

Ship strikes in the north-east Atlantic: identifying hotspots and simulating mitigation measures

Large whales are likely the marine megafauna most at risk from vessel collisions; however, studies often identify areas of greatest risk by calculating two-dimensional overlap metrics, ignoring vertical overlap in the water column. Dive profiles of 21 fin whales instrumented with time-depth recorders in the Azores were used to estimate the proportion of time spent within reach of vessel draughts across the north-east Atlantic. Fin whales were at greater vertical risk at night, with a median dive depth of 5m compared to 12m during daylight hours. When vertical risk was integrated into temporal-spatial variation of vessel characteristics and animal distribution, 972 collisions were estimated to occur annually, of which 641 were likely to be fatal. This is well above the estimated sustainable potential biological removal level of 131 individuals a year in this region. Simulation of potential mitigation measures indicated that re-routeing vessels may be largely infeasible whereas slowdowns may be more practical and effective. However, how such measures would be accepted by the shipping industry remains to be seen. These findings provide a quantitative assessment of ship strike risk and inform mitigation methods for a vulnerable cetacean species, providing an invaluable basis for discussions with environmental managers and maritime authorities.