Review of Korean SBT Fishery for 2010 fishing year

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Summary

This report summarizes the Korean Southern Bluefin Tuna (SBT) fishery for 2010 and historical period. The Korean SBT fishery has been operated by the large longline only since its commencement in 1991. In 2010 fishing year, Korea sets a total allowable catch of 876.4 mt, for which 9 vessels were engaged and their total catch was 869.1 mt (total catch in 2010 calendar year was 867.4 mt). The number of active vessels was reduced to match with the reduced national allocation. The nominal CPUE was increased from 2007 and represented 3.23 fishes/1000hooks in 2010, which is almost at the same higher levels than an average as 3.39 in 2008 and 3.32 in 2009. The size composition of the SBT caught by Korean longline ranged 86-196 cm (FL) with a main mode of 110-132 cm (FL) and a secondary mode of 150-180 cm (FL). Scientific observer program was conducted onboard the 2 longline vessels in 2010 and come up with 12.7% coverage in terms of fishing effort (catch/1000 hooks).

1. Introduction

The Korean distant-water longline fleets have been operating to mainly fish bigeye and yellowfin tuna in the Indian Ocean since 1957. They started targeting Southern Bluefin Tuna (*Thunnus maccoyii*, SBT) in 1991. The catch was low at the beginning but gradually increasing with a peak ed at 1,789 mt in 1998. Korea became the member of the CCSBT Commission in 2001. In spite of annual catch limit of 1,140 mt as membership, the catch was sharply decreasing to a considerably low level until 2007. It was mostly attributed to the availability of vessels, as well as low market price and high fuel price. In recent years, the Korean fleets have well completed their allocated quota with an improved availability and arrangement. 4 Korean fishery companies have been participating in SBT catch with a total of 19 large longline vessels since 1991. The national quota is allocated to companies by the government authority and then the companies split their allocation by vessels equally. The allocations are transferable if any company is not able to exhaust its share. Korea's yearly quota are 859 mt for the year 2010-2011.

2. Catch and effort

In 2010 fishing year, Korea set a total allowable SBT catch of 876.4 t out of the yearly catch limits of 859 mt for 2010-2011, for which 9 vessels were engaged and caught a total of 869.1 mt (total catch in 2010 calendar year was 867.4 mt) (Table 1, Fig. 1). The number of active vessels was reduced to match with the reduced national allocation. It resulted in the decrease both in the catch and effort. The historical catch of SBT represented a marked fluctuation. It was low at the beginning and increased to reach a peak at 1,562 mt in 1998, and afterward dropped to the lowest of 38 mt in 2005 but followed by the increasing to 1,134 mt in 2008 and 1,117 mt in 2009, almost near to the TAC of 1,140mt. The historical trend of total catch was nearly proportionate to the effort in terms of the number of vessel. The logbook data compiled from the vessels showed that the catch (no of fish) generally took the same trend as the effort (no. of hook), except for the year 2004 and 2005 when the catch was the lowest and notably different from the normal distribution (Table 2, Fig. 2).

3. Nominal CPUE

In 2010, the nominal CPUE derived from the longline vessel logbooks for SBT was 3.23 individuals/1000hooks (Table 2 and Figure 3). It was 2.1-3.3 during 2000-2003, decreased to 0.5-0.6 in 2004 and2005, and increased to 3.4 in 2008 and 3.3 in 2009, respectively. The 2010 CPUE was almost at the same higher levels than an average year. The CPUE was apparently higher in area 9 than in area 2 and 8 through the period of 2000-2010. It was shown that fishing pattern of Korean longline for SBT captured from the distribution of CPUE had changed; during 2000-2002, higher CPUEs were widely distributed in area 2, 8 and 9, with an extention to area 7 in 2002. On the other hand, a rare or no CPUE was observed in area 2, 8 during 2003-2007, even in area 9 in 2005. In recent years, they were widely restored in density and distribution in area 2, 8 and 9, as in the period of 2000-2002. Low and narrowed distribution of CPUE during 2003-2007 is known of resulting from economic and operational conditions such as vessel availability, low market price and high fuel price at that time.

