2015 Annual Report to the Ecologically Related Species Working Group (ERSWG)

Republic of Korea

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1. Introduction

Korean SBT fishery started in 1991, which was shifted from Korean Indian Ocean tuna longline fishery, mainly have been fishing for bigeye tuna, yellowfin tuna and albacore tuna, commenced with a small experimental operation in the 1957. Korea became the member of the CCSBT Commission in 2001 with a membership allocation of annual catch limits of 1,140 mt. In 2014 (calendar year), SBT catch of Korean tuna longline fishery was 1,049 mt with 9 vessels in active. Fishing mainly occurs between 35°S-45°S and 5°E-115°E, especially in the western Indian Ocean from April to July/August and in the eastern Indian Ocean from July/August to December.

This paper describes information and data on Ecologically Related Species (ERS) of Korean SBT fishery collected by scientific observer program.

2. Review of SBT Fisheries

Korean tuna longline vessels fishing for the SBT are all deep freezers with a range from 200 to 500 gross tonnage. The numbers of vessel were fluctuated from 8 in 1996 to 19 in 1998, 2008 and 2009. Since 2010, they have reduced to 7-9 vessels, commensurate with the national quota (Table 1).

The catch was low at less than 400 mt in the beginning during 1991-1995 and increased up to 1,796 mt in 1998. Korea became the member of the CCSBT Commission in 2001 and was allocated 1,140 mt of annual catch limits as membership. However, the catch largely decreased below 200 mt during the mid-2000s and still low at 521 mt in 2007. It was mostly attributed to the availability of vessels as well as low market price and high fuel price. Since 2008 the annual catches ranged from 705 mt to 1,134 mt, which were well commensurate with the national catch limits. In 2014 (calendar year), a total of 1,049 mt was caught by Korean SBT longline fishery (Table 1).

The geographical distribution of nominal CPUE (no. of fishes/1,000 hooks) showed two fishing grounds, of which one was located in the western Indian Ocean off South Africa with an occasional expansion to the eastern Atlantic Ocean and the other was in the eastern Indian Ocean off the Western Australia (Fig. 1). The CPUE was generally higher in the western Indian Ocean (area 9) than in the eastern Indian Ocean (area 8). Fishing occurred from April to July/August in the western Indian Ocean and from July/August to December in the eastern Indian Ocean. The distributions of fishing ground have rarely changed throughout the history, except in 2005 when some catches were taken in the central and southern Indian Ocean.

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. For 2014, 2 observers had deployed onboard and their coverages were 9% in provisional. During the trip, they collected the information on the amount of catch and discard/release for SBT as well as bycatch, species composition, catch and effort by set, gear characteristics, fishing strategy, biological data, etc.

Catch and effort data on SBT have been daily recorded in the logbook and reported to the National Fisheries Research and Development Institute (NFRDI) since the early of 1970s. To address the increasing data collection and reporting requirement by the tuna RFMOs such as the inclusion of discards/release, ecologically related species and bycatch mitigation, etc. the Act on Fisheries Information and Data Reporting was revised and put into effect from December 2012. Especially, logbook format for ecologically related species (ERS) was added. Along with the Act, fishermen should record and submit catch and discard/release for SBT in the logbooks of target species (tuna and tuna-like species) and ERS (sharks, seabirds, marine reptile, etc.) in the logbook of bycatch, separately. In addition, the NFRDI has been developing a program able to monitor submission of data from fishing vessel in real time and to cross-check the data with those of Catch Documentation Scheme (CDS) and Vessel Monitoring System (VMS).

4. Seabird

Total numbers, CPUE and mortality of seabirds by species incidentally caught by Korean SBT longline fishery are shown in Table 3. In 2014, a total of 2 individuals, only 1 species, black-browed albatross (*Thalassarche melanophrys*) was 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 2014, a total of 1,148 individuals, 4 species were recorded by the Korean observer program for Korean SBT longline fishery, of which 99 individuals were released. The sharks mainly bycaught by Korean SBT longline fishery were blue shark (*Prionace glauca*), porbeagle (*Lamna nasus*) and shortfin mako shark (*Isurus oxyrinchus*), of which the dominant species was blue shark.

6. Marine Mammal and Marine Reptile

No species for marine mammals and reptiles was caught by Korean SBT longline fishery. Observers also reported that marine mammals or reptiles were not caught incidentally by Korean SBT longline fishery.

