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

WCPFC-SC5-AR/CCM-11

KOREA

Summary

Over 90% of Korea's total Pacific Ocean tuna catches are taken from the Western and Central Pacific Fisheries Commission Convention Area (WCPFC-CA). WCPFC-CA catches fluctuated from 216,000 to 285,000 mt and averaged 262,000 mt. Purse seine catches during the last five years ranged from 183,000 mt to 258,000 mt, averaging 231,000 mt. Skipjack and yellowfin tuna comprised 80.3% and 19.6% of this catch, respectively. The Korean longline fishery targets bigeye and yellowfin tuna, with minor catches of albacore, and comprises 86.0% of the total catch. Billfish and other fish species are incidentally caught in longline fishery. The total annual catches in the WCPFC ranged from 22,800 mt to 38,400 mt by the longline fishery during the past 5 years. The number of operating longliners and purse seiners fishing at WCPFC-CA in 2008 was 108 and 28, respectively, which represents a decrease by 14 longliners compared to the previous year.

A fishing strategy of Korean tuna longliners was changed because of the soaring of fuel price. They do not want to move long distance for searching fishes anymore and then they are operating mainly at the western Pacific rather than the eastern Pacific.

The Ministry for Food, Agriculture, Forestry & Fisheries (MIFAFF) of Korea initiated the development of an observer program for distant-water fisheries, including tuna fisheries, in 2002. In 2008, a total of 5 observer trips with 462 days were conducted to monitor Korean tuna longline and purse seine fisheries, of which 4 cruises were carried out in the Pacific Ocean.

Monthly biological sampling for purse seine catch has been carried out at a domestic landing site once a month since 1993, to obtain size data and information on the reproductive biology of yellowfin and skipjack tuna. A total of 1,653 skipjack, 1,010 bigeye, 3,419 yellowfin and 368 albacore tunas were sampled for morphometric measurements and GSI index during 2008.

To solve practical problems that fishermen usually encounter when they record bycatch species, NFRDI issued 'Field Guide to Bycatch Species in Korean Distant-Water Fisheries' in 2008. This field guide provides color drawings or photos of 333 species of target and bycatch species which was included sharks, seabirds, sea turtles and cetaceans for Korean tuna fishery.

NFRDI introduced a new logbook data sheet in this year for collecting bycatch species data which were included 5-6 species of seabirds, sea turtles and sharks by species, respectively.

2009 ANNUAL REPORT TO THE COMMISSON

Republic of Korea

Part 1. INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

Doo-Hae An, Seon-Jae Hwang, doo-Nam Kim, Dae-Yeon Moon, and Joon-Taek Yoo

National Fisheries Research and Development Institute (NFRDI), Republic of Korea

Scientific data was provided to the Commission in accordance with the decision relating to the provision of scientific data to the Commission on the 30th April 2009	**YES**

1.1 ANNUAL FISHERIES INFORMATION

The history of 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 annually grown to expand its power to the three major oceans before the 1970s. The number of tuna fishing vessels peaked in 1975 at around 600 followed by gradual decrease until recent years. Despite the decrease in fishing fleet size, the tuna fishery still remains the most important distant-water fishery in Korea, yielding more than 250,000 mt of tuna catch annually. Many registered vessels migrate between the Pacific and Indian Ocean, depending on the conditions of each fishing ground.

1.1.1 Annual catch by species, gear in the WCPFC Convention Area

In spite of the decreasing trend of fishing fleet size, annual catches of tuna by the Korean tuna fishery remain relatively constant at over 200,000 mt after 1990 until recent years. In general, the majority of tuna catches by the Korean fleet have been taken from the Pacific of which the Western and Central Pacific area accounted for over 90% of total Pacific catches. Table 1 represents annual catch estimates for the Korean fleets, by gear (purse seine and longline) during the past 5 years in the WCPFC Convention area and whole Pacific Ocean. WCPFC catches fluctuated from 216,500 to 285,600 mt and averaged 262,400 mt. Almost

97.0% of the total catch in the WCPFC area was composed of three tunas, skipjack, yellowfin and bigeye, and among which skipjack was dominant, comprising about 67.7% of the total catch (Fig. 1). Although yellowfin and bigeye are the second most important species in quantity, 21.6% and 7.6%, respectively, both species represent higher commercial values than skipjack as they are caught in longline fishery and sold in the sashimi market.

