Ship noise and Good Environmental Status (GES)

WP7 GES ONLINE TOOL

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What is Good Environmental Status (GES)?

Marine Strategy Framework Directive:

"Introduction of ... underwater noise, is at levels that do not adversely affect the marine environment"





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HELCOM BalticBoost workshop report (2016):

- Noise levels should not affect the energy budget nor breeding to a degree likely to affect the population significantly => <u>Disturbance/displacement</u>
- Noise should not be at levels that induce masking leading to significant negative change in population growth rate => Interference with communication





Disturbance and GES Physiological Change Heart rate Respiration SOUND Vital Rates Frequency Exposure Health Duration Survival to stressor Eneraetic status I evel fecundity Source Duty cycle 2 BEHAVIOR **Behaviour Change** + + +CHANGE Time budget Orientation Breathing Energy intake LIFE FUNCTION Vocalization 3 Energy expenditure IMMEDIATELY Diving 0 AFFECTED Resting Survival Mother-infant spatial-Migration relationships Feeding Population consequences of Disturbance (PCoD) VITAL RATES Avoidance Breeding Stage specific Nurturing Pirotta et al. (2018) Survival Response to + +Maturation predator Reproduction POPULATION EFFECT

Population growth rate

Population structure Transient dynamics

Sensitivity Elasticity Extinction probability

Population consequences of Acoustic Disturbance (PCAD) Natl. Res. Council (2005)

- Principles behind impact well ۲ known
- Some work remains before • frameworks are operational





Population

dynamics

Disturbance and GES

Habitat quality paradox:

If the reward is high and the risk low, habituation will happen There is more to habitat quality than noise





















Masking is natural

- Weather
- Other animals
- Own species!







Masking is natural

- Masking in itself is not the problem
- Too much masking, too often, is a problem
- Masking is linked to signal-to-noise ratio => Habituation is not possible







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Assessing GES

126 Hz : % of time > 20 dB dominance over instantaneous wind

Area below curve useful index of GES: Dominance increases -> index increases Affected area increases -> index increases

62

60

58

54

52

50

-5

atitude (degrees north)

NOR

NNS

0

5



MRU pressure curves







Pointer

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A framework for a fully operational joint monitoring programme for ambient noise in the North

Sea.

Browsing maps and collected data Download maps and source data files Combine maps to calculate GES Tool outputs



Data Files

Search and download the source data files



Maps and Layers

View all the input sound and habitat maps



GES Calculator Tool

View and calculate the Good Environment Strategy tool

Interreg

North Sea Region

European Regional Development Fund EUROPEAN UNION

Jomopans

