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**ANNUAL REPORT TO THE COMMISSION
PART 1: INFORMATION ON FISHERIES, RESEARCH, AND STATISTICS**

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Republic of Korea

Part 1. INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

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SUMMARY

Korean tuna fisheries operating in WCPFC Convention Area are distant-water purse seine fishery and longline fishery. In 2010, total catches by 29 purse seine vessels and 122 longline vessels were 277,312 mt and 28,513 mt, respectively, which were slightly decreased in the catch and increased in the vessel number for both fisheries than in the previous year. The purse seine catch was distributed higher in the areas westward, while the longline catch was lower in the central area but higher in the east-south areas than in the previous year. The CPUEs were slightly decreased in both fisheries to the previous year. The coverage rates of logsheet were 95.4% for purse seine and 71.2 % for longline in 2010. No scientific observation was carried out for longline fishery in 2010, due to problems with the domestic system and the operational reason. Species identification trial for purse seine catch was conducted in a cannery in Korea.

1. ANNUAL FISHERIES INFORMATION

Korean tuna fisheries dates back to the mid-1950s when Korean distant-water fishery began with small experimental longline fishing for tunas in the Indian Ocean. Since

then the Korean tuna fishing fleet has expanded to the three major oceans before the 1970s. Currently, over 94% of Korean catch of tuna and tuna-like species has occurred in the western and central Pacific ocean (WCPO) area.

1.1 Fleet structure

The number of vessels is presented in Table 1 and Fig. 1. The number of purse seine vessels, once peaked at 39 in 1990, had been reduced to 26-28 until 1998 and since then has been maintained at the present level of 28 in 2008, 27 in 2009 and 29 in 2010. In terms of GRT class, 13 vessels were of 500-1000 class, 13 vessels of 1000-1500 class and 3 vessels of over 1500 class, where 1 vessel of 500-1000 class was reduced and 2 vessels of over 1500 class were increased in 2010 from those in 2006. The number of longline vessels was reduced from 220 in 1991 to 108 in 2008 but slightly increasing to 122 in 2010. All longline vessels were in the class of 201-500 GRT.

1.2 Annual catch

The annual catch by fishery in the Pacific and the WCPFC Convention area of the recent 5 years are as in Table 2. In 2010, total catches by 29 purse seine vessels and 122 longline vessels were 277,312 mt and 28,513 mt, respectively, which were slightly decreased in the catch and increased in the vessel number for both fisheries than in the previous year. The total catch of the recent 5 years ranged from 279,157 to 314,736 mt, with an average of 292,358 mt, of which 90.3 % were caught by purse seiners and 9.7% by longliners. The purse seine catch was in an increasing trend while the longline catch was in decreasing.

1.2.1 Purse seine fishery

Purse seine fishery is targeting skipjack and yellowfin tuna. In 2010, total catches by 29 purse seine vessels were 277,312 mt, which were slightly decreased in the catch than in the previous year. The total purse seine catch during the last five years ranged from 204,500 mt to 283,300 mt, with 249,585 mt on average. Skipjack and yellowfin tuna were the main species caught with the proportion of 82.6% and 17.2% of the total catch, respectively (Table 3 and Fig. 2). The CPUE was 39.9 mt/set in 2010, which were stable for the recent 5 years, with a range of 36.5-42.1 mt/set (Table 4).

1.2.2 Longline fishery

Korean longline fisheries have been mainly targeting bigeye and yellowfin tuna and secondarily albacore. In 2010, total catches by 122 longline vessels were 28,513 mt, which were slightly decreased than in the previous year. The total annual catch in the WCPFC area ranged from 22,876 mt to 32,370 mt in the recent 5 years (Table 5). Of the total catch, bigeye tuna, yellowfin tuna and albacore were 48.3%, 30.9% and 4.9%, respectively and billfishes (swordfish, blue marlin, striped marlin and black marlin) were 12.1%. Bigeye tuna contributed the most to the change in total longline catch as it fluctuated from 10,054 mt in 2007 to 17,001 mt in 2008, in which it was decreasing for a recent couple of years (Fig. 3). The CPUE was 0.4 mt/1000 hooks in 2010, which were slightly decreased, and were in increasing trend for the recent 5 years (Table 6).

