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DEPREDATION AND INCIDENTAL CATCHES ON LONGLINE FISHERY OF SOUTHERN MOZAMBIQUE

Preliminary information on ecosystem issues based on observer on-board sampling

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ABSTRACT

In this report, the level of depredation on longline fishery of Sothern Mozambique and the level of impacts of fishery itself on sharks, seabirds, marine mammals and turtles were assessed. The report comes as a preliminary result of deployment of observers on board of Mozambique national longline fleet.

Results indicated that depredation was responsible for discarding of about 13% of the total target species caught in longline fishery, which is composed by swordfish, bigeye tuna and yellowfin tuna. Generally it is suspected that sharks are the main group of predators responsible for depredation in southern Mozambique longline fishery. A total of ten shark species were caught during fishing operations, including oceanic whitetip shark, blue shark and dusky shark as the main shark species. In total sharks represented 12 % of the total catch in numbers. Another charismatic species caught during fishing operations were marine turtles. On total it was observed two leatherback turtles and one green turtle giving an estimated bycatch ratio of 0.14 per 1000 hooks.

Assuming that the fishery is on initial phase and due to the temporal constriction of the observations, the findings of this report cannot be assumed as conclusive. There is a need to continue deploying observers in this fishery, which fleet is on growing, to have a better evaluation of associated ecosystem issues.

1. BACKGROUND

As part of the national tuna fishery development plan, two Mozambique flagged longliners (23.3 m LOA) were certificated by IOTC in 2014 and started operating late December off the southern coast of Mozambique. In February 2015 three more vessels with same characteristics were added to fishery, raising the national longline fleet to five vessels. Since April we started deploying observers to collect fishery data, biological data of exploited species and ecosystem data related with the fishery.

Despite Mozambique possess an on-board observer program since the 1980s it only has been carried out in national fleet targeting shallow water shrimps, deep-water shrimps (trawling) and on those for demersal fish (*Semi-industrial linefishing*). All observers are government employers, technicians of Fishery Research Institute, and they have been trained by the institute. In general they have basic levels of literacy but long time of experience as on-board sampling officers (more than 15 years). Most of these observers are above 50 years of age what poses a challenge to IIP in training new people who will answer to future challenges. Most of the skills of Mozambique observers and activities undertaken routinely are related on species identification (catch composition) and collection of biological information (lengths, sex and maturity) of target species. Ecosystem issues like depredation and levels of discards are not well covered by their working routines. However, recently eight of these observers were trained under the SWIOFP project (observer training curse held in South Africa) and have the respective registration and certification as regional observers. This short report focus on ecosystem issues related with the activity of longline fishing in Sothern Mozambique. It comes as a preliminary result of deployment of observers on board of national longline fleet during the second quarter of 2015.

2. OBJECTIVES

The main objectives in this document are to:

- Assess the level of depredation and respective impacts on fishery production.

- Estimate the catch levels of baycatch species, sharks, marine seabirds, mammals and turtles.

3. GENERAL DESCRIPTION OF FISHERY OPERATIONS AND OBSERVER WORK

The national longline fleet is actually composed by five 23, 3 m LOA vessels. Fishing operations took place between 20° S to 26° S and between 35°E to 37°E. Generally the total number of fishing days, per trip, is less than 10 (average of 7 days) and only one longline set is performed daily by vessel. The logline set is composed by 800 -1200 hooks (average 1000) baited with squids and a soaking time of about 7 – 10 hours (time when gear hauling starts subtracted by time when gear setting ends).

Observers deployed in longline tuna fishery were those involved in monitoring of Semi-industrial linefishery and recreation fisheries (other tuna related fisheries). To date, three trips were covered, one trip per month, representing 5-10% of coverage. A total of 460 fish were directly observed in these three trips. Catch composition was assessed both in terms of numbers and weight, by identifying all fish caught at species level (no sub-samples). Species were identified by using a field guide for identification of commercial marine species of Mozambique (Fischer *et. al*, 1990). Depredation episodes were recorded. In some cases the observer recorded the name of suspected group of predator responsible for depredation (sharks, marine mammals or squids), based on fish damage (depredation type) and predator-prey interactions during gear hauling.

