indonesian tuna LL fleet

Indonesia Country Report Ecologically Related Species in the Indonesian Southern Bluefin Tuna Fishery

Prepared for the Technical Ecologically Related Species Technical (ERSTech) Meeting of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) in Wellington, New Zealand, 7 – 11 April 2025.

by A. Anung Widodo, Lilis Sadiyah, Fayakun Satria, Dodiet R. Slamet, Putuh Suadela. Aris Budiarto, Satya Mardi, Ade Januar, Sri Patmiarsih, Rizka Devita Saraswati, Rista Devi Yuniar.

Introduction

Southern bluefin tuna (*Thunnus maccoyii*) hereinafter referred to as SBT considered as bycatch from Indonesian tuna longline vessel targeting bigeye tuna-BET (*Thunnus obesus*) and yellowfin tuna-YFT (*Thunnus albaceres*) in the Indian Ocean. Since April 2008 Indonesia has been a member of the Commission on Conservation of Southern Bluefin Tuna (CCSBT). To date, with a membership allocation of annual catch limits of 1,336 tons for a period 2024-2026. Based on 2023 and 2024 catch documentation scheme (CDS), as reported, SBT catch of Indonesian tuna longline fishery was 1,029 tons derived from 227 active vessels and ± 1,224 tons derived from 211 active vessels respectively. In addition to SBT, bycatch of Indonesian tuna long line is Ecological Related Species (ERS) include sharks-rays, sea turtles, marine mammals and sea birds. This report provides the data and information on ERS of Indonesian tuna longline fisheries. The data and information collected by scientific observers on-board of Research Institute for Tuna Fisheries (RITF) MMAF updated to 2010-2021 and Regional Observer Scheme (ROS) of Directorate General Capture Fisheries (DGCF) MMAF updated 2022-2024.

1. Brief overview of SBT fisheries

Tuna longliner was introduced to Indonesia by Japan in the 1930s (Simorangkir, 1982: Ishida *et al*., 1994), but the first commercial fishing commenced in the early 1960s, almost three decades later (Proctor *et al*., 2003). SBT has been historically caught as a by-catch from Indonesian tuna longline fisheries targeting YFT since the late-1970s (Farley *et al.,* 2014) and BET since the early 1980s after deep-longlining (set at 100-300 m below the surface) was introduced (Sadiyah *et al*., 2011). Among the tuna fishing ports, SBT mainly landed in Benoa Port (Bali). Landing activities are regularly monitored by Research Institute for Tuna Fisheries (RITF) through scientific port sampling and scientific observer programs. The first program was initiated in mid-2002 but had a long history as a collaboration project, dated back to 1993 (Farley *et al*., 2014). On the other hand, the scientific observer program has been introduced since mid-2005 as an Indonesia-Australia collaboration (Project FIS/2002/074 of Australian Centre for International Agricultural Research-ACIAR). After 2010 the activities were conducted by RITF with support from the Indonesia's government budget. To establish reliable catch data, the Directorate General of Capture Fisheries (DGCF) introduced a catch documentation scheme (CDS) in 2010 under the CCSBT framework. It has been fully implemented as a basis for official catch data since 2015. SBT catch for the last four years increased steadily, whereas the excess catches compensated for by carrying over policy. The total catch in 2023 (1,029 tons) was slightly lower than the previous year (1,031tons) but in 2024 increased about 17% (1,224 tons). The summary of SBT catches history of Indonesian tuna longline fishery is shown in the Table 1.

Table 1. The summary of SBT catches history of Indonesian tuna longline fishery

Year	Active vessels	Catch reported to CCSBT (tons)	Catch based on CDS (tons)
2004	N/A	633	613
2005	N/A	1,726	1,690
2006	N/A	598	558
2007	N/A	1.077	1,077
2008	N/A	926	905
2009	N/A	641	641
2010	186	636	580
2011	187	842	769
2012	145	910	817
2013	158	1,383	722
2014	191	1,063	1,187
2015	112	593	593
2016	107	601	601
2017	109	835	835
2018	139	1,087	1,087
2019	150	1,206	1,206
2020	155	1,298	1,298
2021	149	1,123	1,123
2022	170	1,031	1,031
2023	227	1,029	1,029
2024	211	1,224*)	1,224*)

*) __ The number is likely to change after a data update.

