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INDONESIANational Report to The Scientific Committee of The Indian Ocean Tuna Commission, 2014

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 10/02, final scientific data for the previous year was provided to the Secretariat by 30 June of the current year, **for all fleets other than longline** [*e.g.* for a National report submitted to the Secretariat in 2012, final data for the 2009 calendar year must be provided to the Secretariat by 30 June 2012)	YES or NO [delete one] DD/MM/YYYY [Add submission date here]
In accordance with IOTC Resolution 10/02, provisional **longline data** for the previous year was provided to the Secretariat by 30 June of the current year [*e.g.* for a National report submitted to the Secretariat in 2012, preliminary data for the 2011 calendar year was provided to the Secretariat by 30 June 2012). **REMINDER:** Final longline data for the previous year is due to the Secretariat by 30 Dec of the current year [*e.g.* for a National report submitted to the Secretariat in 2012, final data for the 2011 calendar year must be provided to the Secretariat by 30 December 2012).	YES or NO [delete one] DD/MM/YYYY [Add submission date here]
If no, please indicate the reason(s) and intended actions:	

Executive Summary

For fisheries management purpose, Indonesian waters is divided into eleven Fisheries Management Areas (FMA). Three of them located within the IOTC area of competence, namely Fisheries management Areas (FMAs) 572 (Indian Ocean – West Sumatera), FMA 573 (South of Java – East Nusa Tenggara) and 571 (Malacca Strait and Andaman Sea). Because of the fish resources in the shore areas are indicated in overexploited so that some fishermen conducted the fishing in the offshore waters especially for catching large pelagic fishes such as tuna, skipjack, marlins etc. For fishing these resources, the fishers usually use tuna long line, purse seine and hand line. Long line is the main fishing gear type operated in those FMAs, was 1,282 vessels in 2014**.** The national catch of four main tuna species in 2013 was estimated 185,742 ton which composed of yellowfin tuna (61,380 t); bigeye tuna (34,259 t), skipjack tuna (90,103 t) and albacore (6,095 t). Port sampling and scientific observer programs are still continuing and conducted by Research Institute for Tuna fisheries (RITF) Benoa. Recently ministerial regulation of MMAF no 01year 2013concerning observer onboard for fishing and carrier vessel was issued, furthermore Database Sharing Systems for Fisheries Management which integrate a number of databases, including the licensing, logbook and VMS databaseshas recently launched by the Minister of Marine Affairs and Fisheries on 19 November 2013 in Jakarta.

Contents

1. BACKGROUND/GENERAL FISHERY INFORMATION

Indonesia is an archipelagic nation located between the continents of Asia and Australia surrounded by two oceans, Pacific Ocean in the northern part and Indian Ocean in southern part. It consist of 17,508 islands and coast line of approximately 81,000 km. Totally, Indonesia has 5.8 million km^2 of marine waters consisting of 3.1 million km^2 of territorial waters (<12 miles) and 2.7 million km^2 of EEZ (12-200 miles). For fisheries management purpose Indonesia waters is divided into eleven Fisheries Management Areas (FMAs) (Figure 1). FMAs 572 (Indian Ocean – West Sumatera) , 573 (South of Java – East Nusa Tenggara),and 571 (Malacca Strait and Andaman Sea) are located within the IOTC area of competence (Figure 1).

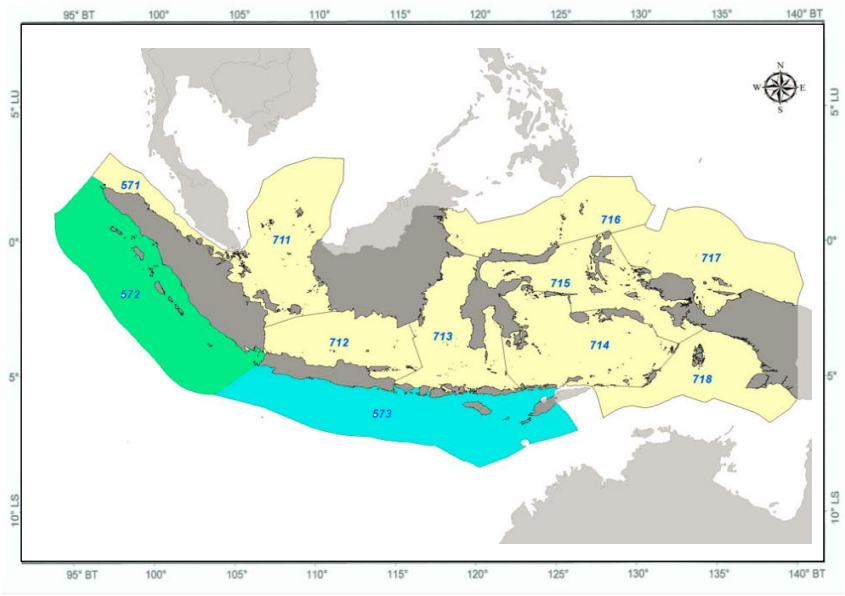

Figure 1. The eleven of Fisheries Management Area (FMA) in Indonesian waters

Across South Indonesian marine waters from Banda Aceh to NTT (East Timor) there are at least 12 fishing ports as landing site for tuna. Five main landing sites for Indian Ocean tuna industrial fleet are Benoa Fishing Port (Bali), Muara Baru Port (Jakarta) and Cilacap Port (Central Java), Pelabuhan Ratu (West Java) and Bungus (West Sumatera).There are also several non industrial fishing ports located in Sumatera, Jawa, Bali and NTT Island that known as tuna landing place (Figure 2). Benoa Fishing Port is considered as main tuna landing port for Indonesian tuna catch

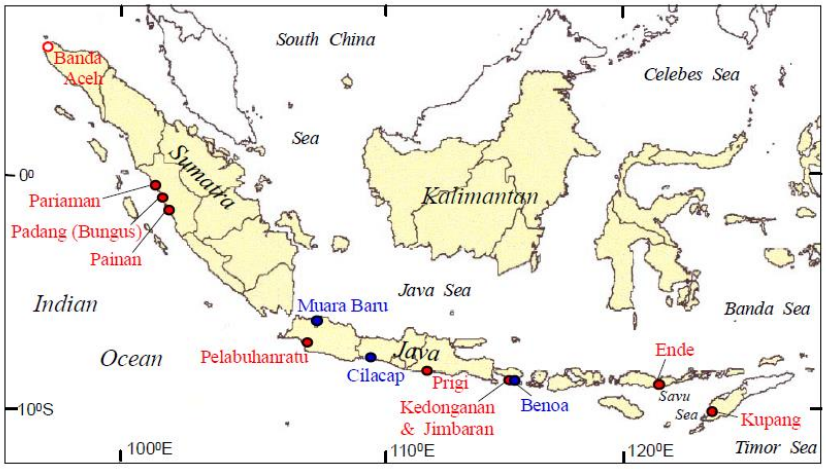

Figure 2. Primary fishing port/landing sites the industrial (*blue label*) and artisanal (*red label*)
Source: RCCF- ACIAR Report 2003 (Source of map Proctor *et al* 2003)

The species of tropical tuna that are commonly found in Indonesia waters are yellowfin tuna (YFT), bigeye tuna (BET), albacore (ALB) and skipjack tuna (SKJ). These species are targeted by various fishing gears such as tuna longline (LL), purse seine (PS), pole and line (PL), hand line (HL), and gill net (GN). Among those, long line and purse seine are gears type that mainly contribute a significant catch from the total catch of tuna.