1.3 Fishing patterns

Korean tuna purse seine fisheries have generally been operating throughout the year in the tropical area of the Western and Central Pacific between 140°E-180°E and extended to the east over 160°W when oceanographic conditions were favorable. Recent years are the case (Fig. 4). On the other hand, longline fisheries have been fishing throughout the tropical area of the whole Pacific between 20°N and 20°S (Fig. 5). In recent years, the catch and efforts have been higher in the western Pacific than in the eastern Pacific.

1.4 Estimated total catches of non-target, associated and dependent

For collection of non-target, associated and dependent species, additional columns were introduced in the logbook for seabirds, sharks, turtles and marine mammals in 2009. In 2010, a total of 1,006 mt of unclassified sharks species were collected from the vessel logsheets, the coverage of which were 71.2%. Of about 100 longline vessels having submitted logsheet to the NFRDI at the time of compilation of the catch statistics for 2010, 1.4 mt of blue sharks and 5.2 mt of porbeagles were recorded in the logsheet only 4 vessels (Table 7). As a part of improvement, a series of measures has been taken such as workshop and dissemination on a related conservation measures and implementation, including strengthening enforcement. It was strongly urged that fishers should comply with reporting the catch of non-target, associate and dependent species in accordance with the relevant CMMs.

2 RESEARCH AND STATISTICS

2.1 Summary of observer programs

Korean scientific observer program for the distant-water fisheries has been conducted by the National Fisheries Research and Development Institute since 2002. A total of 19 scientific observations were made for tuna fisheries operating in the WCPO up to 2009 but no observation were carried out in 2010, due to some problems with the system and the operational reason (Table 8).

2.2 Research Activities

A preliminary study for species identification from the catch of purse seine was conducted in a cannery of Korea in April 2011. In the cannery the catch was sorted into six categories according to species and size classes (above 9 kg and 3.4-9 kg for yellowfin tuna, and above 3.4 kg, 1.8-3.4 kg, 1.4-1.8 kg, below 1.4 kg for skipjack). Of total 700 mt we sampled randomly each category and re-sorted them. The species composition examined in the cannery for the catch of a purse seine vessel were skipjack, yellowfin tuna and bigeye tuna, the proportion of which were estimated 95%, 3% and 2%, respectively. In comparison, the proportion of bigeye tuna examined in the cannery was 1 % higher than that reported by the vessel.

2.3 Statistical data collection system

Tuna catch statistics of Korea are obtained from two sources of data reports. Korea Deep-Sea Fisheries Association (KODEFA) collects total catches by gear types from the Korean tuna industries, which are used as Korea's official total catch. National Fisheries Research and Development Institute (NFRDI) collects logsheet sampling data from vessels. The Distant-water Fisheries Act obliges fishers to report the catch statistics to NFRDI when they return to home 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.

2.4 Data coverage of catches, effort and size data for all species

The logbook provides for the information on of the catch and effort for all species. The size data are obtained for recording from 1 specimen per 1 mt of the catch. The observer program has been collecting size data for all species. In 2010, logsheet coverage rate was 71.2 % for Korean longline fishery and 95.4 % for purse seine fishery.

Table 1. The number of Korean vessels by gear and size, actually operating in the WCPFC Convention Area, 2006-2010

Year	GRT class by gear									
	Longline					Purse seine				
	Total	0-50	51-200	201-500	500+	Total	0-500	501-1,000	1,001-1,500	1,500+
2006	130	-	-	130	-	28	-	14	13	1
2007	122	-	-	122	-	28	-	14	13	1
2008	108	-	-	108	-	28	-	15	12	1
2009	111	-	-	111	-	27	-	13	11	3
2010	122	-	-	122	-	29	-	13	13	3

Table 2. Annual catch estimates (in metric ton, round weight) for the Korean fleets by gear for the WCPFC Convention Area and whole Pacific Ocean, 2006-2010

Year	Pacific Ocean			WCPFC		
	Total	PS	LL	Total	PS	LL
2006	293,076	251,790	41,286	279,157	251,790	27,367
2007	298,171	258,177	39,994	281,053	258,177	22,876
2008	286,387	254,316	32,071	280,107	248,802	31,305
2009	324,275	283,278	40,997	315,648	283,278	32,370
2010	316,282	277,312	38,970	305,825	277,312	28,513

* The catch for 2010 is provisional.

