

21. Electrotrawling for brown shrimp: short-term effects on various adult fish species

Desender Marieke^{1,2}, Chiers Koen³, Verschueren Bart², Polet Hans², Decostere Annemie¹

1. Department of Morphology, Faculty of Veterinary Medicine – Ghent University, Salisburylaan 133, 9820 Merelbeke, Belgium

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

3. Department of Pathology, Bacteriology & Poultry Diseases, Faculty of Veterinary Medicine – Ghent University, Salisburylaan 133, 9820 Merelbeke, Belgium

E-mail: marieke.desender@ugent.be

Pulse trawling is used to a growing extent in the North Sea and considered as one of the most promising alternatives to increase the sustainability of demersal trawl fisheries. The pulse trawl for brown shrimp selectively induces a startle response in shrimp. Consequently other benthic organisms are left untouched and can escape underneath a hovering trawl. Extensive testing of this device revealed a lower discard rate up to 65% and a reduction of seabed contact by 80%. Nevertheless, effects of suchlike electric field on marine organisms are largely unknown. To fill this gap in knowledge that could enable to revalue the standing ban on electric fishing in the EU, plaice, sole, cod, bull-rout, pogge and dragonet, 20 individuals per species, were exposed under laboratory conditions for five seconds to this heterogeneous shrimp pulse. Until 30 minutes after exposure behavioral reactions were recorded. After 24 hours all fish were macroscopically inspected, subsequently necropsied and samples for histological analysis from the gills, liver, spleen, kidney, intestine, heart and dorsal muscle were taken. To investigate possible spinal injuries also X-rays were taken of each fish. No mortality nor spinal injury were observed in all investigated species. Behavioral reactions were variable and species dependent. Round fish species, cod in particular, were mostly excited during and after exposure, displaying more active and fast swimming patterns. The flatfish species showed only minor behavioral reactions, although 15% of the exposed soles swam upwards during exposure. Mild multifocal petechial hemorrhages on the tail were equally present in exposed and control individuals of flatfish. In five exposed animals, two plaices, two soles and one bull-rout, a focal small hemorrhage between muscle fibers was found, which was never encountered in control animals.

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