and Future Oceas pingers

Another small project was carried out in active static net fisheries of the Baltic Proper between May 2019 – Sept 2020, where two small-scale fishermen were given high-frequency pingers (seal-safe Banana pingers and Future Oceans pingers) to use on half of their deployments of fishing nets. For each deployment, with and without pingers, they filled out a data collection form, estimating the catch and the amount of catch damaged or taken by seals. The difference between deployments with and without pingers was analysed and it could be shown that the high-frequency pingers did not cause an increase in seal-damage to catch (Figure 31). A paper is currently in review.

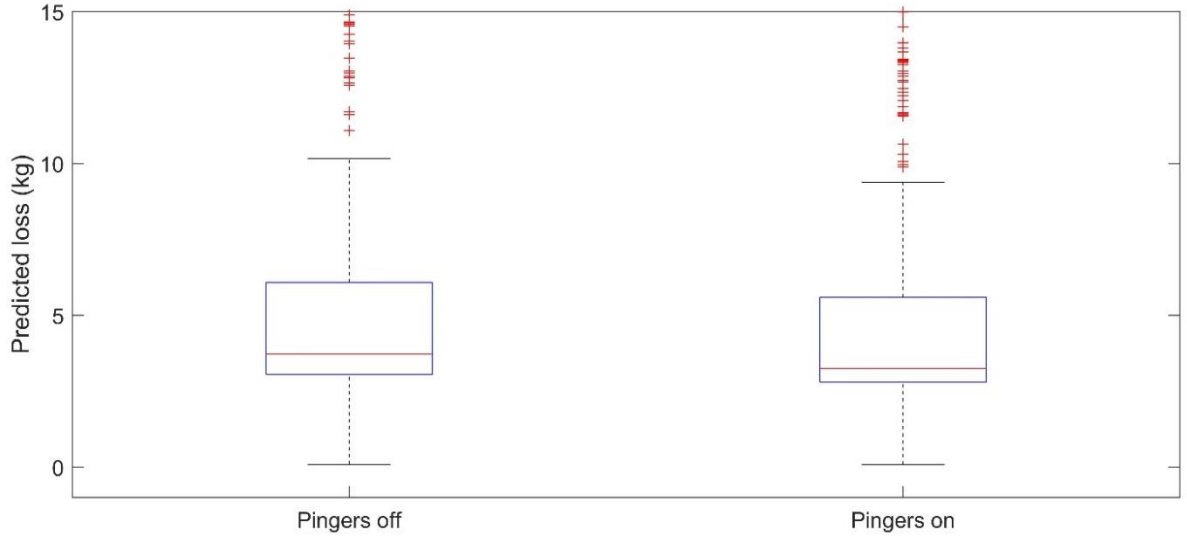


Figure 31. Predicted loss to seals. Boxplots of predicted loss (kg) in two scenarios: when the pingers are off or when they are on. The image is truncated at 15 kg to aid visualisation.

In the Swedish small-scale coastal fisheries, alternative fishing gear has been, and is still being, developed, with the work led by SLU Aqua. Pontoon traps for fishing salmon, white fish, trout and vendace are now used in commercial fisheries in the northern Baltic. During recent years, there has been a development of a pontoon trap to be used for cod in the southern Baltic. The results show that during certain times catches of cod can be high. However, gear needs further development with regards to resistance to rough seas and open archipelagos as well as practical handling (Nilsson, 2018). The main reason behind the development of the fishing gear is the seal inflicted damages to fishing gear and catch, which threatens an economically viable gillnet fishery. There is also ongoing development of passive gear for small scale fisheries such as pots, trapnets and fyke-nets.
Several studies have been undertaken to evaluate the catch efficiency of different cod and lobster pots and what factors affect it (Hedgärde et al., 2016; Ljungberg et al., 2016; Nilsson, 2018). This is

done partly by studying the behaviour of cod in relation to cod pot models and other fisheries related factors such as soak-time. The entry rate of cod entering pots gives an indication on the catch efficiency of the pots and by studying the entry rate in relation to factors such as cod pot model, number of fish inside the pot, and current strength, one gains information on what factors are affecting catchability. The results are show that the number of entrances on the pot and the number of cod already inside the pot affect the entry rate of the cod entering the pot (Hedgärde et al., 2016). Another study has shown that using a funnel on the entrance opening to the fish holding chamber also affects the behaviour of cod while entering the pots. However, it increases the catch efficiency (cpue) due to the decreasing number of cod exiting the pots (Ljungberg et al., 2016).

An alternative to both trawl and gillnet fisheries is bottom seine netting, such as Danish Bottom Seine. Bottom seines are generally considered less damaging than bottom trawls, and well-managed seine fisheries generally have minor ecosystem impacts (Morgan and Chuenpagdee, 2003). In 2016, the Swedish University of Agriculture Science has continued to develop a seine net modified for small open boats and tried it for pelagic and demersal species as a possible alternative to gillnet fisheries. The development is still under progress and the upcoming years there will be a focus on evaluating the seines environmental impact on the benthic habitat.

The cod fishing ban is making trials of alternative gear for cod difficult to carry out. SLU Aqua is currently evaluating the impact that the cod ban and the resulting decrease in fishing effort has had on the harbour porpoise population.

In July 2020, an infringement procedure was opened by the EC against Sweden for not complying with Habitats directive articles 6.2 for not having taken sufficient action to monitor harbour porpoise bycatch, and 12.4 for not taking sufficient measures to protect harbour porpoises within designated Natura2000 areas. Sweden responded to the formal notice in October 2020 but there is not yet information on whether the EC will move on to a reasoned opinion or not.

HELCOM

For HOLAS 3, there will be a bycatch indicator for the Baltic Proper harbour porpoise population, with a threshold for GES of zero bycatch. It is likely that there will be an operational bycatch indicator also for the WBBK area, however the threshold has not yet been set.

Key Conclusions and Recommendations *There are large differences between countries in the Baltic in terms of funding for monitoring, estimating and mitigating bycatch, but the overall picture is that not nearly enough is being done to protect the Baltic Proper harbour porpoise population from bycatch, or to monitor the extent of bycatch. Fishing with static nets is steadily decreasing due mainly to seal-fisheries conflicts and the ban on cod fisheries in the Baltic Proper, but there are still large gillnet fleets in operation around the Baltic Sea.*

Most importantly, for this Critically Endangered harbour porpoise population, mitigation actions should be taken starting immediately, in the entire population range. The delegated act published in February 2022 is certainly a good start, but if pingers cannot be implemented in all static net fisheries in the population range, other measures need to be put in place.

Attention needs to be paid to improvement in the extent and methods of recording fishing effort and cetacean bycatch. There are detailed provisions as to how this should be done in ASCOBANS Resolution 8.5 Monitoring and Mitigation of Small Cetacean Bycatch, the ICES advice on fisheries Emergency Measures to minimize Bycatch of short-beaked common dolphins in the Bay of Biscay and harbour porpoise in the Baltic Sea and in the HELCOM Roadmap on fisheries data in order to assess incidental bycatch and fisheries impact on benthic biotopes in the Baltic Sea. Parties should strive to implement these monitoring measures without delay.

We would also encourage countries to involve fishers and their organisations at a much larger scale to explore alternatives to gillnets, and to resolve whether pingers and other alerting devices are effective mitigation measures.

Increased cooperation with fishers might help reduce potential bycatch, with particular attention to recreational fishermen using gillnets.

4. *Monitor and mitigate impact of underwater noise*

In the context of impacts upon marine mammals, underwater noise can be divided into continuous low frequency sounds largely derived from shipping, and low and mid frequency impulsive sounds derived from sources such as seismic survey airguns, pile driving, detonations and active sonar. For this reason, under the EU Marine Strategy Framework Directive, two indicators were developed for Descriptor 11 on the introduction of energy/noise:

- 11.1. Distribution in time and place of loud, low and mid frequency impulsive sounds
- 11.2. Continuous low frequency sound

For Indicator 11.1, ICES have set up a registry in support of HELCOM and OSPAR. This registry provides an overview of the spatial and temporal distribution of impulsive noise events over the frequency band of 10 Hz to 10 kHz causing a "considerable" displacement (http://ices.dk/data/data-portals/Pages/underwater-noise.aspx). "Considerable" displacement is defined as displacement of a significant proportion of individuals for a relevant time period and at a relevant spatial scale. Data are now being entered. Maps downloaded on 28 April 2022 showing the blocks with activity for each of the main source types for the years 2010-2021, are depicted in Figures 32-35.

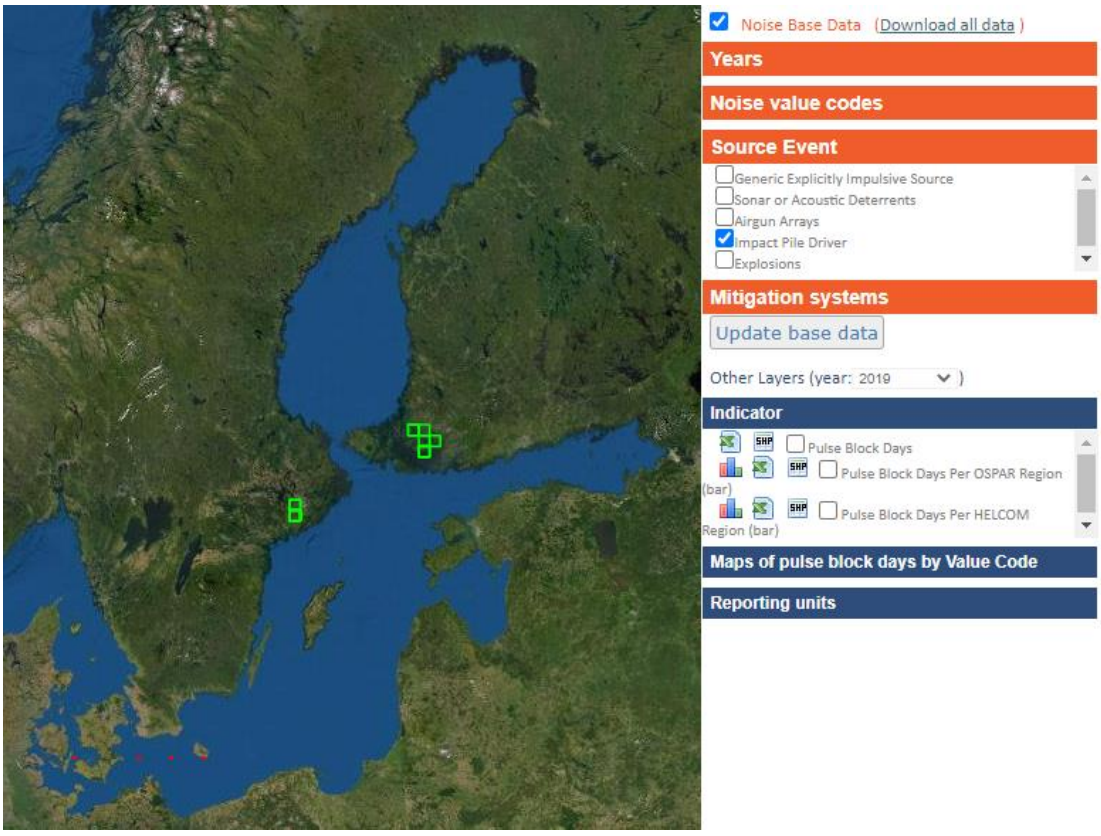


Figure 32. Noise Map of Impulsive sound produced from pile driving between 2010 and 2021 (Source: ICES database).