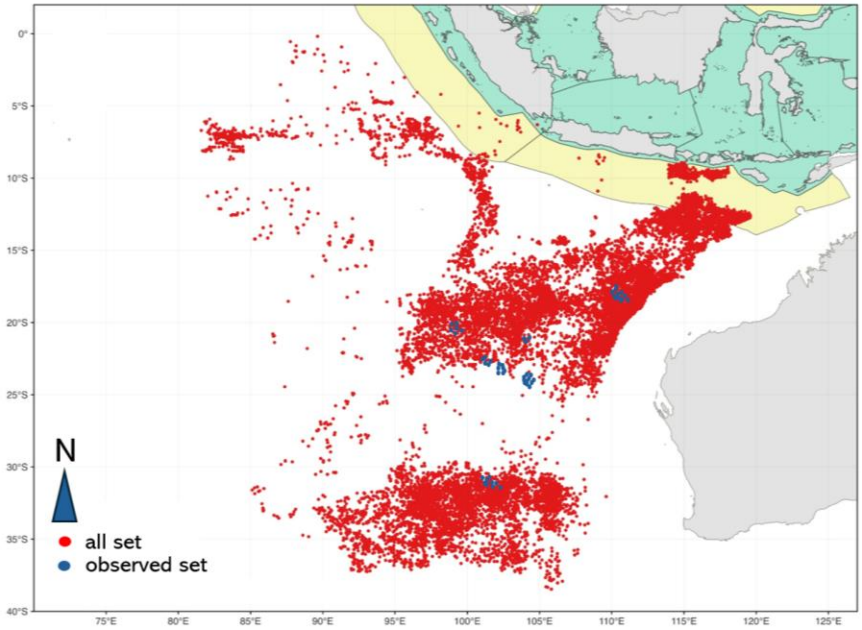
2. Fisheries Monitoring

Since 2005 MMAF has developed an onboard observer program. It began with the Tuna Scientific Tuna Observer Program (STOP) conducted by Research Institute for Tuna Fisheries (RITF) MMAF Bali which started in 2005 and lasted until 2021. The outstanding issue of STOP is the low coverage level compared to the level requested by the RFMO (CCSBT and IOTC) due to the limited number of budget and observers. To increase the coverage level from 2013 to date Directorate General of Capture Fisheries (DGCF) MMAF has developed ROS and ROP. The implementation of Indonesia's observer program both STOP and ROS in terms of data collection onboard fully refers to RFMOs regulations (IOTC, CCSBT, WCPFC). This report focuses on the results of ROS in 2023 and 2024, in 2023 the ROS involved 7 trips, lasting for 358 days at sea (DAS) with 156 gear sets and about 308,725 hooks observed. In 2024 the ROS involved 25 trips, lasting for 1,102 DAS with 453 gear sets and about 768,051 hooks observed respectively. The summary of the STOP (2005-2021) and ROS 2022 and 2024 present in Tabel 2. The monitoring also presents summary of the position of the fishing sets in 2023 and 2024 (Figure 1 and 2), where extend from 70-125°E and 0-35°S.

Table 2. Summary of scientific observer activities period 2005-2021 (STOP-RITF) and 2022-2024 (ROS-DGCF) MMAF present in Tabel 2.