Table 3. Annual catch estimates (in metric ton, round weight) for the Korean purse seiners by primary species for the WCPFC Convention Area, 2006-2010

Year	Total	SKJ	BET	YFT	OTH
2006	253,170	205,220	28	46,542	1,380
2007	258,177	214,933	-	43,244	-
2008	248,802	187,277	45	61,480	-
2009	283,278	257,481	135	25,652	10
2010	277,312	216,026	2,972	58,314	-

* The catch for 2010 is provisional.

Table 4. The effort and CPUE of Korean purse seine fisheries by year and species, 2006-2010

Year	No. of sets	Total catches (mt)	CPUE (mt/set) by species			
			Total	SKJ	BET	YFT
2006	1,223	51,487	42.1	36.3	<0.1	5.8
2007	5,142	166,711	37.4	32.4	<0.1	5.0
2008	6,044	166,513	36.5	27.6	0.1	8.8
2009	6,658	273,668	41.7	37.6	0.2	3.9
2010	6,626	264,477	39.9	31.5	0.3	8.2

* Data compiled from logbook. Catch is round weight.

Table 5. Annual catch estimates (in metric ton, round weight) for the Korean longliners by primary species, for the WCPFC Convention Area during 2006 to 2010

Year	Total	ALB	YFT	BET	BFT	SKJ	BLM	BUM	STM	SWO	OTH
2006	27,367	1,050	9,529	12,489	0	1	42	3,301	171	708	76
2007	22,876	1,433	8,817	10,054	0	1	1,693	166	54	245	413
2008	31,035	1,481	7,846	17,001	0	2	1,966	422	59	1,206	1,052
2009	32,370	1,608	10,032	15,231	0	0	2,453	571	54	1,134	1,289
2010	28,513	1,337	7,644	13,914	51	0	1,595	579	27	786	2,581

* The catch for 2009 and 2010 is provisional.

Table 6. The effort and CPUE of Korean longline fisheries by year and species, 2006-2010

Year	No. of hooks ($\times 10^3$)	Total catches (mt)	CPUE (mt/1000 hooks) by species			
			Total	ALB	YFT	BET
2006	69,643	23,403	0.336	0.016	0.086	0.187
2007	66,223	24,074	0.364	0.018	0.107	0.193
2008	33,670	11,121	0.330	0.025	0.089	0.170
2009	58,930	25,448	0.432	0.019	0.113	0.231
2010	63,878	25,316	0.396	0.023	0.082	0.215

* Data compiled from logbook. Catch is gilled weight.

Table 7. The catches (in kg) of key shark species in the WCPFC Convention area in 2010

Year	Fishing type	Blue shark	Porbeagle
2010	Longline	1,440	5,233

* Data compiled from logbook.

Table 8. Korean observation trips of purse seine and longline fisheries in the Pacific Ocean, 2006-2010

Year	Number of observation trips by fishery	
	Purse seine	Longline
2006	1	1
2007	1	2
2008	2	2
2009	2	1
2010	-	-