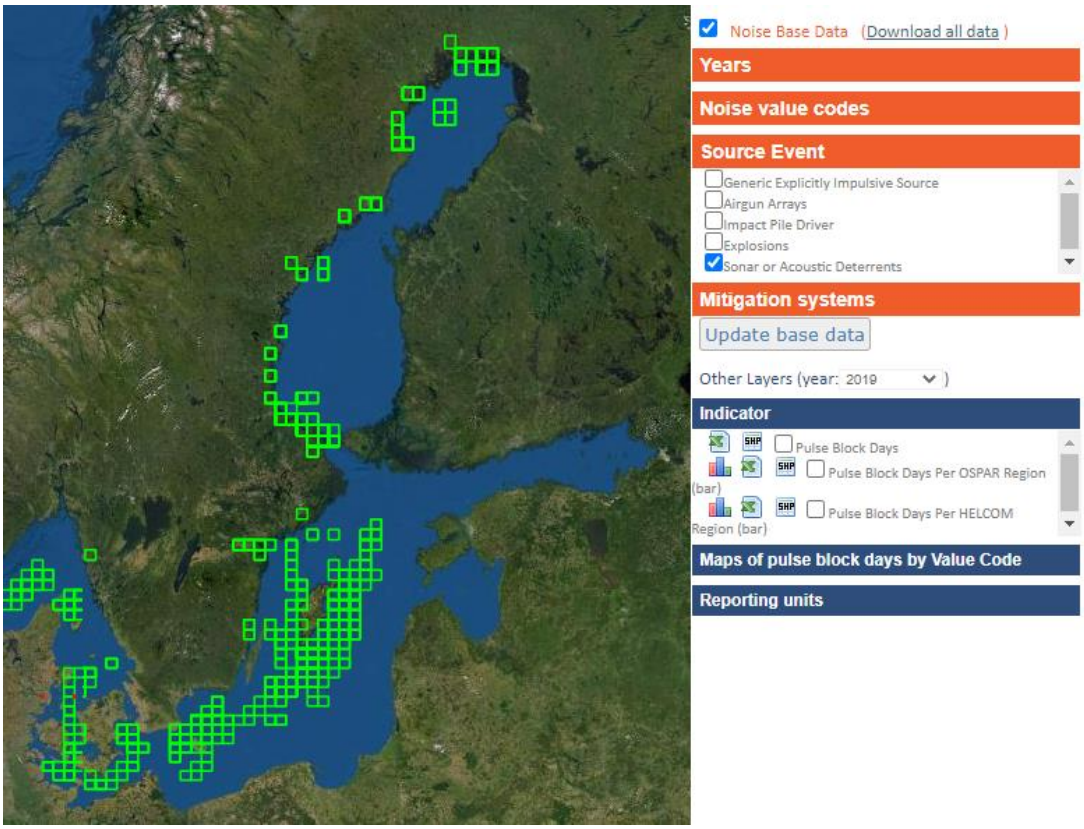


Figure 33. Noise Map of Impulsive sound produced from sonar or ADDs between 2010 and 2021 (Source: ICES database).

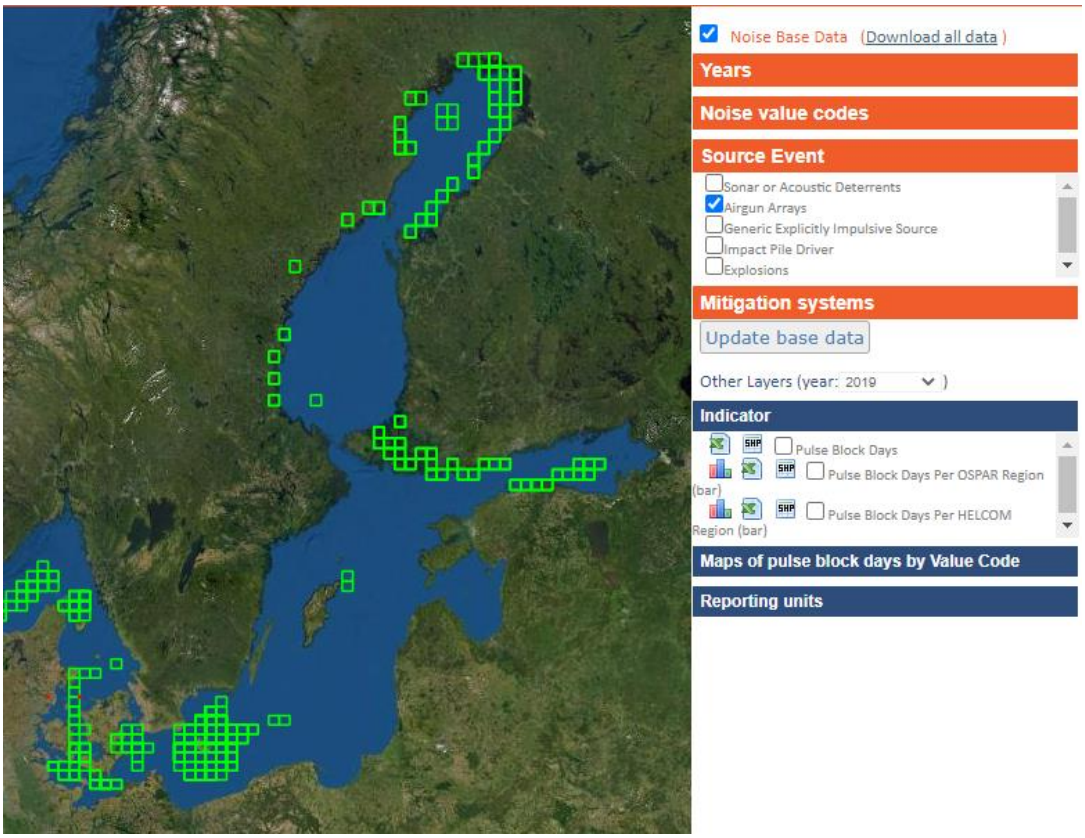


Figure 34. Noise Map of Impulsive sound produced from airgun arrays between 2010 and 2021 (Source: ICES database).

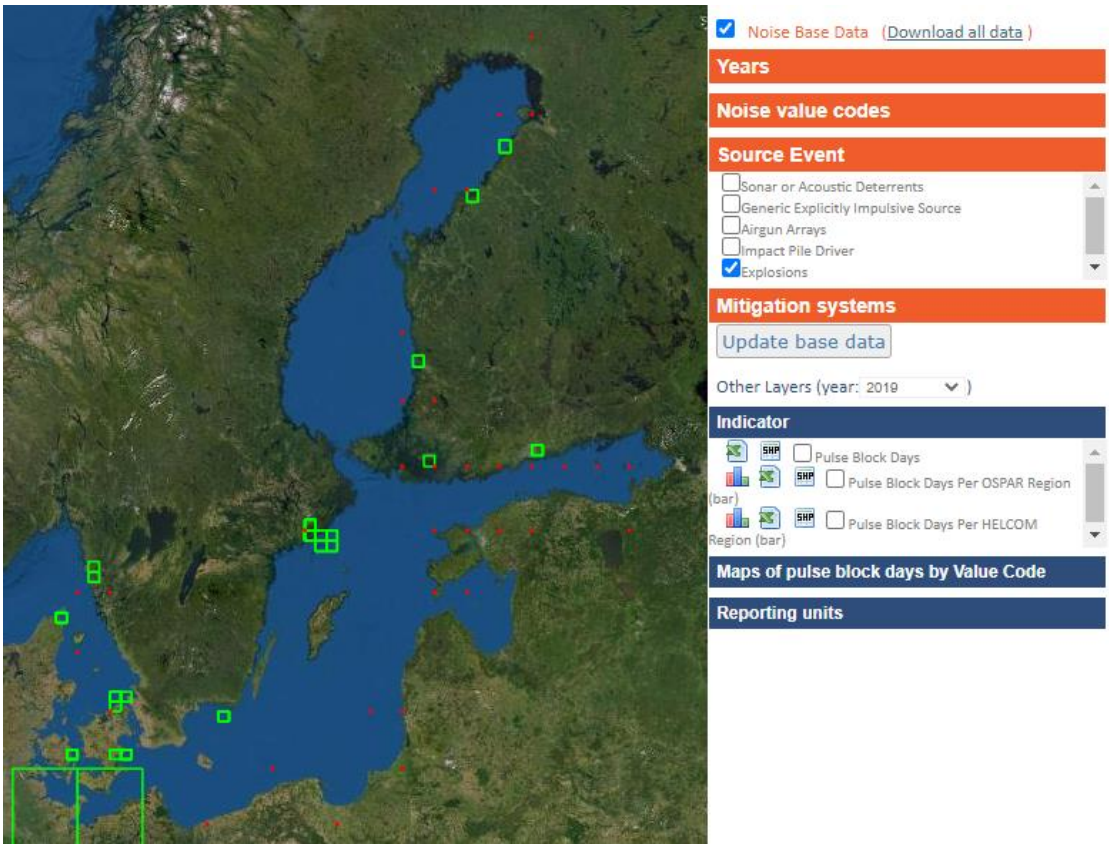


Figure 35. Noise Map of Impulsive sound produced from explosions between 2010 and 2020 (Source: ICES database).

From the maps it looks like there are data still to be provided by countries so it would be premature to draw many conclusions from these maps other than to note that a variety of sources of impulsive sound are active within the Baltic Proper. Countries known to have contributed data include Germany, Denmark, Sweden and Finland. The noise registry is a positive initiative, but it is still unclear how it is used. Ideally it should have up-to-date information on noise producing activities and the be queried during permitting procedures to ensure that thresholds are not exceeded.

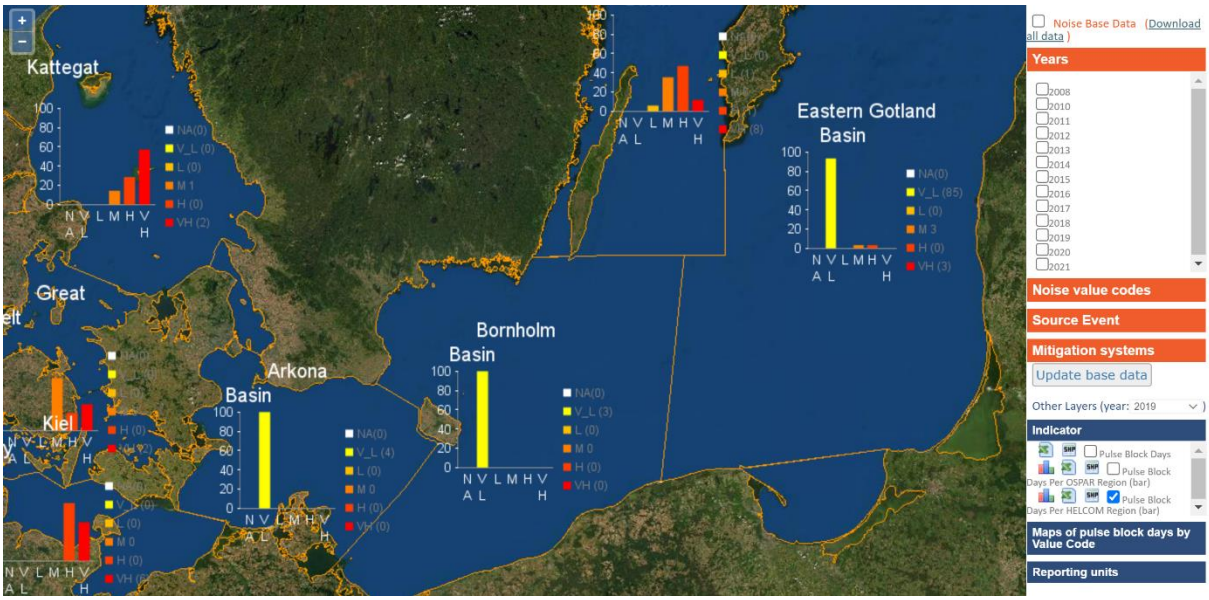


Figure 36. Graph of pulse block days per HELCOM sub-basin (source: ICES database).

