

2019 Annual Report to the Ecologically Related Species Working Group (ERSWG)

Republic of Korea

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1. Introduction

Korean longline fleets have engaged in fishing for southern bluefin tuna, *Thunnus maccoyii* (SBT) in the CCSBT convention area. This fishery commenced with a small experimental operation in the Indian Ocean in 1957, mainly fishing for bigeye, yellowfin and albacore tuna but shifted targeting SBT in 1991. In 2017, SBT catch in calendar year of Korean tuna longline fisheries was 1,080 mt (1,102 mt in fishing year) with 12 vessels in active. In general, fishing occurs between 35°S-45°S and 10°E-120°E, especially in the western Indian Ocean from April to July/August and in the eastern Indian Ocean from July/August to December. However, since 2014 SBT fishing vessels have moved westward than previous years, and mainly operated in the western Indian Ocean and eastern Atlantic Ocean between 20°W-35°E. In terms of the CCSBT statistical area, SBT catch and effort of Korean longline fisheries were relatively higher in area 9 than area 8. In 2017, fishing vessels operated only in area 9 where was the western Indian Ocean and eastern Atlantic Ocean.

This paper describes information and data on Ecologically Related Species (ERS) caught by Korean longline vessels fishing for SBT, which have been collected by scientific observer program.

2. Review of SBT Fisheries

Korean longline vessels fishing for the SBT are all deep freezers with a range from 200 to 500 gross tonnage. After 1996 the annual number of fishing vessels is fluctuated from 4 to 19. Since 2010, annually 7 to 12 fishing vessels have operated in active for fishing SBT so as to be equivalent to the national quota, and 12 vessels operated to fish for SBT in 2017 (Table 1).

SBT catch of Korean longline fisheries was low with less than 400 mt at the beginning during 1991-1995, and increased up to 1,796 mt in 1998 but largely decreased to below 200 mt in the mid-2000s. Korea became the member of the CCSBT Commission in 2001 and was allocated to 1,140 mt of annual catch limit as membership, while Korean SBT catches were

much lower than the national catch until 2007. Since 2008 the annual catch ranged from 705 mt to 1,134 mt, which was well commensurate with the national catch limit (Table 1). In 2017 calendar year, SBT catch by Korean longline fisheries was 1,080 mt (1,102 mt in fishing year).

As for the distribution of SBT CUE of Korean longline fisheries, fishing vessels generally operated between 35°S-45°S and 10°E-120°E, in the western Indian Ocean (10°E-50°E) of area 9 from April to July/August and in the eastern Indian Ocean (90°E-120°E) of area 8 from July/August to December. After 2014, however, they moved further westward than previous years, which mainly operated in the western Indian Ocean and in the eastern Atlantic Ocean between 20°W-35°E.

3. Fisheries Monitoring for Each Fleet

Korea initiated scientific observer programs for distant-water fisheries in 2002 and has been applied to the SBT longline fishery since 2004. The tasks of observer are the same as those adopted by the RFMOs. The recent observer coverages of Korean SBT longline fisheries are shown in Table 2. In 2017, 3 observers were placed onboard 3 longline vessels targeting SBT. They observed the SBT catch of 181 mt and the effort of 509×10^3 hooks in 216 sets during 310 days in fishing area, which the observer coverage was 18% in fishing efforts.

The data collected by observer programs are vessel and gear attributes, setting and catch details (including discard/release), incidental catch and interaction of ERS (ecologically related species), biological measured information, sighting of marine mammals, etc.

In terms of data collection and reporting requirements, the Act on Fisheries Information and Data Reporting was revised and put into effect from December 2012. It includes data collection and reporting requirements recently adopted by the tuna RFMOs regarding especially ecologically important species, discards/release and bycatch mitigation, etc. Since 1st September 2015, the Act on Fisheries Information and Data Reporting has obliged fishers to report the catch statistics every day to National Institute of Fisheries Science (NIFS) through the electronic reporting system in order to manage/cross-check the data in real time.