Table 1. Annual catch estimates for the Korean fleets, by gear for the WCPFC Convention Area and whole Pacific Ocean, for years 2004 to 2008

Year	Pacific Ocean			WCPFC		
	TOTAL	PS	LL	TOTAL	PS	LL
2004	234,777	186,276	48,501	216,556	183,490	33,066
2005	258,350	213,212	45,138	248,224	209,790	38,434
2006	293,076	253,170	39,906	280,537	253,170	27,367
2007	298,171	258,177	39,994	281,059	258,177	22,882
2008	286,387	254,316	32,071	285,642	254,316	31,326

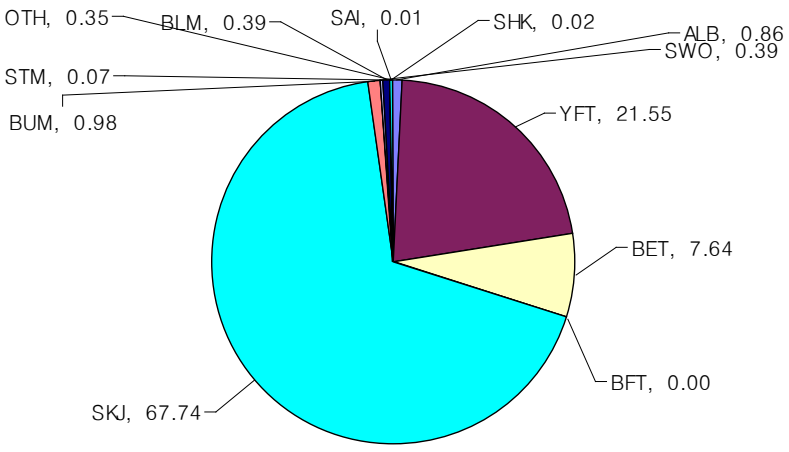

Fig. 1. Catch composition (averaged 2004-2008) of Korean tuna fisheries.

Purse seine fishery

Purse seiners have been concentrating their fishing activities in the Western Pacific

throughout the year. Since 1990 when the number of vessels was 39, there has been a steady decrease in number of the purse seiners operating in this region and only 28 purse seiners remained in 2008. The total catches from this fishery during the last five years ranged from 183,000 mt to 258,000 mt averaging 231,000 mt, among which skipjack and yellowfin tuna comprised 80.3% and 19.6% of total catch, respectively (Fig. 2 and Table 2).

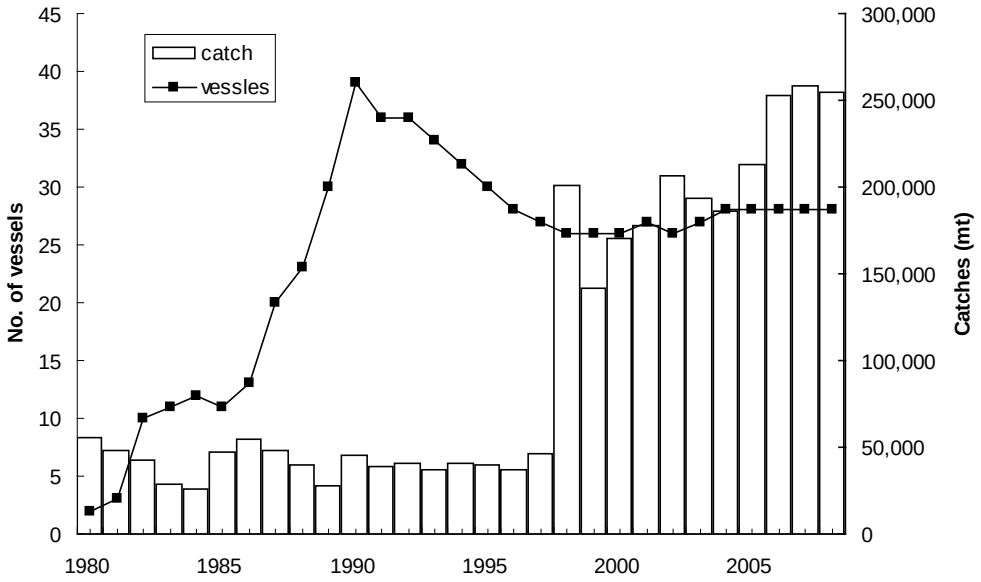

Fig. 2. Annual catch and number of vessel of Korean tuna purse seine fisheries.