The ICES noise register also allows for the calculation of pulse block days by time period (e.g. year) for each of the five categories of sources (Figure 36).

The BIAS project and monitoring of underwater noise

For indicator 11.2, the trends of ambient noise measured in 1/3 octave bands centred at 63 and 125 Hz are to be monitored. In the Baltic marine region, the LIFE+ project called BIAS (Baltic Sea Information on the Acoustic Soundscape), running from September 2012 – August 2016, measured the ambient noise during 2014 and modelled monthly soundscape maps based on the measurements, data on AIS traffic and environmental covariates (www.bias-project.eu). In addition to the MSFD centre frequencies, BIAS also measured the ambient noise at 2 kHz, as a compromise between the hearing ranges of herring, seals and the harbour porpoise. Figure 37 shows the 38 recording stations used to monitor continuous noise.

The BIAS project produced soundscape maps in 2016, showing the underwater noise generated by commercial vessels, the major source of human-induced underwater noise in the Baltic Sea. Seasonal soundscape maps were produced for each of the demersal, pelagic and surface zones. These soundscape maps will serve as a baseline for the development of monitoring and assessment of ambient noise in the Baltic Sea. Figure 38 shows noise maps across the whole water column for the three centre frequencies, 63 Hz, 125 Hz, and 2 kHz. The BIAS soundscape maps are also available through the ICES portal (https://www.ices.dk/data/data-portals/Pages/Continuous-Noise.aspx).

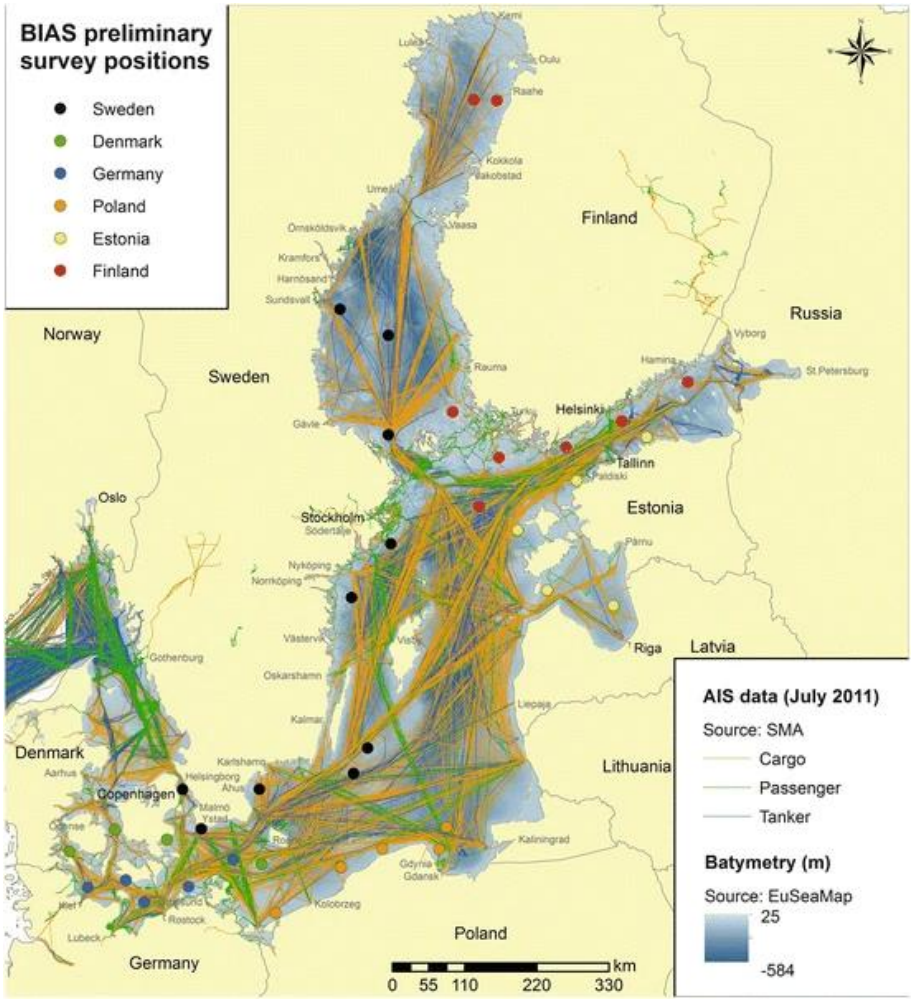


Figure 37. Baltic Sea Regional Map showing the positions of the acoustic measurements carried out by the BIAS Project and ship traffic in July 2011 at the major transects in the Baltic Sea. *Colour of the lines* indicates type of ship. *Coloured dots* show the planned deployment positions (Source: Sigray et al., 2016).

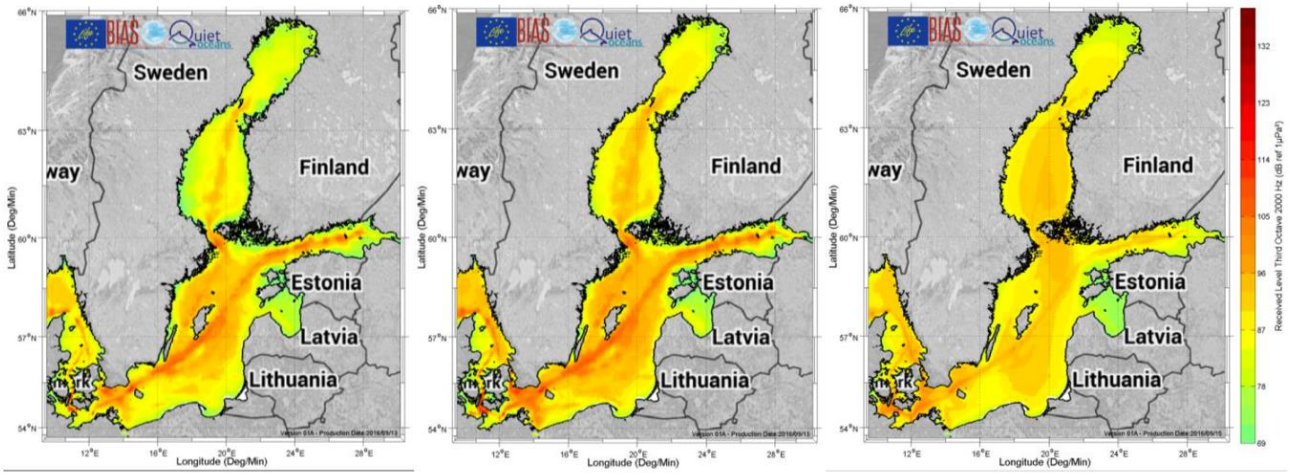


Figure 38. Annual median noise maps for the full water column for the 63 Hz third-octave (left), the 125 Hz third-octave (middle), and the 2kHz third-octave (right) (Source: Folegot *et al*., 2016).

Since the end of the BIAS Project, countries were asked to maintain at least some of their recording stations (Figure 39). In **Sweden** there are currently three stations: one on the Northern Midsea Bank in the Baltic Proper, and one at Hönö on the Swedish west coast, which have both been active since 2015. Monitoring was also started at another BIAS station in the Bothnian Bay in 2018. Joint monitoring of underwater noise and harbour porpoise is undertaken at Hönö and the Northern Midsea Bank, and will be started also in the Bothnian Bay during 2022.

Currently, some BIAS stations are kept active in Denmark, Estonia, Finland, Germany and Poland, and Lithuania also started monitoring of underwater noise at two stations in 2022. Unfortunately, there is no Baltic-wide coordination, and although it is hoped that this can be done through the HELCOM expert network on underwater noise (EN NOISE) it is not yet happening. The BIAS data-sharing platform where monitoring data can be shared, has been adopted by ICES and is available on the ICES website with data submitted from Denmark, Sweden and Germany.

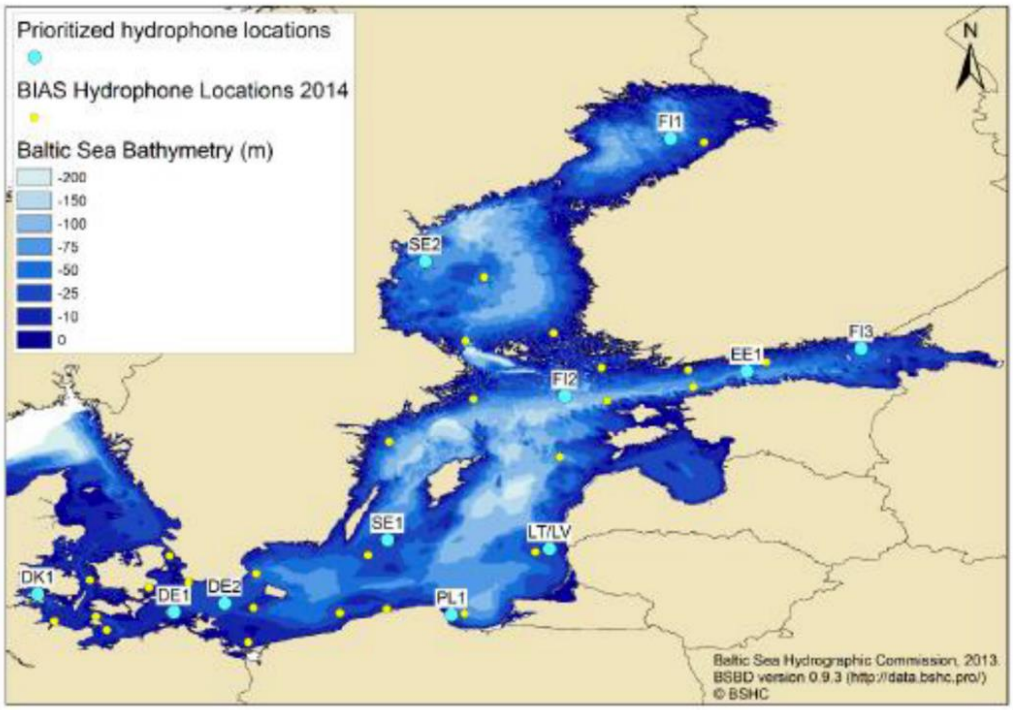


Figure 39. Selected prioritised locations for minor assessment are shown in blue, while the additional measurement locations used in the BIAS project and proposed for major assessment are shown with yellow circles (HELCOM 2017a).

It is important to note, however, that since porpoises are high frequency echolocators with a hearing range most sensitive above 15 kHz (maximum sensitivity c. 125 kHz) (Kastelein et al., 2015, 2002), the MSFD frequencies are unsuitable for assessing impact of continuous noise on this species (Dyndo et al., 2015; Hermannsen et al., 2014; Wisniewska et al., 2018).

