Agenda Item 6.1.1	Further Implementation of the Agreement Species Action Plans Recovery Plan for Baltic Harbour Porpoises (Jastarnia Plan)
Information Document 6.1.1b/Rev.2	**Progress Report on the Jastarnia Plan**
Action Requested	Take note
Submitted by	Harbour Porpoise Coordinator

Note:
Delegates are kindly reminded to bring their own document copies to the meeting, if needed.

PROGRESS REPORT

on

THE JASTARNIA PLAN:

THE RECOVERY PLAN FOR THE HARBOUR PORPOISE

IN THE BALTIC PROPER

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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., 2008; HELCOM, 2013). The population is currently listed as Critically Endangered (CR) by IUCN (Hammond et al., 2008), 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 (16^{th}) meeting was held online in June 2020. 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 whale.

Therefore, there is a strong need for an awareness raising programme. This could usefully 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 has had a long history of raising awareness about harbour porpoises, led by initiatives from Krzysztof Skóra and Iwona Pawliczka, in collaboration with WWF Poland. The WWF voluntary network Blue Patrol reports stranded animals to Hel Marine Station and assists in delivering carcasses to the station. All those efforts should continue.

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). A sightings programme where the public can report harbour porpoise observations is run by the Swedish Museum of Natural History.

WWF Sweden and the Swedish Society for Nature Conservation has recently been active by including the plight of the harbour porpoise in their campaigns. 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.

CCB has a Facebook page aimed at the Swedish general public informing them about the Baltic harbour porpoise, and models of porpoises have been placed in Sweden's largest zoo, Kolmården, where Mats Amundin has done much to raise awareness of the species.

There is little done in the way of public awareness campaigns in **Denmark**. However, 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. Also, in 2020 a small campaign on the harbour porpoise will be launched by the Danish Society for Nature Conservation. There is currently no public sightings programme in operation. Although there is no comprehensive stranding scheme, reporting to the Maritime Museum in Esbjerg (https://fimus.dk) is encouraged. Strandings data is reviewed at intervals but the reports should be seen as an absolute minimum number of strandings, since it is believed that not all strandings are reported.

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/). Project "STELLA" (November 2016 – December 2019) is another project involving close cooperation with

fishers to develop of alternative management approaches and fishing gear. Public engagement activities include an exhibition "Die letzten 300" in collaboration with NGOs NABU and OceanCare as well as with ASCOBANS. The exhibition displayed the many works received as part of the creative competition, and was on display in the German Oceanographic Museum in Stralsund from January – April 2015, and visited by an estimated 30,000 people. The 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 is doing 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). Press releases have been made in early summer 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.

However, 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.

In **Lithuania**, on the other hand, 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). There are also future plans by the Lithuanian Sea Museum (LSM) for a Baltic Sea Animals and Therapy Centre (BARTC).

Several of the above initiatives were most active a few years ago. 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 recent 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.

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
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)	Sightings and strandings should be reported to https://www.nrm.se/tumlare Sightings can also be reported to: https://www.artportalen.se/	

Involvement and cooperation

One of the major pressures upon the Baltic harbour porpoise is fisheries bycatch. In order to address this, efforts should be made to engage with stakeholders, in this case, particularly fishers. Ghost nets has 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 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 recognised as part of the native 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 2), the abundance of the Baltic harbour porpoise population was estimated at 497 individuals (95% CI 80–1091) (Carlén et al., 2018; SAMBAH, 2016).

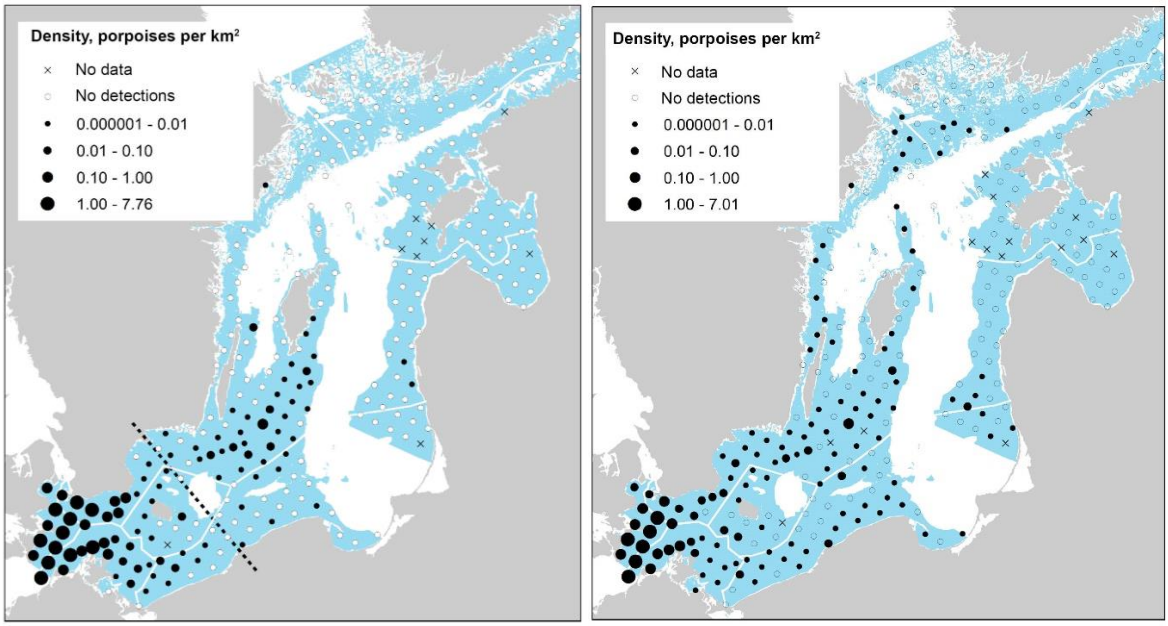


Figure 2. Estimated densities of harbour porpoises derived from SAMBAH Project in summer, May-Oct (left) and winter, Nov-Apr (right). The legend shows estimated porpoise density per km^2. Crosses indicate no data and white circles no detections (Source: SAMBAH, 2016)

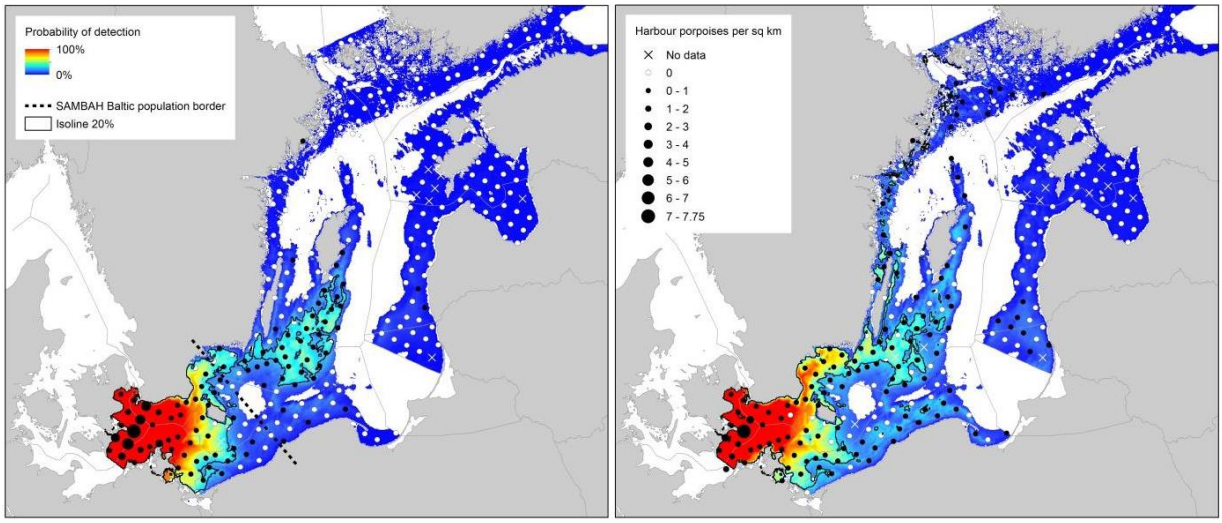


Figure 3. Predicted probability of detection of harbour porpoises per month in the SAMBAH project area during May – October (left) and November – April (right). The black line indicates 20% probability of detection, approximately equivalent to the area encompassing 30% of the population, often used to 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 (SAMBAH, 2016; 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 3). 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 3). The area around the Hoburg's and Northern and Southern Mid-sea banks in the Baltic Proper should be considered essential and probably the main breeding area for the Baltic harbour porpoise population (Figures 2, 3).

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. There are well progressed plans for a SAMBAH-II project, and a concept note will be submitted to LIFE in June 2020.

Regional/national surveys

Since SAMBAH, some countries have continued acoustic monitoring. In **Denmark,** the Nature Agency has initiated monitoring of the Baltic population under MSFD, with C-PODs deployed at ten stations around Bornholm between June 2018 and June 2019 (Figure 4). This is planned to be repeated every 3 years. The data from 2018-2019 indicates an increase of detections in the area compared to the SAMBAH data.

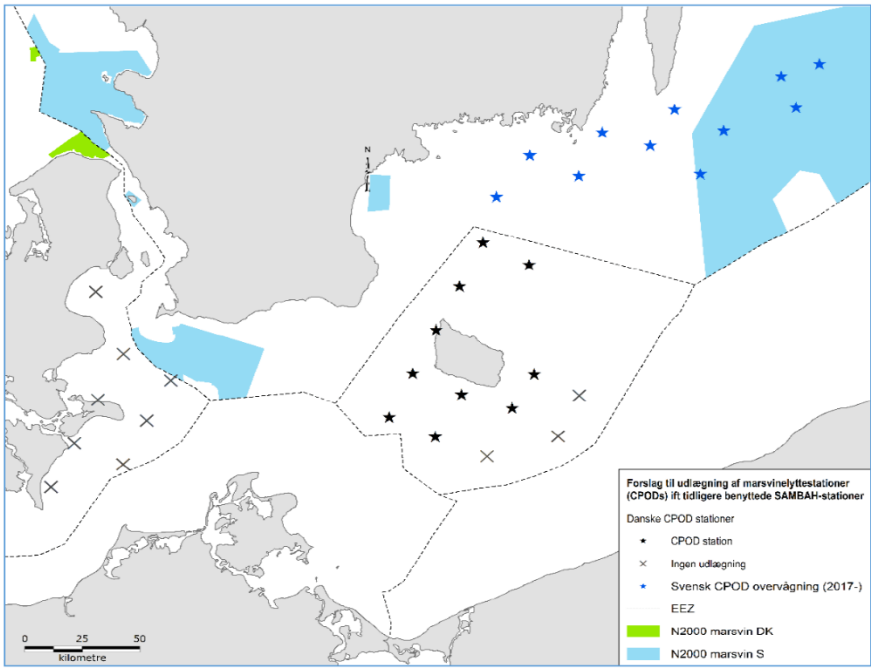


Figure 4. Locations of ten C-POD acoustic monitoring stations in Danish waters of the Baltic. Legend shows proposals for the deployment of porpoise acoustic stations (CPODs) in the previously used SAMBAH stations. Black stars signify Danish stations, blue stars Swedish monitoring proposed in 2017, and crosses are stations recovered. Green shows Danish Natura 2000 site, and pale blue Swedish Natura 2000 sites (Source: Danish Nature Agency).

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 5 for detections per station. The methods applied are the same as in the SAMBAH Project. This monitoring programme is undertaken by Turku University of Applied Sciences, funded by the Finnish Ministry of the Environment and Åland Government. The results 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 during the cold-water season. Opportunistic sightings also show occasional presence in coastal waters, including Gulf of Finland and Bothnian Bay.

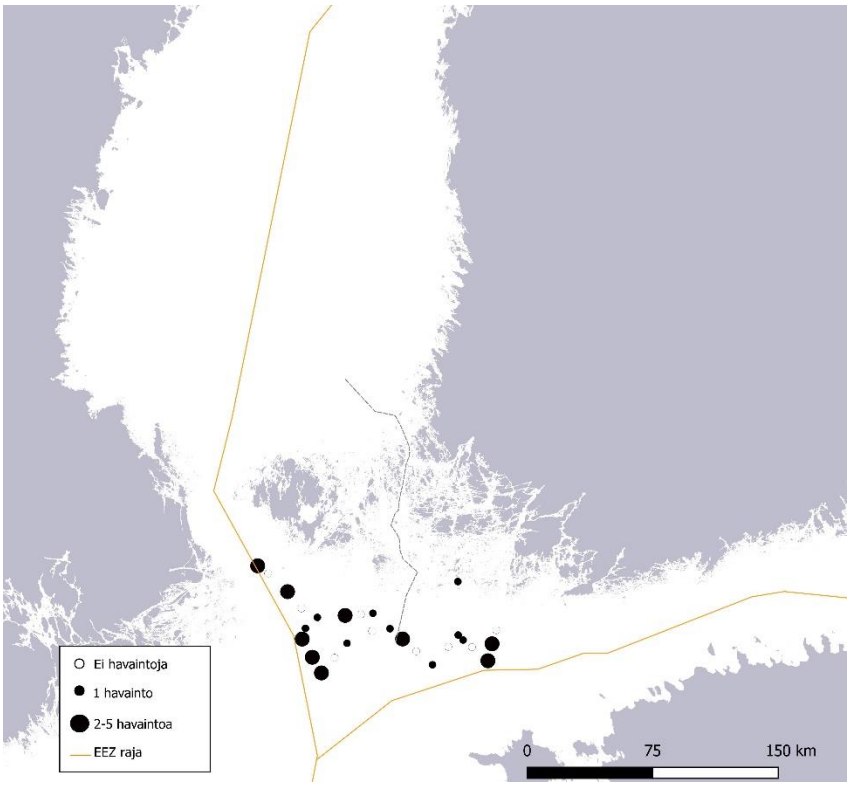


Figure 5. Passive acoustic monitoring stations in Finnish waters within SAMBAH between 2011-2013 and within national monitoring programme between 2016-2019. Empty circles denote stations without detections, black circles with size depending on number of detections.

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 (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. 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 8.

