

Results of the sufficiency of measures analysis for marine mammals

Document 2-3

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Action requested

- The Meeting is invited to:
 - review the results of the SOM analysis for mammals and identify unexpected outcomes,
 - provide context and guidance for interpretation of results.



Aims

- Review the SOM approach and main results of the analysis

Outline

- SOM analysis overview
- Results for marine mammals



Overview of the sufficiency of measures (SOM) analysis

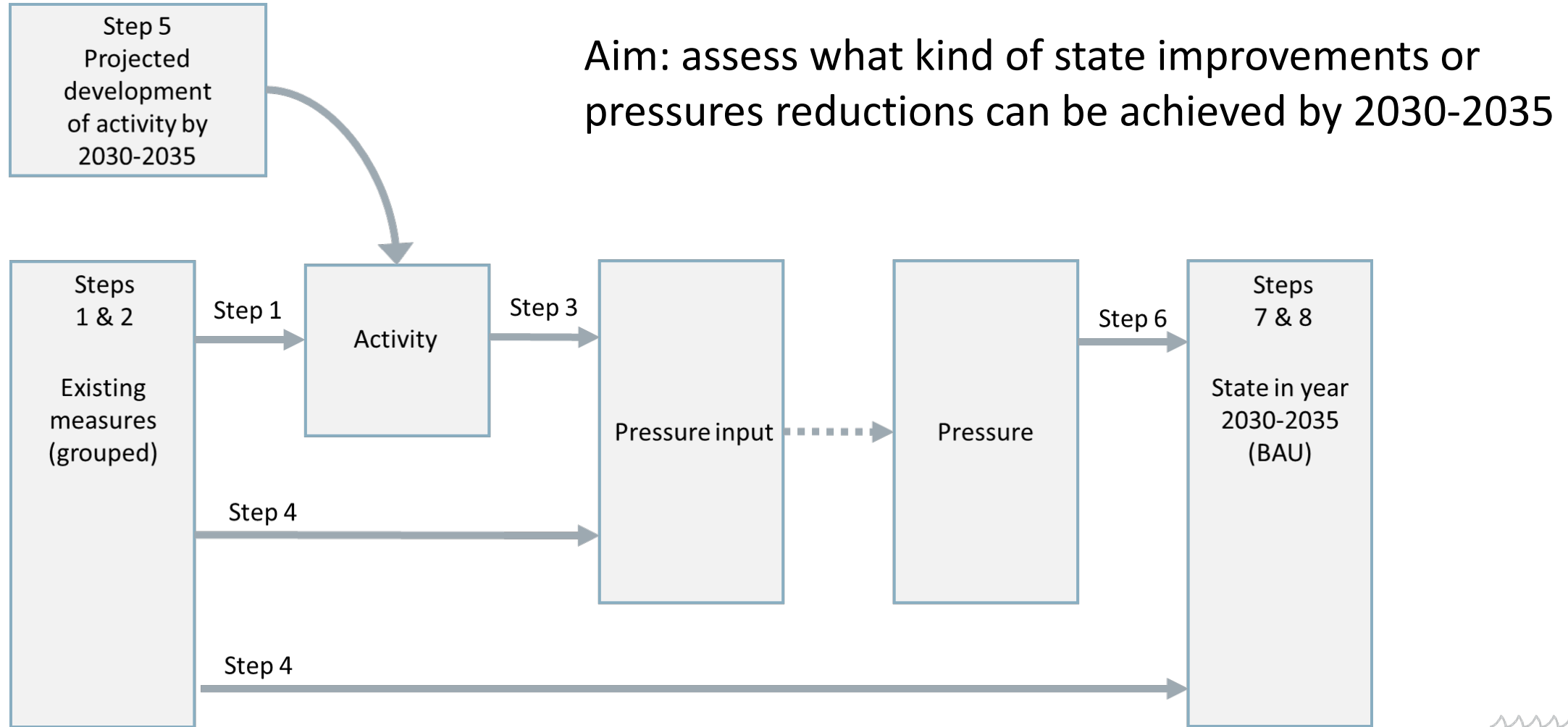


Background

- 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



Relationship between pressure inputs and pressures

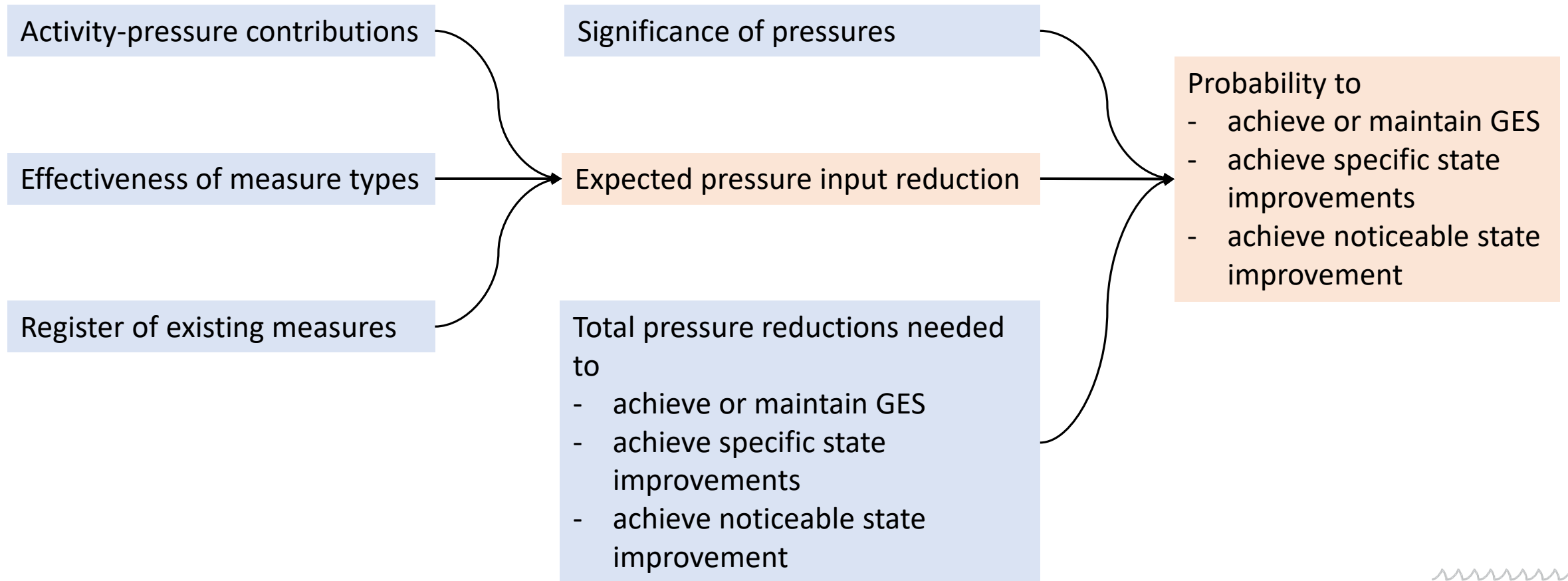
Pressure input	Relationship	Pressure
Bycatch of porpoise	Equivalent	Bycatch in fishing gears
Potential loss of seabed	Assumed equivalent	Physical loss of marine habitats
Input of continuous noise 63/125 Hz + Input of continuous noise 2 kHz	Assumed equivalent	Continuous underwater noise
Anthropogenic 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



Independent

Dependent on previous results

Relationships between 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
- Data mainly from expert elicitation
 - Literature data on effectiveness of measures not yet included



Results are preliminary – improvements in autumn 2020

- Input from SOM Topic Teams and SOM Platform, review by Working Groups
- Validation of input data by HELCOM Working and Expert Groups
- Changes to projected pressure reductions and state improvements
- Addition of alternative scenarios on development of human activities
- Substantial increase in results interpretation and contextualization
- Improved figures