The BIAS project focused upon modelling shipping noise, which generates most sound at low frequencies, below 1 kHz. However, Hermannsen et al. (2014) using a broadband recording system in four heavily ship-trafficked marine habitats in Denmark, found that vessel noise from a range of different ship types substantially elevated ambient noise levels across the entire recording band from 0.025 to 160 kHz at ranges between 60 and 1000 m. These ship noise levels are estimated to cause hearing range reduction in harbour porpoises of >20 dB (at 1 and 10 kHz) from ships passing at distances of 1190 m and >30 dB reduction (at 125 kHz) from ships at distances of 490 m or less. They conclude that a diverse range of vessels produce substantial noise at high frequencies, where toothed whale hearing is most sensitive, and that vessel noise should therefore be considered over a broad frequency range, when assessing noise effects on porpoises and other small toothed whales. Ship noise extending to higher frequencies and thus potentially affecting toothed whales and dolphins has been reported also by other authors (see for example McKenna et al., 2012; Southall et al., 2017; Veirs et al., 2016; Williams et al., 2014). Of relevance to the porpoise in particular is that recreational craft are generally not equipped with AIS and so are un-monitored, yet those craft usually produce sounds at frequencies of 1-15 kHz. Veirs & Veirs (2005) found that recreational vessels on average increased background noise 5 – 10 dB higher than the average of large commercial ships. It would therefore be prudent to establish better ways to monitor these craft.

Work in HELCOM

Presently, shipping (continuous noise) and piling (impulsive noise) are considered to constitute the two major sources of underwater noise in the Baltic Sea. In the 2013 HELCOM Copenhagen Ministerial Declaration, it was agreed that the level of ambient and distribution of impulsive sounds in the Baltic Sea should not have a negative impact on marine life, and that human activities that are assessed to

result in negative impacts on marine life should be carried out only if relevant mitigation measures are in place. Also, as soon as possible and by the end of 2016, using mainly already on-going activities, countries should have:

- established a set of indicators including technical standards which may be used for monitoring ambient and impulsive underwater noise in the Baltic Sea;
- encouraged research on the cause and effects of underwater noise on biota;
- mapped the levels of ambient underwater noise across the Baltic Sea;
- set up a register of the occurrence of impulsive sounds;
- considered regular monitoring on ambient and impulsive underwater noise as well as possible options for mitigation measures related to noise taking into account the ongoing work in IMO on non- mandatory draft guidelines for reducing underwater noise from commercial ships and in CBD context;

Some of these points have not yet been implemented. The indicator on impulsive noise was not included in HOLAS II as an operational indicator. It has been agreed that if threshold values are agreed at the EU level in time for them to be applied in HOLAS 3, there will be a quantitative assessment of an indicator for impulsive underwater noise in HOLAS 3. If threshold values are not available in time, a qualitative indicator evaluation will be undertaken. Work on indicator thresholds is currently ongoing in EU TG Noise. The indicator on continuous noise seem to be even further from being operational. A HELCOM Regional Action Plan (RAP) and an accompanying HELCOM recommendation on underwater noise was adopted in June 2021.

Table 8 outlines a qualitative description of conditions to be met to consider good status to be achieved and are meant to facilitate a coherent approach among the countries. They are meant to be used to develop guidance levels i.e. thresholds of noise consistent with good status for each noise sensitive species and furthermore the establishment of environmental targets, i.e. the reduction in pressure needed to reach good status, if the national evaluation show that is needed. It is proposed that environmental targets are defined based on a risk based approach even if the status and impacts are not fully known, since there is a risk of degradation in environmental status, in particular in relation to activities known to cause significant pressures on the environment. Decision support trees for establishing environmental targets for impulsive noise and continuous noise have been developed within HELCOM, but no thresholds have been set.

Indicators will be used to seek synergies with the work of OSPAR and be provided as input to the work of EU TG Noise and the decision to establish GES principles and threshold values which is to be made at European Union level. The international framework provided by IMO (in relation to continuous noise) will also be applicable when considering further work.

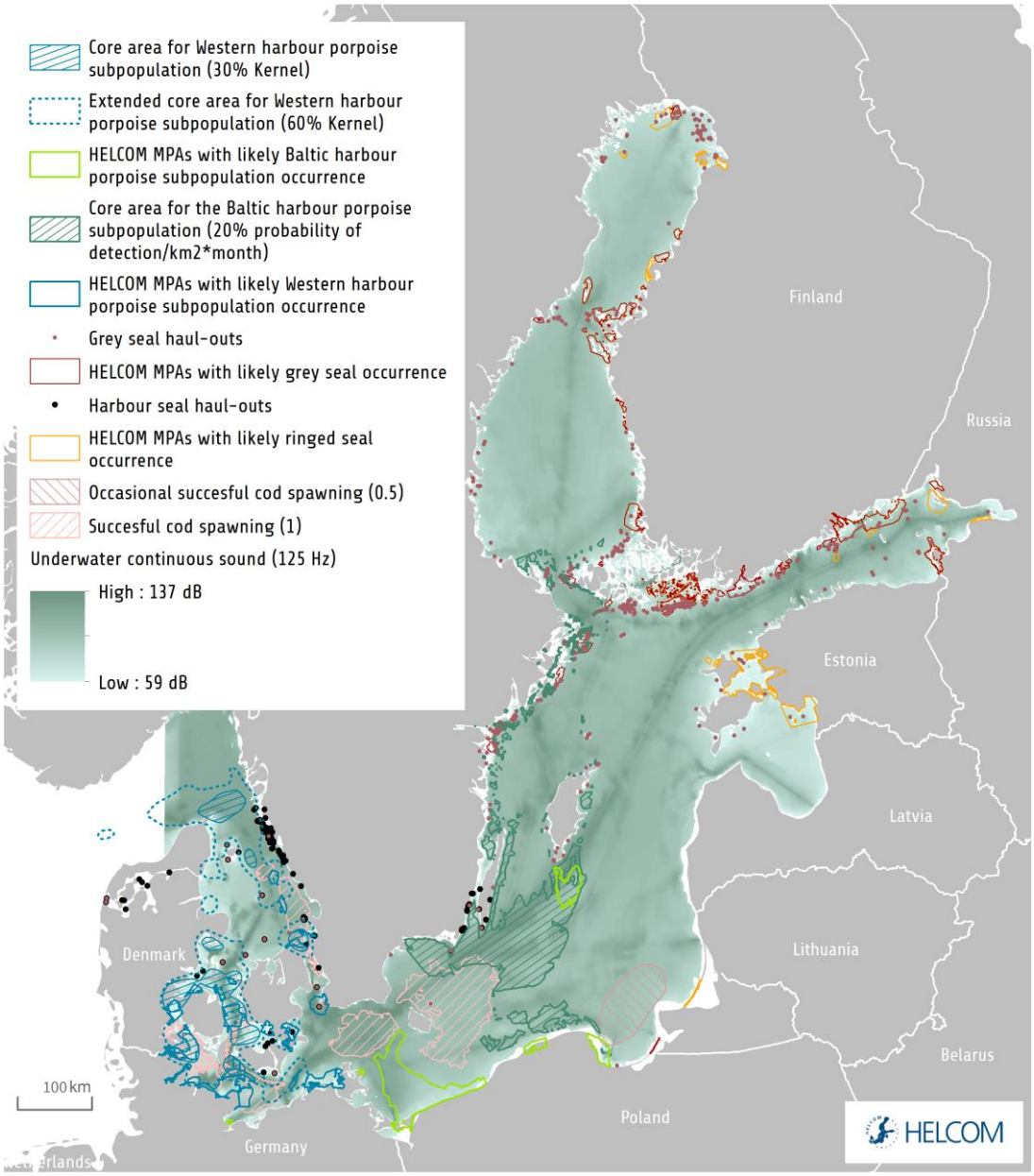


Figure 40. Example of how information on the distribution of sound can be compared with important areas for species that are sensitive to sound. The example shows areas identified so far (based on HELCOM, 2016). The soundscape shown is the sound pressure level (dB re 1uPa) for the 125 Hz frequency band occurring 5 % of the time, for the whole water column (surface to bottom) in June 2014 (Source: http://stateofthebalticsea.helcom.fi/pressures-and-their-status/underwater-sound/).

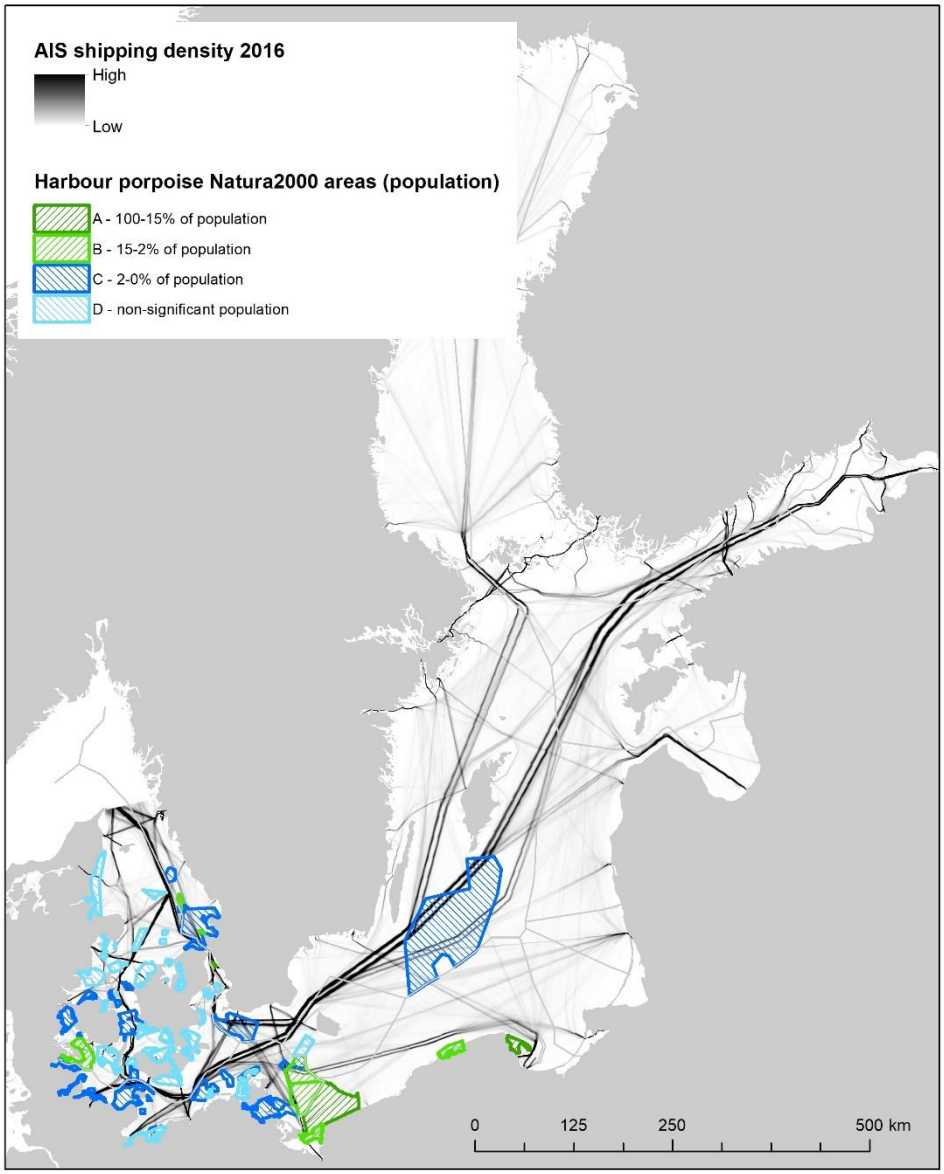


Figure 41. AIS data from 2016 (all vessel types) and Natura2000 areas designated for harbour porpoise or with harbour porpoise on the list of species present.