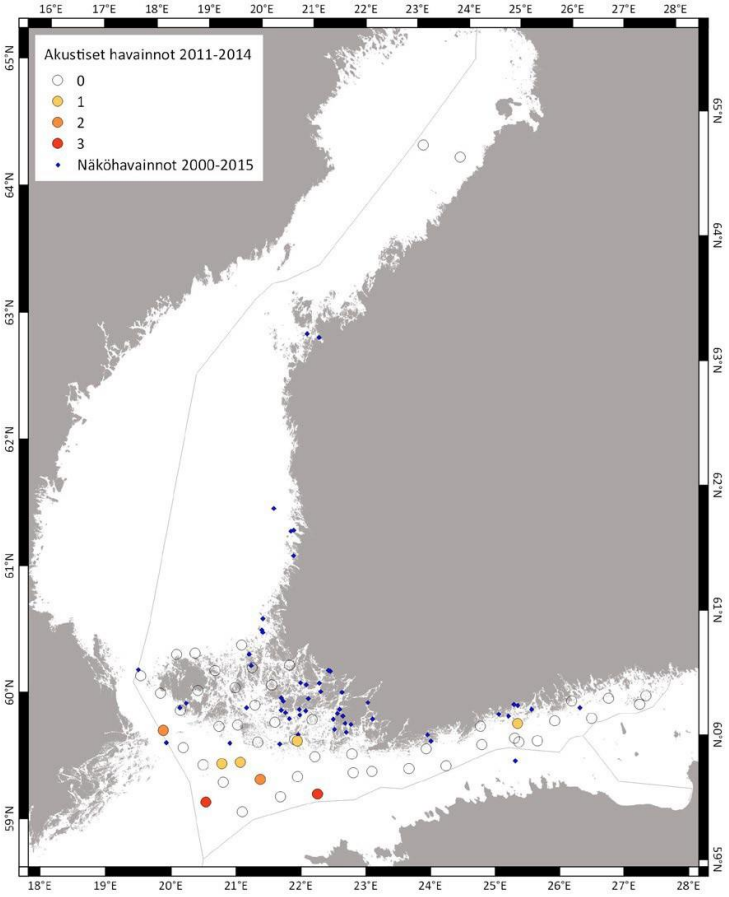


Figure 6. Acoustic and visual observations of harbour porpoises in Finnish waters. The blue dots represent visual observations (in total 53) in 2000-2015. The circles represent passive acoustic monitoring stations and the number of observations received from then in 2011-2014. Legend shows acoustic observations for 2011-2014 and visual observations 2000-2015 (Source: Loisa, 2016).

In **Germany**, there is an established acoustic monitoring programme with C-PODs deployed at 15 stations in five areas (Figure 7). 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).

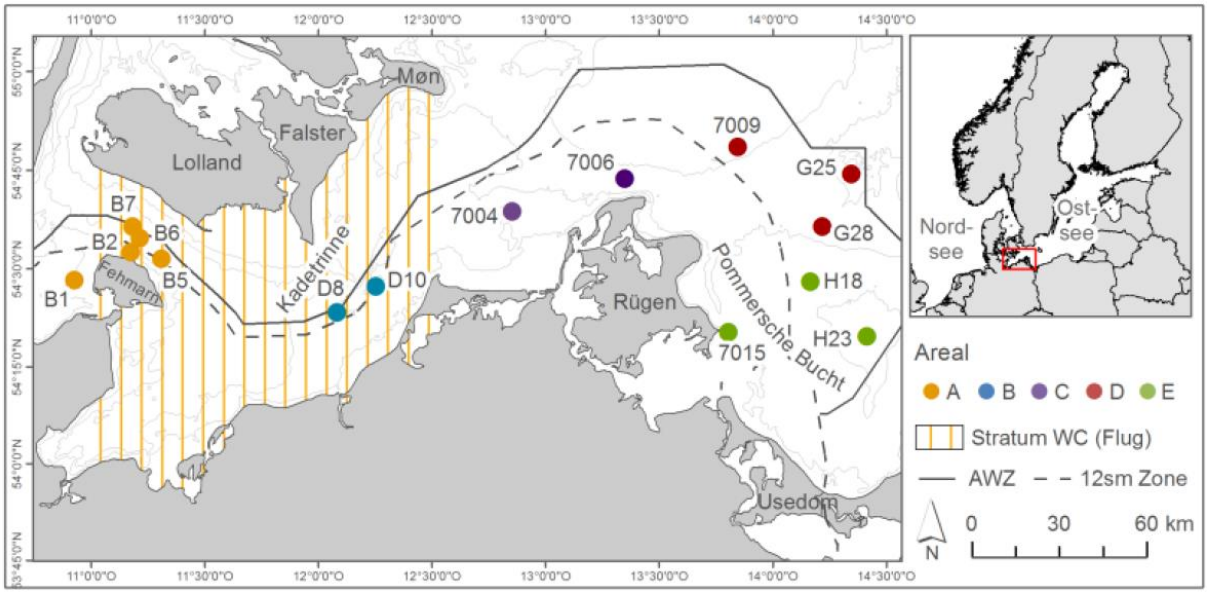


Figure 7. Monitoring Programme to determine abundance and distribution of harbour porpoises in German waters of the Baltic, with aerial survey tracks & C-POD deployments (Source: German Oceanographic Museum).

Hel Marine Station in **Poland** has undertaken static acoustic monitoring using C-PODs in the southern part of the Gulf of Gdańsk between 2013 and 2014, and at 25 stations in Puck Bay between 2017 and 2018, building upon earlier acoustic monitoring there, from 2009-2013 (Figure 8). For Puck Bay in particular, they show a seasonal influx of animals during the winter period (November-April) (Figure 9). Since 2018, there is national monitoring of harbour porpoise included in the Polish "Monitoring of marine habitats and species programme". This is carried out using static acoustic methods, two years out of six, in three sites: Pomeranian Bay, Stilo Banks and Gulf of Gdansk. The next monitoring period was due to start in 2020 but is postponed, hopefully only to 2021. In the past years there are also some EIA studies for offshore construction such as windfarms and pipe-laying, as well as a few research projects by University of Gdansk.

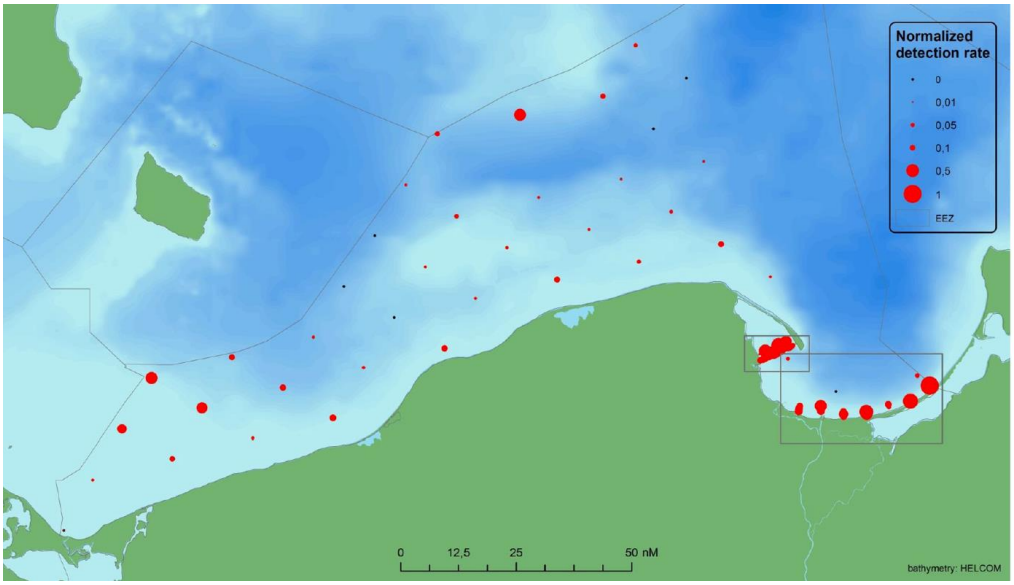
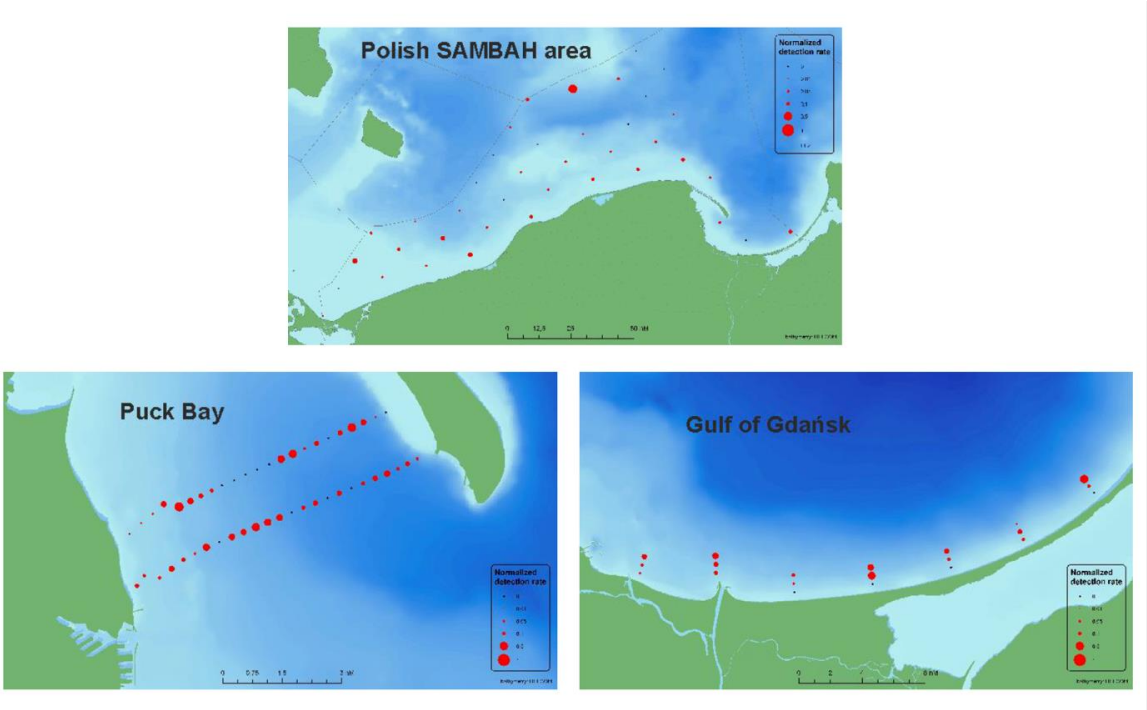


Figure 8. Results of Static Acoustic Monitoring Projects carried out in Polish Baltic waters, 2017-18. PPM were calculated for a period of deployment in each location (Source: Hel Marine Station).

a) Winter period (November to April)



b) Summer period (May to October)

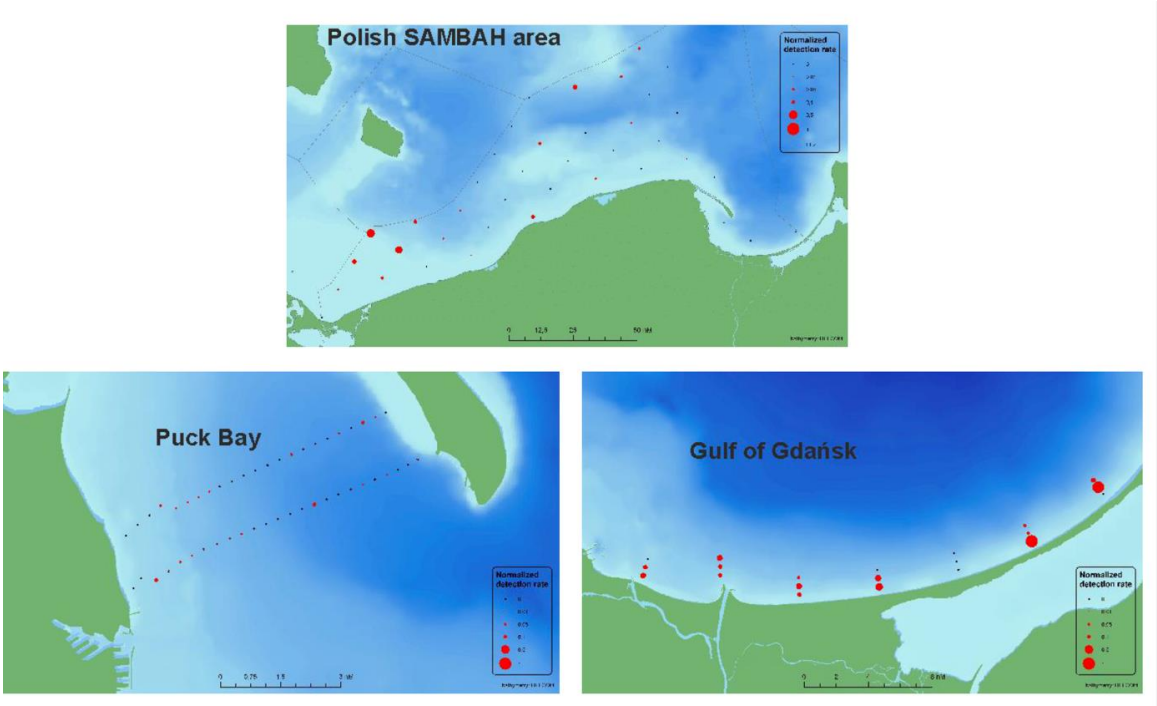


Figure 9. Seasonal Variation in Harbour Porpoise Acoustic Detection Rates (PPM) in coastal waters of the Polish Baltic, 2017-18 (Source: Hel Marine Station).

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. The monitoring of the harbour porpoise was carried out at two sites: in the Pomeranian Bay and the Stilo Sandbank. 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 (Nind./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 of harbour porpoise (Nind/km^2) at SAMBAH stations in Polish pilot projects

Project	Site	
	Pomeranian Bay	**Stilo Bank**
Polish pilot	0,03776	0,00109
SAMBAH	0,0017	0,0003

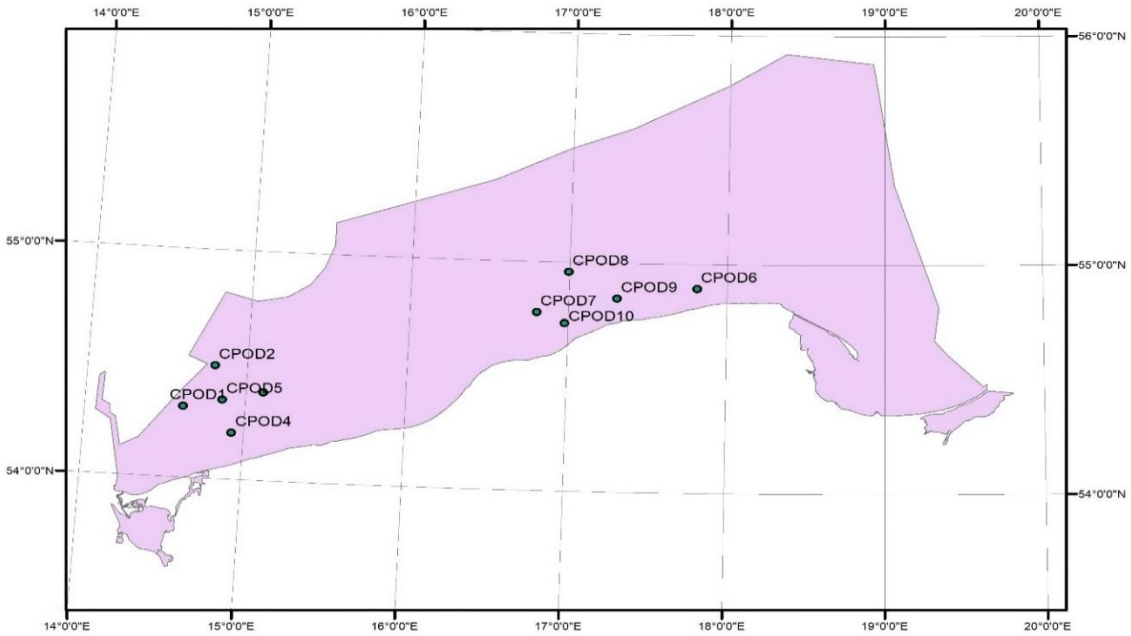


Figure 10. Location of monitoring stations in the Polish Marine Waters under the "Pilot monitoring of marine species and habitats" project (Pomeranian Bay – west coast, Stilo Bank – middle coast).