2. FLEET STRUCTURE

The number of registered fishing boats operated, as reported to IOTC as per 26 November 2014 in the FMAs 572, 573 and high seas Indian Ocean was 1,334 fishing vessels which consisted of long liner (1,282), purse seiner (40), gillnetter (2) , carrier boat (10). Those fishing boats were vary in size from less than 50 GT to 1,025 GT.

Table 1. Registered Indonesian fishing vessels by size (GT) as reported to IOTC as per 26 November 2014 (Source: DGCF, 2014)

Size	Long liner	Purse seiner	Gill netter	Carrier/cargo freezer	Total
<50	241	0	2	1	244
51-100	474	8	0	1	483
101-200	546	28	0	7	581
201-300	3	1	0	0	4
301-500	6	0	0	1	7
501-800	12	0	0	0	12
>800	0	3	0	0	3
Total	1,282	40	2	10	1,334

3. NATIONAL CATCH

Indonesian national statistic reported that annual catch of four (4) main species such as bigeye tuna, yellowfin tuna, skipjack tuna and albacore as described in the (Table 2), Total catch of main tunas in 2013 was 185,742 ton which composed of yellowfin tuna (61,380 t); bigeye tuna (34,259 t), skipjack tuna (90,103 t) and albacore (6,095 t). The average of tunas catch since 2005 to 2013 is estimated 139,206 t (ton). The catch proportion in average since 2005 to 2013 was yellowfin tuna (28.34 %) , bigeye tuna (16.44%), skipjack tuna (47.88%) and albacore (7.34%). There was indication that catch of albacore is decreasing from 11,028 ton in 2012 became 6,095 ton in 2013. Long line was the main fishing gears targeting tuna that contribute a significant proportion among others gear type. Table 2 did not include data for Southern Bluefin tuna (SBT), tuna like species, sharks, billfishes, seerfish and others associated species, therefore the actual total catch of all species might be much more *(DGCF, 2014)*.

Table 2. Annual catch of tuna by main species and gears type during 2005-2013

Gear Type	Species	Year									Rata-Rata (MT)	*(%)
		2005	2006	2007	2008	2009	2010	2011	2012	2013		
Longline	Yellowfin	47,570.0	21,992.0	15,837.1	15,133.4	13,487.7	14,572.0	9,503.0	10,222.4	16,324.6	18,294	43.39%
	Bigeye	13,337.0	13,278.0	12,708.5	11,830.4	10,001.7	14,202.0	8,251.6	9,621.0	14,537.4	11,974	28.40%
	Cakalang	1,850.0	2,741.0	1,306.4	492.4	585.3	1,463.0	4,189.3	8,943.1	9,517.0	3,454	8.19%
	Albacore	9,222.0	7,950.0	9,148.1	8,653.6	13,025.6	5,505.0	8,775.0	7,631.4	6,021.0	8,437	20.01%
	Total	71,979.0	45,961.0	39,000.1	36,109.8	37,100.3	35,742.0	30,718.9	36,417.8	46,399.9	42,159	*100.00%*
Purse-seine	Yellowfin	651.0	371.0	1,282.5	3,373.2	1,717.9	4,334.0	8,331.0	9,257.0	20,229.4	5,505	16.00%
	Bigeye	-	237.0	1,478.9	726.6	7,070.9	8,226.0	7,385.0	8,920.0	12,011.6	5,117	14.87%
	Cakalang	22,960.0	11,722.0	16,982.3	13,216.9	27,209.7	22,652.0	36,016.0	27,667.0	33,871.0	23,589	68.54%
	Albacore	-	-	218.3	86.6	-	341.0	1,027.0	93.0	70.0	204	0.59%
	Total	23,611.0	12,330.0	19,962.0	17,403.3	35,998.5	35,553.0	52,759.0	45,937.0	66,182.1	34,415	100.00%
Pole and Line	Yellowfin	684.0	373.0	-	-	358.7	457.0	1,639.0	416.0	3,860.0	865	20.02%
	Bigeye	-	-	-	-	-	-	-	-	-	-	0.00%
	Cakalang	2,071.0	3,780.0	-	-	3,613.1	2,255.0	2,506.0	6,626.0	10,256.0	3,456	79.98%
	Albacore	-	-	-	-	-	-	-	-	-	-	0.00%
	Total	2,755.0	4,153.0	-	-	3,971.8	2,712.0	4,145.0	7,042.0	14,116.0	4,322	100.00%
Handline	Yellowfin	80.0	554.0	856.0	5,256.5	3,028.8	3,117.0	2,133.0	2,251.0	9,524.0	2,978	50.38%
	Bigeye	-	-	1.8	58.9	200.8	200.0	239.0	116.0	445.0	140	2.37%
	Cakalang	66.0	353.0	685.3	2,947.1	3,720.2	3,373.0	2,743.0	3,143.0	7,167.0	2,689	45.48%
	Albacore	-	-	0.6	453.8	-	39.0	39.0	405.0	3.0	104	1.77%
	Total	146.0	907.0	1,543.7	8,716.3	6,949.8	6,729.0	5,154.0	5,915.0	17,139.0	5,911	100.00%
Others	Yellowfin	10,389.0	2,196.0	16,212.4	328.9	6,965.9	25,446.0	16,905.0	16,386.6	11,442.0	11,808	22.23%
	Bigeye		732.0	6,507.8	3,510.1	5,848.6	2,142.0	10,983.0	13,883.0	7,265.0	6,359	11.97%
	Cakalang	21,721.0	31,922.0	33,278.0	31,443.6	34,677.7	38,723.2	39,147.0	40,954.0	29,292.0	33,462	63.01%
	Albacore	63.0	-	-	-	1,544.4	7,145.0	1,642.0	2,899.0	1.0	1,477	2.78%
	Total	32,173.0	34,850.0	55,998.2	35,282.6	49,036.6	73,456.2	68,677.0	74,122.6	48,000.0	53,106	100.00%
Grand Total	Yellowfin	59,374	25,486	34,188	24,092	25,559	47,926	38,511	38,533	61,380	39,450	28.34%
	Bigeye	13,337	14,247	20,697	16,126	23,122	24,770	26,859	32,540	34,259	22,884	16.44%
	Cakalang	48,668	50,518	52,252	48,100	69,806	68,466	84,601	87,333	90,103	66,650	47.88%
	Albacore	9,285	7,950	9,367	9,194	14,570	13,030	11,483	11,028	6,095	10,222	7.34%
	Total	*130,664*	*98,201*	*116,504*	*97,512*	*133,057*	*154,192*	*149,971*	*158,406*	*185,742*	139,206	100%