Table 2. Annual catch estimates for the Korean purse seiners by primary species, for the WCPFC Convention Area , for years 2004 to 2008

Year	TOT	SKJ	BET	YFT	OTH
2004	183,490	152,126	60	31,304	-
2005	204,500	166,280	-	38,202	18
2006	253,170	205,220	28	46,542	1,380
2007	258,177	214,933	-	43,244	-
2008	254,316	187,277	50	66,989	-

Longline Fishery

Korean longline fishery targets bigeye and yellowfin tuna with minor catches of

albacore, comprising 86.0% of the total catch, and billfishes and other fish species are incidentally caught in this fishery. The total annual catches in the WCPFC area ranged from 22,900 mt to 38,400 mt during the past 5 years as shown in Table 3. Recent decrease in longline catch was resulted mainly from decreased bigeye catch from about 18,000 mt in 2004 to about 10,000 mt in 2007, a decrease by 45%, but catch of bigeye tuna in 2007 was similar to 2004's catch. However, in 2008 the bigeye catch was increased at the level of 2004. Annual shift of longliners from east to west and vice versa might have contributed to the annual catch fluctuations and changes in species composition in longline fishery (Fig. 3 and Table 3).

Table 3. Annual catch estimates for the Korean longliner by primary species, for the WCPFC Convention Area , for years 2004 to 2008

Year	TOT	ALB	YFT	BET	BFT	SKJ	BUM	STM	SWO	BLM	SAI	SHK	OTH
2004	33,066	1,163	10,058	17,941	3	3	2,310	163	1,203	113	7	84	19
2005	38,434	3,919	13,329	15,622		1	4,120	260	737	272	91	78	5
2006	27,367	1,050	9,529	12,489		1	3,301	171	708	42	14	55	7
2007	22,882	1,433	8,817	10,054	6	1	166	54	245	1,693	-	-	413
2008	31,326	1,481	7,847	17,002			402	59	1,206	1,966	-	5	1,358

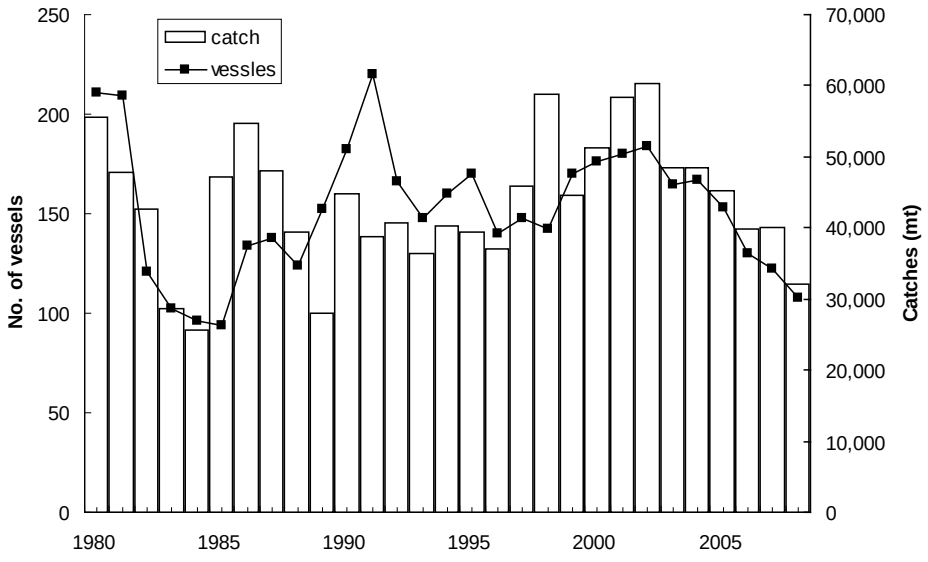

Fig. 3. Annual catch and number of vessel of Korean tuna longline fisheries.

1.1.2 Number of vessels by gear type, size (fleet structure)

Korea's tuna fleets consist of longliners and purse seiners. The total number of tuna vessels operated by the Korean tuna industry has been decreasing since the mid- 1970s (Fig. 4). 220 longliners in 1991, for example, has been reduced to 108 in the year 2008. The number of purse seine vessels also decreased from 39 in 1990 to 26-28 in recent years. Of around 200 licensed longliners for fishing in the Pacific, about 120-170 vessels were operated in the WCPFC area during the past 5 years. In contrast, all purse seiners kept fishing exclusively in the WCPFC area. The number of longliners and purse seiners fishing in 2008 was 108 and 28, respectively, which represents a decrease by 14 longliners compared to the previous year. Regarding vessel capacity, dominant sizes range from 300 to 500 GRT for longliners and 700 to 1,500 GRT for purse seiners (Table 4) and these features remained unchanged during the past 5 years.