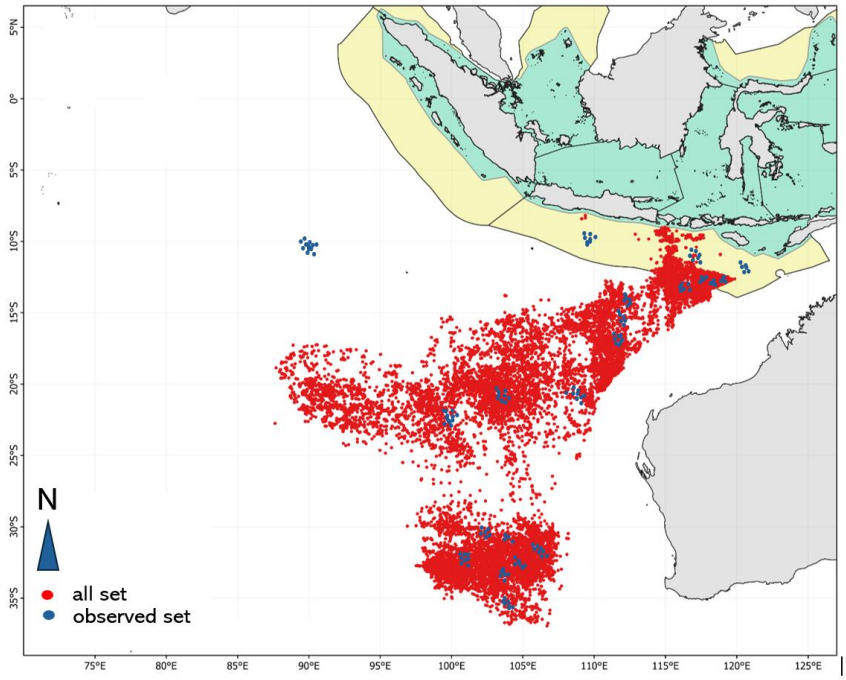
Year	No. of active vessels	No. of Trip	Day at Sea (DAS)	No. of set observed	No. of hook observed	Estimation of total effort (hooks)	Coverage (%)
2005	N/A	6	251	88	140,406	N/A	N/A
2006	N/A	19	758	417	667,479	N/A	N/A
2007	N/A	14	481	248	396,952	N/A	N/A
2008	N/A	15	481	327	523,627	N/A	N/A
2009	N/A	14	535	201	321,591	N/A	N/A
2010	186	8	240	138	220,302	34,788,063	0.62
2011	187	6	210	82	131,644	35,980,472	0.37
2012	145	7	496	176	282,147	27,899,297	1.01
2013	158	3	170	220	351,774	30,400,613	1.16
2014	191	6	371	135	216,641	36,750,108	0.59
2015	112	5	241	108	172,463	21,549,801	0.80
2016	107	3	170	110	175,868	20,587,757	0.85
2017	109	5	241	121	192,188	20,972,575	0.92
2018	139	6	321	164	262,856	29,241,984	0.90
2019	150	9	328	136	216,836	26,573,553	0.82
2020	155	2	108	55	86,845	28,554,500	0.30
2021	149	5	248	124	197,424	22,831,204	0.86
2022	170	10	453	248	396,700	22,128,927	1.79
2023	227	7	358	156	308,725	31,411,900	0.98
2024	211	25	1102	453	**768,051**	29,197,845	2.63

Note: 2005-2021 by Scientific Observers (RITF); 2022-2024 by ROS (DGCF).



Source: Fishing Logbook Program (red dots) and ROS of DGCF (blue dots) in 2023.

Figure 1. Total of set positions of all tuna longline active vessels (red dots) and set positions observed of 7 trips – 156 sets (blue dots) of the Indonesian tuna longline registered in the Secretariat of CCSBT in 2023.



Source: Fishing Logbook Program (red dots) and ROS of DGCF (blue dots) in 2024.

Figure 2. Total of set positions of all tuna longline active vessels (red dots) and set positions observed of 7 trips – 453 sets (blue dots) of the Indonesian tuna longline registered in the Secretariat of CCSBT in 2024.

3. Ecological related species (ERS)

Shark and Rays

Clarke *et al*., (2014) stated that longline fisheries tend to have very high catch rates of sharks (reached about 30% of the longline catches are sharks). In some cases, sharks can be a target of fishing operations, at least for parts of a trip. Blue shark (*Prionace glauca*) and pelagic thresher shark (*Alopias pelagicus*) dominated the ERS during ROS in 2023 and 2024, about 40% of total blue shark catches were released alive while the rest were retained, and all pelagic thresher shark catches were released. As for rays, at least three species, i.e. giant manta, spinetail mobula, and pelagic stingray were caught by tuna longline during the ROS 2023 and 2024. All giant manta catches were released alive, but most of stingrays catches were retained.

