Offshore wind renewable energy:

The impact on Harbour Porpoise *Phocoena phocoena*

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Agenda:

- Introductions
- Renewable energy: offshore wind
- Harbour porpoise and offshore wind
- Results: main findings, responses and pressures
- Conclusions and gaps
- Key takeaways

Introductions

Grace Chandler

Giulia Costa-Domingo

Our project:

- **Aim**: Assess the evidence for the impacts of renewable energy on marine migratory species

Help **mitigate the impacts of renewables** on the marine environment

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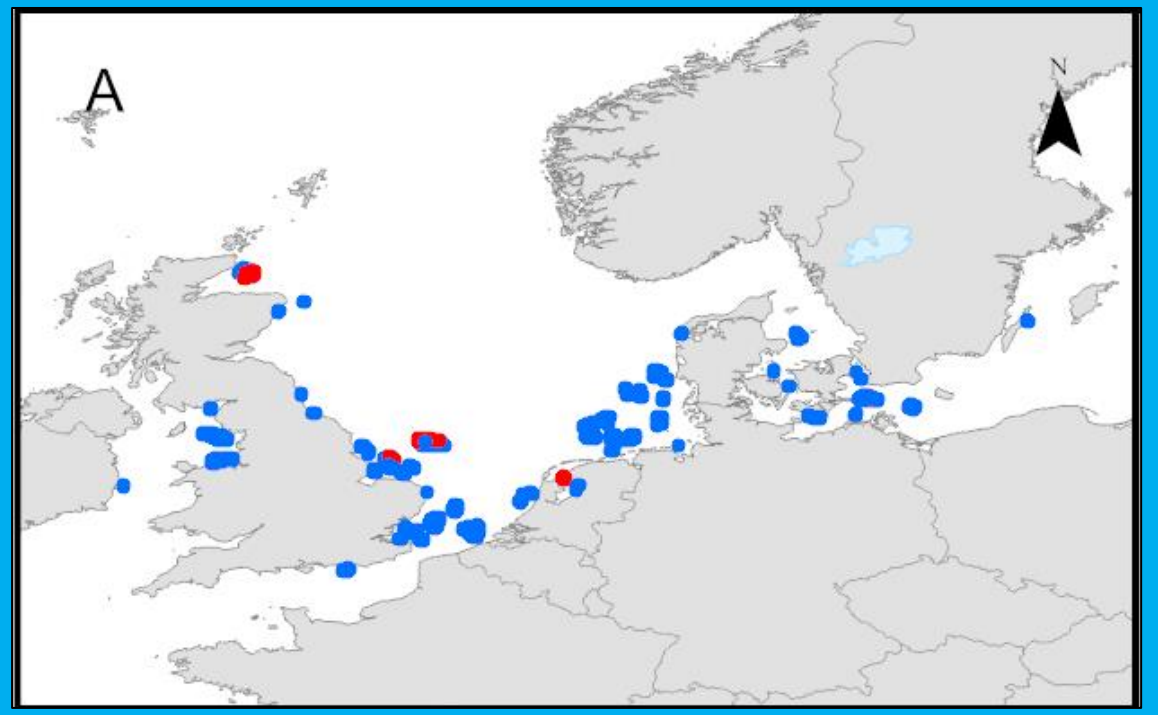
proteus

Offshore wind energy in the North Sea

- Offshore wind energy capacity will increase x6 by 2030
- The North Sea is an important region for offshore wind energy
  - Set to increase x8 by 2050
- Offshore wind development stages:
  - pre-construction → construction → operation → decommissioning
- Offshore wind infrastructure can be fixed or floating



Offshore wind farm development stage:

- Under construction
- Operational

Hoeser, T. and Kuenzer, C. (2022). DeepOWT: A global offshore wind turbine dataset. Zenodo [DeepOWT.geojson (Dataset)], https://doi.org/10.5281/zenodo.5933967.

