

# Monitoring and management of marine mammals in Swedish waters

Karl Norling

Susanne Viker



[karl.norling@havochovatten.se](mailto:karl.norling@havochovatten.se)

[susanne.viker@havochovatten.se](mailto:susanne.viker@havochovatten.se)

Swedish Agency  
for Marine and  
Water Management

# **Swedish Agency for Marine and Water Management**

**Implement a coherent maritime and water policy**

**Work with conservation, restoration and sustainable use of lakes, streams and seas**



## Harbour porpoise (*Phocoena phocoena*)

- one of the smallest toothed whales
- three subspecies of harbour porpoise  
(Black Sea, North Atlantic, North Pacific)
- three subspecies of harbour porpoise

# Harbour porpoise populations in Sweden



The Baltic Proper population is classified as Critically Endangered by IUCN

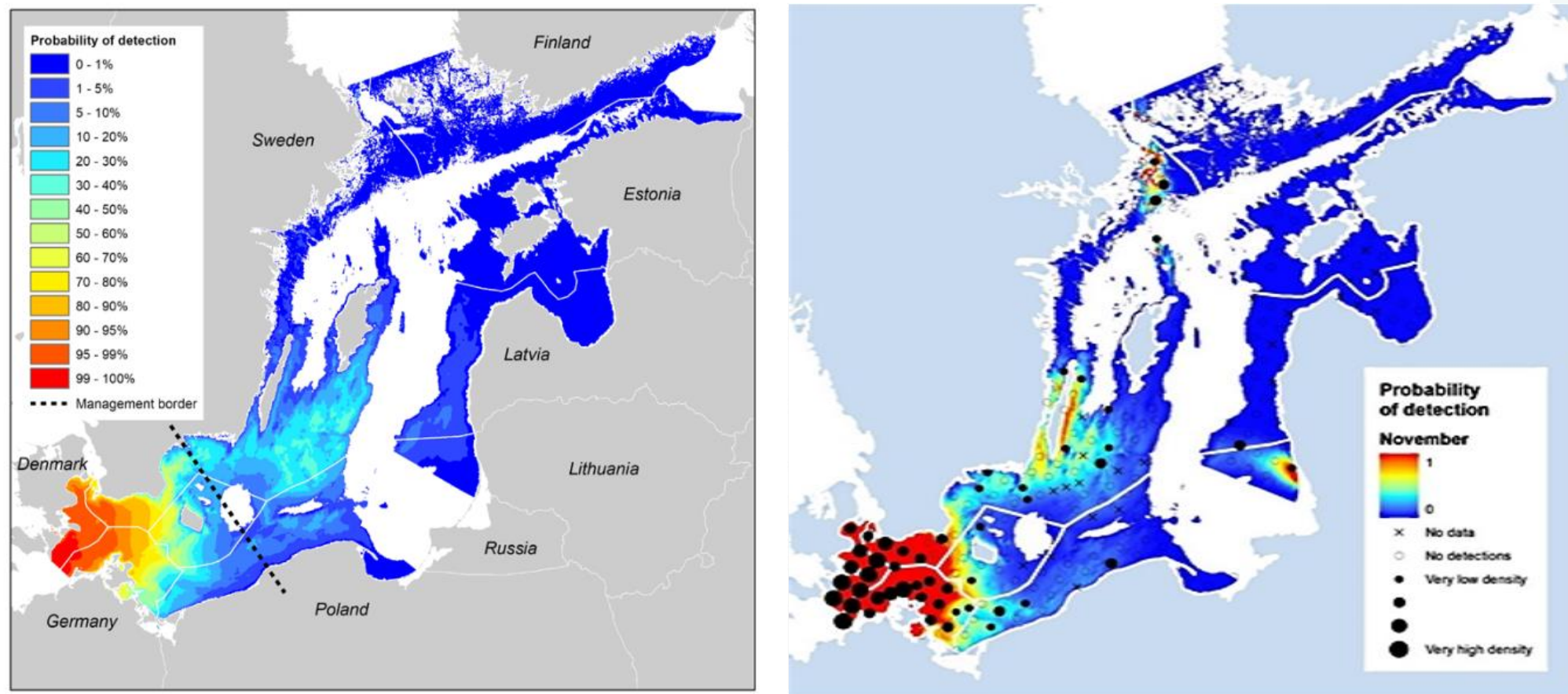
Threats include

- bycatch in passive net fisheries,
- persistent environmental pollutants,
- prey depletion
- disturbance by underwater noise.

