

National Progress Report for Sweden



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13-14 March 2024

Increase involvement, awareness and cooperation



What has been done in terms of raising public awareness, by authorities, NGOs and other organisations?

- NRM press release on IUCN red list assessment Baltic Proper population, and publication on Belt Sea population trend and mortality limit.
- SwAM, NRM, SVA, LU, SLU, County Administrative Boards (CABs) completed several interviews for TV, newspapers, radio.
- CAB Gotland: three campaigns to raise public awareness on the Baltic Proper porpoise.
- CAB Stockholm: Published a web page with harbour porpoise information.

Increase involvement, awareness and cooperation



What has been done to engage stakeholders in dialogue?

- SwAM has continuous dialogue meetings with different fisheries.
- SLU many meetings with fisherman in relation to research projects and monitoring projects
- SwAM held conversations with the navy to discuss PAM data security.
- CABs collaborate on public awareness actions

What has been done to increase cooperation between authorities and stakeholders (incl. fishers)? Have any reference groups or similar been established?

- No

Monitor and estimate abundance and distribution



Are there any new results from national monitoring programmes or large-scale surveys?

- SCANS IV completed summer 2022- lowest abundance estimate to date for the Belt Sea population (14,403 animals (95% CI = 9,555-21,769).
- Passive acoustic monitoring of the Belt Sea and Baltic Proper populations:
 - Belt Sea stations taken up during 2023 to ensure equipment is available to SAMBAH II
 - Power analysis currently being completed to determine future plan for stations (published by end of 2024) (NRM, SwAM)
- SAMBAH II (coordinated by NRM) has begun with harmonised monitoring planned between July 2024 and June 2025. Kylie Owen to present more later.
- Swedish regional monitoring program (County Administrative Boards/SwAM/NRM) now allowed to deploy FPODs (with a frequency filter) in the Baltic, but now have a resources issue.

Monitor and estimate abundance and distribution



Other work

- Publication on trend in abundance and mortality limit for the Belt Sea population. Julia Carlström to present more later.
- Sweden led work to update of the IUCN redlist assessment of the Baltic Proper harbour porpoise.
- NRM assisted PL and DE with B8 of Baltic Sea Action Plan- now under review for publication as two companion articles
 - Review of current knowledge on the Critically Endangered Baltic Proper harbour porpoise population
 - Knowledge gaps on the impact of threats, and future recommendations for protecting the Critically Endangered Baltic Proper harbour porpoise population

Monitor and estimate abundance and distribution



What is being planned for the near future?

- Postdoc (Magie Aiken) investigating historic population size of BP population using genetics, and their capacity for recovery given management scenarios (NRM)- starting June 2024.
 - Sequence entire genome of ~10 animals pre-1950.
- CABs Gotland and Kalmar plan to complete an additional towed acoustic survey in Natura 2000 site Hoburgs bank och Midsjöbankarna.
- FORMAS-project 2024-2026 mapping spatiotemporal distribution in Skåne (LU, NRM, AU?)

Monitor and mitigate impact of underwater noise



What projects or research or monitoring is in place to monitor underwater noise and its impact on harbour porpoises? Are there any results to present?

- Joint monitoring of HP and underwater noise: N Midsea Bank (Baltic) and Hönö (S Skagerrak), and off Sundsvall (Bothnian Sea) (FOI, NRM, SwAM).
- Extension and validation of DEPONS model of HP reactions to ship noise, as part of SATURN project (SE collaborators: FOI, NRM)

Are there any measures in place or planned to mitigate the impact of underwater noise?

