Results of the sufficiency of measures (SOM) analysis

Document 3-Rev.1

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Outline

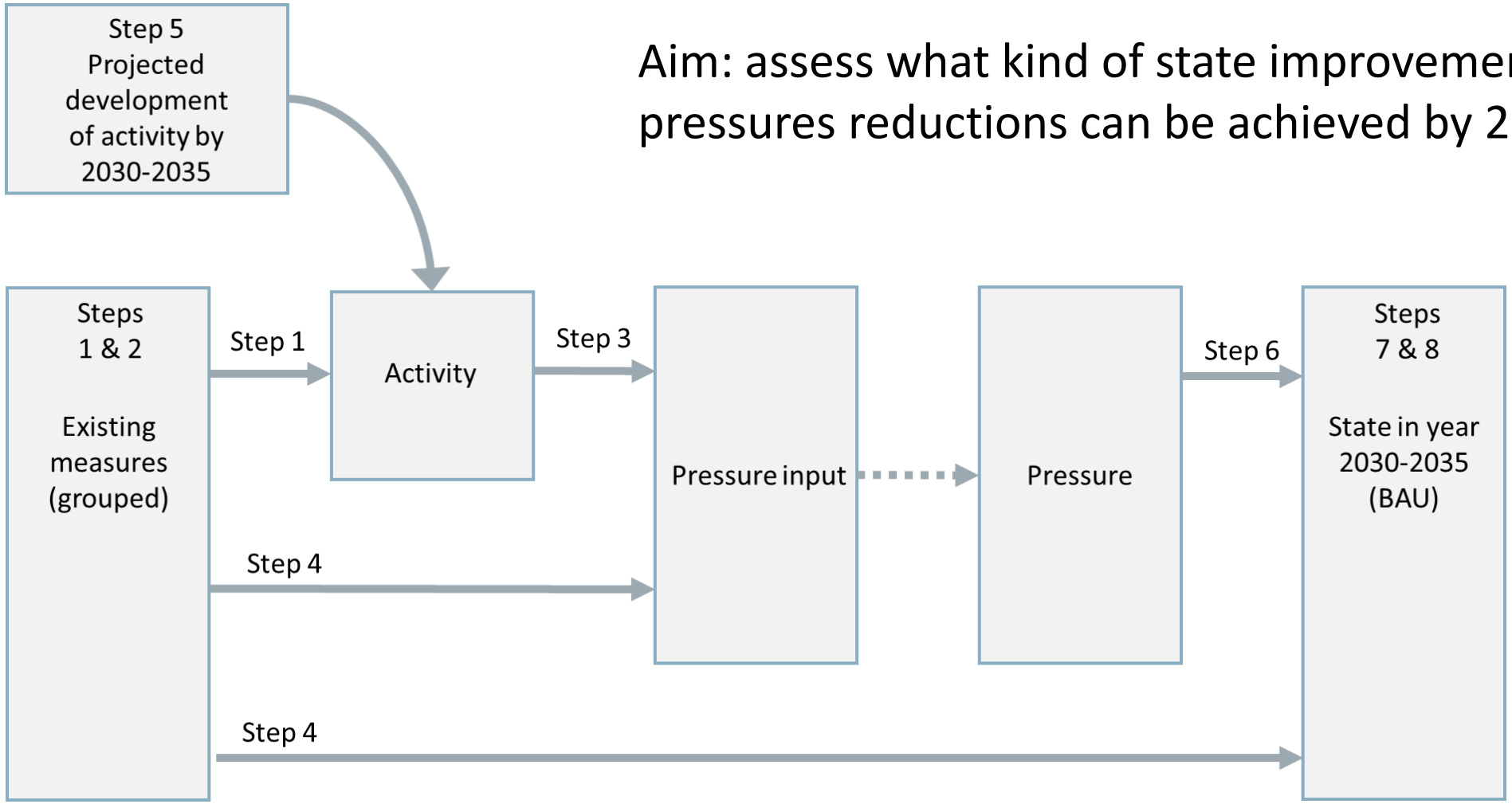
- Brief overview of the SOM approach
- Coverage of results of interest/concern
- Identified changes and additions
- Schedule for work in autumn 2020