Sea turtles

Sea turtles are also caught in longline operations, most of which are released back to the sea, including dead and live releases. Restrepo, *et al*., (2024) stated that roughly a half, or more, of the turtles caught are alive, so the main mitigation measures aim to dehook them and release them alive. Results of ROS-DGCF-MMAF 2023 and 2024 noted that three species caught by tuna longline are olive ridley, loggerhead and green turtles. All turtles were released alive.

Seabirds

Clarke *et al*., (2014) and Anderson *et al*., (2011) said that seabirds are also caught in longline operations as bycatch, especially in higher latitudes, particularly South of 25°S. During the 2023-2024 ROS activity reported 5 southern royal albatrosses (2 birds in 2023) and (4 birds in 2024) were caught by tuna longline. Other species (not clearly identified) interact by flying around the ship during setting and hauling gear. All the birds caught in 2023 were released alive, while one bird caught in 2024 was discarded as dead and three others released alive.

Marine mammals

It has been known that fisheries throughout the world result in mortality for cetaceans (whales, dolphins, and porpoises). Incidental catch or by-catch in fisheries is considered the biggest threat to the survival of cetaceans globally (Soede, et al., 2019). It is further said that the interactions between marine mammals and tuna fisheries are primarily due to cetacean predation on tuna. Based on the results of the ROS in 2023 and 2024, no marine mammals have been caught by tuna boats. However, the tuna longline skippers explained that there are strong indications of interaction between tuna long line and marine mammals, especially orcas that prey on tuna that have caught tuna longline, in general, orcas leave the heads of preyed tuna.

Summary of interactions between Indonesia tuna longline and the ERS based on ROS 2023 and 2024 presents in Table 3.

Table 3. Summary of interactions between Indonesia tuna longline and the ERS based on ROS 2023 and 2024.