4. RESULTS

4.1. Depredation

In the southern Mozambique longline fishery the target species, catch composition is dominated basically by three species, *Xiphias gladius* (swordfish), *Thunnus obesus* (bigeye tuna) and *Thunnus albacares* (yellowfin tuna) (Figure 1). These species represented 70% of the fish caught in numbers (Figure 1) and approximately 85% of total production in weight.

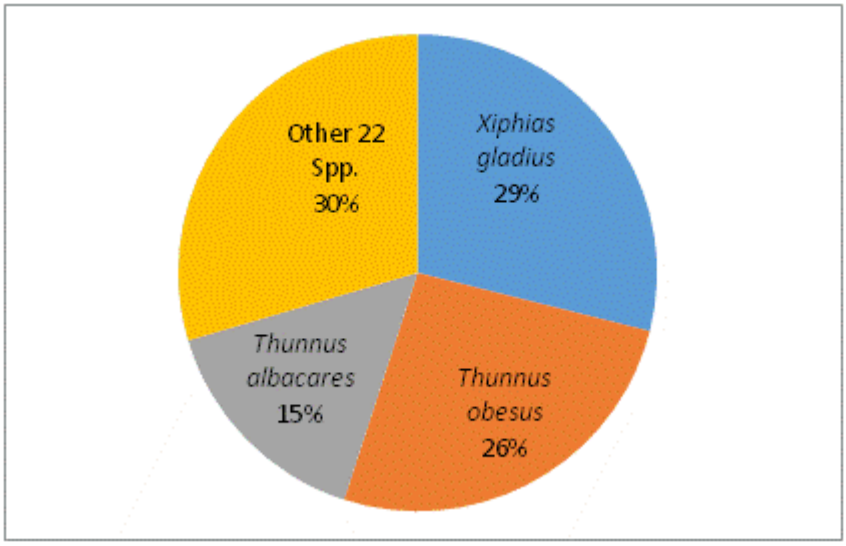

Figure 1. Contributions of swordfish, bigeye and yellowfin tuna to total catch of longline fishery (n=460).

However, form the total catch of these target species about 13% was discarded due depredation. Depredation was specifically responsible of discards of 22% of total number of swordfish, 7% of total yellowfin tuna and 6% of bigeye tuna (figures 2). Appendix 1 provides species composition with retention on discards levels for all species considering the total number of fish observed (n=460).

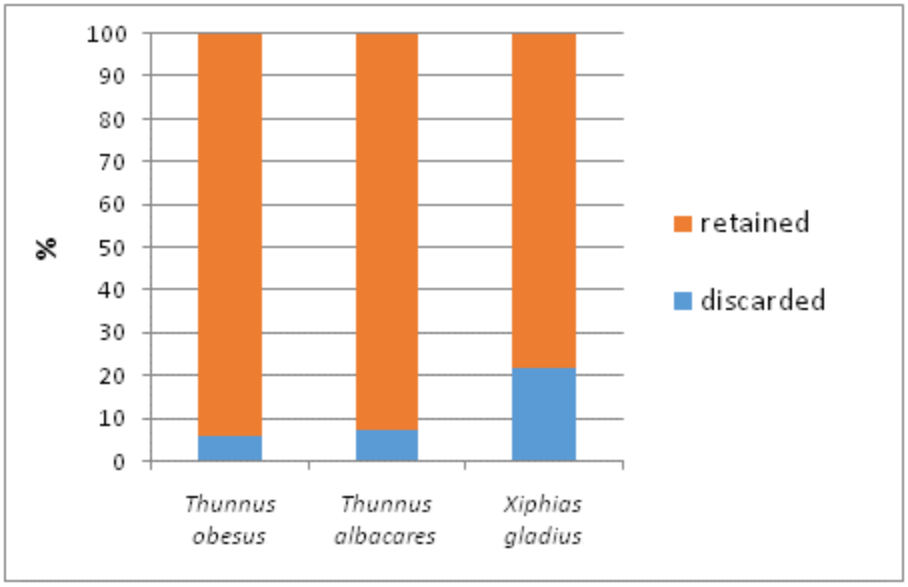

Figure 2. Proportion of fish discarded due depredation and fish retained among the main target species in national logline fishery of southern Mozambique (n=324).

