Review of Korean SBT Fishery of 2009

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1. Introduction

It was 1957 that Korean longliners first set out fishing tunas by advancing to the Indian Ocean. The Korean Southern Bluefin Tuna (SBT) fishery commenced to the distant-water longliners in 1991. SBT did not attract the attention of Korean fishing industry in the early years but soon got important by virtue of higher market price. At the beginning, the SBT catch was low and then reached a peak at 1,562 mt in 1998, but followed by decreasing cathces. Korea has become the member of the CCSBT Commission since 2001. Even since then, the catch sharply decreased in spite of the annual catch limit of 1,140 mt. Regarding this, industry explained that it might be due to worsened situation in market and fuel price and also availability of vessel for operation in high latitude. In recent years, the vessel availability was stable so that the catch would be anticipated proportionate to the TAC. In this report, fisheries information, observer activities and the measures related to data collection are introduced for the year 2009.

2. Data source

There are two sources of data collection. Korea Overseas Fisheries Association (KOFA) collects total catches by gear from Korean tuna industries, which are used as the official total catch that covers all tunas and tuna-like species. National Fisheries Research and Development Institute (NFRDI) collects logsheet sampling data from vessels. The logsheet contains operation location, catches by species, number of hooks, etc. The estimates of annual catch for the CCSBT area presented in this report are made with cross-checking the logsheet data and the official total catch. In accordance with the distant-water fisheries acts, fishing vessels are obliged to report the logsheet and biological measurement to NFRDI when they return to home-based port. Usually, a fishing trip of longline vessels lasts more than 20 months so that the catch statistic data would be completed that much later. Accordingly, the reported Korean catch data for 2008 and 2009 is usually provisional. In 2010, the logsheet has got reported by electronic format submission as soon as fishing operation ended.

3. Fleet size and distribution

Korean SBT fishery commenced in 1991 with a few longliners shifting from tropical waters where they targeted bigeye and yellowfin tunas. SBT did not attract the attention of Korean fishing industry in the early years but soon got important by virtue of higher market price so that the number of longliners rapidly increased to 19 vessels in 1998. Since then, the annual fleet size maintained 19 registered vessels by the voluntary regulation of the fishing industries. In general, the annual active number of vessels engaged in fishing SBT largely depends on Japanese market price, the condition of fishing grounds and recently the TAC (Table 1). In 2008 and 2009 the number of active longline vessels was 19.

4. Catch and effort

The Korean SBT fishing season usually starts in March and ends by November or December. During the first half of the fishing season which is from March to July or August, Korean longliners usually fish on the high seas of the western Indian Ocean off South Africa with an occasional expansion to the southeastern Atlantic, while during the second half they move to the eastern Indian Ocean off the Western Australia. This SBT fishing pattern and fishing grounds have rarely changed for the past 18 years except in 1991; but in 2008 and 2009, some catches were also taken from the western and central fishing grounds from March to December.

The annual catch of SBT from 1991 to 2009 is shown in Table 1. The data for 2008 and 2009 is still preliminary and may be revised in the coming year. It reached a peak in 1998, followed by continuous decrease until 2005 and then it has been increasing until recent years. The monthly SBT catch distribution of 2009 in terms of CPUE is mapped in Figure 1. It is shown that the fishing was operated mainly off eastern South Africa and secondarily off western Australia.

5. Nominal CPUE

In Figure 2 is shown that CPUE (number of fish caught per 1000 hooks) of the Korean longline fishery for SBT was very low with 0.5 and 0.6 in 2004 and 2005, compared to 2.1-3.3 during 2000-2003 but increased to 3.4 in 2008 and 4.7 in 2009, respectively. The CPUE of 2008 and 2009 is preliminary.

6. Size composition

Korean distant-water longline vessels are obliged to submit the data on length and weight measurement along with logsheet to NFRDI when they return to home-based port. However, due to the present reporting rule, which requests logsheets when fishermen return to home-based port, data submissions are logged. So the size compositions were resorted to observe data. In 2009 and 2010, two observers were deployed to monitor the tuna longline fishery in the southwestern Indian Ocean, between 30S°-43°S and 11E°-43°E for 109 days from March to June. The size and weight distribution, and relationship between fork length and weight of SBT in 2009 were shown in Figure 3 and 4, respectively.

7. Scientific observation program

Korea initiated a fisheries observer program for distant-water fisheries including tuna fisheries in 2002. The purpose of this program is to meet the requirements of relevant regional fishery bodies, thus the mission of trained observers is similar to those set out in the convention of the fishery bodies.

