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Co-location of passive gear fisheries in offshore wind farms: Fairytale or future marine spatial planning approach?

Stelzenmüller, V. *, Diekmann, R., Bastardie, F., Schulze, T., Berkenhagen, J., Kloppmann, M., Pogoda, B., Buck, B., Kraus, G.

Worldwide the renewable energy sector is expanding at sea to mitigate increasing energy demands. Together with the general increase of human activities in coastal and offshore marine areas this calls for integrated marine management approaches such as marine spatial planning (MSP). Recently the race for space in heavily used areas such as the North Sea triggered the proposal of co-locating other activities such as aquaculture or fisheries with passive gears in offshore windfarms (OWFs). Using international VMS and logbook data (2010-2012) we assessed for the German EEZ of the North Sea the spatial overlap of OWF areas with activity patterns of international gillnet fleets and potters and analyzed respective landings. Also based on a qualitative stakeholder consultation we concluded on the actual feasibility of co-locating passive gear fisheries in OWF areas. Results revealed spatially consistent fishing effort patterns of international gillnetters and potters in the EEZ and surrounding waters. Further, closing OWF areas for fisheries could result in a loss of up to 50 % of international landings of gillnet fleets operating in the EEZ and targeting cod (*Gadus morhua*), plaice (*Pleuronectes platessa*) and sole (*Solea solea*), whereby effects were found to be largest for the Danish fleet. No spatial overlap was found for the UK potters targeting brown crab (*Cancer pagurus*) in the EEZ. However, to put co-location into MSP practice we identified some key issues: defining the legal base; implementation of safety regulations; delineation of minimum requirements for fishing vessels such as capacities, quotas, technical equipment; implementation of a licensing process; and scoping for financial subsidies to set up business. Finally, to underpin an informed MSP process future research should comprise comprehensive economic viability studies which account for ecological effects of OWFs on target species.

Key-words: fishing effort displacement, gillnet fishery, pots, logbook data, spatial overlap, stakeholder consultation, mapping, mitigation, VMS data

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