

## An overview of the hooking mortality of elasmobranchs caught in a swordfish pelagic longline fishery in the Atlantic Ocean



Hooking (or “at-haulback”) fishing mortality was analysed in elasmobranchs captured by Portuguese longliners targeting swordfish in the Atlantic Ocean. Information was collected by on-board fishery observers who monitored 834 longline fishing sets between August 2008 and December 2011, and recorded information on 36 067 elasmobranch specimens from 21 different taxa. The hooking mortality proportions were species-specific, with some species having relatively high percentages of live specimens at time of haulback (e.g., blue shark, crocodile shark, pelagic stingray, manta, devil and eagle rays), while others had higher percentages of dead specimens (e.g., smooth hammerhead, silky shark, bigeye thresher). For the most captured species (*Prionace glauca*, *Pseudocarcharias kamoharai*, *Isurus oxyrinchus* and *Alopias superciliosus*), logistic generalized linear models (GLMs) were carried out to compare the mortality rates between sexes, specimen sizes and the regions of operation of the fleet. The sex-specific proportions of hooking mortality were significantly different for blue and crocodile sharks, with the males of both species having higher proportions of hooking mortality than the females. Specimen size was significant for predicting the hooking mortality for blue and shortfin mako sharks: in both cases, the larger specimens had lower odds of dying due to the fishing process. There were differences in the hooking mortality depending on the region of operation of the fleet, but those differences were also species-specific. For blue and crocodile sharks, the hooking mortality was higher in the Equatorial and southern Atlantic areas (when compared to the NE Atlantic region), while the opposite was observed for the shortfin mako, with lower mortality rates in the NE tropical area compared with the other regions. The results presented in this paper can be integrated into future ecological risk assessment analysis for pelagic elasmobranchs. Furthermore, the new information can be used to evaluate the impact of recent recommendations prohibiting the retention of some vulnerable elasmobranch species.

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