In general, it was suspected that sharks are the main group of predators responsible for depredation in southern Mozambique longline fishery. During the observed period, 12% of the total catch in numbers was composed by shark species (Figure 3). Interactions of tiger sharks and blue shark with the gear during hauling process were directly observed.

Observers related that it is a common practice of vessels to throw heads and visceral material of processed fish directly into to the sea (fishing area) and this probably could be one of the causes that contribute to such levels of depredation reported here. Another cause could be the discarding of depredated fish directly in the fishing are. All these practice seem to attract or concentrate sharks in the fishing area increasing the probability of a depredation episode happening.

4.2. Incidental catches

Sharks represented 12% of total catch being composed mainly by oceanic whitetip shark (*Carcharhinus longimanus*), blue shark (*Prionace glauca*) and dusky shark (*Carcharhinus obseurus*) (Figure 3). Oceanic whitetip shark, blue shark and sandbar shark (*Carcharhinus plumbeus*) were retained while other shark species were released or discarded.

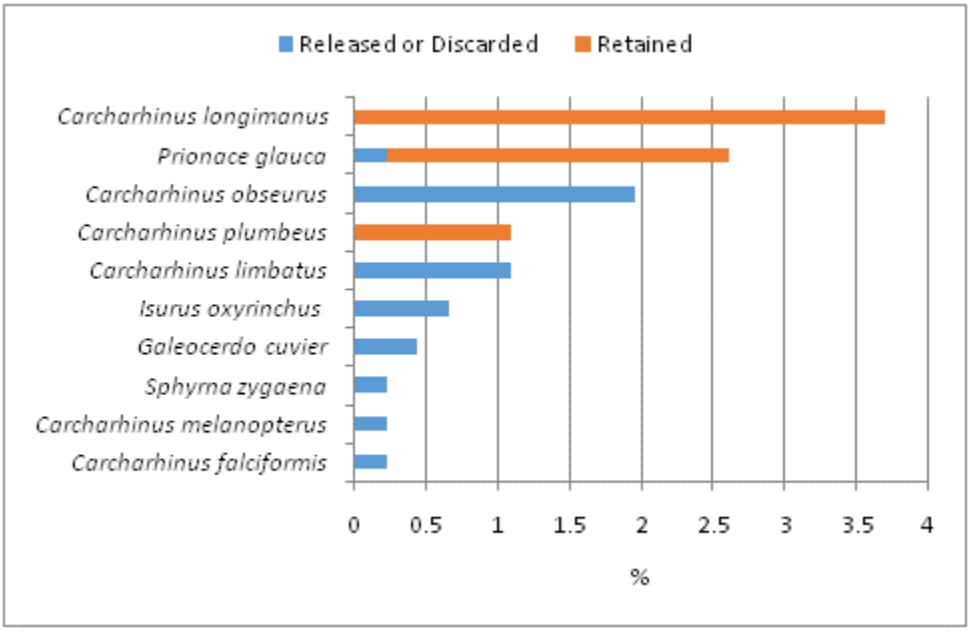

Figure 3. Proportion of sharks species (retained and released) from total catch of logline fleet operating in southern Mozambique.

From the total catch observed (n=460) three marine turtle were found, two leatherback turtles *Dermochelys coriacea* and one green turtle *Chelonia mydas*. This gives an estimated ratio of 0.14 per 1000 hooks deployed (1 marine turtle caught per 7000 hooks). However it is important to note that all turtles captured were released back to the sea alive and in good state.

It was not seen any incidental catch of marine mammals and seabirds during the cumulative 20 longline sets observed. It seems that southern Mozambique longline fishery was no interaction with marine seabirds and mammals in that particular area and period of the year (April-June) as they were not even seen around the fishing area.

5. GENERAL REMARKS

The information of this report is preliminary, as Mozambique longline fishery is on initial phase and also due the temporal constriction of the scientific onboard observations. It is recommended to continue monitoring the ecosystem issues related with this fishery in order to increase the consistency of the information reported and to assess the seasonal variations on the analysed ecosystem issues. Retention of oceanic whitetip shark is prohibited under the resolution 13/06 of IOTC. It seems that captains of Mozambique longline fleet are not aware about this mandatory measure and there is a need to warn the operators about this and other compliancy issues. At the same time, there is a need to continue improving collection of ecosystemic and bycatch data through the scientific observer program. Use of photographic cameras is recommended as it will help on validation of species identification and record of predation marks which ultimately will help to identify the possible predator responsible for each depredation episode observed.