No.	Common name	Scientific name	2023				2024			
			Catch	Fate			Catch	Treatment		
				Retain	Release			Retain	Release	
					Dead	Alive			Dead	Alive
TUNAS										
1	Albacore	*Thunnus alalunga*	27,564	27,564	0	0	30,309	30,309	0	0
2	Yellofin tuna	*Thunus albacares*	29,677	29,677	0	0	39,078	39,078	0	0
3	Bigeye tuna	*Thunns obesus*	**7,838**	**7,838**	0	0	27,903	27,903	0	0
4	Southern bluefin tuna	*Thunnus macoyii*	**1,520**	**1,520**	0	0	37,319	37,319	0	0
5	Skipjack	*Katsuwonus pelamis*	**10,554**	**10,554**	0	0	929	929	0	0
BONY FISHES										
6	Sarda	*Sarda spp*	76	76	0	0	51	51	0	0
7	Escolar	*Lepidocybium flavobrunneum*	10,554	10,554	0	0	11,722	11,722	0	0
8	Sickle pomfret	*Taractichthys steindachneri*	495	495	0	0	559	559	0	0
9	Opah	*Lampris guttatus*	**6,491**	6,491	0	0	24,328	24,328	0	0
10	Common dolphinfish	*Coryphaena hippurus*	321	321	0	0	391	391	0	0
11	Great barracuda	*Sphyraena barracuda*	0	0	0	0	177	177	0	0
11	Oilfish	*Ruvettus pretiosus*	**330**	**330**	0	0	672	672	0	0
12	Keeltail pomfret	*Taractes rubescens*	193	193	0	0	320	320	0	0
BILLFISHES										
13	Swordfish	*Xiphias gladius*	6218	6218	0	0	**11,512**	**11,512**	0	0
14	Black marlin	*Istiompax indica*	1330	1330	0	0	2,968	2,968	0	0
15	Sailfish	*Istiohorus platypterus*	667	667	0	0	2,065	2,065	0	0
16	Shortbill spearfish	*Tetrapturus angustirostris*	1246	1246	0	0	3,742	3,742	0	0
17	Striped marlin	*Tetrapturus audax*	**1665**	**1665**	**0**	**0**	**2,185**	**2,185**	0	0
SHARKS-RAYS										
18	Blue shark	*Prionace glauca*	6822 (114)	4,707(69)	0	2,115 (45)	9,799 (153)	5,585 (87)	0	4214 (66)
19	Spinner shark	*Carcharhinus brevipinna*	205 (3)	0	0	205 (3)	376 (7)	0	0	376 (7)
20	Shortfin mako shark	*Isurus oxyrinchus*	606 (8)	0	71 (1)	535 (7)	163 (2)	0	0	163 (2)
21	Longfin mako shark	*Isurus paucus*	216 (3)	0	0	216 (3)	151 (2)	0	0	151 (2)
22	Oceanic whitetip shark	*Carcharhinus longimanus*	105 (2)	0	0	105 (2)	375 (4)	0	0	375 (4)
23	Pelagic thresher shark	*Alopias pelagicus*	630 (11)	0	(58 (1)	630 (11)	430 (7)	0	0	430 (7)
24	Bigeye thresher shark	*Alopias superciliosus*	135 (3)	0	0	135 (3)	132 (2)	0	0	132 (2)
25	Hammerhead sharks nei	*Sphyrna* spp	373 (6)	0	0	373 (6)	173 (3)	0	0	173 (3)
26	Tiger shark	*Galeocerdo cuvier*	182 (2)	0	0	182 (2)	103 (1)	0	0	103 (1)
27	Crocodile shark	*Pseudocarcharias kamoharai*	190 (2)	0	0	242 (3)	221 (3)	0	0	221 (3)
28	Giant manta	Manta birostris	129 (2)	0	0	129 (2)	170 (3)	0	0	170 (3)
29	Spinetail mobula	Mobula japanica	235 (3)	0	0	235 (3)	122 (2)	0	0	122 (2)
30	Pelagic stingray	*Pteroplatytrygon violacea*	182 (6)	73 (2)	0	109 (4)	203 (3)	203 (3)	0	0
OTHERS										
31	Lancetfishes nei	*Alepisaurus spp.*	86	0	0	0	243	0	243	0
32	Snake mackerel	*Gempylus serpen*	57	0	0	0	172	0	172	0
33	Tapertail ribbonfish	*Trachipterus fukuzakii*	48	0	0	0	135	0	135	0
34	Ocean sunfish	Mola mola	94 (1)	0	0	94 (1)	76 (1)	0	0	76 (1)
36	Olive ridley turtle	*Lepidochelys olivacea*	104 (2)	0	0	104 (2)	133 (3)	0	0	133 (3)
37	Loggerhead turtle	*Caretta caretta*	0	0	0	0	41 (1)	0	0	41 (1)
38	Green turtle	*Chelonia mydas*	142 (3)	0	0	142 (3)	94 (2)	0	0	94 (2)
39	Southern royal albatross	*Diomedea epomopore*	… (2)	0	0	(2)	… (4)	0	… (1)	… (3)

4. Mitigation measures to minimize ERS and other by-catch species.

In accordance with Ministerial Regulation No. 12/2002, it is mandatory for each tuna longline vessel to implement mitigation measures to seabirds when they are fishing in south of 25°S. The option of night setting, seabirds scaling line and weight line has become a requirement. Some vessels are developing weighted swivels; it is believed that such devices are more effective for sinking hooks compared to using line weighting, which can cause line tangling. However, further research is needed to determine its efficiency and technical details. In relation to mitigation measure on marine turtle, it is a requirement for tuna longline vessel to carry on-board a necessary equipment to appropriate release of marine turtle caught incidentally, such as de-hooker, line-cutting and scope net.