Mitigation

Mitigation of impulsive underwater noise is done for some events such as piling and detonations of unexploded ordinance, and there are guidelines for this in Germany, while in other countries the knowledge and use of possible mitigation techniques is limited. For continuous noise there are no mitigation measures in place except the IMO non-obligatory Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life (http://www.imo.org/en/MediaCentre/HotTopics/Documents/833%20Guidance%20on%20reducing%20underwater%20noise%20from%20commercial%20shipping%2C.pdf).

Table 7. Summary of Progress made by countries within the Baltic Sea on noise mitigation actions (Ruiz and Lalander, 2017)

Exclusion of noise generating activities for a certain time period	DK*, FI*, SE
Exclusion of wind farms in Nature Conservation Areas (Maritime Spatial Planning)	DE
Restriction of anthropogenic underwater noise to a certain level	DE, DK, SE
Exclusion of noise generating activities from certain areas (e.g. wind farms)	DE, SE
Spatio-temporal exclusion or limitation of noise causing activities	DK*, SE
Usage of alternative techniques	SE
Modification of operational state of noise source, e.g., reducing ship speed	SE
Refraining from applying activities (e.g. by refrain from using explosives when decommissioning offshore constructions)	SE
The environmental courts may impose any of these restrictions as conditions for granting a project license. For shipping over 500 tonnes, the Swedish Transport Agency may propose "Areas to be avoided" through the IMO. Two such areas were implemented in the Baltic in 2005. No speed restrictions for larger vessels have been proposed, though regional authorities have implemented coastal "Consideration Areas" which include speed restrictions for motorboats. The Swedish Armed Forces use a marine biological calendar when planning exercises to minimize environmental disturbance.	SE

**Potential measure*

Table 8. Principles for defining guidance levels of a) Impulsive underwater noise and b) continuous underwater noise consistent with good status for a sound sensitive species, the harbour porpoise (Source: HELCOM, 2017).

Sound type	**Guidance Principles**
a) Impulsive noise	Levels of anthropogenic noise should not: - Cause injury on individual animals - Cause loss of habitat, through displacement, for a significant period of time or significant less of habitat that leads to a decrease on the population level that affects the conservation status - Affect the energy budget of individual animals nor reproduction to a degree that leads to a decrease on the population level that affects the conservation status; particular emphasis should be on calving and nursing grounds and biologically sensitive times
b) Continuous noise	Levels of anthropogenic noise should not: - Cause injury on individual animals - Cause loss of habitat, through displacement, for a significant period of time or significant less of habitat that leads to a decrease on the population level that affects the conservation status - Affect the energy budget of individual animals nor reproduction to a degree that leads to a decrease on the population level that affects the conservation status; particular emphasis should be on calving and nursing grounds and biologically sensitive times - Cause masking leading to a decrease in the population level

Unexploded ordinance

In some areas of the Baltic Sea, there are old unexploded ordinance from WWII which were left or even dumped after the war. These mines or other types of explosives, when found, often have to be removed, and the safest way to do that is through controlled explosions. Such operations are carried out by the respective national military forces or within joint exercises, for example under the NATO umbrella. It has come to our attention that the military organisations operating in the Baltic Sea Region often are not aware of the hazard that explosions pose to marine life generally and harbour porpoises specifically, nor do they use the available mitigation methods such as bubble curtains to minimize any damage.

For example in **Germany** and **Denmark**, between 29 August – 18 September 2019, the standing NATO Mine Countermeasure Group 1 (SNMCMG1) detonated 45 mines using underwater drones, in Fehmarn Belt, some very close to Natura 2000 areas designated for harbour porpoise (see Figure 42) and within an area where porpoises are known to give birth and nurse their calves, all without employing any kind of mitigation measures. This was despite the fact that the German Federal government has stated bubble curtains are the Best Available Technique as well as Best Environmental Practice for munitions blasting.

In **Sweden**, a military exercise to detonate a mine in Hanö Bight was cancelled in June 2020, after the military had submitted the exercise to consultation by the County Administrative Board, who in turn asked for comments from the Swedish Agency for Marine and Water Management, the Swedish Museum of Natural History and the Swedish Defence Research Agency, and all three instances expressed serious concerns.

In **Poland**, on the other hand, detonations are carried out. As an example, a detonation of a mine in Puck Bay was carried out in June 2020, with some mitigation measures as presented to ASCOBANS in 2013 in place, but despite calls for caution and an offer from the German company Hydrotechnik Lübeck to provide a bubble curtain to protect Baltic Proper harbour porpoises. Following this event in Poland, there has been some discussion about the possibility to use bubble curtains as mitigation for explosions of larger charges of 1000 kg TNT equivalents or more, as in the case in Puck Bay. Opinions differ here, and there is some unclarity on the presence of methodology or experience on the positive use of bubble curtains in such large explosions. However, from Hydrotechnik Lübeck there seems to be a willingness to provide mitigation also for large charges.

Offshore wind

In **Poland**, as a result of the decision to decrease the use of coal as a source of energy, a large number of offshore windfarms are at different stages of planning, with Baltyk 1 being one of the first in line. Figure 43 shows that almost the entire Polish part of the Southern Midsea bank will be covered with windfarms. Investor companies should be delivered coherent guidelines including measures to protect and reduce the impact of windfarms in the environment, including the harbour porpoises for which this area seems to have great importance.

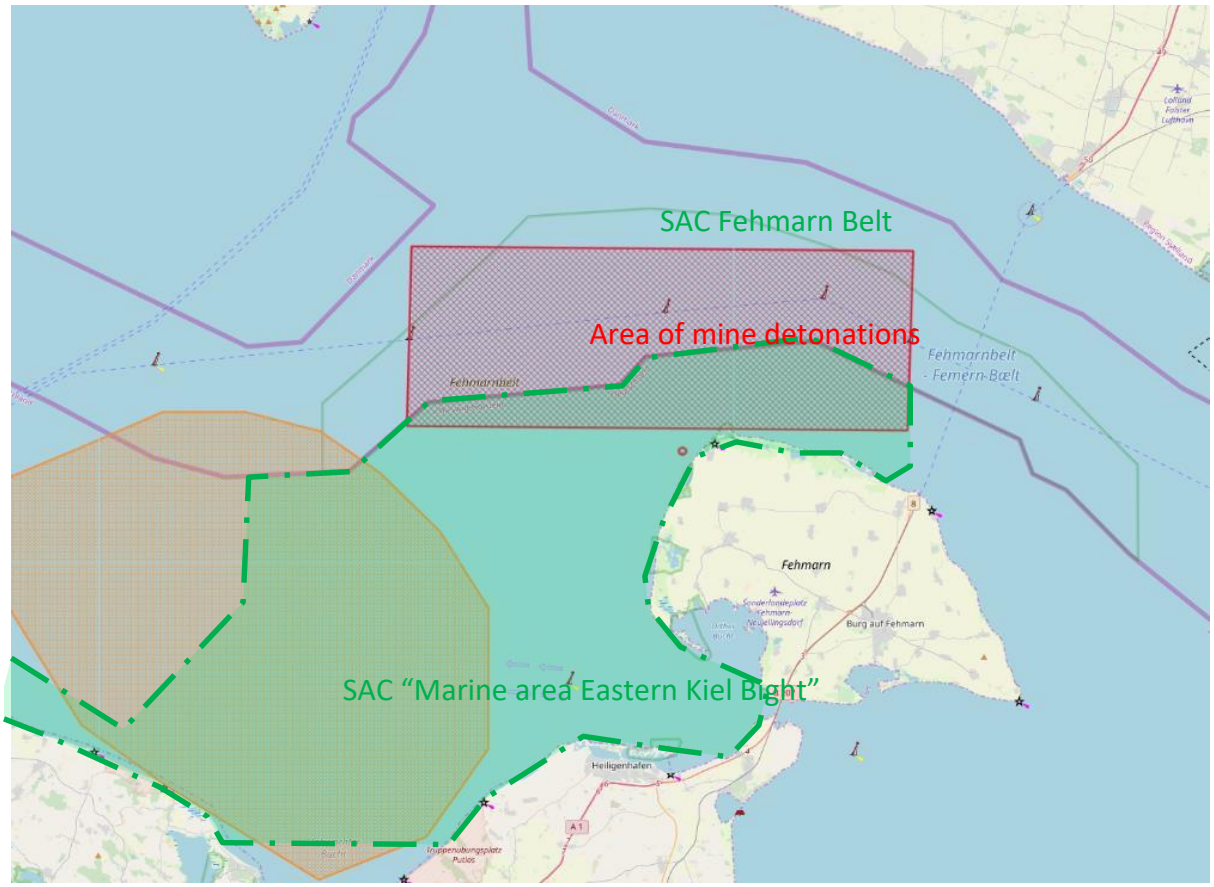


Figure 42. Map showing the area where NATO SNMCMG1 detonated 45 mines in August-September 2019, in relation to Natura 2000 areas designated for harbour porpoise.

Figure 43. Map of planned offshore windfarms in Polish waters.

In Sweden and especially Germany, recent policy developments have increased the goals of offshore wind significantly, and there is a worry that other aspects of environmental protection will be set aside in the quest to increase the production of renewable energy. In Germany, at the end of 2021 there was approximately 7.8 GW of offshore wind installed, but new plans are that Germany will have 70 GW by 2045. Most of this will be in the North Sea but some will also be built in the German part of the Baltic Sea. This means that a very large part of the German marine area will be used for production of offshore wind. With current technology, 57 GW would cover the entire German marine area except shipping lanes, MPAs and some buffer zones around MPAs, and anything above 57 GW would have to be built within MPAs and their buffer zones.

Of particular concern in Sweden is the military banning the use of porpoise click detectors, not only for regional monitoring but also for offshore wind companies preparing EIAs for permit procedures for offshore windfarms. The fact that such permitting procedures then have to rely only on data from SAMBAH, which are now approximately ten years old, is very concerning.

Impact of underwater noise

In Sweden, a project funded by the Swedish Postcode lottery through WWF Sweden and carried out by SMNH and FOI studied the impact of noise on harbour porpoise detection. In general the measured noise levels were below the threshold for avoidance reaction. Despite this, there was a negative correlation between transient peaks of noise that exceeded the noise levels predicted based on wind speed, and harbour porpoise detection rate. These transient peaks of excess noise were most likely shipping noise. However, there was a positive correlation between median noise and harbour porpoise detection rate, which may be because the noisiest stations are located in important harbour porpoise areas where animals do not choose to leave despite the noise. There are plans within SAMBAH II (if funded) to produce noise risk maps for harbour porpoises within the Baltic Proper porpoise population range.

In the WBBK area, the TANGO project, investigating the effects on soundscape and harbour porpoise presence and foraging behaviour from a rerouting of shipping lanes, as well as the SATURN project using tagging of porpoises to look at impacts of disturbances on harbour porpoise, are likely to give new knowledge on impacts of underwater noise on harbour porpoise individuals and populations that will benefit also the protection of the Baltic Proper harbour porpoise. Additionally, in Germany, the project Underwater noise effects-2 (UWE-2) running Sept 2021 – Aug 2024 will investigate thresholds of individual behavioural reactions of harbour porpoises (and seals) to vessel noise and other significant noise events, additional energetic demands in porpoises due to vessel noise, make recommendations for noise mitigation measures for harbour porpoises, (and seals) for the North-and the Baltic Sea, and evaluate noise mitigation measures for anthropogenic noise sources based on current knowledge.