SBT catch statistics are obtained from two sources of data reporting. Korea Overseas Fisheries Association (KOFA) collects total SBT catch by month and vessel through Catch Documentation Scheme (CDS) issued by National Fishery Products Quality Management Service (NFQS). NIFS collects logbook data from vessels filled out by captain onboard. The data collected are verified and confirmed through cross-checking between NIFS and KOFA.

4. Seabird

Total bycatch, BPUE and mortality of seabirds by species incidentally caught by Korean SBT longline fisheries are shown in Table 4. In 2016, a total of 147 individuals belonging to

11 species which were buller's albatross (*Thalassarche bulleri*), grey-headed albatross (*T. chrysostoma*), black-browed albatross (*T. melanophrys*), Indian yellow-nosed albatross (*T. carteri*), wandering albatross (*Diomedea exulans*), southern giant petrel (*Macronectes giganteus*), sooty shearwater (*Puffinus griseus*), sooty Albatross (*Phoebastria fusca*), white-chinned petrel (*Procellaria aequinoctialis*), *P. cinerea*, *Andenna gravis* were recorded by the Korean observer programs for Korean SBT longline fisheries. And in 2017, 1 individual which was grey-headed albatross (*T. chrysostoma*) was bycaught.

5. Shark

Total bycatch, CPUE and mortality of sharks by species incidentally caught by Korean SBT longline fishery are shown in Table 4. In 2016, a total of 1,164 individuals belonging to 7 species which were thresher shark (*Alopias vulpinus*), blue shark (*Prionace glauca*), longfin mako (*Isurus paucus*), porbeagle (*Lamna nasus*), shortfin mako (*I. oxyrinchus*), velvet dogfish (*Zameus squamulosus*), *Echinorhinus cookei* were recorded by the Korean observer programs for Korean SBT longline fisheries. And in 2017, a total of 1,699 individuals belonging to 5 species excluding unidentified species which were blue shark (*P. glauca*), porbeagle (*L. nasus*), shortfin mako (*I. oxyrinchus*), velvet dogfish (*Z. squamulosus*), sixgill shark were bycaught. The sharks mainly bycaught by Korean SBT longline fisheries were blue shark, porbeagle and shortfin mako, of which the dominant species was blue shark.

6. Marine Mammal and Marine Reptile

No marine mammal or reptile was caught by Korean SBT longline fisheries in 2016 and 2017. Observers also reported that marine mammal or reptile was not caught incidentally by Korean SBT longline fisheries.

7. Mitigation Measures to Minimise Seabird and Other Species Bycatch

7.1. Mandatory Measures

According to the conservation and management measures on reducing seabird bycatch adopted by the tuna-RFMOs (ICCAT, IOTC, WCPFC), Korean longline fishery operating south of 25°S are obligated to use 2/3 options (night setting, seabirds scaring line and weighted line).

For compliance monitoring, Korea has implemented the scientific observer programs and the electronic logbook system that fishermen should record not only catch information but also seabird mitigation measures used.

Korea has fully implemented ERS mitigation measures, and most of fishing vessels have used seabirds scaring line and weighted line for mitigating the mortality of seabirds.

7.2. Voluntary Measures

To mitigate the impact of fishing operations on marine reptiles, Korean tuna longline fisheries have to retain and use necessary equipment, including de-hooking, line cutting tools and scoop nets, for appropriate release of marine reptiles caught incidentally and non-target shark species. The measures implemented are monitored through the observer programs.

8. Public Relations and Education Activities Public Relations Activities

To avoid or reduce mortality of ecologically related species by Korean longline vessels, guidebooks, booklets and posters for the information, and releasing manual of these species have been distributed to fishing vessels since 2007. The NIFS has conducted a regular education for vessel captains by visiting the Korean Tuna Longline Fishing Association before the beginning of their fishing trip. The education largely includes recording and reporting of fishing activity, information of target species and ERS, newly adopted measures and better practices from tuna RFMOs concerned.

To increase awareness of seabirds, especially albatrosses, and their conservation, NIFS and BridLife South Africa hosted an education workshop on the use of best practice seabird bycatch mitigation measures for fisherman in Korea, 2018.

