



Universiteit
Leiden
The Netherlands

Sound investigation: effects of noise on marine animals across trophic levels

Hubert, J.

Citation

Hubert, J. (2021, September 9). *Sound investigation: effects of noise on marine animals across trophic levels*. Retrieved from <https://hdl.handle.net/1887/3209242>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3209242>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <https://hdl.handle.net/1887/3209242> holds various files of this Leiden University dissertation.

Author: Hubert, J.

Title: Sound investigation: effects of noise on marine animals across trophic levels

Issue Date: 2021-09-09

Sound Investigation

Effects of noise on marine animals
across trophic levels

Jeroen Hubert

Hubert, Jeroen

Sound Investigation:

Effects of noise on marine animals across trophic levels

PhD thesis, Leiden University, the Netherlands

An electronic version of this thesis can be downloaded from:

openaccess.leidenuniv.nl

Cover design by Lucas Hubert

Edited by Jeroen Hubert

Printed by Ridderprint, Ridderkerk

© 2021

Sound Investigation
Effects of noise on marine animals across trophic levels

Proefschrift

ter verkrijging van
de graad van doctor aan de Universiteit Leiden,
op gezag van rector magnificus prof.dr.ir. H. Bijl,
volgens besluit van het college voor promoties
te verdedigen op donderdag 9 september 2021
klokke 11:15 uur

door

Jeroen Hubert
geboren te Zoetermeer, Nederland
in 1991

Promotores

Prof. dr. Carel J. ten Cate

Dr. Hans W. Slabbekoorn

Promotiecommissie

Prof. dr. Gilles P. van Wezel (voorzitter)

Prof. dr. Annemarie H. Meijer (secretaris)

Prof. dr. Martina G. Vijver (Leiden University)

Dr. Lise Doksæter Sivle (Institute of Marine Research, Norway)

Dr. Hansjoerg P. Kunc (Queen's University of Belfast, United Kingdom)

Table of Contents

Chapter 1	General introduction	7
Chapter 2	Effects of seismic airgun playbacks on swimming patterns and behavioural states of Atlantic cod in a net pen	19
Chapter 3	Exploring effects of sound on the time budget of fishes: An experimental approach with captive cod	45
Chapter 4	The role of ambient sound levels, signal-to-noise ratio, and stimulus pulse rate on behavioural disturbance of seabass in a net pen	59
Chapter 5	Effects of broadband sound exposure on the interaction between foraging crab and shrimp – A field study	81
Chapter 6	No negative effects of boat sound playbacks on olfactory-mediated food finding behaviour of shore crabs in a T-maze	99
Chapter 7	Blue mussels habituate to repeated sound exposures and respond just to the on-set of fast pulse trains	119
Chapter 8	Thesis summary & General discussion	143
	Nederlandse samenvatting	157
	Acknowledgements	165
	Curriculum Vitae	169
	Publications	173