Overview of the sufficiency of measures (SOM) analysis

Background of SOM analysis

- Provides supporting information for evaluating proposed new actions
- First attempt to quantify the effects of existing measures on achieving objectives
- Combination of natural and social sciences approaches
- No final answers - should be considered in relation to other relevant results and assessments

Main components of the SOM analysis



Aim: assess what kind of state improvements or pressures reductions can be achieved by 2030-2035

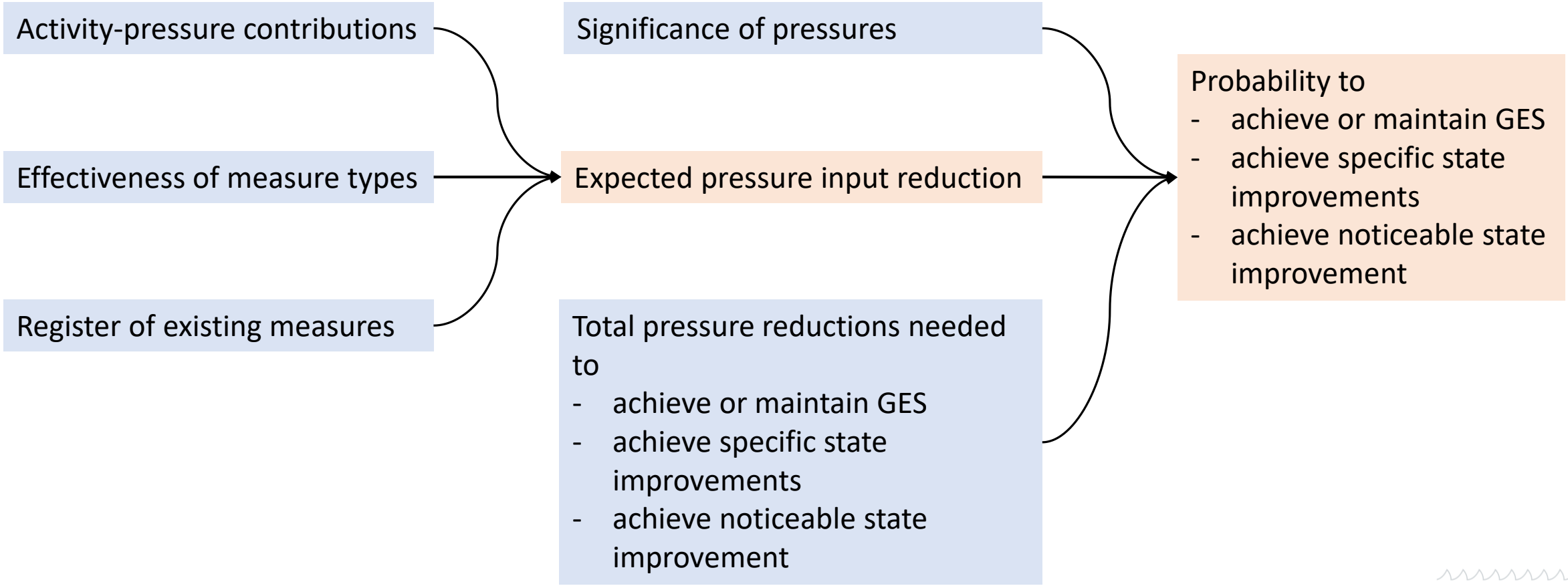
Relationship between pressure inputs and pressures

Pressure input	Relationship	Pressure
Bycatch of porpoise	Equivalent	Bycatch in fishing gears
Potential loss of seabed	Assumed equivalent	Physical loss of marine habitats
Input of continuous noise 63/125 Hz + Input of continuous noise 2 kHz	Assumed equivalent	Continuous underwater noise
Anthropogenic introductions of NIS	Link not quantified	Effects of non-indigenous species
Input of nutrients	Link not quantified	Effects of eutrophication
NA	No link	Human-induced food web imbalance
NA	No link	River, lake, or land habitat loss/degradation