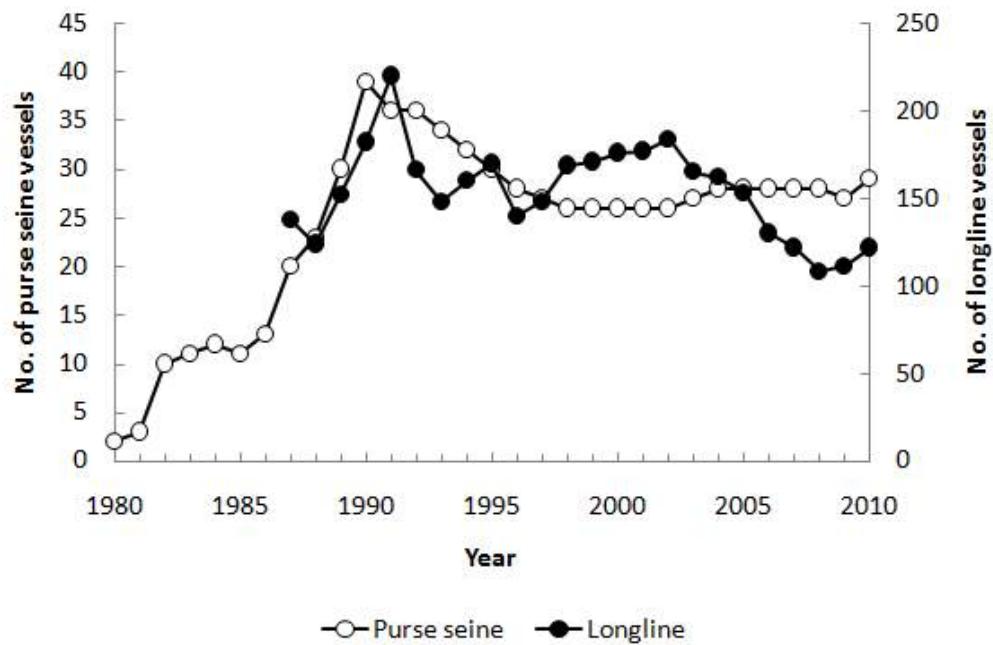


Fig. 1. Historical annual vessel numbers of Korean tuna fisheries in the WCPFC convention area during 2006-2010.

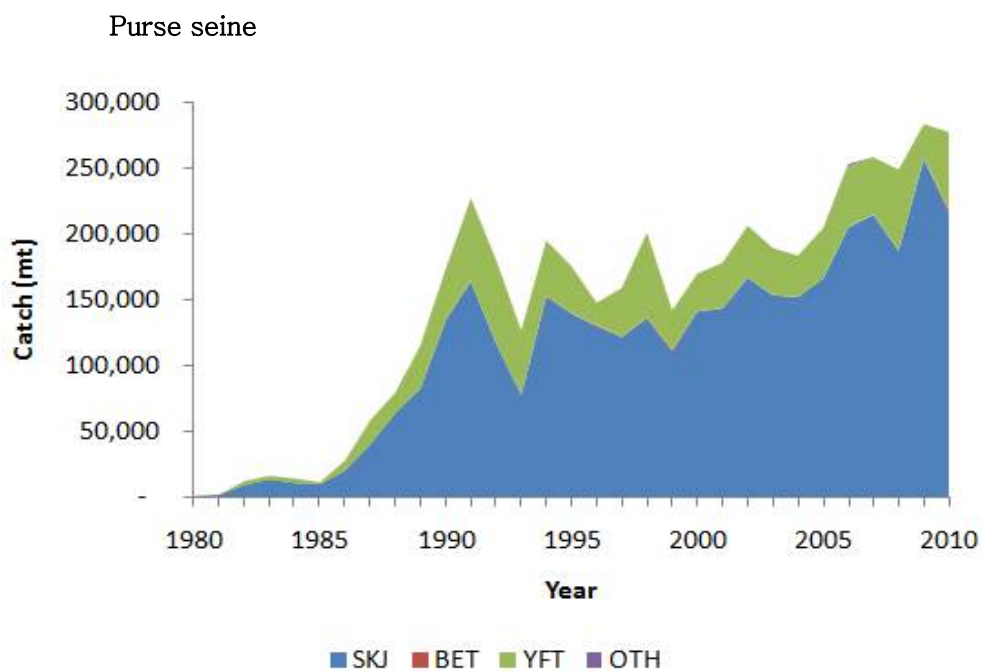


Fig. 2. Historical annual catch of Korean purse seine fishery by primary species in the WCPFC convention area during 2006-2010.