Base map: United Nations Geospatial, 2023
Coordinate system: Geographic WGS84
Disclaimer: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Offshore wind energy and harbour porpoise

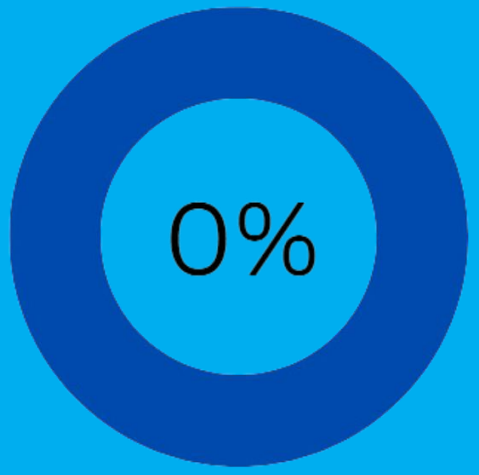
- Harbour porpoise distribution and key areas overlap with offshore wind energy development in the North Sea
- Harbour porpoise are vulnerable to offshore wind developments

What current evidence exists for the potential impacts of offshore wind energy on harbour porpoises?

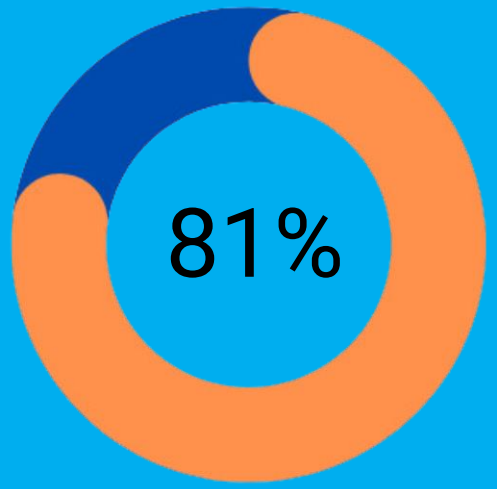
Results: Main findings

- Out of 68 total papers; North sea dominated published research
- **47%** of all papers reviewed were on the Harbour porpoise.
- Observed responses by harbour porpoises were recorded from these papers

