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Depredation on pelagic longlines in the Indian Ocean: an analysis of historical trends, severity, implications

by

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ABSTRACT

Depredation is a common term for removal or damage of the catch (bait) from fishing gear or cultured animals in stocking facilities due to interaction with predators, mainly marine mammals and elasmobranch. Depredation usually causes (i) economic losses and (ii) non-reporting capture statistics. Most affected by depredation fisheries worldwide are pelagic and bottom longlining. In the Indian Ocean severe losses in the industrial and artisanal longline operations raised concerns on increasing trends of depredation and damage. In this study, we analysed long-term data series (1961-1989) originated from 91 Soviet longline research cruises consisting 4142 positive sets throughout Indian Ocean within a GLM framework. We compare this data with recent dataset from small-scale experimental fishing around Seychelles. We demonstrate an absence of historical trend in depredation suggesting that assumptions of its increasing level worldwide could be related with expansion of longline fisheries and increased encountering rate with cetaceans and sharks. We found that depredation is observed in several 'hotspots' mostly associated with specific features of bottom topography: seamounts, shoals, semi-closed sea areas. These 'hotspots' may represent areas of the higher abundance of particular sharks and fidelity sites for cetaceans. Damage rate caused by cetaceans is low 1.7% of operations, while shark damage is common 26.8%. Cetacean depredation is sporadic but its impact is high: 56% of the total tuna catch in the operations affected. Shark damage was 13% of tuna caught. Cryptic longline fishing mortality for tuna caused by non-reporting of damaged fish could reach 16% in terms of hook rate. Such potential bias should be considered in stock assessment, fisheries statistics and observers programs. Recent fishing operations around Mahe plateau show higher depredation level both for cetaceans (20%) and sharks (51%). GLM analysis demonstrated that deeper longlines reduces the risk of depredation by sharks, while longer soaking period increase risk of depredation.