4. Size composition

The size composition data of SBT were taken from the logbooks and the observer data onboard the Korean longline vessels from 2004 to 2010 (no data in 2008). Fishers were requested to submit the data on measurement together with logsheet to NFRDI when they return to home-based port and scientific observer program has started since 2002. However, it was appeared that the measurement and submission by fishers had not yet been fully implemented enough to meet the requirement and it was recent years when the observer data had been actively collected. The size composition data were collected in area 9 of 10-45^{o}E

and 35-45°S from March to October. In 2010, the size composition ranged 86-196 cm (FL) with a main mode of 110-132 cm (FL) and a secondary mode of 150-180 cm (FL). It was observed that the mode of length was slightly moving to the larger side during 2007-2010 (Fig. 4).

5. Fleet size and distribution

19 Korean longline vessels are registered for the SBT fishery and all are over 40 meters and 350 gross tons. The number of active vessels has varied with fisheries operational and economic conditions and it was reduced by 9 vessels in 2010 because of a reduced national catch limits. Korean longliners usually fish on high seas of the western Indian Ocean off South Africa with an occasional expansion to the southeastern Atlantic during the first half of the fishing season from April to July or August and move to the eastern Indian Ocean off the Western Australia during the second half from August to December. This SBT fishing fleet size and distribution have rarely changed throughout the history, except in 2005 when some catches were taken in the Central and southern Indian Ocean.

6. Development and implementation of scientific observation program

Appendix 1 summarized Korean observer program in 2010.

7. Other relevant information

The qualified scientific data collection and submission in timely way is a routine notice in the annual meetings. In relation to this matter, it would be problematic that Korean domestic law requests the data submission to National Fisheries Research and Development Institute (NFRDI) within 6 months after the fishing vessel returns to the home-base port from its fishing trip for about 20 months. In case of this practice, it is impossible not only to meet the timely submission of data but also to have a chance to review and check the status of data collection and biological measurement undergoing onboard fishing vessels. For the remedy, a workshop was held for improving scientific activities and data collection, with participation of managers, fishers, scientists and distant-water fishery association in the NFRDI on January 17, 2011. The workshop recommended the improvement of data collection and reporting. A series of subsequent follow-up has been made on logsheet updates including the incorporation of ERS, implementation of the biological measurement and sampling required, timely reporting and dissemination, etc. Finally, fishers were requested to monthly report to the NFRDI the logsheet with length measurement in electronic format.

Table 1. The number of active Korean tuna longline vessels fishing for SBT and their total SBT catches by year in CCSBT convention area, 1991-2010

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

Table 2. The catch of SBT and the effort of Korean longline vessels targeting SBT by year and area, 2000-2010

Year	Total			Area 2			Area 8			Area 9			Others		
	No. of inds.	No. of hooks ($\times 10^3$)	CPUE	No. of inds.	No. of hooks ($\times 10^3$)	CPUE	No. of inds.	No. of hooks ($\times 10^3$)	CPUE	No. of inds.	No. of hooks ($\times 10^3$)	CPUE	No. of inds.	No. of hooks ($\times 10^3$)	CPUE
2000	5,425	2,547	2.13	35	10	3.40	2,796	1,533	1.82	2,415	593	4.07	179	410	0.44
2001	11,125	4,208	2.64	12	44	0.27	5,484	2,524	2.17	5,629	1,594	3.53	0	45	0.00
2002	15,114	4,635	3.26	22	16	1.33	1,768	1,314	1.34	13,141	3,213	4.09	183	90	2.02
2003	2,835	1,300	2.18	-	-	-	92	80	1.14	2,743	544	5.04	0	675	0.00
2004	1,829	2,951	0.62	0	29	0.00	-	-	-	1,822	2,075	0.88	7	847	0.01
2005	889	1,762	0.50	425	154	2.76	14	9	1.49	291	761	0.38	159	837	0.19
2006	3,737	1,437	2.60	-	-	-	-	-	-	3,722	785	4.74	15	651	0.02
2007	6,689	3,391	1.97	-	-	-	-	-	-	6,615	2,696	2.45	74	695	0.11
2008	16,853	4,972	3.39	607	229	2.64	6,926	2,597	2.67	9,301	1,798	5.17	19	347	0.05
2009	19,789	5,962	3.32	0	3	0.00	4,348	2,142	2.03	15,269	3,501	4.36	172	315	0.55
2010	6,689	2,068	3.23	82	95	0.86	2,834	1,062	2.67	3,773	910	4.14	-	-	-