In Finland, the LIFE IP project BIODIVERSEA will conduct research on underwater noise in archipelago conditions, including mapping and modelling underwater noise, identifying noisy/silent areas, making recommendations for mitigation as well as conducting experimental studies on selected species (not including the harbour porpoise).

Key Conclusions and Recommendations *Through the BIAS Project and the work of HELCOM, the region has received a lot of attention with respect to assessment and monitoring of noise. Some of the BIAS listening stations in Denmark, Estonia, Finland, Germany, Poland, and Sweden have been maintained (with different effort in different countries) but it would be good for there to be full coverage of the Baltic Proper with listening stations. Almost all Baltic Sea countries have contributed at least some kind of information on impulsive noise events to the MSFD impulsive noise register maintained by ICES. This needs to be extended across all Range States and all types of data.*

It is highly recommended that all countries that do not have national guidance documents on EIA procedures to assess noise impact on e.g. harbour porpoises, noise limits/thresholds and control programmes, should develop and implement such documents and programmes. Also, the military forces of all Baltic Sea countries, as well as NATO should be aware of the issues with underwater explosions and employ proper mitigation measures in the cases where such explosions cannot be avoided. ASCOBANS together with experts could maybe somehow provide guidance on this matter.

EIA investigations for offshore wind should assess porpoise spatiotemporal presence in and around the area for a potential wind farm. At present, the only reliable method is considered to be passive acoustic monitoring.

5. *Monitor and assess population status*

Assessment of population status and examination for linkages to specific human threats are necessary before appropriate conservation action can be taken. Bycatch in gillnet fisheries has been recognised as the primary threat for the survival of the Baltic harbour porpoise population. Other concerns are high contaminant levels, anthropogenic noise and overfishing. The continuing eutrophication of the Baltic Sea increases the area of seabed devoid of oxygen, which has a negative impact on harbour porpoise prey species. A lack of top predators such as cod and porpoises is thought to be allowing numbers of sprat and herring to increase to the extent that it is affecting the nutritional status of these prey species. A similar link has been proposed as affecting grey seals in the Baltic (Kauhala et al., 2017). Although warming climate decreases ice coverage in the Baltic Sea during winter and can thus be considered to have a positive impact on harbour porpoises, climate change may also influence the distribution, availability and quality of harbour porpoise prey. The overall effects that changing climate has on the Baltic Sea ecosystem remains poorly understood (HELCOM/Baltic Earth, 2021; Meier et al., 2022).

IUCN (Hammond et al., 2016) has classified the Baltic subpopulation of the harbour porpoise as critically endangered. Table 9 gives an overview of the conservation status of the harbour porpoise according to national red data books or red lists. Note that Denmark and Germany do not give a separate classification for the Baltic harbour porpoise population, but one general classification for all populations in their national waters. We encourage separate listing of the Baltic Proper population for those countries where two or more populations occur, in line with the IUCN listing, and expect the classification to be changed to "Critically endangered" if that is not already the case. In Denmark this work is just finalised in May 2022 and the Baltic Proper harbour porpoise population is listed separately as Critically Endangered (https://ecos.au.dk/forskningraadgivning/temasider/redlistframe/soeg-en-art#38892).

Table 9. National Red Data list status of the Baltic Proper harbour porpoise.

Country	Red list status	Reference
Denmark	Critically Endangered (CR)	Wind & Pihl (2004)
Estonia	Data Deficient (DD)	Anonymous (2008)
Finland	Not assessed	Liukko et al. (2019)
Germany*	Endangered (EN)	Haupt et al. (2009)
Latvia	Probably extinct (0)	Andrušaitis (2000)
Lithuania	Not listed	Rašomavičius (2007)
Poland	Least Concern (LC)	Glowacinski et al. (2002)
Russian Federation	Uncertain Status (4)	Iliashenko & Iliashenko (2000)
Sweden	Critically Endangered (CR)	SLU Artdatabanken (2020)
HELCOM	Critically Endangered (CR)	HELCOM (2013)

* The Baltic Proper harbour porpoise population not assessed separately

In the Habitats Directive Article 17 reporting for 2012-2018, Denmark, Germany, Poland, and Sweden, reports the status for harbour porpoises in the Baltic marine region as "Unfavourable-Bad", the worst status class. Finland, Estonia, Latvia and Lithuania has not reported at all or reported N/A on the harbour porpoise. The next reporting period ends in 2024.

Microplastics in harbour porpoises

A first study on microplastics in harbour porpoises in the Baltic Sea Region was carried out in 2020 (Philipp et al., 2021). Gastrointestinal samples were collected from harbour porpoises from the German Baltic (16 samples) and North Seas (14 samples) during necropsies, and the amount of

microscopic plastic particles (mainly particles ≥100 µm) was analysed on an individual level. No differences between sexes or age groups could be detected, meaning there does not seem to be accumulation of microplastic particles over time. However the burden of microplastics was found to be significantly higher in individuals from the Baltic Sea compared to individuals from the North Sea. No connection was found between health status and microplastic burden, however there were signs that a good nutritional status was connected to a higher quantity of microplastics, likely because the level of microplastics are dependent on ingestion of prey, and particles are not accumulated. Further studies are needed to resolve any health effects of microplastic burden.

Germany

In the Jastarnia area, only Germany has a dedicated stranding scheme, which operates in both Schleswig-Holstein and Mecklenburg – Vorpommern. The scheme is administered in the former region by the Terrestrial and Aquatic Research Institute (ITAW) in Büsum, and in the latter region by the German Oceanographic Museum in Stralsund.

Since German waters span the transition zone, it is difficult to know how many animals stranded in Germany that come from the Baltic Proper population. In Schleswig-Holstein, 112 animals in 2020 and 190 animals in 2021 were reported stranded. In Mecklenburg – Vorpommern, 67 animals were reported stranded in 2020. This seem to be a slight increase in later years, just like seen in Poland. Necropsies are undertaken on fresh specimens to determine cause of death and collect life history information. Kesselring et al. (2017) investigated the first signs of sexual maturity for a period of almost two decades (1990-2016). Ovaries from 111 female harbour porpoises stranded or bycaught from the German North Sea and Baltic Sea were examined for the presence and morphological structure of follicles, corpora lutea and corpora albicantia. They found that whereas there were no significant differences in the demographic structure of females between the two regions, the average age at death differed significantly with 5.70 (± 0.27) years for North Sea animals and 3.67 (± 0.30) years for those in the Baltic Sea. By comparing the age structure with the average age at sexual maturity, it has been estimated that around 28 % of the female harbour porpoises found dead along the German Baltic coast of Schleswig-Holstein had lived long enough to reach sexual maturity. In comparison, about 45 % of the dead females from the North Sea had reached sexual maturity. They concluded that growing evidence existed to suggest that the shortened lifespan of Baltic Sea harbour porpoises is linked to an anthropogenically influenced environment with rising bycatch mortalities probably due to local gillnet fisheries since about 30% of the animals sampled were thought to be by-caught.

Between 2021-2024, a concept for monitoring and assessing the pollution load of marine mammals in the North and Baltic Seas in being developed. Also, indicator pathogens in marine mammals are being investigated to advance assessment of anthropogenic impacts.

Denmark

The reporting of strandings to the Maritime Museum in Esbjerg (https://fimus.dk) is promoted in Denmark although there is no comprehensive coordinated stranding scheme. Carcasses that are in good enough condition to be autopsied and/or used for a blubber thickness indicator study for the HELCOM indicator for nutritional state are collected by Aarhus University. There is funding for 25 necropsies per year. In 2019, 59 dead porpoise were reported, all of them from the Belt Sea population range, whereof 56 stranded and 3 known bycatches. 14 of them were necropsied. No signs of infectious diseases were found, and all individuals were negative for morbili virus. Six of the individuals were assessed to have died from being bycaught. A review of Danish strandings (see Table 3) was published recently by Kinze et al. (2018).

Sweden

In Sweden, records of strandings are collected opportunistically by the Swedish Museum of Natural History (SMNH) in collaboration with the Swedish National Veterinary Institute and the Gothenburg Museum of Natural History, and carcasses are collected for necropsy. From the Baltic Sea coast, if a carcass is too decomposed to carry out a necropsy on, the carcass (or parts of it) is still collected and sampled. Which samples that are taken depends on how decomposed the carcass is, and what parts of it that remains. Sometimes still some soft tissue samples can be taken, or at least some bones and/or teeth. Some form of genetic samples are also always taken. From the Swedish west coast carcasses are collected if they are fresh enough for necropsy. Necropsies are carried out in collaboration between SMNH and the Swedish National Veterinary Institute (SVA). In 2020, a new health and disease monitoring programme was designed including seals, porpoises and the occasional strandings of other species of cetaceans. The aim for this programme is to continue to undertake necropsies at the level of 30 animals/year, approximately 15 bycaucght and 15 stranded animals, in total.

In 2020 a report was published by the Swedish National Veterinary Institute and the Swedish Museum of Natural History on health and causes of death in 109 harbour porpoises dead between 2006-2019 (Neimane et al., 2020). Most of the animals necropsied and included in this study were from the Swedish west-coast, so most probably belong to the Belt Sea population. It could be noted that two animals had wounds consistent with predation. DNA samples have been taken to investigate what species of predator may have caused the wounds. Given findings from the North Sea and the increasing numbers of grey seal in the Baltic, it is not unlikely that it may be grey seal.

In 2021 31 animals were necropsied and cause of death was determined. 12 animals died from confirmed or probable bycatch, and this was the most common cause of death in 2021. Of the 31 animals one was found on the island of Öland, as is therefore likely to belong to the Baltic Proper population.

Poland

Although Poland does not have a dedicated national stranding scheme, a network of volunteers called Blue Patrol started in 2010 and is maintained by WWF Poland and Hel Marine Station UG. One of their tasks is to cooperate with HMS UG in stranding project and help collect samples or carcasses for postmortem analysis. between Since 2017 an increase in the number of stranded animals found on the beaches of Poland from 5 in previous years to 16 individuals in 2021. (Figure 44), but it is unclear what the reasons behind this may be, and which population the stranded animals belong to. It seems likely that animals stranded in the west of Poland may come from the Belt Sea population and the majority of strandings were observed in the same season under stormy conditions. In 2021, 16 animals were found stranded (Figure 45).

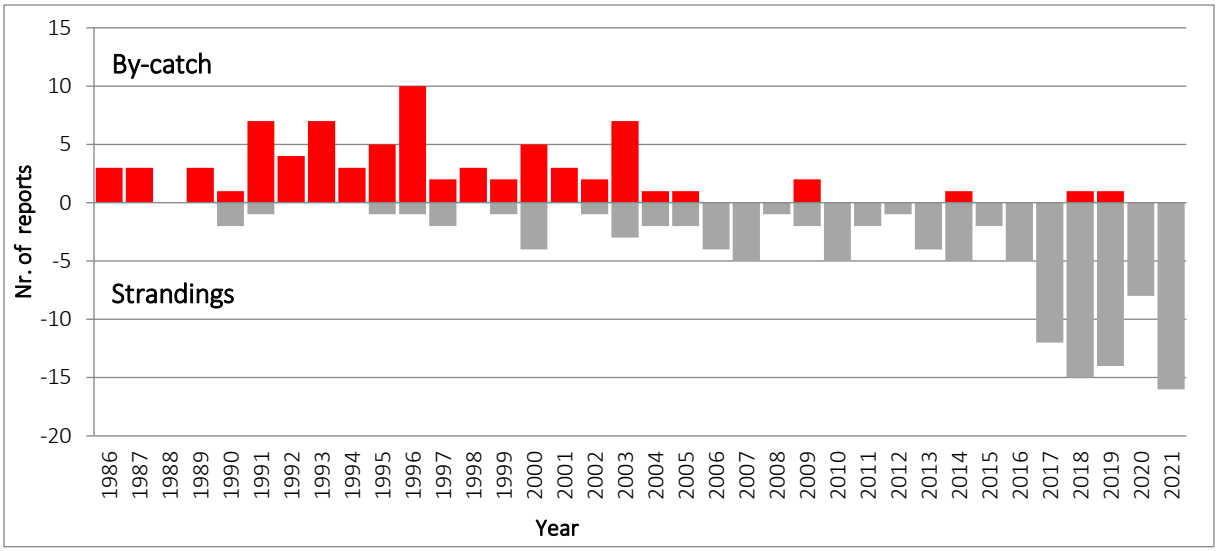


Figure 44. Number of reported bycaught and stranded harbour porpoises in Poland from 1986 to 2021.

