

The impact of electrotrawls on marine organisms

Soetaert Maarten^{1,2}, Hans Polet², Annemie Decostere³ and Koen Chiers¹

¹ Department of Pathology, Bacteriology & Poultry Diseases, Faculty of Veterinary Medicine, Ghent University, Salisburylaan 133 Merelbeke, Belgium
E-mail: maarten.soetaert@ugent.be

² Institute for Agricultural and Fisheries Research (ILVO), Animal Sciences - Fisheries, Ankerstraat 1, 8400 Oostende, Belgium

³ Department of Morphology, Faculty of Veterinary Medicine - Ghent University, Salisburylaan 133, Merelbeke, Belgium

Flatfish and shrimp are by far the most targeted marine organisms by the Belgian fishermen and are mainly caught using beam trawls with tickler chains or bobbin ropes. High fuel consumption, seabed disturbance and high discard rates are well-known disadvantages of this fishing technique. These shortcomings are increasingly gaining international public and political attention, especially with the upcoming discard ban in Europe. The most promising alternative fishing technique meeting both the fisherman's aspirations and the need for ecological progress is pulse fishing with electrotrawls. Here, the mechanical stimulation by tickler chains or bobbins is replaced by electrical stimulation resulting in reduced bottom contact, fuel costs and discards. However, several concerns about possible side effects on target and non-target species needed to be addressed before final conclusions could be drawn on the likely ecosystem effects of electrotrawls. Experiments have been carried out to fill the gaps in knowledge. Two vertebrate species (sole & cod) and two invertebrate species (brown shrimp & sandworm) were exposed to a broad range of possible electrical pulse fields, where the different pulse parameters like frequency, field strength, pulse shape, pulse duration and exposure time were varied.

No increased mortality or injuries were found for sole, sandworm or shrimp. The preliminary results for cod showed no mortality, but the occurrence of epileptic seizures and an occasional spinal dislocation were observed. These undesirable effects were related to high energy contents of the pulses. This indicates that roundfish is more susceptible than flatfish or small invertebrates and may be harmed when exposed to strong electric fields. Further research to define the threshold intensity will be done in order to fence off a safe zone for the commercial introduction of this innovative technique.