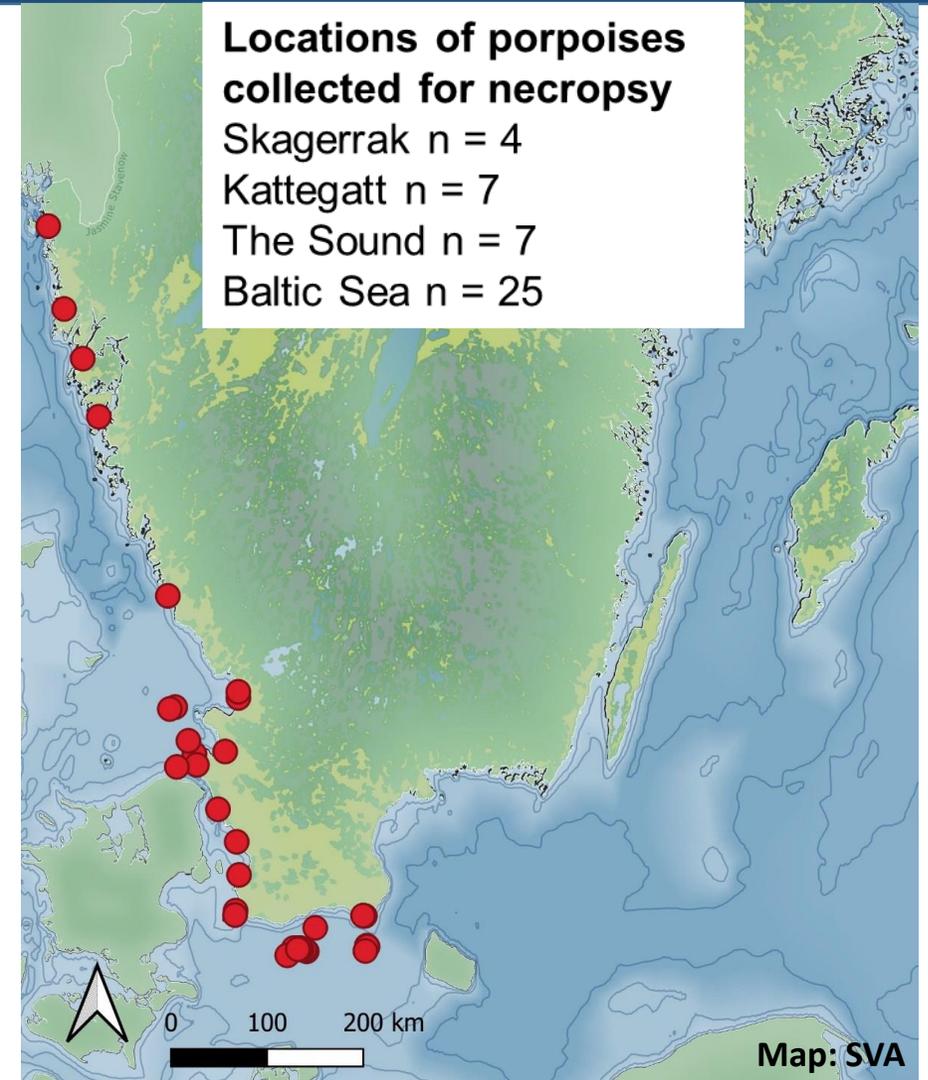
- CAB Kalmar denied OWF Victoria at Southern Midsea Bank, has now been appealed by RWE Offshore.
- SAMBAH II searching for “umbrella project” funding to fund the production of noise impact maps for the BP population.

Monitor and assess population health status



What is the status of collection of animals found dead, (approximately) how many animals have been sampled and necropsied?

- 109 individual porpoises were reported stranded in 2023 (Ulfsson et al, 2024)
- In 2023, a total of 43 porpoises were examined by necropsy
 - 15 were found stranded
 - 28 were bycaught (submitted by fishermen)
- 25 porpoises (22 bycaught, 3 stranded) were collected from the Baltic Sea (east of Falsterbo)



