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Abstract

The Korean tuna longline fishery has shown a decreasing trend from the late 1970s to recent years in both number of fishing vessels and annual catches. In 2005, total catch amounted to 6,985 mt by 28 longliners, which is the record low in Korean longline fishery in this area. This was mainly due to the shift of longliners from the Indian to the Pacific Ocean. Catch consists of 32 mt of southern bluefin tuna, 3,295 mt of yellowfin tuna, 183 mt of albacore, 2,481 mt of bigeye tuna, 400 mt of other tunas and 566 mt of billfishes respectively. The National Fisheries Research and Development Institute (NFRDI) began to operate fisheries observer program in 2002 to monitor Korean distant-water fisheries for tunas and to meet the requirements of regional fisheries bodies. NFRDI dispatched one scientific observer to monitor the Korean tuna longline vessel in the Indian Ocean from August to September 2006. The results of observer program for the Indian Ocean during 2006 will be reported later.

General Fishery Statistics

Catch

Tunas in the Pacific and Indian Ocean have been the most important target species for distant-water fishery industries in Korea. Korean tuna fishery has operated its longline fleet in the Indian Ocean since the mid-1960s. Major target species of tunas include yellowfin, bigeye and albacore tunas. However, recently albacore tuna remains as a minor species whereas southern bluefin tuna was enlisted in one of the target species of Korean longliners.

Catches by longline fishery has shown a decreasing trend from a peak at 71,100 mt in 1978 to 1,259 mt in 2002 (Table 1) and then increasing to 2004. In 2005, annual total

catch amounted to 6,958 mt, which is the record low in Korean longline fishery in this area. Catch consists of 3,295 mt of yellowfin tuna, 2,481 mt of bigeye tuna, 183 mt of albacore, 32 mt of southern bluefin tuna, 400 mt of other tunas and 566 mt of billfishes, respectively (Table 2 and Fig. 1). Catch of southern bluefin tuna decreased by more than 72% to the previous year and yellowfin tuna, bigeye tuna and albacore also decreased in 2005. This was mainly due to the shift of longliners from the Indian to the Pacific Ocean.

Recently, yellowfin and bigeye tunas have been the most important species for Korean tuna longline fishery because of higher commercial value in most of Japanese sashimi market. In 2005, the two species accounted for most of the catch by longliner (47.3% and 35.6% respectively) from the Indian Ocean.

The traditional fishing grounds of Korean tuna longline fishery were mainly formed in the central tropical area between 20^{o}N and 20^{o}S. From 1991 onward some longliners moved to the south (43 ^{o}N) of the Indian Ocean where they target southern bluefin tuna, yellowfin tuna, bigeye tuna and albacore catches were also recorded. To catch the major tunas, Korean longliners were operated in the fishing grounds with a range of 5°N~35°S and 20°~80° E. In 2005, total catch of 73.3 % was caught in the western Indian Ocean. The fishing grounds were not extended to the eastern Indian Ocean as compared to 2004 (Fig. 2).

Fleet structure

Number of Korean tuna longline fishing vessel in the Indian Ocean has shown a decreasing trend from a peak at 185 in 1975. In 2005, only 28 vessels were operating in the Indian Ocean, which is a decrease by 8 vessels as compared to 2004. This is one of the main causes of the decrease in total annual catch for the year 2005. The size of Korean tuna longliners ranges from 298 to 525 gross tonnage classes.

