Calculating bottom fishing impact for trawl and longline gears in SIOFA

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EXECUTIVE SUMMARY

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A bottom fishing impact assessment method was developed for trawl and longline gears in the SIOFA Area. A relative benthic status method was used, considering both the sensitivity of vulnerable marine ecosystems to the effects of bottom fishing, and their potential for recovery.

Preliminary results were presented at the third SIOFA protected areas and ecosystems working group (Mormede 2021). They highlighted the need for more fine-scale information, which was then provided for further analysis. The final BFIA calculation reported here was carried out at a 0.1° resolution south of 20°S (SIOFA Subareas 1 to 7) and 1° resolution north (SIOFA Subarea 8) for both trawl and bottom longline gears.

Results indicate that, at that scale, the cumulative bottom fishing impact of trawl and longline gears on stony corals, Demospongiae and Hexactinellida, and on Anthiparia is expected to range from 0.4% to 1% on average in 2020 in the various SIOFA Subareas and reach up to 13% when not corrected for fishable depth, or 100% when corrected for fishable depths. The SIOFA Subarea most impacted is Subarea 2 followed by Subareas 3a, 3b and 4.

When considering fishable area at the cell level, 48% of Subarea 3b and 45% of Subarea 2 have been fished by trawl and longline gears since 1998 at the 0.1° resolution; and 88% of Subarea 8 has been fished at the 1° resolution. Moreover, the area fished has been expanding steadily between 1998 and 2020. As noted by SC6, this expansion of the SIOFA footprint "could not be solely explained by the addition of data from CCPs that newly acceded to SIOFA in the later years of the study period, as well as the limited availability of historical fishing data." (SIOFA 2021b, paragraph 80).

Sensitivity analyses showed that the two parameters of most influence in the estimation of bottom fishing impact were the size of the cell used for calculation and the inclusion of fishable depth. Further sensitivity analyses showed that at the 0.1° resolution, the VME characteristics (steepness of the stock-recruit curve, sensitivity and recovery parameters) were the most influential parameters in the calculation of bottom fishing impact, followed by the width of the bottom impact of trawl gear.

We recommend:

- That VME characteristics, in particular sensitivity to fishing gear, recovery rates and likely stock recruit relationship be discussed, and values agreed.
- That the actual population status of a range of VMEs in the SIOFA area be calculated once spatial distribution maps are available (an illustration is provided).
- That all future fishing effort be recorded on a haul-by-haul basis, including start and end positions, distance trawled, trawl width and longline length.

1. INTRODUCTION

The objectives of the Southern Indian Ocean Fisheries Agreement (SIOFA, also known as APSOI - Accord relative aux Pèches dans le Sud de l'Océan Indien) are "to ensure the long-term conservation and sustainable use of the fishery resources in the Area through cooperation among the Contracting Parties, and to promote the sustainable development of fisheries in the Area, taking into account the needs of developing States bordering the Area that are Contracting Parties to this Agreement, and in particular the least developed among them and small-island developing States" (www.apsoi.org). The SIOFA Area is depicted in Figure 1. SIOFA has developed a bottom fisheries impact assessment (BFIA) standard consistent with the Food and Agriculture Organisation of the United Nations (FAO) guidelines on bottom fishing (SIOFA 2017). One of the requirements of this standard is the