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**An update on the recent development of IOTC BTH PRM Project**

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**ABSTRACT**

This note provides recent updates on IOTC bigeye thresher shark (*Alopias superciliosus*, BTH) post-release mortality study project (IOTC BTH PRM Project). The objective of the study is to evaluate the efficiency of the IOTC Conservation and Management Measure on non-retention of thresher sharks of the genus *Alopias* (Resolution 12/09). The summary of collective efforts since the 13<sup>th</sup>, 14<sup>th</sup>, 15<sup>th</sup>, and 16<sup>th</sup> IOTC WPEB are presented.

## Introduction

The primary objective of this study is to assess the post-release mortality of bigeye thresher sharks caught and released (in accordance with IOTC CMMs<sup>1</sup>) by the major commercial longline fleets fishing in the IOTC Area of Competence. For details of project development and experimental design please see IOTC-2018-WPEB14-27 and IOTC-2019-WPEB15-16 for details.

The project started in 2017 has represented collaborative efforts of several research institutions working with following fishing fleets (in alphabetic order): China, France, Japan, Portugal, South Africa, and Taiwan, China. On 16 September 2020 Taiwan, China has withdrawn from the project (please contact IOTC Secretariat for further details). For this reason report for WPEB (IOTC-2020-WPEB16-INF1) was also withdrawn from the list of documents presented at WPEB 16 in 2020.

Current IOTC BTH PRM Project collaborators (in alphabetic order): Pascal Bach<sup>(1, 2)</sup>, Sylvain Bonhommeau<sup>(3)</sup>, Rui Coelho<sup>(4)</sup>, Paul DeBruyn<sup>(5)</sup>, Sarah Martin<sup>(5)</sup>, Hilario Murua<sup>(6)</sup>, Stewart Norman<sup>(7)</sup>, Evgeny V. Romanov<sup>(8)</sup> (Project co-ordinator), Philippe S. Sabarros<sup>(1, 2)</sup>, Yasuko Semba<sup>(9)</sup>, Charlene da Silva<sup>(10)</sup>, Jiangfeng Zhu<sup>(12)</sup>

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Past collaborators: Wen-Pei Tsai, National Kaohsiung University of Science and Technology, Taiwan.

## MiniPAT battery issues (repeating from IOTC-2020-WPEB16-INF1)

In February 2020, the tags manufacturer, Wildlife Computer, released a notification: “Increased variability in total transmissions from MiniPATs shipped from mid-2018 through 2019” that concerns reliability of miniPATs fabricated between 2017 and 2019. The notification announced a recall for certain series of non-deployed tags shipped from mid-2018 to late 2019. While IOTC BTH PRM tags were received in April 2018 and were not covered by the recall directly, observed weak performance of certain miniPAT (see section ‘Preliminary results’ below) and further analysis of miniPAT transmissions together with Wildlife Computers engineers indicated the presence of battery problems. Consequently six miniPATs were exchanged for new ones.

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<sup>1</sup> Indian Ocean Tuna Commission Conservation and Management Measure: Resolution 12/09 *On the conservation of thresher sharks (Family Alopiidae) caught in association with fisheries in the IOTC Area of Competence.* <http://www.iotc.org/cmm/resolution-1209-conservation-thresher-sharks-family-alopiidae-caught-association-fisheries-iotc>

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## COVID-19 Effect

The COVID-19 pandemic has heavily affected the project. Placing observers onboard fishing vessels was suspended for variable periods in China, Japan, France, Portugal and South Africa. However, in 2020 Japan arranged the tagging through direct contract with the industry: a person initially trained as observer was recruited by the industry and voluntarily proposed collaborated with NRIFSF to carry out deployment within the IOTC BTH PRM Project. No progress was reported in 2021 by Japan. France and South Africa were able to re-start observers activity in 2020 and continue in 2021.

## Training material

No progress since WPEB16.

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No progress since WPEB16.

## Tagging efforts to date

Please see IOTC-2018-WPEB14-27 and IOTC-2019-WPEB15-16 for details of operations in 2018-2019. One bigeye thresher shark was tagged by Japan in June 2020. In 2021 observers were placed onboard by France and South Africa, however no bigeye thresher sharks were tagged either due to absence of encounters (France) or high at haulback mortality (South Africa). No tagging operations were performed by China and Portugal.

## Preliminary results

A preliminary estimation of post-release survival rate for bigeye thresher shark caught and released by pelagic longline fleet in the Indian Ocean is 41.2% (7 out of 17 individuals considered in the analysis). However this estimate should not be used in the evaluation of conservation measures efficiency since operations are still ongoing and several participating fleets are poorly covered or not represented at all. Compliance of each tagging operation to experimental design and protocols are also not evaluated yet.

### Tag performance

Several of the miniPAT tags deployed demonstrated reduced transmission performance. An analysis of the information from the reported data of six miniPATs, showed that the transmission period lasted less than 11 days, 6.2 days in average. Tags with full deployment period have transmitted data not longer than six days; two other tags that were attached to sharks for a relatively long programmed deployment period (180 days) have transmitted data for three days only. Expected duration of data transmission usually varies from 15 to 28 days (generally between

15-21 days). Compared with tag performance observed during PROSPER Project Phase 2 (tagging of yellowfin and bigeye tuna with miniPATs) (Sabarros et al., 2015) (21.5 days of transmission on average) and the ongoing POREMO Project (tagging of oceanic whitetip sharks with minPATs and sPATs) (Bach et al., 2019) (15.5 days on average), tag transmission capacities were substantially reduced. While poor transmission performance does not interact negatively with IOTC BTH PRM Project goals (i.e. evaluation of post-release survival of bigeye thresher sharks released by commercial fishing vessels), it reduces the volume of additional data on habitat, vertical behaviour and horizontal movements.

Wildlife Computers' analysis of tag health information indicated degraded batteries in two miniPAT tags, which performed poorly, these tags were replaced under standard warranty. A replacement of another six non-deployed miniPATs was also requested and was accepted by Wildlife Computers.

Overall, the non-reporting tags rate equals 9.1%, which lies within the limits requested by the 'Terms of Reference' of tag purchasing with Wildlife Computers. It is relatively low compare to other studies and across various tag suppliers.

## **Perspectives**

In view of the delay in the project implementation, it is expected that tagging operations will be extended through the entire year 2022. In this context it is highly desirable to extend the project duration until December 2023 (i.e. a three years extension).

## References

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