Results of SOM analysis for marine mammals

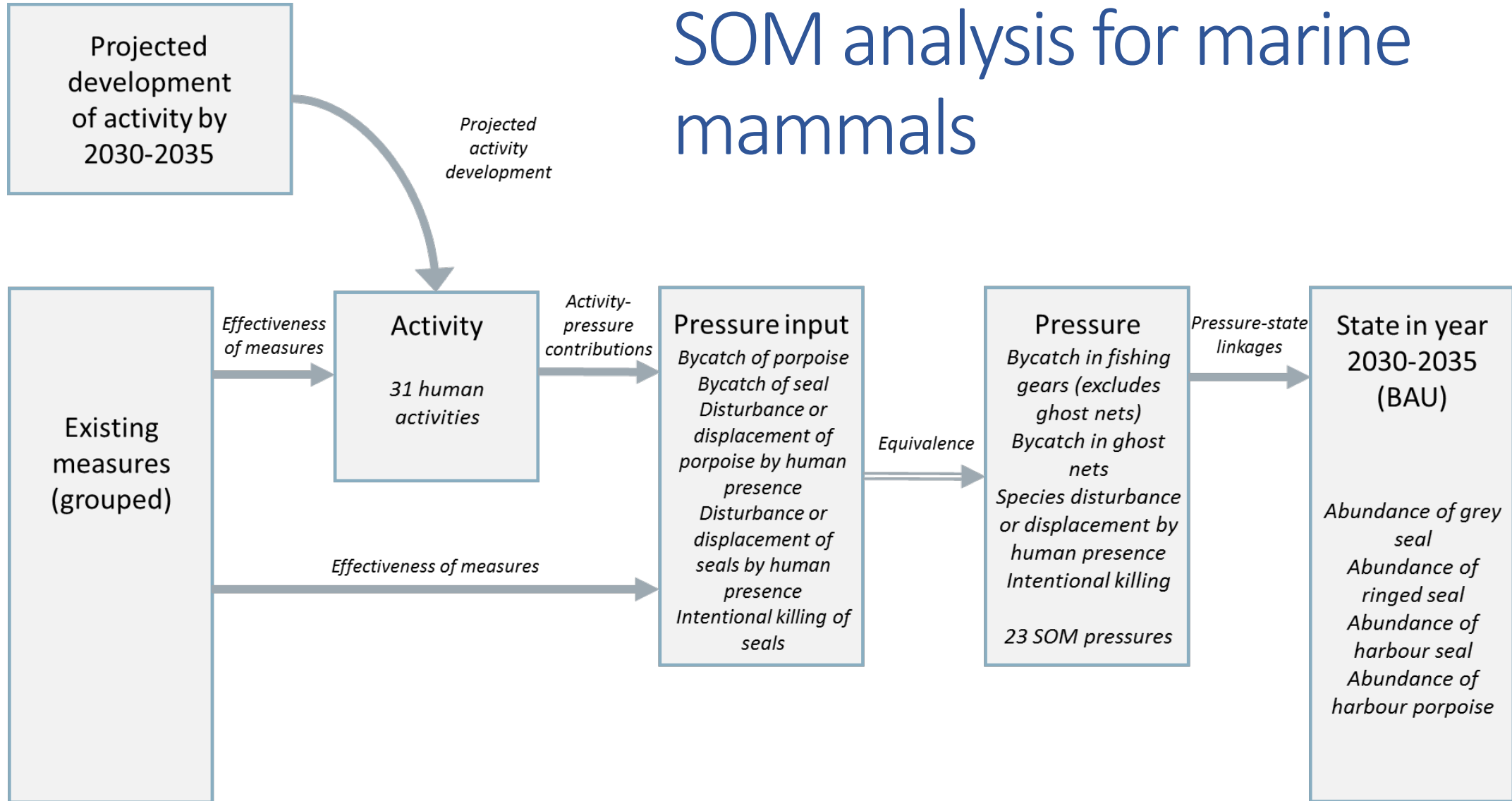


Topic-specific issues

- Full analysis only for 6 populations – missing data for 2 seal populations
- Only expert-based data
 - Number of experts per data component: 0 -12
- Very low number of participating experts for most populations in the pressure-state expert survey
 - 0 experts: 1 population
 - 1 expert: 2 populations
 - 2 experts: 2 populations
 - 3 experts: 1 population
 - 4+ experts: 2 populations
- Somewhat unexpected results



SOM analysis for marine mammals



Data for marine mammals

Data component	Origin of data	Spatial resolution
Activity-pressure contributions	Expert evaluation	Varies by assessed population
Existing measures	Literature review, Contracting Parties	17 sub-basins
Effectiveness of measures	Expert evaluation	Whole Baltic Sea
Development of human activities	Literature review, existing data and projections	Whole Baltic Sea
Pressure-state links	Expert evaluation	Varies by assessed population



Focus of SOM assessment for marine mammals

- Probability to achieve or maintain HELCOM GES threshold for
 - i. Abundance of grey seal
 - ii. Abundance of ringed seal
 - i. Northern population
 - ii. Southern population
 - iii. Abundance of harbour seal
 - ~~i. Kattegat population~~
 - ii. Southern Baltic population
 - ~~iii. Kalmarsund population~~
- Probability to achieve a noticeable state improvement for
 - i. Abundance of harbour porpoise
 - i. Western Baltic
 - ii. Baltic Proper