Source Data: Statistik Perikanan Tangkap (2005-2013)
**) Catch Proportion (%) by species for all gears*
Exclude catch for SBT, all catch include FMA 571-573
Change of the catch (in particular albacore) as adopted in WS of catch of estimate with IOTC June 2013

3.1. Annual Catch Estimation at Benoa Fishing Port

Estimation of annual catch from port sampling program at Benoa Fishing Port reported a decrease trend of total tuna landed around 13,686 tons in 2009 become 6,121 tons in 2013 as shown in Table 3.

Table 3.Estimation of annual catch (in tonnes) of primary species by longline landed at the Benoa Port (YFT=Yellowfin tuna, BET=Bigeye tuna, SBT=Southern bluefin tuna, ALB=Albacore) from 2004 to 2013

YEAR	YFT	BET	SBT	ALB	TOTAL
2004	4,413	4,184	613	1,906	11,116
2005	4,196	3,939	1,690	1,494	11,319
2006	4,323	4,366	558	1,450	10,697
2007	5,354	5,292	1,077	1,132	12,855
2008	6,924	5,033	905	2,811	15,673
2009	7,240	4,680	746	1,020	13,686
2010	5,372	2,168	566	983	9,089
2011	3,006	2,504	432	384	6,326
2012	2,049	2,719	613	1,221	6,602
2013	2,474	2,238	721	688	6,121
TOTAL	45,351	37,123	7,921	13,089	103,484

The number of tuna long liner unloaded the catch at Benoa fishing port since 2004 showing a steady decrease trend down up to 60-70% in 2011compare to the number of long liner in 2004 and continue to decrease in 2013 (Figure 3). Decreasing the number of long line landed at Benoa is probably caused decreasing total catch of tuna recorded in Benoa from the Indian Ocean.

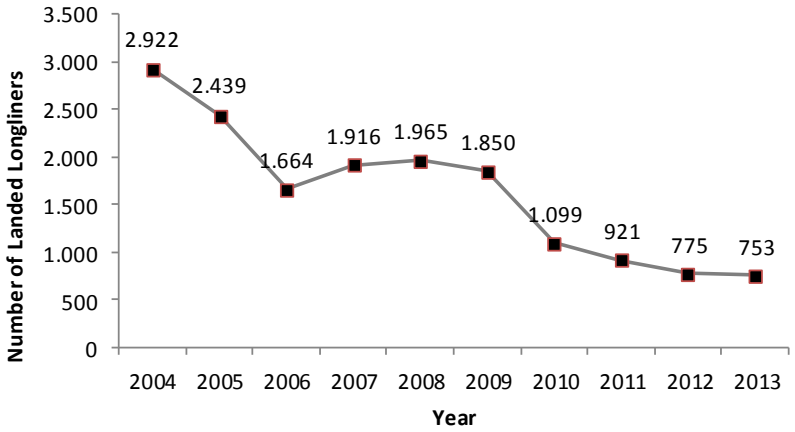

Figure 3, The number of tuna longliner landed at Benoa Fishing Port during 2004-2013

3.2. Catch Data of tuna from Scientific Observer

Scientific observer program in Benoa Bali was initially a collaboration program between Indonesia's Ministry of Marine Affairs through Research Center for Capture Fisheries (RCCF), now namely Research Center for Fisheries Management and Conservation (RCFMC) and CSIRO Marine and Atmospheric Research (Australia), in 2005. Later, in 2011 a new research institution namely Research Institute for Tuna Fisheries (RITF) with full funded by

Indonesian government is established that basically conduct continuation of port sampling and scientific observer program for tuna fisheries in the Indian Ocean. Some data were collected by scientific observer including catch, composition by species, fishing ground, number of setting, number of hooks etc. Following will be presented the calculated hook rate of tuna long liner recorded by observer at fishing vessels during 2005-2013.

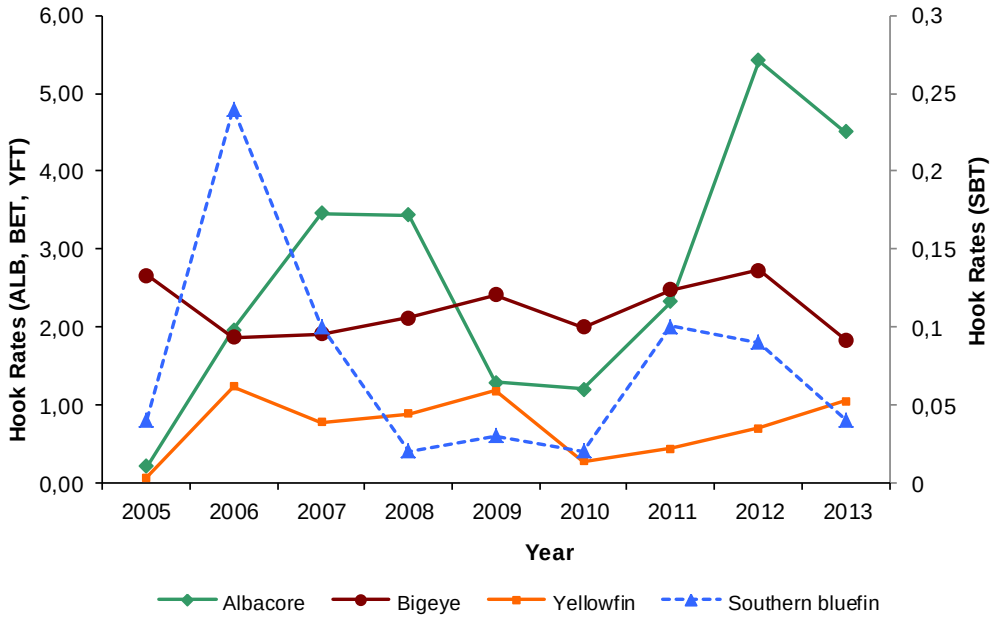

Figure 4. Fluctuation of average hook rate (fish/1000 hooks) for tuna (ALB, BET, YFT and SBT) based on scientific observer data in the Indian Ocean (2005-2013).