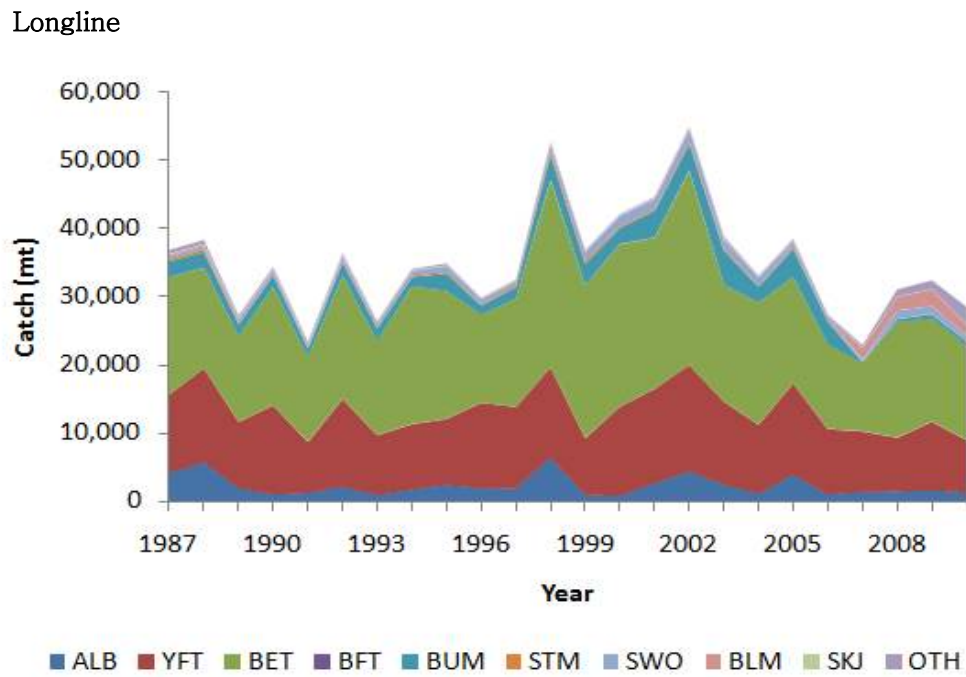


Fig. 3. Historical annual catch of Korean longline fishery by primary species in the WCPFC convention area during 2006-2010.