Relationships between results

Independent

Dependent on previous results



Assumptions and features to keep in mind

- Only measures affecting pressures in 2016-2035 considered
- All existing measures assumed to be fully implemented
- Effectiveness of measure types used to approximate the effectiveness of existing measures
- When considering total pressure, all pressures are interchangeable
- Not able to account for the effect of reductions of all pressure inputs on state components (e.g. because no link between input of nutrients and effects of eutrophication)
- Only most likely scenario on development of human activities included
- Data mainly from expert elicitation
  - literature data on effectiveness of measures not yet included

Selected results of the SOM analysis

Bimodal distribution

Example from hazardous substances

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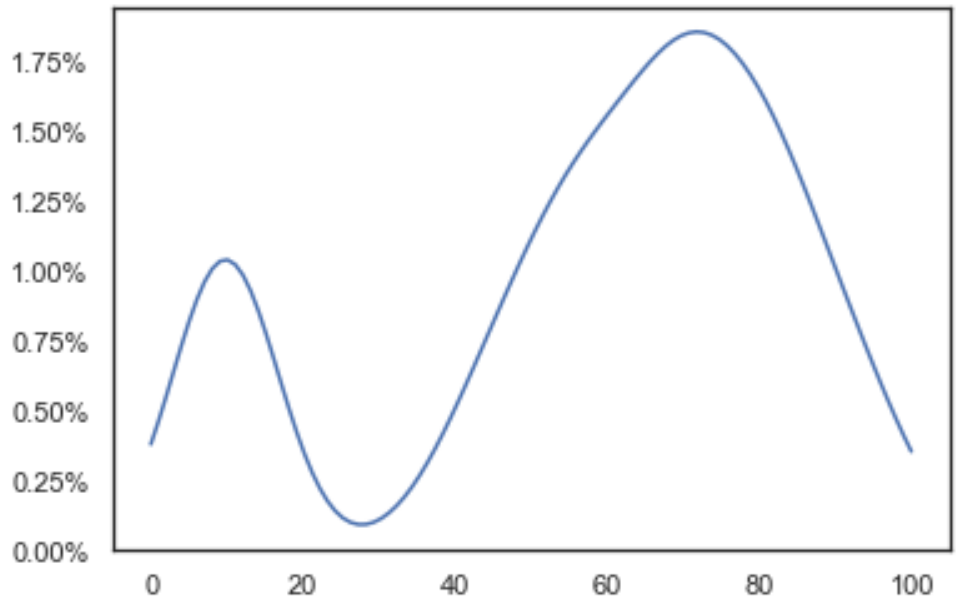
Probability to reach GES for PFOS is…

Low

Expected pressure reduction
6 – 20%

Required pressure reduction to achieve GES: 51%
(standard deviation: 21%)



Bimodal distribution vs uncertainty

Example from hazardous substances

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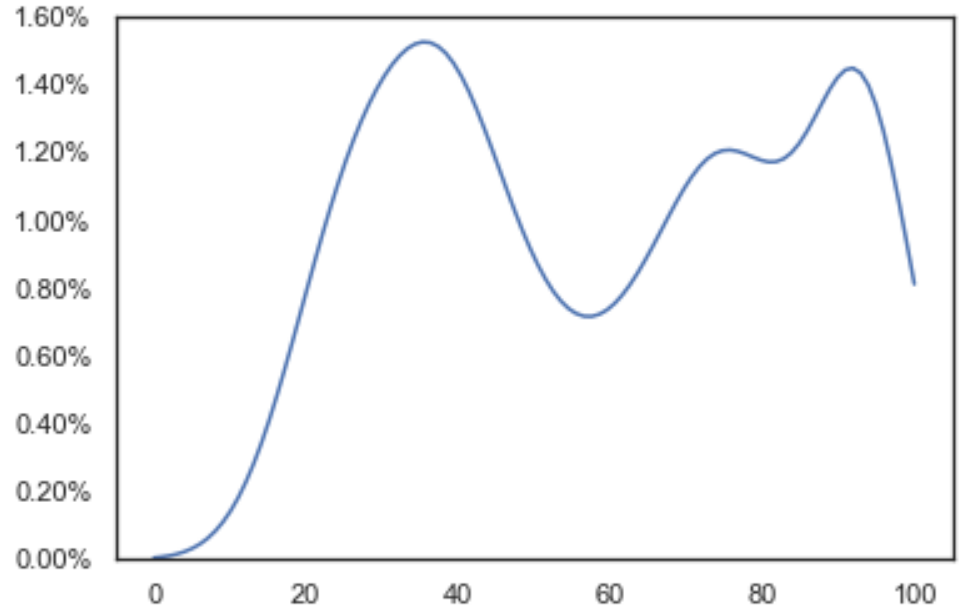
Probability to reach GES for TBT is…

