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INDONESIA SCIENTIFIC OBSERVER PROGRAM ACTIVITIES IN INDIAN OCEAN 2019

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Summary

This paper presents a progress summary of the Indonesian scientific observer program on the tuna fishing vessels operating in the Indian Ocean. The observer data is the most detailed information not only associated with catch and effort, but also information on fishing practices, gear configuration and environmental conditions. Only low fleet coverages were available from this data set. Hence this could be expanded to get robust abundance indices from the fishery.

Indonesian observer program in the Indian Ocean

There are two Indonesian observer programs currently operating in the Indian Ocean, namely national observer program and scientific observer program. The national observer program has been formally legalized by the MMAF since 2013 through Ministerial Decree No. 1/2013. Catch and effort data have been collected through the national observer program, however, issues on data entry and validity as well as the need for verification and validation prior analysis is remained (Irianto et al. 2016). The need to improve the capacity of the observers and related officers were highlighted (Irianto et al. 2016).

The scientific observer program was initiated in mid-2005 through a research collaboration between RCCF-MMAF (Indonesia) and CSIRO (Australia) funded by ACIAR. The program formerly known as trial observer program. After the collaboration finished, it transferred, continued and funded by the Indonesian Government through the RCCF (2009-2011) and Research institute for Tuna Fisheries (RITF) (2012-present). RITF was established in 2011 in order to conduct researches on tuna fisheries in the Indian Ocean including continuing the scientific observer program. The trial observer program (2005-2008) has been reported in the 13th Meeting of the Extended Scientific Committee in 2008, while the scientific observer data have been reported within the Indonesian National Report Scientific Meetings of the IOTC and CCSBT since 2010. This information paper provides an update of the Indonesian scientific observer program activities in the Indian Ocean during 2015-2019.

Design of the scientific observer program

There are currently 8 trained scientific observers at the RITF. They were not only deployed in the longline vessels based in Benoa, but also Palabuhanratu (West Java), Muara Baru (Jakarta) and Cilacap (Central Java). A total of 5 scientific observer were deployed in 2019, involved in 9 trips, lasted for 328 days-at-sea (36 days/trip in average) with 221,786 hooks observed. The number of hooks observed slightly lower (18.5%), but the number of trips

was higher (33.3%) compared to previous years. Geographically, the capacity of scientific observer covered the fishing ground of statistical area 1 and 2.

Table 1. Observer activities in authorized Fishing Vessels in 2019 (source: Indonesian National Report for the CCSBT SC meeting)

No.	Day at sea	No of Setting	No of Hooks	No of SBF	HR(x10 ³)	CCSBT Area
1	39	21	26330	0	0.000	1
2	104	10	15375	9	0.585	1
3	104	42	59625	66	1.107	2
4	36	12	17290	3	0.174	1
5	36	3	4225	2	0.473	2
6	32	10	11154	0	0.000	EEZ
7	32	6	6592	0	0.000	1
8	22	3	3850	0	0.000	EEZ
9	22	4	4950	0	0.000	1
10	18	14	19250	0	0.000	EEZ
11	15	9	11895	0	0.000	EEZ
12	15	2	2585	0	0.000	1
13	32	16	17930	0	0.000	EEZ
14	31	8	8910	1	0.112	EEZ
15	31	8	11825	8	0.677	1

Spatial distribution of the observed sets and tuna catch composition

The observed tuna longline sets covered the area between 5°-35° S and 90°-115° E. Most of the observed sets were conducted in the area 1, and the other was either inside EEZ or inside area 2. Darker color indicates higher number of hooks observed (Figure 1). Southern bluefin tunas were caught in set within region CCSBT statistical area 2 (Figure 2)

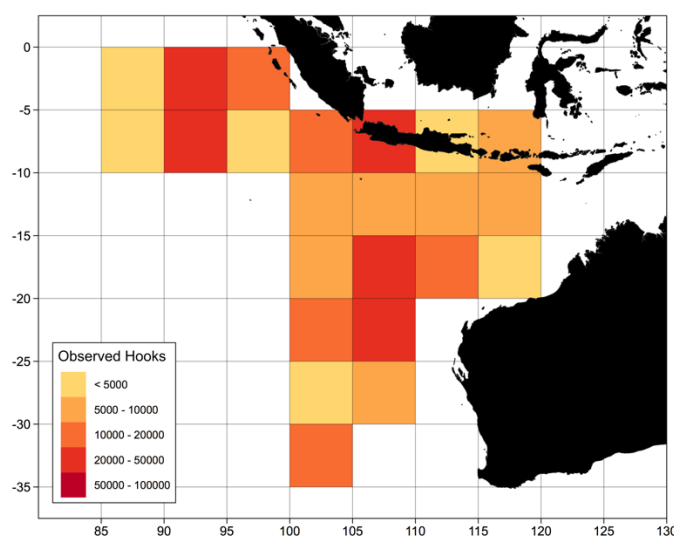


Figure 1. Effort distribution from Indonesian tuna longline vessels year 2019 (Source: Scientific observer data).