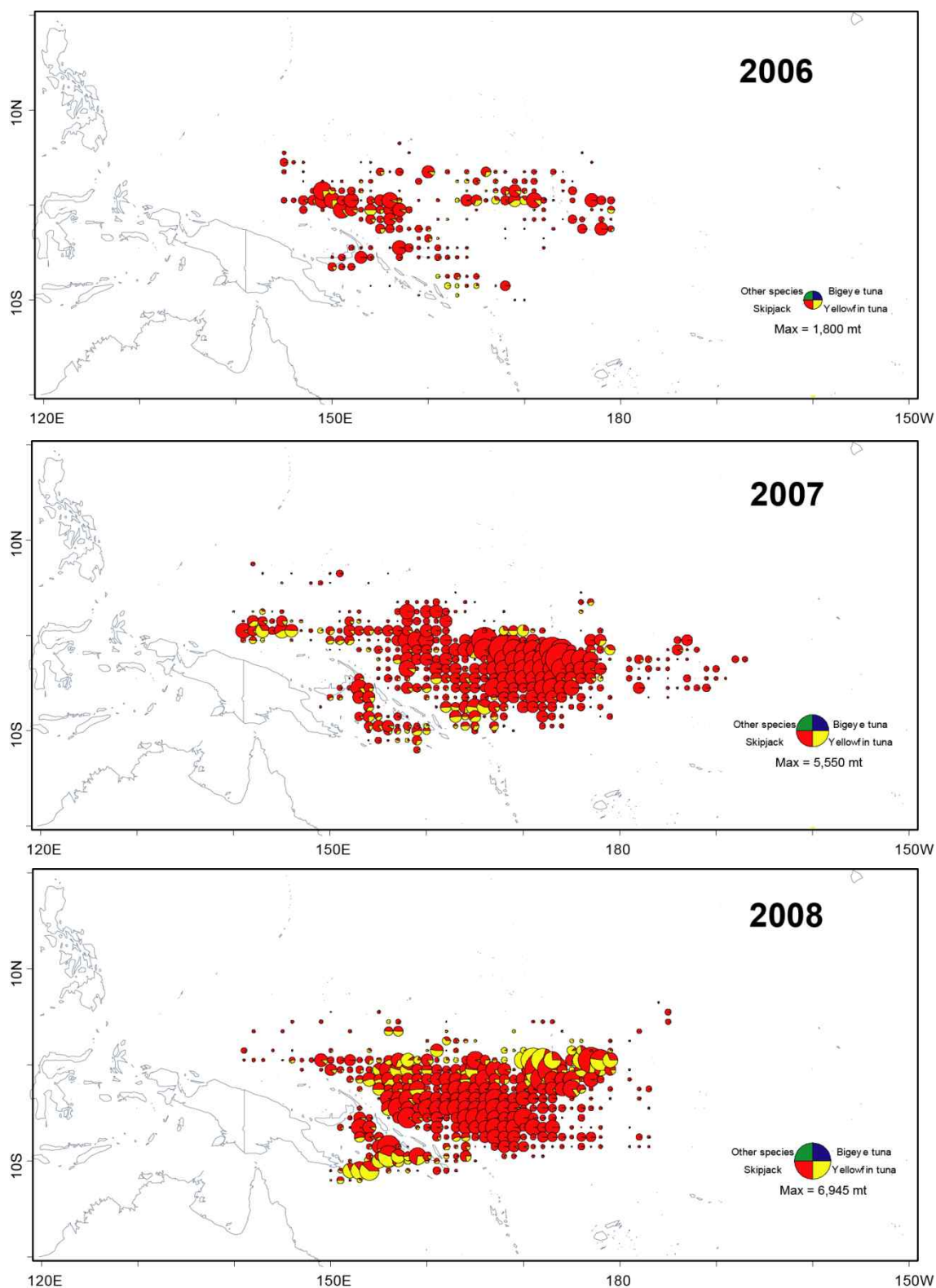


Fig. 4. Annual catch distribution of target species by Korean purse seine fleets operating in the Pacific Ocean, 2006-2010.