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 11). 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 pSCI. 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 Öland, and more counties have expressed interest to start monitoring. In a temporal trends analysis by the Swedish Museum of Natural History, data from 11 stations from the SAMBAH project in 2011-2013 was compared to data from the same stations in the national monitoring programme in 2017-2020, and preliminary results show that detection positive days may be increasing over time. This is interesting, especially given that similar results were seen in the Polish "Pilot monitoring of marine species and habitats" (Table 2).

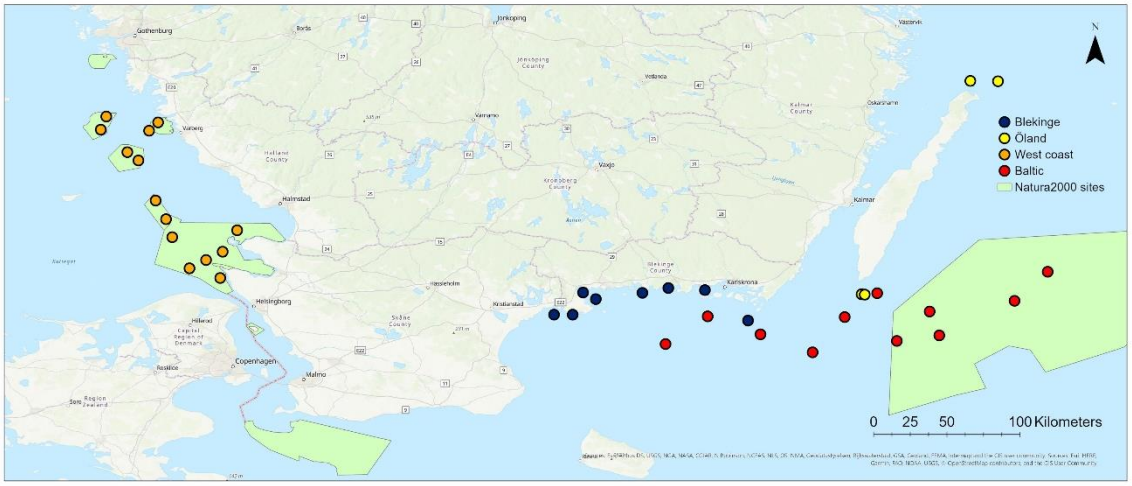


Figure 11. Monitoring stations for harbour porpoises in the Swedish waters of Baltic proper (right of the dashed line) including the location of Marine Protected Area (Natura 2000) (Source: Swedish Museum of Natural History)

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. No formal monitoring programmes exist in other eastern Baltic states. The deployment of C-PODs in this part of the Baltic would provide a useful assessment of the occurrence of porpoises in the region.

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 will also expand 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 2000–2019, there has been approximately 70 sightings of 120 animals, with an average group size of 1.8 (range 1-6).

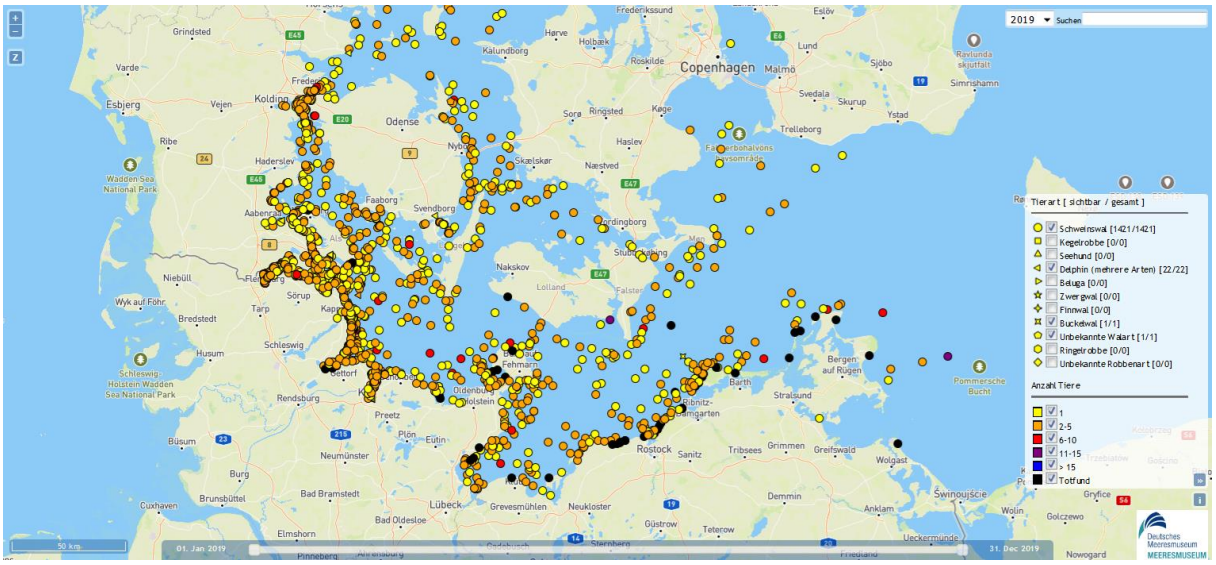


Figure 12. Opportunistic records of sightings of harbour porpoises from German waters in 2019 (Source: German Oceanographic Museum).

Germany has a well organised sighting scheme, and sightings are being logged annually. Figure 12 shows a map of the 1421 harbour porpoise sightings reported in 2019, as well as a few sightings of dolphins and a humpback whale.

In **Poland**, voluntary reports of sightings, strandings, and bycaught animals between 1986 and 2015 are summarised in Figure 13.

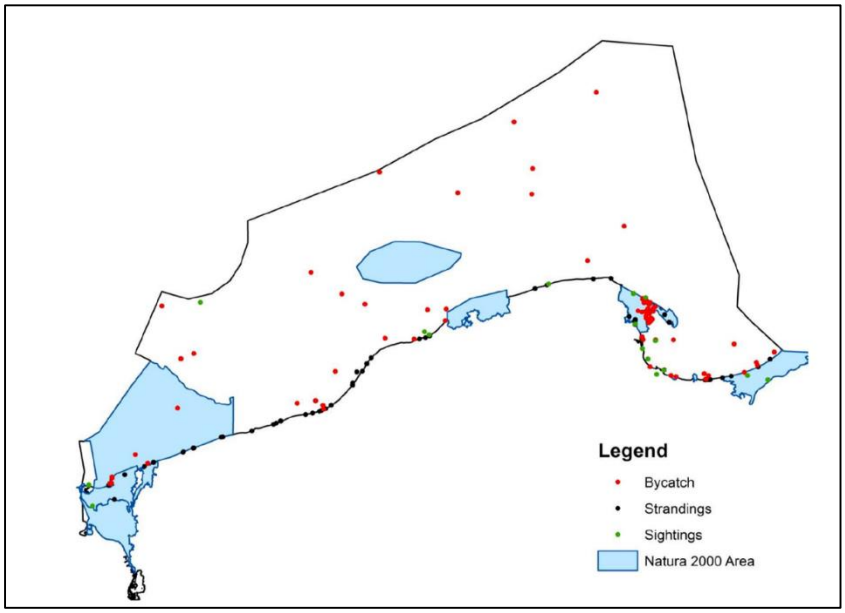


Figure 13. Occasional voluntary reports of harbour porpoises in the Polish EEZ between 1986 and 2015 (Source: Hel Marine Station).

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. In 2019 there were a total

of 189 live observations reported, whereof 8 were north-east of the SAMBAH summer management border and 13 east of 13.0°E (Figure 14).

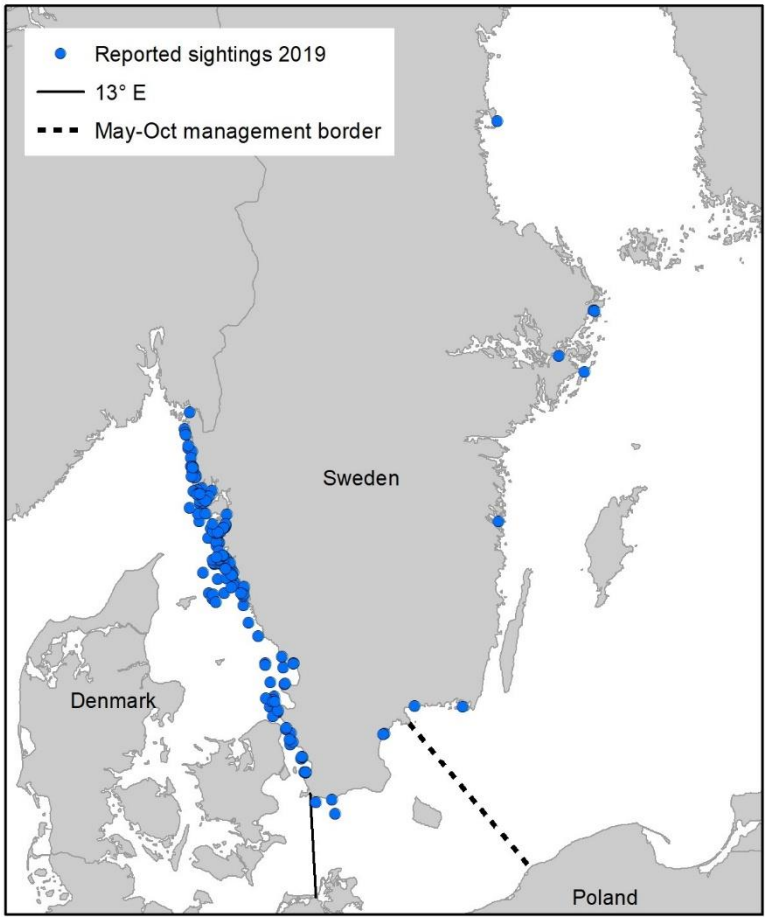


Figure 14. Live sightings reported to the Swedish Museum of Natural History during 2019.

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.

HELCOM has been collaborating with ASCOBANS to produce an online database of records of harbour porpoise from the Baltic Proper. A plot of live sightings from 1800-1980 is presented in Figure 15.

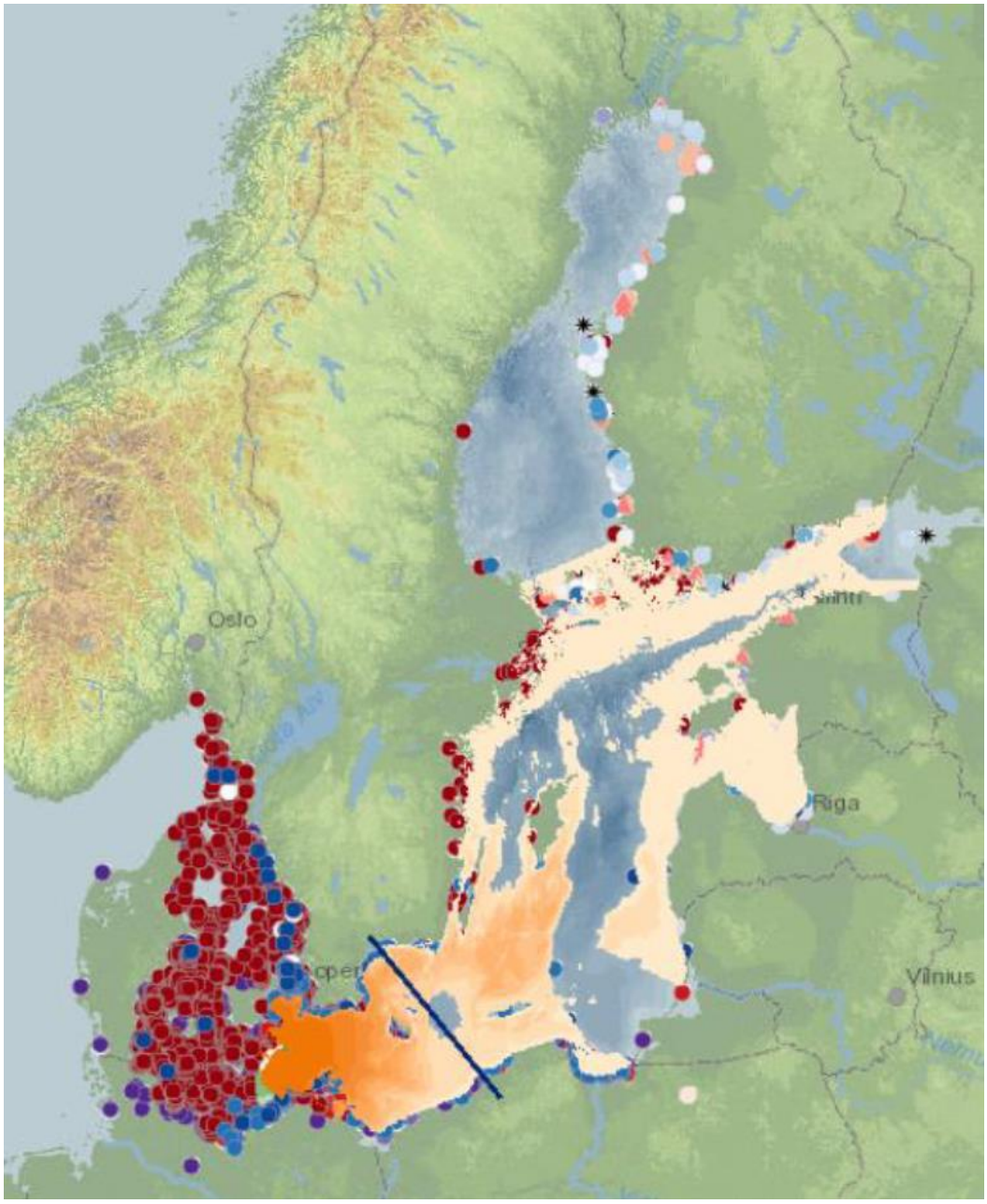


Figure 15. HELCOM Map of Harbour Porpoise Records from the Kattegat, Belt Seas and Baltic Proper, 1800-1980. Different colour circles refer to different time periods, the red circles representing 1961-80 (Source: HELCOM Database).