Förvaltnings-område	År	Antal tumlare	CV	95 % konfidens-intervall	Täthet (tumlare/ km <sup>2</sup> )	Referens
Nordsjö-populationen	2016	345 373	0,18	246 526–495 752	0,52	(Hammond et al., 2017)
Bälthavs-populationen	2016	42 324	0,30	23 368–76 658	1,04	(Hammond et al., 2017)
Östersjö-populationen	2011–2013	497	0,66	80–1 091	0,033	(Sambah, 2016)

Map of the approximate distribution ranges of harbour porpoise populations in the Baltic Sea Region.

# SAMBAH project results



Maps show predicted probability of detection for May – October (left) and Nov April (right), with the proposed summer management border in the summer map

# Monitoring of marine mammals

# Strategy for aquatic and marine monitoring

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Identify knowledge

Responsibility

Coordinated,  
adaptive,  
risk-based  
monitoring

Methodology  
cost effective

Collection,  
handling,  
digitalisation



# Background

- » Marine mammal monitoring programs are performed by several authorities and
  - The Swedish Museum of Natural History, NRM
  - The Swedish University of Agricultural Sciences, SLU
  - The National Veterinary Institute, SVA
  - County administrative boards, Lst
  
- » Monitoring marine mammal numbers, distribution and population trends (NRM + Lst)
  
- » Health and disease monitoring of marine mammals generate important information used in indicators for assessing the condition of our coastal and marine areas (NRM +SVA)
  
- » Effects of human activities that cause bycatch (SLU), noise, physical impact, environmental pollution, weak fish stocks and, in the long term, the impact of climate change on ecosystems and marine mammals (NRM & SVA) are evaluated within the Marine Strategy Framework Directive