* Catch and effort compiled from logbook.

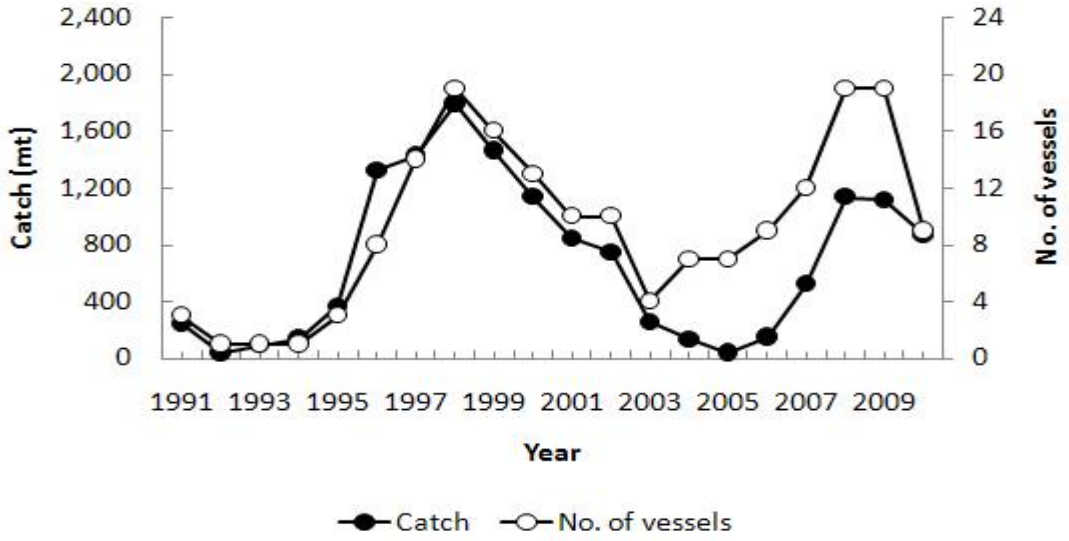

Fig. 1. The total catch of SBT and the number of Korean active longline vessels targeting SBT, 1991-2010

