

2013 Annual National Report of Korean SBT Fishery

Republic of Korea

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1. Introduction

Korean fleet is using only longline gear to fish southern bluefin tuna, *Thunnus maccoyii*, (SBT) in the CCSBT convention area. Korean tuna longline fishery in the Indian Ocean started with a small experimental operation in the 1957 and since then has targeted bigeye tuna, yellowfin tuna and albacore tuna. Korean tuna longline fishery has been operating to mainly fish bigeye tuna, yellowfin tuna and albacore tuna in the Indian Ocean since 1957, and started targeting SBT in 1991. In 2012, SBT catch of Korean tuna longline fishery was 922 mt (889 mt in fishing year) with 7 vessels in active. Fishing occurs mainly in the area of 25°S-45°S and 15°-115°E, of which mainly in the western Indian Ocean from March to July/August and in the eastern Indian Ocean from July/August to December. In recent years, the Korean SBT is strictly controlled by the Government in terms of catch and the number of vessels in order to fulfill the conservation and management of the stock by the CCSBT.

2. Catch and Effort

The catch was low at the beginning but increased up to 1,320 mt in 1996, peaked at 1,796 mt in 1998, and then showed a largely decreasing down 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. It was mostly attributed to the availability of vessels as well as low market price and high fuel price. Since 2008, the annual catch ranged from 705 mt to 1,134 mt, which was well commensurate with the national catch limit (Table 1, Fig. 1). In 2012 fishing year, Korea was set at 911 mt as the yearly total allowable SBT catch, and a total of 889 mt was caught (922 mt in calendar year).

The historical distribution of SBT catch and effort of Korean tuna longline fishery by area is shown in Table 2. Korean SBT fishery has generally operated in the south of 35°S between 10°E-50°E (area 9) and between 90°E-120°E (area 8). In general, efforts for fishing SBT were concentrated relatively higher on the eastern Indian Ocean (area 9) than on the western Indian Ocean (area 8).

3. Nominal CPUE

The nominal CPUE was 2.1-3.3 during 2000-2003, 0.5-0.6 in 2004-2005, and increased up

to 3.4 in 2008, which was maintained until 2011. In 2012, it further increased to 5.2. In general, the CPUE by area was apparently higher in area 9 than in areas 2 and 8 throughout the period of 2000-2012, and especially it showed a jump in area 9 in 2011 and 2012 (Fig. 2).

4. Size composition

The size composition data of SBT were taken from the logbooks and the observer data from 2004 to 2012 (no data in 2008 and CDS data for 2011). The size composition data were collected in only area 9 from 2004 to 2010, 2012 and in areas 8 and 9 for 2011 (Fig. 3). The average of fork length (FL) was 139.9 cm in 2004 and 112.8 cm in 2007. In 2012, it was 124.7 cm with a range of from 69 cm to 120 cm.

5. Fleet size and distribution

Korean longline fleet for the SBT is 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 2011, 7 vessels have operated in active for fishing SBT so as to be equivalent to the national quota (Table 1, Fig. 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. 4). The CPUE was generally higher in the western Indian Ocean than in the eastern Indian Ocean. 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.

6. Development and implementation of scientific observer programs

A. Observer Training

National Fisheries Research and Development Institute (NFRDI) is responsible for implementing and developing the program. Observer training programs include basic safety for seafaring, necessary handling of navigation devices, fishing operational data collection, and biological knowledge and sampling for target, non-target species and ecologically important species, including interaction information and live releasing. In the end of the training they have to pass two tests. First is for a technical term of fisheries and biology, and the other is for species identification. The person who scores 70% overall from the two tests and complete 100% attendance of the training course can be qualified as a scientific observer. In 2012, Korea has 20 persons being able to be deployed onboard as an active scientific observer.

B. Scientific Observer Program Design and Coverage

In 2012, 3 observers were placed onboard 3 longline vessels targeting the SBT. Observers were deployed only in area 9 in 2012. They observed the SBT catch of 162 mt and the effort of $3,473 \times 10^3$ hooks in 142 sets during 176 days in fishing area, which the observer coverage

was estimated to be 12% (Table 3).