Hook rate of tuna long liner for yellowfin tuna shows decrease from 1.23 fish/1000 hooks in 2006 become 0.27 fish/1000 hooks in 2010, however in 2013 the hook rate of yellowfin tend to slightly increase recorded 1.04 fish/1000 hooks (Figure 4).

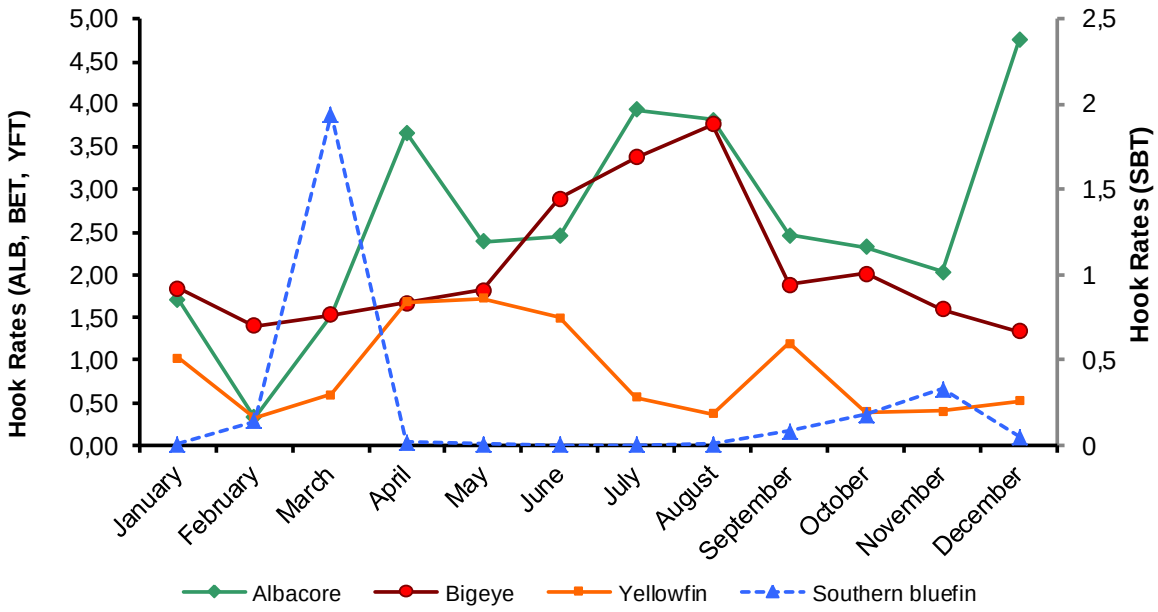

Figure 5. Monthly average of hook rate (fish/1,000 hooks) for ALB, BET, YFT and SBT based on scientific observer data in 2005-2013

There was also shown the fluctuation of the average of hook rate for ALB, BET, YFT and SBT by monthly as illustrated in Figure 5. The highest hook rate (2.88-3.77 fish/1,000 hooks) occured on June to August for bigeye (BET) and (1,5-1,72/1,000 hooks) recorded on April-June for yellowfin tuna (YFT). In the average of hook rate by monthly shown that bigeye tuna (BET) are commonly higher compare to yellowfin tuna (YFT) especially on July-August.

4. RECREATIONAL FISHERY

There is no official reported catch from Indonesia recreational fishing, An organization deal with sport fishing has been established since 1997 "FORMASI" (*Indonesia Fishing Sport Federation*) and this organization is a member of International game fish association (IGFA), FORMASI regularly conduct international sport fishing tournament at least once time a year in the Indian Ocean, information could be accessed at www.formasi.or.id activities in the convention area, There is no improvement report regarding the catch of tuna from sport/recreational fishing.

5. ECOSYSTEM AND BYCATCH ISSUES

5.1. Sharks

Recent progress related to the management of shark in Indonesia after establishment of National Plan of Action of the Shark (NPOA-Shark) on 10th October 2010 is the issuance of ministerial decree no 12, 2012 chapter X which regulate a management and conservation of bycatch and ecological related species on tuna fisheries, Several activities in 2012 is raising the fishers awareness on the important of sharks resource sustainability through workshops, seminars and producing and distribute posters which prohibit several keys species of sharks to catch, Due to budget constraint, implementation of the key actions isbeing focussed in Tanjung Luar Fish Landing Center (East Lombok), since this place is considered as a main place where sharks is landed, however, it is still difficult to change the tradition for the sharks fisher to not target the sharks particularly in Tanjung Luar (East Timor). Recently in October 2013 a workshop attended by stake holder of sharks was conducted in Jakarta and continue with initiation to set national quota for (*Charcharhinus longimanus, Sphyrna zygaena, sphyrna mokaran, Sphyrna lewini*) it was agree by the WS to limit the catch with a certain quota for selected sharks however the WS also noted the difficulties to estimate sharks quota with limited data available while also consider a highly migratory nature of the species,

In 2013 scientific observer from RITF Benoa reported121 individuals were caught by tuna long liner, comprised of 9 shark species during 226 days trip operation with 386,178 hooks observed as presented in Table 4.

Table 4. Catch composition of shark caught by long line during on board observer in 2013

	Scientific Name	Code	Number	Total in 2013 (%)	Hook rate
Hiu buaya	*Pseudocarcharias kamoharai*	CSK	63	1,44	1,63
Hiu Selendang biru	*Prionace glauca*	BSH	44	1	1,14
Hiu lanjaman	*Carcharhinus brevipinna*	CCB	4	0,09	0,1
Hiu moro	*Isurus oxyrinchus*	MSO	3	0,07	0,08
Hiu koboy	*Carcharhinus longimanus*	OCS	2	0,05	0,05
Hiu tikus	*Alopias pelagicus*	TSP	2	0,05	0,05
Hiu tikus	*Alopias superciliosus*	TSS	1	0,02	0,03
Hiu martil	*Sphyrna spp,*	SPY	1	0,02	0,03
Hiu macan	*Galeocerdo cuvier*	TIG	1	0,02	0,03

Regarding the Manta Rays, the Indonesian Government made the new regulation through the Ministerial Decree Number 4 Year 2014 on the full protection status of Manta Rays in Indonesia (*Manta birostris* and *Manta alfredi)* and published the Development of Manta Rays Identification Guideline (2014)

5. 2 Seabirds

Scientific observer program also include seabirds on their data record and since 2005 to 2012, in 2012 observed reported within 638 setting were incidentally caught 8 seabirds, 6 were released alive while 2 seabirds already dead, In 2013 there is no trip oberver in frozen tuna fleets wich operated at 15 - 35^0 S, observer just follow fresh tuna fleets and no interaction with seabirds, Indonesia currently do not has national plan of action for seabird mitigation**.**

5. 3 Marine Turtle

Recent update on marine turtle In 2013 observer of RITF benoa reported 6 Olive Ridley turtle caught by longliner. All of sea turtle there were released to the sea comprised of 1 turtle is still live and 5 of them dead. While update from 10 observer of

WWF-Indonesia during 2012-2013 there were recorded 25 tuna longline bycatch of sea turtle from 638 setting (20,988 hooks), From total 25 of sea turtle there were released to the sea in life 14 turtle and 11 dead as presented in Table 5.