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 16).

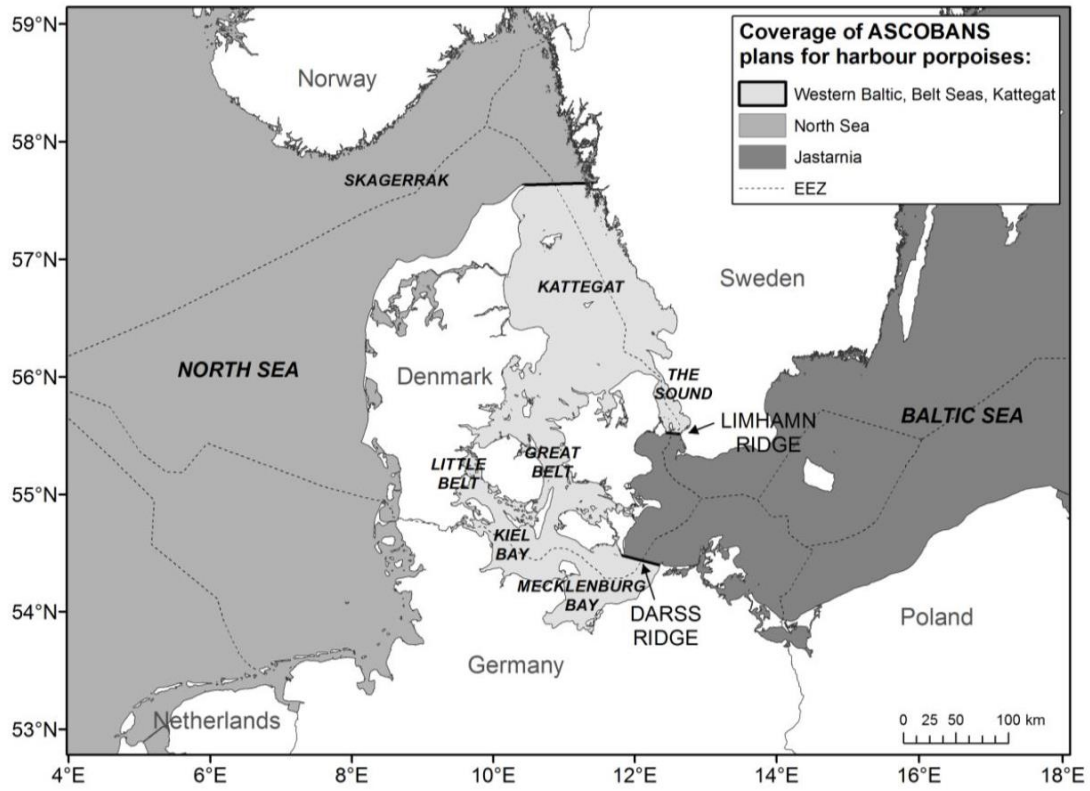


Figure 16. Map of the North Sea and the Baltic indicating where the geographical area covered by the Plan for the population in the Western Baltic, the Belt Sea and the Kattegat adjoins that of the ASCOBANS North Sea Plan and the ASCOBANS Jastarnia Plan. The dashed line indicates the national borders 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 3, in the summer months May-October (Carlén et al., 2018; SAMBAH, 2016). 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 17). They recommend that ASCOBANS reconsider the boundaries for each of the plans taking account of these findings.

The ICES 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).

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.

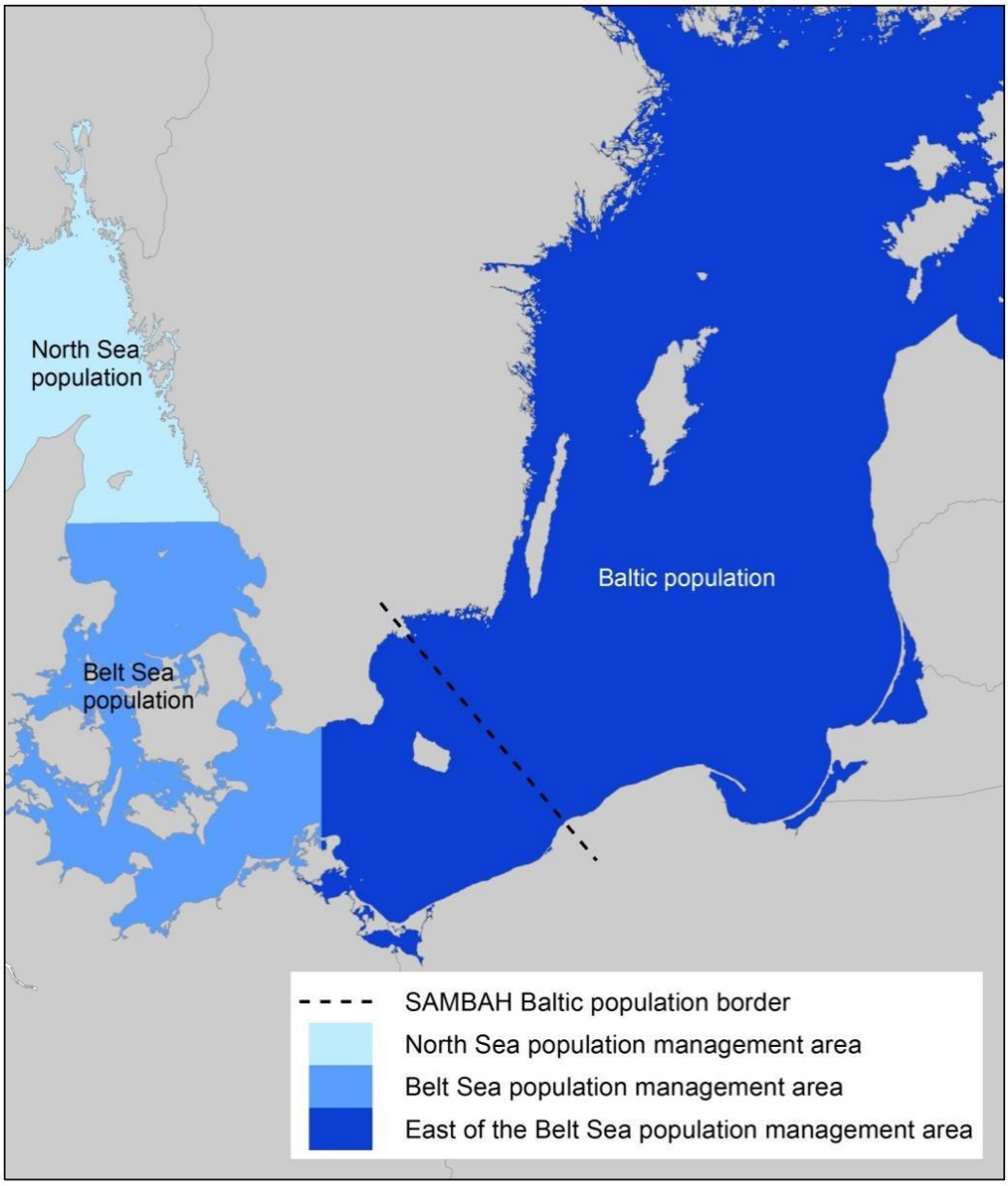


Figure 17. Harbour porpoise populations in the Baltic region. Blue shading indicates the borders proposed for the management unit of the Belt Sea population by Sveegaard *et al.* (2015), the dotted black line the spatial separation during May-Oct of the Belt & Baltic populations by SAMBAH (2016a). All 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 last Jastarnia Group meeting. 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. 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.

Ralph Tiedemann and colleagues at the University of Potsdam are currently working on an informative SNP panel for population assignment, which may be ready by the end of 2020. However, samples from the Baltic Proper population are needed to calibrate the model. Countries where stranded or bycaught animals can be assumed to be from the Baltic Proper harbour porpoise population, such as Finland, Sweden and Poland, are strongly encouraged to make samples available to the team. When the SNP population assignment panel is ready it would be very interesting to run samples from for example the seven 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. In summer the population in the Baltic Proper is separated from the one in the Belt Sea, but in winter there is some mixing in the Western Baltic.*

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

National monitoring continues mainly in the western parts of the Baltic. The existing programs should continue and similar monitoring should be put in place in the eastern countries as well. 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.

3. Monitor, estimate and reduce bycatch

Reporting of fishing effort and any associated bycatch is done by ICES Area, with subdivisions as indicated in Figure 18. In 2017, no bycatch of harbour porpoises was recorded in The Baltic Proper east of ICES Area 24; two porpoises were reported bycaught in the Sound (27.3.b.23) and one in Skagerrak/Kattegat (27.3.a) (ICES, 2019).

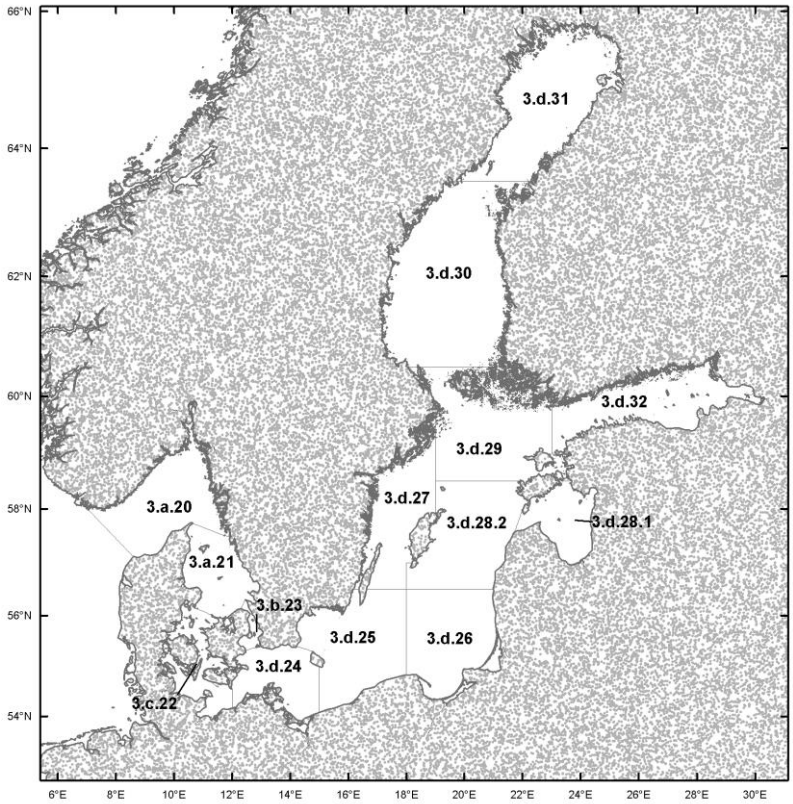


Figure 18. Map of the ICES Area subdivisions of the Skagerrak, Kattegat, Belt Seas and Baltic Proper, for the reporting of catch statistics (Source: ICES).

The distribution of fishing effort for static gear is shown in Figure 19. 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.

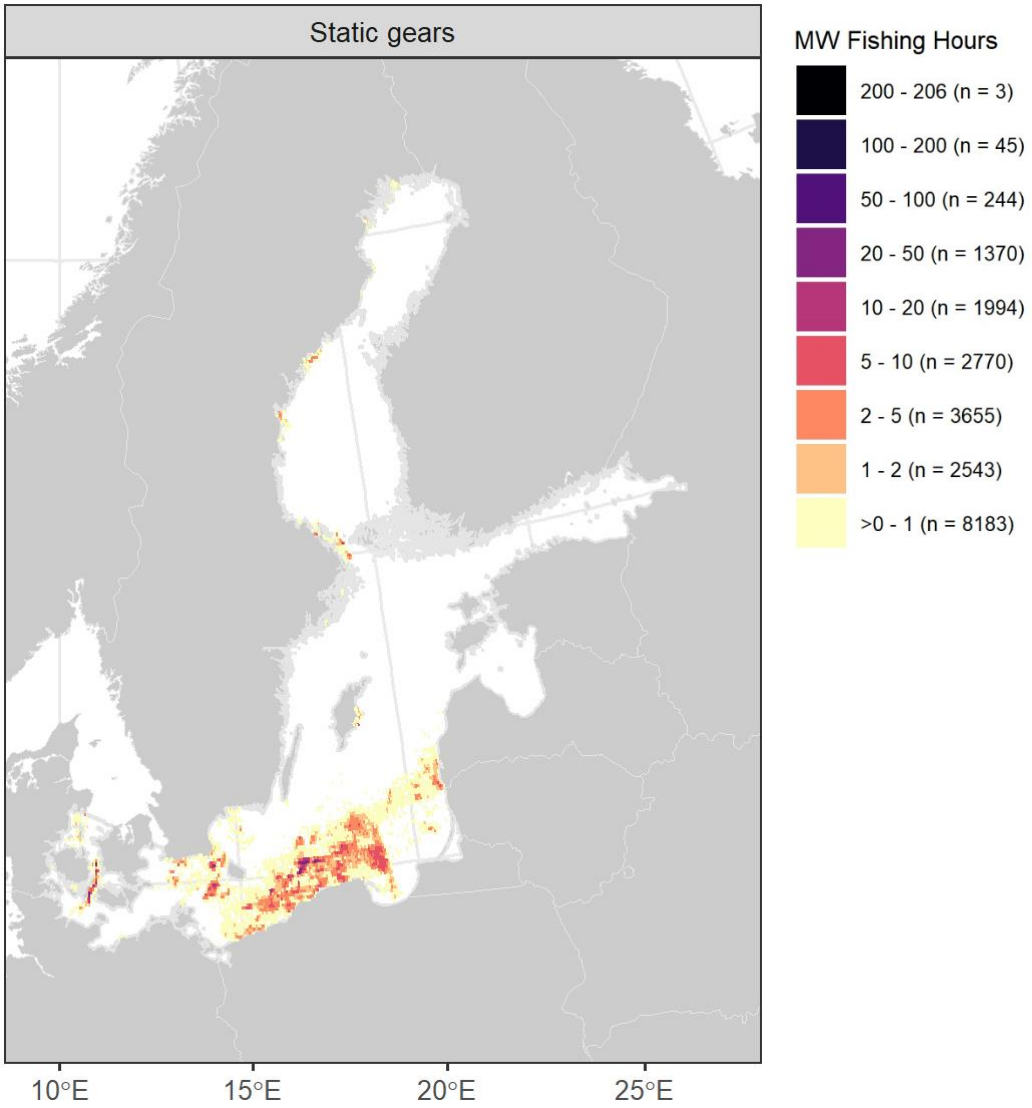


Figure 19. Spatial distribution of average fishing effort (mW fishing hours) in the Baltic Sea during 2015-2018 for static gear. Fishing effort data are only shown for vessels >12 m carrying VMS. Russian data are absent as they were not received. (Source: ICES, 2019).