6. LITERATURE CITED

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Appendix I

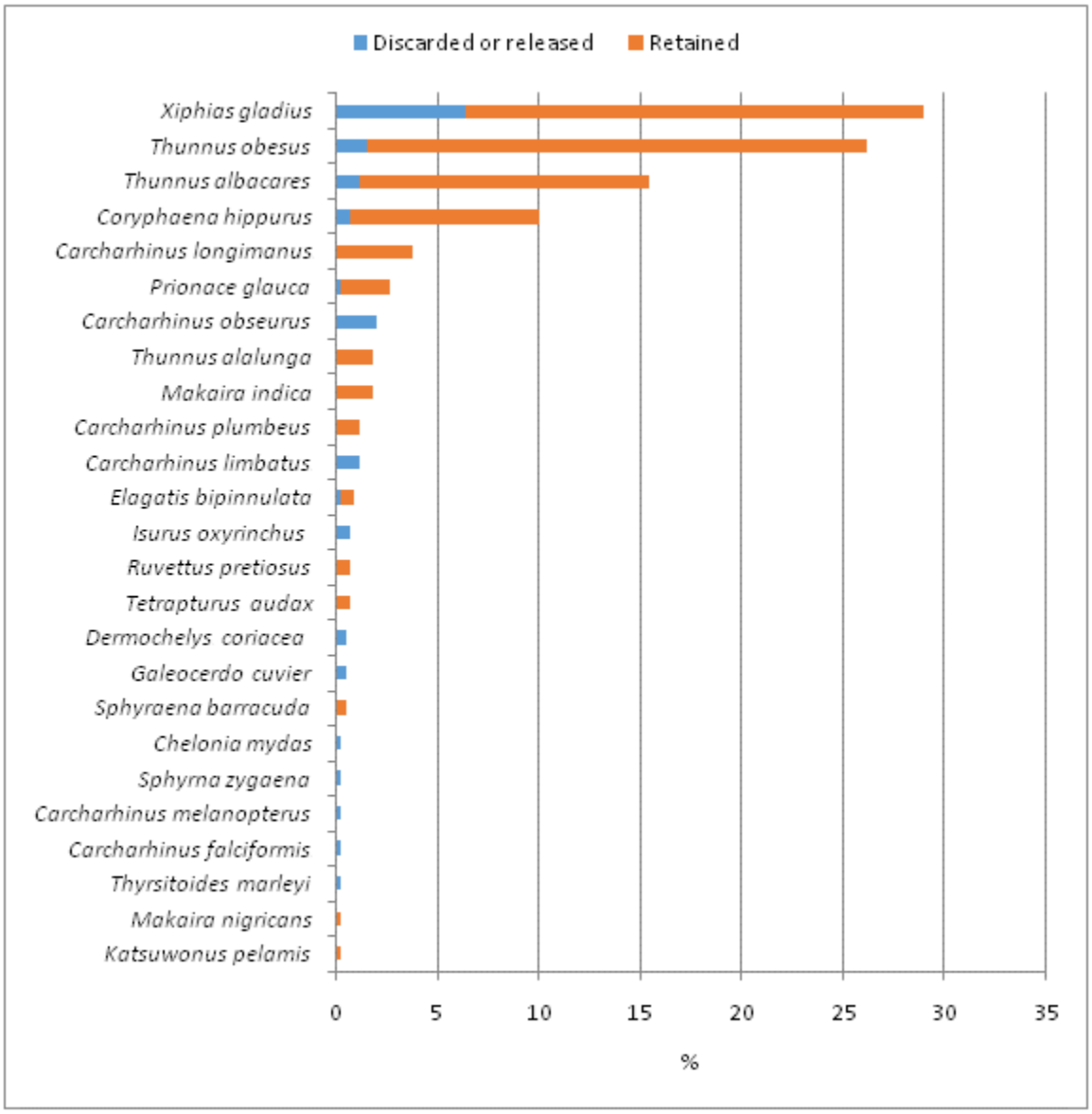

Figure 1. Species composition (in numbers) of Mozambique longline fleet operating in southern Mozambique (n=460).