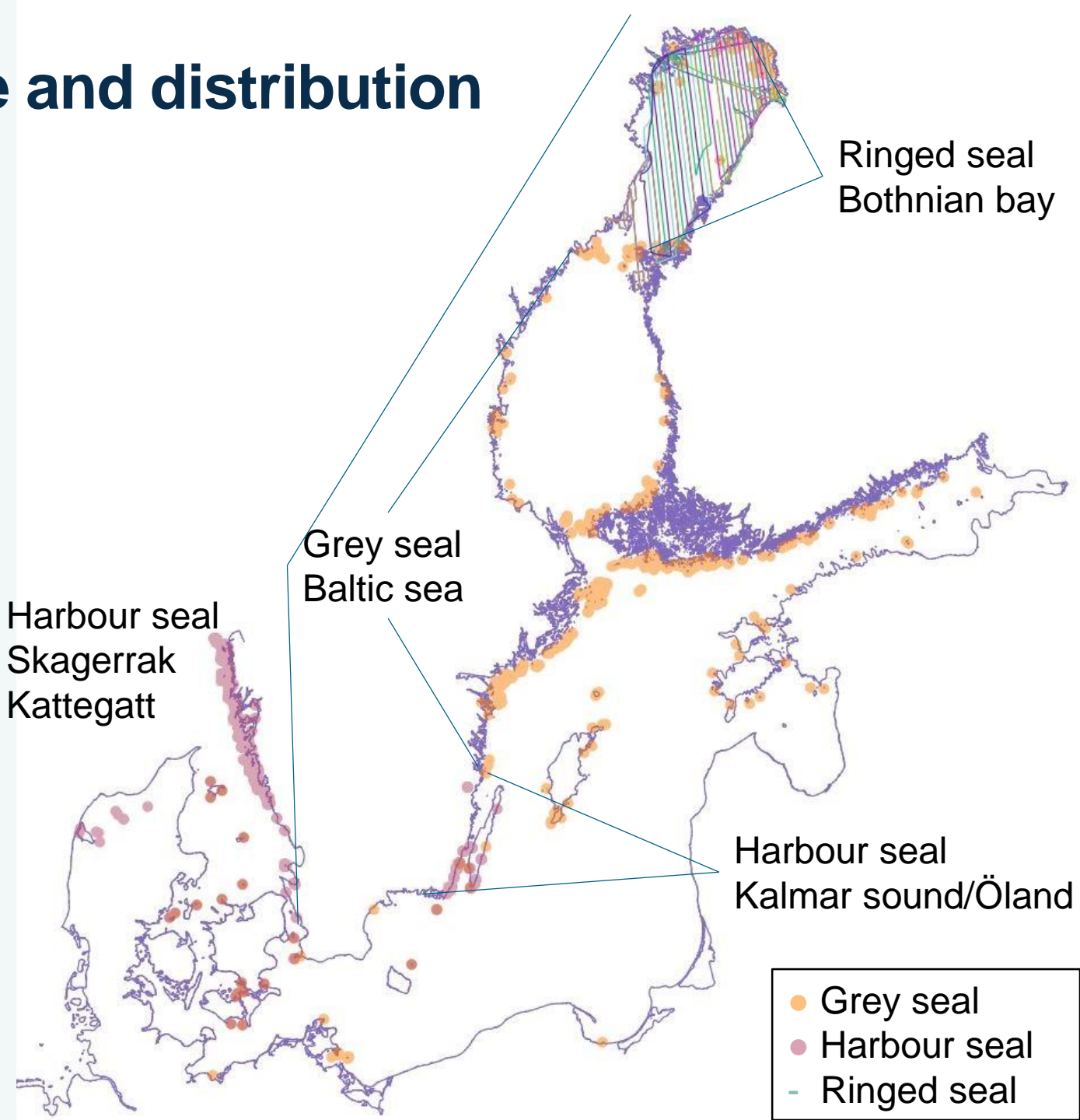


# Marine mammal monitoring aims & objectives

- » SwAM use marine monitoring data to follow several nationally and internationally set goals in the environmental area regarding the state of our coastal and marine areas.
- » Reliable measures of abundance and distribution are needed, as well as analyzes of population trends affected by reproduction, mortality and migration.
- » Health and possible diseases in seals and porpoises are needed to monitor effects of increased mortality due to bycatch in fishing, hunting, environmental toxins and diseases.
- » Changes over time in population numbers, distribution and reproduction together with individual diet, burrows, health, reproduction and disease can also indicate changes in the food web and food availability of marine mammals in different areas to support ecosystem-based management,
- » Management plans for grey seal, harbour seal and ringed seals.
- » Action program for harbour porpoises

# Seal monitoring - abundance and distribution

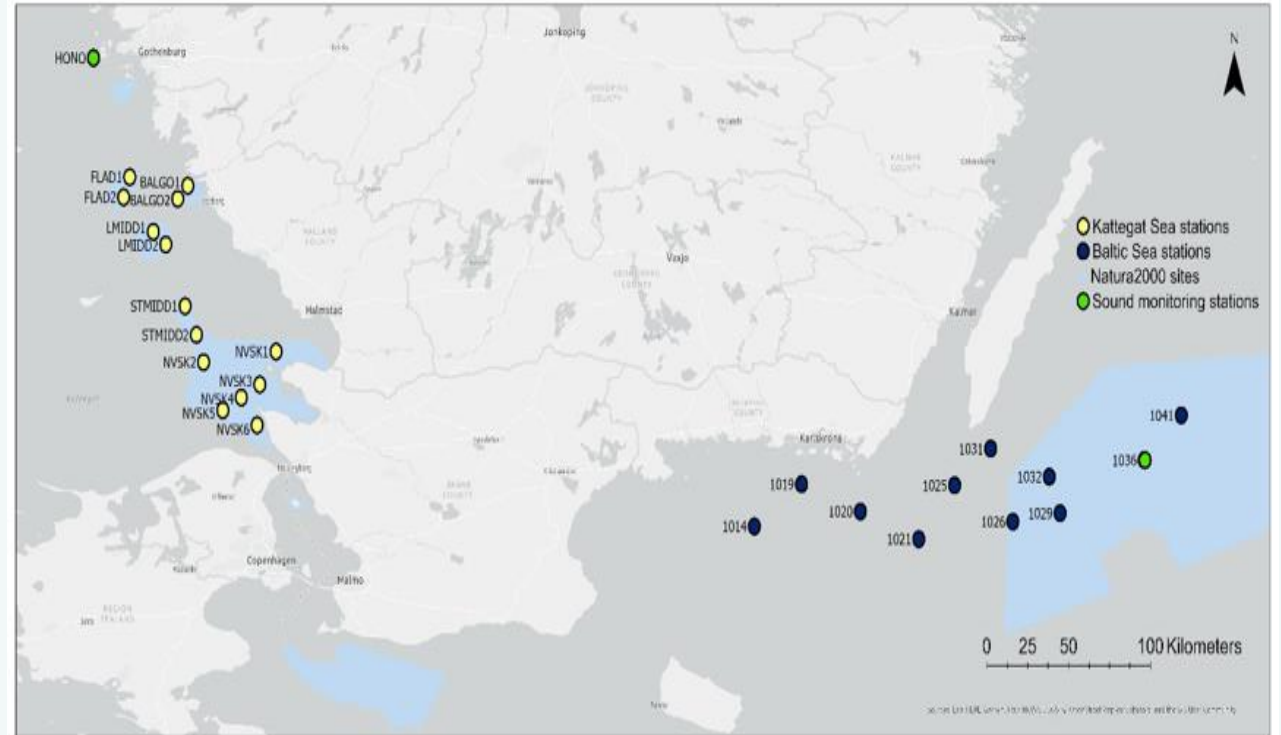
- » Grey seal cub counts in March
  - » Helicopter in the core area
- » Grey seal moulting period in May-June
  - » Helicopter in the core area (3 d)
  - » Swedish Coastguard aeroplane
  - » Land/boat based counts
- » Harbour seal seal cub counts in June
  - » Fixed wing aeroplane
- » Harbour seal moulting in August
  - » Fixed wing aeroplane (3 d)
- » Ringed seal in April
  - » Fixed wing aeroplane (13% of ice extent)