C. Observer Data Collected

Table 4 shows an amount of SBT catch and effort compiled from the Korean observer program in area 9 in 2012. The data collected were i) vessel and gear attributes, ii) setting and catch details (including discard/release), incidental catch of ERS (ecologically related species) and sighting of marine mammals. The biological measurements were conducted on all SBT, ERS and other species. Biological samplings carried out were stomach content and gonads of SBT and other tunas. In 2012, 3,198 individuals of SBT were observed and measured of length and weight during the trips (Table 5). The information of SBT and ERS on sex and stomach contents, including other species, were collected (Table 5).

D. Tag Return Monitoring

During the 2012 scientific observation, 7 individuals of SBT tagged were recaptured and 22 individuals were released by Korean observer program (Table 6). In addition, 1 bigeye was recaptured, and 7 albacore tunas and 1 skipjack tuna were released.

E. Problems Experienced

Nothing

7. Other relevant information (Data collection and reporting)

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. Along with the Act, the NFRDI developed a program being able to monitor and manage data collection and reporting in timely and accurate way.

Table 1. The annual number of active Korean tuna longline vessels fishing for SBT and their annual SBT catches in the CCSBT convention area, 1991-2012

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

Table 2. The catch of SBT and the effort of Korean longline vessels targeting SBT by year and area, 2000-2012

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	-	-	-
2011	8,415	2,489	3.38	39	60	0.65	4,430	1,928	2.30	3,946	501	7.88	-	-	-
2012	18,213	3,473	5.24	19	10	1.86	5,680	1,695	3.35	12,514	1,768	7.08	-	-	-

* Catch and effort data compiled from logbook.

Table 3. Observer coverage of SBT catch and hooks observed through the Korean observer program, 2008-2012

Year	Trips observed	Effort observed (X1,000)	Total effort estimated (X1,000)	Catch observed of SBT (mt)	Coverage (%)
2008	-	-	-	-	-
2009	2	446	5,419	92	8
2010	2	389	3,537	95	11
2011	-	-	-	-	-
2012	3	421	3,473	162	12

Table 4. Amount of SBT catch and effort observed by area, 2012

Year	Stratum	Catch (mt)			Effort (no. of hooks)		
		Total estimate	Total observed	Coverage	Total estimate	Total observed	coverage
2012	2	2	-	-	10,197	-	-
	8	402	-	-	1,695,244	-	-
	9	482	113	23.4	1,767,642	282,931	16.0

* For 2012, 3 observers had deployed onboard, but the data of one observer was not included in this table due to the need of data to be checked further.

Table 5. Number of fish measured or collected for biological information by species, 2012

Species	No. sampled	No. measured	No. weighted	No. sexed	Maturity stage
Southern bluefin tuna	3,198	3,196	3,175	1,975	24
Albacore	5,034	3,683	5,013	1	0
Bigeye tuna	258	248	258	143	9
Skipjack tuna	8	8	7	0	0
Yellowfin tuna	24	24	23	20	0
Swordfish	19	14	19	7	0
Sharks	1,179	1,087	1,163	1,048	0
Seabirds	15	15	15	0	0
Others	1,231	572	1,205	340	1

* For 2012, 3 observers had deployed onboard, but the data of one observer was not included in this table due to the need of data to be checked further.

