SCIENTIFIC COMMITTEE
SECOND REGULAR SESSION

7-18 August 2006
Manila, Philippines

NATIONAL FISHERY REPORT

WCPFC-SC2-2006

Paper prepared by

KOREA

National Report of the Republic of Korea

Part 1. INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

Dae-Yeon Moon, Seon-Jae Hwang, Doo-Hae An and Soon-Song Kim

National Fisheries Research and Development Institute (NFRDI)

Republic of Korea

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 200,000 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. Tables 1 and 2 represent annual catch estimates for purse seine and longline fisheries during the past 5 years in the WCPFC area, respectively. WCPFC catches fluctuated from 210,000 to 260,000 mt and averaged 230,000 mt. Almost 97% 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% of the total catch (Fig. 1). Although yellowfin and bigeye

are the second most important species in quantity, 21% and 9%, respectively, both species represent higher commercial value than skipjack as they are caught in longline fishery and sold in the sashimi market.

Purse seine fishery

Purse seiners have been concentrating their fishing activities in the western Pacific throughout the year. Since 1990, there has been a steady decrease in number of the purse seiners operating in this region and only 28 purse seiners remained in 2005. The total catches from this fishery during the last five years ranged from 180,000 mt to 210,000 mt averaging 190,000 mt, among which skipjack and yellowfin tuna comprised 82.3% and 17.4% of total catch, respectively.

Table 1. Annual catch estimates (mt) for Korean tuna purse seine fishery in the WCPFC area, 2001-2005

Year	Total	Skipjack	Bigeye	Yellowfin	others
2001	178,072	137,561	-	40,511	-
2002	206,150	173,693	-	32,457	-
2003	190,452	153,312	645	36,495	-
2004	183,285	162,073	100	21,112	-
2005	210,790	171,595	-	38,195	-

Longline Fishery

Korean longline fishery targets bigeye and yellowfin tuna with minor catches of albacore, comprising 80-88% of the total catch and billfishes and other fish species are incidentally caught in this fishery. The total annual catches in the WCPO ranged from 33,000 mt to 54,000 mt during the past 5 years as shown in Table 2. Recent decrease in longline catch was resulted mainly from decreased bigeye catch from over 20,000 mt in both years of 2001 and 2002 to about 15,000 mt in 2005, a decrease by 40%. 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.

Table 2. Annual catch estimates (mt) for Korean tuna longline fishery in the WCPFC area, 2001-2005

Year	Total	Albacore	Yellowfin	Bigeye	Bluefin	Skipjack	Blue Marlin	Striped Marlin	Swordfish	Black Marlin	Sail fish	Sharks	Others
2001	44,564	2,675	13,768	22,172	18	4	3,868	279	1,480	164	2	92	42
2002	54,782	4,415	15,497	28,533	2	10	3,845	341	1,745	211	10	129	43
2003	38,813	2,465	12,134	17,151	4	6	4,962	351	1,316	165	11	209	38
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

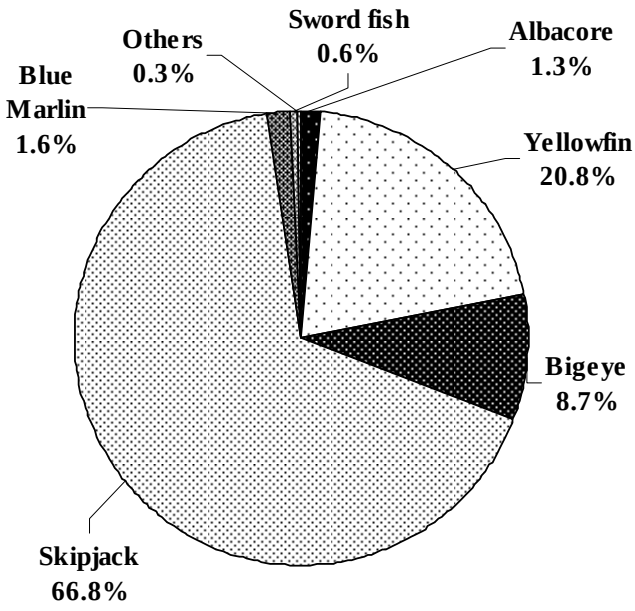

Fig. 1. Catch composition of Korean tuna fisheries.

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

Korea's tuna fleet consists 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. 2). Over 500 longliners in the mid 1970s, for example, has been reduced to around 200 in the year 2000. 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, 150-180 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 2005 was 153 and 28, respectively, which represents a decrease by 9 longliners compared to the previous year. Regarding vessel capacity, dominant sizes range from 300 to 500 GRT for longliners and 700 to 2000 GRT for purse seiners (Table 3) and this feature remained unchanged during the past 10 years.