In 2009 and 2010, two observers were deployed to monitor the tuna longline fishery including by-catch species in the southwestern Indian Ocean, between 30S°-43°S and 11E°-43°E for four months starting from March to June (Table 2). In 2009 the observer recorded a total catch of 1,068 individual of SBT, and that of 1,152 individual of albacore tunas during 109 days of observation. The percentage of SBT was 18.2% of the total catch in number and sharks were 38.9% (Table 3). In 2010 the observer recorded a total catch of 2,175 individual of SBT, and a total catch of 1,412 individual of albacore tunas, and during 149 days of observation. The percentage of SBT was 22.9% of the total catch in number and especially, sharks were 46.4% of that has twice as much as SBT (Table 3).

Seabirds bycatch

According to fishermen, some seabird species (mostly albatross and petrel) are usually encountered as they set longlines. During the recent scientific observation trip in 2009 and 2010, 4 observers reported that there were 188 incidental catches of seabirds although fishermen used several on-board voluntary measures to avoid seabird bites such as hook-casting before dawn, tori line installing, using heavy weight and thawed baits, etc. Catch rates of seabirds were estimated 0.25 seabirds/ 1,000 hooks and 0.19 seabirds/1,000 hooks in 2009 and 2010, respectively.

Sharks bycatch

During the recent scientific observation of central Indian Ocean in 2007, 2009 and 2010, a total of 292 longline sets (one set per day) with total 1,081,162 hooks were monitored. A total of 12 sharks were identified, comprising 7,452 individuals. The dominant species were blue shark (85.5% of the total catch in number), porbeagle (12.0%), and shortfin mako shark (2.6%) (Table 4). Catch rate of sharks were estimated 5.12 sharks/1,000 hooks and 11.34 sharks/1,000 hooks in 2009 and 2010 respectively.

Other Non-target Fish

More than 31 bycatch species were recorded, including non-target tunas and tuna like species. The dominant species were opah (31.2% of total catch of in number), oilfish (12.5%), escolar (11.0%) and sickle pomfret (10.1%) (Table 5).

Marine Mammals and Marine Reptiles

No data are available for marine mammals or reptiles incidentally caught by Korean SBT longline fishery. During the scientific observation trip in 2009 and 2010, common dolphins, false killer whales and seals were observed nine times. There was no incidental catch of sea turtles.

8. Mitigation measures

Current Measures

Mandatory Measures for Each Fleet

Currently there are no mandatory measures taken by the Korean Government to reduce the incidental catch of seabirds by its tuna longline fishery. However, the Ministry of Food, Agriculture, Forestry and Fisheries (MIFAFF) is developing the National Plans of Action for the reduction of seabird and shark bycatch from longline fisheries. The preliminary NPOA-seabird and sharks are under compilation. They will be completed by 2010.

Voluntary Measures for Each Fleet

While no mandatory measures to reduce seabird bycatch has been taken by the Korean Government, fishermen voluntarily adopted the seabird deterrent device called tori line. Based on fishermen’s interviews, it was around 1990s when Korean longliners voluntarily began to deploy tori line to deter seabirds from baited hooks.

Fishermen recognize from their experiences that deterring seabirds from contacting baits during SBT longline sets is beneficial not only to reduce seabird mortality but to their fishery by reducing bait and effort loss.

From 2006, MIFFAF and NFRDI published guidebooks, information booklets and posters to educate fisherman through recent information and identification key for bycatch species in tuna fisheries.

9. Public relations and education activities

To avoid or reduce mortality of seabird and sea turtle by tuna longline vessels, guidebooks, information booklets, posters, and manuals of these species were distributed to fishing boats including tuna longliners in 2007, 2008 and 2009.

NFRDI conducts a training session for fishing vessel captains as they visit the Korean Tuna Longline Fishing Master Association before they begin their fishing trip. During last 2 years, 8 training sessions were held for fishing captains. The session largely includes reporting of fishing activity, target species and implementation of international regulations. Therefore, the importance of bycatch reporting is also encouraged.

10. Other Research Activities

To collect data of fishing behavior and survival time on ecological related species (sharks and non-target species) including target species (tunas), hook timers were used during the 2009 and 2010 observation. A total of 34 individuals were monitored in experimental branch lines with hooks timer. The preliminary result will be reported in near future.

During the 2009 and 2010 observation, 4 observers released 25 fishes with Korean dart tags and recaptured 8 southern bluefin tunas, and they reported 23 seabird-bands to NFRDI.