Table 6. Number of Tag recaptured and released by species through the Korean observer program, 2012

(a) SBT

Size class (cm)	Number	
	Recaptured	Released
60-69	-	1
70-79	-	2
80-89	1	2
90-99	1	10
100-109	-	7
110-119	-	-
120-129	-	-
130-139	2	-
140-149	3	-

(b) Others

Species	Number	
	Recaptured	Released
Bigeye tuna	1	-
Albacore tuna	-	7
Skipjack tuna	-	1

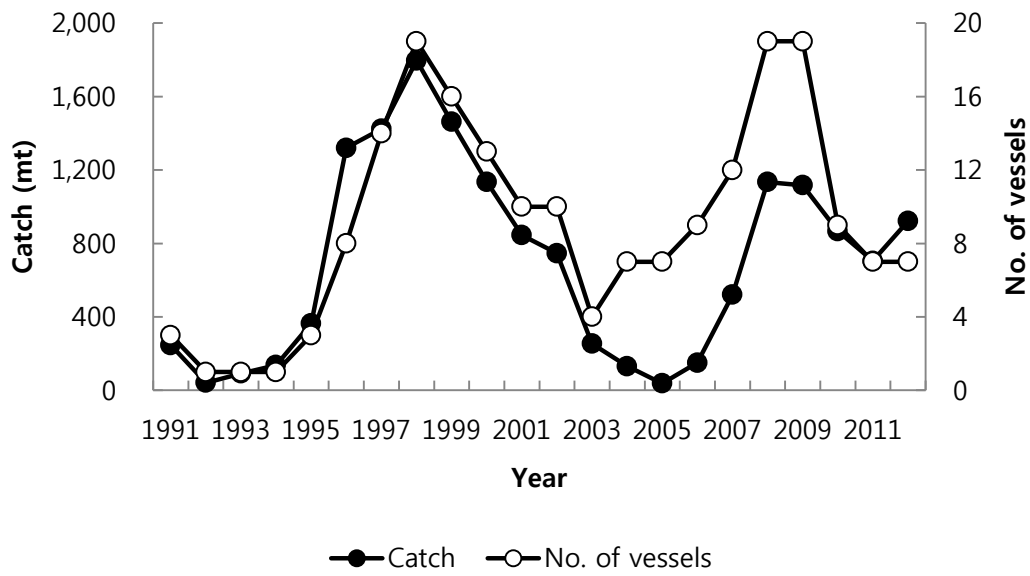


Fig. 1. The annual number of active Korean tuna longline vessels fishing for SBT and their annual SBT catches in the CCSBT convention area, 1991-2012.

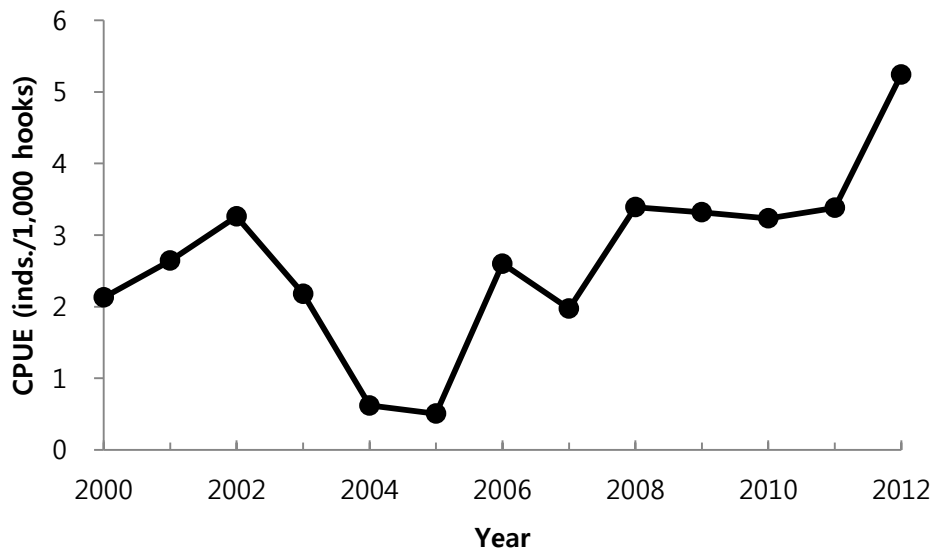


Fig. 2. The nominal CPUE series of Korean tuna longline vessel targeting SBT form 2000 to 2012.

