ASCOBANS

PROGRESS REPORT on THE CONSERVATION PLAN FOR THE HARBOUR PORPOISE POPULATION IN THE WESTERN BALTIC, THE BELT SEA AND THE KATTEGAT

MAY 2026

Photo: Patrik Eld

This report was compiled by Ida Carlén as the coordinator of the ASCOBANS conservation plan for the harbour porpoise population in the Western Baltic, the Belt Sea and the Kattegat. Please note that the coordinator's recommendations do not necessarily reflect the collective views or consensus of the Jastarnia Group.

Contents

Summary of progress in 2025-2026

Here is a summary of the status and progress since the last report was published, under each main action point of the plan. Priority recommendations are also given for each main action point.

Actively seek to involve fishermen in the implementation of the plan and in mitigation measures to ensure a reduction in bycatch

All three Range States are actively engaged in collaborative projects with fishermen. Denmark and Sweden both have a long history of working with fishermen on pinger deployment and on developing alternative gear together with fishers.

- In Germany, somehow getting fishermen involved to get bycatch monitoring in place would be the most prioritised action.

Cooperate and inform other relevant bodies about the conservation plan

Germany and Sweden have more awareness-raising activity than Denmark. The decline of the Belt Sea population has the attention of both IWC and Baltfish.

- Efforts should be made to increase awareness-raising in all countries, but especially in Denmark.
- All WBBK countries are members of Baltfish, and should ensure a joint recommendation on bycatch mitigation for the population is agreed urgently.

Protect harbour porpoises in their key habitats by minimizing bycatch as far as possible

Several Natura 2000 sites now exist in the Western Baltic, Belt Sea and Kattegat. Many of them have no management plans and/or not sufficient measures to mitigate bycatch.

- All harbour porpoise MPAs should have management plans but most importantly conservation measures in place
- Given the decline of the population and the unsustainable bycatch, bycatch mitigation measures in existing MPAs should urgently be taken.

Implement pinger use in fisheries causing bycatch

Pingers are deployed in parts of the static gillnet fishing fleets of all three Range States, mainly as part of projects or voluntary efforts, although in Swedish waters there are now some regulations that require pingers in certain areas. In Germany the PAL is still used by many fishermen.

- The German PAL system needs further investigation to determine to what extent it functions as an alerting rather than deterrent device, and to establish its potential in different situations.

Where possible, replace gillnet fisheries known to be associated with high porpoise bycatch with alternative fishing gear known to be less harmful

Studies are ongoing in all three countries to find alternative fishing methods that are less harmful to marine wildlife including porpoises.

- When economically viable alternative gear that do not cause harbour porpoise bycatch are available, efforts should be made to implement these into active fisheries.

Estimate total annual bycatch

The work to estimate bycatch rates and total bycatch in the WBBK area has really been moving forward in the last decade, and estimates are available for the Belt Sea population.

- Dedicated marine mammal bycatch monitoring should urgently be implemented in Germany.
- Efforts should also be made to gather data on static net fishing effort in German waters.

Estimate trends in abundance of harbour porpoises in the Western Baltic, the Belt Sea and the Kattegat

Regular surveys have shown that the Belt Sea harbour porpoise population is declining.

- To further increase our knowledge about seasonal changes in distribution, more effort should be put into monitoring seasonal variations, using passive acoustic survey methods or visual surveys, or both.

Monitoring population health status, contaminant load and causes of mortality

Germany has a stranding scheme and performs necropsies on a routine basis. Sweden has a health monitoring programme performing necropsies on quite a large sample of stranded animals each year. The situation has also considerably improved in Denmark in recent years.

- These efforts should be continued and built upon.

Ensure a non-detrimental use of pingers by examining habitat exclusion and long-term effects of pingers

Scientists from the Range States have led much of the research that has been undertaken to date on the interactions between porpoises and pingers, and studies continuing to investigate the efficacy of pingers should be encouraged.

- Further studies are needed to evaluate whether the PAL can actually be used as bycatch mitigation while minimising disturbance.

Include monitoring and management of important prey species in national harbour porpoise management plans

Studies have provided some insight into the diet of porpoises in the region, illustrating the importance of cod and herring for adult porpoises whilst juveniles also consumed a significant quantity of gobies. Both cod and herring stocks have declined in the Skagerrak, Kattegat and Belt Seas as well as in the Baltic. Trends in the stocks of these important prey species could potentially affect porpoise reproductive rates and possibly also survival rates.

- Predator-prey interactions should be studied at an ecosystem level.
- Fish stock management needs to improve considerably to ensure there is enough prey for harbour porpoises and other animals.

Restore or maintain habitat quality

Discussions on thresholds for impulsive and continuous underwater noise are being discussed at the HELCOM and EU levels. While thresholds are not yet set, there is enough knowledge to improve mitigation measures and work towards minimising impacts of underwater noise on harbour porpoises.

- 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.
- Cumulative effects must be properly evaluated in all EIAs, not only relating other offshore wind projects, but including all threats to the population.
- The dialogue started at the Joint ACCOBAMS-ASCOBANS Workshop with Navies on Underwater Noise and Cetaceans in Toulon in November 2024 should be continued.

The ASCOBANS Conservation Plan for the Harbour Porpoise Population in the Western Baltic, the Belt Sea and the Kattegat – Background

The ASCOBANS Conservation Plan for the Harbour Porpoise Population in the Western Baltic, the Belt Sea and the Kattegatt is a conservation plan for the Belt Sea harbour porpoise population (figure 0.1). The harbour porpoise is the only cetacean species occurring throughout the year in the Baltic Sea Region. Genetic (Lah et al. 2016; Wiemann et al. 2010; Celemín et al. 2025), morphometric (Galatius et al. 2012), and distributional studies (Carlén et al. 2018; Sveegaard et al. 2015) all indicate that the Belt Sea population is separate from the neighbouring Baltic Proper and North Sea populations.

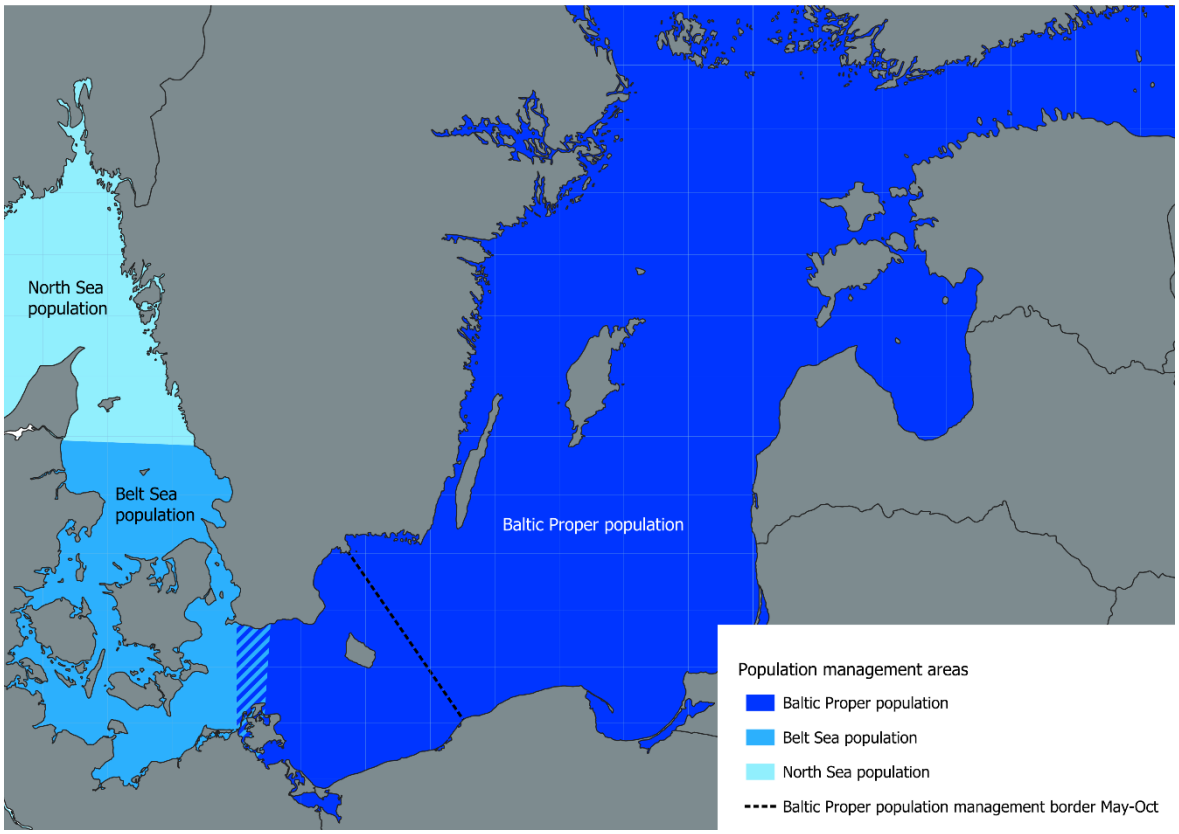

Figure 0.1. *The management areas of harbour porpoise populations in the Baltic region. The mid-blue area indicates the management area for the Belt Sea population as described by Sveegaard et al. (2015). Dark blue indicates the management area of the Baltic Proper population during November-April, with the dotted black line showing the May-October management border identified in the SAMBAH project (Carlén et al. 2018). The striated area indicates overlap between the Baltic Proper and the Belt Sea populations.*

Following the establishment of the Recovery Plan for Baltic Harbour Porpoises (the Jastarnia Plan) and the Conservation Plan for Harbour porpoises in the North Sea, it was decided at the 18th Meeting of the ASCOBANS Advisory Committee in Bonn, Germany in 2011 that there should also be a Conservation Plan for porpoises inhabiting the waters between these two regions, i.e. the Western Baltic, the Belt Sea and the Kattegat. Concern had been expressed over potential

declines in harbour porpoise abundance in this region from the two wide-scale surveys of SCANS in 1994 and SCANS II in 2005. The plan was formally adopted by the 7th Meeting of the Parties in Brighton, UK, in September 2012. A revision of the plan has been requested by the Jastarnia group since its 18th meeting in 2022, and a consultant will be contracted in 2026.

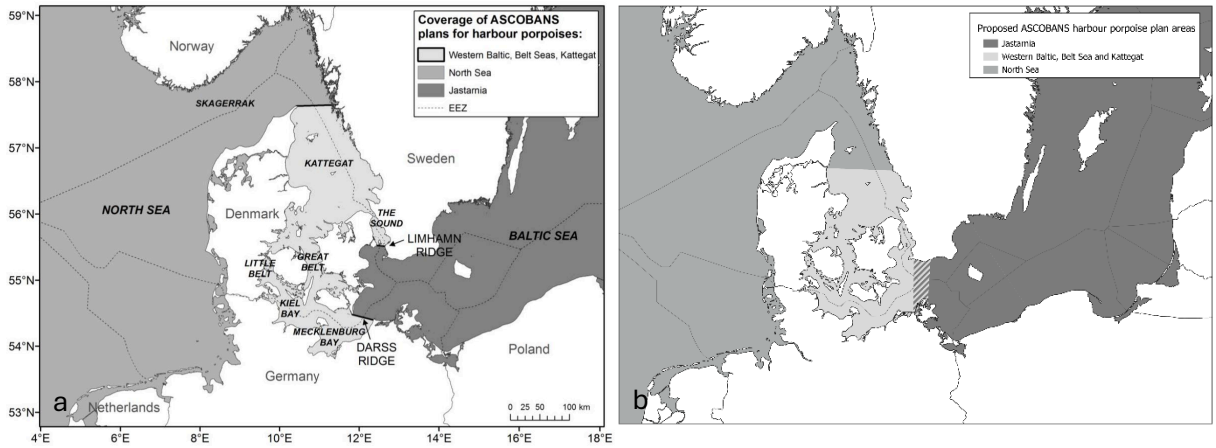

Figure 0.2. *Maps showing the current (a) and proposed (b) division between the ASCOBANS harbour porpoise plans for the North Sea, WBBK and Jastarnia areas.*

It was agreed in 2021 that the Jastarnia and WBBK areas will be adjusted as the plans are updated, so that the WBBK plan will include waters from 56.95°N to 13.5°E, and the Jastarnia plan will include the Baltic from 13.0°E, i.e. there will be a slight overlap between the plan areas (figure 0.2).

Eleven main action points are identified in the WBBK plan, and the progress under each action point is presented below. Until 2024, the coordinator report on the progress under the WBBK plan summarised progress for the entire lifetime of the plan. The current report will summarise the progress under each action point for 2025-2026, with some background where needed. For greater detail on previous years, earlier reports are available on the ASCOBANS website.

1. Actively seek to involve fishermen in the implementation of the plan and in mitigation measures to ensure a reduction in bycatch

Denmark was the first country in Europe to trial the use of Remote Electronic Monitoring (REM) to assess bycatch, in 2008, operating on pelagic trawl fisheries (Ulrich et al. 2015, 2013). Since 2010, they have been used routinely in Danish fisheries (Kindt-Larsen et al. 2012), and currently boats are using REM in the WBBK area as part of the Danish Data Collection Framework monitoring. A paper calculating bycatch rates from REM data was published in 2023 (Kindt-Larsen et al. 2023). REM has proved to be a cost-effective and accurate method of monitoring. Part of its success has been due to the relationship built up between fisheries authorities and fishers themselves, through a mixture of trust and incentives. Collaborations with the fishing industry have also taken place in exploring mitigation measures such as pingers, and the use of alternative fishing methods. The developing and testing of different electronic pingers with different spacing on the net continues, directly involving fishermen, as well as testing the use of lights, low nets and pearl nets to reduce bycatch. 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 Department of Aquatic Resources at the Swedish University of Agricultural Sciences (SLU Aqua), Sweden. In Sweden there is also development and testing ongoing with fishermen on push-up fyke nets for perch, flatfish and mixed species and Danish seine for herring and Danish mini seine for flatfish.

Germany has been investigating alternative management approaches and the use of alternative fishing gear. The inter-disciplinary STELLA and STELLA II projects were funded by the Federal Agency for Nature Conservation (BfN) and conducted by the Thünen Institute of Baltic Sea Fisheries, and included 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. The second project, STELLA II, is now finalised and three scientific papers have been published (Milanelli et al. 2026; Berzosa et al. 2025; Kindt-Larsen et al. 2024). The project report is being compiled.

In summer 2024, the first course of the new German program “Sea Rangers” was finalised. The program is now continuing, and two handouts are to be presented for coastal fishing on the topics "Tourism as a new field of activity for coastal fishermen" and "Ecology as a new field of activity for coastal fishermen". The aim of the program is to secure and create jobs and training in coastal fisheries through diversification of fields of activity in the direction of tourism and environmental protection and through measures to adapt to structural changes in fisheries.

Since 2013, there has been a voluntary agreement with fishers in Schleswig-Holstein, for the conservation of harbour porpoises and sea ducks in the German Baltic. This has involved the Fishery Association and Fishery Protection Union of Schleswig-Holstein, the Baltic Sea Information Centre (OIC), and the Ministry of Energy Transition, Agriculture, Environment and

Rural Areas Schleswig-Holstein (MELUR). The result has been 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. This agreement was recently extended to December 2026. 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. For further discussion on the PAL, see action point 9 on non-detrimental use of pingers.

In **Sweden**, authorities have been holding 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). As a result, a delegated act regulating fisheries in some Marine Protected areas in Kattegat came into effect in July 2022.

Projects on remote electronic monitoring (REM) and mobile electronic monitoring (MEM) have been carried out at the SLU Aqua in collaboration with fishers from 2020, and results are now implemented in the bycatch monitoring programme that has been running since 2022. Spatiotemporal patterns in bycatch rate in the Swedish gillnet fishery in the WBBK area, have been investigated from the bycatch monitoring programme. There has been a decline in bycaught individuals, a result directly dependent upon overall decreasing gillnet fishing effort (Säterberg *et al.* 2026, in review; Global Ecology and Conservation). Also, in collaboration with small-scale coastal gillnet fisheries, alternative fishing gear has been, and is still being, developed, see 5. Alternative fishing gear. This includes trials of loud pingers, developing seine fisheries and other selective gears, and functionality tests of pingers available on the market today.