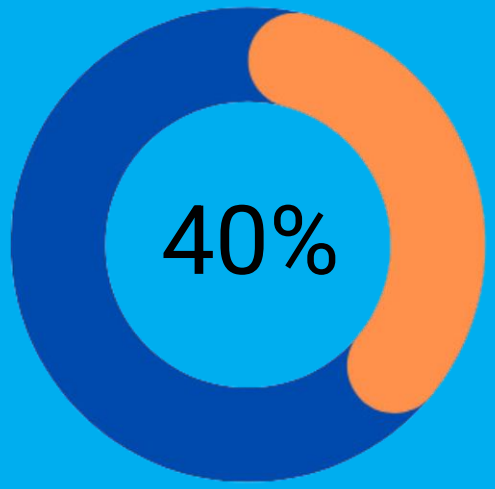
Pre-Construction



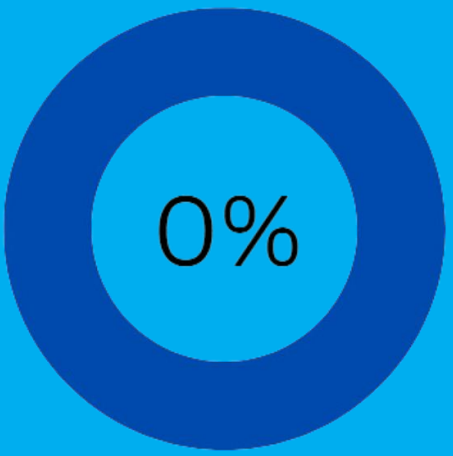
Construction



Operational