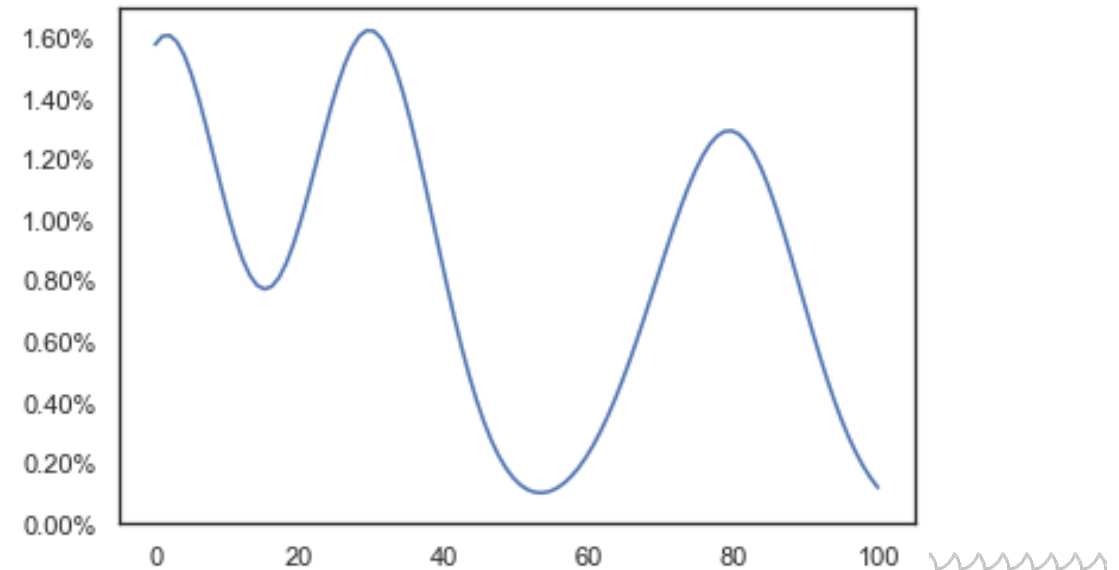


Probability to maintain
GES for **grey seal** is...

Moderate

Expected pressure reduction
2 – 8%

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

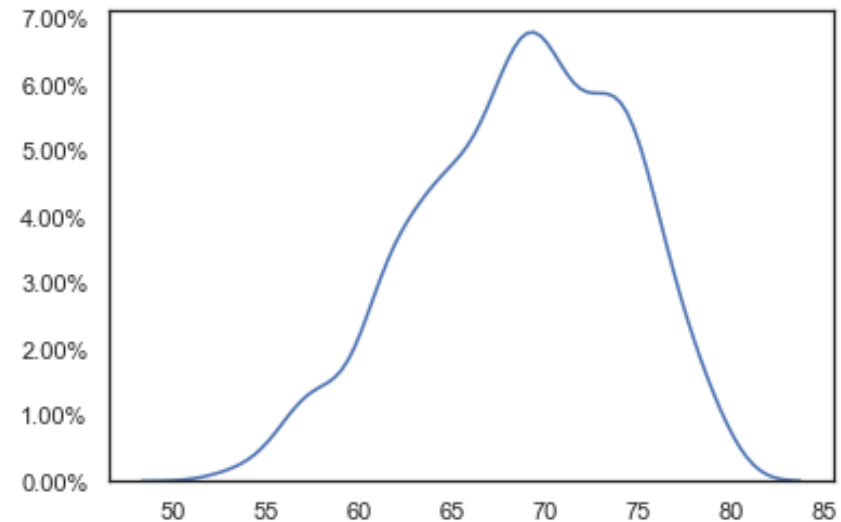


Probability to achieve GES
for the northern
population of ringed seal
is...

Very low

Expected pressure reduction
0 – 10%

Required pressure reduction
to achieve GES: 70%
(standard deviation: NA)