Size composition data

Fishermen on board are encouraged to collect size data of main target species, bigeye and yellowfin tuna. Fig. 3 showed the size distribution of yellowfin tuna (YFT) and bigeye tuna (BET) caught by Korean longliners during the past 2 years in the Indian Ocean. Size composition in 2004 ranges from 96 to 176cm Fork length (FL) for YFT and from 102 to 192 cm FL for BET. The mean FL of YFT was 131.0 cm with mode 130~132 cm and that of BET was 129.0 cm with mode 122~124 cm. The size of target

species has shown slightly decreasing trend. In 2005, size composition ranges from 100 to 177 cm fork length (FL) for YFT and from 90 to 190 cm FL for BET. The mean FL of YFT was 130.3 cm with mode 126 cm and that of BET was 136.7 cm with mode 136 cm. According to a scientific observer's monitoring carried out from August to September 2006, the mean FL of YFT was 121.4 cm with mode 120~124 cm and that of BET was 133.0 cm with mode 140~144 cm, respectively.

National data collection system

Korean longline fisheries in the Indian Ocean usually have operated in all year round since the fishery started. Thus, fisheries statistics are collected and reported for a calendar year. Coverage rate in catch of all species was 52 to 69% during the 1981-1985 periods, but it increased to the highest level of 91% in 1987. In recent years, the coverage rates maintained over 50% reaching at around 70% in certain years.

There are two national data collection systems for Korean tuna fisheries. The first system has been operated by the Korean Deep-Sea Fisheries Association to collect total catch by species. All Korean distant-water fishing vessels report their catch records in terms of weight by species to their companies once a week or at 10-day intervals. The Association compiles the data by month and by FAO fishing area to submit to the Ministry of Maritime Affairs and Fisheries for the final review and publication. Both the Association and the Ministry publish the catch statistics for official use annually.

The second data collection system is to sample catch and effort data based on the logbooks. This system was lawful in 1977 by the Ministry of Agriculture and Fisheries. According to this domestic regulation, distant-water fishing vessels have to submit the reports of their fishing operations within 30 days (home-based) or 60 days (foreign-based) after completion of their operations NFRDI. The requested catch and efforts data were already provided to the IOTC secretariat.

Implementation of recommendations

As a responsible fishing nation, Korea has implemented recommendations and resolutions adopted by regional fisheries organizations. Legislation of domestic regulations, initiation of observer program, and submission of fisheries statistics are among its efforts to meet the requirements by various fisheries bodies including IOTC.

Other relevant information

The NFRDI began to operate fisheries observer program in 2002 to monitor Korean distant-water fisheries including those for tunas and to meet the requirements of regional fisheries bodies. At the initial stage, the scale of observer program will be fairly small to cover only for the fisheries to be urgently implemented such as a southern bluefin tuna longline fishery in CCSBT convention area, but it will be gradually developed to a bigger scale to cover all required areas of fisheries.

The goal of the first stage of observer program development from 2004 to 2006 is to establish a domestic training system to educate national observers. In 2005, a total of 5 observer candidates received a trainship from Korean longline observer program provided by NFRDI. Among those 5 trainees, four observers joined 2-months on-board Korean commercial fishing vessels in 2005. NFRDI dispatched one scientific observer to monitor the Korean tuna longline vessel in the Indian Ocean from August to September 2006. The results of observer program for the Indian Ocean during 2006 will be reported later.

Table 1. Number of vessel, catch (ton) and CPUE (no. of fish/100 hooks) by Korean tuna longline fishery in the Indian Ocean, 1966 2005. * Catch included FAO area 51, 57 and 58

Year	No. of vessel	Catch (ton)	CPUE (No of fish / 100 hooks)	Year	No. of vessel	Catch (ton)	CPUE (No of fish / 100 hooks)
1966	3	761		1991	19	6,317	1.38
1967	46	6,594		1992	50	10,311	1.42
1968	33	11,596		1993	50	14,198	1.20
1969	41	18,612		1994	52	14,581	1.08
1970	36	8,808		1995	52	10,905	1.15
1971	52	16,786		1996	62	18,432	1.34
1972	75	20,967		1997	58	18,100	1.30
1973	112	29,799		1998	59	8,411	0.88
1974	173	41,958		1999	31	3,836	0.82
1975	185	47,908	1.64	2000	38	6,888	0.83
1976	128	43,497	1.86	2001	23	4,033	0.92
1977	165	66,015	2.48	2002	11	1,259	0.47
1978	151	71,123	2.37	2003	25	3,840	1.12
1979	169	46,176	1.66	2004	36	7,735	1.42
1980	174	38,085	1.28	2005	28	6,958	1.49
1981	142	36,138	1.47				
1982	146	42,531	1.60				
1983	115	36,975	1.38				
1984	75	24,613	1.32				
1985	62	28,185	1.49				
1986	66	30,639	1.73				
1987	81	30,904	1.78				
1988	112	34,469	1.49				
1989	87	23,610	1.00				
1990	77	20,335	1.00				