Table 1. The annual number of active Korean lonline vessels fishing for SBT and their annual SBT catches in CCSBT convention area, 1991-2009

Year	Number of longline vessel	Catch (mt)	Year	Number of longline vessel	Catch (mt)
1991	3	214	2001	10	735
1992	1	36	2002	10	649
1993	1	80	2003	4	221
1994	1	119	2004	7	114
1995	3	317	2005	7	33
1996	8	1,148	2006	9	130
1997	14	1,238	2007	12	453
1998	19	1,562	2008	19	986
1999	16	1,271	2009	19	971
2000	13	987			

*** Catch unit : GG weight in mt**

Table 2. Observed catch and effort of SBT by Korean tuna longliners in 2009-2010

Year	Fishery	Observers Deployed	Sea Days	Sets/Tows Observed	Observed Vessels	Observed Effort (units: hooks)	Total Cost (Won)
2009	Longline	2	109	97	10%	446,479	37,300,000
2010	Longline	2	149	119	10%	389,042	45,000,000

Table 3. Observed species composition (%) of the Korean tuna longliners for targeting SBT in 2009 and 2010

Year	TOTAL	SBT	ALB	YFT	BET	STM	SWO	BLM	SHA	OTH
2009	5,879 (100.0)	1,068 (18.2)	1,152 (19.6)	14 (0.2)	46 (0.8)	0 (0.0)	4 (0.1)	0 (0.0)	2,288 (38.9)	1,307 (22.2)
2010	9,511 (100.0)	2,175 (22.9)	1,412 (14.8)	91 (1.0)	63 (0.7)	0 (0.0)	6 (0.1)	1 (0.0)	4,415 (46.4)	1,348 (14.2)

SBT : southern bluefin tuna ALB : albacore tuna YFT : yellowfin tuna BET : bigeye tuna
STM : striped marlin SWO : swordfish BLM : black marlin SHA : sharks OTH : other fishes

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Table 4. Observed shark species composition (%) of the Korean tuna longliners for targeting SBT in 2009 and 2010

Species	2009		2010	
	Number	%	Number	%
Blue shark	1,840	80.4	3,879	87.9
Porbeagle	403	17.6	439	9.9
Shortfin mako shark	41	1.8	87	2.0
Silky shark			1	0.0
Bigeye thresher shark			3	0.1
Sandbar shark			3	0.1
Crocodile shark				
Dusky shark	2	0.1		
Galapagos shark			2	0.0
Thresher shark	1	0.0	1	0.0
Smalltooth and tiger	1	0.0		
Velvet dogfish				
Total	2,288	100	4,415	100.0

Table 5. Observed bycatch species composition (%) of the Korean tuna longliners for targeting SBT in 2009 and 2010

Species	2009		2010	
	Number	%	Number	%
Brama pomfret	167	12.8	160	12.0
Butterfly kingfish	132	10.1	123	9.2
Common dolphinfish	1	0.1		
Common mola	1	0.1	23	1.7
Crested oarfish	1	0.1		
Dagger pomfret			2	0.1
Dolphinfish	1	0.1	1	0.1
Escolar	31	2.4	68	5.1
Indo-pacific marlin	2	0.2		
Indo-pacific sailfish	3	0.2		
Lancetfish			22	1.6
Oilfish	58	4.5	160	12.0
Opah	562	43.1	440	32.9
Patagonian toothfish	5	0.4	12	0.9
Pelagic stingray	2	0.2	23	1.7
Pomfret	101	7.8	92	6.9
Roudi's escolar	2	0.2		
Rough pomfret	16	1.2		
Sharptail mola	3	0.2		
Shortnose lancetfish	2	0.2	3	0.2
Sickle pomfret	204	15.7	158	11.8
Skipjack tuna	3	0.2	1	0.1
Slender tuna	1	0.1		
Snake mackerel	3	0.2	8	0.6
Tapertail ribbonfish	1	0.1		
Wahoo	1	0.1	5	0.4
Other species	4	0.3	37	2.8
Total	1,303	100	1,338	100

