

22. Electrotrawling for brown shrimp: impact on embryonated eggs, larvae and young juveniles of cod (*Gadus morhua*)

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The application of electric pulse fields in fishing gear is considered to be 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 the shrimps. Other benthic organisms are left untouched and can escape underneath a hovering trawl. Extensive testing of this device in the North Sea revealed a lower discard rate up to 65%, and a reduction of seabed contact by 80%. In addition, exposure and survival experiments seem to indicate that this pulse has no immediate harmful effect on different adult fish and invertebrates. However, the impact on other marine life stages is still unknown. As brown shrimp are caught in coastal zones and estuaries, important nurseries or spawning areas for a wide range of marine species, electrofishing over these grounds could therefore harm embryos, larvae and juveniles. Because cod is considered as a vulnerable species to electrical pulses, experiments were carried out on different developmental stages of this round fish. Three stages of embryonated eggs, four larval stages and one juvenile stage were exposed to a homogeneous worst-case electrical field of 150V.m⁻¹ during five seconds. Survival, injury and development were inspected until two weeks after metamorphosis. No significant survival or hatching differences could be established between control and exposed groups in the egg stages. Also in the juvenile stage, no difference in mortality was observed, as well as in the larvae exposed in the endogenous, mixed and metamorphosing stage. Although in the exogenous larval stage, there was a significant difference with the exposed animals exhibiting a higher mortality rate. To elucidate these findings, a morphological analysis on sampled larvae is on-going focussing on yolk resorption, size and possible deformations.

Keywords: Pulse fishing, life stages, survival, development

Acknowledgments: The research leading to these results has received funding and support from the Agency for Innovation by Science and Technology in Flanders (IWT), The European fisheries fund (EFF) and the The Norwegian Institute of Food, Fisheries and Aquaculture Research (NOFIMA).