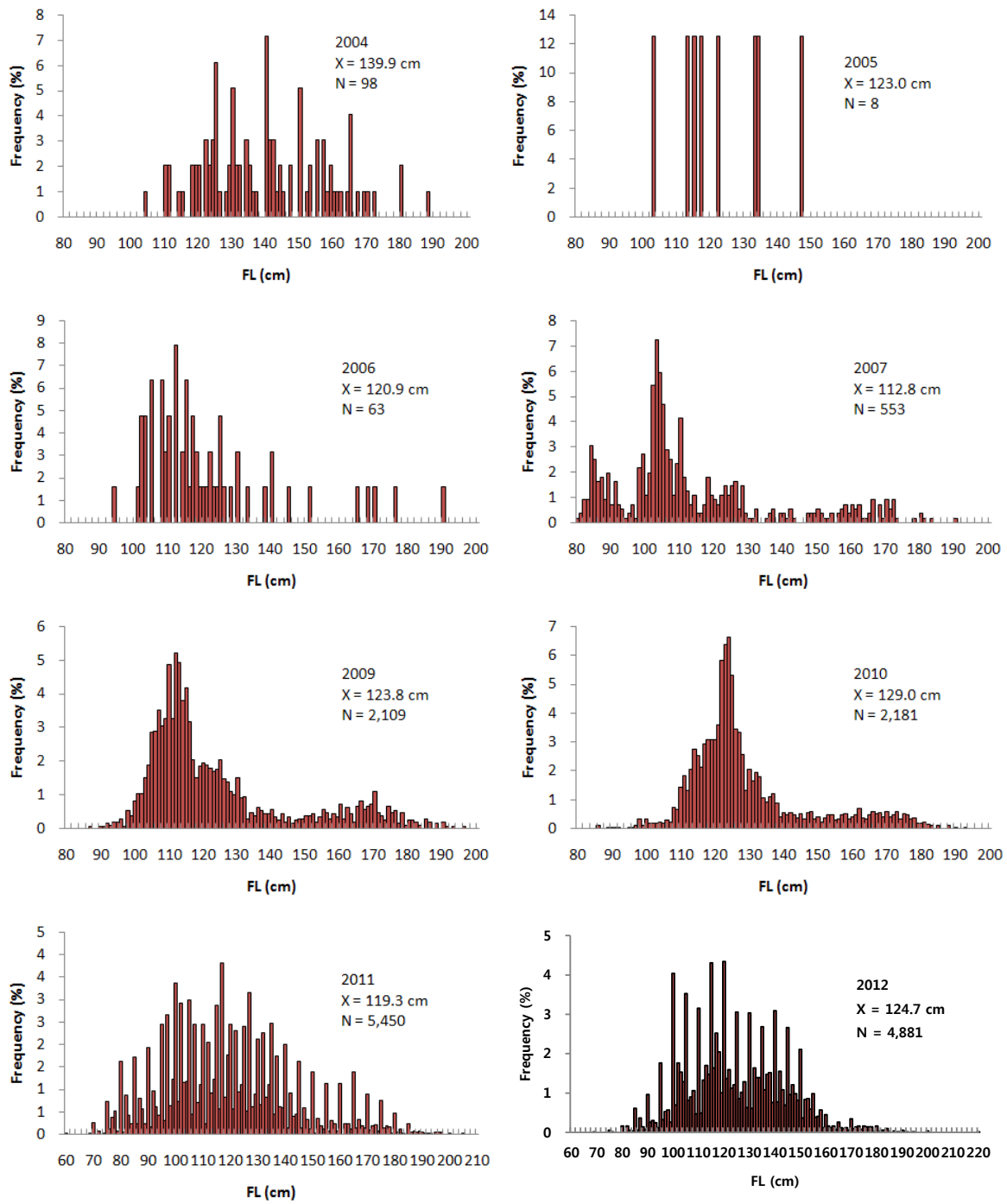


Fig. 3. Length frequency distribution of SBT caught by Korean tuna longline fishery, 2004-2012.

