

Beam trawling, benthic diversity and ecosystem functioning in temperate soft bottom habitats

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(Broad Scale Patterns And Sources Of Variation In Biodiversity-Ecosystem Functioning Relationships)

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This research focuses on degradation of benthic habitats from destructive fishing practices. The ecosystem-engineer *Lanice conchilega* is used as a proxy to test beam-trawl impacts on soft-bottom habitats in the North Sea. Therefore, different experiments were performed, of which the results are presented here. During mesocosm experiments, different beam trawl regimes were simulated in dense *L. conchilega* patches. Mortality was high for all regimes, but only after several subsequent beam-trawl passages; *L. conchilega* is thus relatively resistant to fishing pressure. However, an intertidal one-off experimental trawling showed significant community impacts ($p=0.001$), due to the response of highly dominant species. Analyses of macrofaunal long-term data from a shallow fine-sediment bottom proved these dominant species to be strongly dependent on *L. conchilega*; this tube-builder shapes the community composition by expanding the realized niche of species that otherwise occur in low densities. *In situ* measurements of *Lanice* aggregations (e.g. elevation $p<0.0001$) allowed qualifying them as reefs. Finally, the reef-functions for *Solea solea* are being investigated. The presented work characterizes variation in BEF relationships and improves our capacity to assess consequences of anthropogenic threats.