Very low

Expected pressure reduction
-2 – 8%

Required pressure reduction to achieve GES: 55%
(standard deviation: 27%)



Impact of bimodal distribution

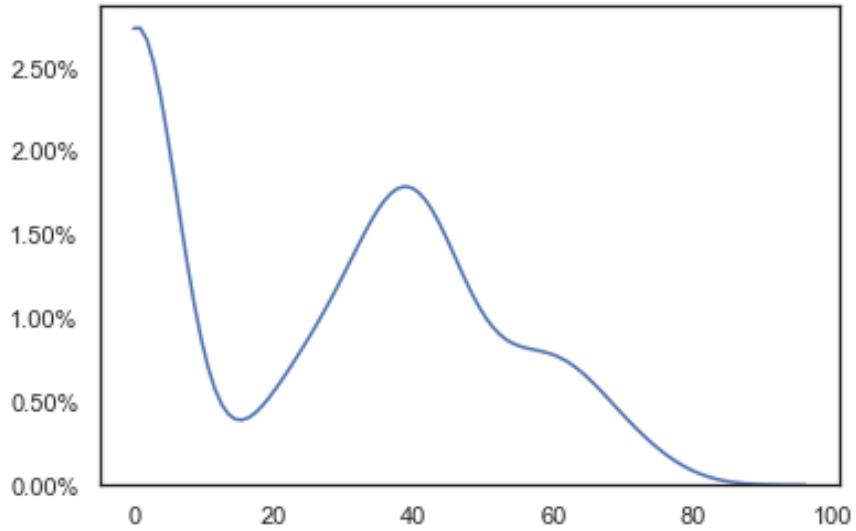
Example from birds

Probability to achieve a 10% state improvement for **long-tailed duck** is…

Moderate

Expected pressure reduction
0 – 40%

Required pressure reduction to achieve 10% state improvement: 36%
(standard deviation: 16%)



Consensus and uncertainty in the same figure

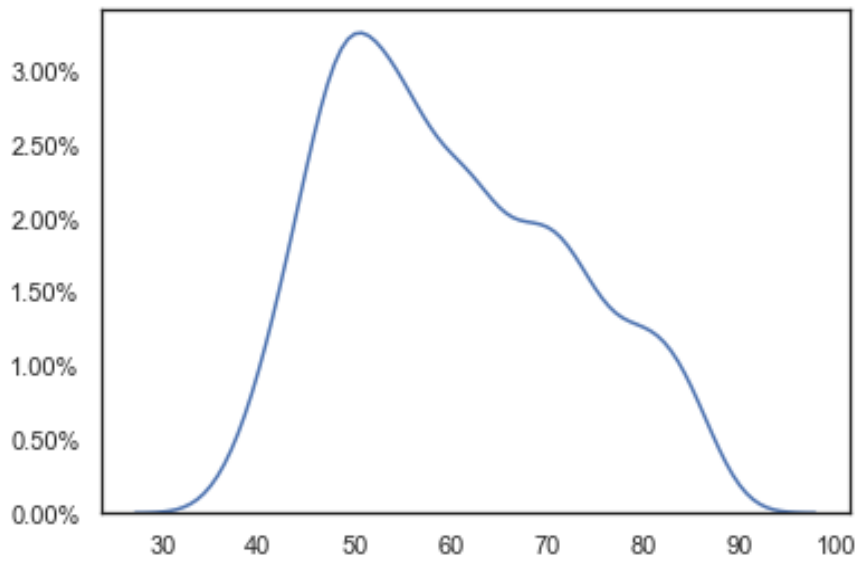
Example from marine mammals

Probability to achieve noticeable state improvement for the **western Baltic population of harbour porpoise** is…