Monitor and assess population health status



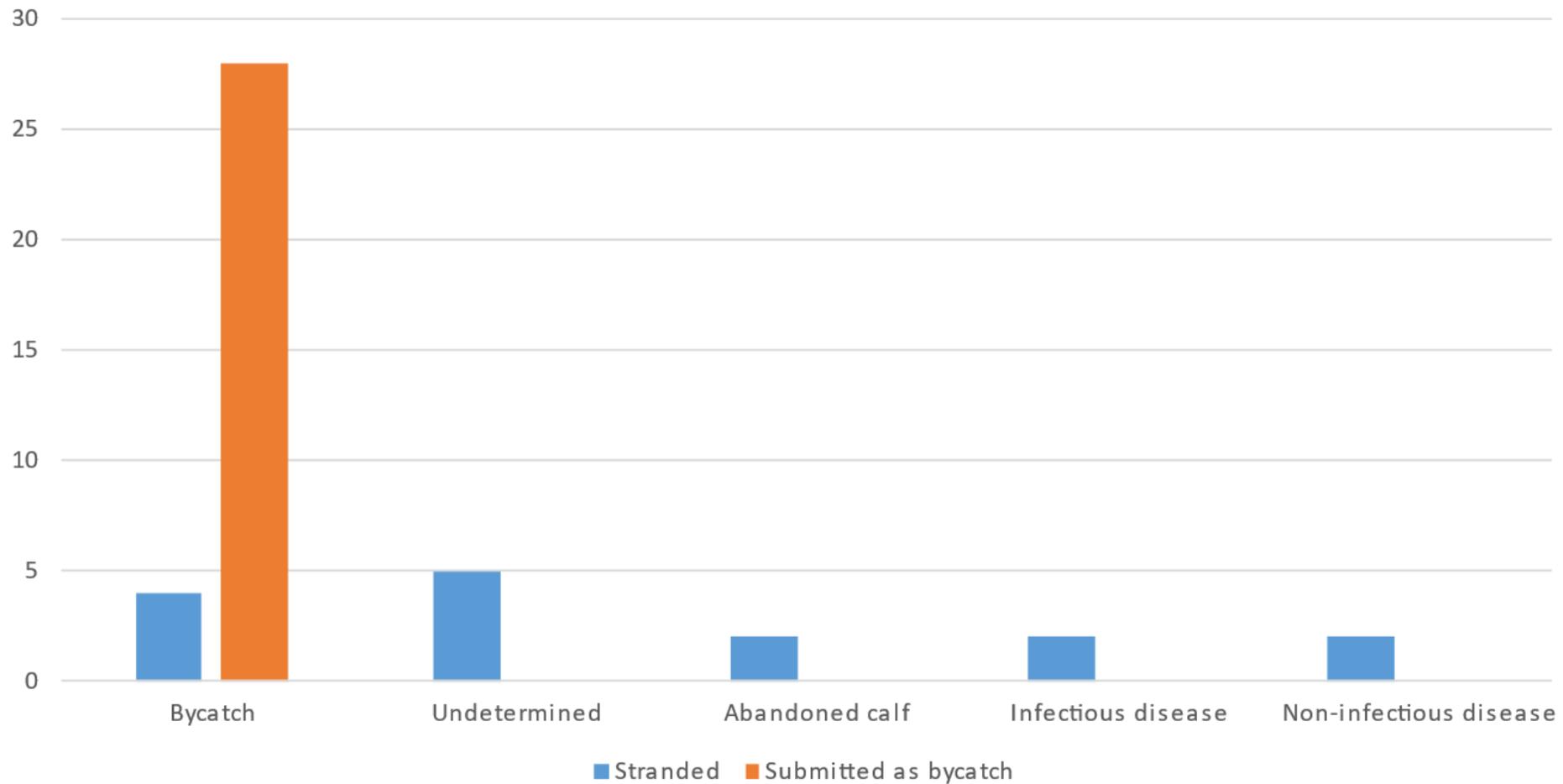
Porpoises examined by necropsy:

- 20 females, 23 males
 - 10 adults, 14 juveniles and 19 calves
 - 3 of the 6 adult females were either pregnant, lactating or both.
- SVA together with NRM determine cause of death and health status, nutritional condition, reproductive status, genetics, age and other life history parameters, and collaborate with researchers at LU and GU to investigate diet