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 ADDs on any bottom-set gillnet or entangling net in the same areas of the Baltic Sea as Regulation 812/2004, 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.

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. Notably, in Sweden it is not entirely clear if there is an obligation to report a bycaught harbour porpoise, since there is no such obligation in the fisheries legislation, but in the hunting regulation it is clearly stated that all dead cetaceans are the property of the state and must be reported to the police. This should be clarified, and we would suggest that the Swedish fisheries regulation is amended to include the obligatory reporting of bycaught cetaceans. 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)	
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	No, only landed catch should be reported. Bycatch over 50 kg should be reported. However, the harbour porpoise is the property of the state, and should therefore be reported, but this is not mentioned in fisheries legislation.	§ 33 Jaktförordningen (hunting regulation)

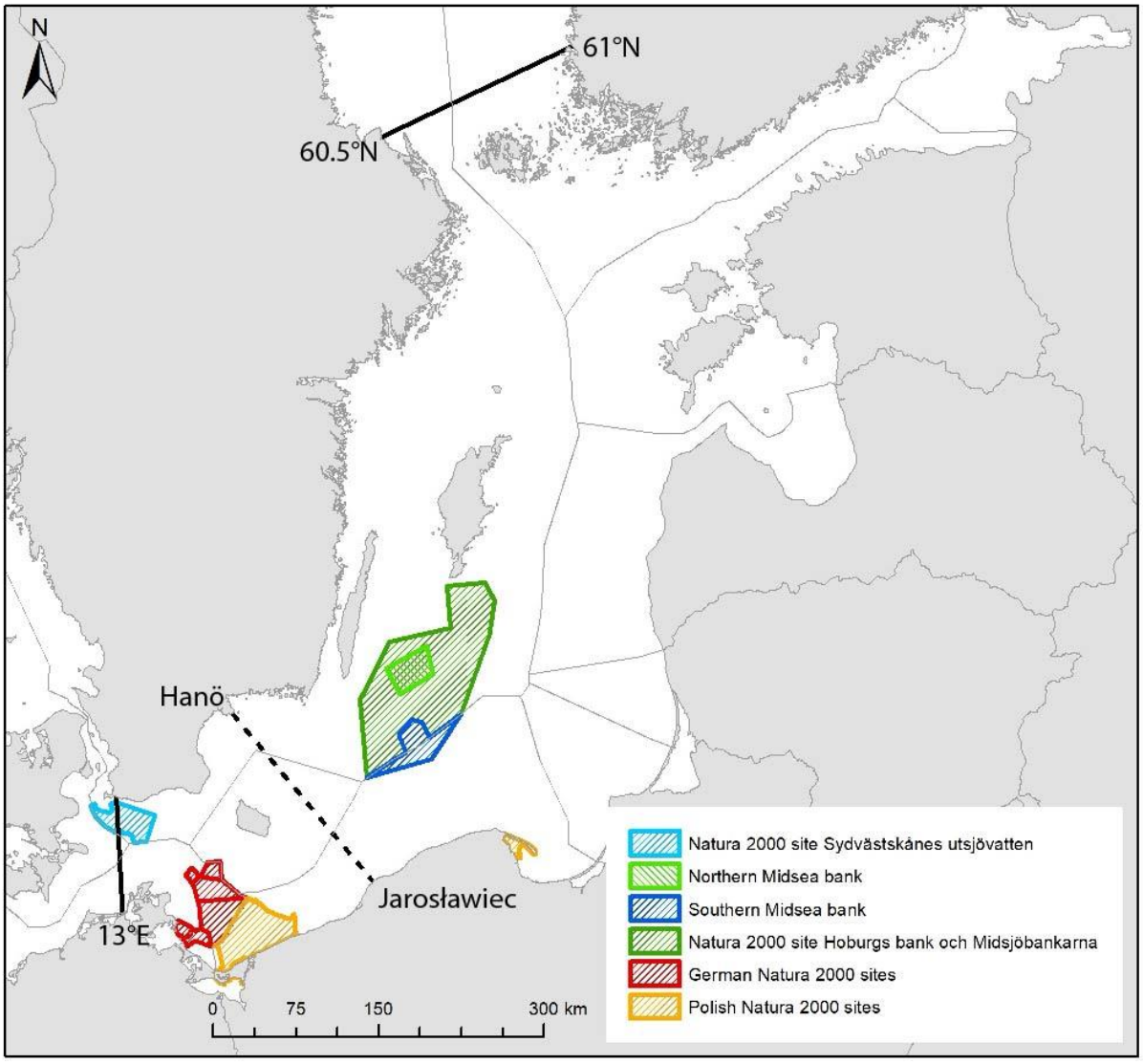


Figure 20. Map showing the Baltic Sea region with sites and areas referred to in the ICES advice (ICES, 2020).

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. 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 20) 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 20):
   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 Jastarnia group meeting that took place 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.

Denmark

The Danish fleet comprises close to 350 vessels divided into offshore fisheries (approximately 100 vessels 8–12 m and 80 vessels >12 m) and coastal fisheries (approximately 150 vessels). 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. In 2017, one harbour porpoise bycatch was registered in area 27.3.b.23.

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

progressing to better understand the factors affecting bycatch rates. With regard to mitigation, "pingers" were being developed and tested, and trials conducted using lights and setting nets lower. In developing and testing alternative gear, studies are taking place to improve the catch efficiency of cod traps, using push-up traps for cod as well as developing and testing small-scale Danish seine for cod. These actions are being undertaken in collaboration with SLU, Sweden. These programmes of research are scheduled to be completed by 2020.

Estonia

In Estonia, the active offshore fleet comprises around 30 fishing vessels (17–42 m), while the coastal fishery consists of several hundred small vessels of < 12 m. Gillnets are allowed in recreational fisheries, with a limitation of max 3 nets ≤70 m at any given time. In 2017, Estonia had bycatch monitoring under Regulation 812/2004 in pelagic trawl fisheries. No harbour porpoise bycatch was recorded. No bycatch mitigation is currently in place.

Finland

In Finland there are almost 1500 vessels active in professional 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 is dominated by the recreational fishery which is entirely unrecorded and not included in this estimate. Finland has no bycatch monitoring but states that it has been made obligatory to report any bycatch in the logbook.

The reporting of bycatch of marine mammals is mandatory since 2016, but it is not clear how the compliance to this is followed up in practice. There is no effort towards alternative gear or other mitigation measures in Finland. 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 recent management proposal (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. One 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 2017, no harbour porpoise bycatch was registered under this monitoring.

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.

Germany has also been investigating alternative management approaches and the use of alternative fishing gear. The "Stella" Project (November 2016 – December 2019) had 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 was funded by the Federal Agency for Nature Conservation (BfN), and conducted by the Thünen Institute of Baltic Sea Fisheries. It has engaged 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 last 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 should 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. The final report from the Stella project is expected during 2020, but hopefully trials with modified gillnets will continue.

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. In 2017, Latvia had bycatch monitoring under Regulation 812/2004. No harbour porpoise bycatch was recorded.

Lithuania

In 2018, the Lithuanian fishing fleet comprised 21 offshore vessels (>18 m) and 59 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. 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. No report from Lithuania was made available for

ICES WGBYC in 2019.

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 approximately 500 coastal vessels under 12 m, most of which use gillnets. Gillnets are not allowed in recreational fisheries. No vessels are using alternative gear like cod pots (that are used on Swedish coast). They are not suitable due to the open coastline with strong currents. 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. In 2017, no harbour porpoise bycatch was registered under this monitoring.

In Polish waters, the breakdown of different gear types in Puck Bay between the years of 2004 and 2017 is shown in Table 5, with a spatial comparison of fishing effort for the years 2009 and 2017 in Figure 21. Today, information on bycatch in Polish waters comes entirely from strandings.

Table 5. 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

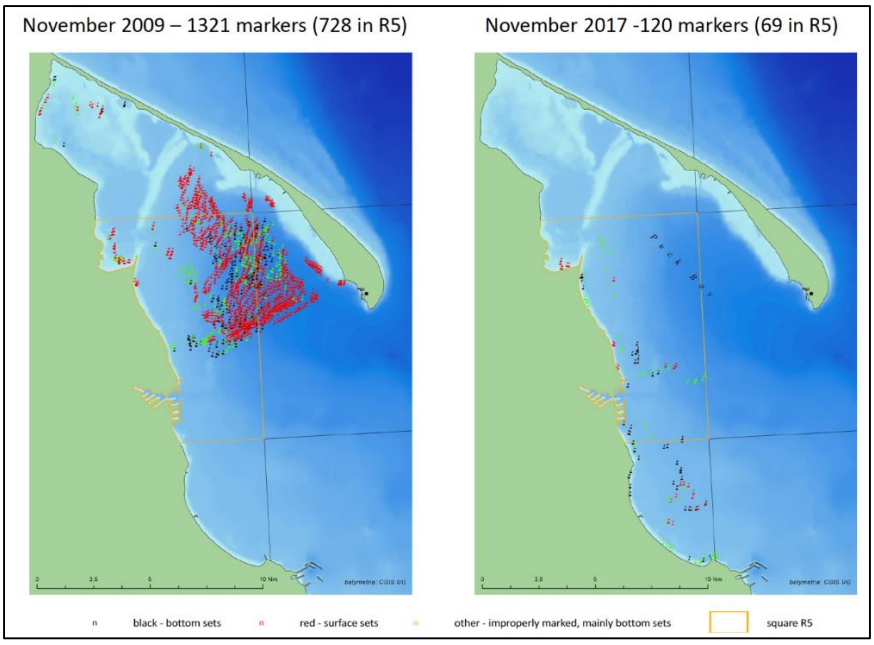


Figure 21. Changes in fishing effort (number and distribution of nets) in Puck Bay, Nov 2009 & Nov 2017 (Source: Hel Marine Station).

Since 2015, the programme for monitoring incidental catches has been part of the National Fisheries Data Collection Programme. The observation scheme includes possible catches or entanglements of cetaceans and other marine mammals, as well as seabirds and protected species such as twaite shad (*Alosa fallax*) and sturgeon (*Acipenser oxyrhynchus*).

No observations of cetacean bycatch were made during the observer programme carried out according to EU Council Regulation 812/2004 in 2016-2017. Also, no cetacean bycatch was documented during the pilot programme in 2006-2009 or during the follow-up of the monitoring programme in the years 2010-2016. However, on 26 April 2018, a fisherman from Rowy in Poland reported a porpoise bycatch. 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.

Some trials are ongoing using pingers on gillnets. From 2018-2020 Banana pingers were given to 25 gillnet fishermen who operate vessels below 12 m in length. Data collection is still ongoing. In 2020 trials will also start with pontoon traps in shallow waters, probably in Puck Bay, as a possible alternative to gillnets.

Sweden

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. In Swedish waters, harbour porpoises are bycaught mainly in gillnets and not in pelagic trawls, and therefore observing 5% of Swedish pelagic trawl effort in the Baltic is insufficient to provide an estimate of total cetacean bycatch with acceptable confidence limits, and in 2017, no bycatch of cetaceans was observed under the DCF monitoring programme.

However, in a pilot project carried out by the Department of Aquatic Resources at the Swedish University of Agricultural Sciences (SLU Aqua) during 2017, where observers were onboard on a total

of 36 Days at Sea, two porpoises were recorded bycaught in large mesh gillnets in ICES SubDivision 23 (the Sound).

A project on remote electronic monitoring (REM) is ongoing at SLU Aqua and at present has about 8 fishermen engaged. SLU Aqua is looking for more fishermen to participate and there is funding available for the project from 2020. The biggest problem has been to find good cameras, and own equipment has been built for trials. Soon a new system from New Zealand will be tested.

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 implemented in regulated fisheries in Sweden. 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 ends and a report will be available at the end of 2020. There is no funding to buy more pingers, but the fishermen who participated are still using the pingers they were given and are still reporting data to SLU Aqua.

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. A paper on this study is in prep. and is expected to be submitted at the end of 2020.

In the Swedish small-scale coastal fisheries, alternative fishing gear has been, and is still being, developed. 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.

Between 2014-2020 there have been funding opportunities for fishers to put forward their ideas for selective fishing gear to the “Secretariat for selective fishing gear” funded by the Swedish Agency for Water Management. The purpose of the Secretariat was to enable the fishing industry to develop selective fishing gear to help the transition to the new landing obligation. Projects were carried out by SLU Aqua in cooperation with the involved fishers. From 2020 and onwards funding is uncertain.

SLU Aqua together with DTU Aqua and the Thünen Institute have been engaged in a programme to improve the design of cod pots to reduce bycatch. However, due to the ban on cod fisheries in the Baltic Sea, this study and others focusing on alternative gear for cod fisheries have been postponed or cancelled.

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.

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. 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 gives detailed recommendations on such actions, and although the actions listed may not be enough to eliminate bycatch, it is certainly a good start. We recommend that the recommendations made in the ICES advice are implemented as a matter of urgency, and that it is ensured that those or similar measures are kept in the long-term. Since these measures include large-scale use of pingers, at least until commercially viable alternative gear is available, we also recommend that in-depth monitoring is carried out in parallel to these mitigation action, to ensure that any negative effects of pinger use can be detected and remedied.

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 and do not have unintended population-level consequences.

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 27 August 2020 showing the blocks with activity for each of the main source types for the years 2010-2018, are depicted in Figures 22-25.

