



Activity 2:  
A2 – Improved regional assessment of biodiversity



**BLUES**



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# HELCOM BLUES – Activity 2.5

17<sup>th</sup> January 2023

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# Overview of Task A2.5 – BEAT/ food web

Task	Deliverable
Subtask 2.5.1	Further development of the BEAT tool
Subtask 2.5.2	Exploratory work towards an assessment of food webs





# Results A2.5.1

## **Aim: Further development of the BEAT tool**

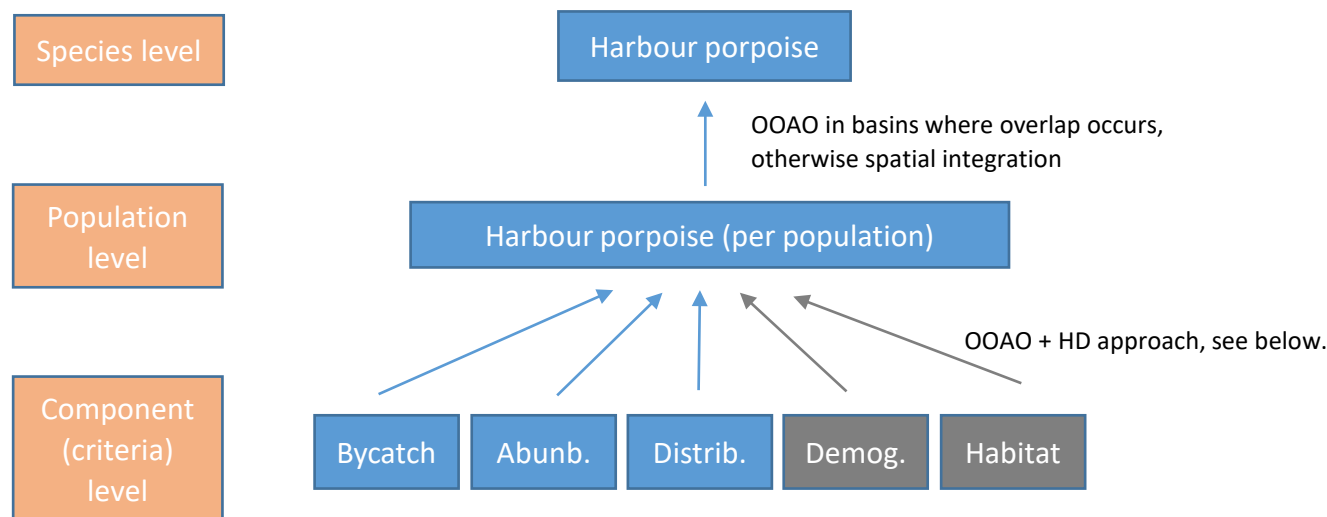
- Ecosystem component structure updated with new species
  - Harbour porpoise, birds, fish
- Spatial structure updated
  - Updated spatial assessment unit areas
  - Included spatial assessment units used in the eutrophication assessment
- New indicators added
  - Size structure of coastal fish
  - Abundance and distribution of harbour porpoise
  - Bycatch indicator “Number of drowned mammals and waterbirds in fishing gear”
- Adjusted integration structure and weighting for pelagic habitats





# Results A2.5.1

- Integration rules modified to better align with MSFD Art. 8 guidance
  - Fish: species-based integration within monitoring areas, OOA between monitoring areas, OOA between species
  - Birds: >75% of species within species groups need to achieve GES for species group to be in GES, OOA between species groups
  - Mammals: adapting Habitat Directive evaluation process in the integration, in practice aligning indicators according to HD criteria and applying OOA between criteria



# Results A2.5.2



## Aim: Exploratory work towards an assessment of food webs

- Analyzes of how indicators can inform assessments of food webs

**Table 1. Indicative trophic guilds. X denotes where the taxonomic groups contribute significantly to each guild. Nekton includes bony fish, elasmobranchs, and squids.**

Guild\Taxonomic group	Phytoplankton <sup>1</sup>	Zooplankton	Benthos	Nekton warm-blooded	excl.	Seabirds	Marine mammals
Primary producers	X						
Secondary producers		X					
Filter-feeders			X				
Deposit-feeders			X				
Planktivores			X	X		X	X
Sub-apex pelagic predators				X		X	X
Sub-apex demersal predators			X	X		X	X
Apex predators				X		X	X

- HELCOM indicator available
- Data available, but no indicator
- Not relevant in the Baltic Sea

<sup>1</sup>In shallower waters, macrophytes may also be important.

# Results A2.5.2



- Results of indicators addressing food web aspects

Indicator	Trophic guild	Criterion	Kattegat	Great Belt	The Sound	Kiel Bay	Bay of Mecklenburg	Arkona Basin	Bornholm Basin	Gdansk Basin	Eastern Gotland Basin	Western Gotland Basin	Gulf of Riga	Northern Baltic Proper	Gulf of Finland	Åland Sea	Bothnian Sea	The Quark	Bothnian Bay	
Seasonal succession of functional phytoplankton groups	Primary producers - phytoplankton	D4C1, D4C2	**	NA	NA	+	+	**	**	+	-	NA	+			*	**	*	+	
<i>Diatom/Dinoflagellate index (test indicator)</i>	Primary producers - phytoplankton	D4C2	NA	NA	NA	**	**	NA	NA	NA	**	+	NA	NA	NA	NA	NA	NA	NA	
Cyanobacterial bloom index	Primary producers - phytoplankton	D4C4	NA	NA	NA	NA	**	**	**	**	**	**	**	**	**	**	**	**	NA	NA
Zooplankton Mean Size and Total Stock	Secondary producers - Zooplankton	D4C1, D4C2, D4C3	NA	NA	NA	NA	NA	NA	**	**	**	**	**	**	**	**	**	**	+	**
Abundance of coastal fish key functional groups	Planktivores/Sub-apex predators - Fish	D4C2	NA	NA	NA	NA	NA	NA	*	*	+	-	*	+	*	*	*	+	*	*
Nutritional status of seals	Apex predators - Mammals	D4C4	NA																	
Reproduction status of seals	Apex predators - Mammals	D4C4																		