# Harbour porpoise - abundance and distribution

## North sea population

- » Acoustic monitoring
  - SAMBAH (2011-2013)
  - CPOD in Baltic sea (start 2017)
  - CPOD in Kattegatt (start 2019)
- » Coordinated surveys by airplane
  - SCANS 1994, 2005, 2016, 2022
  - Mini SCANS – 2012 och 2020



## Belt sea population

## Baltic sea population

# Health and disease monitoring of marine mammals

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Harbour porpoise waiting for examination.  
Photo: Anna Roos.

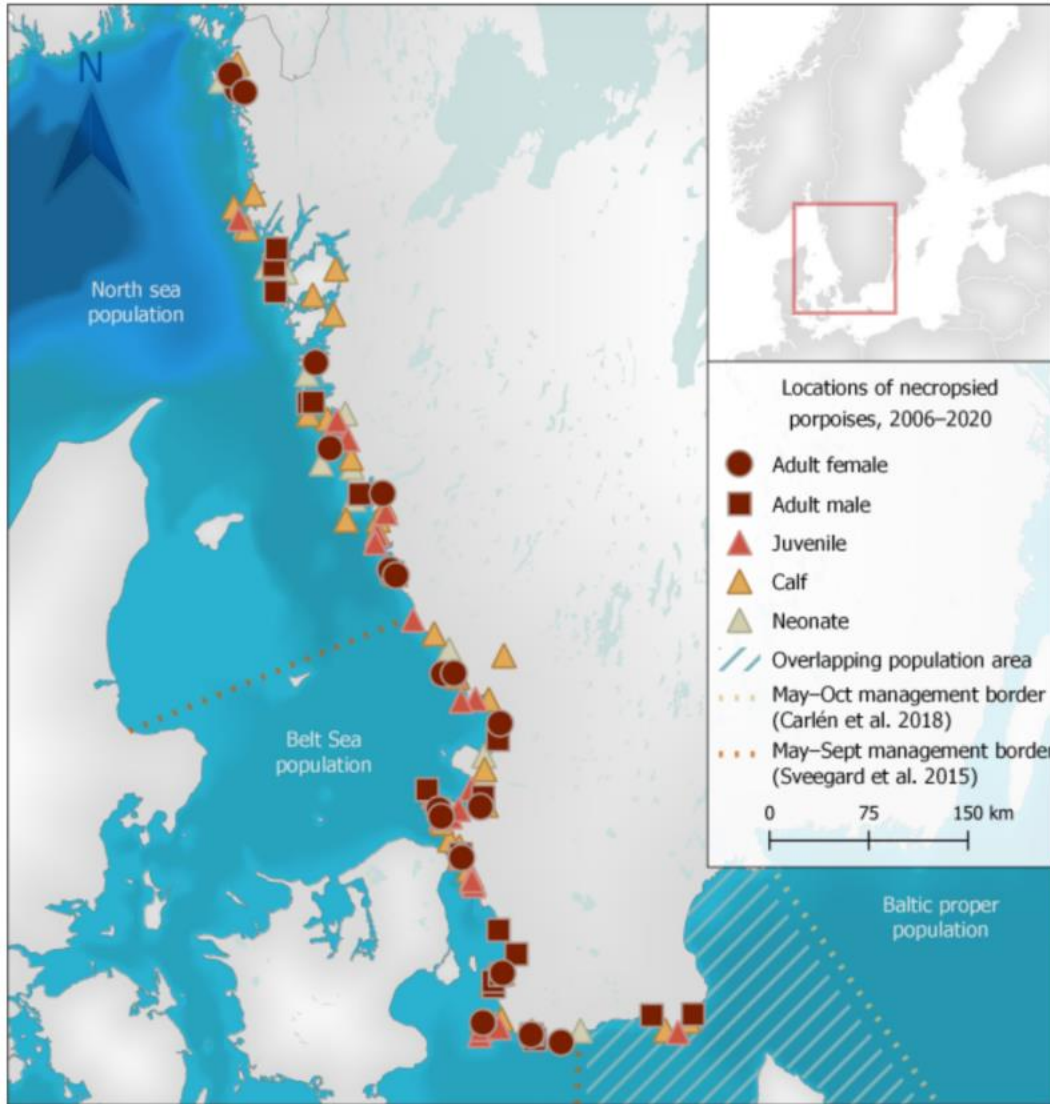
30 bycaught/hunted/stranded seals per year  
30 bycaught/stranded harbour porpoises per year