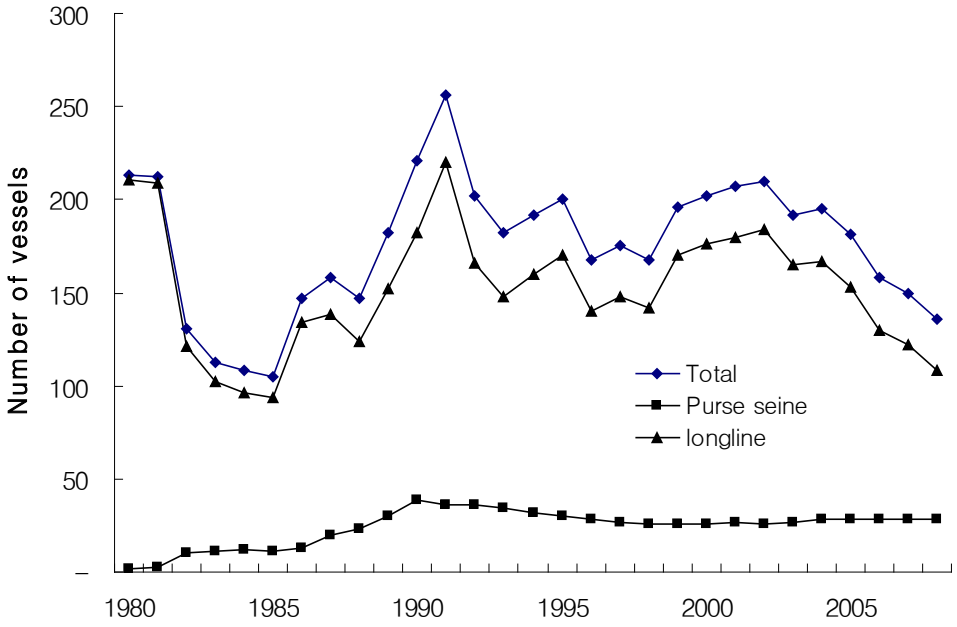

Fig. 4. Changes in Korea's annual tuna fleets structure, 1980~2008.

Table 4. Number of Korean vessels, by gear and size category, operating in the WCPFC Convention Area for years 2004 to 2008

GRT	Gear	2004	2005	2006	2007	2008
Total	**Longline**	167	153	130	122	108
	Purse seine	28	28	28	28	28
0-50	**Longline**					
	Purse seine					
51-200	**Longline**					
	Purse seine					
201-500	**Longline**	167	153	130	122	108
	Purse seine					
501-1000	**Longline**					
	Purse seine	15	15	15	15	15
1001-1500	**Longline**					
	Purse seine	12	12	12	12	12
1500+	**Longline**					
	Purse seine	1	1	1	1	1

1.1.3 Fishing grounds

In general, the Korean tuna purse seine fishery occurs in the tropical area of the Western and Central Pacific between 140°E-180° and rarely extends to the east over 160°W, depending on oceanographic conditions such as the El-Nino events (Fig. 5). In contrast, longline fishery occurs in the tropical area of the whole Pacific, between 20°N and 20°S and longliners are shifting freely from one place to another within their traditional fishing grounds or to another ocean for efficient catch (Fig. 6). However, recently fishing strategy of Korean tuna longliners was changed because of the soaring of fuel price. They do not want to move long distance for searching fishes any more and then they are operating mainly at the western Pacific rather than the eastern Pacific.