Key Conclusions and Recommendations

All three Range States are actively engaged in collaborative projects with fishermen but there is always scope to do more. In Germany, somehow getting fishermen involved to get bycatch monitoring in place would be the most prioritised action. Denmark and Sweden have had a long history of working with fishermen on pinger development and deployment and Sweden, Denmark and Germany do a lot of work on developing alternative gear together with fishers.

2. Cooperate and inform other relevant bodies about the conservation plan

Explicit information about the Conservation Plan specifically has not been disseminated to the public in any of the three countries. However, several of the actions recommended within the Plan have been promoted within each country. Raising of public awareness of harbour porpoises in general is ongoing, particularly within Germany and Sweden where effort has increased in recent years.

In **Denmark**, there is no comprehensive coordinated stranding scheme although reporting is encouraged to the Maritime Museum in Esbjerg (https://fimus.dk/en/about-the-museum/emergency-management-for-marine-mammals/). There is also no active public sighting reporting scheme, but Fjord&Bælt in Kerteminde has developed the "Marine Tracker" app which can be used to report sightings, and the Facebook group hvaler.dk is very active with people posting sightings of marine mammals. 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 and https://ecos.au.dk/forskningraadgivning/temasider/baelt-i-balance/), to listen in real time to any porpoises present around the hydrophone in Middelfart harbour. There were some media interviews done by Aarhus University on the SCANS-IV survey, and the Facebook page hvaler.dk is also very active, reporting sightings of different cetacean species.

In **Germany**, sightings and strandings programmes involving the public are well developed. For Schleswig-Holstein, they are coordinated by the Terrestrial and Aquatic Wildlife Research (ITAW) in Büsum, and for Mecklenburg – Vorpommern they are administered by the German Oceanographic Museum in Stralsund, who have also produced an app "OstSeeTiere" (Baltic Sea Animals). Every year, the museum also participates in the International Day of the Baltic Harbour Porpoise coordinated by ASCOBANS, with specific activities and information for the public. Although located in the Baltic Proper, the museum serves the public over a much wider region and their conservation education activities are clearly relevant to the Western Baltic region to which this Conservation Plan applies.

In **Sweden**, records of strandings are collected opportunistically by the Swedish Natural History Museum (NRM) in collaboration with the Swedish Veterinary Institute (SVA) and sometimes the Gothenburg Museum of Natural History. In 2024, a letter was sent by SVA to all coastal municipalities, CABs and other stakeholders (n = 104) to initiate or continue cooperation with reporting, storage and transport of stranded cetaceans. NRM also collects reports of opportunistic sightings and strandings at https://marinadaggdjur.nrm.se/rapportera-tumlare. Sightings and strandings of porpoises can also be reported to Artdatabanken (https://www.artportalen.se/), at https://rapportera.artfakta.se/eftersokta/rappen/skapa and at www.valar.se.

Also, NRM, the Swedish Agency for Marine and Water Management, SVA, Lund University, Swedish University of Agricultural Sciences (SLU), and several County Administrative Boards

(CABs) completed several interviews for TV, newspapers and radio as well as written several popular science articles. The NRM teachers' educational activities have information about harbour porpoises and how they are affected by underwater noise, and there is online teaching material available. Harbour porpoises are included in the exhibition "World of water", which opened at NRM in 2024, and there is information on harbour porpoises at the dolphinarium at Kolmården Wildlife Park. WWF Sweden, the Swedish Society for Nature Conservation and Coalition Clean Baltic also do awareness-raising, mainly through social media. In conjunction with the first-night of an omnimax film on dolphins, the Swedish Museum of Natural History arranged a public event with presentations on marine mammal monitoring, and researchers displaying items relevant for marine mammal research and answering questions. At Lund University, the first Marine Mammal Symposium Sweden (MARMASS) was arranged with almost 70 attendants from five countries. In conjunction with the finalisation of two reports on the knowledge status and mitigation measures for underwater noise from ships and recreational vessels, the Swedish Transport Agency arranged a one-day seminar for each of the reports, well attended by a wide range of stakeholders from different sectors. An annual meeting on porpoise management with participants from national agencies, research institutions and an NGO has been established, and presentations and dialogues are held at meetings with fisheries organisations, management agencies and international collaborations such ICES and CIBBRiNA.

In relation to other relevant bodies, the Scientific Committee of the International Whaling Commission (IWC) at its session in 2024 noted the decline in the Belt Sea harbour porpoise population and recommended further mitigation actions (https://iwc.int/public/downloads/KxHsW/SC_REP_2024.pdf). Additionally, the Baltfish high-level group has noted the need for bycatch mitigation in the Belt Sea harbour porpoise range, and will be discussing a possible joint recommendation on fisheries measures.

Key Conclusions and Recommendations

Germany has a long history of working with stakeholders and the general public on conservation issues, and Sweden is getting more active as well with the harbour porpoise gaining more attention. NGO efforts to raise awareness are present in Germany and Sweden, but slightly less so in Denmark. Efforts should be made to address this.

It is also relevant to note that the decline of the population has the attention of both IWC and Baltfish. A joint recommendation from Baltfish on bycatch mitigation for the population can make a considerable difference and should be agreed urgently.

3. Protect harbour porpoises in their key habitats by minimizing bycatch as far as possible

The harbour porpoise is listed in Annex II of the EU Habitats Directive (1992/43/EEC), which means that Member States should identify and establish Natura 2000 sites as Special Areas of Conservation (SACs) for the species. Figure 3.1 shows the Natura 2000 sites established for harbour porpoises in the WBBK and the surrounding area, as of 31 December 2023. It should be noted that the database at the European Environment Agency does not correctly reflect the Danish Natura 2000 areas, but this has been corrected here. See Annex II of this report for a table of all Natura 2000 areas from Skagen to 13.5°E.

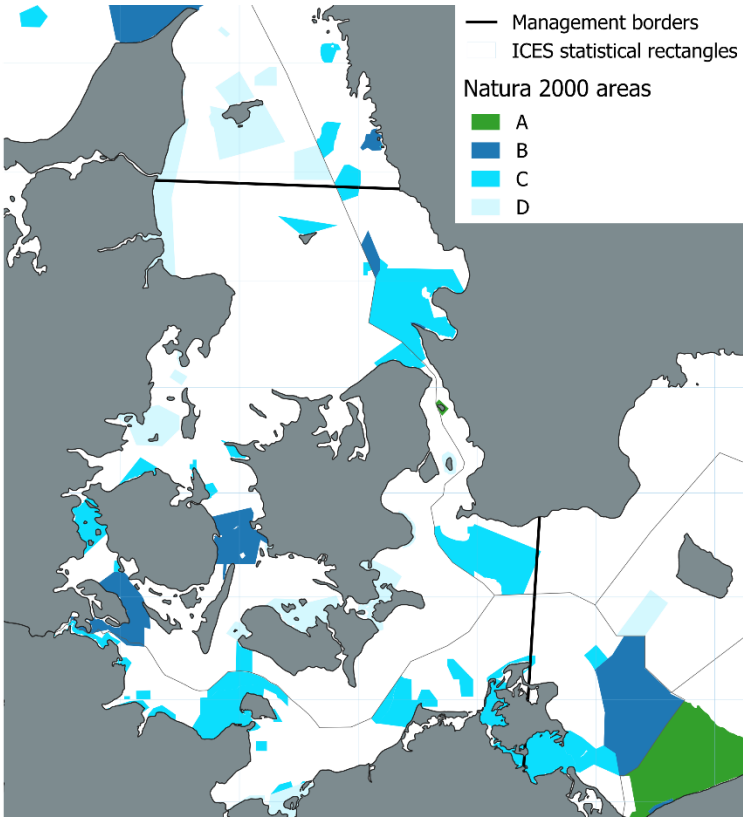

Figure 3.1. *Natura 2000 sites where the harbour porpoise is on the list of species. Green and blue colours refer to the population assessment of the site (source: https://www.eea.europa.eu/data-and-maps/data/natura-13, as of 31 Dec 2023, and separate data from Denmark)*

The next step is to develop management plans for the SACs that are still missing them, and to implement conservation measures including fisheries regulations to avoid bycatch, decrease the disturbance from underwater noise and ensure sufficient prey availability. To date, few of these areas have any concrete conservation measures in place.

In **Denmark**, in 2020 the harbour porpoise was added to an additional 20 Natura 2000 sites, which means that there are now a total of 35 Natura 2000 areas designated for harbour porpoise in accordance with the EU Habitats Directive. 22 of those are within the area between Skagen and 13.5°E (see Annex II). The designation was based on a review of existing knowledge at the time (S.

Sveegaard et al. 2018). None of the Natura 2000 areas currently have any specific conservation or fisheries measures implemented to protect harbour porpoises, 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 was planned for 2021 but was not in place yet in April 2026. 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). Since 2011, harbour porpoises have been monitored as part of the Danish monitoring programme, NOVANA, both within the SCIs and in their entire range.

In **Germany** there are 16 SACs designated for harbour porpoise within the WBBK area. Additionally, three new protected areas were recently designated in the coastal area of Schleswig-Holstein. In these areas, all fishing will be banned and regulations for shipping are being planned.

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. In February 2022 the management plans for the Natura 2000 areas in the EEZ of the German Baltic Sea came into force. A delegated act on fisheries measures for mobile bottom-contacting gear in protected areas came into effect in 2024. Apart from the Natura 2000 sites included in the Baltic porpoise delegated act of February 2022, measures for passive gears are currently under development, being discussed nationally and taking into account the outcomes of the Stella I and II project, and it has recently been decided that three existing Natura 2000 areas will be designated as no-take zones. A report was published by BfN in 2024 that proposes management measures for static net fisheries in the German Baltic EEZ, for example it proposes closing static net fisheries in several MPAs in the German Baltic EEZ all year, which would be a considerable step forward from the three months that are currently closed. The report also proposes the interim mandatory use of Acoustic Deterrent Devices (ADDs) on static nets in all areas outside Natura 2000 sites for a maximum of 5 years, to be accompanied by further research and effective monitoring scheme. During those five years, there would be a systematic review of the effect and effectiveness of Acoustic Deterrent Devices (Pingers and PALs), as well as research on alternative gear and gear modifications and research on the willingness of fishers to shift to alternative and/or modified gear and the role of incentives. No decisions are made yet, however.

In **Sweden**, there are 10 SACs within the area between Skagen and 13.5°E designated for harbour porpoise. All of them have management plans, and five areas have fisheries regulations in place through the 2022 Delegated Acts 2022/303, 2022/952 and recently 2026/57. In the Natura 2000 area Sydvästskånes utsjövatten, pingers are obligatory on static nets during May-October, and static nets are completely banned during November- April. In the Natura 2000 areas Fladen, Lilla Middelgrund and Stora Middelgrund och Röde bank, all in Kattegat, approximately 50% of each area is completely closed to all fisheries, while the rest of the areas are so-called restricted fishing zones (figure 3.1). This means that pelagic trawling, handheld gear and pots and traps are allowed. Static nets are allowed if the vessel is part of a national program conducted by or on

behalf of the national authorities for monitoring and assessing accidental bycatch of harbour porpoise and seabirds by use of remote electronic monitoring (REM) including the use of CCTV and position data. However, this possibility to use static nets in these areas is planned to be removed through a new joint recommendation submitted to the Commission in summer 2024, and the delegated act should be published within 2026. Lastly, from 29 January 2026, pingers are now also obligatory on static nets in the SAC 'Havet kring Ven'.

Additionally, from 1 October 2024, pinger use is mandatory in all Swedish static net fisheries in ICES area 24 south of Skåne, where the bycatch monitoring program detected high bycatch rates in 2023. Notably, there are no fisheries measures to decrease bycatch risk in place in the areas of Vrångöskärgården in Kattegat and Kosterfjorden-Väderöfjorden in Skagerrak.

On 2 July 2020, the European Commission sent a letter of formal notice to Sweden for non-compliance with articles 6.2 and 12.4 of the Habitats Directive, specifically for not establishing a system to monitor incidental bycatch of harbour porpoise and taking the necessary measures to protect harbour porpoise to ensure such incidental capture and killing does not negatively impact the species (art 12.4), as well as taking the appropriate steps to avoid disturbance within SACs designated for the species (art 6.2). The Commission also raised the issue of not correctly transposing the indicated articles from the Habitats Directive into Swedish law. In February 2024, the Commission took next step and sent a reasoned opinion to Sweden. The third and final step, if Sweden does not fulfil the requirements, is a case in the European Court of Justice.

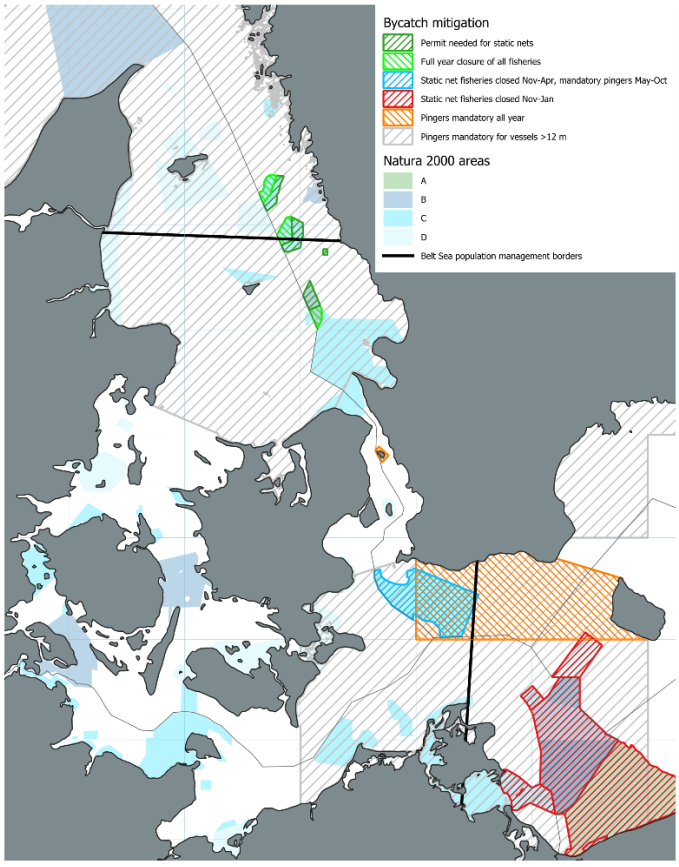

Figure 3.1. *Map showing the fisheries regulations in place to mitigate bycatch in the WBBK area.*

Key Conclusions and Recommendations

Several Natura 2000 sites now exist in the Western Baltic, Belt Sea and Kattegat. The next step is to develop management plans for each site and more importantly to ensure that there are mitigation measures in place to minimise adverse effects of human activities such as fisheries and noise disturbance. Since a decrease in population size of the Belt Sea harbour porpoise has been detected, and bycatch has been assessed as unsustainable, measures in existing MPAs should urgently be taken.

4. Implement pinger use in fisheries causing bycatch

Regulation (EU) 2019/1241 stipulate areas in the western Baltic and Kattegat/Skagerrak where pinger use is mandatory (figure 3.1). Unfortunately, these areas miss the Sound and the Danish Belts which are important areas for the Belt Sea population. Also, the fact that the regulation only includes vessels with a length of over 12 m means that most static net fisheries in the region are excluded, and the regulation hence has very little actual impact on harbour porpoise conservation. Monitoring effort of pinger use is very low, and compliance is very likely low in all three countries.

In **Denmark**, within the MITIBYC (Mitigation and bycatch of protected species) project, funded by national funds and EMFAF funding, pinger trials are ongoing where four types of pingers are being tested.

In **Germany**, in Schleswig-Holstein, around 90 fishermen currently use PALs in their fisheries. 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), However, studies have not shown clear evidence that PAL operates as an alerting device. A research project, PAL-CE, aiming to investigate the effectiveness of PALs to mitigate bycatch, whether this changes over time (habituation) and if/how PALs affect the spatial distribution of porpoises over longer time periods was finalised in 2025. The project was funded by BfN and started in 2021, led by the German Oceanographic Museum. The final report and scientific publications are in preparation, a dissertation (Dinkel 2025) is already available. So far, the results from the project are not conclusive as to whether PALs will mitigate bycatch effectively.

