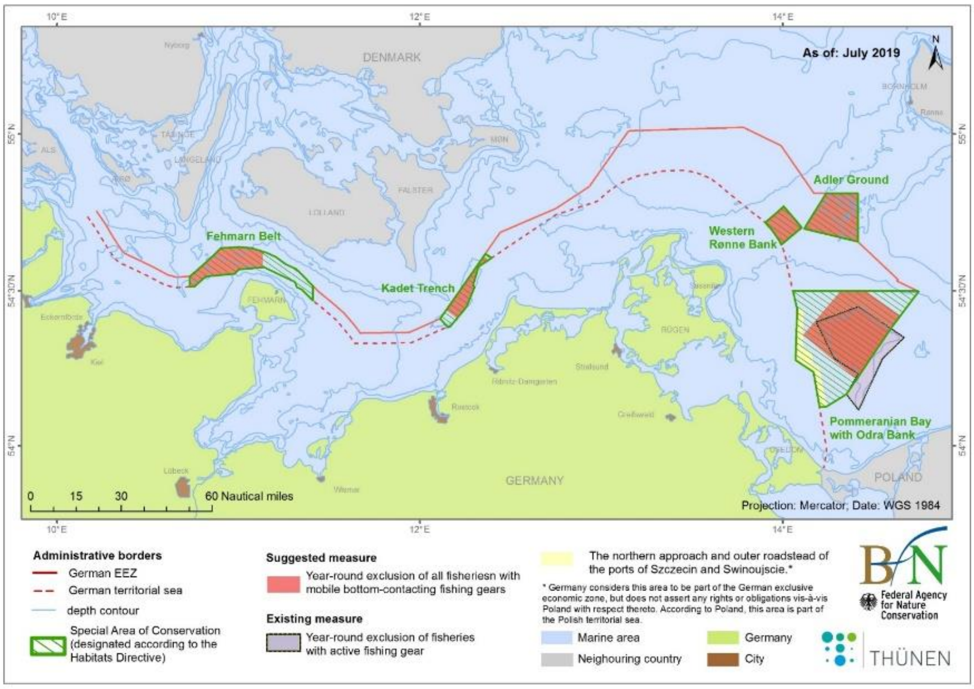
MGF
Ostsee

Exclusion of mobile bottom-contact fishing in Marine Protected Areas of the German EEZ of the Baltic Sea

Background

Marine Protected Areas (MPAs) are intended to maintain biodiversity, diverse ecosystem functions & achieve good environmental status according to the Marine Strategy Framework Directive (MSFD). However, mobile bottom fishing (MGF) still takes place in the MPAs of the German Exclusive Economic Zone (EEZ) & its negative impact on marine sediments are documented worldwide. At present, knowledge about effects of MGF on the biodiversity & sediment functions of sandy & muddy sediment areas in the Baltic Sea is scarce. The impact depends on multiple factors as e.g.: gear size, sediment type & structure of the benthic community.

The plan to exclude MGF in parts of the MPAs in the near future provides a unique opportunity to study the concrete impact of MGF & the effects whether and how ecosystems regenerate after fisheries exclusion.



(1) Marine Protected Areas (MPAs) within the German EEZ of the Baltic Sea. Study areas of MGF-Ostsee are within the MPAs Fehmarn Belt, Rönne Bank & Odra Bank.

Approaches and Objectives

(1) Suitable areas inside & outside (=reference) the MPAs were identified that have similar physico-chemical characteristics & are affected by comparable MGF-intensity. Those areas are a basis for the assessment of the current status of the MPAs & future developments after fishery exclusion

(2) A complete survey of the entire benthic communities, from microorganisms to demersal fish, provides snapshots of the total benthic biodiversity. Sediment properties, biogeochemistry & sediment-water interactions, will also be measured. Annual assessments will show if and how the benthic ecosystems change after fisheries are excluded

(3) Experimental trawl surveys will be conducted in nearshore areas to assess the short-term effects of MGF

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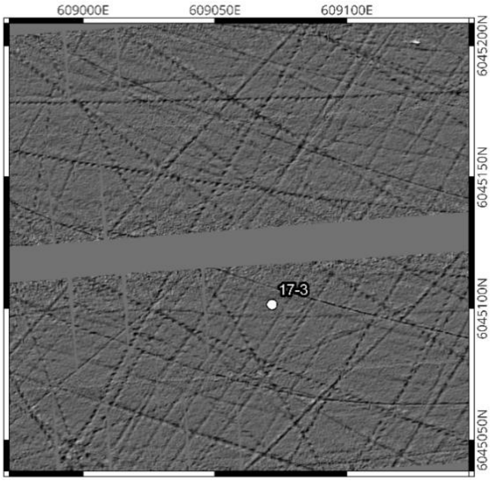
Preliminary results from MGF-Ostsee phase I (2020-2023) & Outlook

1. First complete survey of the benthic food web & the associated sediment functions revealed:

→ MPAs in the Baltic Sea represent strikingly different communities & food webs, probably due to differences in salinity & sediment properties
→ No or only minor differences were found between areas inside & outside the MPAs with respect to benthic biodiversity & sediment functions
→ Geoacoustic surveys of the sea bottom floor can be used to assess ongoing trawling activity by quantifications of trawl marks (2) .

2. Successful execution of a near-shore trawling experiment:
With the help of several research vessels & one fish trawler the short-term effects of bottom trawling on sediment resuspension & benthic biota could be monitored & quantified (3).



(2) Multibeam-echosounder visulisation of trawl marks to assess the ongoing trawling intensity (Schönke et al. 2022, https://doi.org/10.3390/rs14122782).

Scheme of trawling experiment, involving research vessel for assessing short-term impacts of trawling activity.

Outlook

In the 2nd phase of MGF-Baltic Sea, the tested techniques will be used to monitor the development of benthic ecosystems after exclusion of MGF. In addition, the development of new non-invasive monitoring tools & indicators for an efficient assessment of the impact of MGF is in the foreground. The knowledge gained from this project is to be translated into concrete recommendations for actions for the sustainable management of marine protected areas in the Baltic Sea & ecosystem-compatible fisheries.

Consortium

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