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Evaluating regional designs for the on-shore sampling of North Sea demersal fisheries

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The data collection programmes operating in the North Sea presently reflect the priorities, commitments, and budgetary considerations within individual nations. The combined output of these national schemes is far from optimal for estimating the catch of mixed demersal species in the region. Here we evaluate potential regional designs that differ in stratification and effort allocation. We use a simulation model to mimic the on-shore sampling of species from individual fishing trips, the data sampled being the collated logbook and sales note data provided by Belgium, Denmark, England, France, Germany, Netherlands, Scotland and Sweden. We replicate two-stage sample selection involving firstly the arrival location and date (“harbour-days”), and secondly the voyage. We estimate total landed tonnages, by species and by country, as a proxy for the age distributions and length distributions that are, in reality, collected. The designs evaluated included stratification by country with the current national effort allocation, a regional major & minor port stratification, and a within country major & minor port stratification; the present sampling effort being reallocated on a regional basis for the latter two designs. Results suggest that the present national designs are less efficient than a simple random sample, and that a country major & minor port design would provide better estimates both for the differing fish species and for individual countries. However such a design would require considerable redistribution in sampling effort between nations, and may be predicated on an ability to undertake on-shore sampling at locations where presently none occurs.

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