Table 5. Bycatch of sea turtle from tuna longliners operated in Indian ocean from WWF Indonesia observer (2012-2013)

Sea Turtle	Condition				Handling Success	Percentage (%)
	Catch		Release			
	Life	Dead	Life	Dead		
Leatherback Turtle	3		2	1	2	12.5
Green Turtle		1		1	0	0
Olive Ridley Turtle	11	8	10	9	10	62.5
Loggerhead Turtle	2		2		2	12.5
Total	16	9	14	11	14	87.5

Currently Indonesia does not have NPOA for marine turtles but progressing to have one under Directorate General of Coastal and Small Islands-MMAF. Areas of critical habitats, such as migratory corridors, nesting beaches, and Inter-nesting and feeding areas were identified. Map that shows migration corridors, nesting beaches, and critical habitats for marine turtle in Indonesia are produced and available online. http://kkji.kp3k.kkp.go.id/sig

5. 4 Billfish

Based on RITF observer data the catch proportion of billfishes contribute 6.3 % from the total catch of tuna longliner. Six species of billfishes were caught by longline vessels in Benoa Port from 2005 to 2012 i.e.: 973swordfish (*X. gladius*) range: 50-280 cm; mean±SE: 128±1.48 cm. 310 black marlin (*I. indica*) range: 60-307 cm; mean±SE: 184±1.92 cm , 252 shortbill spearfish (*T. angustirostris*) range: 82-221 cm; mean±SE: 151±1.05 cm, 222 blue marlin (*M. mazara*) range: 110-298 cm; mean±SE: 192±2.39 cm, 109 striped marlin (*K, audax*) range: 69-270 cm; mean±SE: 177±3.23 cm,and 94 sailfish (*I. platypterus*) range: 98-259 cm; mean±SE: 165±3.51 cm, (Jatmiko *et al* 2013), Swordfish 49.67 % was a dominant by catch followed by (15.82 %) black marlin (*I. indica*), (12.86 %) shortbill spearfish (11.31 %) blue marlin (*M. mazara*), (5.54 %) striped marlin (*K. audax*) and 94 (4.8 %) sailfish (*I. platypterus*).

During IOTC Working Party on Billfish, Indonesia presented some biological aspect of Bill fish especially for swordfish (*Xiphias gladius*), black marlin (*Makaira indica*), and blue marlin (*Makaira nigricans*) caught by Indonesian longliners in the Indian Ocean. The equations use for transforming eye fork length and pectoral fork length to lower jaw fork length, and pectoral fork length to lower jaw fork length. The

result showed that there were no significant differences existed between females and males among length measures for swordfish, blue marlin, and black marlin (ANCOVA, P> 0,05), The sex ratio (proportion of female to total of male and female) for swordfish and black marlin was 0,51 and 0,55 respectively (equal with 1:1) while for blue marlin was 0,62 where proportion of female was higher than male,

Table 6. Regression equations for predicting from non-standard measurements into standard lengths (pectoral fork length & eye orbit fork length to lower jaw fork length) for swordfish, black marlin and blue marlin caught by Indonesian longliners in Indian Ocean.

Regression Equations	Sex(es)	Sample Size (n)	Approx, Length Range	Intercept	Slope	R^2	P
				a	b		
Swordfish (SWO)							
LJFL = a*EFL + b	M	19	58 - 254	1,082	7,908	0,997	0,000**
	F	20	76 - 252	1,059	7,206	0,996	0,000**
	M+F+U	160	50 - 254	1,060	9,027	0,988	0,000**
LJFL = a*PFL + b	M	19	59 - 254	1,243	11,863	0,991	0,000**
	F	20	77 - 252	1,289	10,21	0,988	0,000**
	M+F+U	160	51 - 254	1,241	12,44	0,977	0,000**
EFL = a*PFL + b	M	19	60 - 254	1,147	3,802	0,991	0,000**
	F	20	78 - 252	1,216	3,007	0,989	0,000**
	M+F+U	160	52 - 254	1,168	3,532	0,983	0,000**
Black Marlin (BLM)							
LJFL = a*EFL + b	M	15	139 - 244	1,059	13,686	0,988	0,000**
	F	5	170 - 266	1,183	-5,473	0,978	0,000**
	M+F+U	37	126 - 266	1,060	14,185	0,965	0,000**
LJFL = a*PFL + b	M	15	139 - 244	1,271	8,215	0,979	0,000**
	F	5	170 - 266	1,267	10,828	0,992	0,000**
	M+F+U	37	126 - 266	1,249	11,299	0,967	0,000**
EFL = a*PFL + b	M	15	139 - 244	1,195	4,367	0,982	0,000**
	F	5	170 - 266	1,054	16,073	0,986	0,000**
	M+F+U	37	126 - 266	1,195	-4,367	0,982	0,000**
Blue Marlin (BUM)							
LJFL = a*EFL + b	M	11	183 - 232	0,974	30,646	0,936	0,000**
	F	10	170 - 264	1,017	25,11	0,990	0,000**
	M+F+U	53	154 - 264	0,983	28,63	0,889	0,000**
LJFL = a*PFL + b	M	11	183 - 232	0,992	50,815	0,850	0,000**
	F	10	170 - 264	1,300	6,891	0,969	0,000**
	M+F+U	53	154 - 264	1,115	31,674	0,806	0,000**
EFL = a*PFL + b	M	11	183 - 232	1,028	19,265	0,926	0,000**
	F	10	170 - 264	1,281	-18,376	0,984	0,000**
	M+F+U	53	154 - 264	1,163	-1,019	0,952	0,000**

5. 5. Neritic Tuna

Six neritic tuna and mackerel species bullet tuna (*Auxis rochei),* frigate tuna (*Auxis thazhard*), kawakawa (*Euthynnus affinis*), longtail tuna (*Thunnus tonggol*), Indo-Pacific king mackerel (*Scomberomus guttatus*), narrow-barred Spanish mackerel (*Scomberomus comerson*) in Indonesia waters were caught by various of fishing gears including. Pelagic danish seine, Purse seine ,surface handline, drifting gillnet and landed in various fishing port in along coastal of west Sumatera (Banda Aceh, Pariaman, Bungus/Padang and Painan) as well as south Java, Bali and Nusatenggara (Muarabaru/Jakarta, Pelabuhanratu, Cilacap, Kedonganan, Benoa). In 21013 scientist of RITF Benoa participated on 4th WP Neretic Tuna and presented Biological population of Kawa-kawa (*Euthynnus affinis*) in Indonesian waters.