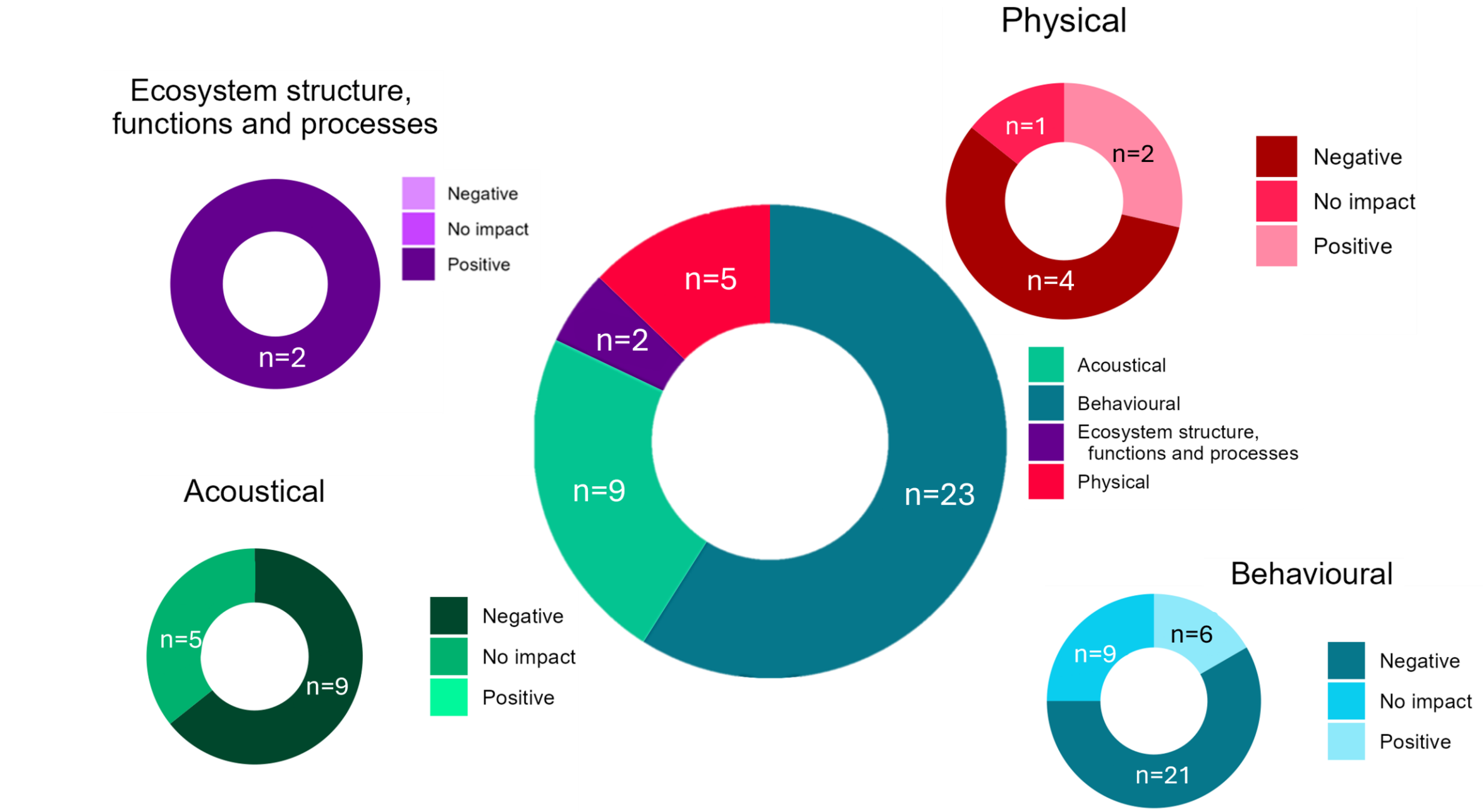


Decommissioning



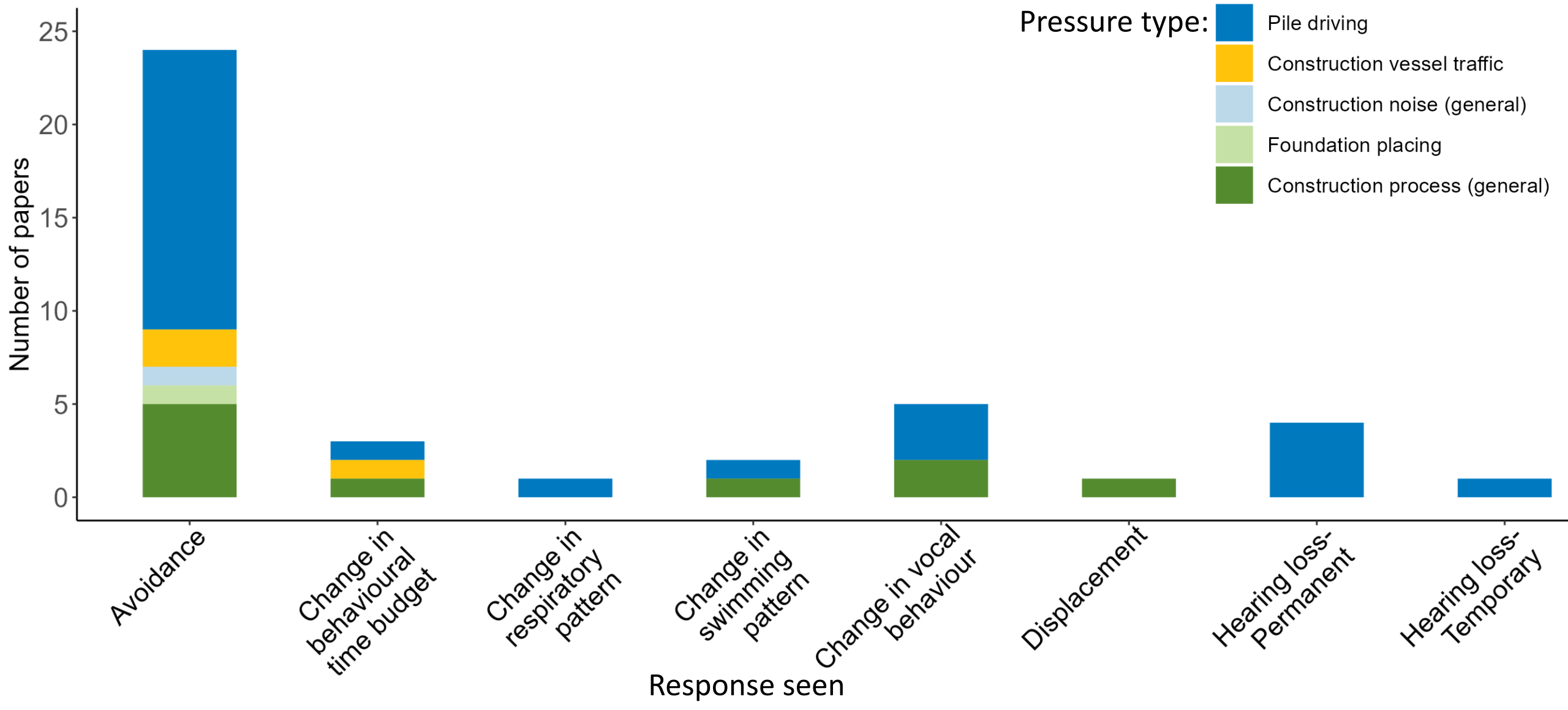
%=Number of papers

