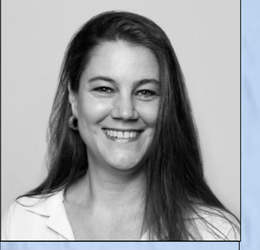

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Fishing exclusion in offshore windfarms and its effects on the marine environment

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Introduction

In Germany, during the operational phase of an offshore wind farm, there is currently no active or passive fishing within the operational area nor is there any active (and partly passive) fishing within a 500 m radius around a wind farm (provided that a safety zone has been set up). Active fishing means the catching of fish and other aquatic animals using actively moving equipment (e.g. trawl nets). Passive fishing means that the fishing equipment is not moved and the animals are caught through their activity (e.g. traps and baskets). Excluding fishing within offshore wind farms can have a positive effect on the protected assets relevant to the German Exclusive Economic Zone (EEZ), i.e. benthic habitats, fish, marine mammals, and seabirds and resting birds (Table 1).

Methods and Results

Based on a literature review, we identified the following:

Main effects of excluding fishing on the marine environment:

- rehabilitation of benthic habitats when active fishing is excluded
- no removal of individuals/overfishing of the target species when active and passive fishing are excluded
- change in food availability (no removal of target species/no discards/no foraging behind trawlers) when active and passive fishing are excluded
- no bycatch when active and passive fishing are excluded

Factors influencing the intensity of the effect:

- relevance of the area
- size of the area
- intensity of fishing effort before fishing exclusion
- shift of fishing effort to other areas
- biology of the species
- abiotic factors

The exclusion of fishing has a positive effect on the seabed and invertebrates in the unfished area, which in turn can also have an impact on fish stocks and higher trophic levels, thus contributing to the recovery of the local ecosystem and can be regarded as an ecosystem enhancement (so-called ‘reserve effect’). In particular, the combination of ‘reserve effect’ and ‘artificial reef effect’ can increase biodiversity and contribute to protecting the oceans. However, there is (still) a lack of further empirical evidence for this hypothesis.

Table 1: Impact of active and passive fisheries on the protected assets in the German Exclusive Economic Zone (EEZ).

Impact factors	Benthic habitats	Fish	Marine Mammals	Migratory birds/ resting birds
Rehabilitation of benthic habitats				
Reduced turbidity				
Reduced acoustical emissions from low-frequency shipping				
Reduced acoustical emissions from high-frequency technical equipment				
Reduced chemical emissions				
Reduced introduction of invasive and pathogenic species				
No removal of individuals/ overfishing				
No bycatch				
Increased prey availability				
Reduced collision with ships				
No foraging behind trawlers				
No food from discarded bycatch				

only active fisheries

active and passive fisheries

Conclusion

To achieve the Kunming-Montreal Global Biodiversity Framework objective, there is a debate about classifying offshore wind farms as so-called "other effective area-based conservation measures" (OECMs), i.e. as areas that contribute to the long-term conservation of biodiversity even outside of protected areas. German offshore wind farms meet the criteria for OECM classification regarding administration/management, whereas the criteria regarding biodiversity may apply and must be proven in individual cases using empirical data. Offshore wind farms located in a degraded area and where the underwater structures could help to restore the degraded ecosystem and increase biodiversity seem to have the greatest potential for recognition as OECMs. Recognition of offshore wind farms as OECMs requires targeted monitoring at multiple sites and over longer periods of time to increase the reliability of the predicted/determined trends (so-called case-by-case assessment).

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