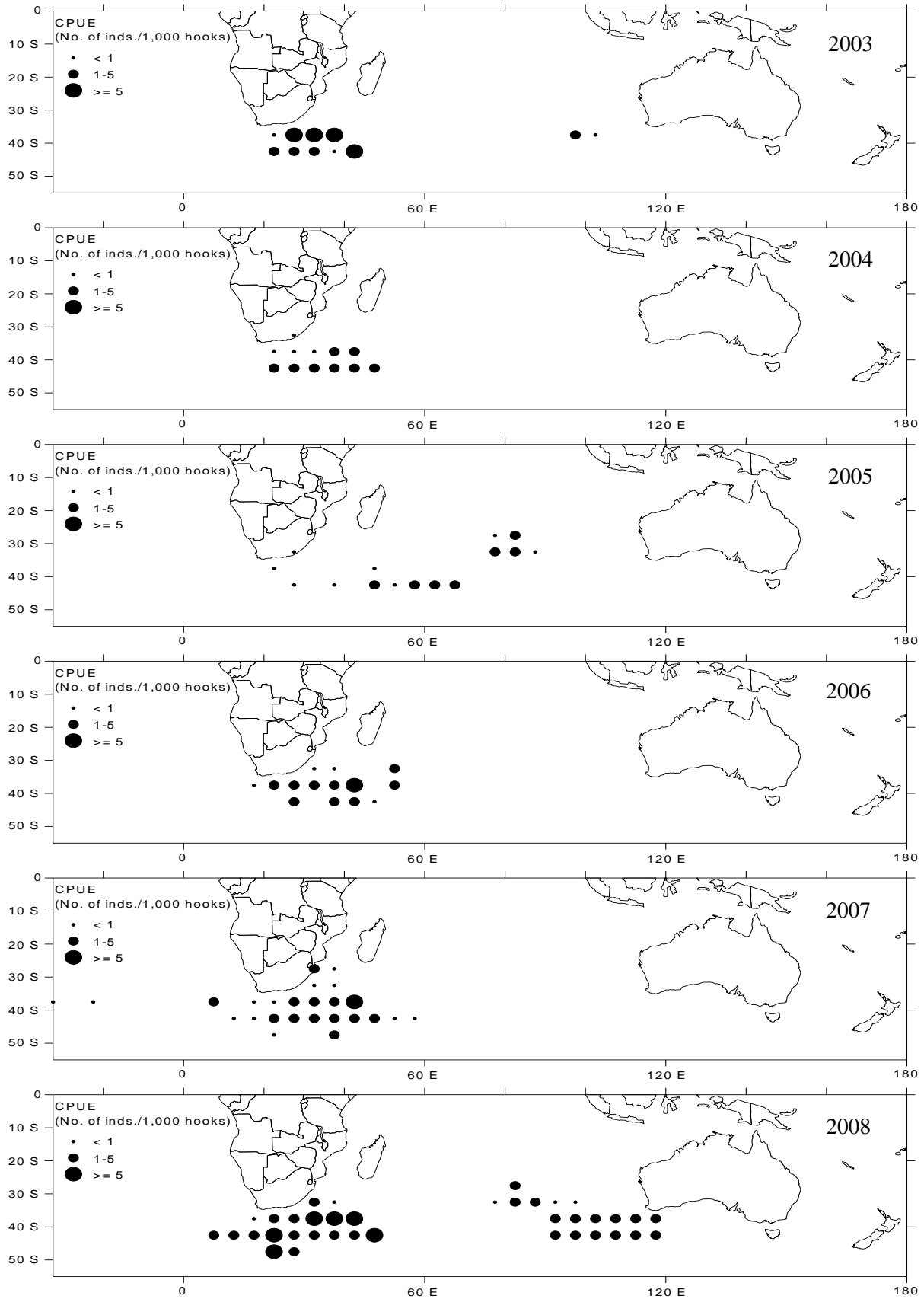


Fig. 4. The CPUE distribution of Korean tuna longline targeting SBT by year and by area, 2003-2012.