Cause of death and other data from examination  
necropsy:

- General health and nutrient status
- Reproductive organs and status
- Presence of parasites
- Bacteria and viruses
- Gut content
- Age

Samples are taken from all animals, eg blubber, muscle, liver, kidney to SVAs biobank and NRMs Environment for future studies on diseases, genetic and hazardous substances.

# Examination of stranded harbour porpoises



**Table** show cause of death that could be determined for 78 of the animals

Cause of death	Calf	Juvenile	Adult	Total
Bycatch	1 (5%)	13 (65%)	6 (30%)	20
Probable bycatch	3 (20%)	7 (47%)	5 (33%)	15
Infectious disease	3 (15%)	6 (30%)	11 (55%)	16
Non-infectious disease	2 (50%)	0 (0%)	2 (50%)	4
Trauma	1 (12.5%)	6 (75%)	1 (12.5%)	8
Emaciated	6 (55%)	3 (27%)	2 (18%)	11
Abandoned	2 (100%)	0 (0%)	0 (0%)	2
Probable predation	2 (100%)	0 (0%)	0 (0%)	2
Undetermined	6 (31.5%)	6 (31.5%)	7 (37%)	19
Unsuitable	5 (42%)	4 (33%)	3 (25%)	12

**Figure** indicate locations of stranded harbour porpoises (*Phocoena phocoena*) collected from 2006 to 2020 in Sweden for post-mortem examination

# Questions?

Further reading on directives and assessments.

» National reporting to European Union (EU), see SwAM webpages

<https://www.havochvatten.se/en>

» HELCOM –State of the Baltic Sea "HOLAS II" colleagues now working on "HOLAS III"

<http://stateofthebalticsea.helcom.fi/>

» OSPAR – "Intermediate Assessment 2017 "IA 2017" now working on "QSR 2023"

<https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/>

# Management of harbour porpoise

# Management of small cetaceans in Sweden

- » Species and populations that are managed and occasional visitors
- » Harbour porpoise
- » National conservation plan/action plan
- » Main threats
- » Cooperation between range states
- » Monitoring – The base of management (Karl)
- » MPA:s as part of the toolbox (Jenny, Lena et al.)