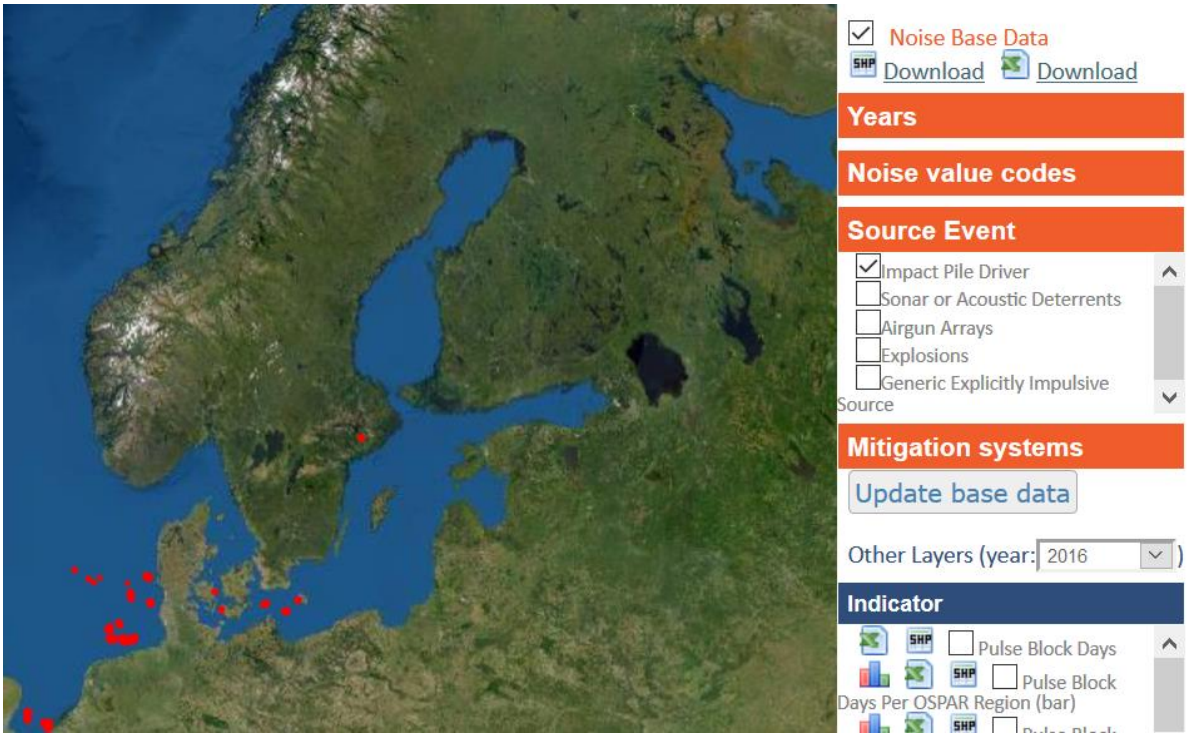


Figure 22. Noise Map of Impulsive sound produced from pile driving between 2010 and 2019 (Source: ICES database).

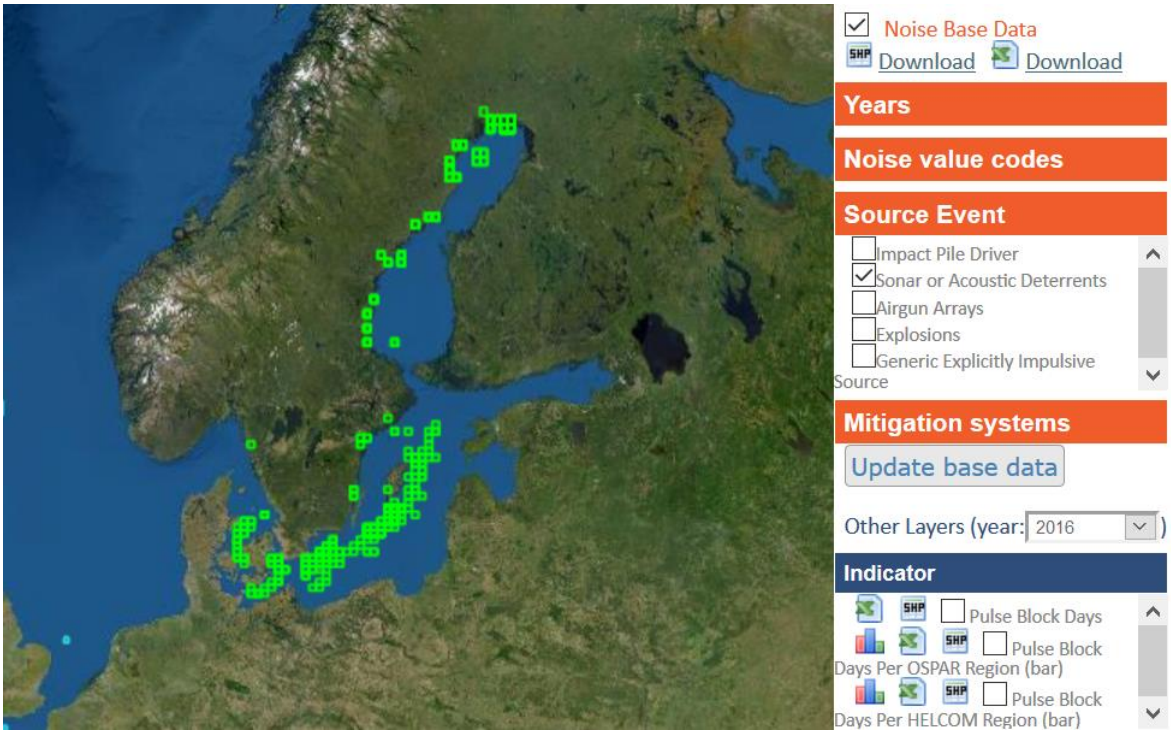


Figure 23. Noise Map of Impulsive sound produced from sonar or ADDs between 2010 and 2019 (Source: ICES database).

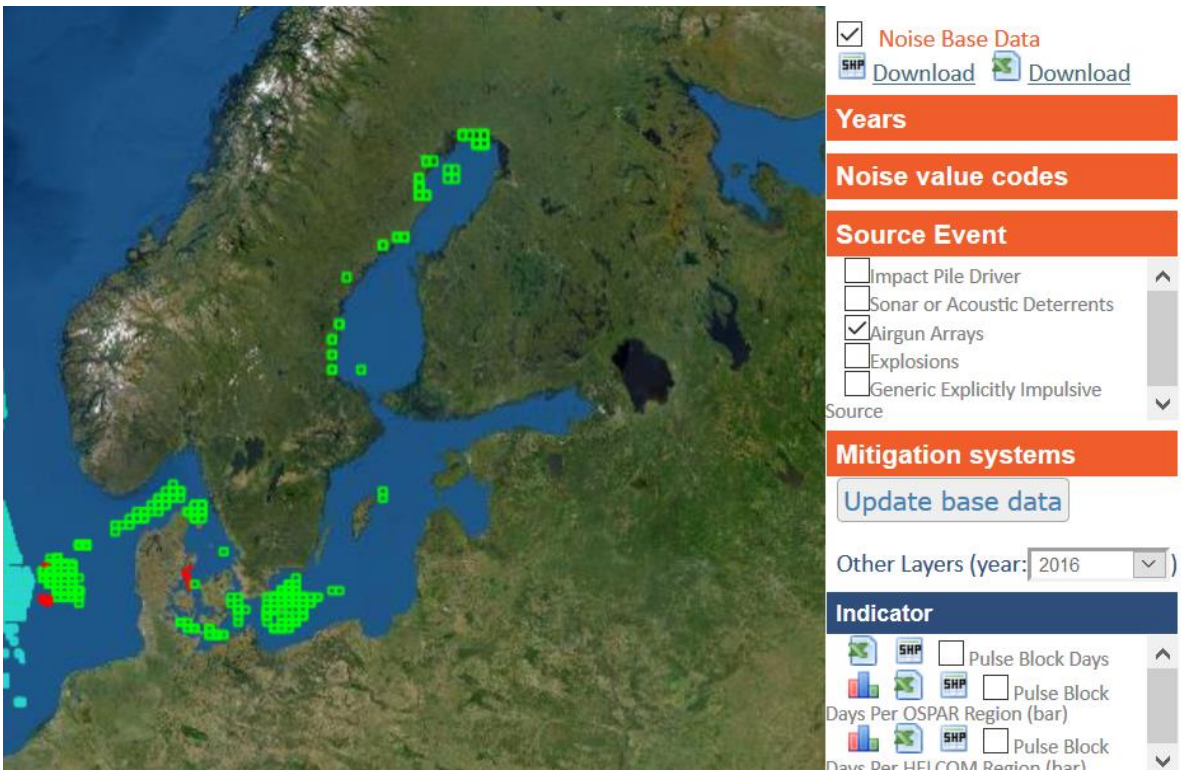


Figure 24. Noise Map of Impulsive sound produced from airgun arrays between 2010 and 2019 (Source: ICES database).

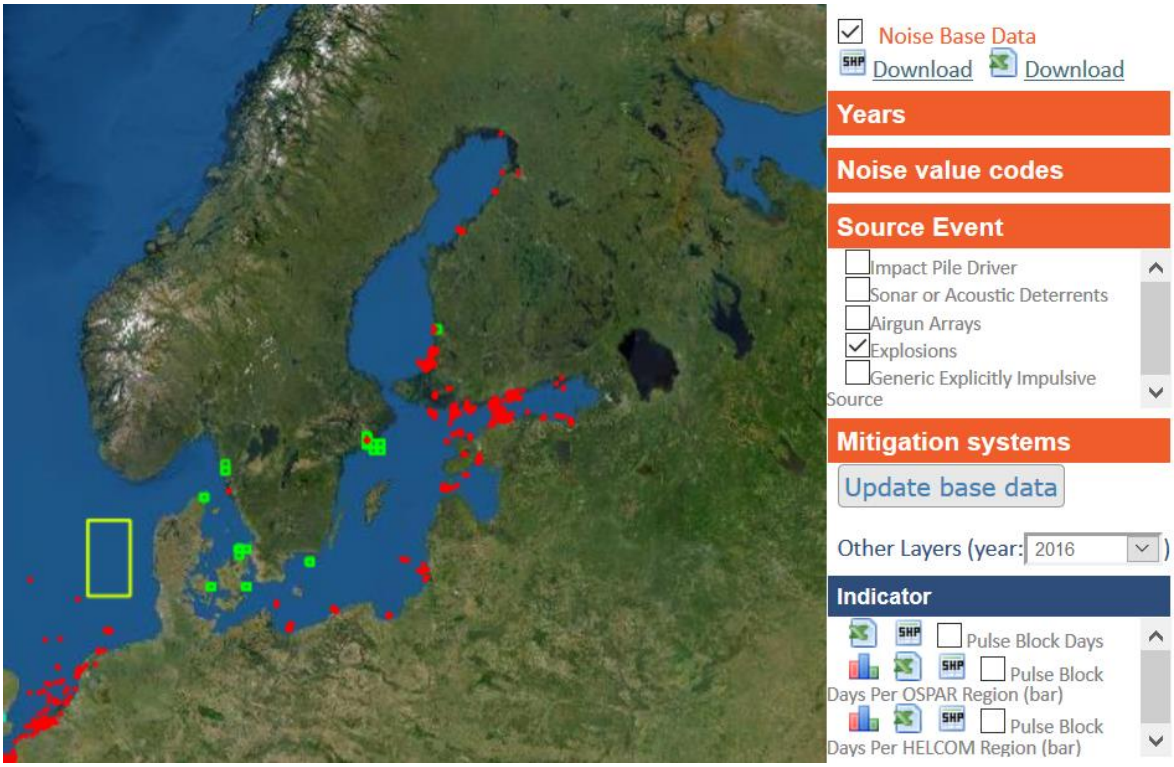


Figure 25. Noise Map of Impulsive sound produced from explosions between 2010 and 2018 (Source: ICES database).

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 and Sweden.

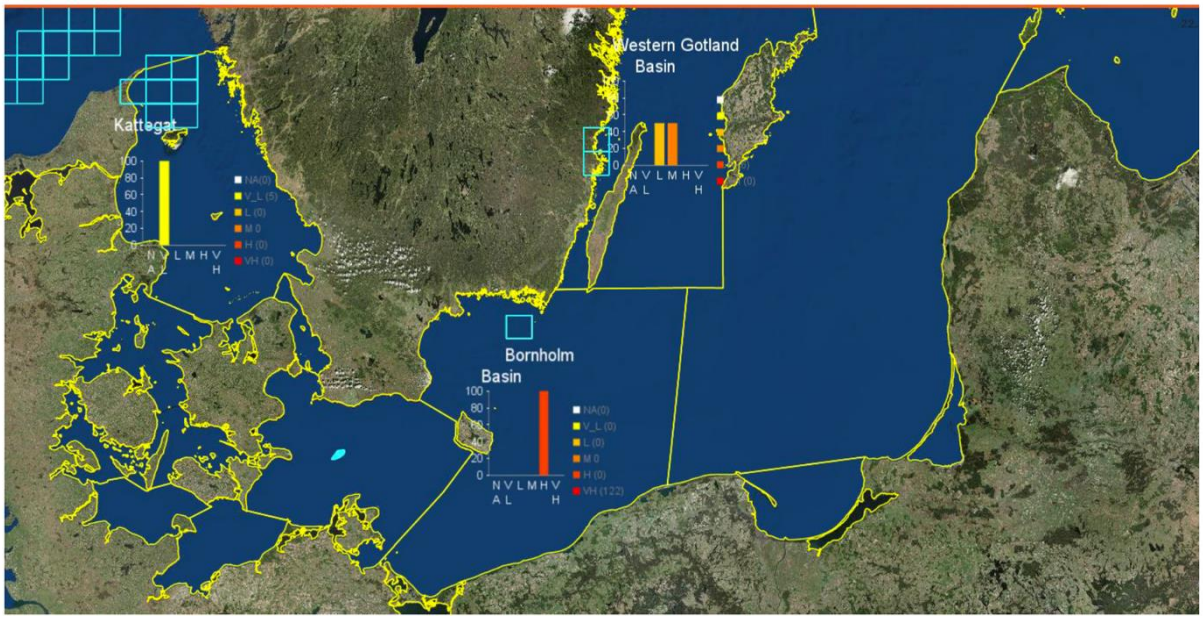


Figure 26. First draft of the graphs of pulse block days per HELCOM sub-basin based on data from the regional registry (Source: HELCOM, 2017a).

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. A start on this has been made in the Baltic (Figure 26).

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 27 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 28 shows noise maps across the whole water column for the three centre frequencies, 63 Hz, 125 Hz, and 2 kHz.