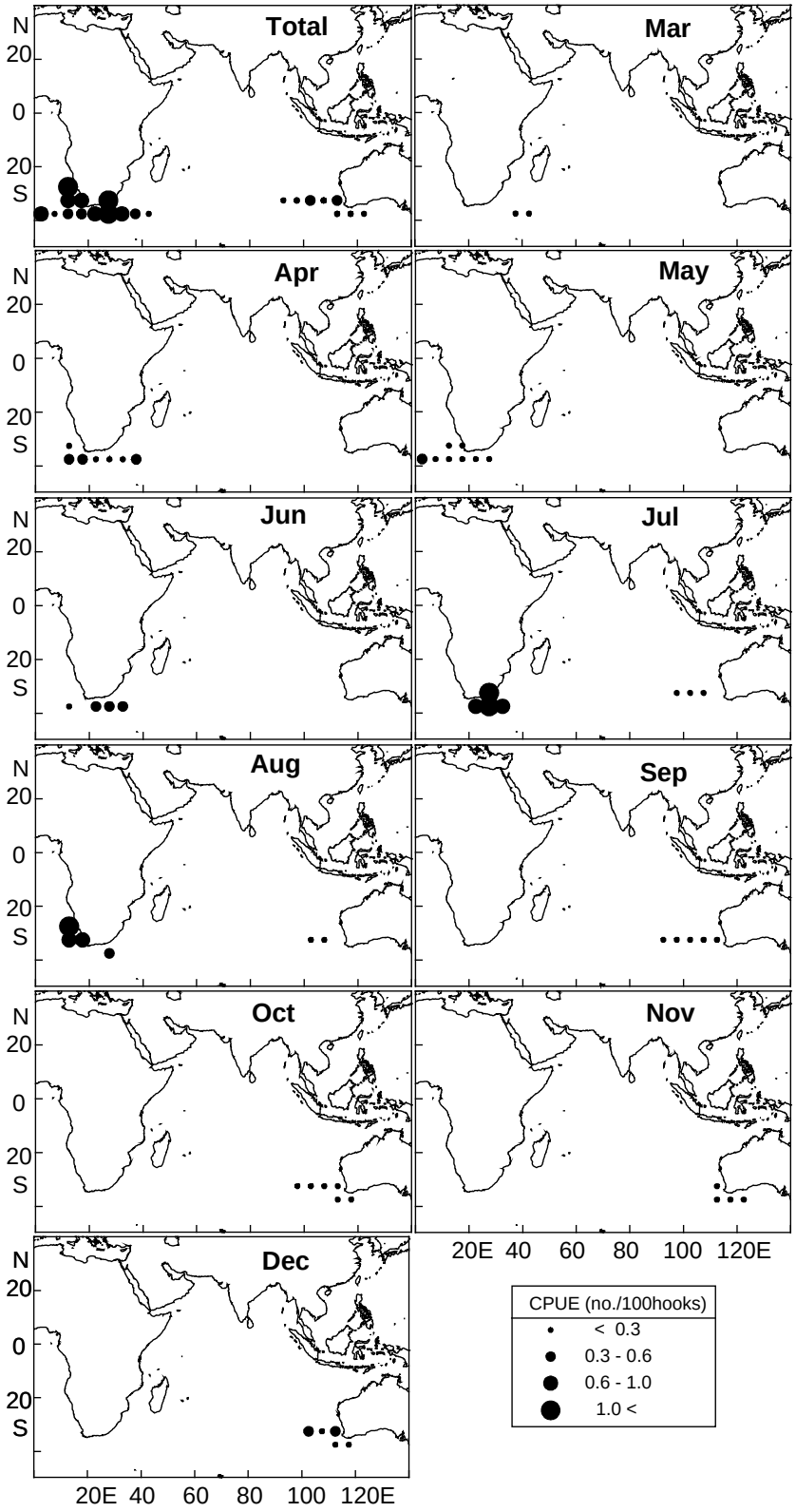

Fig. 1. CPUE (No./100 hooks) distribution of SBT by Korean tuna longliners in 2009.

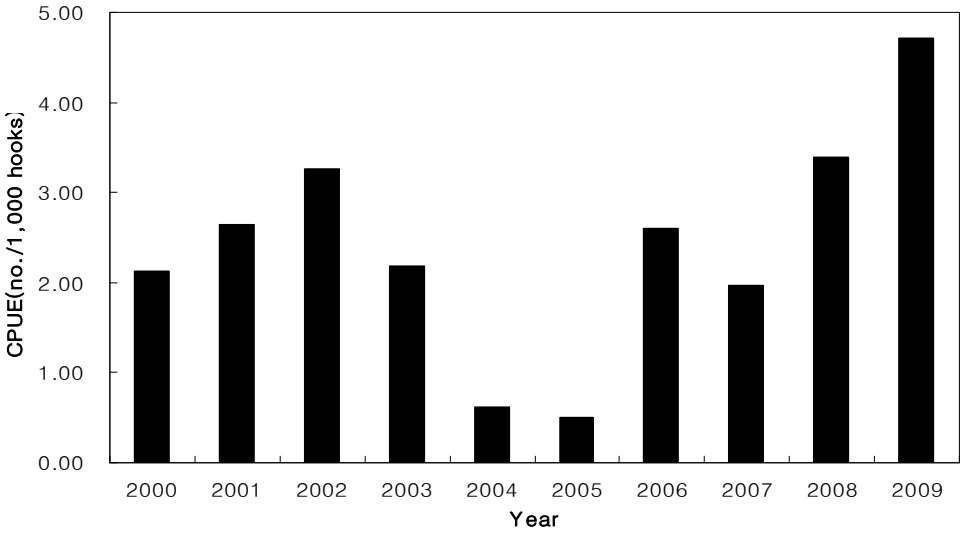

Fig. 2. The nominal CPUE series of SBT during 2000-2009 (Data of 2008 and 2009 is preliminary.).

