

## Toothed whale and shark depredation indicators: a case study from La Reunion Island and Seychelles pelagic longline fisheries

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Depredation (damage or removal of fish from fishing gear by predators), raises concerns about conservation, fisheries profitability and stock assessment. There is a lack of knowledge about depredation impacting pelagic longline fisheries, especially in the southwest Indian Ocean (SWIO). Therefore, the development of accurate depredation indicators is needed. In La Reunion and Seychelles, local pelagic longline fisheries targeting swordfish (*Xiphias gladius*) and tuna (*Thunnus* spp.) are affected by toothed whale and shark depredation. Fishery data collected between 2004 and 2015 were considered to estimate depredation indicators. For both fisheries, the Interaction Rate (depredation occurrence) was higher for shark depredation, but when toothed whale depredation occurred, the Depredation Per Unit Effort (number of fish depredated per 1000 hooks) and the Damage Rate (proportion of fish depredated per depredated set) were greater for toothed whale depredated sets. The Seychelles Gross Depredation Rate was 18.3% (9.3% from toothed whales, 8.1% from sharks and 0.9% from both predators). A slight increase of the GDR was observed for La Reunion since 2011, when the local longline fleet concentrated its fishing effort around La Reunion EEZ and the east coast of Madagascar (GDR was 4.1% in 2007-2010 and 4.4% in 2011-2015). Therefore a southward decreasing toothed whale and shark depredation gradient is highlighted in the SWIO. Seychelles depredation levels would be among the highest observed in the world revealing this area as a "hotspot" of interactions between pelagic longline fisheries and toothed whales. Economic losses were estimated from those indicators and from official statistics. 0.09 €/hook and 0.63 €/hook were lost to depredation for La Reunion and Seychelles fleets, respectively. This accounted for 20% and 54% of the landed price per hook. This study enlightens the need of indicators setup to allow a global standardization of depredation rates for comparison purposes between various areas and fisheries.