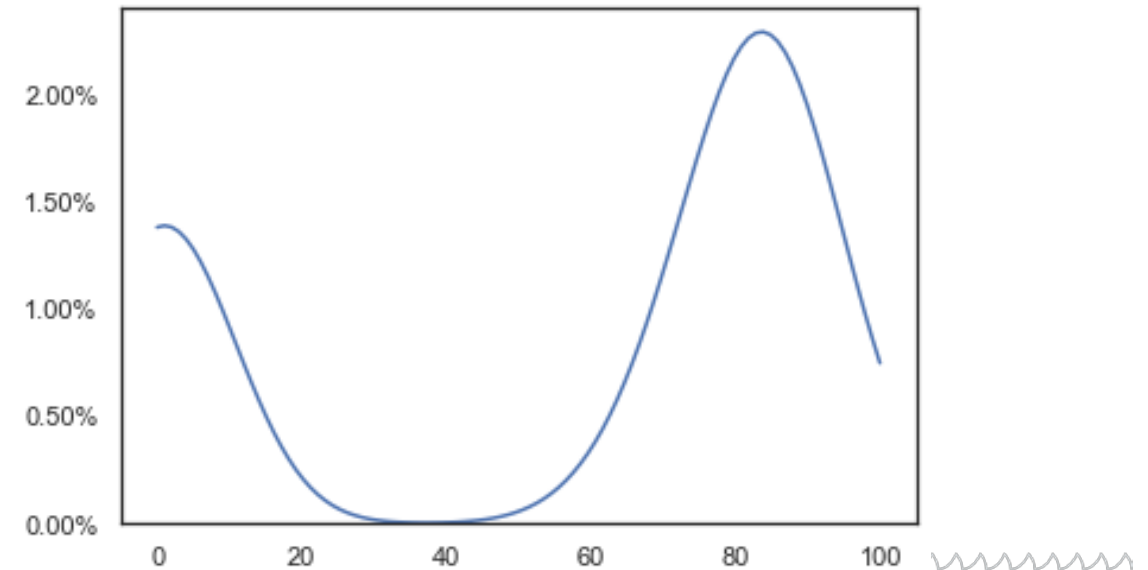


Probability to achieve GES
for the southern
population of ringed seal
is...

Moderate

Expected pressure reduction
-1 – 7%

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

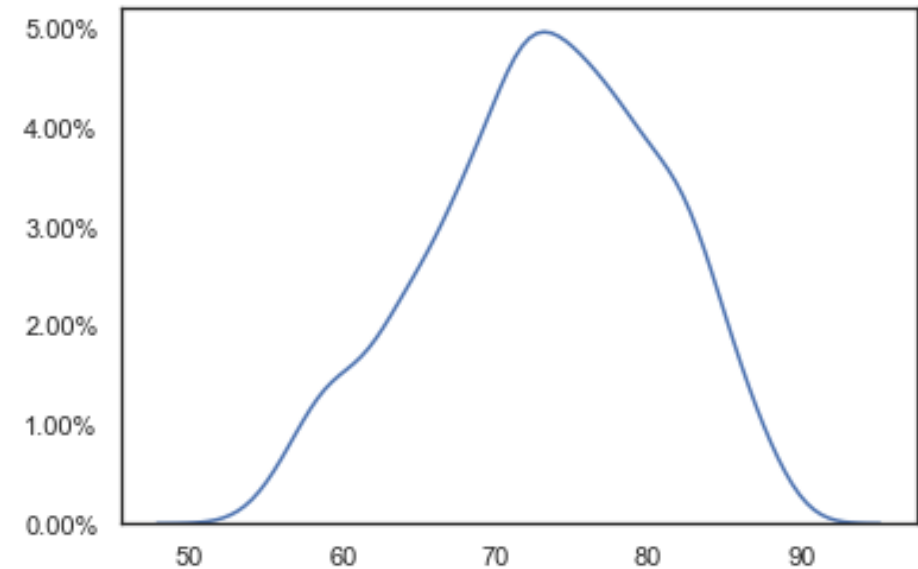


Probability to achieve GES
for southern Baltic
population of harbour seal
is...

Very low

Expected pressure reduction
-3 – 6%

Required pressure reduction
to achieve GES: 75%
(standard deviation: NA)