Kawakawa is an Indo-West Pacific species, found in warm waters including oceanic islands and archipelagos, This research were to provide length frequency distribution and population parameters of kawakawa caught by purse seine in Northwest Sumatera, The data is the time series data from the research before, Data collection was conducted during a period of July 2012 to December 2013, The result showed that from 4,225 fish were collected with ranged from 23,5 – 61,5 cm, the Von Bertalanffy growth function estimates were $L\infty$ = 64,58 cm, K = 0,87 year^{-1} and t_0 = -0,04801 years, The annual instantaneous rate of total mortality (Z) was 3,61 year^{-1}, the natural mortality (M) was 1,32 year^{-1} and the fishing mortality (F) was 2,29 year^{-1}, The exploitation rate (E = 0,64) is higher than the predicted value (E_{max} = 0,420) indicating that *Euthynnus affinis* was highly exploited in Northwest Sumatera,

5.6 . Southern Bluefin Tuna

The number of registered tuna longliners in the port of Benoa (Bali) was 757, Indonesia tuna longliners authorized by CCSBT in 2012 increased 52% from 209 (2011) to 317 (2012), In fact the active fishing vessels decreased 27% from 172 to 125 [1] ,Those tuna fishing boats were vary in size from 22-589 GT, mainly based in Benoa port Bali and about 85% of Indonesia's catch of SBT is landed in the port of Benoa, DGFC reported that total catch of SBT from CDS Bali and Jakarta in 2012 was 778,7 mt, The annual catch estimate from sampling on landing data in Benoa of SBT was 879 mt, The catch monitoring activities on fish size landed in Benoa revealed that size distribution of SBT was range from 82 to 214 cm FL, the mean length of SBT in 2010-2012 has fluctuated between 162 and 171 cm FL with tend of smaller size of specimens occurred in 2012, The nominal CPUE 2005-2012 showed higher catch rates in the

[1]Source : www.ccsbt.org

temperate regions, The average hook rate was 0,1 per 1000 hooks, A higher hook rate of SBT in 2012 occured on October, November for 0,1-0,3 per 1000 hooks, Lower hook rate occured on April to August 0-0,01 per 1000 hooks, Indonesia and Australia (CSIRO) is continuing to work together to provide age composition data (based on direct ageing using otoliths) and close kin analysis, Scientific observer program activities in 2012 cover 496 days at sea with 9 observer for longliners and 1 observer for purse seiner (as presented inSatria *et al* 2013)

The catch monitoring activities on Southern Bluefin Tuna (SBT) in Benoa during September 2013 to April 2014 revealed that size distribution of SBT ranged from 70 to 225cmFL,Regular length measurements during period of 1998-2013showed that the mean length in 2013 tend to decline to162 cm FL. Monthly landing occurred in a similar pattern with higher volume compared previous landings, and its contributes at around 93% of the national catch data. Enumeration data on length frequency measurements indicated that a significant portion of smaller size (<120 cm) caught during December 2013, this data indicated that there some fishing vessels operated in the area off spawning ground, Number of active vessels in the port of Benoa in 2013 is relatively the same as in 2011 and 2012, Onboard observer carried out on CCSBT authorized fishing vessels for 170 days which 13^0 South latitude was the highest latitude and 113^0 East in the far west longitude, CDS data shows the estimate total catches in 2013 at about 18005individual SBT with total weight of 1,383 tons (DGCF, 2014 *in prep*),

6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS

6.1 Logsheet data collection and verification

Template of Indonesia fishing logbook was developed under the collaboration with IOTC, WCPFC, CCSBT and OFCF Japan.There are three (3) kind of logbooks template such as longline/handline; purse-seine/pole and line and other gear. For implementation of this logbook program, Ministry of Marine Affairs and Fisheries has released Regulation Number 18 Year 2010 of 5 October 2010. It is stipulated that logbook report has to be submitted to port authority prior to catch landing and mandatory to vessels above 5 GT. Up to December 2013, for three FMA's (571-573), there are differences number of logbook number for each of it. During 2013, total number of vessel which filling logbook for FMA 571, 572 and 573 are 222, 70 and 70 respectively.. For effective implementation of this program, it is necessary to increase efforts to introduce this program and capacity both to fishers as well as port officers.

6.2. Vessel Monitoring System

VMS for fishing vessels has been started to be implemented in Indonesia since 2003, Currently, trough Ministrial Regulation No,10/2013, all fishing vessel above 30 GT mandatory to be equipped by VMS transmitter, Without VMS transmitter on board, the fishing vessel will not get permission to leave the fishing port for their fishing operations, Fishing monitoring center (FMC) for Indonesia's VMS is base in Jakarta, In order to combate of illegal, unreported and unregulated (IUU) Fishing, Indonesia has started to implement Database Sharing Systems for Fisheries Management, The system is developed to integrate a number of databases, including the licensing, logbook and VMS databases, The Launching of the system application has recently been made by the Minister of Marine and Fisheries on 19 November 2013 in Jakarta that will be applied to 45 fishing ports of Indonesia, fisheries Information and services for Indonesia VMS is provided and could be accessed at http://dkpvms,dkp,go,id,

6.3. Observer programme

Indonesia fishing vessels have joined Regional Observer Programme for Transhipment at Sea since 2009 under resolution IOTC No, 08/02, which has been superseded by Resolution 11/05 and Resolution 12/05 concerning on establishing a programme for transhipment by large-scale fishing vessels stated that "*Each CPC shall ensure that all carrier vessels transhipping at sea have on board an IOTC observer,"* Scientific observer program in Benoa Bali was initially a collaboration program between Indonesia's Ministry of Marine Affairs through research center for capture fisheries and CSIRO Marine and Atmospheric Research (Australia), in 2005 (see sadiyah *et al* 2011), Later, in 2011 a new research institution namely Research Institute for Tuna Fisheries (RITF) with full funded by Indonesian government is established that basically conduct continuation of port sampling and scientific observer program for tuna fisheries in the Indian Ocean,The number of scientific observer involved in 2012 was 7 observers, In 2013 the observer was also include Purse seiner to be observed onboard (Table 5), Recently ministerial regulation of MMAF no 01 year 2013 formally regulate an observer onboard for fishing and carrier vessel, a positive progress to secure government budget for observer program in the future. Up to June 2014, DGCF already deployed 14 (fourteen) observers on board to 14 longliner started from Benoa.