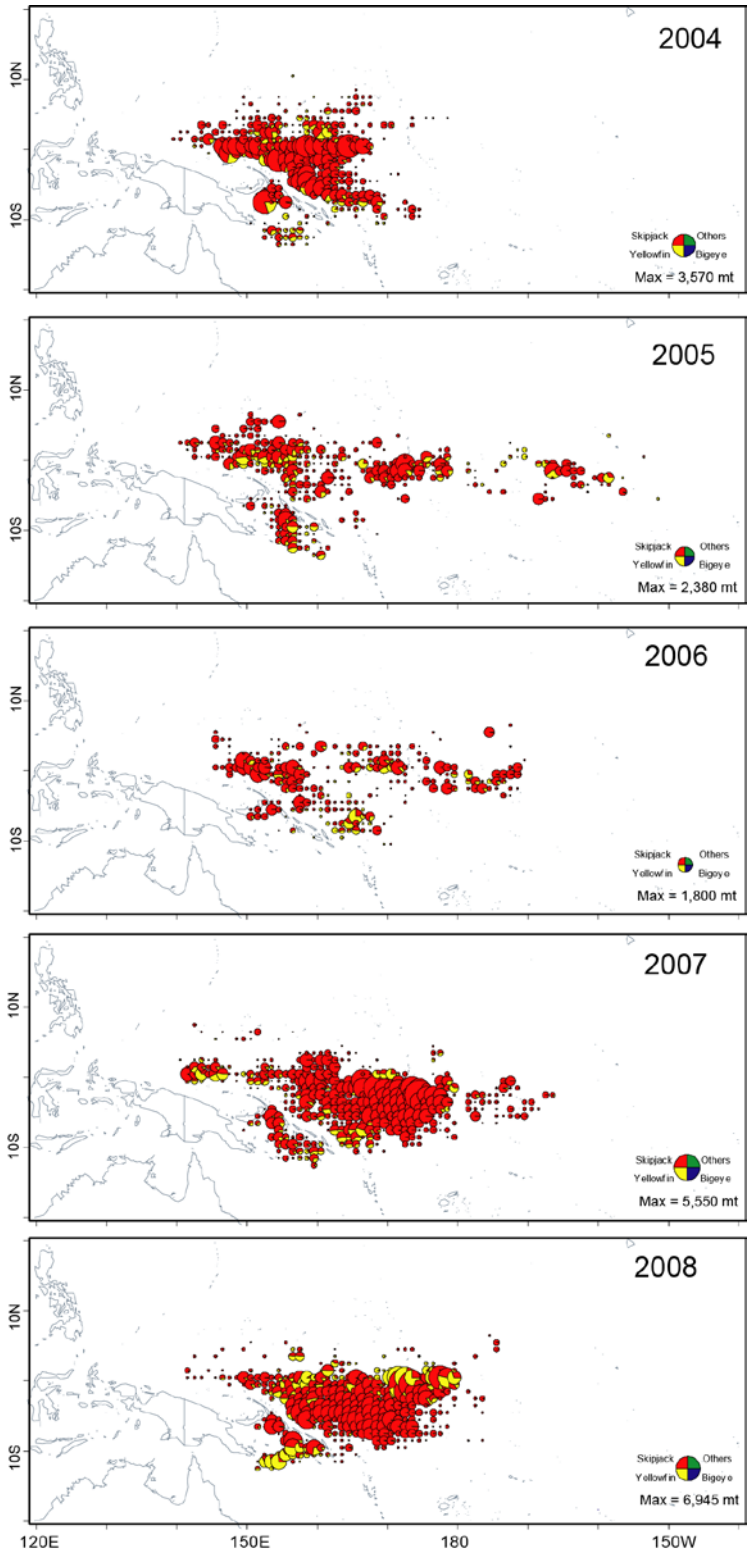

Fig. 5. Distribution of Korean tuna purse seine fishing area in the Pacific Ocean.