Very low

Expected pressure reduction
0 – 15%

Required pressure reduction to achieve state improvement:
52%
(standard deviation: 16%)



Effect of development of human activities scenarios

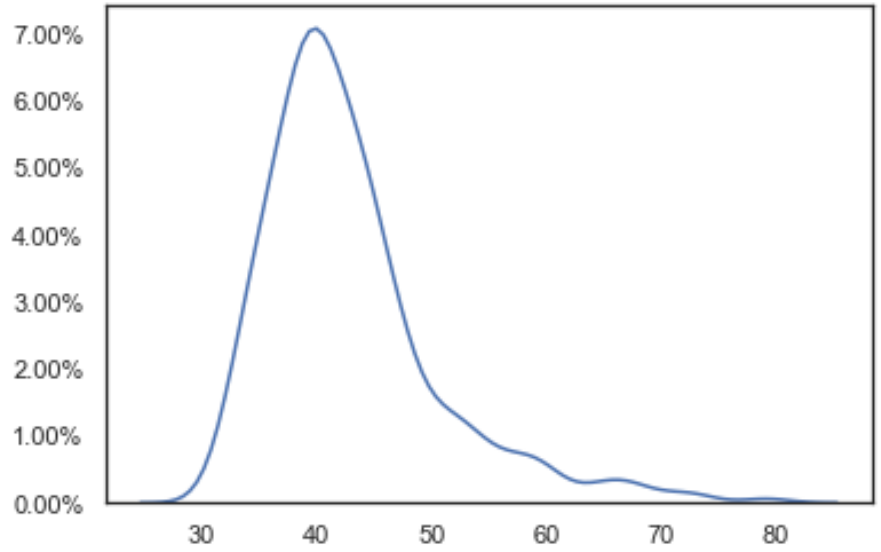
Example from birds

Probability to maintain GES for **great black-backed gull** is…

Very low

Expected pressure reduction
-40 – 17%

Required pressure reduction to maintain GES: 42%
(standard deviation: 1.5%)



Effect of development of human activities scenarios

Example from birds

Projected changes in waterbird collisions

Collisions
Very high increase (-160 – -150%)

Most effective measure types to reduce collisions

Activity: Renewable energy generation
Seasonal or real time (e.g. radar based) closures of wind farms
MSP considers migratory patterns and other sensitive areas
Environmentally sound lighting of offshore installations

Changes in pressure inputs result from existing measures and changes in human activities (e.g. offshore wind energy production)

Gap in development of human activities scenarios

Example from underwater noise

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Projected reductions in pressure inputs

Input of continuous noise 63/125 Hz	Input of continuous noise 2 kHz	Input of impulsive noise with peak energy below 10 kHz
Low increase (-18 – -6 %)	Low to moderate increase (-21 – -2%)	Low to moderate reduction (12 – 20 %)*

Changes in pressure inputs result from existing measures and changes in human activities (e.g. shipping, tourism and leisure activities)

*Development of human activities scenarios only cover 0 – 10% of activities relevant to impulsive noise input compared to >80% for continuous noise. Options currently under review to increase coverage.

Projected reduction in pressure inputs

Input of top 15 litter items to the beach
High reduction (70-100%)

Top 15 litter items comprise 67% of all beach litter items around the Baltic Sea

Changes in pressure inputs result from existing measures and changes in human activities (e.g. waste waters, shipping infrastructure)