Results: Responses from Harbour porpoise



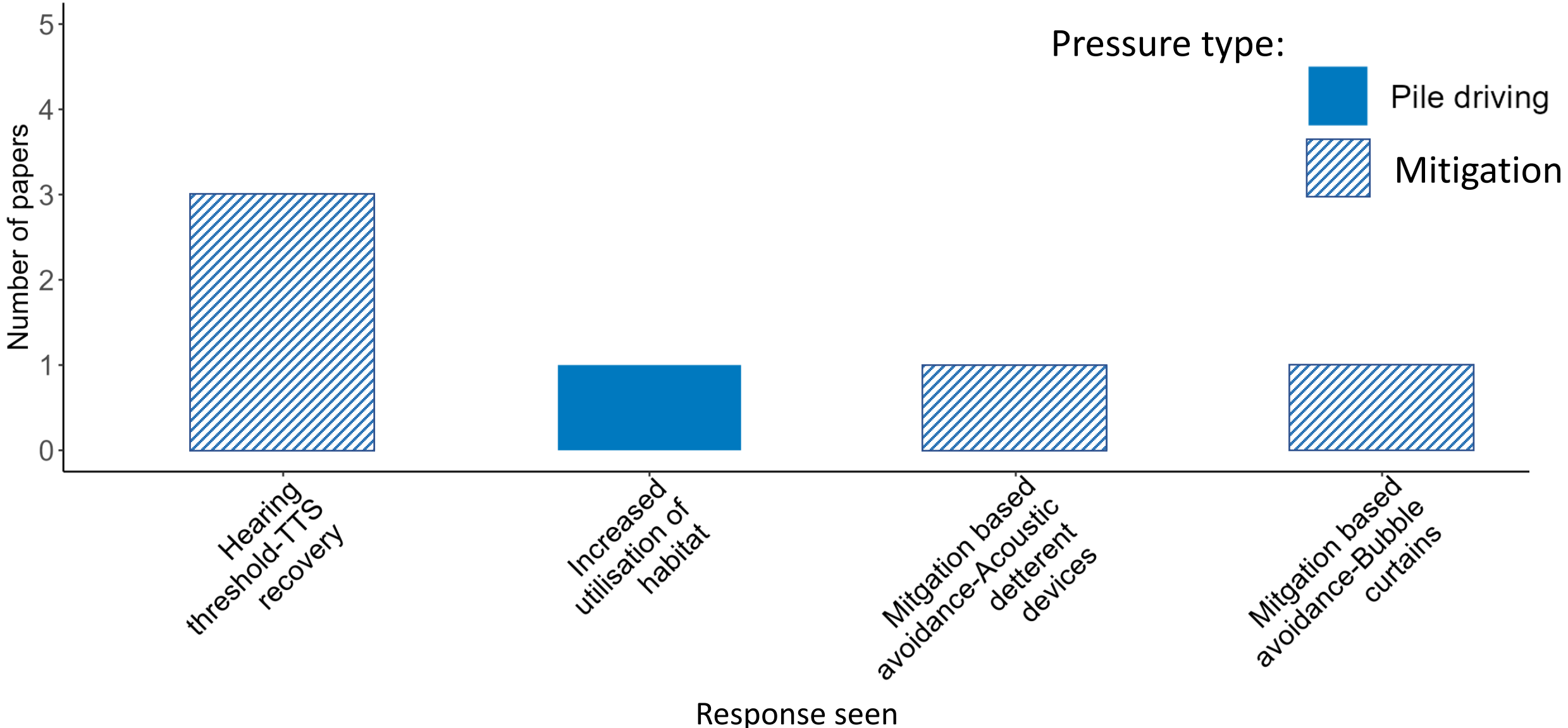
Results: Responses from pressures across OWF development stages