Monitor and assess population health status



Causes of death in Harbour porpoises examined at SVA 2023



Monitor and assess population health status



- In addition to the 28 animals submitted by fishermen, stranding data contributed information on incidental bycatch (SVA)
 - In 2023, 4 of the 15 stranded animals were diagnosed as bycaught
- **Bycaught animals**, including those submitted by fishermen, continue to show other **significant health findings** including **skin lesions** and **pneumonia**. These animals help us follow general health trends in the population



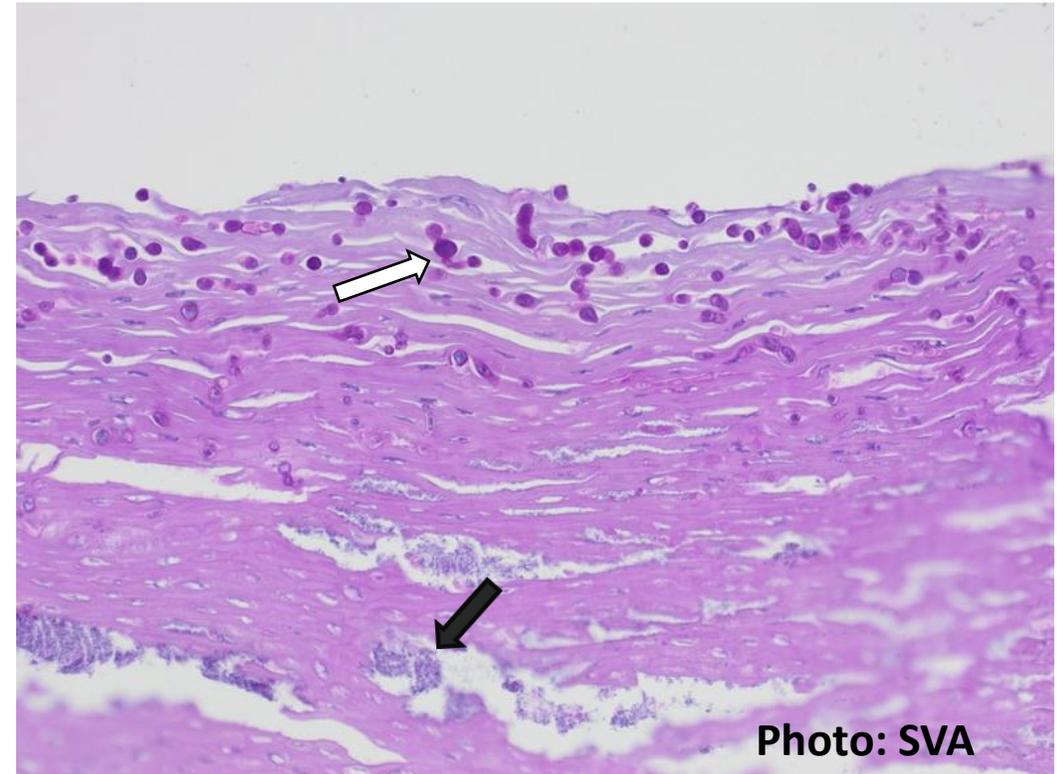
Photo SVA

Bycaught harbour porpoise from 2023 with skin lesions

Monitor and assess population health status



- Skin infections are frequently seen and may serve as indicators of overall health status. Further characterization is on-going.
- Two of the four stranded adult female porpoises died from calving complications. Such cases have also been seen previously and further investigation is on-going



Skin infection with fungi (white arrow) and bacteria (black arrow)

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Monitor and assess population health status