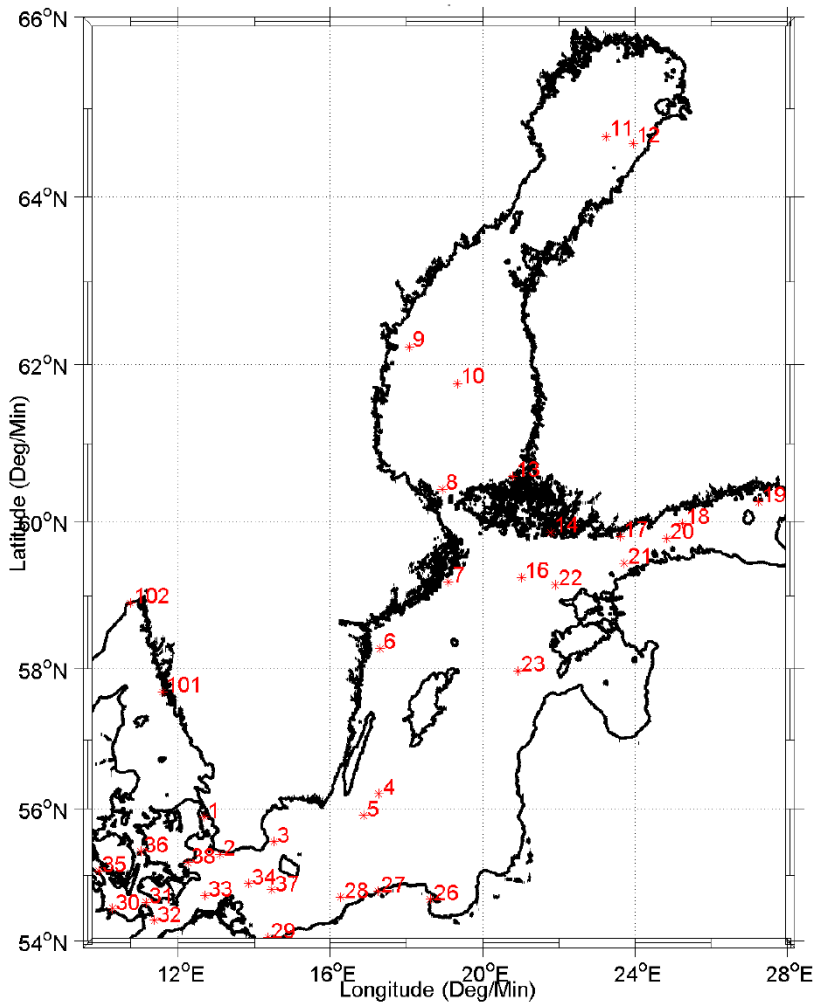


Figure 27. Baltic Sea Regional Map showing the positions of the acoustic measurements carried out by the BIAS Project (Source: Folegot *et al.*, 2016).

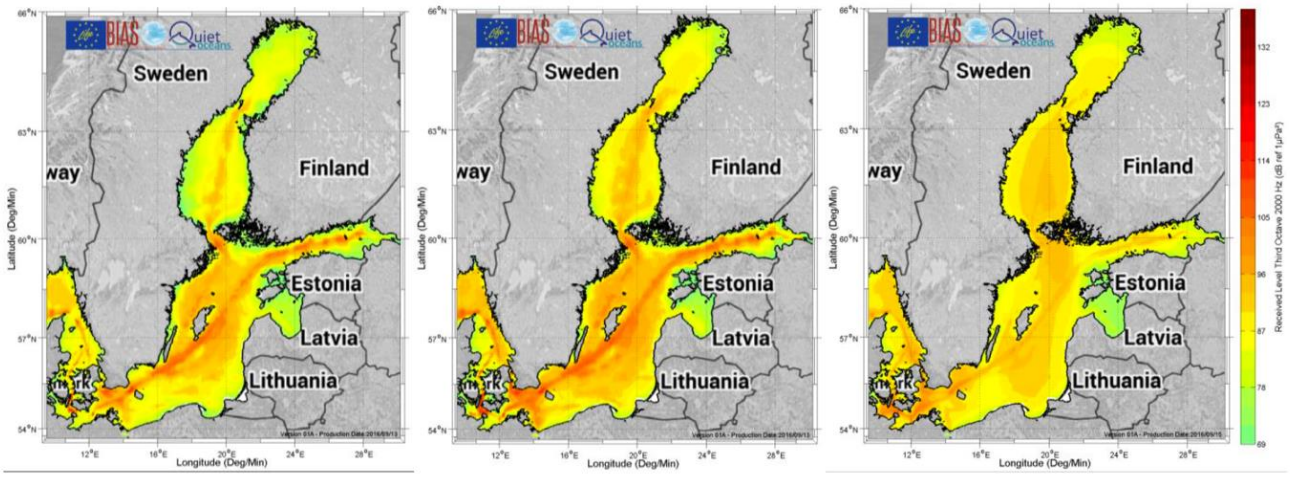


Figure 28. Annual median noise maps for the full water column for the 63 Hz third-octave (left), the 125 Hz third-octave (middle), and the 2kHz third-octave (right) (Source: Folegot *et al*., 2016).

Since the end of the BIAS Project, countries were asked to maintain at least some of their recording stations (Figure 29). 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. However, from approximately summer 2019 until summer/autumn 2020, there is a gap in monitoring, mostly due to the fact that there is no long-term planning or funding for this monitoring.

In 2018, BIAS stations were also kept active in Denmark, Estonia, Finland, Germany and Poland, and Latvia and Lithuania were hoping to start. 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 will probably be launched in autumn 2020.

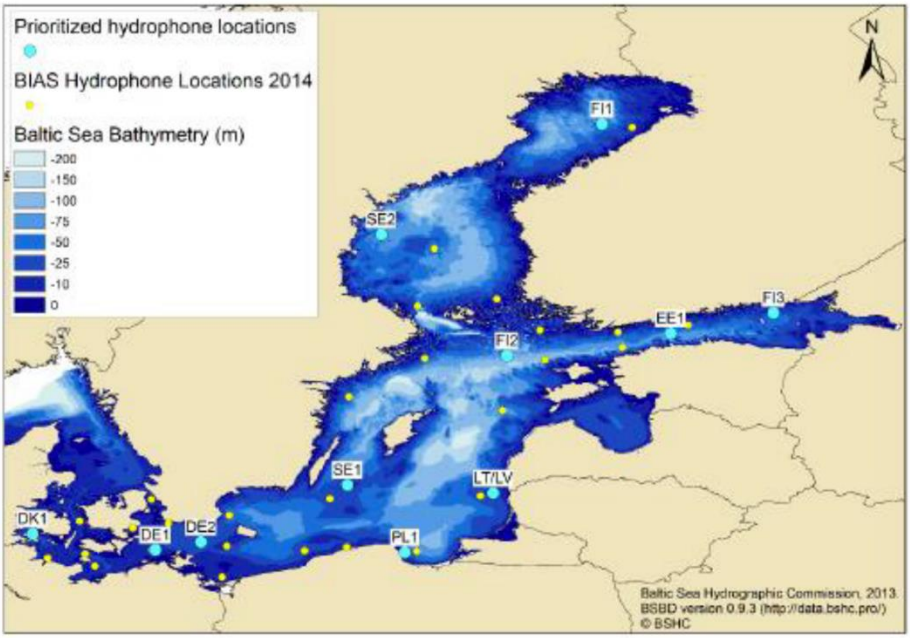


Figure 29. Selected prioritised locations for minor assessment are shown in blue, while the additional measurement locations used in the BIAS project and proposed for major assessment are shown with yellow circles (HELCOM 2017a).

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.

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;

The indicator on impulsive noise was not included in HOLAS II as an operational indicator, but there is a chance that it could be fully operational for HOLAS III. The indicator on continuous noise seem to be further from being operational. The register of occurrence of impulsive sounds is up and running, hosted by ICES at http://ices.dk/data/data-portals/Pages/underwater-noise.aspx, see above. Some monitoring on underwater noise is in place with some of the BIAS stations being continued by some countries, see above. 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 for example Germany, while in other countries the knowledge on 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).

The aim of the Baltic underwater noise roadmap was to prepare a knowledge base towards a regional action plan on underwater noise to meet the objectives of the 2013 Ministerial Meeting. This action plan is now under development and is currently being discussed in HELCOM EN NOISE with the aim to bring it to HOD 59-2020.

By 2018, a review of sound sources and their impacts upon marine life had been made, along with a summary of potential underwater noise mitigation measures that could be employed for the different sound sources (HELCOM, 2018a). Harbour porpoise was identified as one of the priority species (along with harbour seal, ringed seal, grey seal, cod, herring and sprat). A map compiling noise sensitive areas derived from biological data on noise sensitive species so far identified has also been produced (see, Figure 30), and incorporated in the latest version of the State of the Baltic Sea report (HELCOM, 2018b). An inventory of noise mitigating measures already used in the Baltic Sea region has been compiled (HELCOM, 2017). The inventory shows that at least three countries (Germany, Denmark, Sweden) are implementing measures to reduce the impact of noise on the marine environment, i.e. by exclusion of noise generating activities for a certain time period or from certain areas, restriction of anthropogenic underwater noise to a certain level, and use of noise reducing techniques (Table 6).

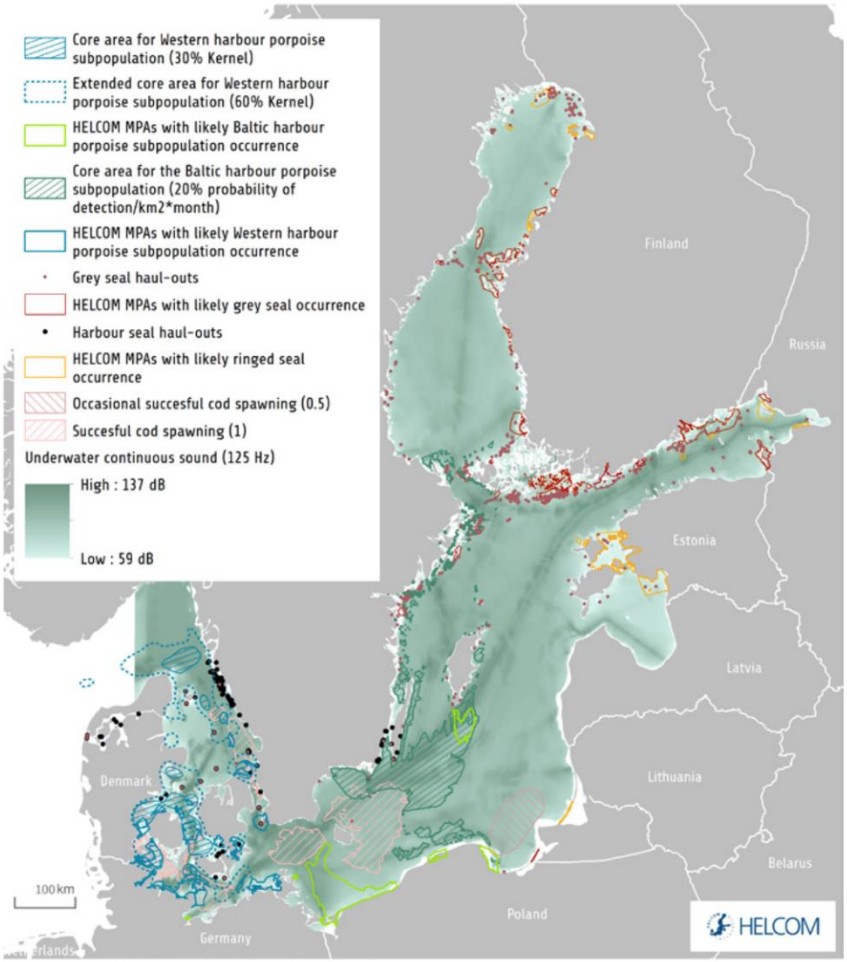


Figure 30. Example of how information on the distribution of sound can be compared with important areas for species that are sensitive to sound. The example shows areas identified so far (based on HELCOM, 2016). The soundscape shown is the sound pressure level (dB re 1uPa) for the 125 Hz frequency band occurring 5 % of the time, for the whole water column (surface to bottom) in June 2014 (Source: HELCOM, 2018b).

Table 6. 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 7. 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, 2017b).

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

HELCOM indicators to assess status in relation to underwater noise are still being developed. Table 7 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.

These 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.

Recent events

In **Poland** a large number of offshore windfarms are at different stages of planning, with Baltyk 1 being one of the first in line. It is evident from Figure 31 that harbour porpoise distribution is not taken into account in planning of these projects, with almost the entire Polish part of the Southern Midsea bank covered with windfarms.

Figure 31. Map of planned offshore windfarms in Polish waters.

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, 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 32) 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.

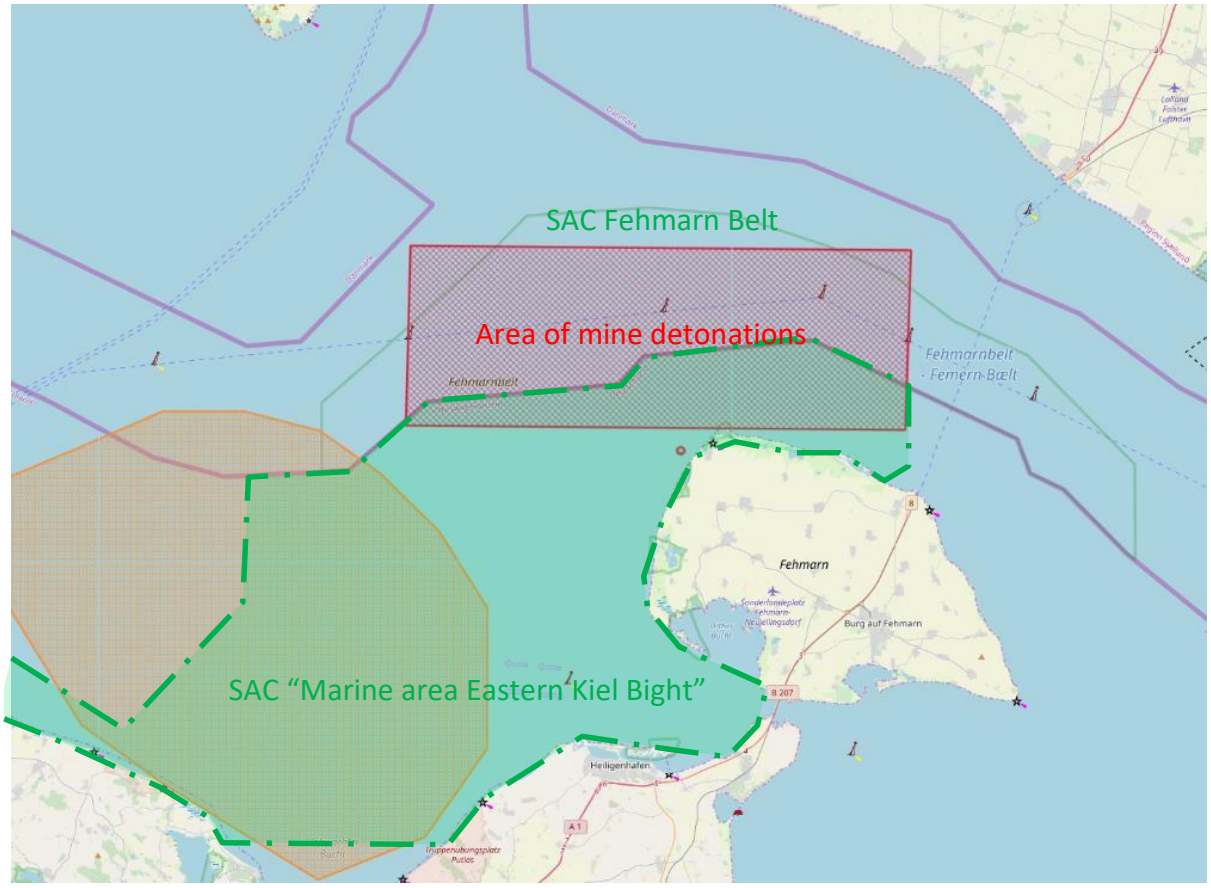


Figure 32. Map showing the area where NATO SNMCMG1 detonated 45 mines in August-September 2019, in relation to Natura 2000 areas designated for harbour porpoise.