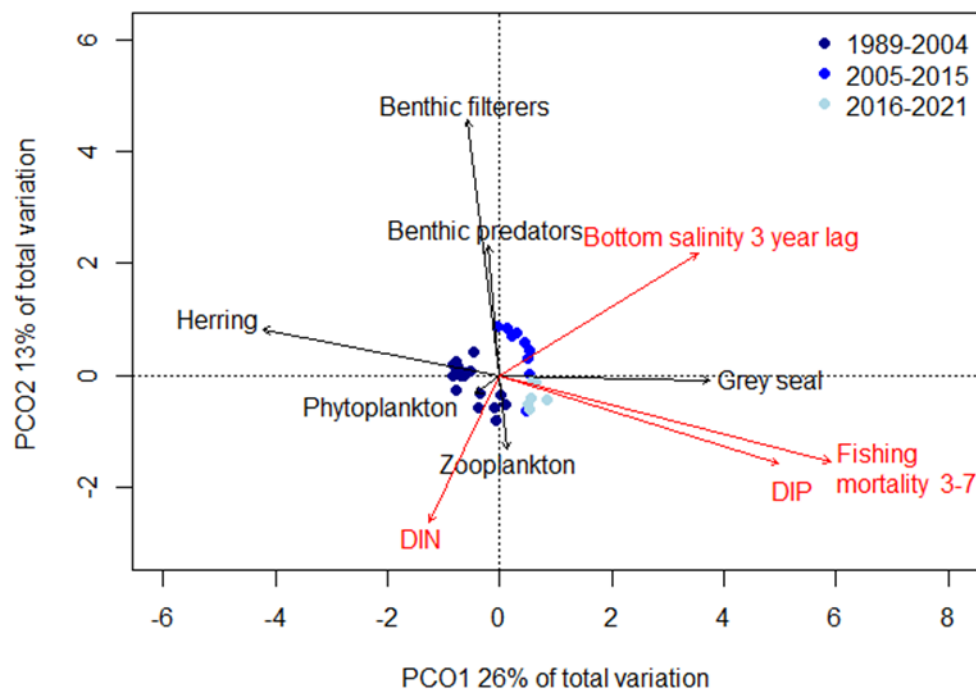
\* = coastal areas only, \*\* = open sea areas only, +/- = improved/worsened from HOLASII





## Results A2.5.2

- Review of methods/approaches for food web assessments
- Case study Bothnian Sea using integrated trend analysis



The figure only shows an example of the results. The full analysis is included in the HOLAS 3 Thematic assessment of biodiversity.

Analyses done by Carolyn Faithfull, SLU





# Results summary - BEAT/ food web

Task	Deliverable	Results
Subtask 2.5.1	Further development of the BEAT tool	Integrated assessments for fish, waterbirds, marine mammals and the pelagic habitat → HOLAS 3
Subtask 2.5.2	Exploratory work towards an assessment of food webs	Contributions to HOLAS 3 food web assessment







# Key messages

- Key messages for **science**

- 1) Further indicator development needed to cover all biodiversity aspects and increase spatial coverage
- 2) Specific food web indicators needed, including energy flows and transfer efficiency
- 3) Indicator threshold setting an important aspect of integrated assessments

- Key message for **policy makers**

- 1) Monitoring important as the foundation of the assessments
- 2) Streamlining assessments across policies advantageous
- 3) Ecosystem-based management need to include food web aspects



# Use of results so far and in future

- HELCOM → Further development of integrated assessment of Biodiversity, especially for fish, waterbirds, marine mammals and pelagic habitats
- HELCOM → Improving food web assessments and contributing to CG/EG Foodwebs work
- → HELCOM HOLAS 3 Thematic Assessment of Biodiversity
- BSAP Goal → “Baltic Sea ecosystem is healthy and resilient”
- BSAP → actions B33 and B34 to further develop indicators allowing improved holistic assessments
- MSFD → facilitate reporting on Descriptor 1 and Descriptor 4 according to Art. 8 Guidance





# Data for BEAT/ food web A2.5

**This work was possible due to support from**

2.5.1:

- Biodiversity indicator leads and national experts

2.5.2:

- CG/EG Foodwebs
- SYKE, LUKE and ICES
- SLU



# Outputs

- Feeding into HOLAS 3: Thematic assessment of biodiversity
  - Integrated assessments of fish, birds, marine mammals and the pelagic habitat
  - Food web assessment
    - Use of HELCOM indicators in a food web context
    - Providing input to the case study on integrated trend analyses in the Bothnian Sea
- BEAT R-script will be updated on GitHub (<https://github.com/helcomsecretariat/BEAT>)





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# Thank you!



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