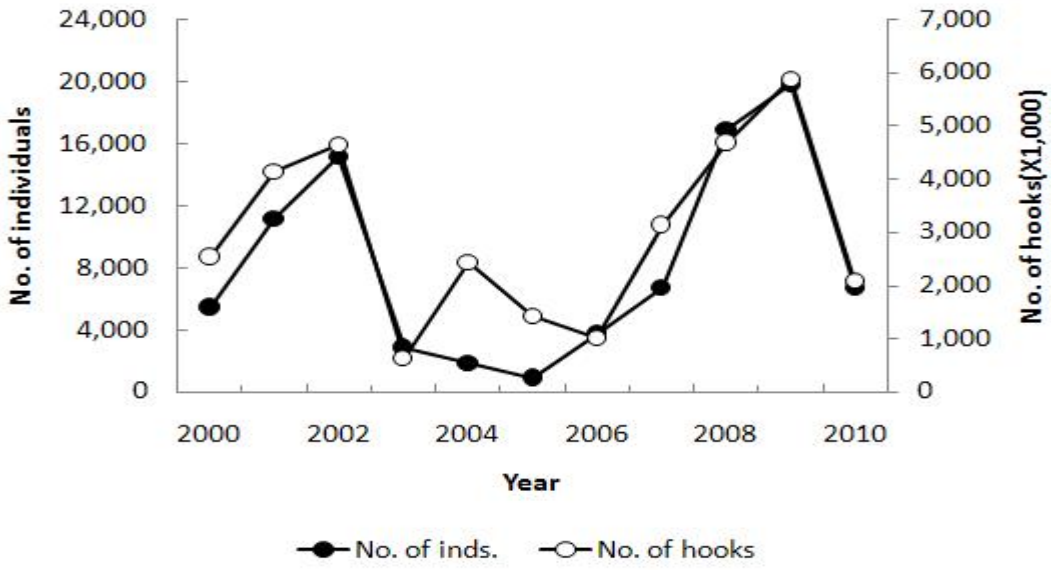

Fig. 2. The SBT catch (number of fish) and fishing effort (number of hook) compiled from Korean longline vessel logbooks, 2000-2010.

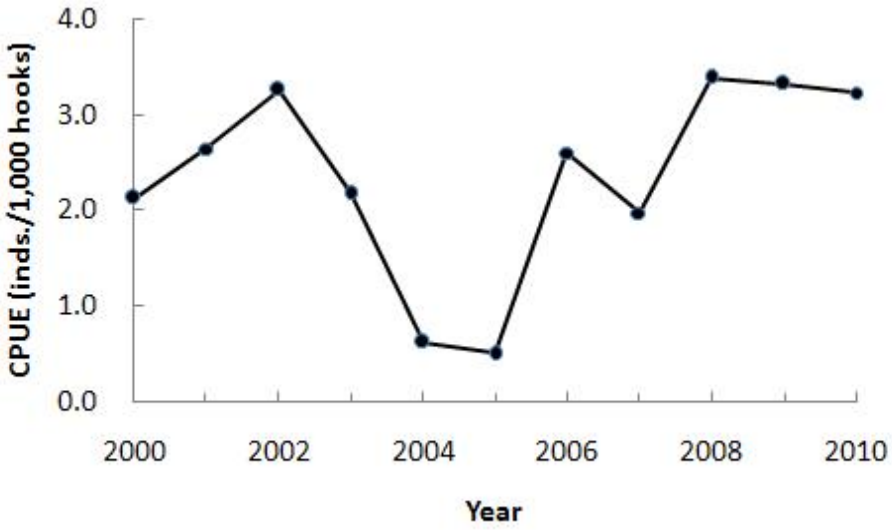

Fig. 3. The nominal CPUE series of Korean SBT longline vessel targeting SBT form 2000 to 2010.

