

2017 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. These fisheries commenced with a small experimental operation in the Indian Ocean in 1957, mainly fishing for bigeye tuna, yellowfin tuna and albacore tuna but shifted targeting SBT in 1991. SBT catch of Korean longline fishery in 2015 (calendar year) was 1,051 mt (1,051 mt in 2015/16 fishing year) with 10 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, in 2014/15 and 2015/16 fishing years, fishing vessels moved westward than previous years, and operated in the Atlantic Ocean of the area between 20°W-15°E in the western part.

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. The annual numbers of vessel were fluctuated from 8 in 1996 to 19 in 1998, 2008 and 2009. Since 2010, 7 or 10 vessels have operated in active for fishing SBT so as to be equivalent to the national quota, and 10 vessels operated to fish for SBT in 2015 (Table 1).

SBT catch of Korean longline fishery 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, and SBT catch in 2015 was 1,051 mt (Table 1).

As for the historical distribution of SBT catch and effort of Korean longline fishery by area, Korean SBT 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. However, in 2014/15 and 2015/16 fishing years, they moved westward than previous years, which operated in the Atlantic Ocean of the area between 20°W-15°E in the western part. In addition, the catch and effort in 2014/15 and 2015/16 fishing years were relatively higher in the western Indian Ocean (area 9), and their fishing for SBT was closed finished earlier than previous years. Fig. 1 shows the geographical distribution of nominal SBT CPUE (no. of fishes/1,000 hooks) of Korean longline fishery.

3. Fisheries Monitoring for Each Fleet

Korea initiated scientific observer program 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 fishery are shown in Table 2. In 2015, 3 observers were placed onboard 3 longline vessels targeting SBT. They observed the SBT catch of 223 mt and the effort of 349×10^3 hooks in 161 sets during 189 days in fishing area, which the observer coverage was estimated to be 15% 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 and sighting of marine mammals.

The progress was made 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 the 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 monitor the data in real time.

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

4. Seabird

Total numbers, CPUE and mortality of seabirds by species incidentally caught by Korean SBT longline fishery are shown in Table 3. In 2015, a total of 29 individuals belonging to 7 species which were grey-headed albatross (*Thalassarche chrysostoma*), black-browed albatross (*T. melanophrys*), wandering albatross (*Diomedea exulans*), light-mantled albatross (*Phoebastria palpebrata*), sooty Albatross (*P. fusca*), Indian yellow-nosed albatross (*T. carteri*), shearwater were recorded by the Korean observer program for Korean SBT longline fishery.

5. Other Non-target Fish

Total numbers, CPUE and mortality of sharks by species incidentally caught by Korean SBT longline fishery are shown in Table 4. In 2015, a total of 1,629 individuals belonging to 5 species which were Blue shark (*Prionace glauca*), Longfin mako (*Isurus paucus*), Porbeagle (*Lamna nasus*), Shortfin mako (*I. oxyrinchus*), Velvet dogfish (*Zameus squamulosus*) were recorded by the Korean observer program for Korean SBT longline fishery. Of them, 20 individuals were released alive. The sharks mainly bycaught by Korean SBT longline fishery 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 fishery. Observers also reported that marine mammal or reptile was not caught incidentally by Korean SBT longline fishery.

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 program 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 fishery should 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 program.

7.3. Measures under Development/Testing

During 2013-2016, Korea conducted sea trials to facilitate the implementation of seabird mitigation measure on weighted line and investigate operational and safety problems with this implementation in collaboration with BirdLife International.

8. Public Relations and Education Activities Public Relations Activities

To avoid or reduce mortality of ecologically related species by tuna 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 BirdLife South Africa hosted a seabird photo exhibition at NIFS from 12 April to 31 May 2016. Seabird photos and some denoted by seabird researchers were displayed at a special room, and a short video was continuously played at the exhibition. During the photo exhibition, we had an educational program targeted at kids and their parents using seabird color book to introduce seabird biology and conservation concepts.

9. Information on other ERS (non-bycatch) such as prey and predator species (Nothing)

10. Others (Nothing)

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

Korea established and has implemented the NPOA-Sharks since August 2011. According to the NPOA-sharks, fishing vessels should not have onboard fins that total more than 5% of the weight of sharks onboard, up to the first point of landing. And the NPOA-Seabirds was established in the early of 2014.