Construction - Negative responses to pressures



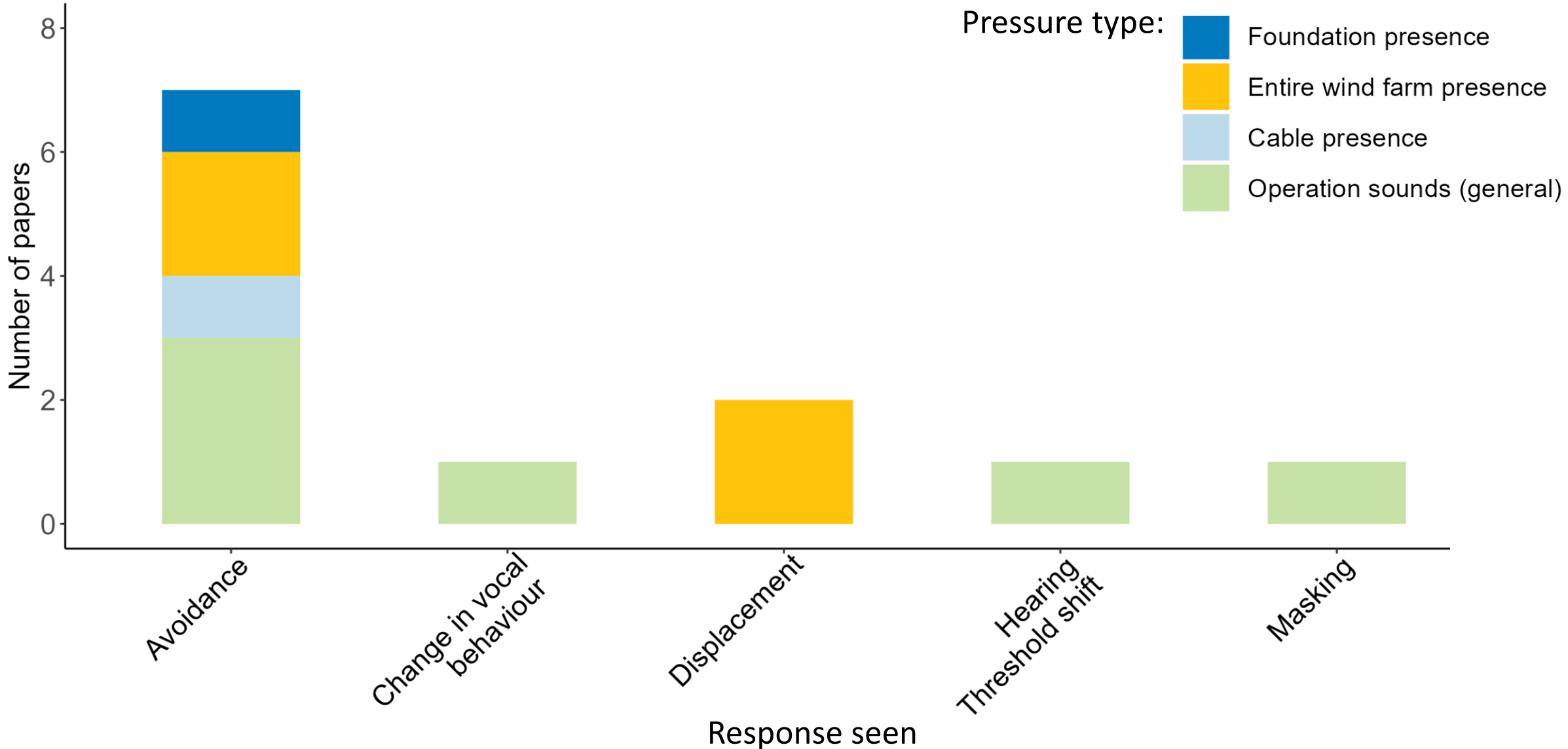
Results: Responses from pressures across OWF development stages