Other work

- MSc thesis (Sara Bollina, LU) published on microplastics in harbor porpoise intestines and lungs, using optical photothermal infrared (LU, NRM)
 - Significantly higher amount of microplastics in males than females
 - Significantly higher amount of microplastics in intestines than lungs
 - Also analysis of mtDNA, showing presence of two haplotypes in the Baltic Sea
- Ongoing diet study (LU, NRM and SVA):
 - Stranded and bycaught porpoises in Sweden between 2006-2023.
 - Analysed using three methods:
 - Traditional macroscopic analysis of gastrointestinal content,
 - Stable isotope analysis of teeth, ribs and muscle, and
 - eDNA-analysis.
 - New FORMAS project 2024-2026: diet and health status over time (LU, NRM, SVA)
- Sweden is involved in the indicator work on the reproductive status and nutritional status of marine mammals within HELCOM and OSPAR (NRM).

Investigate habitat use and protect important areas



Are there any projects or other research ongoing on porpoise distribution or habitat use? Any “new” important areas identified?

New projects

- eDNA sampling (financed by WWF) as a side-project to SAMBAH II: To produce maps of relative prey availability for the Baltic Proper in summer and winter to investigate porpoise habitat quality (NRM)
- Two drone studies at Kullaberg during 2024: Mother-calf presence and distribution + effects from recreational boat traffic on porpoise distribution and behaviour (LU, CAB Skåne)
- FORMAS project 2024-2026: environmental drivers of spatiotemporal distribution and habitat use in Skåne (LU, NRM, AU?)

Ongoing projects

- Drone study of foraging techniques, plan to publish 2014 (LU, SDU)
- Drone inventory: spatiotemporal distribution of porpoises within a high density area studied using standardized drone transects (LU)

Investigate habitat use and protect important areas



Are there any projects or other research ongoing on porpoise distribution or habitat use? Any “new” important areas identified?

Completed projects

- Hydroacoustic sailing drone survey of prey in N2000 Hoburgs bank and Midsjöbankarna (CAB Gotland)
- MSc (Hedda Kjell Dahl) investigated overlap between bycatch risk and location of Natura 2000 sites in Skåne (SU, NRM)- plans to publish in 2024

New publications

- Acoustic study showing micro-scale preferences and temporal cyclicity linked to foraging in harbour porpoises (Stedt et al., 2023; LU, NRM, SDU).
- Investigation of spatiotemporal patterns of strandings in Swedish waters (Ulfsson et al., In press; SVA, NRM).

Investigate habitat use and protect important areas



Are there any new protected areas designated for harbour porpoises?

- No

Any conservation measures and/or management plans in place for existing areas?

- Yes, management and conservation plans in place for several areas

Monitor, estimate and reduce bycatch



What is being done in terms of bycatch monitoring?

2017-2019 Pilot project, observerprogram in South baltic, the sound and Kattegatt,

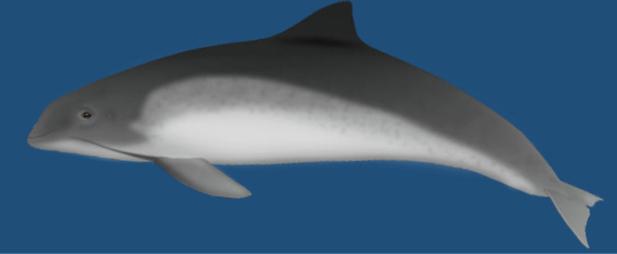
2020-2021 Pilot project MEM Mobile Electronic Monitoring, 490 monitored days

- Development of a Camera system
- Mandatory for fishermen to report bycatch in log books since Feb 2021

2022-2023 MEM and Observers in gillnet fisheries in Skagerrak (2022), Kattegatt, the Sound and Baltic

- Development of a machine learning program to facilitate video analysis of bycatch data
- Commitment in ICES WGBYC, WKRARE, WK Petsamp 1 & 2
- Development of ICES RDBES
- 2023 Bycatch monitoring with observers and cameras
 - 20 fishing vessels with cameras/MEM systems
 - 400 MEM days
 - 135 Observer days

Monitor, estimate and reduce bycatch



- What is being done in terms of bycatch monitoring?