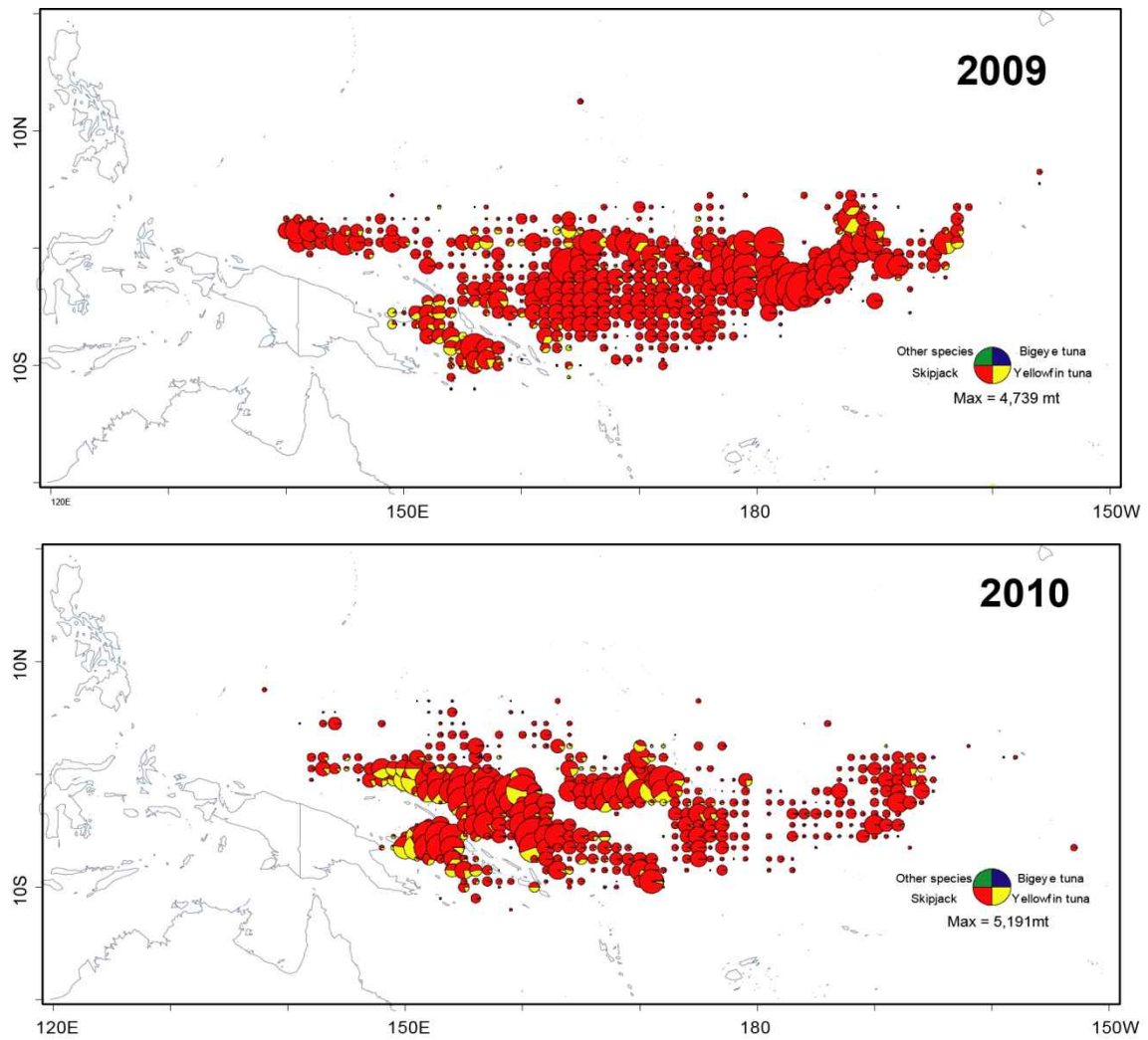


Fig. 4. Continued.

