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Effects of offshore wind farms on the distribution of plaice (*Pleuronectes platessa*) in the Belgian part of the North Sea

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Abstract

Offshore wind farms (OWFs) are built at high speed in European waters to meet the EU 2050 renewable energy targets. The introduction of hard structures and scour protection layers in sandy environments, such as the Belgian part of the North Sea (BPNS), entails various opportunities for reef-associated fish and invertebrate species. For example, local attraction towards hard substrates and increased local production was found for pouting *Trisopterus luscus* and cod *Gadus morhua* in several OWFs, which was mainly attributed to an increased food availability. For flatfish species, which often prefer soft sediment habitats, our knowledge about their behaviour in relation to wind farms is still scarce. In this study we evaluated the presence of OWFs on the distribution of plaice *Pleuronectes platessa*, a commercially important species in the BPNS, at both large (OWF) and small (turbine) spatial scales. Large scale attraction to the wind farm was investigated by means of a BACI (Before/After-Control/Impact) design, using data collected with a shrimp beam trawl from within and outside two Belgian OWFs. A significant positive wind farm effect was found for C-Power, while no such effect was found for Belwind. The small-scale effect was studied by standardized visual diving censuses carried out close to the wind turbines in Belwind. Using Generalized Linear Models, we showed that the number of plaice was higher on the scour protection layer compared to the surrounding sand in between the turbines, implying an attraction effect of plaice towards the hard substrate around the turbine. Some preliminary telemetry results of tagged plaice individuals (age 2+) in the same OWF also indicate high residency and site fidelity during the summer period. As such, we could conclude that plaice can be attracted to OWFs both at a small and large spatial scale, although this effect differed between wind farms.

Keywords

Offshore wind farms, North Sea, flatfish, attraction