

## Caught on the flip-side: Effects of catch composition on the fate of European plaice (*Pleuronectes platessa*) discarded from Belgian beam trawlers

Goley Joanna<sup>1,2</sup>, Uhlmann Sebastian<sup>3</sup>, Bart Ampe<sup>3</sup>, Esther Savina<sup>4</sup>, Broadhurst Matt K.<sup>4</sup> and Hans Polet<sup>3</sup>

<sup>1</sup> Vrije Universiteit Brussel (VUB), Pleinlaan 2, 1050 Elsene, Belgium  
E-mail: Joanna.goley@vliz.be

<sup>2</sup> Flanders Marine Institute (VLIZ), Jacobsenstraat 1, 8400 Oostende, Belgium

<sup>3</sup> Marine Research Area, Animal Sciences Unit, Flanders Research Institute for Agriculture, Fisheries and Food (ILVO), Jacobsenstraat 1, 8400 Oostende, Belgium

<sup>4</sup> Technical University of Denmark, Institute for Aquatic Resources, Section for Fisheries Technology, Willemoesvej 2, 9850 Hirtsha,

This study sought to determine whether the European Union's legislation requiring the use of a 'flip-up' rope on beam trawlers with an engine power output >221-256 kW reduces injury and mortality among discarded European plaice (*Pleuronectes platessa*). The flip-up rope is intended to prevent large stones (>25 cm in diameter) and other unwanted debris from entering the trawl. During eight commercial trips of five Belgian vessels, two scientists monitored 244 codend catches from 197 beam-trawl deployments. They evaluated the reflex responsiveness, injuries, and immediate mortalities of 3,191 European plaice. Of these, 268 specimens were tagged, transferred, and monitored in captivity for at least 21 days. There was a positive association between the total weight of catches and stones in the unwanted catch, head injury and the number of deaths (25%, 17–44%, 95% confidence interval) that were observed as soon as the catch was sorted on deck. Delayed mortality was found to be correlated with injuries, impaired reflexes, and increased seawater temperature. In December 2020, a detailed simultaneous catch comparison was done using two double-rigged beam trawls, one equipped with a flip-up rope and one without. The odds of immediate and delayed mortalities were found to be similar regardless of whether the trawl was equipped with a flip-up rope (odds ratio of 1.19 [0.90-1.97] and 1.22 [0.81-3.02] for the two trips with immediate mortality, and 1.03 [0.52-2.11] for the trip with delayed mortality). To reduce the injury and mortality of discarded plaice, it is necessary to both reduce catch weights and eliminate stones, and thus improve the effectiveness of the legislated flip-up rope.

### Keywords

Fisheries; Fishing Gear; Fisheries Survival; Discards; European Union; Responsible Fisheries