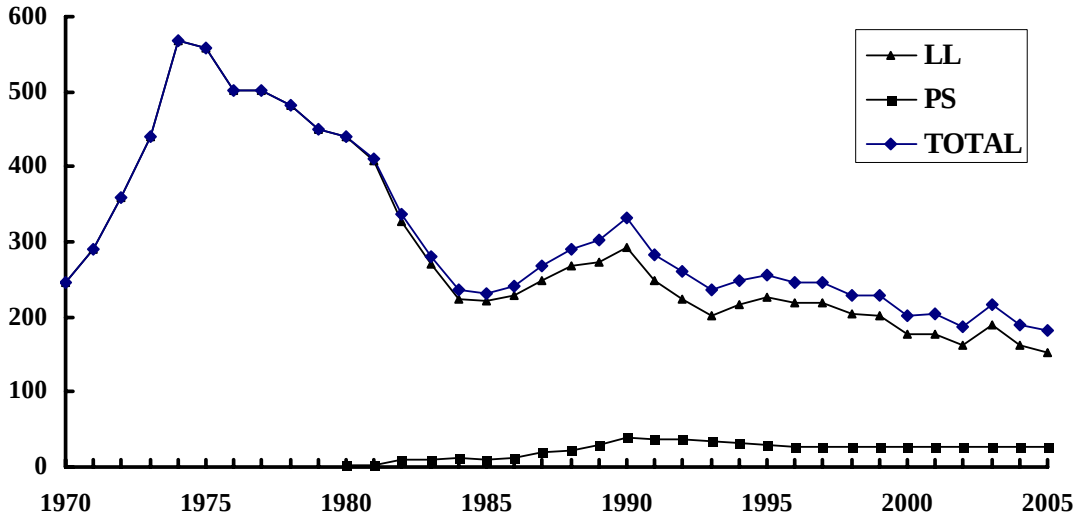

Fig. 2. Changes in Korea's annual tuna fleet structure, 1970-2005.

Table 3. Size class of Korean tuna fishing fleets operated in the WCPFC area in 2005

GRT		301-	401-	501-	601-	701-	801-	901-	1001-
By gear	Number	400	500	600	700	800	900	1000	2000
Longliner	153	51	101	1					
Purse seiner	28					4	2	9	13

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 170°W, depending on oceanographic conditions such as the El-Nino events (Fig. 3). 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. 4). Compared to 2004, 2005 purse seine fishing area was extended eastward close to 150 °W but no significant changes in longline fishery was observed.