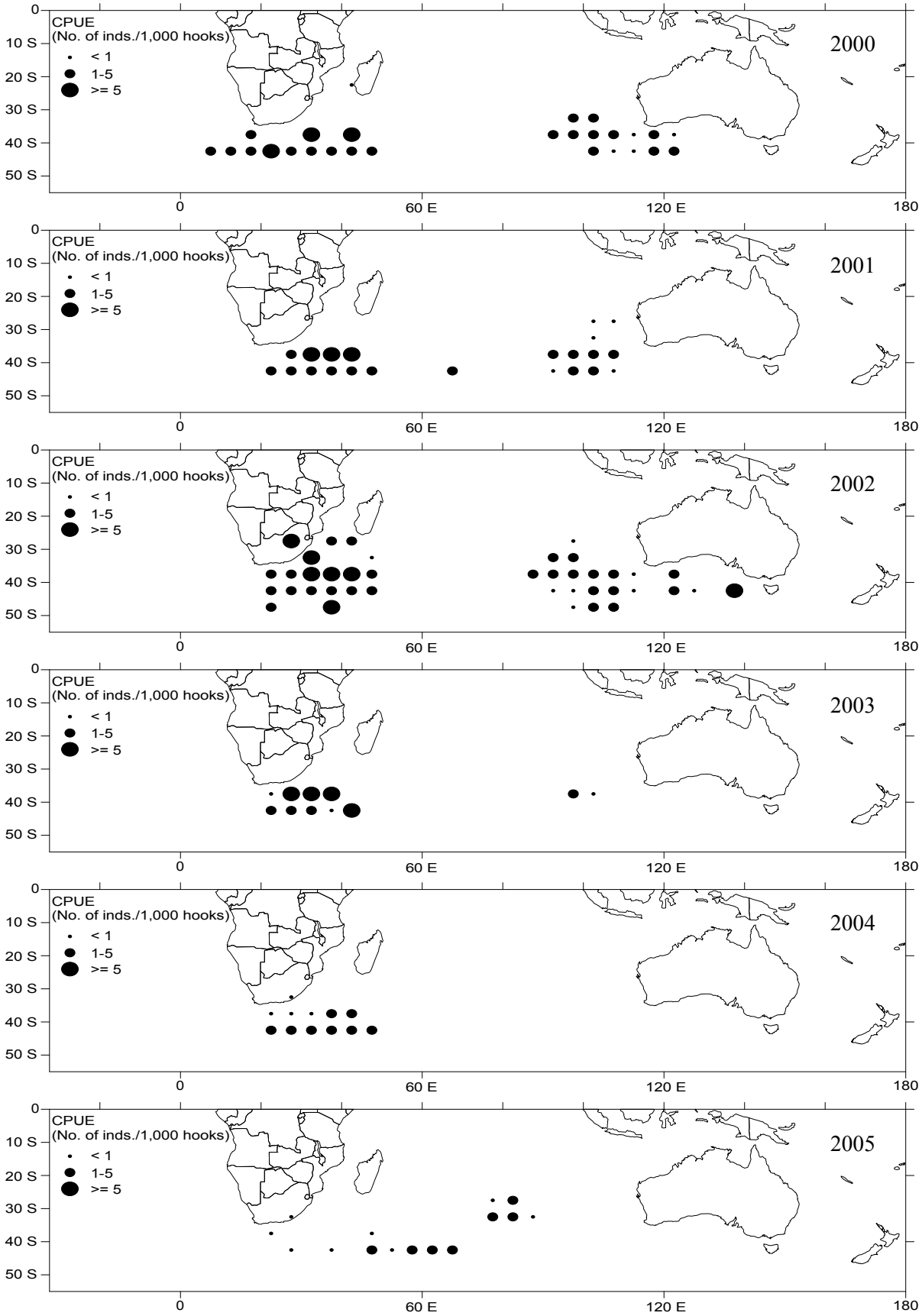

Fig. 4. The CPUE distribution of Korean tuna longline targeting SBT by year and by area, 2000-2010.