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, a detonation of a mine in Puck Bay was carried out in June 2020, without mitigation measures in place, despite calls for caution and an offer from the German company Hydrotechnik Lübeck to provide a bubble curtain to protect Baltic Proper harbour porpoises.

In Sweden, a project funded by the Swedish post code lottery through WWF Sweden as studying the impact of noise on harbour porpoise detection, and it has been shown that a proxy for shipping noise influences the porpoise detection rate. The extent of this impact varies with season.

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, particularly the MSFD continuous low frequency sound indicator. Some of the 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.

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. There is currently a HELCOM process to produce fact sheets on so called "secondary parameters" for effects of climate change, and marine mammals is one of those secondary parameters. Fact sheets are being discussed in HELCOM expert groups during autumn 2020.

IUCN (Hammond et al., 2008) has classified the Baltic subpopulation of the harbour porpoise as critically endangered. Table 8 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.

Table 8. National Red Data list status of the harbour porpoise in the Baltic Sea Region.

Country	Red list status	Reference
Denmark*	Least Concern (LC)*	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)	Artdatabanken (2020)

* No separate assessment has been made for the Baltic harbour porpoise population

In the Habitats Directive Article 17 reporting, 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 on the harbour porpoise.

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 2019, 135 animals were reported stranding in Schleswig-Holstein and 64 in Mecklenburg-West Pomerania. 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.

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. 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 Gothenburg Museum of Natural History, and carcasses are collected for necropsy. From the Baltic Sea coast all carcasses are collected even if they are too decomposed for necropsy, and full skeletons are prepared and added to the collections of SMNH. Some form of genetic samples are also always taken. From the Swedish west coast carcasses are collected if they are fresh enough for necropsy. The aim for this programme is to continue to undertake necropsies at the level of 30 animals/year, which is a slight increase since 2019.

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.

Sweden is now starting up a health and disease monitoring program for harbour porpoise, although at a small scale to begin with. This is very good news and we hope that this effort will be continued and expanded.

Poland

Although Poland does not have a dedicated national stranding scheme, it has started a voluntary pilot project called Blue Patrol in 2015, which is still active, in two areas, and one of the actions is to recover stranded animals. Necropsies are undertaken on fresh carcasses. In 2019, a total of 15 porpoises was collected. There has been a slight increase in the number of stranded animals found on the beaches of Poland in later years (Figure 33), 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 come from the Belt Sea population, since the majority of strandings seem to occur in relation to specific weather conditions.

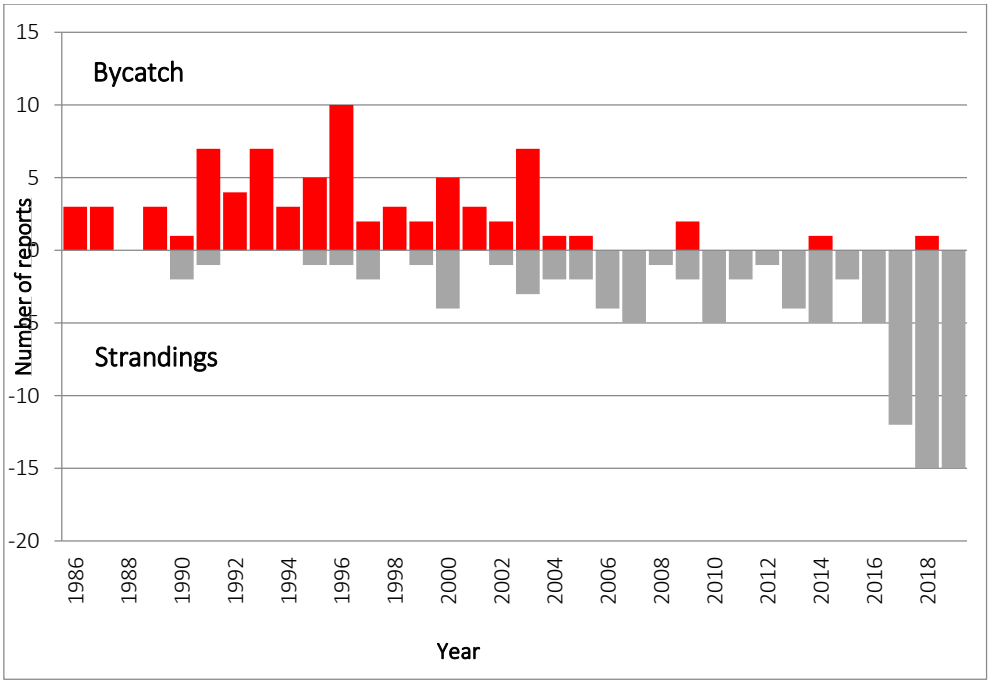


Figure 33. Number of reported bycaught and stranded harbour porpoises in Poland from 1986 to 2019.

Finland, Estonia, Latvia and Lithuania

Baltic countries east of Poland have no formal stranding scheme. In Finland, there have been no strandings (or bycaught animals) since 1999, 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 stranding scheme with good samples of animals necropsied. 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 seasonal distribution of harbour porpoise in the Baltic Proper (see Figure 3). 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. A concept note for SAMBAH II funding was submitted to the LIFE programme in June 2020.

Today, none of the MPAs designated for the harbour porpoise in the Jastarnia area have relevant conservation measures or fisheries regulations. Hopefully the ICES advice and infringement procedure started by the Commission will result in measures implemented within the coming year.

Sweden

The SAMBAH results highlight the area off southern Sweden around the shallow offshore banks south of Gotland as an important hotspot for the Baltic sea 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 34). A management plan is currently being developed, which will include a monitoring strategy, but there are still no conservation measures in place for this area.

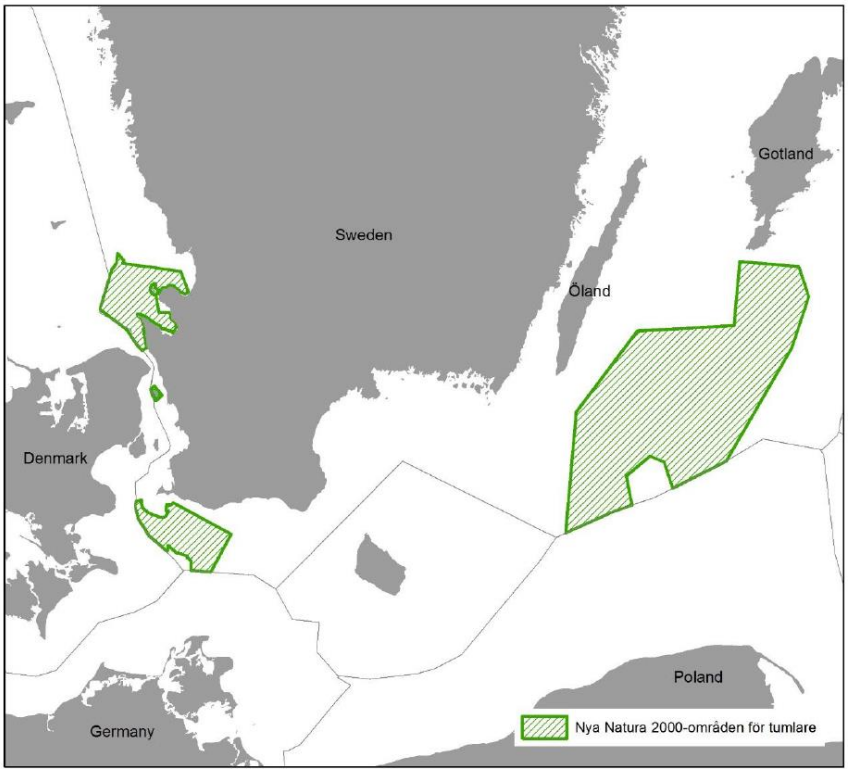


Figure 34. The location of new Marine Protected Areas (Natura 2000 sites) for the protection of harbor porpoises in Swedish waters, designated in December 2016.

A dialogue is ongoing within Sweden on fisheries in protected areas, and the Swedish Agency for Marine and Water Management are due to initiate the process for joint recommendations on fisheries regulations for Natura 2000 areas in the Baltic Proper during 2020.

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 has until 2 October September 2020 to respond to the inquiry, and if there is no or an unsatisfactory response, the Commission will take the next step which would be to send a so called 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) 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. During 2020 draft management plans have been sent out for public consultation, but at this point they do not include fisheries measures. It is said that this will be done once the Stella project final report has been finalized.

Denmark

In Denmark there are a total of 16 Natura 2000 areas designated for harbour porpoise, however none of them are within the population range of the Baltic Proper population. Also, none of the 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 now planned for 2021. 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 several Natura 2000 areas designated for the harbour porpoise, but here too no conservation measures or fisheries regulations have been implemented.

Baltic-wide

With further deployment of some 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 a possible extension of the offshore Swedish site into Polish waters where higher detections were made in the breeding season during the SAMBAH project (this area in Polish waters is included in the ICES advice, see figure 20); consideration for whether the Natura 2000 site in Puck Bay should be enlarged/extended; and further examination of the distribution of harbour porpoises between November and May, bearing in mind that it may be impossible to distinguish animals from the Baltic Proper sub-population from those from the Belt Sea.

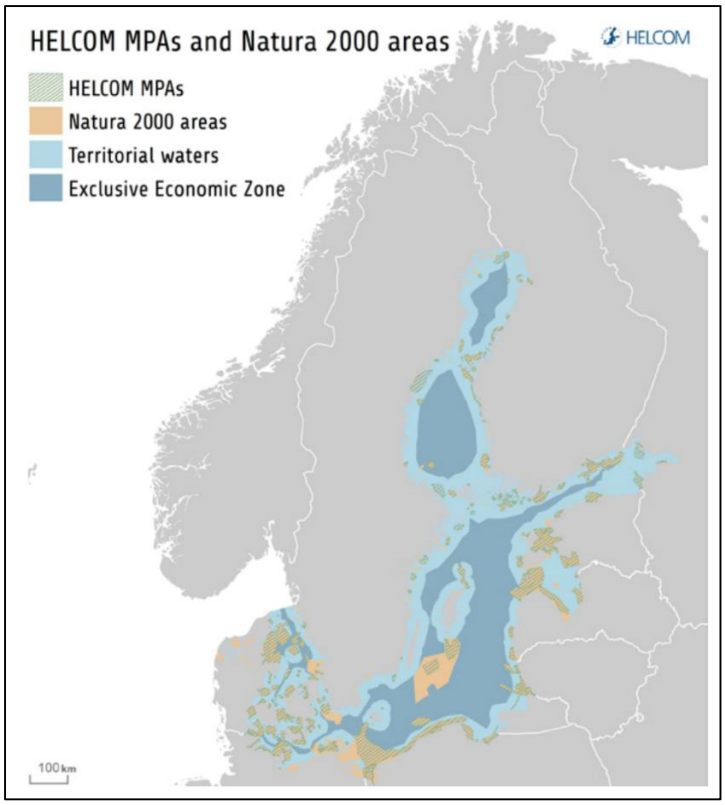


Figure 35. Marine Protected Areas in the Baltic Sea (Source: HELCOM, 2018a).

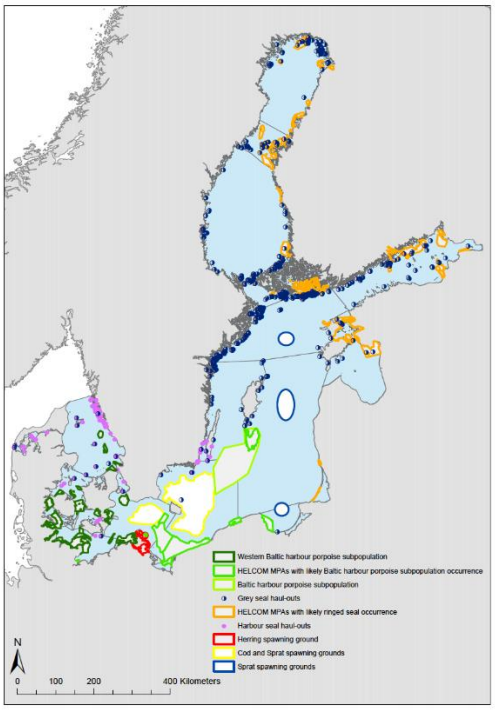


Figure 36. Preliminary biologically sensitive areas. For harbour porpoises, important areas are based on established MPAs where this species occurs as well as recent findings. For the Western Baltic subpopulation, important areas are based on tagging and acoustic survey data (dark green squares, Teilmann *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 2018, the area protected by these marine protected areas (MPAs) was estimated at 11.8% (54 367 km^2) (see Figure 35). 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 (including all those for harbour porpoise). 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 Polish waters adjacent to the protected area in offshore Swedish 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 9 provides a qualitative assessment of progress on the various priority actions by each of the Member States.

Priority Recommendations

1) Immediately implement mitigation measures to minimise bycatch in the entire area, especially in protected areas but also in the rest of the Baltic Proper. Baltic Sea countries are urged to implement the ICES advice on fisheries emergency measures to minimize bycatch of harbour porpoises in the Baltic Sea.
2) 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.
3) Implement proper management of protected areas for porpoises
4) Undertake SAMBAH II to improve estimates of abundance and distribution
5) Increase public awareness, especially in countries where there is little or no engagement

Table 9. Summary of Progress in the Implementation of the Recovery Plan

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	1	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	1	1	1	1	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	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	1	1	1	1	0	0	0	0	0

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