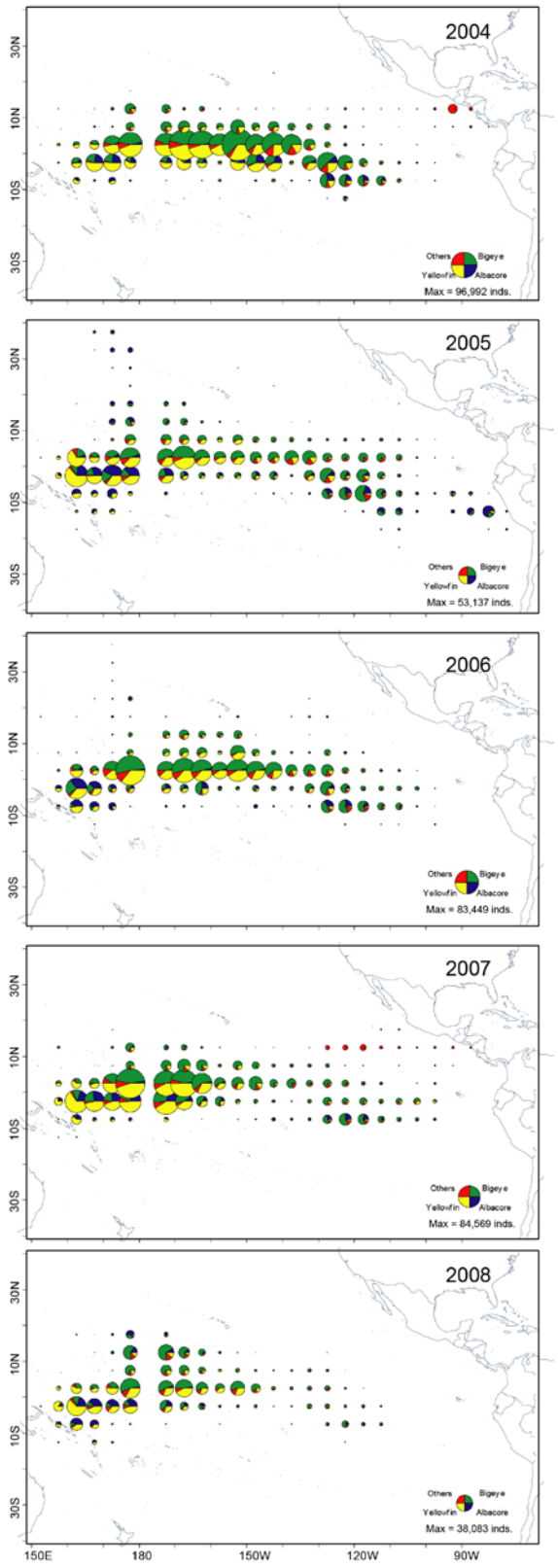

Fig. 6. Distribution of Korean tuna longline fishing area in the Pacific Ocean.

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

Billfishes, such as blue marlin, swordfish, striped marlin, black marlin and sailfish have been caught as by-catch species by Korean longliners (Table 2). The proportion of billfish catches was averaging 14% of total catch during the past 5 years. Species composition of billfish catches showed that blue marlin consisted of higher proportion, over 66% , than other species. Sharks were also reported as bycatch species from the longline fishery but due to onboard identification difficulties they were reported as a group and not by species. Bycatch data by species which were collected by Korean scientific observers in 2008 were presented as an information paper at Ecosystem and Bycach SWG.

1.2 RESEARCH AND STATISTICS

1.2.1 Summary of observer and port sampling programs

Observer program

The Ministry for Food, Agriculture, Forestry & Fisheries (MIFAFF) of Korea initiated the development of an 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 such as the WCPFC and therefore the mission of trained observers are similar to those set out in the convention of the fishery bodies. In 2008, a total of 5 observer trips with 462 days were conducted to monitor Korean tuna longline and purse seine fisheries, of which 4 cruises were carried out in the Pacific Ocean. A summary of their activities was presented as an information paper at the WCPFC Scientific Committee meeting. A similar level of scientific observer activities will be carried out for the Pacific tuna fisheries this year except FAD observer.

Biological sampling

Biological sampling for purse seine catch has been carried out by on-board observer to obtain size data and information on reproductive biology of yellowfin tuna and skipjack tuna. A total of 1,653 skipjack tuna and 2,833 yellowfin tuna were sampled for morphometric measurement and GSI index during 2008. The ranges of fork length were 25-78 cm (58.3 cm) for skipjack tuna and 20-159 cm (90.5 cm) for yellowfin tuna, respectively(Fig. 7).