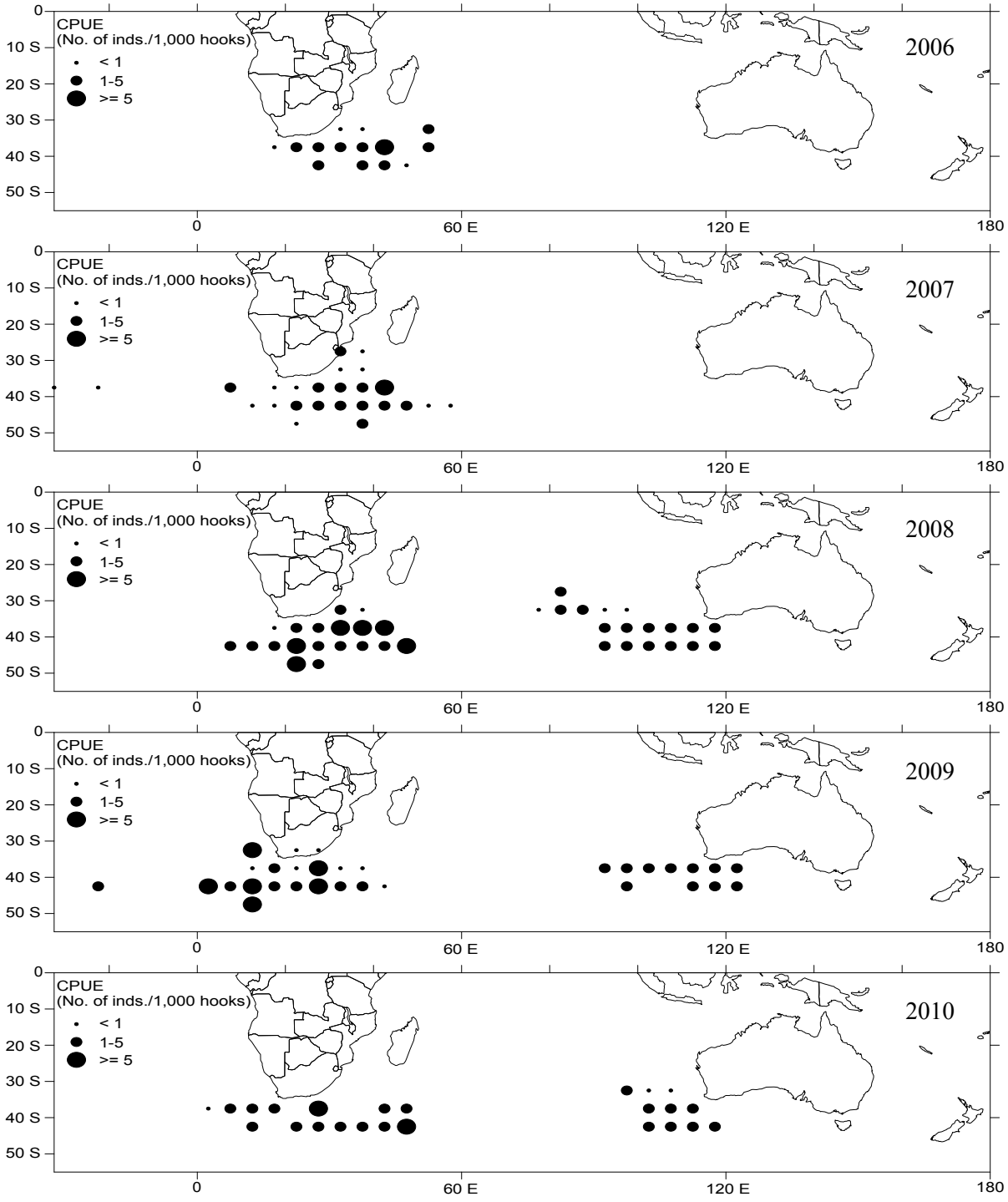

Fig. 4. Continued.

