

Comparing apples and oranges: a statistical approach to compare the impact of active and passive fishing gears on epibenthic communities

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The Belgian marine fishing fleet is dominated by beam trawling, an active fishing method under considerable pressure due to its known ecological effects (fish bycatch, bottom disturbance..). Passive fisheries, such as trammel nets are prompted as gear-related mitigation measures to catch the same commercial target species. But how to judge whether one technique has a higher impact on the epibenthic community than the other? We developed a methodology allowing for a direct comparison of both fishing techniques (both targeting sole), by standardizing discards of epibenthos species per kg marketable sole, based on samples from Belgium and UK waters. We also looked at other potential predictors to explain discard variation, like population size of the discarded species in the fished areas, fishing location, time, depth and sediment type.

More epibenthic species and individuals are discarded per kg sole by beam trawlers (e.g. 50 times more *Liocarcinus holsatus* and 100 times more ophiuroids), while discard rates of *Cancer pagurus* were higher for trammel netters. Discard rates of *C. pagurus* also increased with higher abundance of this species in the fished area, while for *Asterias rubens* no such correlation was found for trammel nets. For trammel nets, higher discard rates were found in deeper waters and outside the major sole fishing season (March-May). Areas with high abundances of non-target species seem to be avoided by commercial beam trawlers.

A DISTLM analysis showed that 42 % of the variation in discard composition could be explained by the combination of gear, depth, latitude and longitude. This means that fishermen themselves can minimize the discard rates by actively using this information to judge where and how to fish or to quit fishing, dependent on the used gear, area and time frame. The potential implications are further discussed in the light of results-based management.

Keywords: Beam trawl, trammel net, epibenthos discards, results-based management