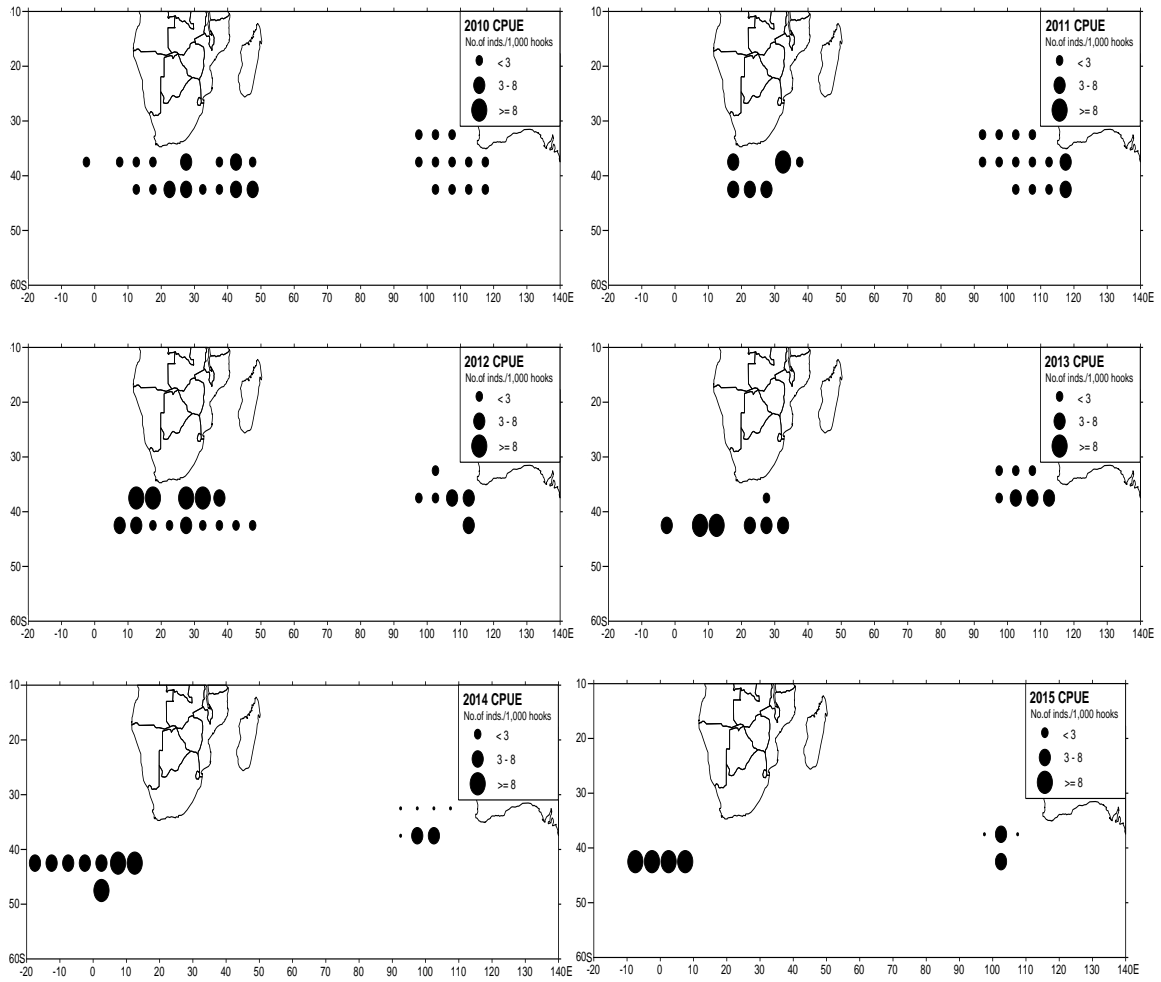


Fig. 1. The distributions of nominal SBT CPUE of Korean longline fishery, 2010-2015.

* Catch and effort data of 2016 are on review.

Table 1. The annual number of active Korean longline vessels fishing for SBT and their annual SBT catches in the CCSBT convention area, 1991-2015

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

Table 2. Observer coverage for the Korean SBT fishery through the Korean observer program, 2012-2015

Year	Trips observed	Effort observed (X1,000)	Total effort estimated (X1,000)	Catch observed of SBT (mt)	Coverage (%)
2012	3	421	3,635	162	12
2013	3	654	2,688	170	24
2014	2	219	3,274	92	7
2015	3	349	2,387	223	15

* As catch and effort data of 2016 are on review, the observer coverage has not decided yet.

Table 3. Estimation of total mortality of seabirds caught incidentally by Korean SBT fishery

Country Republic of Korea Year (calendar year) 2015

Species (or group) Sharks

Species	Fishery		Observed							Estimate	Proportion of observed effort with specific mitigation measures				
	Stratum	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Mortalities (number)	Mortality Rate	Live Releases (number)	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	NIL
DIX	8	754,751	91,190	12.1	1	0.011	1	0.011		8		1.00			
TQH					1	0.011	1	0.011		8		1.00			
DIC	9	1,528,085	258,300	16.9	8	0.031	8	0.031		47		1.00			
DIM					11	0.043	11	0.043		65		1.00			
DIX					1	0.004	1	0.004		6		1.00			
PHE					2	0.008	2	0.008		12		1.00			
PHU					1	0.004	1	0.004		6		1.00			
Shearwater					4	0.015	4	0.015		24		1.00			

* Species name is FAO 3 alpha code.

Table 4. Estimation of total mortality of sharks caught incidentally by Korean SBT fishery

Country Republic of Korea Year (calendar year) 2015

Species (or group) Sharks

Species	Fishery		Observed							Estimate	Proportion of observed effort with specific mitigation measures				
	Stratum	Total Effort	Total Observed Effort	Observer Coverage	Captures (number)	Capture Rate	Mortalities (number)	Mortality Rate	Live Releases (number)	Estimated total mortalities (number)	TP + NS	TP + WB	NS + WB	TP + WB + NS	NIL
BSH	8	754,751	91,190	12.1	1,205	13.214	31	0.340	2	257		1.00			
POR					31	0.340	1	0.011	2	8		1.00			
SMA					11	0.121	3	0.033	1	25		1.00			
SSQ					9	0.099		0.000	5	0		1.00			
BSH	9	1,528,085	258,300	16.9	328	1.270	21	0.081	6	124		1.00			
LMA					13	0.050	3	0.012	4	18		1.00			
POR					18	0.070	7	0.027		41		1.00			
SMA					14	0.054	1	0.004		6		1.00			

* Species name is FAO 3 alpha code.