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

Korea established and has implemented the NPOA-Sharks since August 2011, and the NPOA-Seabirds was established in the early of 2014.

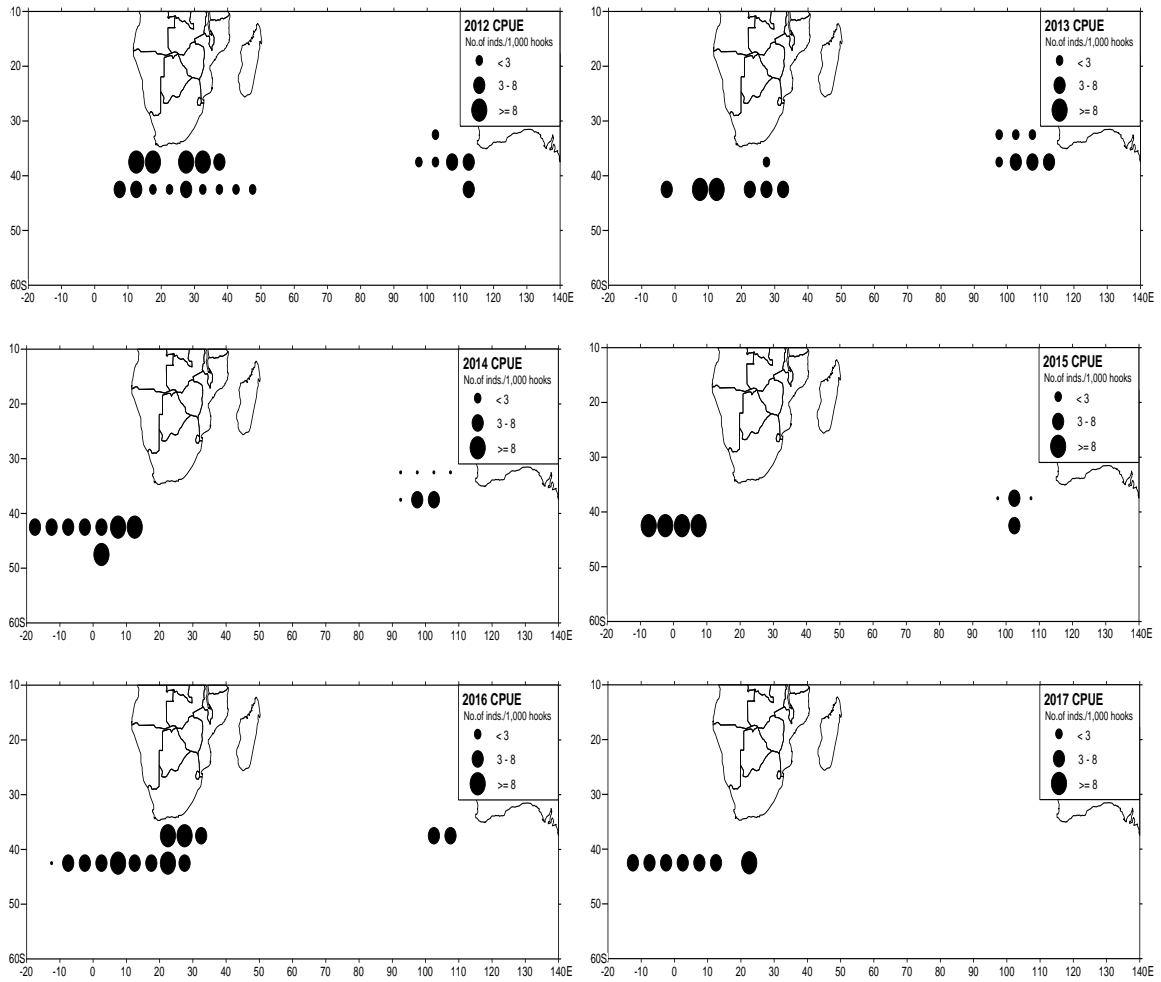


Fig. 1. The distributions of nominal SBT CPUE of Korean longline fisheries, 2012-2017.