In **Sweden**, gillnet fisheries are continuing to decrease, and there are now no vessels >12 m using gillnets in Swedish waters, which means that no vessels in Swedish waters are mandated to use pingers according to regulation (EU) 2019/1241.

However, since 2015, pingers have been implemented on a voluntary basis on boats below 12 in the Sound, ICES divisions 3.21 and 3.23. This has continued (Benavente Norrman and Königson, 2020) and there is funding for pingers available from the European Maritime Fund for Aquaculture and Fisheries. Since 1 October 2024, pinger use is mandatory on static nets for all vessels, independent on size, in ICES area 24 south of Skåne (figure 3.1), after high bycatch rates had been detected in the area by the bycatch monitoring program. This is currently only valid for Swedish vessels, but the aim is to include this in a future joint recommendation from Baltfish, to make it mandatory for all vessels that fish in the area. From 29 January 2026, pingers are obligatory on all static nets in the SAC 'the sea area around the island of Ven' (Havet kring Ven), west of Skåne. Pinger use and functionality is controlled by the fisheries control crew during their regular at-sea fishery controls, in areas where pingers are mandatory.

Analysis is currently ongoing after trials with two types of loud pingers (from Future Ocean and Fishtek Marine), with the aim to be able to increase the distance between pingers. A study on the two pinger types (Future Oceans' Netguard pinger: Dolphin pinger 60-120 kHz and Fishtek

Marine's General Small Cetacean pinger 50-120 kHz) currently on the market and since several years used in the Swedish gillnet fisheries, showed that the Future Oceans pinger was more effective but the Fishtek Marine pinger was more reliable (e.g. much longer battery capacity) and practical to handle. Neither of the pingers showed a 'dinner-bell' effect on seals. The study also showed effects of different gear characteristics and fishing practices (Königson et al. 2026, in review; ICES Journal of Marine Science). Further tests on pinger functionality and resilience will be carried out.

Key conclusions and recommendations

Pingers are deployed in parts of the static gillnet fishing fleets of all three Range States, mainly as part of projects or voluntary efforts, although in Swedish waters there are now some regulations that require pingers in certain areas. Compliance with regulations is not fully checked or enforced throughout the region, and it is uncertain whether they are fully implemented.

The German PAL system needs further investigation to determine to what extent it functions as an alerting rather than deterrent device, and to establish its potential in different situations. The project monitoring the PAL effectiveness in German waters ended in 2025, but the results are not conclusive as to whether PALs will mitigate bycatch effectively. However, they are highly relevant for the continued development of acoustic deterrent devices.

5. Where possible, replace gillnet fisheries known to be associated with high porpoise bycatch with alternative fishing gear known to be less harmful

In **Denmark**, 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, and trials of gillnets with thinner twine. Also, low nets are being tested, as well as using lights instead of pingers for deterrence. A recent study by DTU Aqua have indicated that white flashing lights caused modified behaviour and promoted inspection rather than exclusion, and therefore may have a potential to influence how porpoises interact with fishing gear. However, further studies are needed. All these actions are being undertaken in collaboration with SLU, Sweden, however the work on cod gear has slowed down considerably since the ban on cod fishing in Kattegat and the Baltic Proper. In 2022, trials using pearl nets also began.

In **Germany**, a voluntary agreement has been in place with fishermen since 2013 in Schleswig-Holstein, resulting in a reduced length of gillnets deployed in the months of July and August. This agreement has recently been prolonged until December 2026.

Within the Stella projects and the CIBBRINA project, Thünen Institute of Baltic Sea Fisheries are carrying out trials on fish pots, pontoon traps and, together with CIBBRINA partners in for example Denmark, acoustically reflective gillnets, so called pearl-nets. For the pearl-nets, acrylic glass spheres were found to have the best reflectivity at 120 kHz. In 2020, 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 were not statistically significant, however. The next steps included behavioural experiments to look at porpoise behaviour around standard and modified nets, as well as further trials in commercial fisheries to investigate target species catch rates. Field trials were also conducted in Iceland in April 2024, but results were inconclusive.

Also, a report was published by BfN in 2024 that proposes management measures for static net fisheries in the German Baltic EEZ, including research on alternative gear and gear modifications and research on the willingness of fishers to shift to alternative and/or modified gear and the role of incentives. No decisions are made yet, however.

In **Sweden**, development and testing of several alternative gear is ongoing, including selective gears such as fyke nets, hoovering traps, pontoon traps and pontoon fyke nets, in cooperation with small-scale fishermen. 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). SLU Aqua has together with fishermen developed a Danish mini seine net, targeting flatfish, for small open boats (<12 m length) as a possible alternative to gillnet fisheries. The study showed that the mini seine net could be used in a commercial small-

scale fishery targeting European flounder and there could not be shown any significant negative effect from the gear on the bottom fauna species diversity (short term or long-term effect). Next step is to try the gear a bit earlier in the season, targeting turbot. A scientific paper is planned during 2026, based on the results from this study.

Key Conclusions and Recommendations

Studies are ongoing in all three countries to find alternative fishing methods that are less harmful to marine wildlife including porpoises. These should be strongly encouraged, and knowledge gained should be shared widely across the fishing industry and other marine stakeholders. When economically viable gear are available, effort should be made to implement these into active fisheries.

6. Estimate total annual bycatch

Work in ICES

In 2024, ICES WGBYC (ICES 2024c) further expanded the BEAM approach which was first developed in 2022. The method is designed for evaluating and quantitatively assessing population impacts of bycatch and considers various criteria, including data availability, quality, and representativity, within group expertise and the existence of bycatch management/conservation thresholds or reference points. Additionally, the semi-quantitative methodology for evaluating bycatch risk; ByRA (Verutes et al. 2020), for high priority data limited species was further developed in 2024. This methodology is for species for which reliable quantitative assessments cannot currently be carried out using the BEAM approach, and largely uses expert opinions to assess bycatch risk.

A risk-based approach to highlight potential monitoring gaps and inform coordinated sampling designs was further expanded by ICES WGBYC to include all ecoregions, and provides useful insights into which métiers may currently be under-sampled by existing at-sea data collection programmes with respect to PET species bycatch.

In 2024, ICES WGBYC managed to estimate the number of harbour porpoises bycaught in trammel nets (GTR) in 2023 in the Baltic Sea, i.e. the Baltic Proper and the Belt Sea and Kattegat together, to 45 individuals (95% CI 9.8-624.5). Additionally, the bycatch in gillnets (GNS) in 2023 in the Sound (27.3.b.23) was estimated to 70 individuals (95% CI 43-113.8) and in the Belt Sea (27.3.c.22) to 393 individuals (95% CI 208.5-740.1). This amounts to a likely bycatch of over 500 individuals, which is clearly above all suggested thresholds (Owen et al. 2024; Kindt-Larsen et al. 2023).

Another process to estimate marine mammal bycatch in the OSPAR area, which includes part of the Belt Sea population range, will be initiated in the spring of 2026.

Work in HELCOM

For the third HELCOM Holistic Assessment of the Baltic Sea Ecosystem (HOLAS III), an analysis was carried out by the Swedish Museum of Natural History calculating the mPBR (modified potential biological removal) for the Belt Sea population using code that the OSPAR Marine Mammal Expert Group has developed from the US MMPA PBR methodology. The ASCOBANS conservation objective was used as a basis, stating that the population should reach 80% of carrying capacity (here assumed to be 50 000 animals) within 100 years (Owen et al. 2022). Depending on the recovery factor used, estimates of removal limits vary between 29-292 animals per year. In the HOLAS III indicator for number of drowned mammals and waterbirds in fishing gear, the threshold level for the WBBK harbour porpoise population was set to 73 animals per year based on this mPBR analysis. Comparing the results from this mPBR to the estimated bycatch calculated by for example Larsen et al. (2021) and Kindt-Larsen et al (2023)

for the Danish gillnet fisheries, it was clear that the bycatch estimates significantly exceeded this limit, and the HELCOM HOLAS III indicator was assessed as sub-GES (HELCOM 2023c).

National work

In **Denmark**, the work on estimating bycatch has progressed significantly in the last years. Since 2022, CCTV and observer monitoring of incidental catches of marine is included under the Data Collection Framework scheme, and a paper published in 2023 (Kindt-Larsen et al., 2023) estimated the yearly average bycatch in the region to 2088 animals (95% CI: 667-6798), and in the WBBK area to 939 (95% CI: 206-3679) in 2020. The estimate for the Belt Sea population does not include German fisheries but still exceeds the estimated mPBR value of 99 animals/year (Kindt-Larsen et al. 2023) or 24 animals/year (Owen et al., 2024b). A new estimate of 184 individuals (95% CI 112-302) in 2023 is not yet published (Kindt-Larsen, pers. comm 2025-03-11).

In **Germany**, there is no specific monitoring of bycatch, instead bycatch monitoring is included as part of the Data Collection Framework (DCF) scheme. Estimating bycatch in German waters is further complicated by the fact that fishing effort is not collected in a useful way for most of the German gillnet fishing fleet.

The **Swedish** bycatch monitoring program is the most developed, with systematic stratification of effort based on porpoise density and population vulnerability. In 2025, approximately 13% of the fishing effort was covered in Kattegat and Skagerrak, and 10% of the effort in the Western Baltic (table 6.1, figure 6.1). 23 harbour porpoises were observed bycaught in 2024, all of them in the Belt Sea population range, and the total bycatch has been estimated to 76 animals in this area (Säterberg et al. 2026. In review; Global Ecology and Conservation).

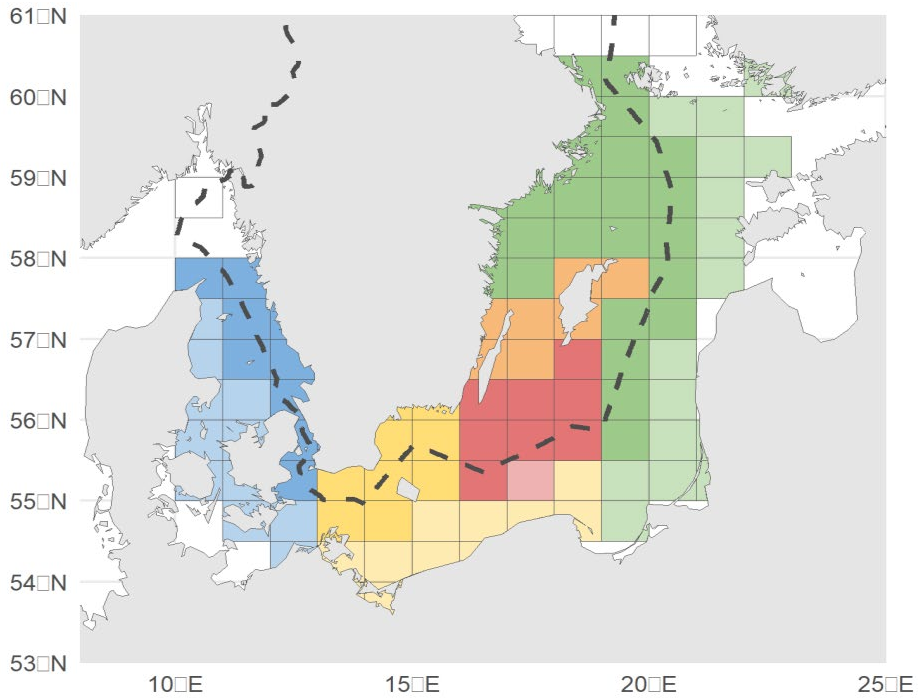

Figure 6.1. *The different areas that are used for stratification in the Swedish bycatch monitoring programme.*

Table 6.1. *Monitoring coverage in the different areas in the Swedish monitoring programme in 2025.*

Area	Coverage	Number of vessels included in the observer programme
Blue – Belt Sea population	12.7 %	27
Green – low risk	2.5 %	18
Yellow – medium risk	9.7 %	24
Orange – low risk	7.7 %	10
Red – high risk	42 %	2
Total	**8.5 %**	**83**

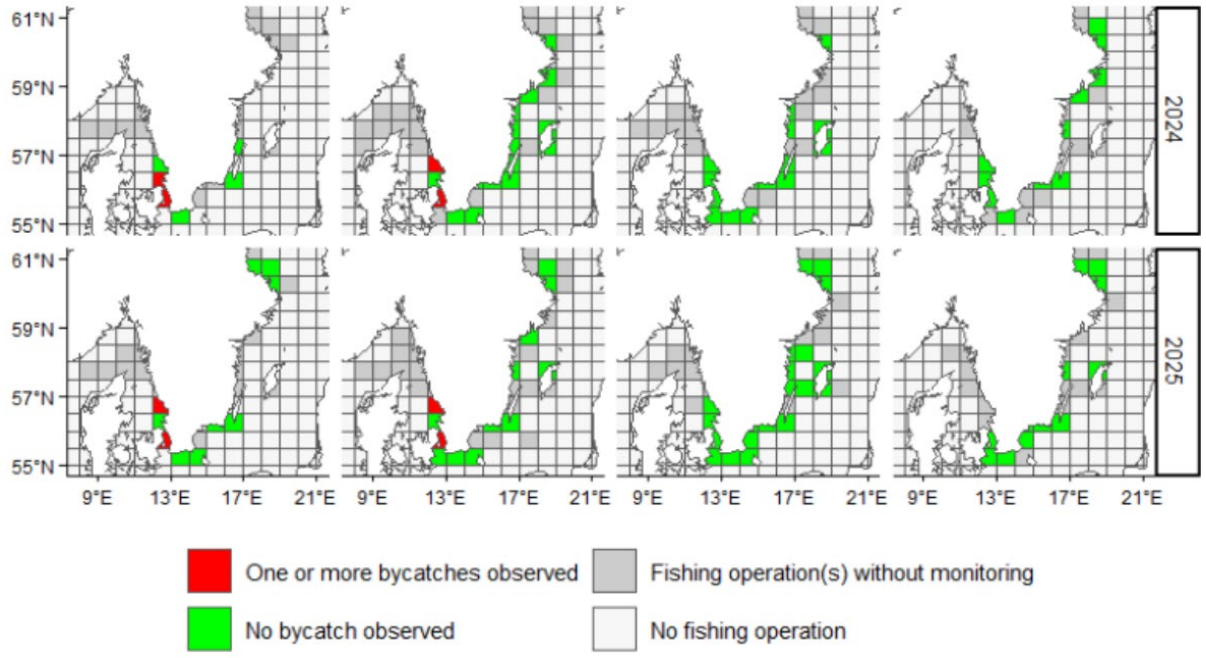

Figure 6.2. *Results from the Swedish bycatch monitoring programme: Fishing and monitoring coverage and observed bycatch during 2024 and 2025 (quarter 1-4)*

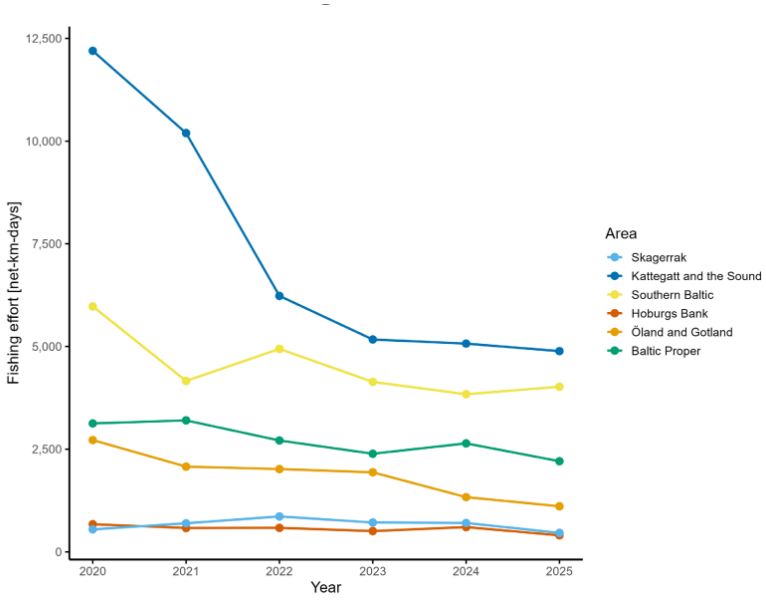

Figure 6.3. *Swedish gillnet fishing effort in the monitoring areas during 2020-2025.*

Key conclusions and recommendations

The work to estimate bycatch rates and total bycatch in the WBBK area has really been moving forward in the last decade, however, dedicated marine mammal bycatch monitoring is not implemented in Germany, which should be done urgently. Further efforts should also immediately be made to monitor the static net fishing effort in German waters. Ideally, VMS data and logbook data should be collected, but if this is not possible, alternative methods should be considered. These data are needed to improve bycatch estimates for the Belt Sea population.