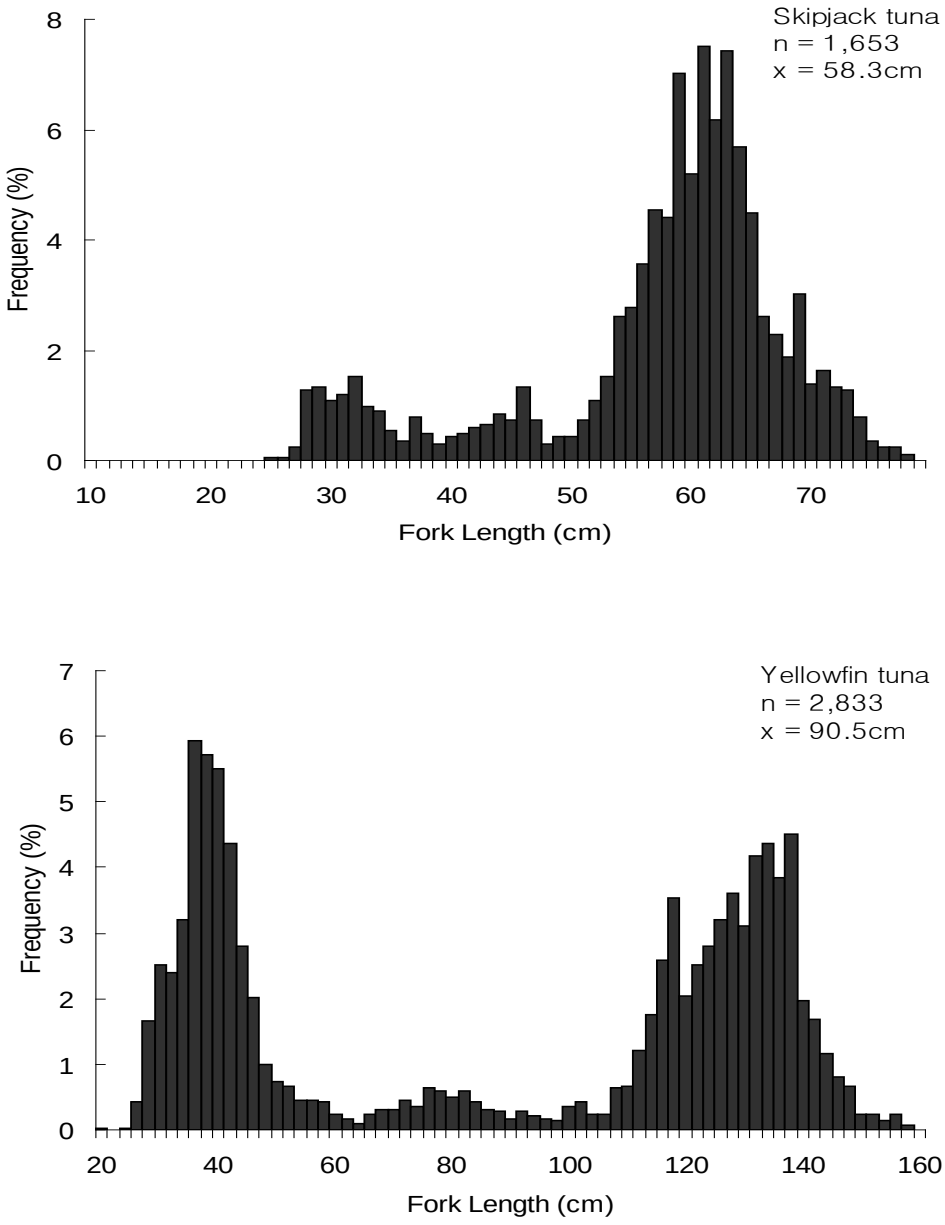

Fig. 7. Length distribution of skipjack tuna and yellowfin tuna caught by Korean purse seiners, 2008.

Biological sampling for longline catch has been carried out by on-board observer to obtain size data and information on reproductive biology of bigeye, yellowfin and albacore. A total of 1,010 bigeye tuna , 586 yellowfin tuna and 368 albacore were sampled for morphometric measurement and GSI index during 2008. The ranges of fork length were 52-183 cm (133.8 cm) for bigeye tuna, 79-169 cm (128.2 cm) for yellowfin tuna and 56-118 cm (96.1 cm) albacore, respectively (Fig. 8).

