

## Fishing for seafloor sustainability: navigating the impact of Belgian bottom trawling on benthic habitats using an integrative approach (Benthis Nationaal 2)

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The Belgian sea fishery transitioned from the exploitation of sprat and herring in the 1970s to its current focus on bottom trawling (81% of the fleet) for sole, plaice and shrimp. Ecological concerns surrounding beam trawling, a key technique in this demersal fishery, have been raised, particularly regarding its impact on the benthic habitat due to gear penetration of the seafloor. It has been shown that bottom trawling leads to a reduction in benthic biomass, diversity, and species body size, and alters the functional traits of the community, with varying effects across gear types and habitats. Therefore, managing and assessing the health status of the seafloor ecosystem is an essential part of the EU conservation policy (E.g. EU action plan on ban of bottom trawling, EU biodiversity strategy, the Marine Strategy Framework Directive) Consequently, research for understanding the extent of beam trawling's impacts on the seabed is crucial.

To comprehensively evaluate bottom trawling's impact on the seafloor, two major groups of benthic indicators were developed: (1) "risk" indicators (e.g. ICES-FBIT and OSPAR BH3) which estimate potential effects through modelling and (2) "state" indicators which are used to judge the actual benthic community state based on monitoring data. While these indicators provide valuable insights into the state and ecological integrity of the seafloor, caution is warranted. Notably, one indicator doesn't capture all ecosystem responses, thus the use of multiple indicators is encouraged. Additionally, indicator selection could influence the outcome of the analysis, potentially leading to different management strategies being set in place. Hence, appropriate indicator comparability research is needed for selecting the most suitable set of indicators for assessing fisheries' impact.

In our ongoing study, we propose a novel approach to enhance the sustainability of bottom trawling by integrating benthic indicators into a sensitivity map for real-time onboard decision-making. We aim to identify the most comprehensive suite of parameters which represent the state and sensitivity of benthic habitats through the analysis of multiple indicators. A preliminary comparison between OSPAR and ICES FBIT-based benthic habitat sensitivity for some regions relevant to Belgian fishery revealed a lack of correlation between both sensitivity classifications. This outcome doesn't imply the inaccuracy of either method but underscores the importance of a precautionary approach when using these methods interchangeably. Additionally, this finding emphasizes the need for further comparisons across multiple indicators and fishing regions, a crucial next step in our research. Based on these findings, we will select a set of indicators representing different aspects of the benthic habitat in relation to fishing pressure and integrate them into a sensitivity map suitable for onboard purposes. Based on this map, they are informed on which areas (high sensitivity) to avoid to reduce their impact on the seafloor ecosystem. By creating this onboard tool, we aim to encourage the fishing community to make informed, sustainable decisions by themselves.

### Keywords

Benthic Indicators; Marine Strategy Framework Directive; Bottom Trawling; Seafloor; Benthic Ecosystems