The knowledge on high-risk fishing gear and important harbour porpoise areas, should immediately be put to use to introduce mitigation measures especially in high-risk areas. With all recent bycatch estimates showing that bycatch significantly exceeds sustainable levels, urgent action is needed to ensure the stability of the population.

7. Estimate trends in abundance of harbour porpoises in the Western Baltic, the Belt Sea and the Kattegat

The abundance of harbour porpoises in northern European waters, (excluding the Baltic Proper) has been estimated four times from internationally coordinated large-scale dedicated surveys; SCANS (Small Cetacean Abundance in the North Sea and Adjacent waters) in July 1994 (P. S. Hammond et al. 2002), SCANS-II in July 2005 (Philip S. Hammond et al. 2013), SCANS-III in July 2016 and SCANS-IV in July 2022. The results from SCANS-IV were published in a report in 2023 (Gilles et al. 2023).

In addition to the four SCANS surveys, the Belt Sea Management Unit has been surveyed in the two MiniSCANS surveys in July 2012 (Viquerat et al. 2014) and in June-July 2020 (Unger et al., 2021). All estimates from SCANS and MiniSCANS surveys are included in table 7.1.

The latest abundance estimate from SCANS-IV of 14,403 (95% CI = 9,555-21,769) is the lowest since the SCANS-II survey in 2005. A Bayesian trend analysis was carried out by Owen et al (2024), showing a decreasing trend of 2.68% per year (95% credibility interval, -4.13% to +1.26%), with a 90.5% probability that the trend was in fact negative (figure 7.1).

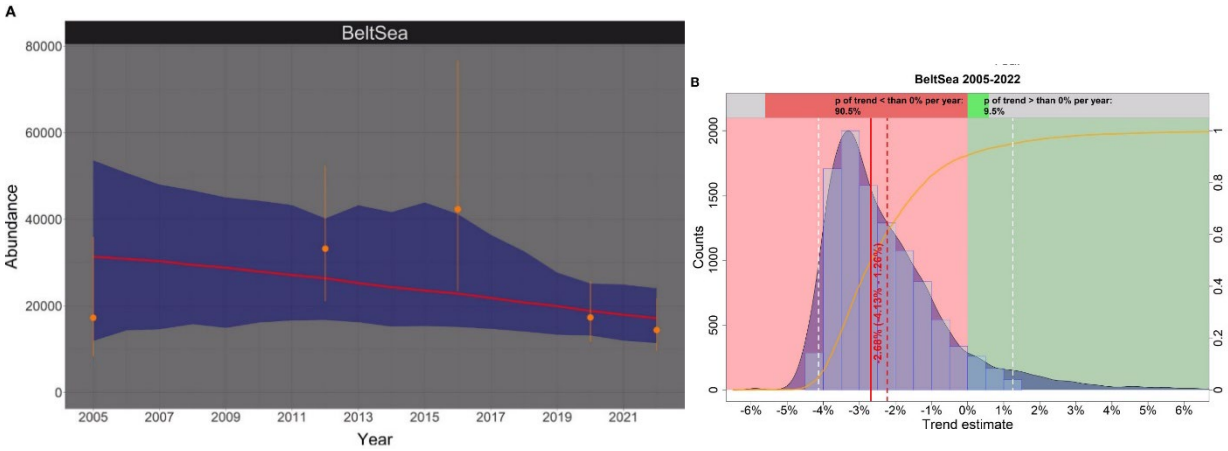

Figure 7.1. *The Bayesian trend in abundance of harbour porpoises in the WBBK area between 2005 and 2022. (A) Stratum-based visual survey abundance estimates and the associated 95% confidence intervals are shown in orange. The median of the posteriori distribution of the calculated 'true' abundance estimates from a Bayesian model is show by the red line, and the corresponding 95% credibility intervals are shown in blue. (B) The distribution of the trend estimates (relative change in abundance) between 2005 and 2022 is shown by the light blue histogram and the blue shaded density curve (x-axis); the solid red vertical line is the median, the vertical red dashed line is the mean, and the white dashed lines represent the upper and lower 95% credibility intervals of the trend estimate. The red coloured area corresponds to an area with a negative trend, while the green coloured area represents a positive trend. The orange solid line illustrates the empirical cumulative distribution function of the trend estimates, giving the probability of a trend estimate at a specified value (e.g. 0%). Hence, the upper bar chart shows*

how likely it is that the trend is either negative (i.e., p< 0%; red) or positive (i.e., p > 0%; green). From Owen et al 2024

Table 7.1 summarises porpoise abundance estimates from each survey, with the SCANS estimates subdivided into the original blocks (Skagerrak, Kattegat and Belt Seas) and then within the management unit area of the Belt Sea harbour porpoise population in the Kattegat and Belt Seas.

Table 7.1. *Overview of harbour porpoise abundance and density (ind./km2) estimates from SCANS and MiniSCANS surveys in the Belt Sea population region. Surveys were either conducted solely on the distribution range of the population (i.e., western Baltic Sea, Belt Sea, The Sound and Kattegat) (BS) or covered a larger area, including the Skagerrak, to different extents (S). *For ship surveys, effort refers to km in sea conditions Beaufort ≤2, and for aerial surveys, under good or moderate conditions. Adapted from Unger et al 2021.*

Year	**1994**	**2005**	**2012**	**2016**	**2020**	**2022**
Survey dates	27 June-09 July 1994	27 June-16 July 2005	02-21 July 2012	5-24 July 2016	24 June-10 July 2020	28 June-15 Aug 2022
Survey	SCANS	SCANS-II	MINISCANS	SCANS-III	MiniSCANS-II	SCANS-IV
Block	I + X	S		2	MS A-I	BS-A – BS-F
Area	S/BS	S/BS	BS	BS	BS	BS
Area (km2)	55,295	68,372	51,511	40,707	42,244	42,264
Platform	ship + aerial	ship	ship	ship	aerial	aerial
Effort (km)*	2,292	1,279	826	1,028	4,533	4,279
Abundance	51,660	27,901	40,475	42,324	17,301	14,403
CV	0.30	0.39	0.24	0.30	0.20	0.21
CI low_abu	29,058	13,387	25,614	23,368	11,695	9,555
CI high_abu	91,841	58,149	65,041	76,658	25,688	21,769
Density	0.93	0.41	0.79	1.04	0.41	0.34
CI low_dens	0.53	0.20	0.50	0.57	0.28	0.23
CI high_dens	1.66	0.85	1.24	1.88	0.61	0.52
Reference	Hammond et al. (2021), revised from Hammond et al. (2002)	Hammond et al. (2021), revised from Hammond et al. (2013)	Viquerat et al. (2014)	Hammond et al. (2021)	Unger et al. (2021)	Gilles et al. (2023)

In **Denmark**, an acoustic monitoring program began in 2012. C-PODs are circulated between harbour porpoise SACs (figure 7.2), and in 2021-2023 SACs in the Northern Sound and Fehmarn Belt was monitored. Results from most of the areas show a steady increase in detections since 2012 (figure 7.3), which is interesting in relation to the overall decrease in the population.

Acoustic monitoring in **German** waters of the WBBK area started in 2002 and continues to use C-PODs (see figure 7.2). Germany also has an established monitoring programme of their waters using visual and digital aerial surveys within the WBBK region (west of 13.5° E around the island of Rügen, see figure 7.4). This is funded by BfN, with surveys in summer every two years. Around Fehmarn, however, the surveys are undertaken annually. There are also winter surveys (in association with seabird monitoring) around the Pomeranian Bay ("Pommersche Bucht").

In **Sweden**, 14 acoustic monitoring stations in Natura 2000 sites in the WBBK area were added into the national monitoring programme in May 2019 (figure 7.2). Most stations have detections

almost every day, and there are indications of summer detection frequencies increasing in Skåne while decreasing slightly in Halland. However, Belt Sea monitoring stations were taken out during 2023 to ensure that Sweden had enough equipment to carry out SAMBAH II, but they will be redeployed again in autumn 2026. Additionally, a regional monitoring programme in the Kattegat and Skagerrak Seas was developed in 2024, and implementation continues in 2025 by the relevant County Administrative Boards in Sweden.

A power analysis for the monitoring in Kattegat was published during 2024 to evaluate whether monitoring effort could be reduced while still providing the power to detect a 30% decline over three generations (equivalent to an annual decline of 1.6%) with 80% power and 20% significance, i.e. similar to the OSPAR's threshold for abundance of cetacean assessment units (Julia Carlström et al. 2024). Results show that a significant trend was estimated to be detected within 12 years, and that decreasing the number of stations within a group from 3 to 2 delays the time to reach 80% power by approximately 1 year, while decreasing it from 2 to 1 delays it by approximately 2 years. Alternating stations within a group has negligible impact on the power.

In HELCOM, for HOLAS III, a qualitative assessment was made for the WBBK harbour porpoise population abundance, and the status was assessed as bad (HELCOM 2023a). In the HELCOM Red List II, the Belt Sea harbour porpoise population is assessed as Endangered (HELCOM 2025), a change from the previous assessment which was Vulnerable.

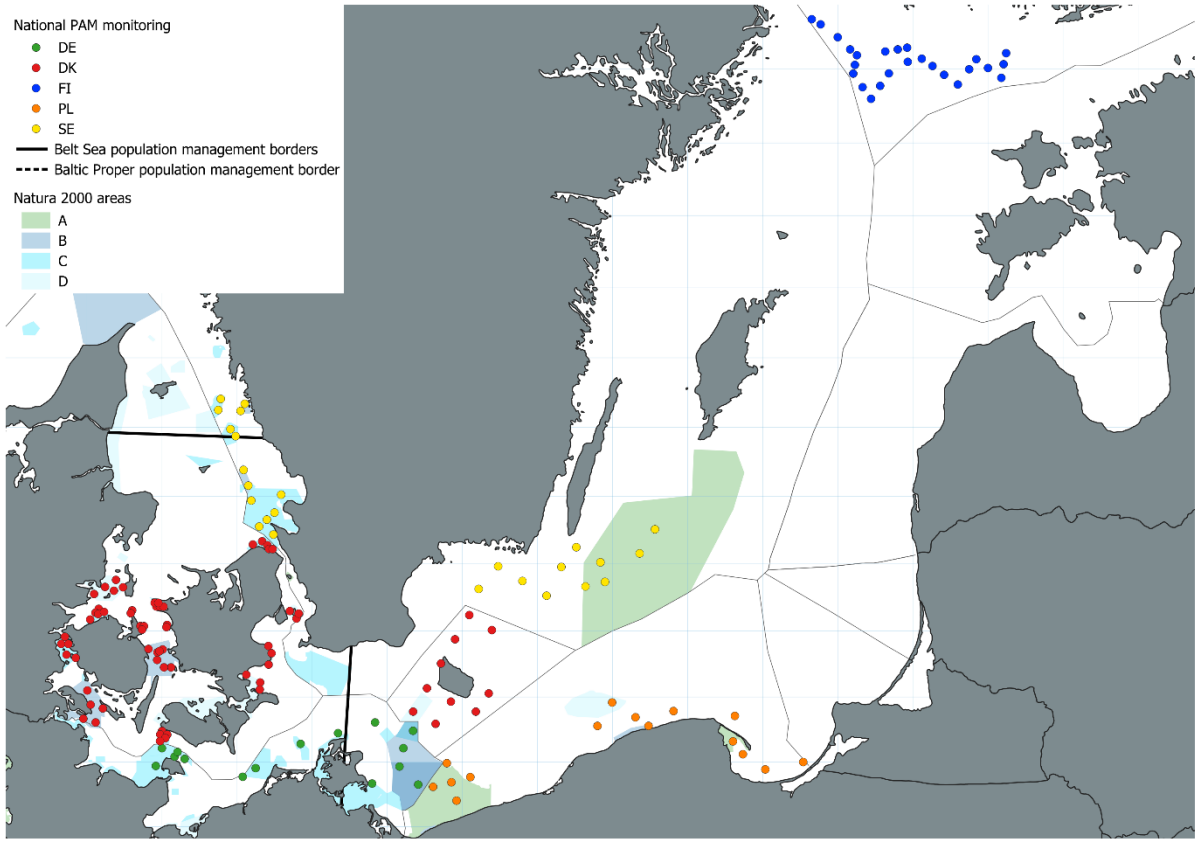

***Figure 7.2**. Stations in the national passive acoustic monitoring programs in the WBBK and Jastarnia areas in 2025-26.*

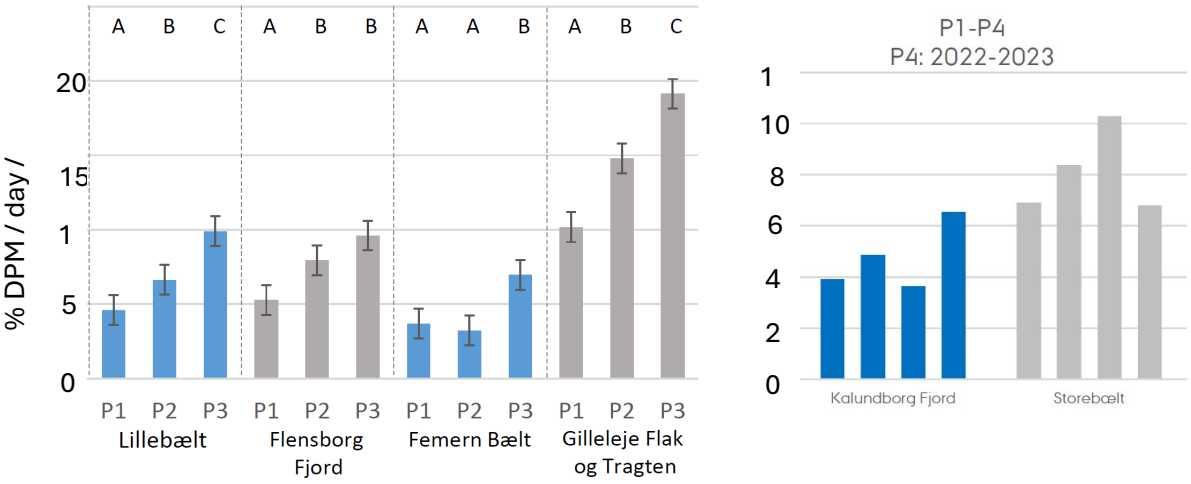

***Figure 7.3**. Results from the Danish passive acoustic monitoring program for three monitoring periods 2012-2021), and for 2022-2023 for two of the sites. Results for each period represents the average of the five acoustic stations within each of the six Natura 2000 sites (see figure 7.3). Vertical lines indicate 95 % CI. A, B and C refer to statistical significant differences (α=0,05), so that different letters are different and the same letter indicates that they are not statistically different. Each period is approximately 1 year.*