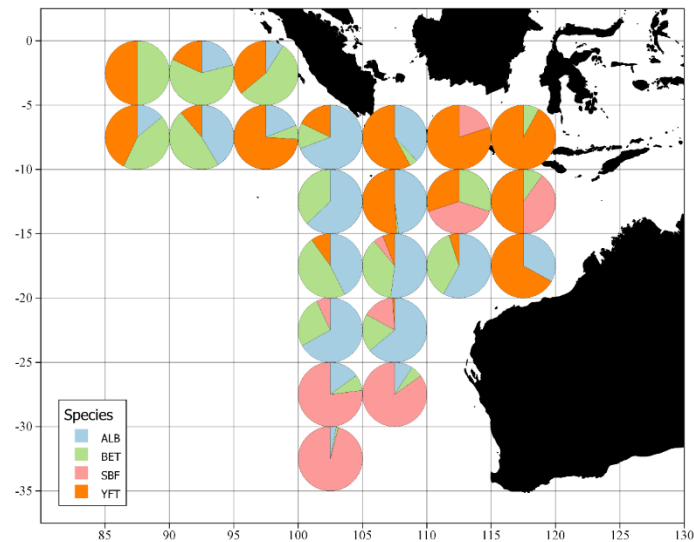


Figure 2. Spatial distribution of tuna catch composition in 2019 (Source: Scientific observer data).

Trends of catch and effort recorded by the observers

Over the last five years, the effort observed by the scientific observers are declining. Mainly because technical issues related to some implementation on onboard observer’s regulations recently. In 2018, only 6 trips were deployed (Table 2). Observed catch and effort from scientific observer data shown the hook rates for most tuna species were declining in the last 5 years (Figure 3.). In order to get a robust catch and effort data, Indonesia is currently improving the quality and quantity of logbook data.

Table 2. Estimated hook-rates of SBT on authorized fishing vessels

SBT					
TRIP	n	HR	Length (cmFL)		
			Min	Max	Mean
1	21	0.000	na	na	na
2	52	1.000	70	176	162.48
3	15	0.232	157	197	178.80
4	16	0.000	na	na	na
5	7	0.000	na	na	na
6	14	0.000	na	na	na
7	11	0.000	na	na	na
8	16	0.000	na	na	na
9	16	0.434	166	192	180.22

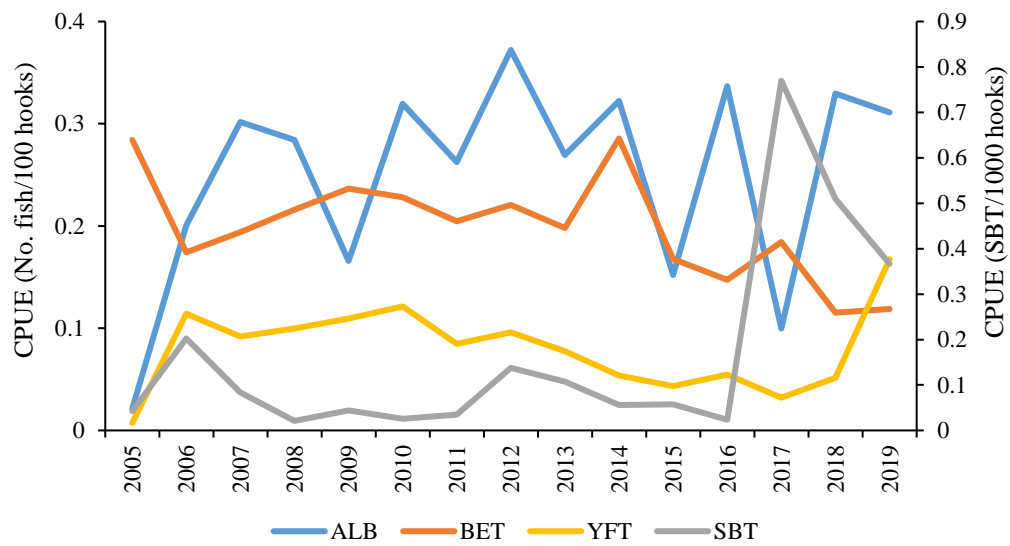


Figure 3. Nominal CPUE of longline catch from 2005-2019 based on scientific observer data

Challenges

Main challenge in term of improvement of the use of the scientific observer data are related to the following issues: low spatial and temporal coverages (region), low fleet coverage (gear types) and no replication for each observed vessel. The scarce dataset was partly caused by refusal from (some) tuna longline fishing companies to be monitored by observers, they expressed their concern about possibility of some key information (i.e. fishing ground) might be leaked to the public.

Appendix 1. Annual activities of scientific observer from 2005 to 2019

Year	No. Of Obs	No. Of Trips	No. Of Company	Number of Hooks	Total Day at Sea	Days/Trip	Avg (d/trip)
2005	6	6	1	140,406	251	19-22	20
2006	6	19	5	667,479	758	7-99	39
2007	6	14	5	396,952	648	21-108	34
2008	5	15	7	523,627	481	23-66	30
2009	5	14	8	321,591	535	15-59	38
2010	5	8	4	220,302	240	40-50	50
2011	5	6	3	131,644	210	30-50	40
2012	6	7	5	282,147	496	11-93	83
2013	5	3	3	251,774	170	52-60	57
2014	8	6	4	216,641	371	29-90	62
2015	4	5	5	172,463	241	31-61	48
2016	3	3	3	175,868	170	32-86	57
2017	5	5	5	192,188	241	31-61	48
2018	6	6	6	262,856	321	26-83	53
2019	5	9	4	221,786	328	15-104	36

Appendix 2. Observed catch and effort data of ecologically related species (ERS) from scientific observer program in 2019.