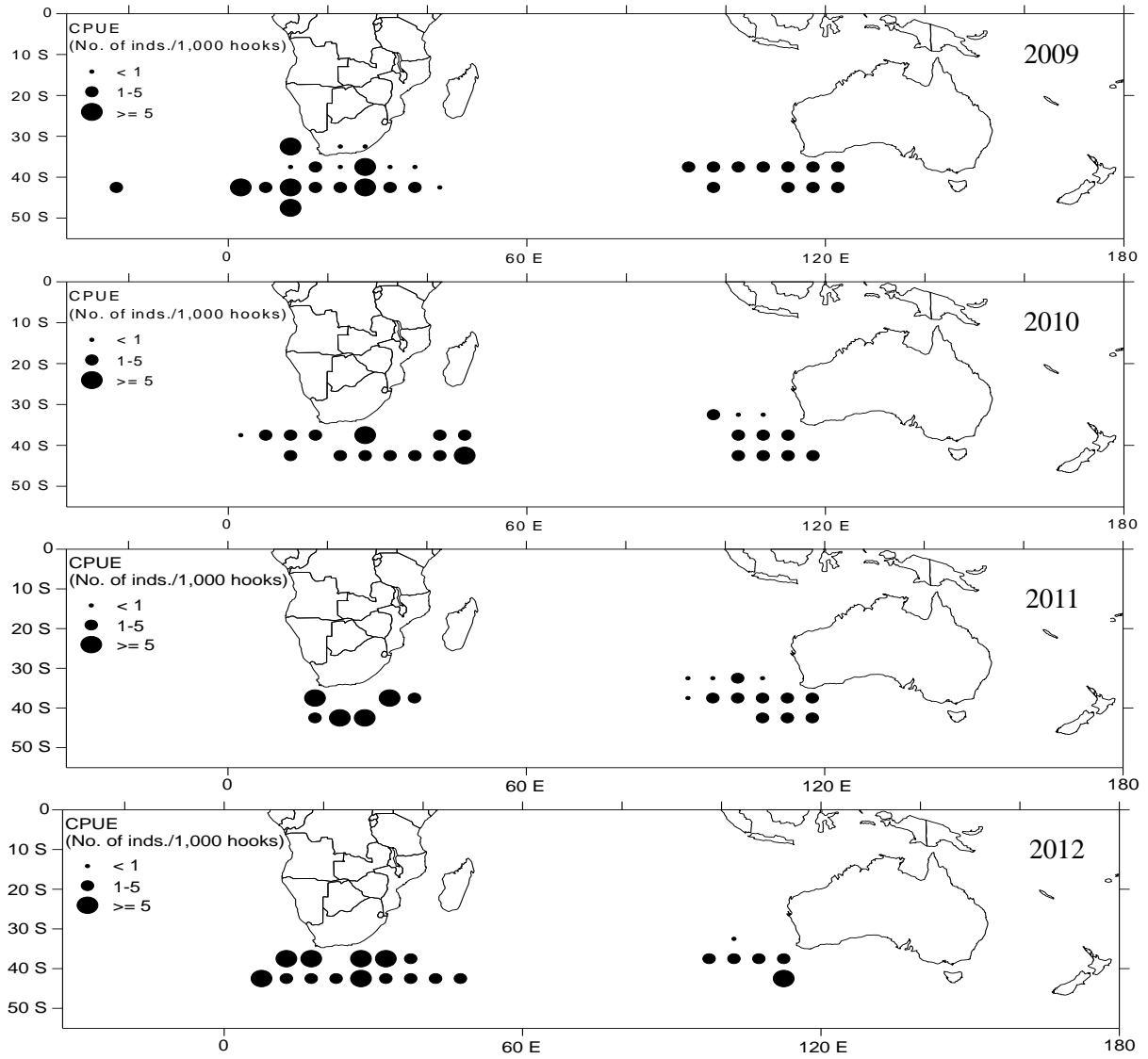


Fig. 4. Continued.