

HARBOUR PORPOISE RESPONSES TO THE INSTALLATION OF MONOPILES WITHOUT NOISE ABATEMENT



PrePARED Output Summary No. 4

Background

Delivery of offshore wind developments must be balanced against the need to minimise disturbance of protected marine mammals from impulsive pile-driving noise.

The management of impulsive noise in the Southern North Sea Special Area of Conservation (SNS SAC) for harbour porpoises uses time-area thresholds to limit the number of days on which activities producing impulsive noise are permitted. Licencing of these activities is underpinned by Effective Deterrent Ranges (EDR), which are used to assess the spatial scale of disturbance from different noise sources.

There are no direct estimates of an EDR for monopiles that are installed without noise abatement systems. Instead, the current EDR for the installation of monopile foundations is 26 km, based on early data from pin-piling which is now recognised to be conservative.

Reducing this conservatism and associated uncertainty over disturbance from monopile installation would ease management constraints that risk delaying delivery of offshore wind in the SNS. Furthermore, this would permit a more robust analysis of the potential costs and benefits of using different mitigation measures to reduce overall disturbance from windfarm construction.

Benhemma-Le Gall, A., et al. (2024). Harbour porpoise responses to the installation of XXL monopiles without noise abatement; implications for noise management in the Southern North Sea. PrePARED Report, No. 004.

Study Aim

To assess the responses of harbour porpoises to pile-driving at the Moray West Offshore Windfarm and directly estimate an EDR for the installation of monopiles without noise abatement.



The objective of PrePARED Report 004 is to provide access to new data on porpoise disturbance ranges from monopile installation, permitting their integration into decision-making and the development of guidance to support delivery of offshore wind projects in UK waters.

Data Collection

The study was carried in 2023 during the installation of the first eighteen 9.5 m and 10 m diameter monopile foundations at Moray West Offshore Windfarm.

Data on changes in porpoise occurrence were collected using an array of 60 echolocation detectors (CPODs) moored up to 33.4 km from the piling vessel.

Data Analyses

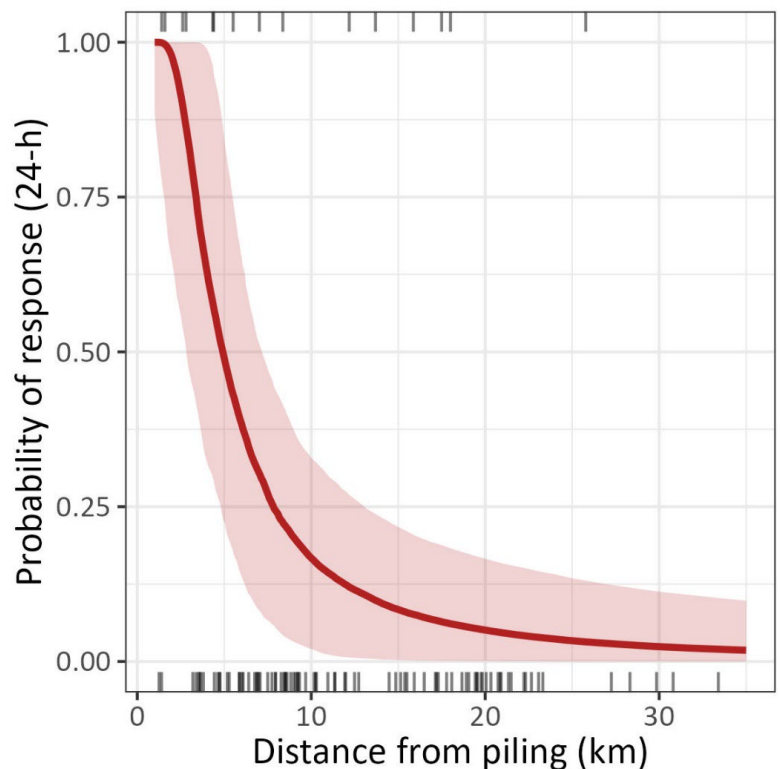
We replicated the approach used by [Graham et al. \(2019\)](#) to estimate a proxy deterrence function curve by modelling changes in harbour porpoise occurrence after piling in relation to distance from pile-driving activities. These analyses focussed on the installation of a sub-set of monopiles where responses in the 24 h after piling could be compared with a matched period three days before piling started.

Using methods developed by [Tyack & Thomas \(2019\)](#), we used this deterrence curve to determine the EDR; essentially the range at which the number of animals exhibiting a response to piling beyond that distance equals the number of animals not responding within that distance

Results

Harbour porpoises were detected every day through the construction period, with no evidence of a large-scale temporal trend in occurrence in response to the piling activity that occurred on 20 days between October and December 2023.

- The response of harbour porpoises over the 24-h following piling events was best explained by distance from and duration of the piling event.
- The proxy deterrence function (shown here for the first two piling events) predicted a $\geq 50\%$ probability of a response at distances up to 5 km.
- Despite noise levels being much higher, the response of porpoises to monopile installation at Moray West was similar to that observed in previous studies of pin-piling at the nearby Beatrice Windfarm.
- Based upon this deterrence function, the EDR for installation of monopiles with no noise abatement was estimated to be 9.4 km.



Conclusions

- Comparison of these results with previous studies highlights the need for broader investigation of existing data to explore how contextual factors such as seasonal variation in foraging, vessel traffic, and use of acoustic deterrent devices shape porpoise responses to received levels of piling noise.
- In the meantime, we suggest that our estimated EDR of < 10 km provides a strong case for reducing the current 26 km EDR for monopiles.