5. Public Relations and Education Activities

Awareness building activity to protect ERS and bycatch such as marine turtles, seabirds and sharks, has been developed in form of printing material such as poster and leaflet. This material has been widely distributed to all stakeholders of tuna fisheries, particularly in Bali and Jakarta where SBT is commonly landed. Education on by-catch mitigation is actively proposed, i.e., observers train of trainers, basic safety training, legislation board members visitation, etc. Indonesia currently also exchanges by-catch data with IOTC and International NGO (Birdlife foundation).

6. Implementation of the IPOA-Seabirds and IPOA-Sharks

In response to the mandate for the establishment of an international plan of action in terms of conservation and management of sharks and rays by the member of United Nations through Fisheries and Agricultural Organization (FAO), as well as increasing global concern towards sharks and rays' sustainability, Indonesia issued the first National Plan of Action (NPOA) for sharks and rays for 2010-2014. The document outlines a strategy and action plan for the sustainability of the entire shark and ray's species. The extension for the period is currently running and being updated. In addition, as work is still in progress, whale sharks will be put as fully protected species in the upcoming action plan. In addition, seabirds' mitigation measure is regulated through Ministerial Decree 58/PERMEN-KP/2020 and 10/PERMEN-KP/2021 related to mitigation for ecologically related species, in which the tori line is obligatory for every vessel operated beyond 25oS. Indonesia already developed NPOA for Seabird back in 2016 and has been reviewed by Birdlife South Africa, with full compliance remarks and obtained the green status.

7. Reference

Anderson O.R.J., C.J. Small, J.P. Croxall, E.K. Dunn, B.J. Sullivan, O. Yates and A. Black. 2011. Global seabird bycatch in longline fisheries. Endang Species Res 14:91-106. https://doi.org/10.3354/esr00347.

Clarke, S., Sato, M., Small, C., Sullivan, B., Inoue, Y. and Ochi, D. 2014. Bycatch in longline fisheries for tuna and tuna-like species. A global review of status and mitigation measures. FAO Fisheries and aquaculture technical paper 588. 199 pp.

Farley, J.H., Eveson, J.P., Davis, T.L., Andamari, R., Proctor, C.H., Nugraha, B., Davies, C.R., 2014. Demographic structure, sex ratio and growth rates of southern bluefin tuna (*Thunnus maccoyii*) on the spawning ground. PloS one 9, e96392.

Ishida, K., Yamamoto, T., Gafa, B., 1994. Development of fisheries for tuna and tuna-like fish in Indonesia with particular reference to the Jakarta-based tuna longline fishery. IPTP/94/WP/26, FAO.

Proctor, C.H., Merta, G.S., Sondita, M.F.A., Wahju, R.I., Davis, T.L., Gunn, J.S., Andamari, R., 2003. A review of Indonesia's Indian Ocean tuna fisheries. CSIRO Marine Research, Australia.

Sadiyah, L., Dowling, N., Prisantoso, B.I., 2011. Changes in fishing pattern from surface to deep longline fishing by the Indonesian vessels operating in the Indian Ocean. Ind. Fis. Res. J. 17, 87–99. http://dx.doi.org/10.15578/ifrj.17.2.2011.87-99.

Simorangkir, Sam. (1982). Perikanan Tuna Long Line Di Indonesia (Tuna Long Line Fishery in Indonesia). Perikanan Samudra Besar., 1982. Indonesia. Perikanan Tuna Long Line Di Indonesia | E-LIBRARY POLITEKNIK STIA LAN MAKASSAR.

Soede, L.P., D Natasasmita, I.G. Mahendra, & W. Rizki (2019). Marine mammals interactions with tuna fishing activities in Indonesian. IOP Conf. Ser.: Earth Environ. Sci. 399 012128.

Restrepo, V., H. Murua, A. Justel and H. Koehler. 2024. Tuna Fisheries' Impacts on Non-Tuna Species and Other Environmental Aspects: 2024 Summary. ISSF Technical Report 2024-03Rev. International Seafood Sustainability Foundation, Pittsburgh, PA, USA.