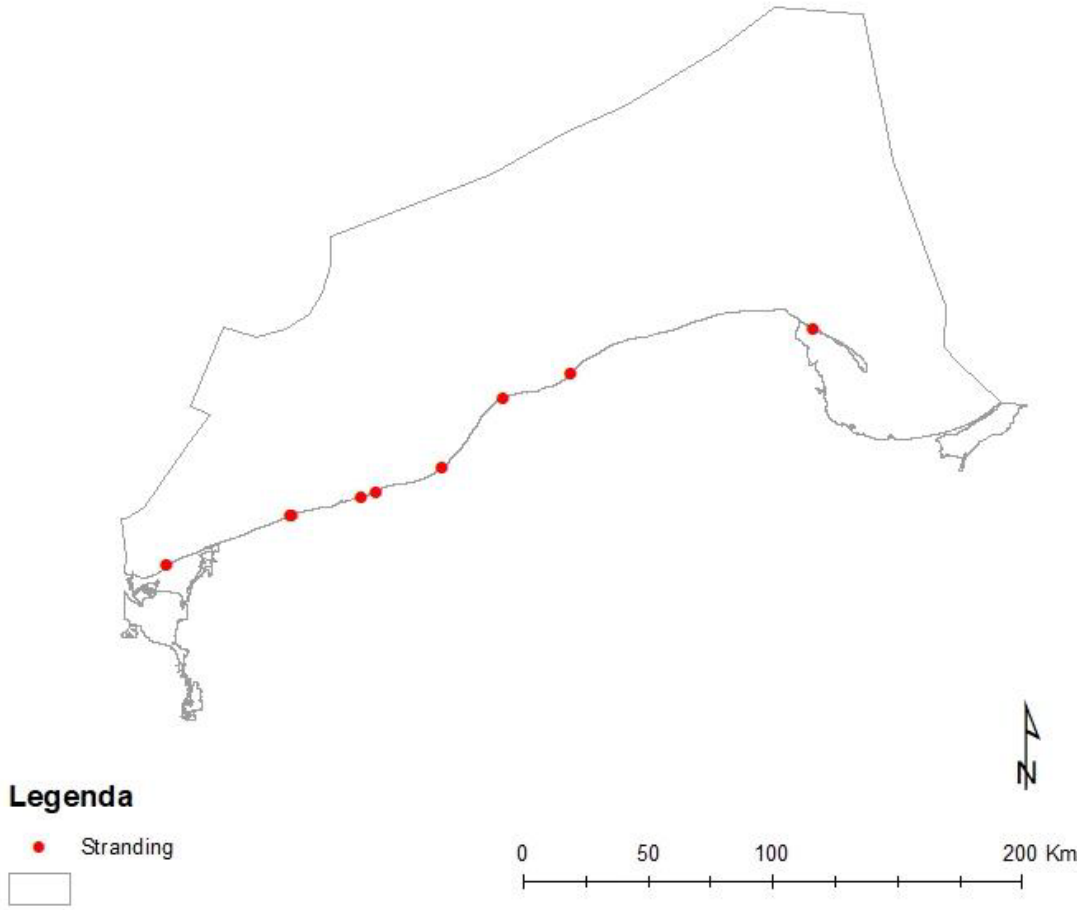


Figure 45. Strandings along the Polish coast in 2020.

Finland, Estonia, Latvia and Lithuania

Baltic countries east of Poland have no formal stranding schemes. In Finland, there have been no strandings or bycaught animals since 1999, except for one animal bycaught and released alive in December 2018, and before that only six specimen in the 1960-1980's. In Lithuania, as noted earlier,

there have been only thirteen documented cases of porpoise stranding or by-catch between 1903-2017; and none confirmed in recent years.

Key Conclusions and Recommendations *Monitoring and assessing population status is challenging for a population that is so rare over large parts of the Baltic Proper. It is important that all lines of evidence are utilised, including acoustics, opportunistic sightings, and strandings along with life history information derived from dead animals. Only Germany has a dedicated national stranding scheme with good samples of animals necropsied, Poland has a stranding scheme based on the WWF-UG project and all possible samples are collected, and Sweden now has a program for undertaking necropsies and performs some form of sampling or necropsy on all porpoises found in the Baltic Proper population range. All other countries need to do more to maximise opportunities for data on porpoises. This will need to be done in combination with a public awareness and education campaign. In this context, the perceived status of Baltic porpoises in national Red Data lists for most countries could usefully be updated. This applies particularly to Poland which lists a status for the porpoise that is clearly misleading (least concern), although it recognises its conservation status as "Unfavourable-Bad" in its Habitats Directive Article 17 reporting.*

6. Investigate habitat use and protect important areas

The SAMBAH Project has provided the best available map of the basin-scale seasonal distribution of harbour porpoise population in the Baltic Proper (see Figure 5). However, as noted earlier, there are some areas (e.g. waters deeper than 80 m and near-shore areas) that were not well sampled by the acoustic stations deployed. The proposed follow-up, SAMBAH II project, aims to fill in some of those gaps. An application for funding for SAMBAH II was rejected by the EU LIFE programme in spring 2021, and there are currently no funding programmes that will allow applications for this type of project.

Today, some of the MPAs designated for the harbour porpoise in the Jastarnia plan area have fisheries regulations through the delegated act described under 3. Monitor, estimate and reduce bycatch (Figure 29). However, no other conservation measures aimed at harbour porpoise protection are in place in any of the areas.

Sweden

The SAMBAH results highlight the area around the shallow offshore banks south of Gotland as an important hotspot for the Baltic Proper population in summer during the period of calving and mating. Following those findings, the Swedish Government proposed establishment of a Natura 2000 site (29 242 km^2) in this area, and this was designated in December 2016 (Figure 46). A management plan was adopted in 2021. Fisheries regulations in this area were put in place with the delegated act in February 2022, closing static net fisheries in the entire area during the entire year, and closing all fisheries except that carried out with pots trap and longlines in part of the area on the Northern Midsea bank (see Figure 29). The closure of static nets also includes the Southern Midsea bank, located between the Natura 2000 area and the Polish border.

In the Natura 2000 area Sydvästskånes utsjövatten, situated on the western winter distribution limit of the Baltic Proper population, the delegated act specifies pingers to be mandatory during the summer season (May - October) when the Baltic Proper population is not expected to be present in the area, and closes static net fisheries during the winter (November – April) when the Baltic Proper population may be present. The pinger measure will be in effect from 1 June 2022, while the closures in the delegated act are all in effect since 25 February.

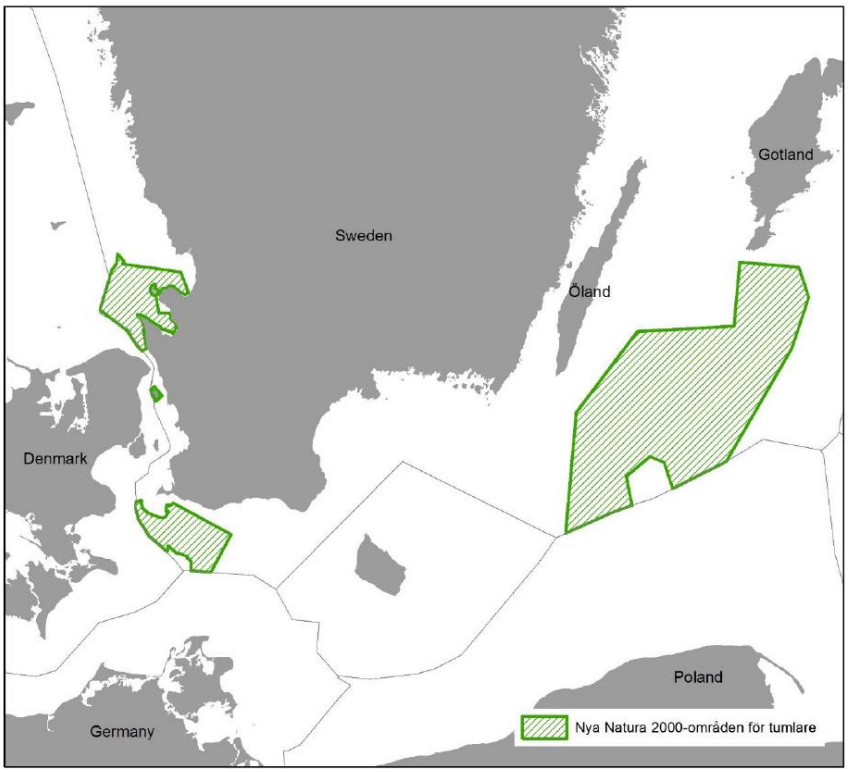


Figure 46. The location of Marine Protected Areas (Natura 2000 sites) for the protection of harbor porpoises in Swedish waters, designated in December 2016.

On 2 July 2020, the European Commission sent a letter of formal notice to Sweden for not living up to articles 6.2 and 12.4 of the Habitats Directive (1992/43/EEC) in regards to taking the necessary measures to protect harbour porpoise within SACs designated for the species, and to establishing a system to monitor incidental bycatch of harbour porpoise. The Commission also raises the issue of not correctly transposing the indicated articles from the habitats directive to Swedish law. Sweden responded to the inquiry in October 2020, but there has so far not been any indications on whether the Commission will move on to a reasoned opinion. The third and final step, if Sweden does not fulfil the requirements, is a case in the European Court of Justice.

Germany

In Germany there are general national ordinances set for the marine protected areas (mainly Natura 2000 areas in the Exclusive Economic Zone) designated for porpoises, which include prohibition of some constructions and aquaculture as well as obligations for compatibility studies for windfarm construction, pipe laying and material extraction. Recreational fisheries are also prohibited in some parts of areas. Management plans for Natura 2000 sites in the German EEZ entered into force in February 2022. The plans do not include any concrete conservation measures and at this point management plans do not include fisheries measures. It is said that this will be done once the STELLA II project is finalized.

However, five areas in the German Baltic Sea (Adlergrund, Westliche Rönnebank, Pommersche Bucht mit Oderbank, Greifswalder Boddenrandschwelle und Teile der Pommerschen Bucht and Pommersche Bucht) are included in the delegated act with closures of static net fisheries in effect from November – January. During the joint recommendation process, the Jastarnia group issued a statement that these closures should extend until April because November – April is the season when Baltic Proper animals are most likely to be present in the areas, however, this concern was not adhered to during BALTFISH

Denmark

In 2020, the harbour porpoise was added to 20 Natura 2000 sites, which means that there are now a total of 36 Natura 2000 areas designated for harbour porpoise in Denmark. Only one of them are within the population range of the Baltic Proper population, namely Adler Grund og Rønne banke, which has the harbour porpoise listed but as non-significant. This area is included in the delegated act and is closed for static net fisheries from November – April. None of the other areas have any conservation or fisheries measures implemented, and the only statement about porpoise conservation is the same in all the management plans, namely that the Danish Nature Agency are developing a strategy for protection of harbour porpoise in Danish waters. This strategy is was planned for 2021 but is not yet adopted. The fishing pressure, also with static nets, is quite high in some of the protected areas (https://mst.dk/media/194110/n1-basisanalyse-2022-27-skagens-gren-og-skagerrak.pdf).