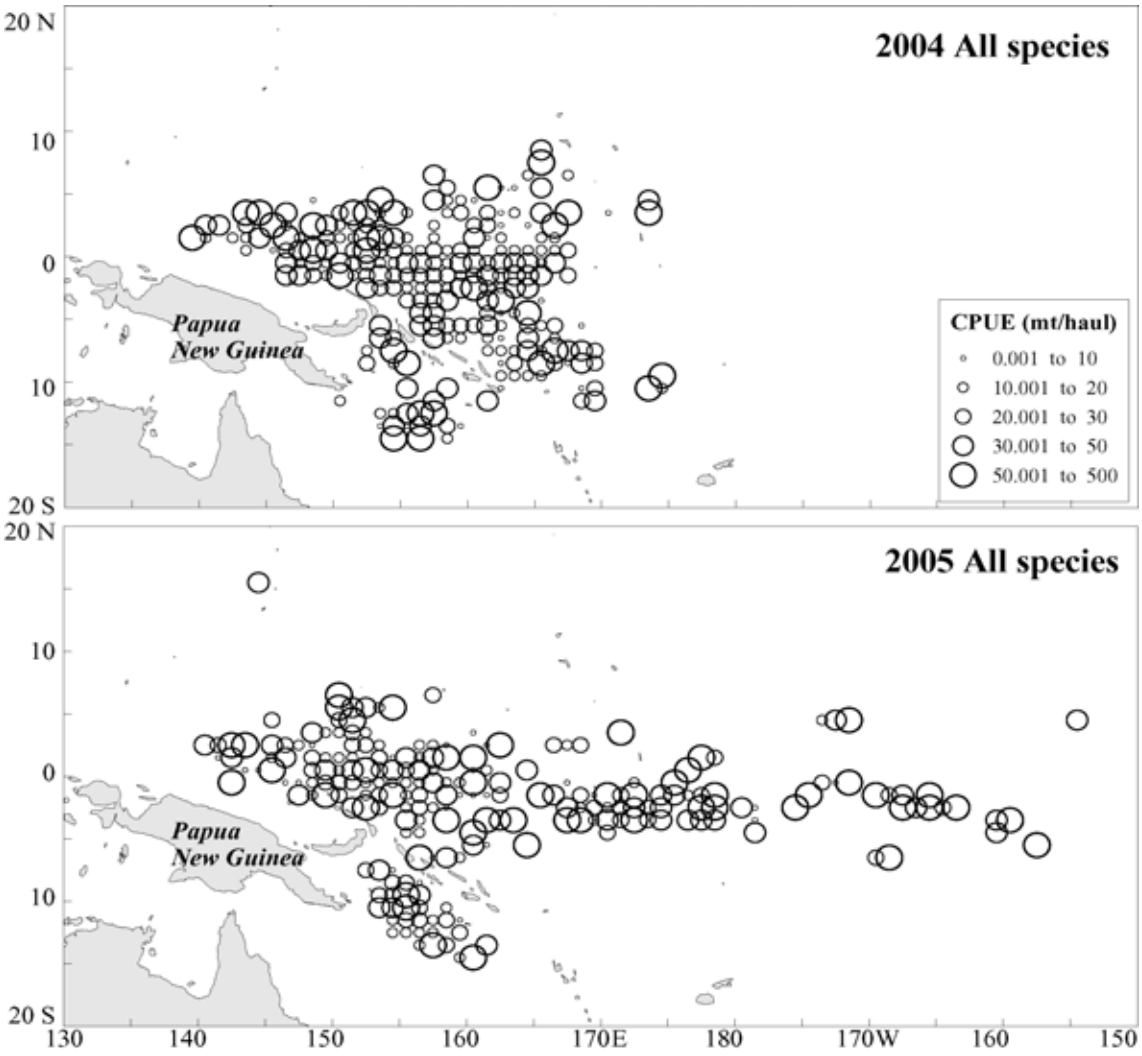

Fig. 3. Distribution of Korean tuna purse seine fishing area in the Pacific Ocean.