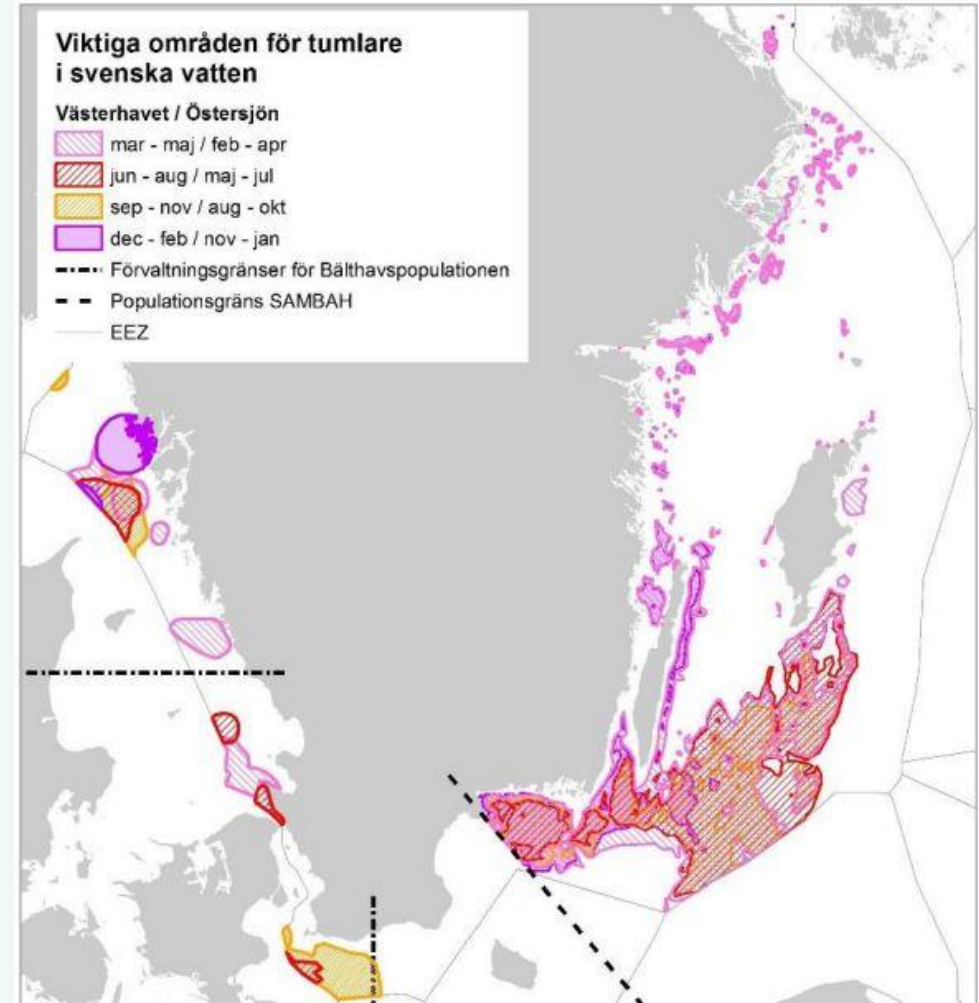
# National Conservation Plan

- » Objectives
- » Knowledge overview
- » Measures
- » Regional activities
- » Only in Swedish at the moment.
  - References in the end most of them in English
  - [Åtgärdsprogram för tumlare \(havochvatten.se\)](http://havochvatten.se)



# Measureas in "blocks"

- » Information, advice and communication
- » New knowledge
- » Monitoring, big scale and regional scale
- » Regulations
- » Protection of important areas
- » Bycatch
- » Underwater noise
- » Monitoring effects of all above
- » They are all expensive – priorities?



# Cooperation between range states

- » CMS – Conservation of Migratory Species of Wild Animals
- » Ascobans - Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas
  - Three Action Plans, one for each population/management unit
- » Helcom – Helsinki Convention
  - Baltic Marine Environment Protection Commission
  - BSAP (Baltic Sea Action Plan) with several action points
- » Ospar – Convention for the Protection of the Marine Environment of the North-east Atlantic
- » EU regulation



# Discussion

- What challenges are similar?
- What are most challenging?

Bycatch?

Monitoring?

Underwater noise?

Waterbased energy like  
windpower, wavepower?

Climate?

Toxins?

Food depletion?

Cooperation?

Who does what?

Other?

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