Interesting result: very high projected pressure reduction, continued

Example from marine litter

Activity Measure type	Fish and shellfish harvesting (all gears; professional, recreational)	Transport – shipping (incl. anchoring, mooring)
More stringent controlling and reporting of ships' delivery of waste in ports	NA	34.1 (19.0) ○●●
Implementation of ISO standard for port waste reception facilities	NA	26.6 (15.2) ○●●
Full implementation of the no-special fee system for waste reception in all Baltic Sea ports	NA	45.5 (24.2) ○●●
Implementing ecolabel schemes and/or incentive systems for environmentally friendly shipping	NA	26.0 (14.8) ○●●
Including marine litter issues in educational programs and materials for professional sea use sectors	NA	40.6 (20.7) ○●●
No-special fee system for waste reception in ports from fishing vessels, including for the litter caught in fishing nets	44.2 (23.7) ○●●	NA
Information and education to fishermen about management and environmental impacts of fishing gear containing plastics and best practice in waste management within fishing sector	40.5 (24.4) ○○●	NA
Improvement in the marking of fishing gear and reporting on lost fishing gear	0.7 (0.7) ○○●	NA
Confidence	Moderate	Moderate
Number of experts	10-13	8-12

Topic-specific issues for marine mammals

- Very low number of participating experts for most populations in the pressure-state expert survey
  - 0 experts: 2 populations
  - 1 expert: 1 populations
  - 2 experts: 2 populations
  - 3 experts: 1 population
  - 4+ experts: 2 populations
- Complete analysis not possible for harbour seal in Kattegat or Kalmarsund
- Somewhat unexpected results

Unexpected result

Example from marine mammals

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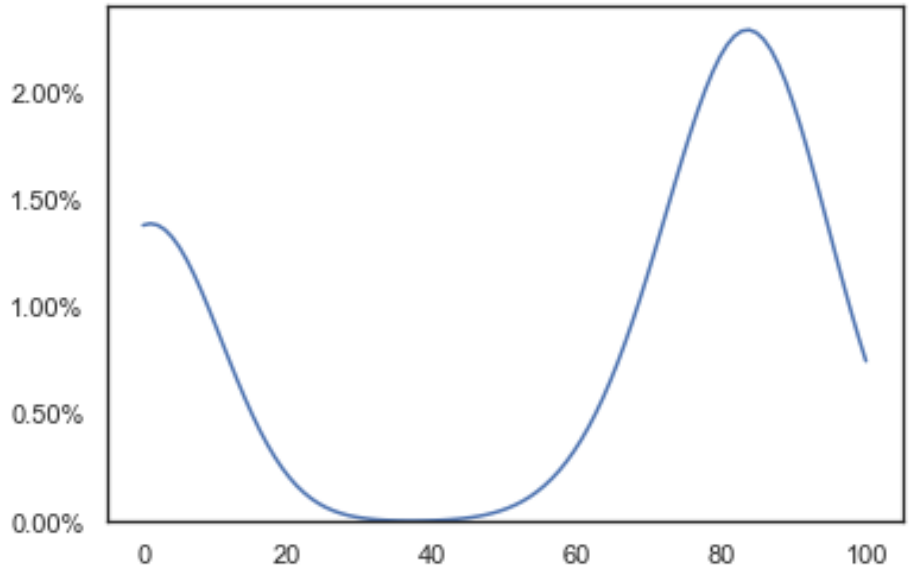
Probability to achieve GES for the **southern population of ringed seal** is…

Moderate

Expected pressure reduction
-1 – 7%

Required pressure reduction to achieve GES: 55%
(standard deviation: 39%)



Unexpected result

Example from marine mammals

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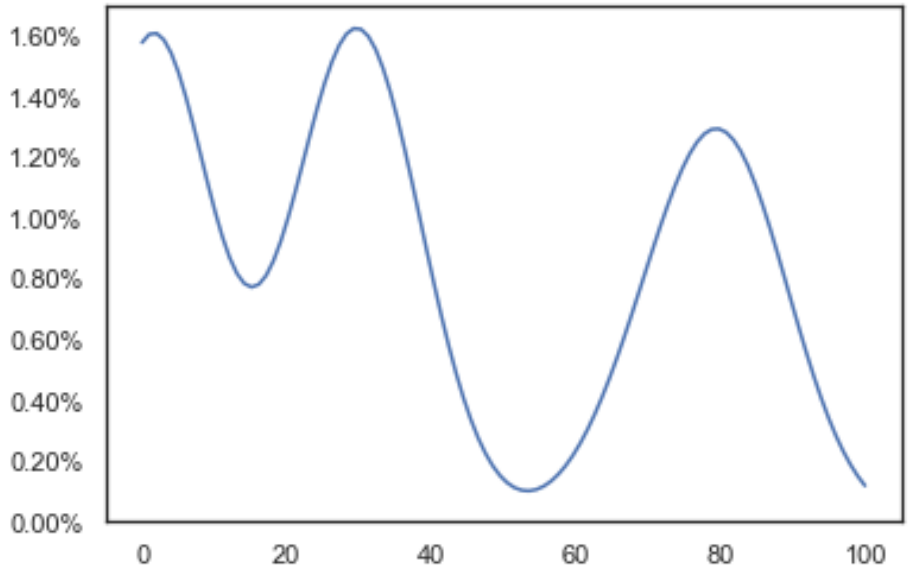
Probability to maintain GES for **grey seal** is…