Poland

Poland has four Natura 2000 areas where the harbour porpoise is listed on the Standard data form of the site. Two of them (Ostoja na Zatoce Pomorskiej and Wolin i Uznam) are included in the recent delegated act with closures of static net fisheries from November – April, and a third, Zatoka Pucka i Półwysep Helski, together with an area outside the Nature 2000 site in Puck Bay has mandatory pinger use in static net fisheries starting on 1 June 2022. The fourth site Ostoja Słowińska is not covered by the delegated act. No other conservation measures are in place.

Baltic-wide

With further deployment of acoustic stations since the SAMBAH project, it is important that the distribution of harbour porpoises continues to be assessed. So far, emphasis has been upon establishing Natura 2000 sites in Swedish waters, but areas in the EEZs of other countries should be examined further. These should include designation of a previously proposed harbour porpoise area in Hanö Bay in Swedish waters, a possible extension of the offshore Swedish site into Polish waters where higher detection rates were made in the breeding season during the SAMBAH project (this area in Polish waters is included in the ICES advice and the delegated act, see Figure 28 and 29); consideration for enlargement of the Natura 2000 site in Puck Bay; and further examination of the distribution of harbour porpoises between November and April including Finnish waters south of Åland, bearing in mind that it may be impossible to distinguish animals from the Baltic Proper sub-population from those from the Belt Sea.

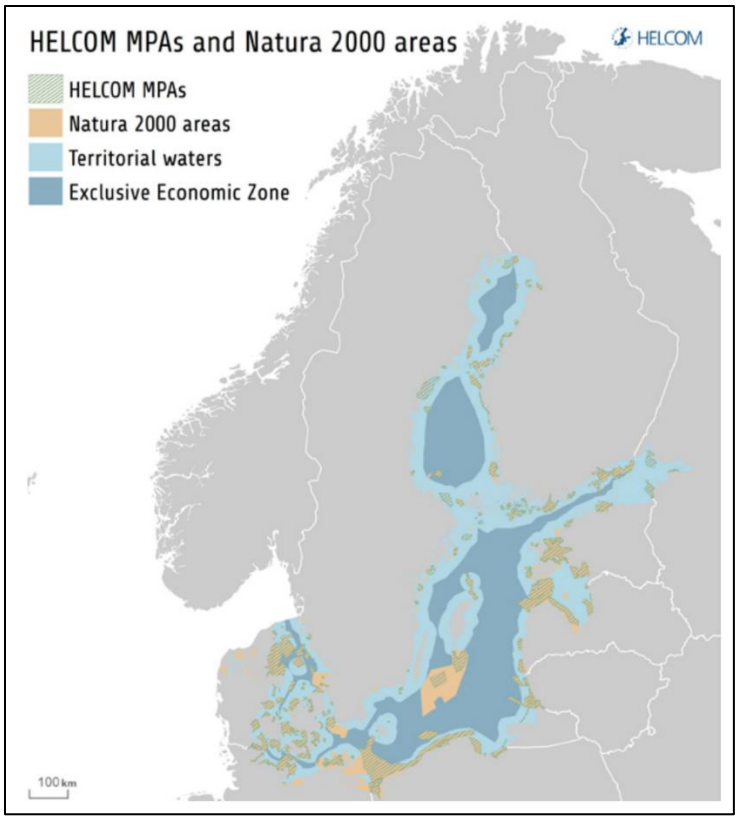


Figure 47. Marine Protected Areas in the Baltic Sea (Source: HELCOM, 2018a).

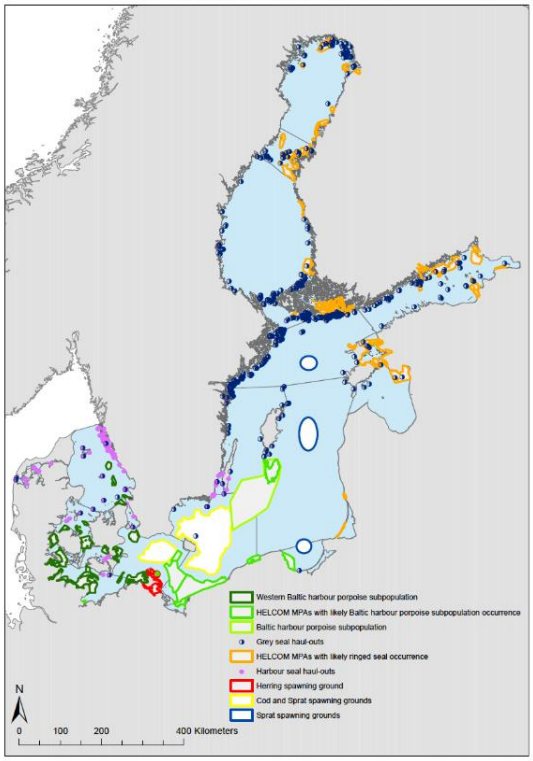


Figure 48. Preliminary biologically sensitive areas. For harbour porpoises, important areas are based on established MPAs where this species occurs as well as recent findings. For the Western Baltic subpopulation, important areas are based on tagging and acoustic survey data (dark green squares, Teilmann *et al*., 2008; Sveegaard *et al*., 2011a and b). For the Baltic sub-population, important areas are based on acoustic survey data (light green squares, Carlström & Carlén, 2016) and marine protected areas where this species occur (HELCOM MPA database; Carlström & Carlén, 2016) (Source: HELCOM, 2017a).

The Baltic Sea has reached the target of conserving at least 10% of coastal and marine areas, set by the United Nations Convention on Biological Diversity. By December 2020, the area protected by these marine protected areas (MPAs) was estimated at 16.5% (see Figure 47). A specific aim for the HELCOM network of marine and coastal Baltic Sea protected areas (HELCOM MPAs) is to be 'ecologically coherent', meaning that a network of protected sites should be designed so that it delivers more benefits than individual areas (HELCOM, 2016b). Management plans remain to be implemented in about 30% of the marine protected areas. HELCOM is working towards the development of a method to assess the management effectiveness of HELCOM marine protected areas and the network.

In February 2018, the UN Convention on Biological Diversity (CBD) held a Baltic Sea workshop in Helsinki, Finland, on the application of the EBSA (Ecologically and Biologically Sensitive Areas) criteria to draw attention to areas needing special attention. Seven criteria are used:

1. Uniqueness or Rarity
2. Special importance for life history stages of species
3. Importance for threatened, endangered or declining species and/or habitat
4. Vulnerability, Fragility, Sensitivity, or Slow recovery
5. Biological Productivity
6. Biological Diversity
7. Naturalness

These criteria can be ranked high, medium, low, or don't know. The workshop explored the potential for EBSAs in the Baltic Sea area covered by the Helsinki Convention. EBSAs are expected to contribute to fulfilling the regional goal of producing and applying maritime spatial plans that are coherent across borders and that apply the ecosystem approach. Nine areas were proposed as EBSAs and are now adopted by the CBD and are now included in the CBD EBSA repository (www.cbdint/ebsa): Northern Bothnian Bay; Kvarken Archipelago; Åland Sea, Åland Islands and the Archipelago Sea of Finland; Eastern Gulf of Finland; Inner Sea of West Estonian Archipelago; Southeastern Baltic Sea Shallows; Southern Gotland Harbour Porpoise Area; Fehmarn Belt; and Fladen and Stora and Lilla Middelgrund.

Key Conclusions and Recommendations *In recent years, particularly with benefit of the results of the SAMBAH Project, attention has been paid to the establishment of protected areas for harbour porpoise. Sweden in particular has key areas designated although these could usefully be extended, for example to include the Southern Midsea bank both in Swedish and adjacent Polish waters. All Baltic Sea countries need to consider whether there is scope for greater protection within their EEZs.*

Additionally, the Southern Gotland Harbour Porpoise Area EBSA in the Baltic Sea, where harbour porpoise has been described as one of the elements fulfilling EBSA criteria, could help to provide protection to the population as these EBSAs may require enhanced conservation and management measures. This can be achieved through a variety of means, including marine protected areas and impact assessments or the information can be used for the Marine Spatial Planning.

Summary of Progress in the Implementation of the Recovery Plan

Table 10 provides a qualitative assessment of progress on the various priority actions by each of the Member States. Status assessment criteria for the Jastarnia area are attached to this report as Annex II.

Priority Recommendations

1) Immediately implement mitigation measures to minimise bycatch in the entire population range. If pingers are not a viable alternative due to national security concerns, further areas should be closed to static net fisheries with effect immediately.
2) Any military issues with the use of porpoise click detectors in Swedish waters need to be resolved as soon as possible, so as not to hinder the gathering of new data on harbour porpoise detection rates, abundance and distribution.
3) Implement monitoring of bycatch and fishing effort to better estimate bycatch, particularly targeting high risk fisheries, by implementing recommendations from ASCOBANS Resolution 8.5, the HELCOM Roadmap on fisheries data in order to assess incidental bycatch and fisheries impact on benthic biotopes in the Baltic Sea, and the ICES advice.
4) Implement proper management of protected areas for porpoises.
5) Undertake SAMBAH II to improve estimates of abundance and distribution, to establish areas of high risk for bycatch and noise disturbance, to develop harmonized monitoring guidelines, and to calculate favourable conservation values and good environmental status thresholds.
5) Increase public awareness, especially in countries where there is little or no engagement.

Table 10. Summary of Progress in the Implementation of the Recovery Plan. For status assessment criteria see Annex II.

Actions from the Jastarnia Plan		Priority		SE	DK	DE	PL	FI	LI	LA	EE	RU
1	**Implementation of the CP: co-ordinator and Steering Committee**	**High**		Co-ordinator for 2020								
2	**Increase involvement, awareness and cooperation**	**High**	Public awareness	2	1	2	2	2	1	0	0	1
			Involvement and cooperation	1	1	1	1	1	0	0	0	0
3	**Monitor and estimate abundance and distribution**	**High**	Population-wide (including modelling)	SAMBAH II planned								
			Regional/national monitoring	2	2	2	2	2	0	0	0	0
			Population structure in the Baltic Region	2	1	3	1	2	0	0	0	0
4	**Bycatch**	**High**	Monitor bycatch	1	1	1	1	0	0	0	0	0
			Estimating bycatch	1	1	1	0	NA	NA	NA	NA	NA
			Reducing bycatch	2	2	2	2	0	0	0	0	0
5	**Monitor and mitigate impact of underwater noise**	**High**	Improve knowledge and develop threshold limits	1	1	1	0	1	0	0	0	0
			Mitigating effects of continuous noise	1	1	2	0	1	0	0	0	0
			Mitigating effects of impulsive noise	1	1	2	0	1	0	0	0	0
6	**Monitoring and assess population health status**	**Medium**		2	0	3	1	NA	NA	NA	NA	NA
7	**Investigate habitat use and protect important areas**	**Medium**	Investigating habitat use	2	2	2	2	2	2	2	2	0
			Protecting important areas	2	2	2	2	0	0	0	0	0

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