Trip No.	Total Hooks	ALX	BSH	BTH	CCL	DOL	FAL	GES	LAG	LEC	LKV	LMA	LOP
1	26,330	75	35	1	0	3	0	0	0	94	0	0	0
2	75,000	158	49	0	0	9	0	0	27	338	0	1	0
3	21,515	161	32	1	0	1	0	18	12	55	0	0	7
4	17,746	62	23	0	0	1	3	5	3	86	1	0	0
5	8,800	0	16	0	0	0	3	15	0	7	0	0	0
6	19,250	6	8	0	1	9	0	23	0	3	1	0	0
7	14,480	14	14	0	2	3	0	0	0	19	0	0	0
8	17,930	67	38	0	0	2	4	44	0	12	0	2	0
9	20,735	114	8	2	0	5	0	5	0	55	0	0	0
Trip No.	Total Hooks	MOX	OCS	OIL	PLS	PSK	PTH	PTZ	SMA	TIG	TST	TUG	WAH
1	26,330	2	0	1	12	13	0	0	0	0	6	0	2
2	75,000	0	0	7	5	20	2	0	0	0	7	0	31
3	21,515	0	1	1	12	7	0	5	0	0	1	1	17
4	17,746	0	1	0	24	3	0	0	2	0	9	0	4
5	8,800	0	0	7	30	40	0	0	0	0	0	0	0
6	19,250	0	1	0	18	0	0	0	0	0	0	0	3
7	14,480	0	1	3	20	1	1	0	0	0	0	0	9
8	17,930	0	1	0	53	8	0	0	2	2	1	0	5
9	20,735	0	1	1	65	30	0	0	2	2	1	0	9

Appendix 3. List of ecologically related species incidentally caught by Indonesia tuna longliners in the last 5 years (2015-2019)

Code	Species	2015	2016	2017	2018	2019
ALX	Long snouted lancetfish	739	693	796	1773	657
ALZ	Albatrosses nei	7	0	0	0	0
BAR	Barracudas nei	5	6	0	0	0
BRZ	Pomfrets, ocean breams nei	121	0	0	0	0
BSH	Blue shark	137	105	184	314	223
BTH	Bigeye thresher	0	0	3	15	4
BTS	Hound needlefish	0	1	0	0	0
CCB	Spinner shark	1	3	0	0	0
CCE	Bull shark	0	0	1	0	0
CCL	Blacktip shark	1	0	0	0	3
CCP	Sandbar shark	0	0	0	0	0
DKK	Leatherback turtle	0	0	0	0	0
DOL	Common dolphinfish	7	13	33	12	33
EBS	Brilliant pomfret	0	0	1	0	0
FAL	Silky shark	26	0	2	12	10
GES	Snake mackerel	0	0	26	65	110
HAR	Longnose chimaeras	14	46	0	0	0
ISB	Cookie cutter shark	0	0	39	9	0
LAG	Opah	30	60	13	60	42
LEC	Escolar	490	353	240	617	669
LHX	Seagulls nei	0	0	0	0	0
LKV	Olive ridley turtle	1	15	5	12	2
LMA	Longfin mako	0	0	0	5	3
MOX	Ocean sunfish	2	1	0	3	2
MSK	Mackerel sharks, porbeagles nei	0	0	0	0	0
OCS	Oceanic whitetip shark	4	4	4	10	6
OIL	Oilfish	16	8	24	19	20
PDM	Great-winged petrel	0	0	0	1	0
PFC	Flesh-footed shearwater	0	0	0	8	0
PHU	Sooty albatross	0	0	1	0	0
PLS	Pelagic stingray	206	272	157	230	239
PSK	Crocodile shark	108	174	84	151	122
PTH	Pelagic thresher	0	0	2	2	3
RME	Longhorned mobula	1	0	0	0	0
RMJ	Spinetail mobula	0	0	0	0	0
SMA	Shortfin mako	1	5	35	13	6
SPL	Scalloped hammerhead	1	0	0	1	0
SPY	Hammerhead sharks, etc. nei	0	0	0	0	0
SSH	Scarlet shrimp	0	0	0	0	0
TCR	Keeltail pomfret	45	62	42	0	0
TIG	Tiger shark	0	0	0	3	4
TPA	Dealfish	0	0	7	0	0
TSK	Flapnose houndshark	6	1	6	0	0
TST	Sickle pomfret	29	117	105	131	25
TTH	Hawksbill turtle	0	0	0	0	0
TTX	Marine turtles nei	0	0	0	0	0
TUG	Green turtle	0	0	0	0	1
WAH	Wahoo	63	61	30	74	80