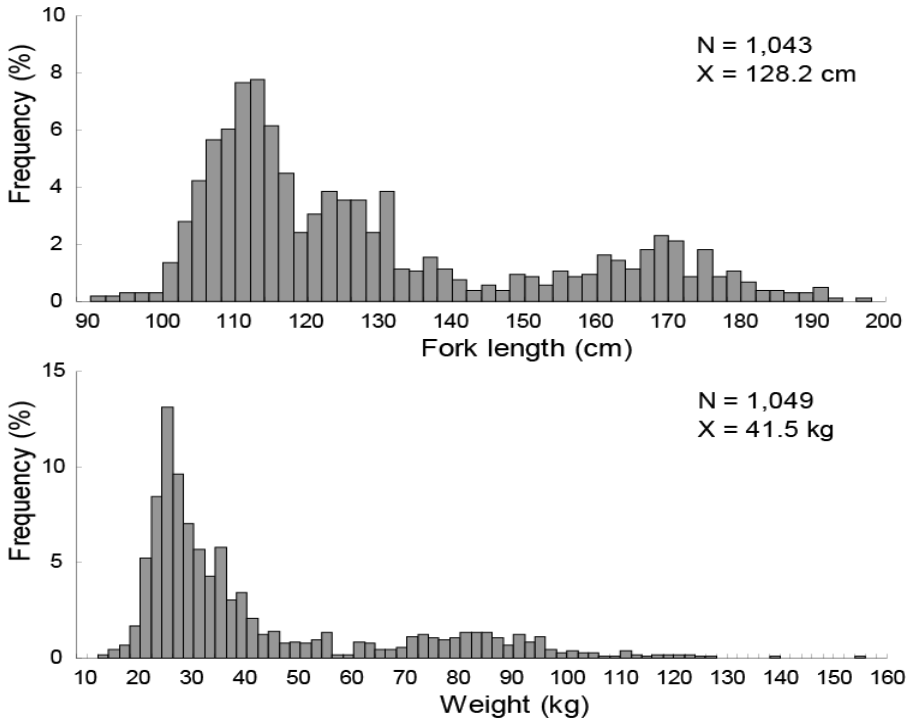

Fig. 3. Size and weight distribution of SBT by Korean tuna longliners in 2009.

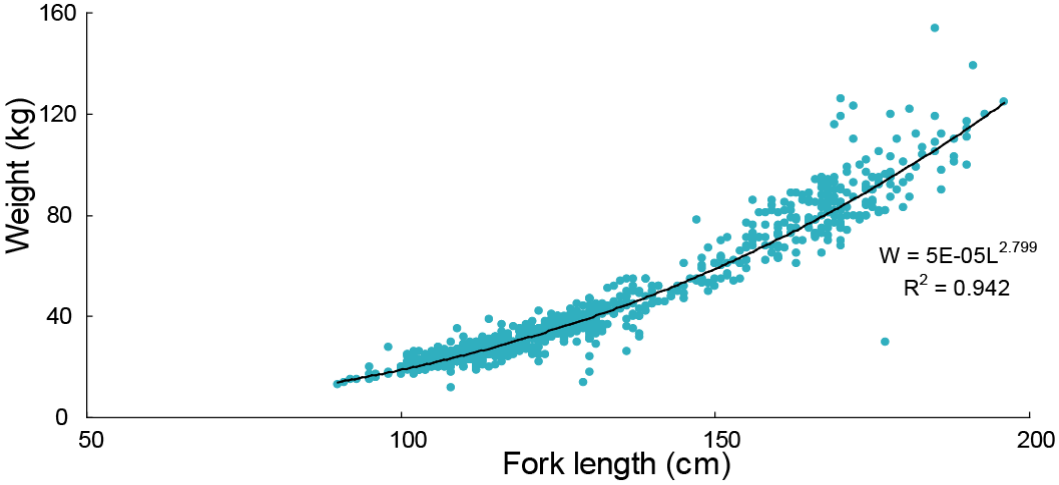

Fig. 4. Relationship between fork length and weight of SBT in 2009.