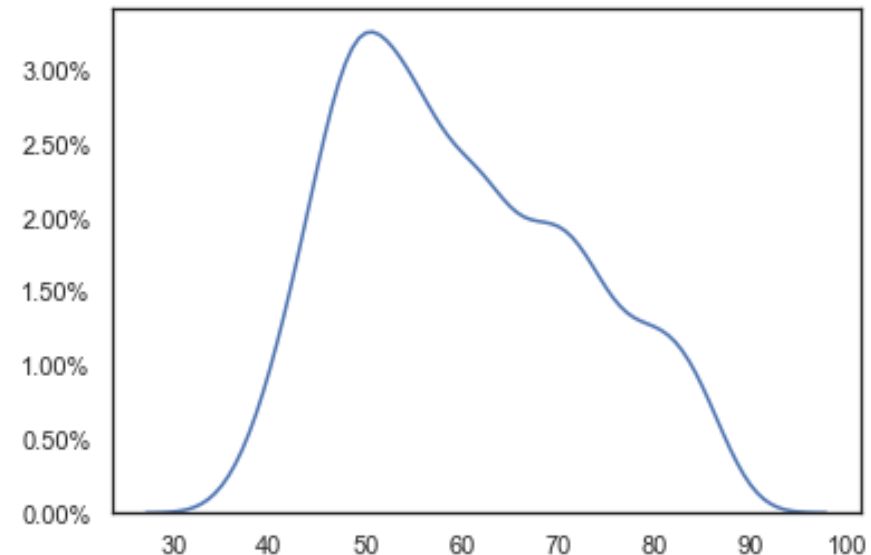


Probability to achieve noticeable state improvement for the western Baltic population of harbour porpoise is...

Very low

Expected pressure reduction
0 – 15%

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

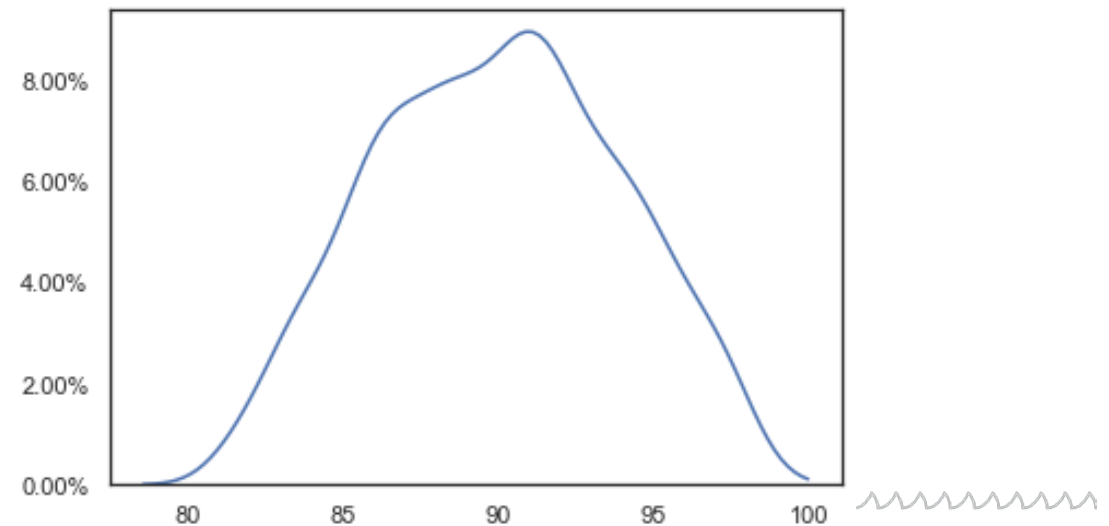


Probability to achieve noticeable state improvement for the **Baltic Proper** population of harbour porpoise is...

Very low

Expected pressure reduction
-1 – 3%

Required pressure reduction to achieve state improvement:
80%
(standard deviation: 10%)



The most significant pressures affecting the abundance of each population

Grey seal	Ringed seal – Northern pop.	Ringed seal – Southern pop.	Harbour seal - Kattegat	Harbour seal – Southern Baltic	Harbour porpoise – Western Baltic & Baltic Proper
<ol style="list-style-type: none"> 1. Bycatch in fishing gears 2. Organohalogen pollution 3. Extraction of fish (includes prey depletion) 	<ol style="list-style-type: none"> 1. Bycatch in fishing gears 2. Organohalogen pollution 3. Bycatch in ghost nets 	<ol style="list-style-type: none"> 1. Bycatch in fishing gears 2. Continuous underwater noise 3. Organohalogen pollution 	<ol style="list-style-type: none"> 1. Species disturbance or displacement by human presence 2. Extraction of fish (includes prey depletion) 3. Intentional killing 	<ol style="list-style-type: none"> 1. Species disturbance or displacement by human presence 2. Bycatch in fishing gears 3. Impulsive underwater noise 	<ol style="list-style-type: none"> 1. Bycatch in fishing gears 2. Impulsive underwater noise 3. Continuous underwater noise



Projected reductions in intentional killing of seals

Grey seal	Ringed seal	Harbour seal
Very low (0 – 5%)	Low (0 – 10%)	Low (0 – 10%)

The most effective measure types to reduce intentional killing of seals

Activity: Hunting and population control
Measures against illegal killing of seals
Killing ban for populations below Limit Reference Level (LRL); above LRL licences are needed
National management plans for seals

Changes in pressure inputs result from existing measures and changes in human activities