Table 1. The annual number of active Korean longline vessels fishing for SBT and their annual SBT catches in the CCSBT convention area, 1991-2017

Year	Number of longline vessel	Catch (mt)	Year	Number of longline vessel	Catch (mt)
1991	3	246	2005	7	38
1992	1	41	2006	9	150
1993	1	92	2007	12	521
1994	1	137	2008	19	1,134
1995	3	365	2009	19	1,117
1996	8	1,320	2010	9	867
1997	14	1,424	2011	7	705
1998	19	1,796	2012	7	922
1999	16	1,462	2013	9	918
2000	13	1,135	2014	9	1,044
2001	10	845	2015	10	1,051
2002	10	746	2016	11	1,121
2003	4	254	2017	12	1,080
2004	7	131			

Table 2. Observer coverage for the Korean SBT fisheries through the Korean observer programs, 2013-2017

Year	Trips observed	Effort observed (X1,000)	Total effort estimated (X1,000)	Catch observed of SBT (mt)	Coverage (%)
2013	3	654	2,688	170	24
2014	2	219	3,274	92	7
2015	3	349	2,387	223	15
2016	3	660	3,482	178	19
2017	3	509	2,805	181	18

Table 3. Total fishing and observed efforts by year and area, 2016-2017

Fishery	Year	Statistical Area	Total & Observed Effort			Proportion of observed effort with specific mitigation measures				
			Total Effort	Total Observed Effort	Observer Coverage (<i>percentage</i>)	TP+NS	TP+WB	NS+WB	TP+WB+NS	Others
Longline	2016	8	268,081	-	-					
		9	3,213,829	659,503	21		100			
	2017	9	2,804,569	509,381	18.2		99.5		0.5	

Table 4. Estimation of total mortality of ERS caught incidentally by Korean SBT fisheries, 2016-2017

(a) 2016 year

Fishery	Year	Statistical Area	Species	Observed Captures						Estimate
				Captures (number)	Capture Rate	Fate (numbers)			Mortality Rate	Estimated total mortalities (number)
						Retained (dead)	Discarded (dead)	Released (live)		
LL	2016	9	<i>Andenna gravis</i>	2	0.003		2		0.003	10
LL	2016	9	DIB	4	0.006		4		0.006	19
LL	2016	9	DIC	83	0.126		82	1	0.124	400
LL	2016	9	DIM	33	0.050		33		0.050	161
LL	2016	9	DIX	2	0.003		2		0.003	10
LL	2016	9	MAI	2	0.003		2		0.003	10
LL	2016	9	PHU	5	0.008		5		0.008	24
LL	2016	9	PRO	1	0.002		1		0.002	5
LL	2016	9	<i>Procellaria cinerea</i>	13	0.020		13		0.020	63
LL	2016	9	TQH	1	0.002		1		0.002	5
LL	2016	9	ALV	1	0.002		1		0.002	5
LL	2016	9	BSH	1,023	1.551	839	143	41	1.489	4,785
LL	2016	9	<i>Echinorhinus cookei</i>	1	0.002		1		0.002	5
LL	2016	9	LMA	9	0.014	1	2	6	0.005	15
LL	2016	9	POR	40	0.061	25	15		0.061	195
LL	2016	9	SMA	36	0.055	13	12	11	0.038	122
LL	2016	9	SSQ	54	0.082		13	41	0.020	63

* Species name is FAO 3 alpha code.

(b) 2017 year

Fishery	Year	Statistical Area	Species	Observed Captures						Estimate
				Captures (<i>number</i>)	Capture Rate	Fate (<i>numbers</i>)			Mortality Rate	Estimated total mortalities (<i>number</i>)
						Retained (dead)	Discarded (dead)	Released (live)		
LL	2017	9	DIC	1	0.002		1		0.002	6
			BSH	1,257	2.468	440	368	449	1.586	4,449
			POR	153	0.300	70	67	16	0.269	754
			<i>Sixgill shark</i>	2	0.004		1	1	0.002	6
			SMA	13	0.026	5	3	5	0.016	44
			SSQ	260	0.510		106	154	0.208	584
			USH	14	0.027			14	0.000	0

* Species name is FAO 3 alpha code.