Construction - positive responses to pressures



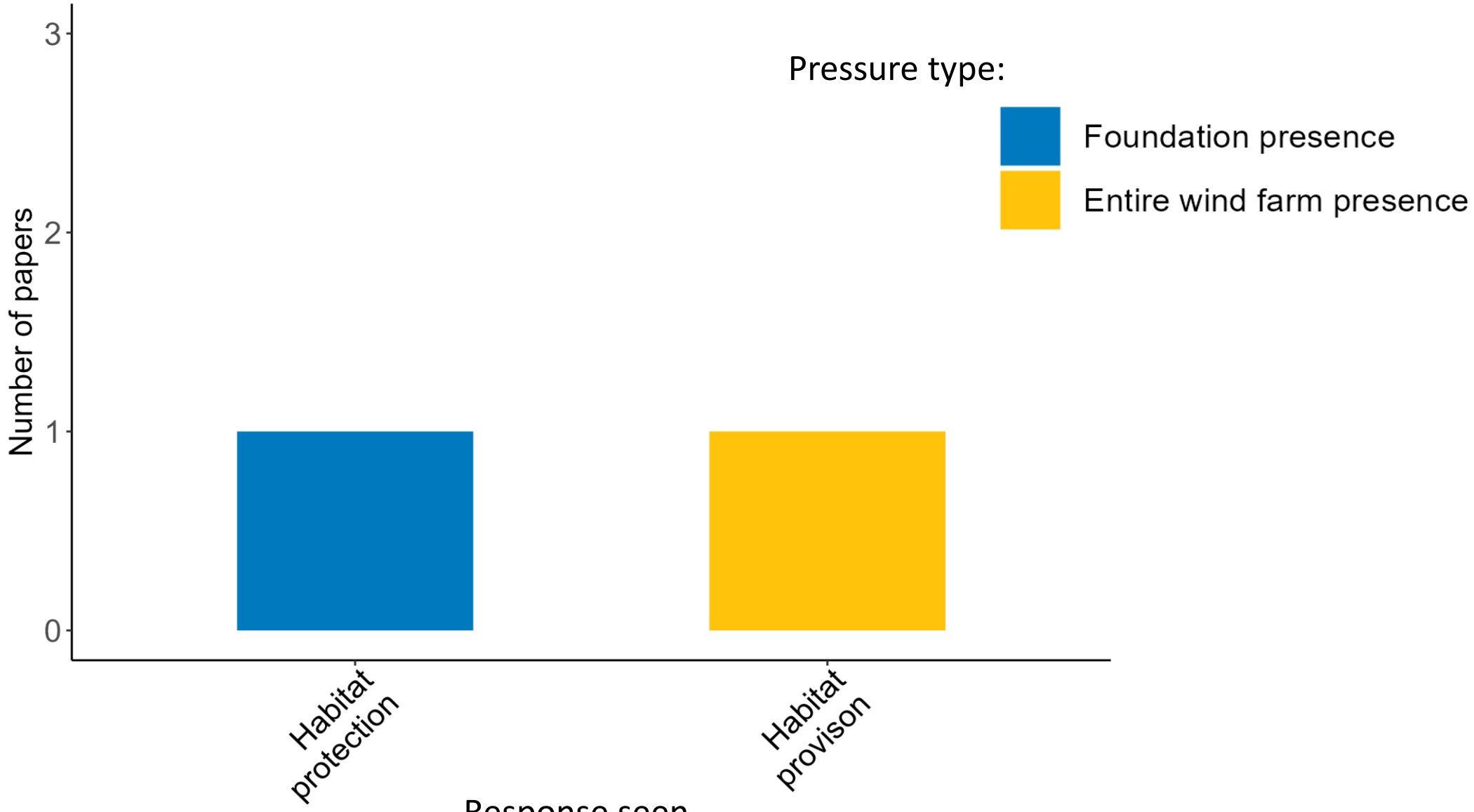
Results: Responses from pressures across OWF development stages

Operation - negative responses to pressures



Results: Responses from pressures across OWF development stages

Operation - positive responses to pressures



Conclusions: Gaps

Responses from other cetaceans:

- No physical injury
- De facto marine protected area
- Migratory routes
- Stress
- A reduction in habitat size, quality or availability

Large scale information gaps:

- Cumulative effects
- Indirect impacts
- Floating wind structures
- Decommissioning stage

Main takeaways

- Offshore wind energy is a rapidly accelerating industry.
- Negative impacts on Harbour porpoise **included avoidance, changes in vocal behaviour** and **hearing loss**.
- A lack of response and research does not equate to no impact.

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