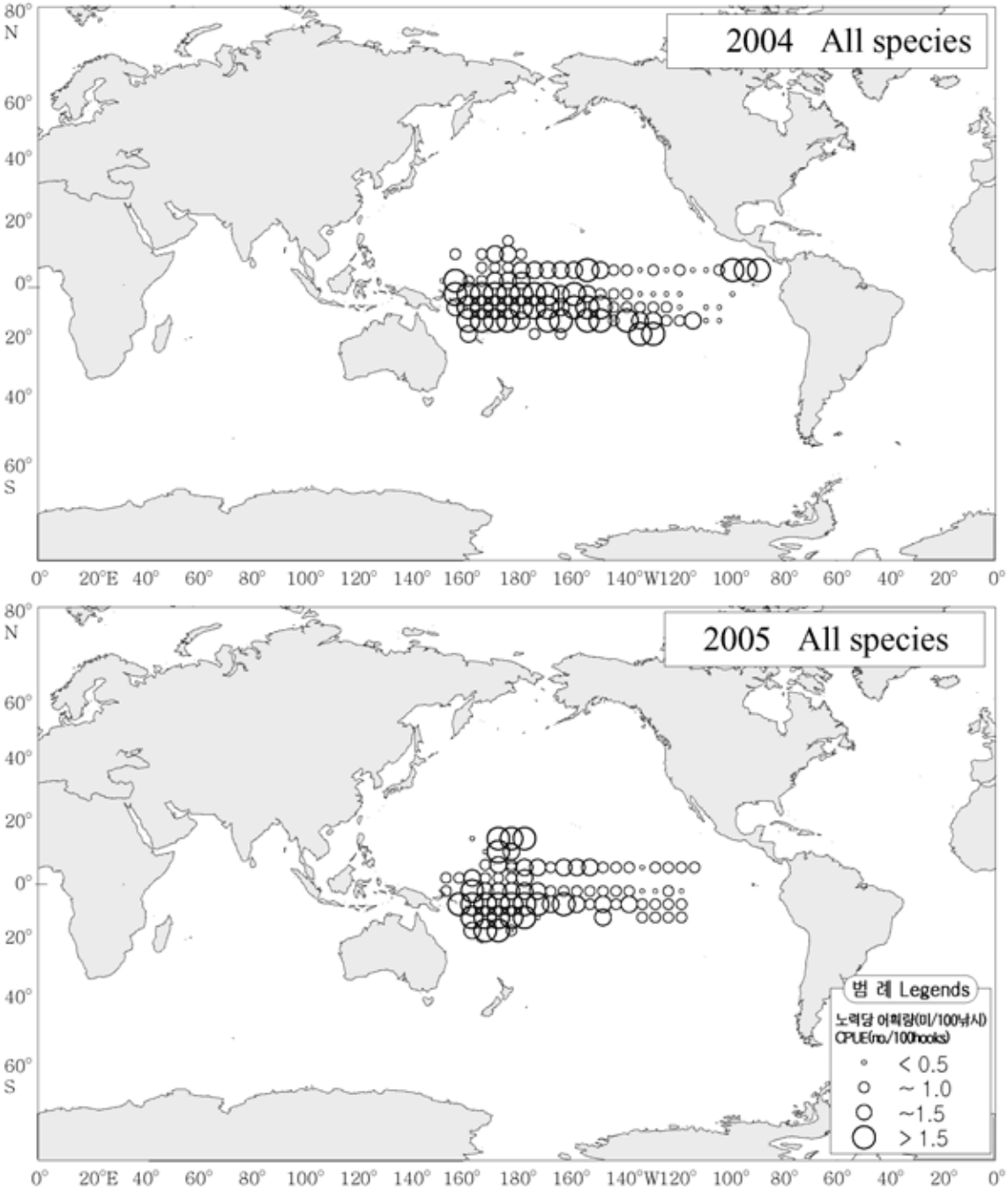

Fig. 4. Distribution of Korean tuna longline fishing area in the Pacific Ocean.

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 fluctuated between 11% and 18% during the past 5 years, averaging 14% to the total catch. Species composition of billfish catches showed that blue marlin consisted of higher proportion, over 50% annually, 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.

1.1.5 Final market destination of catches

Korean tuna fisheries depend on overseas markets to an extent that a large portion of catches is exported to Japan and other international markets. This is mainly because the domestic market is still growing and not big enough yet to accommodate for a substantial amount of tuna caught by the Korean fleet. As shown in Table 3, about 30,000-50,000 mt of longline-caught tuna and 60,000-90,000 mt of purse seine-caught tuna were exported annually. The amount of exports by the Korean longline and purse seine fleet accounted for 64-82% and 33-46% of the total fleet catch, respectively. The remainder was consumed in the domestic market by either sashimi or cans. A major import country of the Korean tuna catch is Japan, consuming 97% of Korea's exported frozen tuna in its sashimi market in 2004. The amount of exports varies by the price of tuna in both domestic and overseas markets.

Table 4. Export statistics by year (mt, 1,000U$)

Year	Longline		Purse seine	
	Amount	Value	Amount	Value
2001	43,830	199,981	81,820	73,184
2002	50,933	200,939	91,934	77,438
2003	36,626	169,104	84,476	62,396
2004	40,266	208,177	61,111	52,567
2005	32,035	159,833	78,491	72,239

1.2 RESEARCH AND STATISTICS

1.2.1 Summary of observer and port sampling programs

Observer program

The Ministry of Maritime Affairs and Fisheries (MOMAF) 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 2005, a total of 6 observer trips 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 2nd WCPFC Scientific Committee meeting. A similar level of observer activities will be carried out for the Pacific tuna fisheries this year.

Port sampling

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 reproductive biology of yellowfin and skipjack. A total of 1,827 skipjack and 230 yellowfin tuna were sampled for morphometric measurement and GSI index during 2005.

1.2.2 Research Activities

Circle hook experiment

Since concerns of sea turtle bycatch in longline fisheries have been raised in various international meetings, the Korean government funded an experiment with circle hooks to investigate if circle hooks can solve this international problem of sea turtle mortality. The experiment was carried out by NFRDI scientists aboard a commercial Korean longliner operating in the Eastern Pacific during July-August 2005, in collaboration with a US scientist from the National Marine Fisheries Service Honolulu Laboratory. The results of this experiment was submitted to the 2nd WCPFC Scientific Committee meeting. This experimental survey will be repeated with various types of circle hooks during August-September 2006.

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 a fishermen's guide to bycatch species in the tuna longline and purse seine fisheries in 2005. This guide provides color drawings or photos of bycatch species and will be helpful to fishermen in identifying various bycatch species including fish, sea turtles, sea birds and etc. This guide was distributed to longline fishermen with a view to facilitating their collection of bycatch information from their 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 and 2 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 port. But since one trip of a Korean tuna vessel generally lasts more than one year, 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.