Table 7. Activity summary of observer based at Benoa Fishing Port (RITF) 2005-2013

YEAR	No. of Obs	No. of trips	No. of Comp	Total day at sea	days/trip	Avg (d/trip)
2005	6	6	1	251	19 – 22	20
2006	6	19	5	758	7 – 99	39
2007	6	14	5	648	21 – 108	34
2008	5	15	7	481	23 – 66	30

2009	5	14	8	535	15 – 59	38
2010	5	8	4	240	40-50	50
2011	5	6	3	210	30-50	40
2012	6	7	5	496	12-90	82.7
2013	9	7	3	604	48-60	86.3
2013 PS Small Scale	1	2	2	21	9-12	10.5
2013 HL Small Scale	1	2	2	19	9-10	9.5

The spatial distribution of observed effort is presented by 5-degree blocks (5° latitude x 5° longitude) (Figure 6), More than 50% of the total number of hooks recorded were concentrated between 110° and 120°E and 10° and 20° (Figure 6), South of 20°S (the temperate area of the Indian Ocean) and in the Banda Sea, the effort recorded in any 5-degree block never exceeded 100,000 hooks,

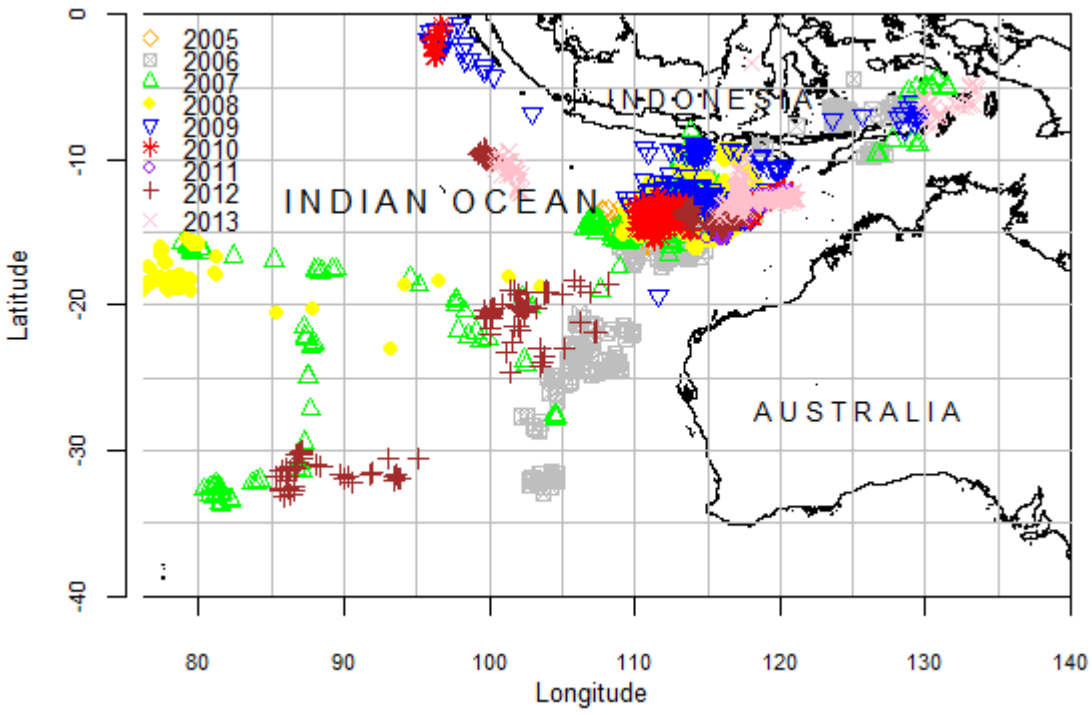

Figure 6. Spatial distribution of the observed sets from 2005 to 2012 (source: Observer Program data RITF, Benoa).

The observed longline sets from 2005 to 2013 covered the Eastern Indian Ocean between latitudes 0° and 34°S and longitudes 75° and 135°E, but also the Banda Sea (Figure 7). The observed sets mostly occurred within the area between 10° - 20°S and 105° - 120°E. The furthest distance of these sets occurred in 2006, 2007 and 2012. Smaller area was covered by the observed longline sets in 2011. The observed sets in 2005 and between 2009 - 2011 have never extended to south of 20°S.

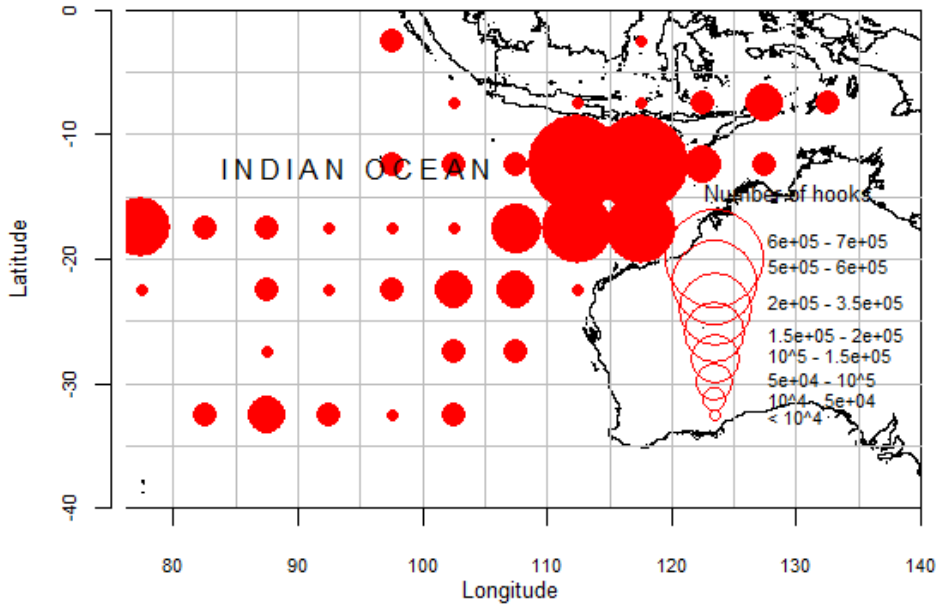

Figure 7. Spatial distribution of observed longline effort (hooks) by 5-degree blocks, aggregated from 2005 to 2013 (source: RITF Observer Program data).

The spatial distribution of observed effort is presented by 5-degree blocks (5° latitude x 5° longitude) (Figure 7). More than 50% of the total number of hooks recorded were concentrated between 110° and 120°E and 10° and 20° (Figure 8). South of 20°S (the temperate area of the Indian Ocean) and in the Banda Sea, the effort recorded in any 5-degree block never exceeded 100,000 hooks.

