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An update for 2024 on the 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 13th, 14th, 15th, 16th, 17th, 18th, and 19th 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 CMMs¹) 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.

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 On 16 September 2020 Taiwan has withdrawn from the project (please contact IOTC Secretariat for further details). For this reason, report for WPEB (IOTC-2020-WPEB16-INF1) was also withdrawn from the list of documents presented at WPEB 16 in 2020.

Currently the IOTC BTH PRM Project active collaborators are limited by two fleets: France (Reunion) and South Africa, see details in the 'COVID-19 Effect and the Project partnership' section.

Experimental design

The complete experimental design document was presented during the 14th WPEB and is available as an appendix to working paper IOTC-2018-WPEB14-27.

Training material

No progress since 2020 since the development of the BTH PRM tagging manual 2019 V2-1.

Training

Training of scientific observers, scientists and students in Reunion Island has been performed routinely along 2023-2024.

COVID-19 Effect and the Project partnership

The COVID-19 pandemic has heavily affected the project. Starting from 2020 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 NRIFS to carry out deployment within the IOTC BTH PRM Project.

After COVID-19-related slow-down of observer activities, the post-COVID period shows gradual decline in the project participation with restrained approach by China, Japan, and Portugal (the latter due to fishermen demand for gratification of tagging operations even for species banned for retention). In 2021-2024 no progress was reported by all partners, except France and South Africa: both were able to re-start observers' activity in 2020 and continue tagging efforts.

¹ 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>

IN 2023, during the WPEB 19, Spanish Institute of Oceanography (IOE) have expressed interest to participate in the project, however administrative decision to participate in the project has not been taken yet.

MiniPAT battery issues

In February 2020, the tags manufacturer, Wildlife Computers, 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 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. Since then, numerous issues with tagware and batteries were also noticed and announced in the e-mail of Wildlife Computers in on 1 February 2023 recalling all tag batches for tagware upgrade and / or eventual replacement if tag batteries doesn’t meet manufacturer requirement. Batteries degradation was visible in IOTC BTH PRM tags in the past (poor transmission performance) (6.2 days transmission period in average see the “Third progress report...” IOTC-2020-WPEB16-INF1) and during recent deployment. In particular two bigeye thresher sharks tagged by South African observers in August 2022 were popped up as expected on 9 and 10 February 2023 (both sarks survived) but poor transmission performance (five satellite uplinks for miniPAT 17P1274 and one and half of a day transmission for miniPAT 17P1276 doesn’t allowed to get obtain sufficient data on shark behaviour except indication of survival). That situation and tag recall by Wildlife Computers led to the decision (together with IOTC Secretariat) to organise coordinate tag replacement form all tagging operational localities: China, Japan, France (Reunion Island), Portugal and South Africa. That operation takes have started in April 2023 and take a particular time due to shipping delays, customs problems, lithium batteries shipping regulation, and new tags fabrication. In 2023 31 tags were sent for maintenance/batteries replacement/tags replacement. In 2024 5 tags were repaired/replaced and other 4 tags will be also sent for maintenance. All these operations are covered by Wildlife Computers warranty and do no need any funding from IOTC or partners.

Right now, 9 miniPATs and 17 sPATs are available for tagging and 5 tags are in maintenance.

Tagging efforts to date

Following to tag recall procedure, no tags were deployed since last WPEB in 2022-2023. In 2024 Reunion Island observers keeps tags onboard during local fishing operations and during longer trips to Mozambique Channel. However, no BTH were tagged due to low encounter rate, compare with other species (e.g. during single trip of 27 sets a total of 2 oceanic whitetip sharks, *Carcharhinus longimanus* and 4 shortfin mako, *Isurus oxyrinchus* were tagged by Reunion Island observer but none of bigeye thresher shark).

Table 1. Summary of PSATs deployment by partner

Fleet	Partner	Number of tags distributed		Year of distribution	Sharks tagged															
		sPAT	mini-PAT		2018		2019		2020		2021		2022		2023		2024		Total	
					sPAT	mini-PAT	sPAT	mini-PAT	sPAT	mini-PAT	sPAT	mini-PAT	sPAT	mini-PAT	sPAT	mini-PAT	sPAT	mini-PAT	sPAT	mini-PAT
Japan	NRIFSF	4	0	2019	N/A*		N/A		1	N/A	N/A		N/A		R	R	1	N/A		
Taiwan	KNU	8	5	2019	4		4		1	1	WD**	WD	WD	WD	WD	WD	5	5		
France	IRD	8	4	2018	1		1		1		1		1		1		2			
Portugal	IPMA	6	4	2018	1	2	4	3	R		R		R		R		5	5		
South Africa	DAFF	4	2	2018	2		2		2		2		2		2		2			
China	ShOU	4	5	2019	R		R		R		R		R		R		0	0		
Total		34	20		1	2	8	8	2	1	0	0	3	0	0	0	0	11	14	

* N/A – Not applicable

** WD – Withdrawn

***R - restrained

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 50.0% (10 out of 20 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.

Perspectives

In view of the delay in the project implementation, in particular COVID-19-related slowdown, it is expected that tagging operations will be relaunched in 2023-24 at least by France (an observer trip to Mozambique Channel is in preparation for September) and South Africa. I advise to extend project till the end 2027.

A total of 31 tags are available for tagging. Additional funds to cover ARGOS transmission will be covered by IOTC regular budget.

References

- IOTC BTH PRM Project Team, 2020 (withdrawn).** The third progress report on the implementation of the IOTC bigeye thresher shark post-release mortality study project (IOTC BTH PRM Project). IOTC Working Party on Ecosystems and Bycatch (WPEB) virtual meeting, 9-10 September 2020, IOTC-2020-WPEB16-INF1, 13 p
- IOTC BTH PRM Project Team, 2019.** The second progress report on the implementation of the IOTC bigeye thresher shark post-release mortality study project (IOTC BTH PRM Project) IOTC Working Party on Ecosystems and Bycatch (WPEB) Reunion Island, France 3-7 September 2019, IOTC-2019-WPEB15-16 rev.1, 12 p
- IOTC BTH PRM Project Team, 2018.** A progress report on the implementation of the IOTC bigeye thresher shark post-release mortality study project (IOTC BTH PRM Project). IOTC Working Party on Ecosystems and Bycatch, Cape Town, South Africa, 10-14 September 2018. IOTC-2018-WPEB14-27, 21 p.