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Offshore wind farm decommissioning and its impacts on marine biodiversity and social acceptance

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INTRODUCTION

Offshore wind farms (OWF) decommissioning, potentially includes a broad range of options from “remove all” to “leave in place” with different impacts on biodiversity. Throughout the lifetime of an offshore wind farm, the ecosystem around the wind farm structures often transforms into a more species rich and diverse ecosystem as the wind farm foundations act as artificial reefs.

In this study, we...

1. investigate the impacts on marine biodiversity from different decommissioning options and develop a life cycle impact assessment method to quantify such impacts.
2. examine the social perception of decommissioning options, to ensure transparency and acceptance from society.

LIFE CYCLE IMPACT ASSESSMENT

Life Cycle Impact Assessment (LCIA) offers a quantitative and transparent approach to impact assessment, but does not cover marine biodiversity impacts adequately. Based on a systematic literature review, we identified links between impacts on marine biodiversity and decommissioning activities related to offshore wind and oil and gas structures. The links for OWF decommissioning are illustrated as impact pathways below, providing the basis for future LCIA development.

We identified 3 main implications for developing an LCIA method:
1) scarcity of quantitative studies and empirical data
2) inconsistency in baseline definitions
3) inconsistency in biodiversity metrics applied across reviewed studies

Our next steps in LCIA development:
- Focus on habitat change
- Quantification of impact pathways based on available data
- Covering composition of species as well as number of species

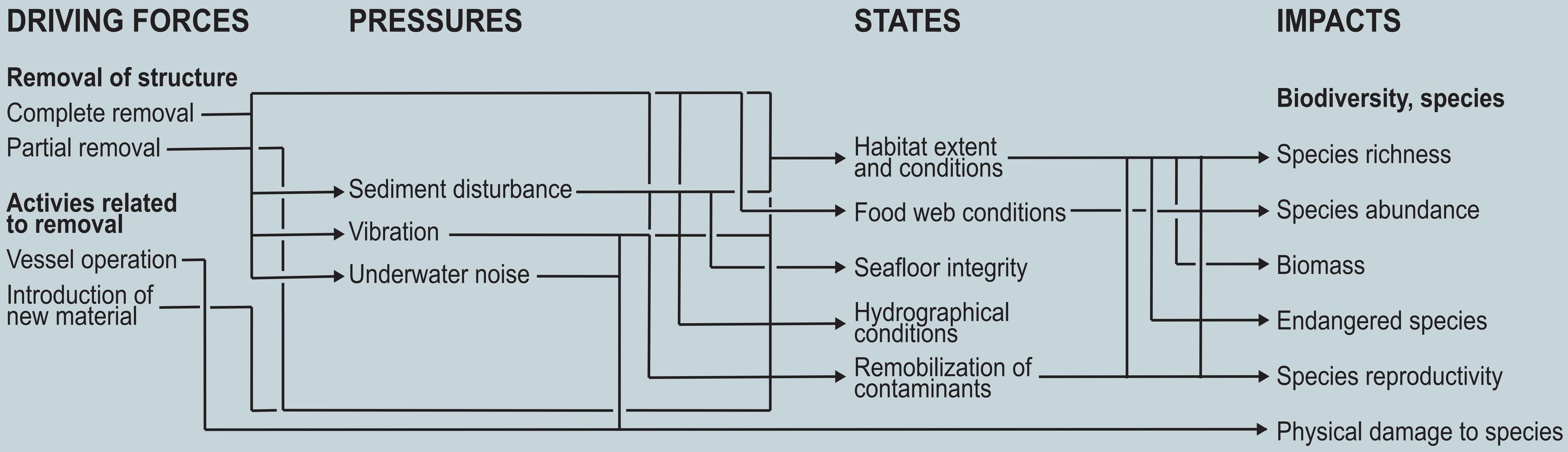

Figure 1 - Impact pathways for offshore wind farm decommissioning and its impacts on marine biodiversity. The pathways were identified through a systematic literature review.

SOCIAL PERCEPTION

To understand the social perception of different decommissioning options, we carried out a survey in the Danish civil society from October to December 2023, and we received around 2300 responses. In the survey, we investigated:
- the view on environmental conditions in the Danish marine areas
- how impacts on biodiversity are weighed compared to climate change impacts
- the perception of different decommissioning options based on illustrations

We also aim at understanding the perception of other stakeholder groups, such as marine experts, NGOs, and authorities.

If you want to participate, please scan the QR code!
You will then be given the same questions as we gave the Danish civil society.

Thank you for your help!

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