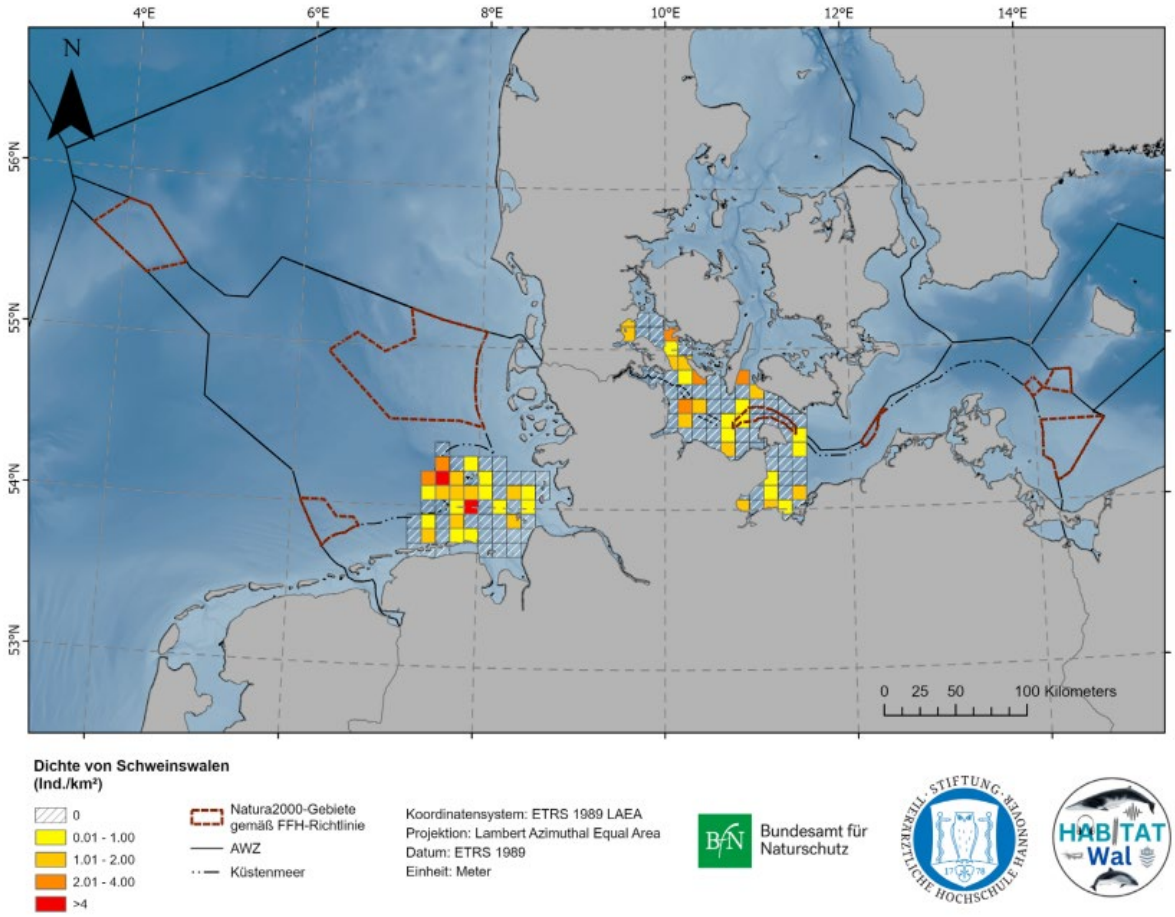

***Figure 7.4**. Results from the German aerial survey in summer 2024. An area of 6691 km^2 was surveyed, the density estimated was 0.43 individuals/km^2 (95% CI 0.26-0.67) and the number of animals estimated in that area was 2860 (95% CI 1742-4505).*

Key conclusions and recommendations

Thanks to regular surveys, we now know that the Belt Sea harbour porpoise population is declining, which is very important information to fuel conservation action for the population. In order to take relevant conservation action in the right areas at the right time, more effort should be put into monitoring the seasonal variation in abundance, using passive acoustic survey methods or visual surveys, or both.

8. Monitoring population health status, contaminant load and causes of mortality

In **Germany** a dedicated stranding scheme 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 come from the Baltic Proper and the Belt Sea population, respectively, but it is likely that the major part of animals found on German shores are from the Belt Sea population. In 2024, 89 animals were reported stranded in Schleswig-Holstein and 31 in Mecklenburg-Vorpommern. Necropsies are undertaken on fresh specimens to determine cause of death and collect life history information. Health and nutritional status as well as diet is also included within the framework of the stranding network. Additionally, a monitoring and assessment concept is being developed for the pollution load of marine mammals of the North Sea and Baltic Sea for the implementation of the MSFD, and a project is ongoing to develop indicator pathogens in marine mammals to advance assessment of anthropogenic impacts.

In **Denmark**, the Danish Nature Agency funds the dissection and necropsy of 25 stranded or bycaught porpoises per year to examine health and cause of death, and 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.

Museum Vest is now responsible for coordinating stranding responses, and also hosts the national database on strandings. In 2024, 274 harbour porpoises were found dead on beaches in Denmark, 6 were reported bycaught and one had to be euthanised. The number of stranded porpoises may have been affected by a young male bottlenose dolphin that during summer 2024 spent some time in the Belt Sea. On several occasions this dolphin was seen attacking harbour porpoises. A total of 13 porpoises were necropsied in 2024, whereof nine were from the Belt Sea population range. All of the necropsied animals were found dead, except for a calf that was euthanised. Six of the animals necropsied were bycaught, three had been killed by grey seal and three had been killed by bottlenose dolphin (Bie Thøstesen and Kristensen 2025).

In **Sweden**, records of strandings are collected opportunistically by the Swedish Museum of Natural History (NRM) and collection of carcasses for examination is conducted by the Swedish Veterinary Agency (SVA). Necropsies are carried out at SVA together with NRM. 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 NRM. A variety of tissues and data are collected including samples for genetic, dietary, life history, contaminant and infectious agent analyses. From the Swedish west coast, i.e. the Belt Sea population range, 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.

In 2025, 93 porpoises were reported stranded and 1 was submitted as bycatch by fishermen. A total of 19 porpoises found dead or submitted as bycatch in 2025 were necropsied, 10 females

and 9 males. Four of the stranded animals were diagnosed as bycaught. Causes of death in the animals necropsied is presented in figure 8.1.

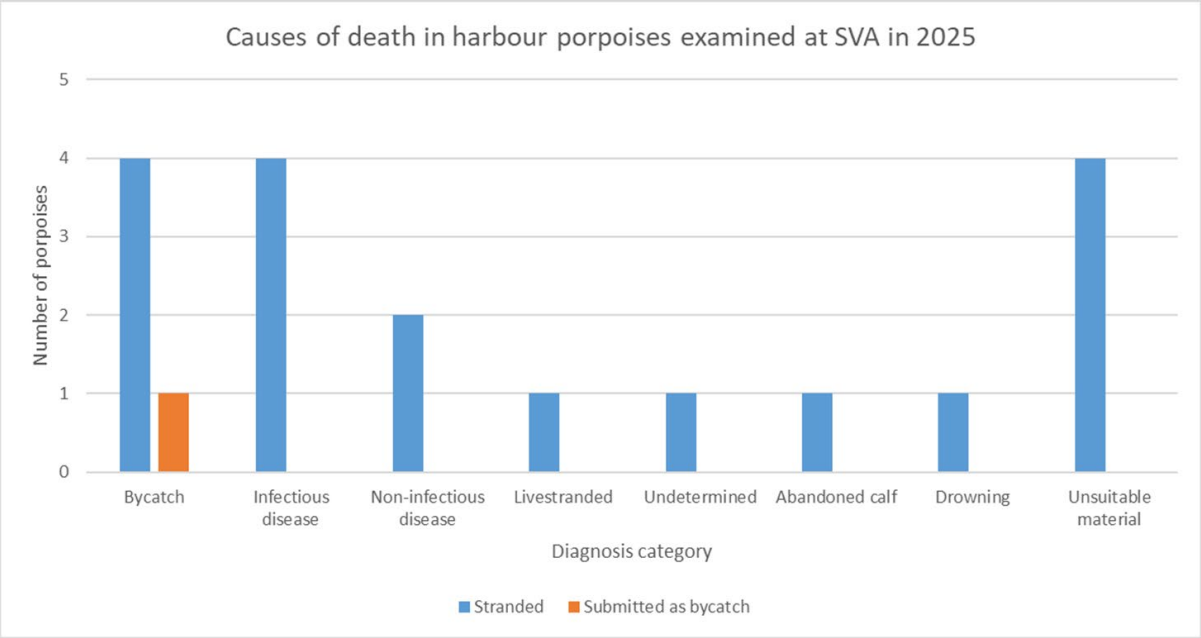

Figure 8.1. *Causes of death in harbour porpoises necropsied in Sweden in 2025.*

The first fatal case of highly pathogenic avian influenza virus (H5N1) was found in a stranded harbour porpoise in 2022. This case coincided in time and space with a large influenza outbreak in seabirds and reflected the high viral infection pressure in the marine environment. In 2025 four animals died from infectious disease. Bycaught animals (both submitted by fishermen and found stranded) continue to show significant health findings such as skin lesions (figure 8.2), pneumonia and heavy parasitism. Skin infections can reflect overall health status, and further characterization is ongoing on pathology as well as whole genome sequencing. Birthing complications continue to be documented (6 cases between 2020-2024 and 2 cases, including uterine rupture during birthing, in 2025).

Samples from 50 porpoises collected from 2017-2025 with full necropsy data are being analysed for numerous environmental contaminants (heavy metals including mercury, PFAS, EOF and PCBs). Results will be available later in 2026. A study on diet was recently published (Johanna Stedt et al. 2025). Also, a new FORMAS project will run 2024-2026 investigating diet and health status over time (LU, NRM, SVA).

Figure 8.2 *Bycaught porpoise (found stranded) with several skin lesions. Photo: Disa Fjellström.*

In all three countries, the protocols used for examining strandings, and for undertaking necropsies, have been the ones recommended from the pathology workshops held by the European Cetacean Society, as well as the ASCOBANS/ACCOBAMS Best practice on cetacean post mortem investigation and tissue sampling guidelines. HELCOM indicators on health and reproduction and on nutritional status is being developed, the latter with input from a blubber thickness project in Denmark as well as data from Sweden and Germany.

Key Conclusions and Recommendations

For studies of health status, contaminant loads and causes of death, there needs to be regular necropsies undertaken of a reasonable sample size. Germany has a stranding scheme and performs necropsies on a routine basis. Sweden now has a health monitoring programme performing necropsies on quite a large sample of stranded animals each year. The situation has also considerably improved in Denmark in recent years, with Museum Vest now being responsible for coordinating stranding responses and hosting the national strandings database. These efforts should be continued and built upon.

9. Ensure a non-detrimental use of pingers by examining habitat exclusion and long-term effects of pingers

A number of studies have examined possible long-term effects of pingers through habitat exclusion (Carlström et al. 2002; Carlström et al. 2009; Kyhn et al. 2015) In Denmark, Kyhn et al (2015) examined the effects of two types of pingers (Airmar: 10 kHz tone; Save-Wave Black Saver: 30–160 kHz sweep) on the presence of wild harbour porpoises, at two sites in Jammerland Bay in the Great Belt, Denmark and concluded that if pingers are used as deterrent devices, the impact of habitat exclusion needs to be considered concurrently with mitigation of bycatch, especially when regulating fisheries in Marine Protected Areas. Another study in Denmark took into account not only the direct effects but also the sub-lethal population level effects of pinger use resulting from e.g. reduced foraging efficiency, and showed through the use of an individual-based model that a combination of time-area fishing closures and the use of pingers was likely the most beneficial way of mitigating bycatch (van Beest et al. 2017). Since this study, further studies have tried to better understand behavioural responses of porpoises in the presence of pingers, for example using drones, so as to improve their effectiveness without deleterious side effects. A scientific paper was published in 2022 on the fine-scale behaviour of porpoises around pingers (Brennecke et al. 2022), showing that pingers can elict strong aversive reactions but also that reactions may vary quite significantly between individuals and/or situations.

In Germany, the Thünen Institute's development of PAL devices aimed to tackle the acoustic deterrent issue. 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 (B. M. 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 (Culik et al., 2015). To date, there is no clear evidence that PAL operates as an alerting device, and the scientific community has called for monitoring of the effects of the massive deployment of PALs in German waters. The PAL-CE project ("Por-poise ALert (PAL) use in German waters – Current Efficiency and mode of operation") started in 2021 and investigated whether the proven effect of PALs persist over longer periods of time and will compare the reaction of naive harbour porpoises in the Danish Belt Sea with the behaviour and reactions to PALs of harbour porpoises in Schleswig-Holstein (Germany) that already know the warning signal. The project was funded by the Bundesamt für Naturschutz and was led by the Deutsches Meeresmuseum. The project ended in 2024, and the final report is currently being compiled. A PhD thesis has been published within the project (Dinkel 2025).

Key Conclusions and Recommendations

Scientists from the Range States have led much of the research that has been undertaken to date on the interactions between porpoises and pingers. The main objective is to ensure that with pinger deployment, porpoises are alerted to the presence of a net in a manner that avoids entanglement whilst not being deterred enough that it excludes them from important habitat for significant periods of time resulting in a population impact. Studies continuing to investigate the efficacy of pingers should be encouraged.

Unfortunately, the results from the PAL-CE project does not fully answer the question about the ability of these devices to decrease bycatch. This needs to be clarified and effective bycatch mitigation in German waters, as well as the entire WBBK area, needs to be ensured.

10. Include monitoring and management of important prey species in national harbour porpoise management plans

In general, studies are largely lacking on the effects of prey depletion on porpoise energetics and its impact upon population dynamics. A major gap exists in understanding prey preferences and how diet varies in time and space, as well as the effect of prey depletion on harbour porpoise behaviour and resulting effects in energy intake and expenditure. In the North Sea, the availability of sandeel has been found to correlate with the number of harbour porpoise that starved to death (MacLeod et al. 2007), indicating that the availability of a specific prey species can have significant effects on harbour porpoise survival. It has also been indicated that harbour seal around the UK have seen declines in areas were seals are more dependent on sandeel and where sandeel stocks have declined (Wilson and Hammond 2019). In the Baltic, a study found that the weight of herring affected the blubber thickness of Baltic grey seals (Kauhala et al. 2017), which raises the question of prey quality and its effects on harbour porpoise. Another study indicates that harbour porpoises in the Kattegat and Belt Seas spend over 60% of their time foraging (Rojano-Doñate et al. 2024), which implies that the prey that they target is small and maybe not very energy-rich, forcing porpoises to spend more time foraging to meet their energy needs.

In the WBBK region, important work has been undertaken on prey preferences. Sveegaard et al. (2012) showed that the distribution in terms of occurrence and number of fish species in stomach contents differed between seasons, indicating a seasonal shift in prey intake. Atlantic cod was found to be the main prey species in terms of weight in the high-density season while Atlantic herring and Atlantic cod were equally important during the low-density season. Results from Andreasen et al., 2017, supports these findings. Atlantic cod and herring were the main prey of adult porpoises in this study, constituting on average 70% of the diet by mass. Juvenile porpoises also frequently consumed gobies, the mass contribution by gobies averaging 25%, which was as much as cod. In this region, other species such as whiting, sprat, eelpout, and sandeels were of minor importance for both juveniles and adults. A recent study by Stedt et al (Stedt et al. 2025) also finds that clupeids, gadoids and gobiids were the most frequent prey groups, but that the use of DNA metabarcoding allowed detection of a greater number of prey taxa.

Sveegaard et al. (2012) also considered that prey availability and predictability were likely to be the main drivers for harbour porpoise distribution in this region. This is supported at smaller spatial scales by results showing that harbour porpoise presence around Kullaberg in the Swedish part of Kattegat is strongly correlated to foraging frequency, suggesting that harbour porpoises spend more time in areas where they can find more prey (Stedt et al. 2023).

The stocks of cod and herring in the region have all declined markedly over the last fifty years. The spawning stock biomass of cod in the Kattegat (ICES SubDivision 21) has declined from around 35,000 tonnes in the early 1970s to historically low levels in 2020 (figure 10.1).