Moderate

Expected pressure reduction
2 – 8%

Required pressure reduction to maintain GES: 37%
(standard deviation: 34%)



Unexpected low likelihood to maintain GES

Example from migratory fish

Probability to achieve or maintain GES for **salmon** is…

Very low – Moderate

Expected pressure reduction
4 – 19%

Required pressure reduction to achieve GES: 41 - 63%
(standard deviation: 7 - 18%)

Very low	Low	Moderate
• AU 4 • AU 5 • AU 6	• AU 3	• AU 1-2

Unexpected low likelihood to maintain GES: issue of unquantifed pressures

Example from migratory fish

The most significant pressures affecting the abundance of each species

Salmon	Eel	Seatrout
1. River, lake, or land habitat loss/degradation 2. Extraction of fish (includes prey depletion) 3. Species disturbance: obstructions	1. Effects of pressures occurring outside the Baltic Sea region 2. River, lake, or land habitat loss/degradation 3. Extraction of fish (includes prey depletion)	1. River, lake, or land habitat loss/degradation 2. Extraction of fish (includes prey depletion) 3. Species disturbance: obstructions

Interesting result: similarities and differences in sub-regional pressure sources

Example from underwater noise

Activity Noise type and area	Fish and shellfish harvesting	Restructuring of seabed morphology	Tourism and leisure activities	Transport – shipping	Military operations	Research, survey and educational activities	Marine and coastal construction	Marine and coastal infrastructure*	Extraction of minerals
Continuous noise 63/125 Hz Western Baltic									
Continuous noise 63/125 Hz Central Baltic									
Continuous noise 63/125 Hz Gulf of Riga									
Continuous noise 63/125 Hz Gulf of Finland									
Continuous noise 63/125 Hz Gulf of Bothnia									
Continuous noise 2 kHz Western Baltic									
Continuous noise 2 kHz Central Baltic									
Continuous noise 2 kHz Gulf of Riga									
Continuous noise 2 kHz Gulf of Finland									
Continuous noise 2 kHz Gulf of Bothnia									
Impulsive noise Western Baltic									
Impulsive noise Central Baltic									
Impulsive noise Gulf of Riga									
Impulsive noise Gulf of Finland									
Impulsive noise Gulf of Bothnia									

Results are preliminary – improvements in autumn 2020

- Internal review
- Input from SOM Topic Teams and BSAP UP workshops
- Review by SOM Platform and Working Groups
- Validation of input data by HELCOM Working Groups and Expert Networks
- Results updated in October 2020

Identified changes and additions

- General, topic-specific and editorial changes
- Changes to activity-pressure input data – will affect most results
- Selected major changes
  - Literature data on effectiveness of measures
  - Alternative scenarios on development of human activities and descriptions
  - Information on the state components most affected by the pressure in question
  - Impacts of measure types
  - Interpretation and contextualization of results
  - Improved figures

Timeline for SOM analysis of existing measures

Task	Responsible	Timing (month in 2020)
Validation of input data	Working Groups, Expert Groups	September
SOM Platform 4-2020 meeting	SOM Platform/Secretariat	September
Providing results to Working Group meetings	ACTION/Secretariat	August-October
Preparing overall and topic-specific reports to support BSAP update	ACTION/Secretariat	June-December
Potential SOM Platform 5-2020 meeting	SOM Platform/Secretariat	November