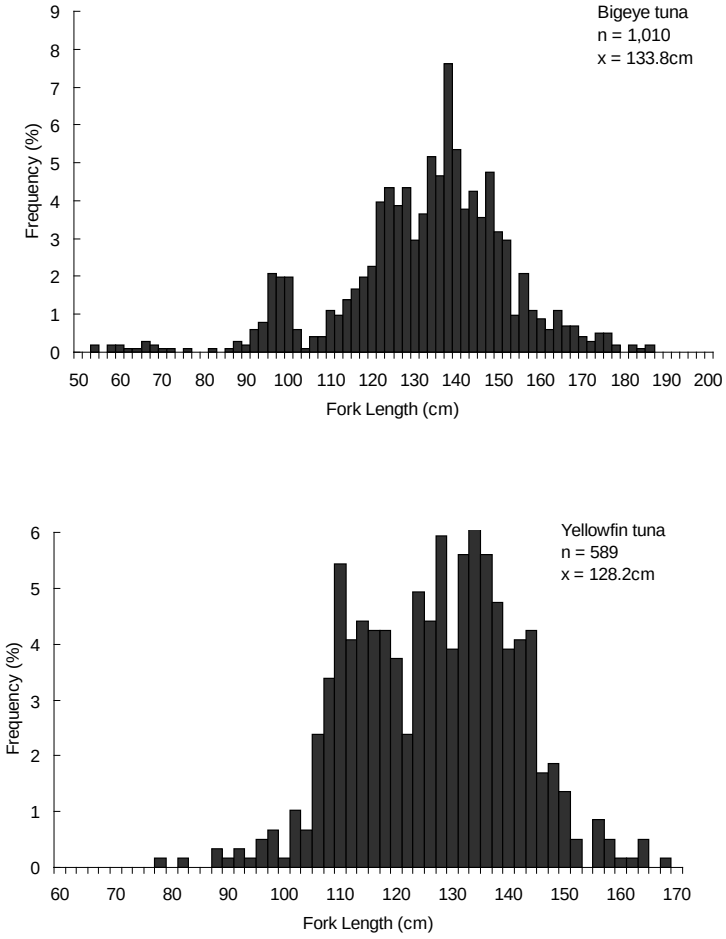

Fig. 8. Length distribution of bigeye tuna, yellowfin tuna and albacore caught by Korean longliners, 2008.

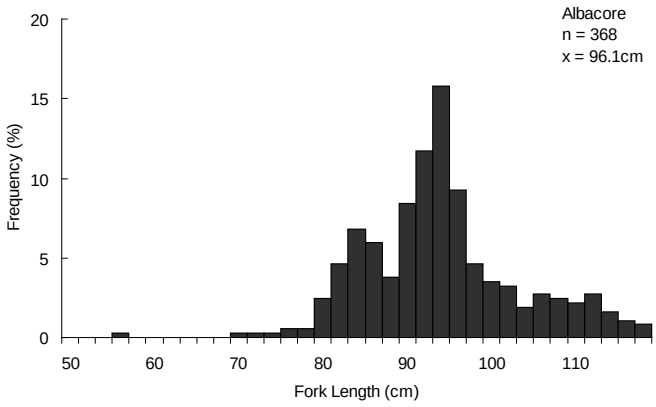

Fig. 8. (continued).

1.2.2 Research Activities

Compilation of bycatch guide to fishermen

Although data collection on bycatch species is not yet among fishermen's responsibilities, Korea encourages fishermen to do so. To solve practical problems that fishermen usually encounter when they record bycatch species, NFRDI issued 'Field Guide to Bycatch Species in Korean Distant-Water Fisheries' in 2008 (Fig. 9). This field guide provides color drawings or photos of 333 species of target and bycatch species which was included sharks, seabirds, sea turtles and cetaceans for Korean tuna fishery and will be helpful to fishermen in identifying various target and bycatch species

Fig. 9. Field Guide to Bycatch Species in Korean Distant-Water Fisheries.

1.2.3 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 from Korean tuna industries, which are used as our official total catch. National Fisheries Research and Development Institute (NFRDI) collects logsheet sampling data from vessels. The annual catch estimates for the WCPFC area presented in Tables 1, 2 and 3 were based on these logsheet data since KODEFA collects data for the whole Pacific not by geographical area. The logsheet contains location, catches by species, number of hooks, etc.

It is our current domestic regulation that distant-water fishing vessels are obliged to report their catch statistics to NFRDI when they returns to home-based port. But since one trip of a Korean tuna vessel generally lasts more than 20 months, it is hard for scientists to collect data from fishing vessels to meet the deadline of data submission set by international fisheries organizations. This is the main reason that coverage of purse seine and longline fisheries is usually well below 100% at the time of data submission; however, low coverage rates are compensated by the further collection of logsheets, which possibly make changes in catch estimates.

NFRDI introduced a new logbook data sheet in this year for collecting bycatch species data which were included 5-6 species of seabirds, sea turtles and sharks by species, respectively.