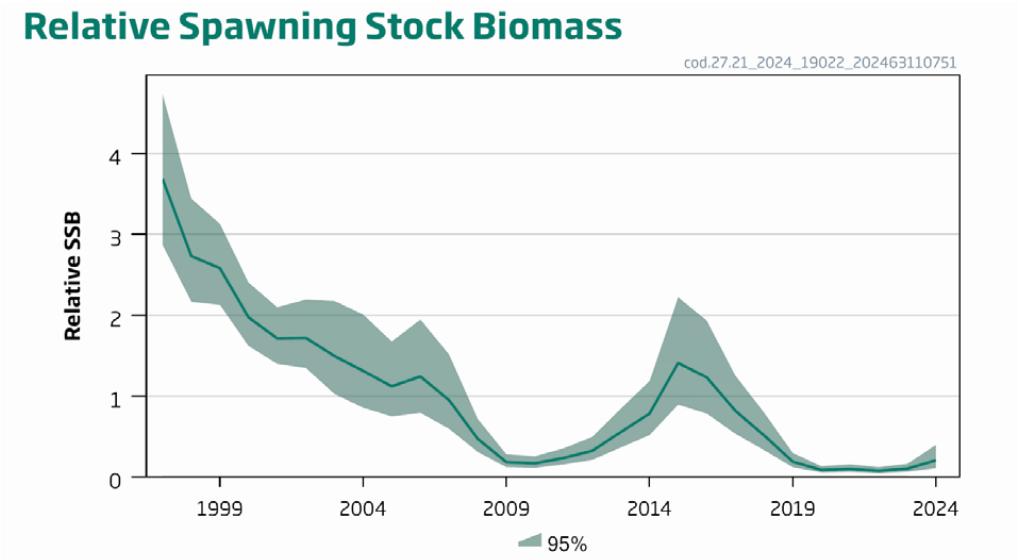

Figure 10.1. *Spawning stock biomass (SSB) trend for the Kattegat cod stock, in 1000 tonnes (ICES 2024a).*

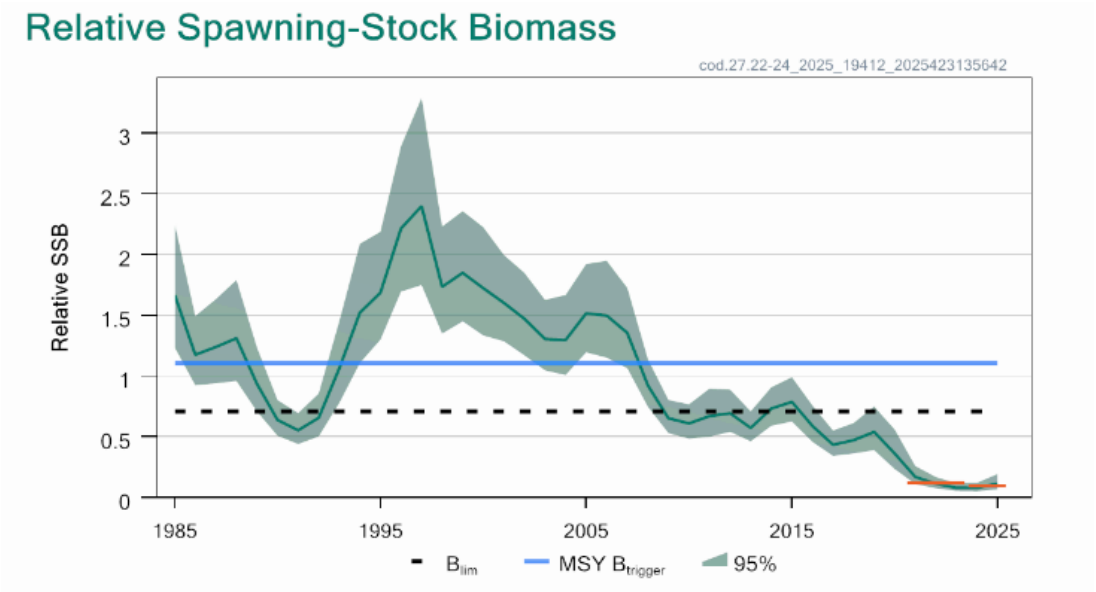

Figure 10.2. *Relative spawning stock biomass (SSB) trend for the Western Baltic cod stock (ICES 2025a).*

The Western Baltic stock of cod (ICES SubDivisions 22-24) has fluctuated over the same time period, now being at record low levels (figure 10.2). There is no sign of a full recovery in stock size from the historical levels (ICES 2012), with it suffering from a fishing mortality above sustainable levels, and reduced recruitment (Oceana 2016), and there is now a complete ban on targeted fishing on both the eastern and western Baltic cod stocks. Spawning takes place in the Sound, in the Belt Sea, and at various locations in the Arkona basin.

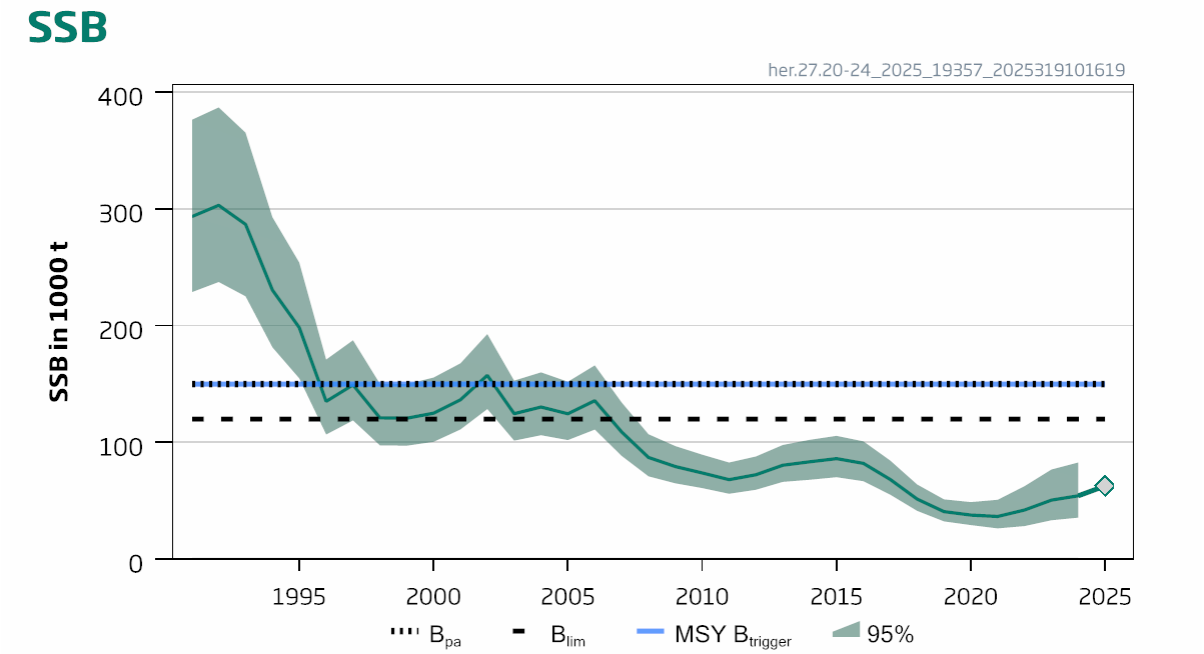

Figure 10.3. *Trend in spawning stock biomass (SSB) for spring spawning herring in ICES SubDivisions 20-24 (ICES 2025b)*

Important stocks of spring spawning herring exist in the Skagerrak (ICES SubDivision 20), Kattegat (ICES SubDivision 21) and Belt Seas (ICES SubDivisions 22-24). A comparison of the spawning stock biomass and assessment of maximum sustainable yield shows a marked decline for the stock in ICES SubDivisions 20-24 during the 1990s (figure 10.3), and the ICES advice has now been to allow zero catch of this stock for the last seven years, continuing in 2026 (ICES 2025b).

Figure 10.4 shows the distribution of extraction of fish of three target species, and harbour porpoise prey species (cod, herring and sprat) for the Kattegat, Belt Seas, Western Baltic and Baltic Proper.

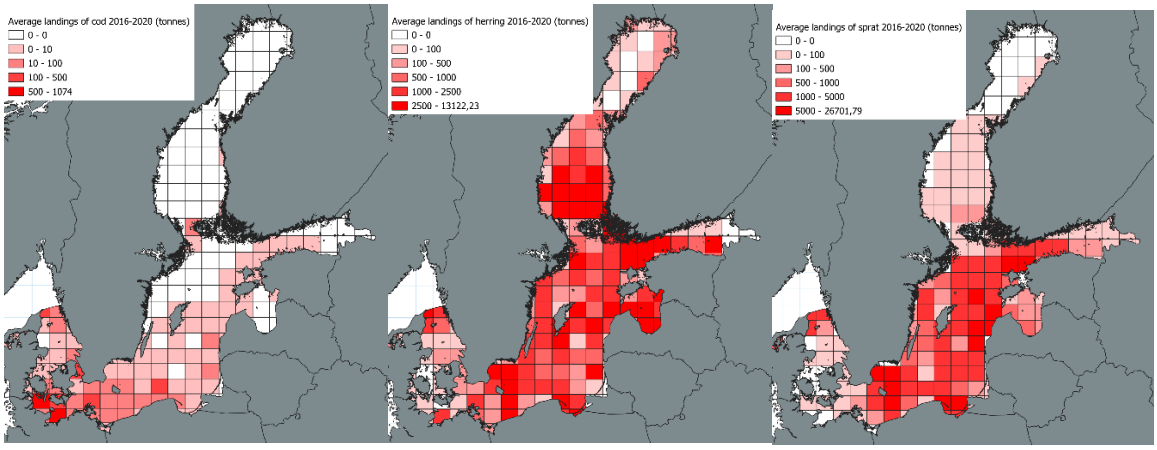

Figure 10.4. *Spatial distribution of commercial landings of cod, herring and sprat in the Baltic Sea in 2016-2020 (HELCOM 2023b).*

Besides being heavily influenced by large-scale industrial fisheries, herring biomass is dependent on the size of the cod stock, which is its main predator, and on the size of the sprat

stock, with which it competes for food. For herring, there are also large differences in growth rates between regions: individuals are small in the northern areas and larger in the south. This has been shown to influence grey seal blubber thickness (Kauhala et al. 2017) and could have implications for other top predators like harbour porpoise.

The state of cod and herring stocks may impact harbour porpoises in various ways: by triggering shifts in their main areas of concentration, switching to other prey, and/or reduced body condition which could lead to lower reproductive rates. These relationships need to be investigated further.

Key Conclusions and recommendations

Studies have provided some insight into the diet of porpoises in the region, illustrating the importance of cod and herring for adult porpoises whilst juveniles also consumed a significant quantity of gobies. Both cod and herring stocks have declined in the Skagerrak, Kattegat and Belt Seas as well as in the Baltic. Trends in the stocks of these important prey species could potentially affect porpoise reproductive rates and possibly also survival rates. It is recommended that studies investigate in more detail predator-prey interactions at an ecosystem level.

It is becoming increasingly evident that ICES advice and fisheries quota need to be based on the ecosystem approach and take into account not only fishing mortality but also the needs of other ecosystem components such as marine mammals. Fish stock management needs to improve considerably to ensure there is enough prey for harbour porpoises and other animals.

11. Restore or maintain habitat quality

MSFD indicators and the work in HELCOM

In the context of impacts on marine mammals, underwater noise can be divided into continuous sounds largely derived from shipping, and 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

In November 2022, continuous underwater noise threshold levels were agreed upon at EU level. In short, to reach good environmental status (GES), excess levels of continuous underwater noise cannot impact more than 20% of a given marine area over the course of a year. Similarly, no more than 20% of a given marine area can be exposed to excessive levels of impulsive noise over a given day, and no more than 10% over a year. Excess levels are defined as noise levels above "Level of Onset of Biologically adverse Effects", LOBE. Now, the next step is to define LOBE for relevant indicator species and habitat size in relation to the three frequency bands that have been agreed on for underwater noise monitoring, namely 63 Hz, 125 Hz and 2 kHz. 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 discussion on LOBE levels and relevant indicator species are currently mainly taking place in HELCOM. Within the EU framework, there are options to set lower threshold values based on regional specificities. For continuous noise, such regional specificities could be indicator species or populations considered particularly vulnerable and/or endangered, such as the harbour porpoise, uncertainty in the noise model, for example related to effects of strong sound speed gradients, which are common in the Baltic Sea, or influence from sources such as recreational boats not included in the current models, all of which requires a precautionary approach. Such regional specificities are to be considered for the HELCOM area in the work towards HOLAS 4.

The pre-core indicator on continuous noise is still to be developed in a range of aspects. While spatial and temporal threshold values have just been adopted at EU level, formal discussions and agreements still remain about their implementation, including the possibility of adopting stricter thresholds and decisions left to be made at the regional level. The indicator will therefore be further discussed and developed towards HOLAS 4.

New soundscape maps were made in the HELCOM BLUES project for the biologically significant dedicades 125 Hz (fish) and 500 Hz (mammals), based on the methodology from BIAS (see below). These maps are available through the ICES portal by looking for data for the year 2018

(https://www.ices.dk/data/data-portals/Pages/Continuous-Noise.aspx). The 500 Hz dedicade is too low to fully represent harbour porpoise hearing, but was used as a compromise between seal and harbour porpoise and also because modelling higher frequencies become less meaningful given their relatively short dispersion distance.

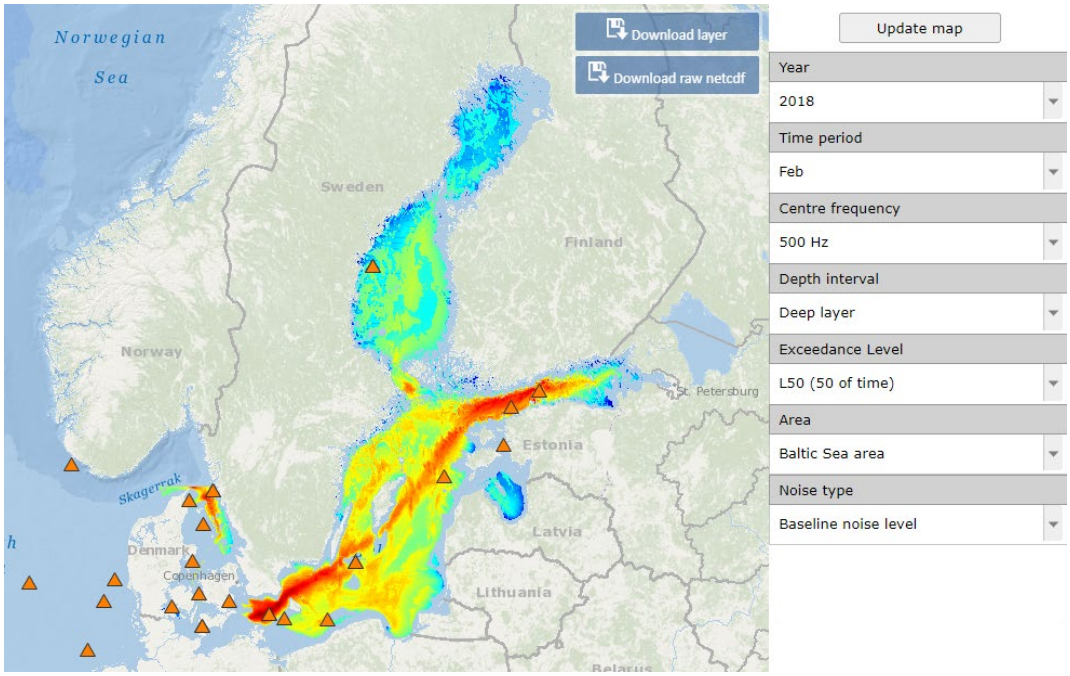

Figure 11.1. *Underwater noise map from the HELCOM BLUES project, calculated using the BIAS methodology with AIS data from the year 2018 and noise data from the remaining BIAS stations (marked with orange triangles). Source: https://underwaternoise.ices.dk/continuous/viewonmap.*

For impulsive noise, the indicator 'distribution in time and space of loud low- and mid-frequency impulsive sounds' was evaluated for HOLAS III. The distribution of sound was partially compared to the distribution of harbour porpoises in the Baltic Sea to get a first idea of overlap of sound and the occurrence of harbour porpoises. At the time of the assessment of this indicator the quantitative threshold values had not been agreed upon, so it was agreed to use an interim assessment threshold value of a daily fraction of exposed area of 10% of the Baltic Sea, which was in agreement with the threshold concept under discussion at EU level. The indicator reached GES but it was unclear whether the data used was complete or if data gaps and insufficient reporting to the database by countries may have influenced the assessment.