2023 Bycatch program continued, monitoring with observers and cameras.

Distributed over defined risk areas* : Green, orange, yellow, red, blue.

Sampling design (risk) areas

Green, low risk area

Orange, low risk area

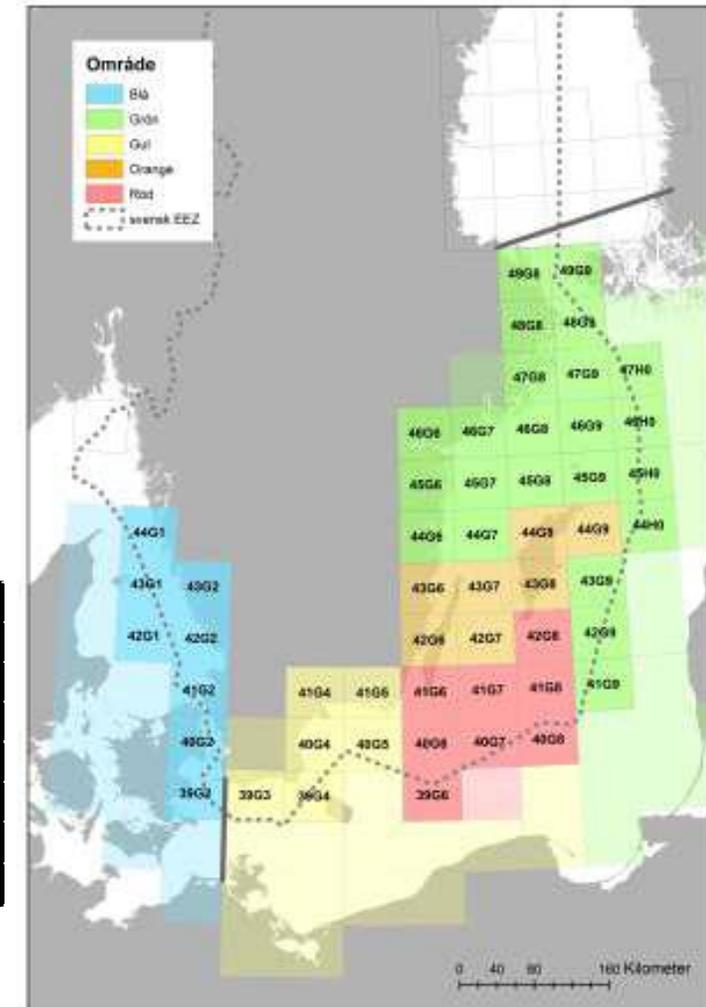
Yellow, medium risk area

Red, high risk

Blue area - Belt pop area

2023	Fishing DaS				Monitoring DaS Observer				Monitoring DaS EM				Coverage
Risk area	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Year
Blue	288	490,5	522	302	12	15	9	6	0	90	106	46	17,7%
Green	168	730	878	426	1	12	10	5	0	0	3	1	1,5%
Yellow	109	566,2	730	200	3	13	20	5	1	29	37	6	7,1%
Orange	18	187	410	39	0	8	9	1	0	0	30	1	7,5%
Röd	18	64,8	85	22	0	0	3	0	0	14	36	0	27,9%
Total	601	2038,5	2625	989	16	48	51	17	1	133	212	54	8,5%

Total numbers of monitored days shown on previous slide.



*Risk areas are based on porpoise density from SAMBAH and Natura 2000 areas where h.p. is included for conservation.

Monitor, estimate and reduce bycatch



Have any bycatch estimates been calculated for either population, nationally or in ICES or any other forums?

- Estimation of bycatch of porpoises in SWE and DK fisheries, DTU with SLU involvement, reported at North Sea meeting 2023
- WGBYC 2023 developed a method to estimate bycatch (the BEAM model), but h.p. data were missing needed criteria to enable approved estimates

Monitor, estimate and reduce bycatch



Have any bycatch estimates been calculated for either population, nationally or in ICES or any other forums?