6. 4. Port Sampling Programme

Port sampling program at three major Indonesian ports, NizamZahman Jakarta fishing port, Benoa-Bali fishing port and Cilacap fishing port central of Java wasinitially commenced in the mid 2002. This was a collaborative research program between Indonesia's Research Centre for Capture Fisheries/Research Institute for Marine Fisheries (RCCF/RIMF) and Directorate General for Capture Fisheries

(DGCF), CSIRO Marine and Atmospheric Research, Australia's Department of Agriculture of Fisheries and Forestry (DAFF), Australian Centre for International Agricultural Research (ACIAR), Indian Ocean Tuna Commission (IOTC) and Overseas Fisheries Cooperation Foundation of Japan (OFCF) (see Sadiyah *et all* 2011). The aim of this port sampling program was to monitor the catches of all tuna species landed, and also to record the number of landings by Benoa-based longline vessel (Proctor *et al*,, 2006), Port sampling program at two sampling sites (Nizam Zahman and Cilacap fishing ports) have been undertook by DGCF since 2007, and Benoa sampling port also covered by DGCF since 2010, In February 2010, the RIMF commenced to undertake the sampling, collecting and monitoring activities (Nugroho *et al*,, 2010). RITF continue tuna catch monitoring program at Benoa Fishing Port with a minimum 30% coverage of landings at each processing plant as a target coverage, as reported in previous year the coverage of port sampling in 2009-2012was above 50 %, continuing in 2013the monthly monitoring of ports sampling were range from 45 – 71 % coverage (Table 8).

Table7. Summary of RITF Monitoring activities at Benoa Fishing Port in 2013

Month	Number Landing	Number Sample	% Covered	Number of weight recorded	Number of length weight measured
January	55	35	63,64	8498	1243
February	71	46	64,79	6188	1101
March	53	30	56,60	5189	593
April	42	30	71,43	5260	812
May	59	34	57,63	7826	1379
June	62	32	51,61	8240	1398
July	86	50	58,14	8539	4005
August	58	34	58,62	4237	482
September	51	35	68,63	6554	1233
October	67	35	52,24	6217	1071
November	74	34	45,95	7358	1343
December	75	36	48,00	7394	1350

6. 5 Catch Documentation scheme (CDS)-SBT

Catch Documentation scheme (CDS) for SBT has been implemented by Indonesia since 1 January 2010 in two fishing ports i.e. Benoa Port, Bali and Nizam Zachman Oceanic Fishing Port, Jakarta. All activities in export of SBT shall complete three forms such as Catch Tagging Form, Catch Monitoring Form, Re-Export/Export after Landing of Domestic Product Form. These three forms have to be validated by DGCF-DFRM officer. DGCF-DRFM will compile CDS data and submitted to CCSBT secretariat in spreadsheet format. During three years implementation of CDS we found that the validation and

supervision in filling the CDS forms should be regularly monitored in order to minimize the possible error. Information on Indonesia CDS could be found in (Satria *et all* 2013).

In 2014, Indonesia initiate to develop an application system of CDS to provide online service of CDS validation (port based). This online system will be run on 1 January 2015.

7. NATIONAL RESEARCH PROGRAMS

1. Project title: Indian Ocean Pelagic fisheries research through Port sampling and observer program, Project Duration: 2010-2015
2. Project title: Catch monitoring and biological observation for tuna species caught by small scale fisheries in West Sumatera, Project Duration: 2014-2016
3. Project title: Developing capacity for management of Indonesia's pelagic fisheries resources, Planned Project Duration: 2012-2016.

   Objectives: To improve Indonesia's capacity to assess and manage its tuna fisheries to improve Indonesia's pelagic fisheries research capacity. The project also address population structure of Bigeye tuna and yellowfin tuna through genetic and parasites analysis

   Implementing Unit: RCFMC – ACIAR

   Recent progress: Field trip and survey to collect samples have been performed and still continuing.

8. IMPLEMENTATION OF SCIENTIFIC COMMITTEE RECOMMENDATIONS AND RESOLUTIONS OF THE IOTC RELEVANT TO THE SC.

Indonesia participates in several IOTC SC working parties. Scientific observer and port sampling program are continued to monitor catch and effort of tuna and other ecologically related species in order to implement scientific Committee Recommendation.

Table 8.Scientific requirements contained in Resolutions of the Commission, adopted between 2005 and 2014.

Res. No.	Resolution	Scientific requirement	CPC progress
13/03	On the recording of catch and effort by fishing vessels in the IOTC area of competence	Paragraphs 1–11	Indonesia has issued Ministerial Decree number 48/PERMENKP/2014 regarding logbook
13/04	On the conservation of cetaceans	Paragraphs 7– 9	• Indonesia has been implementing Resolution 13/04 through Government Regulation No 7/1999 • Ministerial Regulation number

Res. No.	Resolution	Scientific requirement	CPC progress
			12/PERMENKP/2012 regarding capture fisheries fishing business on high-seas
13/05	On the conservation of whale sharks (*Rhincodontypus*)	Paragraphs 7– 9	Indonesia has issued Ministerial Decree number 18/KEPMENKP/2013 regarding conservation of whale shark in Indonesian water
13/06	On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries	Paragraph 5–6	Indonesia has developed national plan of action (NPOA) Shark on 10 october 2010 as well as ministerial decree no 12 , 2012 chapter X which regulate a management and conservation of bycatch and ecological related tuna involved in tuna fisheries
12/09	On the conservation of thresher sharks (family alopiidae) caught in association with fisheries in the IOTC area of competence	Paragraphs 4–8	Indonesia has been implementing Ministerial Regulation number 12/PERMENKP/2012 regarding capture fisheries fishing business on high-seas
12/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3–7	Indonesia has been implementing Ministerial Regulation number 12/PERMENKP/2012 regarding capture fisheries fishing business on high-seas
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	Indonesia has been implementing Ministerial Regulation number 12/PERMENKP/2012 regarding capture fisheries fishing business on high-seas
11/04	On a regional observer scheme	Paragraph 9	Indonesia has been implementing Ministerial Regulation number 1/PERMENKP/2013 regarding observer onboard
10/02	Mandatory statistical requirements for IOTC members and cooperating non contracting parties	Paragraphs 1–7	• Nominal catch data has been submitted • Logbook program started • Tuna size data of longline-fleet have been submitted
05/05	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 1–12	• Indonesia has been implementing Ministerial Regulation number 12/PERMENKP/2012 regarding capture fisheries fishing business on high-seas • NPOA shark and ray

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