The general aim of the indicator is to assess the availability of habitat; there should be enough habitat for harbour porpoises to avoid regions impacted by low- and mid-frequency impulsive sounds.

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, but for the registry to work as intended, countries need to get more proactive in reporting.

Offshore wind

Offshore energy production, and especially offshore windfarms, has been increasing a lot in the last few years, and the EU has been clear with the priority to accelerate deployment of renewable energy, including offshore wind, for example through the directive on renewable energy (EU 2023/2413). Acoustic investigations of bottom structures and sea floor sediment layers before construction, the construction phase as well as windfarms in operation, including service traffic to and within the windfarms, can have negative impacts on harbour porpoises, both at the individual level and at the population level. Given the many threats to the Belt Sea harbour porpoise population, offshore energy production could have significant impacts on population status.

In **Denmark**, there are four offshore windfarms already in operation in the WBBK area (Anholt, Nystedt, Rødsand 2 and Kriegers Flak), as well as two windfarms that have been approved, one in Little Belt and one in the Great Belt. Given that the belts are very important for the Belt Sea population of harbour porpoises, these permits are worrying, and strict terms for construction and operation should be ensured.

Additionally, baseline monitoring of underwater noise in relation to offshore wind farm projects, including estimation of effect of geophysical surveys on baseline data, is taking place at the Danish Energy Island North Sea/North Sea lot1. The ENS screening project in undertaking soundscape mapping of Danish waters, with focus on contribution from windfarms.

The Energy Agency in Denmark recently published guidelines for monitoring windfarms before, during and after construction and are planning to enforce this practice.

In **Germany**, six offshore windfarms are already in operation in the Baltic, whereof only one is west of 13°E (figure 11.2). Two farms in the very eastern part of the German EEZ has had their permits denied, probably because they are situated within Natura 2000 areas, and 4-6 farms are approved or under construction.

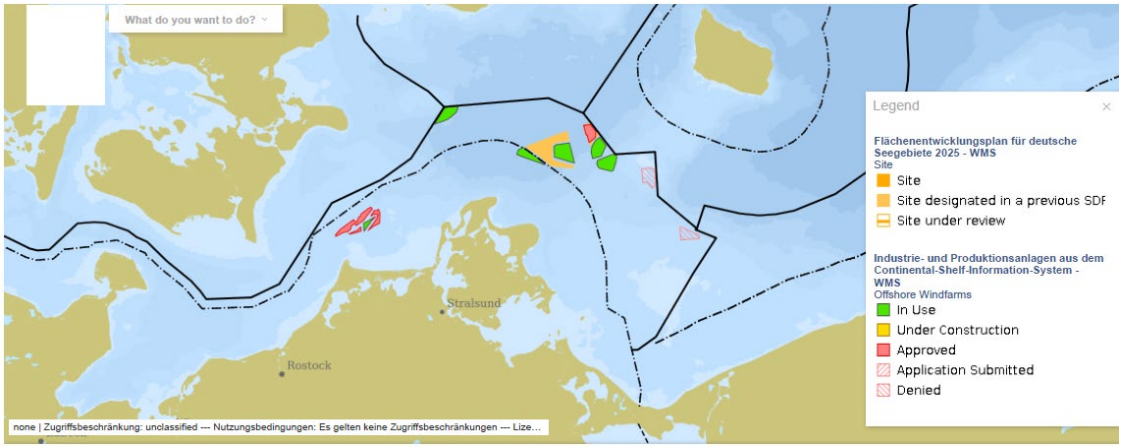

Figure 11.2. *Offshore windfarms in German waters.*

In **Sweden**, the government has announced that Sweden will move from the current "open door procedure", where companies can apply to build OWF anywhere in Swedish waters, to the more common auction system, where the government will appoint certain areas that will then be

auctioned off to offshore wind companies. However, the open-door system is still in operation, and three offshore windfarms have received permits in the Swedish part of the WBBK area, all in Kattegat; Galene, Kattegatt Syd and Vindpark Falkenberg. One windfarm is already in operation, Lillgrund, which is situated in the southern part of the Sound (figure 11.3). One windfarm in Skagerrak, Poseidon Nord, situated to the northeast of Skagen has also received a permit.

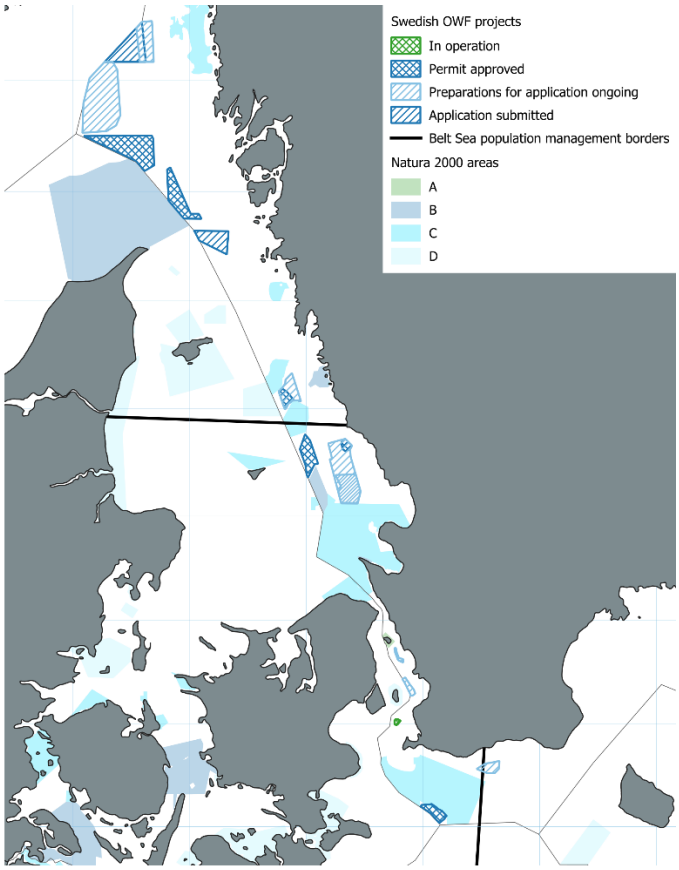

Figure 11.3. *Offshore windfarm projects in the Swedish part of the WBBK area.*

Unexploded ordinance

In some areas of the Baltic Sea, there are old unexploded ordinance from WWII which were left or even dumped after the war. These mines or other types of explosives, when found, often have to be removed, and the safest way for humans to do that is usually through controlled explosions. Such operations are carried out by the respective national military forces or within joint exercises, for example under the NATO umbrella. Unfortunately, the military organisations operating in the Baltic Sea Region are 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.

In Germany, a project called NAVESS (Environmentally compatible blastings at sea) ran in 2023-2024 as a collaboration between BfN and the Military, using scientific data to assess impact of unavoidable blast noise from a nature conservation perspective. The project evaluated the mitigation effect of different bubble curtain configurations and the efficiency of deterrence and mitigation measures (figure 11.4). The final report as well as guidance on nature-friendly removal of UXOs are being prepared.

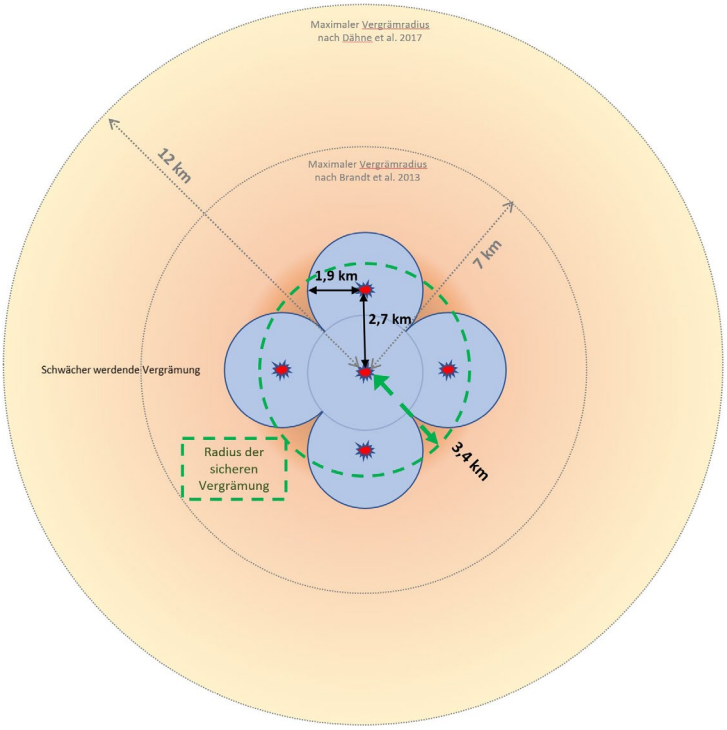

Figure 11.4. *The staged deterrence concept developed in NAVESS. 1.9 km „safe deterrence range" (Brandt et al. 2013). Timeline: 1) Pingers, 2) Seal Scarer middle, 3) Seal Scarer outside + seal scarer middle moves to 2.7 km distance → ~3.4 km safety zone*

In Sweden, the Defence Inspector for Health and Environment, Försvarsinspektören för hälsa och miljö (FIHM) is responsible for ensuring that the environmental laws is followed in relation to clearing of UXOs. They should, if necessary, contact other authorities and gather their input. For clearing of UXOs that cannot be avoided, mitigation measures equivalent to big double bubble curtain or hydro sound damper are required, at least within MPAs.

There has been some discussion about the possibility to use bubble curtains as mitigation for explosions of larger charges of 1000 kg TNT equivalents or more. Opinions differ, and there is lack of clarity on the presence of methodology or experience on the positive use of bubble curtains in such large explosions. However, from the company Hydrotechnik Lübeck there seems to be a willingness to provide mitigation also for large charges.

It should be noted that explosions are sometimes used in construction projects for harbours and to deepen and widen shipping lanes. It is important that available mitigation techniques are used also in these instances.

Carbon Capture and Storage

With climate change rapidly progressing and effects becoming more and more evident, countries are looking for ways to decrease the release of CO2. One method that has arisen on the agenda is carbon capture and storage (CCS), where CO2 is captured into liquid form and pumped down under ground, either into emptied oil and/or gas deposits, or into porous sediments. Because this is associated with some risk, the public opinion is that this type of storage should be found in the sea floor. The problem with CCS is firstly that CO2 may leak back into the atmosphere, but secondly, and in relation to harbour porpoise conservation perhaps

more relevant, that acoustic surveys of the sediment layers in the sea floor is necessary both before potential CCS is carried out, but also with regular intervals (every 1-2 years) after CO2 has been pumped into the storage, to ensure that the storage is intact. The surveys are carried out using powerful acoustic methods such as airguns, which can deter harbour porpoises up to 12 km (Sarnocińska et al. 2020) and cause hearing damage at closer ranges.

In HELCOM, there has been discussions in which some contracting parties argue that CCS is not permissible under the HELCOM agreement, while some countries are of the opinion that it should be possible. A legal analysis is currently ongoing, as well as a report on environmental risks from CCS in the Baltic Sea.

In Sweden, the government has tasked the Swedish Geological Survey with investigating the suitability of the sedimentary bedrock for carbon dioxide storage in two areas: southern Skåne including the sea area south of Skåne (southwestern Baltic Sea), and Gotland and the southeastern Baltic Sea. Public consultations for the surveys in the Baltic Proper took place in spring 2025 and a partial permit has been issued by the CAB, while most of the surveys needed south of Skåne, in the WBBK area, have already been carried out (Lindström et al. 2026).

Vessel noise

In Sweden, the Swedish Transport Agency has produced two reports on methods for reducing underwater noise from ships and recreational vessels, respectively, commissioned by the Swedish Agency for Marine and Water Management. By 30 April 2026, the draft but not the final reports were available (Winroth and Johansson 2026b, 2026a). The reports review current knowledge and possible technical and operational mitigation measures. A study on the effects of recreational boats on harbour porpoise swimming speed and surfacing interval investigated by unmanned aerial vehicles (UAVs) has also been published (Till et al. 2026). Yet another study exploring UAV transect monitoring as a novel method for standardized digital aerial surveys of harbour porpoises show results on effects of boats speed on porpoise swimming speed (Hartmann et al. 2025).

Mitigation

In Sweden, the Swedish Agency for Marine and Water Management published national guidelines for offshore pile driving in December 2025 (Havs- och vattenmyndigheten 2025). The guidelines cover information on thresholds, methods for noise modelling, mitigation measures, and design of control programmes for porpoises, seals and fish, building on a technical report by the Swedish Defence Research Agency (FOI) (Andersson et al. 2025). There are general noise mitigation regulations in place for some protected areas, such as obligatory mitigation measures for impulsive underwater noise pollution during marine exploitation such as pile driving, underwater explosions (military), seismic studies and demands for cumulative underwater noise studies for continues underwater noise pollution when applications for new marine activities in order to better assess and mitigate the impact on marine mammals and fish. In parts of Kosterhavets national park, as well as in the nature reserves Skånska Kattegatt and Hallands Väderö, there are speed limits in place to reduce underwater noise (ICES 2024b).

In Germany, guidelines for the legal and technical nature conservation requirements for the clearance of explosive ordnance in the German North Sea and Baltic Sea are being developed.

Such guidelines are likely to include mitigation measures that are considered for each planned detonation, and includes separation of the fuse box from the main charge in certain types of air mines, translocation of UXO and detonation in shallow waters or on a sandbank (in air), use of pingers/seal scarers and/or bubble curtains, all depending on the situation. In Lower Saxony, which includes the Wadden Sea, there are already binding guidelines for the handling of UXOs. If possible, UXOs are defused. If this is not possible, they are towed to tidal areas, where ignition above water level is possible during low tide. If that in turn is not possible, ignition is carried out on site using double bubble curtain and seal scarer.

For offshore windfarm construction, the sound protection concept developed for windfarm construction in the North Sea is still applied also in the Baltic Sea.

In Denmark, the Energy Agency guidelines for pile driving includes limits for exposures to noise and methods for assessment of projects. Use of noise abatement systems is de facto mandatory for pile driving. The Energy Agency also has put in place guidelines for seismic surveys with air guns, including requirements for soft starts. There are also guidelines for use of deterring sounds prior to underwater explosions. A method for assessing impact on porpoise from anthropogenic effects has been developed and is available within a report by Sveegaard et al (Signe Sveegaard et al. 2024).

Ongoing projects

In Germany, the project UWE-2, studying underwater noise effects on harbour porpoises using DTAGs, finished in 2024. The final report is being prepared, but one paper is already published (Elmegaard et al. 2023).

In Sweden, there is ongoing joint monitoring of porpoises and underwater noise in three stations, one in southern Skagerrak, one on the Northern Midsea Bank in the Baltic Proper and one in the Bothnian Sea. This is a collaboration between the Swedish Museum of Natural History (NRM), SwAM and the Swedish Defence Research Agency (FOI). Additionally, Lund University carries out a BACI study investigating the effects of reconstructed stone reefs on porpoises and prey in Öresund during 2025-2027.

In Denmark, the national underwater noise monitoring stations are continued. The SATURN project ran 2021-2025, using DTAGs to study impacts of disturbances on marine populations and the importance of animal movements and energetics. Another project, A sound marin environment, started in 2024 and monitors the noise from ships and recreational vessels in Aarhus Bay, and the effects on porpoises.

Key conclusions and recommendations

Almost all Baltic Sea countries have contributed some data to the MSFD noise registry maintained by ICES. However, for the registry to be useful in preventing exceeding thresholds, reporting needs to be done with regular and quite short time intervals.