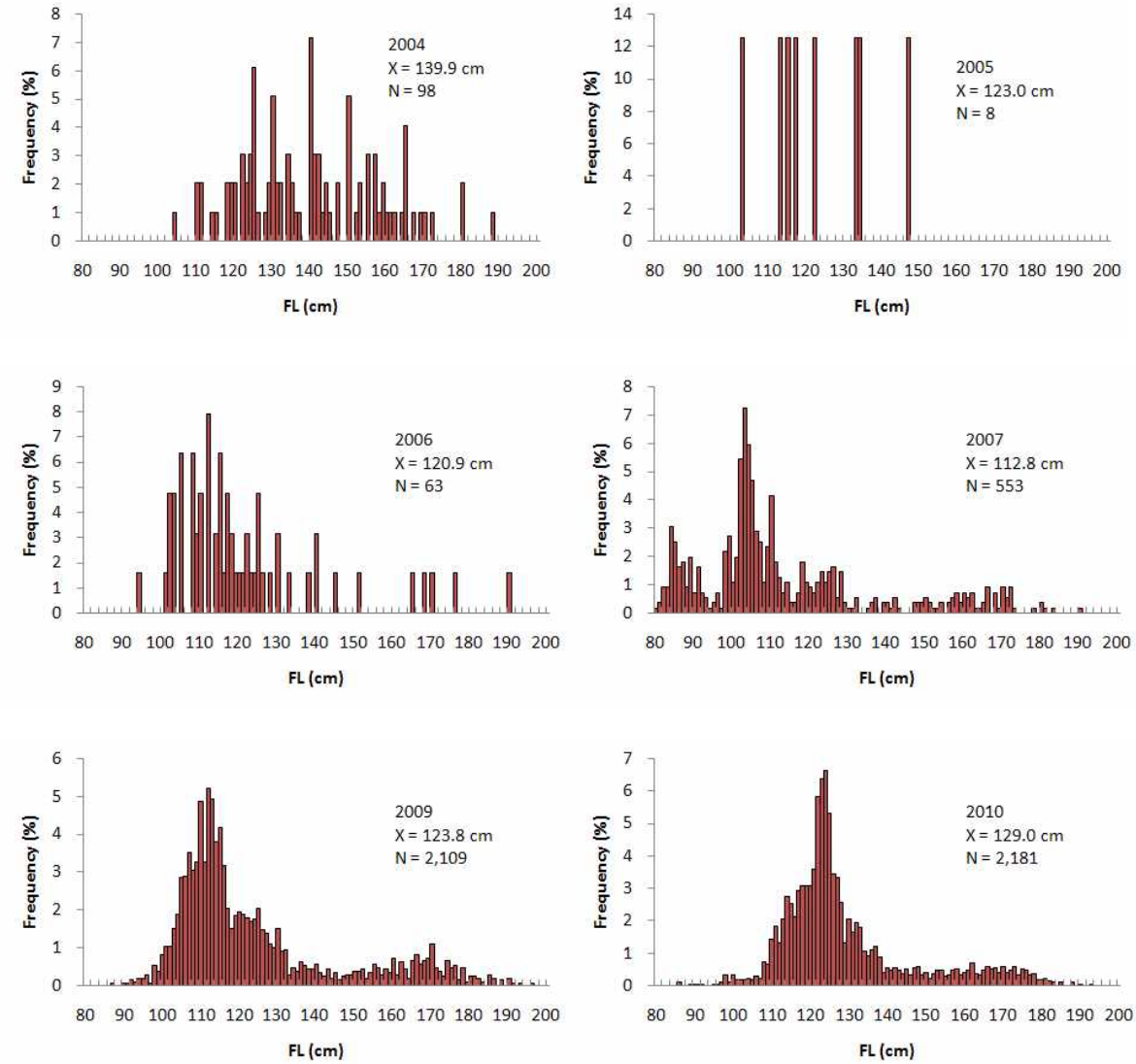

Fig. 5. Length frequency distribution of SBT caught by Korean tuna longline, 2004-2010.

Appendix 1

Scientific observer program

Observer Training

The scientific observer program of distant-water fisheries of Korea was started in 2002. National Fisheries Research and Development Institute (NFRDI) is responsible for implementing and developing the program.

The qualification for observers is college graduated where major field is nature science or fisheries high school graduated with at least 1-year experience on board and certificate of qualification to deck officer. Candidate for observer who have passed the paper review (including medical check) and oral interview have to take training programs for 3 weeks.

Observer training programs include basic safety training for seafaring, operations of navigation devices, biological information training for target and non-target species and data collection method for fishing activities.

During the training program they have two kinds of test. First is the test for a technical term of fisheries and biology, and the other is the test for species identification. The person who scored 70% overall in the two tests and attended 100% of the course timetable can be qualified and deployed on board as a scientific observer.