7. Mitigation Measures to Minimise Seabird and Other Species Bycatch

According to the conservation and management measures on reducing seabird bycatch recently adopted by the tuna-RFMOs (ICCAT, IOTC, WCPFC), Korean tuna longline fishery operating south of 25°S are obligated to use 2/3 options (night setting, seabirds scaling line and weighted line). During 2013-2014, Korea conducted sea trials to facilitate the implementation of seabirds mitigation measure on weighted line and investigate operational and safety problems with this implementation in collaboration with fishers and BirdLife International (see paper "CCSBT-ERS/1503/Info 08"), and the sea trial will continue in 2015.

To mitigate the impact of fishing operations on marine reptiles, Korean tuna longline fishery should retain and use some necessary equipment and take care of appropriate release of marine reptiles caught incidentally, including de-hooking, line cutting tools and scoop nets.

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 NFRDI 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.

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.

Table 1. The annual numbers of Korean tuna longline vessels in active fishing for SBT and the annual SBT catches, 1991-2014

Year	Number of longline vessel	Catch (mt)	Year	Number of longline vessel	Catch (mt)
1991	3	246	2003	4	254
1992	1	41	2004	7	131
1993	1	92	2005	7	38
1994	1	137	2006	9	150
1995	3	365	2007	12	521
1996	8	1,320	2008	19	1,134
1997	14	1,424	2009	19	1,117
1998	19	1,796	2010	9	867
1999	16	1,462	2011	7	705
2000	13	1,135	2012	7	922
2001	10	845	2013	9	918
2002	10	746	2014*	9	1,049

* Data for 2014 is provisional.

Table 2. Observer coverages of hooks observed from the Korean observer program, 2010-2014

Year	Trips Observed	Effort observed (X1,000)	Total effort estimated (X1,000)	Coverage (%)
2010	2	389	4,104	9
2011	-	-	4,048	-
2012	3	421	3,635	12
2013	3	654	2,688	24
2014*	2	270	3,049	9

* Data for 2014 is provisional.