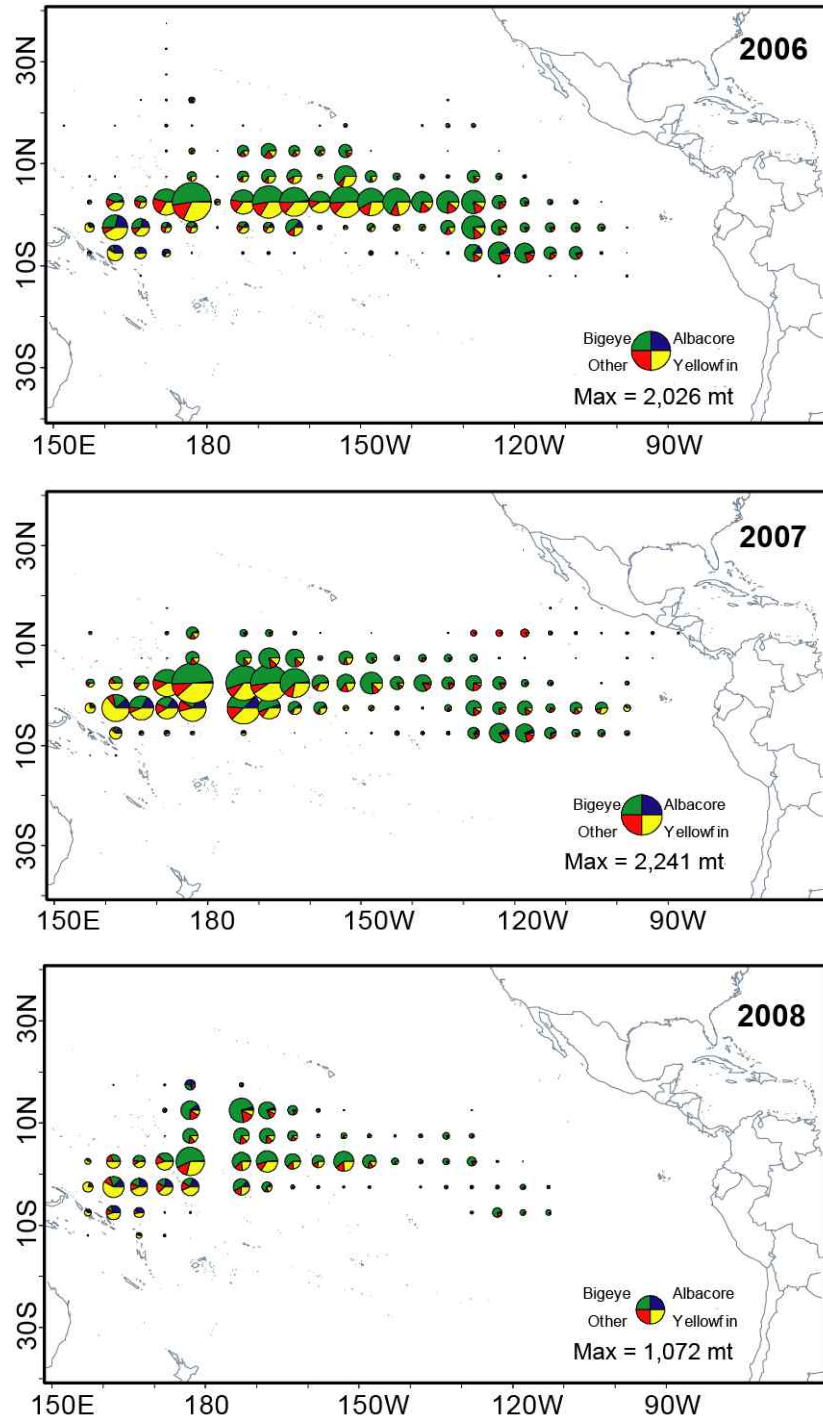


Fig. 5. Annual catch distribution of target species by Korean longline fleets operating in the Pacific Ocean, 2006-2010.

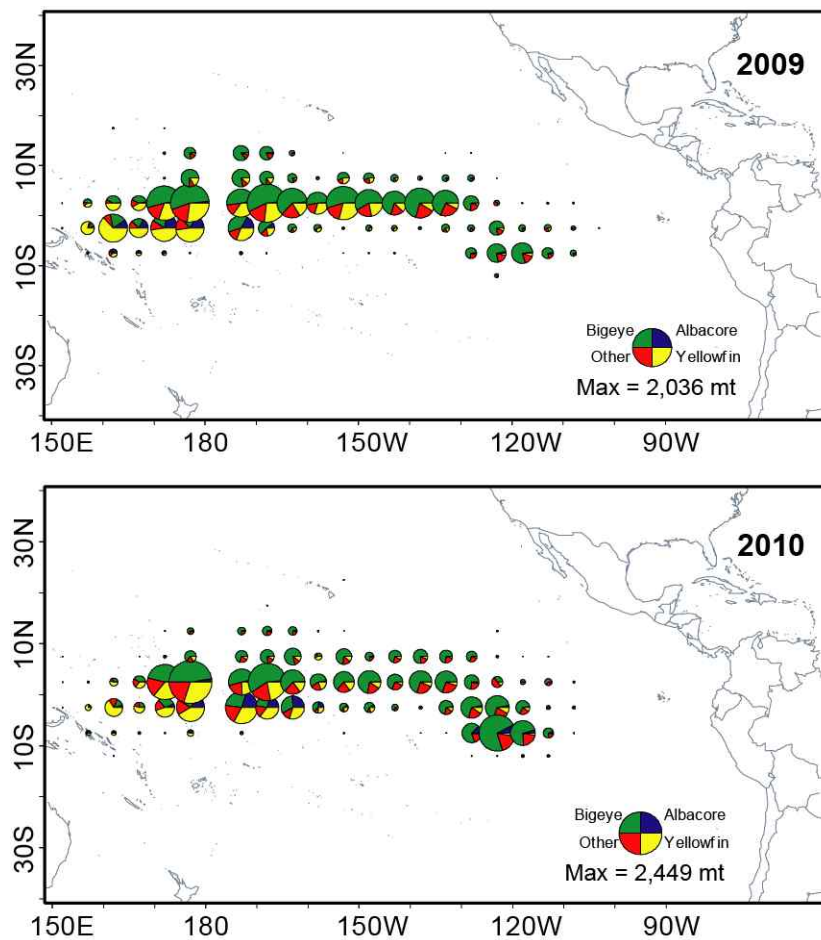


Fig. 5. Continued