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. This would increase awareness of impacts of underwater explosions, for example in authorities responsible for permitting procedures. This is particularly important given the increased interest in offshore wind energy development and the recent increased interest in CCS, which risks impacting the Baltic Proper harbour porpoise population, but also in more common situations like deepening and/or widening of shipping routes. EIA investigations for offshore wind and CCS should assess porpoise spatiotemporal presence in and around the area in question. At present, the only reliable method is considered to be passive acoustic monitoring.

Additionally, investigating the effects on harbour porpoises of the sometimes substantial service traffic in offshore windfarms should be included in studies on impacts of offshore wind development. Cumulative effects must be properly evaluated in all EIAs, not only relating to other similar projects, but including all threats to the population.

Lastly, the military forces of all Baltic Sea countries, as well as NATO, should be aware of the issues with underwater explosions and employ proper mitigation measures in the cases where such explosions cannot be avoided. ASCOBANS together with experts could maybe somehow provide guidance on this matter, and a continuation of the dialogue started at the Joint ACCOBAMS-ASCOBANS Workshop with Navies on Underwater Noise and Cetaceans in Toulon in November 2024 should be arranged.

Summary status assessment of progress of the implementation of the plan

***Table 12.1**. Summary of Progress in the Implementation of the WBBK Conservation Plan. For status assessment criteria see Annex I.*

	Actions from the WBBK Conservation Plan for HP	Priority		SE	DK	DE
1	**Implementation of the CP: co-ordinator and Steering Committee**	**High**				
2	**Actively seek to involve fishermen in the implementation of the plan and in mitigation measures to ensure a reduction in bycatch**	**High**		2	2	2
3	**Cooperate and inform other relevant bodies about the conservation plan**	**High**		2		
4	**Protect harbour porpoises in their key habitats by minimizing bycatch**	**High**		2	0	0
5	**Implement pinger use in fisheries causing bycatch**	**High**		2	2	1
6	**Replacement of high-risk gillnets with alternative gear**	**High**		1	1	1
7	**Estimate total annual bycatch**	**High**	Monitoring bycatch	3	2	1
			Estimate total annual bycatch	3	2	0
			Facilitate landings of bycaught harbour porpoises	2	2	2
8	**Estimate trends in abundance in the Western Baltic, the Belt Sea and Kattegat**	**High**	Population-wide surveys	3		
			Reg/nat passive acoustic monitoring	2	2	3
			Reg/nat visuals surveys and modelling	1	3	3
			Identify a survey interval for population-wide surveys	N.A.		
9	**Monitoring population health status, contaminant load and causes of mortality**	**Medium**		3	2	3
10	**Ensure non-detrimental use of pingers by examining habitat exclusion and long-term effects of pingers**	**Medium**	Research and monitoring of pinger effects	2	2	2
			Implementation of research findings	0	0	0
11	**Include monitoring & management of important prey species in national HP management plans**	**Medium**	Monitoring of prey species	0	0	0
			Ensuring availability of prey	1	0	0
12	**Restore or maintain habitat quality**	**Medium**	Monitoring of continuous noise	2	2	1
			Monitoring of impulsive noise	1	1	1
			Mitigating effects of continuous noise	1	1	1
			Mitigating effects of impulsive noise	2	3	3

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Annex I - Status assessment criteria for progress on the implementation of the actions of the WBBK Plan

1. **Implementation of the CP: co-ordinator and Steering Committee**
   Yes/No

2. **Actively seek to involve fishermen in the implementation of the plan and in mitigation measures to ensure a reduction in bycatch**
   N.A. – Not applicable
   0 – No activity
   1 – Occasional dialogue meetings for certain issues but no established groups
   2 – Dialogue/reference groups established to involve stakeholders in management of some protected areas and/or to mitigate bycatch in some of the distribution range
   3 – Dialogue/reference groups established to involve stakeholders in management of all protected areas and bycatch mitigation in the entire distribution range

3. **Cooperate with and inform other relevant bodies about the conservation plan**
   N.A. – Not applicable
   0 – No activity
   1 – Few contacts with some national governments and/or other relevant national and international bodies
   2 – Occasional contact with national governments and other relevant national and international bodies
   3 – Continuous dissemination of the plan to national governments and other relevant national and international bodies

4. **Protect harbour porpoises in their key habitats by minimising bycatch**
   N.A. – Not applicable
   0 – No activity
   1 – Bycatch mitigation measures and/or ghostnet removal underway in some harbour porpoise MPAs and other key habitats
   2 – Delegated acts in place, bycatch mitigation measures implemented and ghostnet removal completed for some harbour porpoise MPAs and other key habitats
   3 – National regulation, management plans or delegated acts in place, measures on bycatch mitigation implemented and ghostnet removal carried out in all harbour porpoise MPAs and other key habitats

5. **Implement pinger use in fisheries causing bycatch**
   N.A. – Not applicable
   0 – No activity
   1 – Research projects on pinger use underway
   2 – Pinger use in some high-risk fisheries, implementation and functionality of pingers controlled regularly

3 – Pinger use mandatory in all high-risk fisheries, implementation and functionality of pingers controlled regularly

6. **Replacement of high-risk gillnets with alternative gear**

N.A. – Not applicable
0 – No activity
1 – Research projects on development of alternative gear without bycatch underway
2 – Alternative gear without bycatch are available but not implemented in all active static net fisheries
3 – Use of alternative gear without bycatch implemented large-scale in all active static net fisheries

7. **Estimate total annual bycatch**

Monitoring bycatch

N.A. – Not applicable
0 – No activity
1 – Some assessment of bycatch rates (e.g. questionnaire surveys, sample surveys, logbooks) (under Reg. 2019/1241 or equivalent)
2 – Bycatch monitoring of some fisheries known to cause harbour porpoise bycatch (under Reg. 2019/1241 or equivalent) resulting in an estimate of bycatch rates
3 – Bycatch monitoring in all fisheries known to cause harbour porpoise bycatch (under Reg. 2019/1241 or equivalent) resulting in a robust estimate of bycatch rates

Estimate total annual bycatch

N.A. – Not applicable
0 – No estimates available
1 – Estimate of bycatch available from research project, for some of the fisheries known to cause harbour porpoise bycatch
2 – Estimate of bycatch available for >50% of the fisheries known to cause harbour porpoise bycatch
3 – Robust estimate of bycatch available for all fisheries known to cause harbour porpoise bycatch

Facilitate landing of bycaught harbour porpoises

0 – National and EU legislation does not allow landing of bycaught harbour porpoises
1 – National and EU legislation does not allow landing of bycaught harbour porpoises but there can be derogations from these rules
2 – National or EU legislation allow landing of bycaught harbour porpoises
3 – National and EU legislation allow landing of bycaught harbour porpoises

8. **Estimate trends in abundance in the western Baltic, the Belt Sea and Kattegat**

Population-wide (including modelling)

N.A. – Not applicable

0 – No activity
1 – Surveys carried out every 10-12 years, results with wide confidence intervals of CV>0.4, distribution maps showing probability of detection
2 – Surveys carried out every 10-12 years, more narrow confidence intervals of abundance estimates with CV>0.2 to 0.4, maps of harbour porpoise density
3 – Surveys carried out every 6 years, even more narrow confident intervals of abundance estimates with CV of ≤0.2, maps of harbour porpoise density

Regional/national passive acoustic monitoring
N.A. – Not applicable
0 – No activity
1 – Some monitoring going on, at local/national scale, not continuously, covering important areas for harbour porpoises where possible (see HELCOM indicator work)
2 – Continuous (year round) monitoring for at least two years every six years covering important areas for harbour porpoises where possible
3 – Continuous (year round) monitoring for the entire six-year cycle, covering important areas for harbour porpoises where possible

Regional/national visual surveys and modelling
N.A. – Not applicable
0 – No activity
1 – Visual surveys taking place irregularly, no density modelling carried out
2 – Visual surveys and density modelling carried out at least every ten years
3 – Visual surveys and density modelling carried out at least every six years

Identify a survey interval based on power analysis in relation to effort and statistical uncertainty, for population-wide surveys
0 – No survey interval identified
3 – Optimal survey interval identified

9. **Monitor population health status, contaminant load and causes of mortality**
   N.A. – Not applicable
   0 – No activity, no plan or guidance on how to act in case of a stranding
   1 – Samples collected from some carcasses from within the distribution range of the Belt Sea population, no analysis carried out
   2 – Some analysis and assessments completed on certain organs or tissues, and/or some necropsies carried out
   3 – Full necropsies (according to ASCOBANS protocol) conducted for 20 carcasses per year in good enough condition, and samples analysed for health indicators, e.g. contaminant levels and life history parameters. Regular (at least every 6 years) assessments of results

10. **Ensure non-detrimental use of pingers by examining habitat exclusion and long-term effects of pingers**
    Research and monitoring of pinger effects

N.A. – Not applicable
0 – No activity
1 – Research projects underway on effects of pingers, such as habitat exclusion or habituation
2 – Some results available, but not conclusive, on effects of pingers, such as habitat exclusion and habituation
3 – Reliable results available on effects of pingers, such as habitat exclusion and habituation

Implementation of research findings
N.A. – Not applicable
0 – No activity
1 – Some relevant findings have resulted in adapted implementation of pinger use in some areas
2 – Some relevant findings have resulted in adapted implementation of pinger use in all relevant areas, or all relevant findings have resulted in adapted implementation of pinger use in some areas
3 – All relevant findings have resulted in adapted implementation of pinger use in all relevant areas

11. Include monitoring and management of important prey species in national harbour porpoise management plans

Monitoring of prey species
N.A. – Not applicable
0 – No activity
1 – Studies undertaken on what species are important to harbour porpoises, and the presence of those species in some important harbour porpoise areas
2 – Some results available on the most important prey species for the Belt Sea harbour porpoise population, also non-commercial species and for harbour porpoises relevant sizes of commercial species, and the biology and distribution of those species
3 – Knowledge available on the most important prey species for the Belt Sea harbour porpoise population, also non-commercial species and for harbour porpoises relevant sizes of commercial species, and the biology and distribution of those species

Ensuring availability of prey
N.A. – Not applicable
0 – No activity
1 – Measures taken to ensure availability of some harbour porpoise prey species, also non-commercial and for harbour porpoises relevant sizes of commercial species, within some harbour porpoise MPAs
2 – Measures taken to ensure availability of harbour porpoise prey species, also non-commercial and for harbour porpoises relevant sizes of commercial species, within harbour porpoise MPAs

3 – Sustainable management of all known harbour porpoise prey species, also non-commercial and for harbour porpoises relevant sizes of commercial species, in the entire range of the Belt Sea harbour porpoise population

12. Restore or maintain habitat quality

Monitoring of continuous noise (e.g. shipping)
N.A. – Not applicable
0 – No activity
1 – Research projects in place to improve knowledge on impacts on harbour porpoises from continuous noise OR monitoring of continuous underwater noise and the impact on harbour porpoises in the area, is implemented to some extent
2 – Research projects in place to improve knowledge on impacts on harbour porpoises from continuous noise AND monitoring of continuous underwater noise and the impact on harbour porpoises in the area, is implemented to some extent
3 – Monitoring of continuous underwater noise and the impact on harbour porpoises in the area, is implemented in the harbour porpoise distribution range.

Monitoring of impulsive noise (e.g. seismic, sonar, explosions, piling)
N.A. – Not applicable
0 – No activity
1 – Research projects in place to improve knowledge on impacts on harbour porpoises from impulsive noise OR monitoring of impulsive underwater noise and the impact on harbour porpoises, are implemented to some extent
2 – Research projects in place to improve knowledge on impacts on harbour porpoises from impulsive noise AND monitoring of impulsive underwater noise and the impact on harbour porpoises, are implemented to some extent
3 – Monitoring of continuous underwater noise and the impact on harbour porpoises, are implemented in the harbour porpoise distribution range.

Mitigating effects of continuous noise (e.g. shipping)
N.A. – Not applicable
0 – No activity
1 – Mitigation measures to reduce continuous noise (e.g. quieting technologies, speed restrictions, re-routing vessels) under development or being tested
2 – Mitigation measures to reduce continuous noise (e.g. quieting technologies, speed restrictions, re-routing vessels) in place to some extent
3 – Mitigation measures to reduce continuous noise (e.g. quieting technologies, speed restrictions, re-routing vessels) routinely in place

Mitigating effects of impulsive noise (e.g. seismic, sonar, explosions, piling)
N.A. – Not applicable
0 – No activity

1 – Mitigation measures to reduce impulsive noise (e.g. soft starts, bubble curtains, insulation casings) under development or being tested, available mitigation methods used to some extent
2 – Mitigation measures to reduce impulsive noise (e.g. soft starts, bubble curtains, insulation casings) in place to some extent
3 – Mitigation measures to reduce impulsive noise (e.g. soft starts, bubble curtains, insulation casings) routinely in place

Annex II - Natura 2000 sites in the WBBK area

SITECODE	SITENAME	POPULATION
SE0430183	Havet kring Ven	A
DK008X190	Centrale Storebælt og Vresen (Vresen)	B
DK00VA254	Flensborg Fjord, Bredgrund og farvandet omkring Als (Bredgrund)	B
SE0430092	Kullaberg	B
SE0510050	Balgö	B
SE0510186	Stora Middelgrund och Röde bank	B
DE1123393	Küstenbereiche Flensburger Förde von Flensburg bis Geltinger Birk	C
DE1332301	Fehmarnbelt	C
DE1339301	Kadetrinne	C
DE1343301	Plantagenetgrund	C
DE1345301	Erweiterung Libben, Steilküste und Blockgründe Wittow und Arkona	C
DE1423394	Schlei incl. Schleimünde und vorgelagerter Flachgründe	C
DE1526391	Südküste der Eckernförder Bucht und vorgelagerte Flachgründe	C
DE1528391	Küstenlandschaft Bottsand - Marzkamp u. vorgelagerte Flachgründe	C
DE1533301	Staberhuk	C
DE1540302	Darßer Schwelle	C
DE1541301	Darß	C
DE1544302	Westrügensche Boddenlandschaft mit Hiddensee	C
DE1631392	Meeresgebiet der östlichen Kieler Bucht	C
DE1632392	Küstenlandschaft vor Großenbrode und vorgelagerte Meeresbereiche	C
DE1733301	Sagas-Bank	C
DE1934303	Erweiterung Wismarbucht	C
DK005X276	Røsnæs, Røsnæs Rev og Kalundborg Fjord	C
DK008X047	Lillebælt	C
DK008X183	Fyns Hoved, Lillegrund og Lillestrand	C
DK008X184	Æbelø, havet syd for og Nærå	C
DK008X185	Havet mellem Romsø og Hindsholm samt Romsø	C
DK008X198	Maden på Helnæs og havet vest for	C
DK00DX146	Anholt og havet nord for	C
DK00VA171	Gilleleje Flak og Tragten	C
DK00VA250	Store Middelgrund	C
DK00VA260	Femern Bælt	C
SE0420360	Nordvästra Skånes havsområde	C
SE0430187	Sydvästskånes utsjövatten	C
SE0510048	Västra Getterön	C
SE0510126	Lilla Middelgrund	C
SE0510127	Fladen	C
SE0520001	Vrångöskärgården	C
DE1346301	Steilküste und Blockgründe Wittow	D
DE1934302	Wismarbucht	D
DE2031301	Küste Klützer Winkel und Ufer von Dassower See und Trave	D

DK002X110	Saltholm og omliggende hav	D
DK005Y229	Skælskør Fjord og havet og kysten mellem Agersø og Glænø	D
DK006X233	Havet og kysten mellem Præstø Fjord og Grønsund	D
DK006X238	Smålandsfarvandet nord for Lolland, Guldborg Sund, Bøtø Nor, Hyllekrog-Rødsand	D
DK006X242	Nakskov Fjord	D
DK00DX151	Begtrup Vig og kystområder ved Helgenæs	D
DK00DY156	Horsens Fjord, havet øst for og Endelave	D
DK00FX122	Ålborg Bugt, Randers Fjord og Mariager Fjord	D
DK00VA170	Mejl Flak	D
DK00VA305	Stevns Rev	D