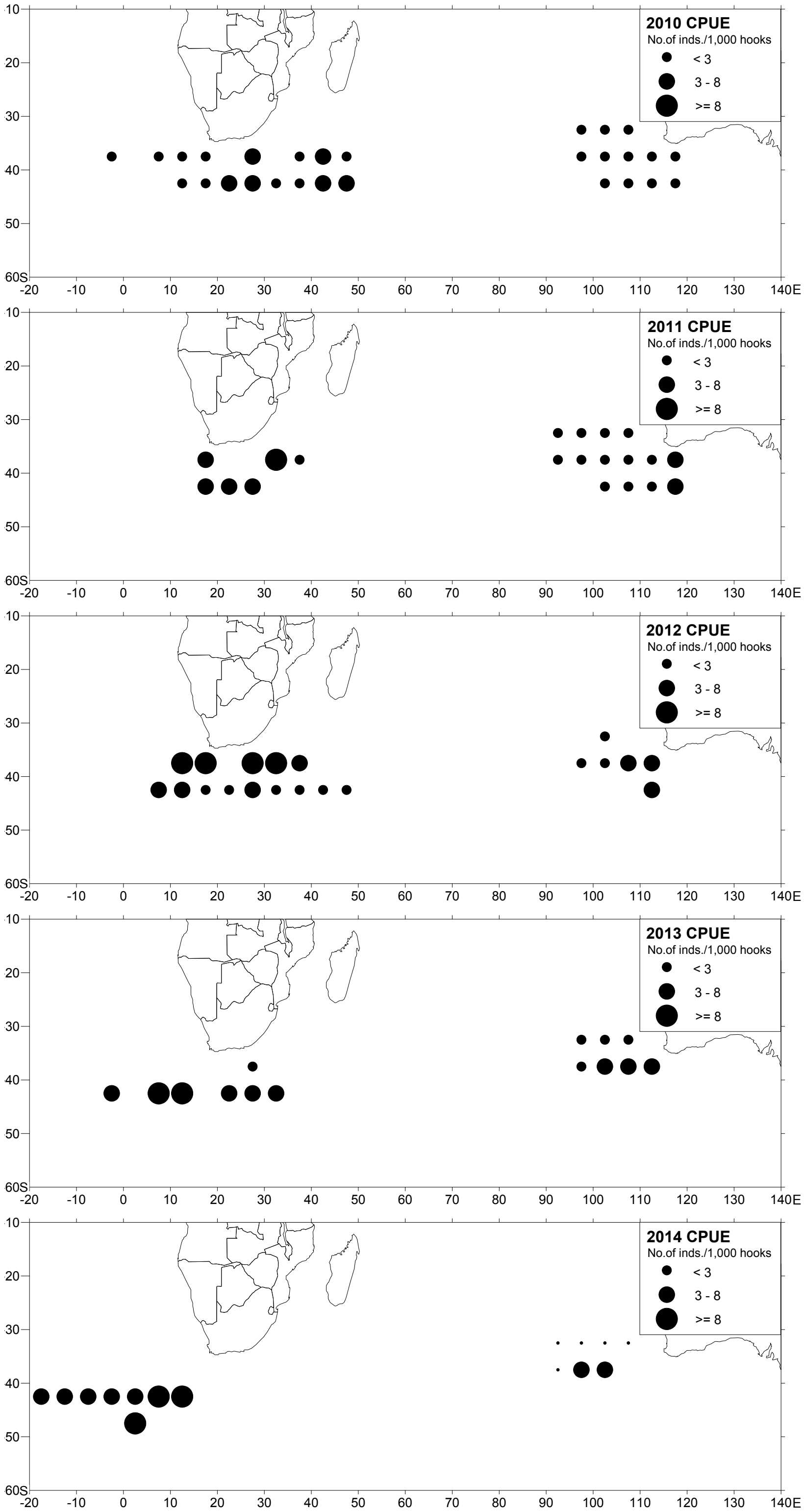

Fig. 1. The distribution of nominal CPUEs of SBT by Korean tuna longline fishery, 2010-2014.

Table 3. Estimation of total mortality of seabirds caught incidentally by Korean SBT fishery, 2010-2014

(1) 2010 year

Fishery				Observed						Estimate
Stratum	Total Effort	Total Observed Effort	Observer Coverage	Species (or group)	Captures (*number*)	Capture Rate	Mortalities (*number*)	Mortality Rate	Live Releases (*number*)	Estimated total mortalities (*number*)
9	1,557,056	389,042	25.0	*Thalassarchecauta*	3	0.008	3	0.008	0	12
				Thalassarchebulleri	9	0.023	9	0.023	0	36
				Thalassarchechrysostoma	2	0.005	2	0.005	0	8
				Thalassarchemelanophrys	24	0.062	24	0.062	0	96
				Diomedeaexulans	11	0.028	11	0.028	0	44
				Macronectesgiganteus	1	0.003	1	0.003	0	4
				Daptioncapense	1	0.003	1	0.003	0	4
				Diomedeachlorhynchos	15	0.039	15	0.039	0	60
				Unidentified (Seabirds)	10	0.026	9	0.023	1	36

(2) 2012 year

Fishery				Observed						Estimate
Stratum	Total Effort	Total Observed Effort	Observer Coverage	Species (or group)	Captures (*number*)	Capture Rate	Mortalities (*number*)	Mortality Rate	Live Releases (*number*)	Estimated total mortalities (*number*)
9	1,767,642	282,931	16.0	*Daptioncapense*	2	0.007	1	0.004	1	6
				Thalassarchemelanophrys	10	0.035	10	0.035	0	62
				Diomedeaexulans	3	0.011	3	0.011	0	19
				Macronectesgiganteus	1	0.004	1	0.004	0	6

(3) 2013 year

Fishery										Estimate
									Observed	
Stratum	Total Effort	Total Observed Effort	Observer Coverage	Species (or group)	Captures (*number*)	Capture Rate	Mortalities (*number*)	Mortality Rate	Live Releases (*number*)	Estimated total mortalities (*number*)
8	1,537,123	320,382	20.8	*Thalassarchecauta*	2	0.006	2	0.006	0	10
				Thalassarchemelanophrys	1	0.003	1	0.003	0	5
				Thalassarchecarteri	1	0.003	1	0.003	0	5
9	1,111,476	294,932	26.5	*Thalassarchechrysostoma*	1	0.003	1	0.003	0	4
				Thalassarchemelanophrys	2	0.007	2	0.007	0	8
				Diomedeaexulans	1	0.003	1	0.003	0	4
				Macronectesgiganteus	2	0.007	2	0.007	0	8
				Unidentified (albtross& petrel)	2	0.007	2	0.007	0	8

(4) 2014 year

Fishery										Estimate
									Observed	
Stratum	Total Effort	Total Observed Effort	Observer Coverage	Species (or group)	Captures (*number*)	Capture Rate	Mortalities (*number*)	Mortality Rate	Live Releases (*number*)	Estimated total mortalities (*number*)
8	1,076,008	266,521	24.8	*Thalassarchemelanophrys*	2	0.008	2	0.008	0	8

* For 2011, no observer was deployed onboard.

