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TITLE: Impacts of offshore wind farm construction on harbour porpoises: acoustic monitoring of echolocation activity using porpoise detectors (T-PODs)

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ABSTRACT:

MEPS Marine Ecology Progress Series Contact the journal Facebook Twitter RSS Mailing List Subscribe to our mailing list via Mailchimp HomeLatest VolumeAbout the JournalEditorsTheme Sections MEPS 321:295-308 (2006) - doi:10.3354/meps321295 Impacts of offshore wind farm construction on harbour porpoises: acoustic monitoring of echolocation activity using porpoise detectors (T-PODs) J. Carstensen^{1,*}, O. D. Henriksen², J. Teilmann¹ ¹National Environmental Research Institute, Denmark, Frederiksborgvej 399, PO Box 358, 4000 Roskilde, Denmark ²Present address: Oluf.dk, Stavnsbjerg Allé 55, 2730 Herlev, Denmark *Email: jac@dmu.dk

ABSTRACT: Offshore wind farming is a new emerging technology in the field of renewable energies. This study investigates the potential impact of the construction of one of the first major, offshore wind farms (>100 MW) on harbour porpoises *Phocoena phocoena* by means of acoustic porpoise detectors (T-PODs) monitoring porpoise echolocation activity. The monitoring program was established as a modified BACI (before, after, control, impact) design, with 6 monitoring stations equally distributed between the impact area and a nearby reference area. Mean waiting times, defined as the period between 2 consecutive encounters of echolocation activity, increased from 6 h in the baseline period to 3 d in the wind farm area during the construction. This increase was 6 times larger than changes observed in the reference area. One specific construction activity, involving the ramming and vibration of steel sheet piles into the seabed, was associated with an additional significant increase in waiting time of 4 to 41 h, in both the construction and reference areas. Assuming that echolocation activity is related to harbour porpoise density, the analysis shows that their habitat-use changed substantially, with the porpoises leaving the construction area of the offshore wind farm. Acoustic monitoring from fixed positions provides data with a high temporal resolution, but low spatial resolution, which can be analysed at a variety of scales, and can be applied to harbour porpoises and other echolocating cetaceans. **KEY WORDS:** Acoustic monitoring · BACI design · Echolocation · Environmental impact · Assessment · Harbour porpoise · Offshore wind farm · Porpoise detector · T-POD

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