Scientific Observer Program Design and Coverage

In 2010, 2 observers were placed onboard 2 longline vessels targeting the SBT. They observed the catch of 95 mt and the effort of 389,042 hooks in 119 sets during 143 sea days. The observer coverage rate was 12.7% both in catch and effort (Table 1).

Observer Data Collected

The observers collected the data required by the CCSBT scientific observer program standards. The data collected were i) vessel and gear attributes, ii) setting and catch details, incidental catch of ERS and sighting of marine mammals. The biological measurements were conducted on all SBT and other tunas and ERS. Biological samplings carried out were stomach content and gonads of SBT and other tunas. In 2010, 2,175 SBT were observed to have been caught during the trips, all individuals of which were measured of length and weight (Table 2, 3). The information of SBT on sex, maturity, gonad weight and stomach

contents, including other species were collected (Table 4)

Tag Return Monitoring

During the 2010 scientific observation, 3 tagged SBTs were recaptured, of which 1 fish belonged to the length class of 110-119 and 2 fishes of 120-129 cm (Table 5), and 7 seabird-bands were reported to the NFRDI (Table 6). 10 SBTs, 5 albacores and 3 blue sharks were released with Korean dart tag during scientific observation (Table 7).

Problems Experienced

Most of observers commonly report to have experienced hardship in their life onboard vessel. The NFRDI, as responsible for observer program, is suffering from a lack of observers because applicants are getting less. It related to some recent observer accident as well as their poor socio-economic security. In relation to biological sampling, skippers and crew were not fully supportive of otolith sampling as it required time and skill in both side.

Table 1. Summary of results for scientific observer programs, 2009-2010

Year	Trips observed	Sea days	Set observed	Effort observed($\times 10^3$)	Effort observed(%)	Catch observed of SBT(ton)	Catch observed of SBT(%)
2009	2	170	141	446,479	9.5	92	9.5
2010	2	143	119	389,042	12.7	95	12.7

Table 2. Species composition (in number of fish) observed in Korean tuna longline, 2009-2010

Year	Total	SBT	BET	YFT	ALB	SWO	BUM	SHA	OTH
2009	13,951	2,621	161	22	2,396	13	-	7,174	1,564
2010	9,511	2,175	63	91	1,412	6	1	4,415	1,348

* SBT: southern bluefin tuna, BET: bigeye tuna, YFT: yellowfin tuna, ALB: albacore, SWO: swordfish, BUM: blue marlin, SHA: sharks, OTH: others.

Table 3. Number of fish measured for length frequency data by species, 2009-2010

Year	Total	SBT	BET	YFT	ALB	SWO	BUM	SHA	OTH
2009	7,885	1,952	94	16	1,409	12	-	2,939	1,463
2010	9,113	2,175	63	90	1,368	5	1	4,169	1,241

Table 4. Number of fish measured or collected for biological information by species, 2009-2010

Year	Sex		Maturity		Gonad weight		Stomach content	
	SBT	Others	SBT	Others	SBT	Others	SBT	Others
2009	2,126	5,379	47	72	-	-	113	170
2010	1,891	3,668	913	406	305	27	268	436

Table 5. Number of SBT tag returns observed, 2009-2010

Year	Total	Size class(cm)			
		100-109	110-119	120-129	130-139
2009	5	1	1	2	1
2010	3	-	1	2	-

Table 6. Number of Seabird tag returns observed, 2009-2010

Year	Species															
	Total	Wandering albatross		Shy albatross		Black-browed albatross		Southern royal albatross		Atlantic yellow-nosed albatross		Antarctic giant petrel		Unidentified	
		L	D	L	D	L	D	L	D	L	D	L	D	L	D
2009	16						1		11		1		2	1	
2010	7		5		1										1

* L: live, D: death.

Table 7. Number of Tag released by species, 2009-2010

Year	Species						
	Total	Southern bluefin tuna	Bigeye tuna	Albacore	Porbeagle	Salmon shark	Blue shark
2009	7		2	2	1	1	1
2010	18	10		5			3