** Data for 2014 is provisional.

Table 4. Estimation of total mortality of sharks by Korean SBT fishery, 2010-2012

(1) 2010 year

Fishery				Observed						Estimate
Stratum	Total Effort	Total Observed Effort	Observer Coverage	Species (or group)	Captures (*number*)	Capture Rate	Mortalities (*number*)	Mortality Rate	Live Releases (*number*)	Estimated total mortalities (*number*)
9	1,557,056	389,042	25.0	*Alopiasvulpinus*	1	0.003	0	0.000	1	0
				Prionaceglauca	3,879	9.971	148	0.380	37	592
				Alopiassuperciliosus	3	0.008	1	0.003	2	4
				Carcharhinusgalapagensis	2	0.005	1	0.003	0	4
				Carcharhinusplumbeus	3	0.008	0	0.000	0	0
				Carcharhinusfalciformis	1	0.003	0	0.000	0	0
				Lamnanasus	439	1.128	87	0.224	4	348
				Isurusoxyrinchus	87	0.224	19	0.049	1	76

(2) 2012 year

Fishery				Observed						Estimate
Stratum	Total Effort	Total Observed Effort	Observer Coverage	Species (or group)	Captures (*number*)	Capture Rate	Mortalities (*number*)	Mortality Rate	Live Releases (*number*)	Estimated total mortalities (*number*)
9	1,767,642	282,931	16.0	*Alopiasvulpinus*	15	0.053	1	0.004	14	6
				Prionaceglauca	1,413	4.994	175	0.619	0	1,093
				Lamnanasus	68	0.240	8	0.028	0	50
				Isurusoxyrinchus	186	0.657	58	0.205	0	362

(3) 2013 year

Fishery									Observed	Estimate
Stratum	Total Effort	Total Observed Effort	Observer Coverage	Species (or group)	Captures (*number*)	Capture Rate	Mortalities (*number*)	Mortality Rate	Live Releases (*number*)	Estimated total mortalities (*number*)
2	39,180	39,180	100.0	*Prionaceglauca*	83	2.118	4	0.102	10	4
				Lamnanasus	12	0.306	3	0.077	5	3
				Pseudocarchariaskamoharai	21	0.536	1	0.026	10	1
				Isurusoxyrinchus	8	0.204	0	0.000	0	0
8	1,537,123	320,382	20.8	*Prionaceglauca*	490	1.529	8	0.025	19	38
				Isuruspaucus	14	0.044	0	0.000	2	0
				Lamnanasus	208	0.649	4	0.012	46	19
				Alopiaspelagicus	1	0.003	0	0.000	0	0
				Isurusoxyrinchus	45	0.140	0	0.000	0	0
				Zameussquamulosus	7	0.022	0	0.000	5	0
9	1,111,476	294,932	26.5	*Prionaceglauca*	754	2.557	15	0.051	0	57
				Lamnanasus	616	2.089	120	0.407	0	452
				Isurusoxyrinchus	18	0.061	4	0.014	0	15
				Squalusacanthias	1	0.003	0	0.000	0	0
				Zameussquamulosus	8	0.027	0	0.000	6	0

(4) 2014 year

Fishery		Observed								Estimate
Stratum	Total Effort	Total Observed Effort	Observer Coverage	Species (or group)	Captures (*number*)	Capture Rate	Mortalities (*number*)	Mortality Rate	Live Releases (*number*)	Estimated total mortalities (*number*)
2	246,117	3,410	1.4	*Prionaceglauca*	68	19.941	0	0.000	0	0
				Lamnanasus	1	0.293	0	0.000	1	0
				Isurusoxyrinchus	3	0.880	0	0.000	1	0
8	1,076,008	266,521	24.8	*Prionaceglauca*	878	3.294	280	1.051	96	1,130
				Lamnanasus	177	0.664	1	0.004	0	4
				Isurusoxyrinchus	19	0.071	9	0.034	1	36
				Zameussquamulosus	2	0.008	2	0.008	0	8

* For 2011, no observer was deployed onboard.

** Data for 2014 is provisional.