Insights in the occurrence of early life stages of sharks and rays in the North Sea area

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Sharks and rays are cartilaginous fish belonging to the class of the Elasmobranchii. As slow-growing species that mature at later ages, they are vulnerable to external pressures such as overfishing. Around ten species of sharks and twelve species of rays and skates are found in the North Sea region. These benthic species are taken as bycatch in demersal fisheries targeting species such as sole (*Solea solea*) and plaice (*Pleuronectes platessa*). Skates are oviparous and deposit their egg cases on different types of substrates. These egg cases are often washed up on the beach and collected during various “citizen science projects” in different countries. However, little is known about the place of deposition of these egg cases, also referred to as the spawning or nursery grounds.

To explore where potential spawning or nursery areas may occur, scientific catch data coming from beam trawl surveys (BTS) from the time period 2004 - 2019 in the North Sea was used. The data from these surveys is freely accessible through DATRAS, the online database of trawl surveys hosted by the International Council for the Exploration of the Sea (ICES). Based on the Belgian and Dutch BTS data, temporal and spatial trends and hotspots in egg case and juvenile counts of different elasmobranch species of the North Sea were investigated. These hotspots can be an indication of a nursery or spawning area of the species.

The results of this study show that juveniles of thornback ray (*Raja clavata*), starry ray (*Amblyraja radiata*) and small-spotted catshark (*Scyliorhinus canicula*) were most abundantly caught during the past 15 years. Juveniles of thornback ray and small-spotted catshark reside mainly in the southern part of the North Sea, in the area of the Thames estuary (ICES rectangle 4c). Starry ray juveniles are mainly caught in the northern ranges of the North Sea (ICES rectangle 4a). Based on the outcomes of this study, sustainable strategies for a better long-term management of these species can be developed.

Keywords: Egg cases; Juveniles; Elasmobranchs; North Sea