Bycatch thresholds

- Work within HELCOM HOLAS III:
 - Developed a bycatch threshold (73 animals) for the Belt Sea population using a modified PBR approach (NRM, AU, TiHO, Univ-Ir)
 - 0 for the Baltic Proper population
 - Both populations in bad status
- Publication on mortality limit (and bycatch estimate) for the Belt Sea population (DTU Aqua, SLU).
- Publication on mortality limit (and trend in abundance) for the Belt Sea population. Julia Carlström to present more later.

Monitor, estimate and reduce bycatch



What measures are in place to reduce bycatch?

- Voluntary use of pingers
- EFF funding available for pingers made available for fisheries
- EFF funding available for selective gears
- Fisheries banned in protected areas in the Baltic Sea - new EU regulations already in Swedish legislation
- Significant reduce in gillnet effort since EU cod fishery ban
- Pingers to be used within Natura 2000 areas

Monitor, estimate and reduce bycatch



Any ongoing projects and trials of alternative gear? Any results on alternative gear effectiveness etc. to present?

- Evaluation of effectiveness of Pingers (Future Ocean and Fishtek Marine) in a commercial fishery (starting soon)
- Evaluation of harbour porpoise presence around a pinger developed by Fishtek Marine
- Participating in CIBBRINA
- Developing alternative gears for catching flatfish (flounder, plaice and turbot)
- Ongoing gear development
- Life project developing new acoustic technique recording harbour porpoise clicks

Relevant links/citations



- Kindt-Larsen, L., Glemarec, G., Berg, C.W., Königson, S., Kroner, A.-M., Sjøgaard, M., Lusseau, D., 2023. Knowing the fishery to know the bycatch: bias-corrected estimates of harbour porpoise bycatch in gillnet fisheries. *Proc. R. Soc. B Biol. Sci.* 290, 20222570. <https://doi.org/10.1098/rspb.2022.2570>
- Owen, K., Gilles, A., Authier, M., Carlström, J., Genu, M., Kyhn, L.A., Nachtsheim, D.A., Ramírez-Martínez, N.C., Siebert, U., Sköld, M., Teilmann, J., Unger, B., Sveegaard, S., 2024. A negative trend in abundance and an exceeded mortality limit call for conservation action for the Vulnerable Belt Sea harbour porpoise population. *Front. Mar. Sci.* 11. <https://doi.org/10.3389/fmars.2024.1289808>
- Stedt, J., Wahlberg, M., Carlström, J., Nilsson, P., Amundin, M., Oskolkov, N., Carlsson, P., 2023. Micro-scale spatial preference and temporal cyclicity linked to foraging in harbour porpoises. *Mar. Ecol. Prog. Ser.* 708, 143–161. <https://doi.org/10.3354/meps14268>.
- Ulfsson, V. et al., In press. Investigation of spatiotemporal patterns of Harbour Porpoise (*Phocoena phocoena*) strandings in Swedish waters for improved monitoring and management. *Oceans, Special Issue: Marine Mammals in a Changing World, 2nd Edition.*

Relevant links/citations



- Current knowledge and knowledge gaps on threats to the Critically Endangered (CR) Baltic Proper harbour porpoise population (Action B8 under the Baltic Sea Action Plan (<https://helcom.fi/wp-content/uploads/2023/12/Current-knowledge-and-knowledge-gaps-on-threats-to-the-Critically-Endangered-Baltic-Proper-harbour-porpoise-population-Action-B8-BSAP.pdf>))
- IUCN red list Baltic Proper harbour porpoise (<https://www.iucnredlist.org/species/17031/50370773>)
- SCANS IV report (<https://www.tiho-hannover.de/en/clinics-institutes/institutes/institute-of-terrestrial-and-aquatic-wildlife-research-itaw/scans-iv-survey>)