Table 2. Annual catch by species and FAO statistical area for the Korean longline fishery in the Indian Ocean, 1994-2005

	Area	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Southern Bluefin tuna	51	98	216	314	1,402	1,415	463	328	363	513	215	75	32
	57		99	597	181	147	210	112	347	136	6	39	
	58						563	456					
	sub-tot				1,583	1,562	1,236	896	710	649	221	114	32
Yellowfin tuna	51	3,608	2,426	3,426	3,607	2,218	718	991	1,240	242	1,679	2,744	2,446
	57	14	18	17	35	47	85	73	161	90	421	1,324	849
	58						105	747					
	sub-tot	3,622	2,444	3,443	3,642	2,265	908	1,811	1,401	332	2,100	4,068	3,295
Albacore	51	9	3	14	102	118	26	85	31	7	56	126	135
	57	4	3			4	1			3	39	224	48
	58							10					
	sub-tot	13	6	14	102	122	27	95	31	10	95	350	183
Bigeye tuna	51	8,179	6,106	10,737	10,129	3,154	608	1,677	1,145	178	854	1,778	1,787
	57	60	48	48	77	33	479	129	256	8	267	688	694
	58						258	1,414					
	sub-tot	8,239	6,154	10,785	10,206	3,187	1,345	3,220	1,401	186	1,121	2,466	2,481
Other tunas	51	584	577	1,036	1,199	705	182	171	294	22	99	173	400
	57			46	5	19	18		29			5	
	58						44	358					
	sub-tot	584	577	1,082	1,204	724	244	529	323	22	99	178	400
Swordfish	51	17	74	51	196	147	8	42	18	9	50	120	210
	57		2		8	2	14		19	3	35	135	106
	58						7	21					
	sub-tot	17	76	51	204	149	29	63	37	12	85	255	316
Blue marine	51	3	7	1	75	101	10	79	16		11	43	20
	57					2	6					1	
	58												
	sub-tot	3	7	1	75	103	16	79	16		11	44	20
Striped marine	51	2	38		65	43		12	2		3	17	11
	57						1	8	1		3	11	11
	58												
	sub-tot	2	38		65	43	1	20	3		6	28	22
Sailfish	51			3	5								
	57												
	58												
	sub-tot			3	5								
Black marine	51		21	8	40	20	2	12	10	4	16	55	55
	57						7		13	2	20	59	51
	58						4	13					
	sub-tot		21	8	40	20	13	25	23	6	36	114	106
Other billfishes	51	2,003	1,242	2,125	939	217	4	124	74	38	30	42	6
	57		25	9	22	15	8	1	4	4	36	74	96
	58						5	23					
	sub-tot	2,003	1,267	2,134	961	232	17	148	78	42	66	116	102
Sharks	51				13	4			10				1
	57											1	
	58							2					
	sub-tot				13	4		2	10			1	1
Total	51	14,503	10,710	17,715	17,772	8,142	2,021	3,521	3,203	1,013	3,013	5,174	5,103
	57	78	195	717	328	269	829	323	830	246	827	2,561	1,855
	58						986	3,044					
	total	14,581	10,905	18,432	18,100	8,411	3,836	6,888	4,033	1,259	3,840	7,735	6,958

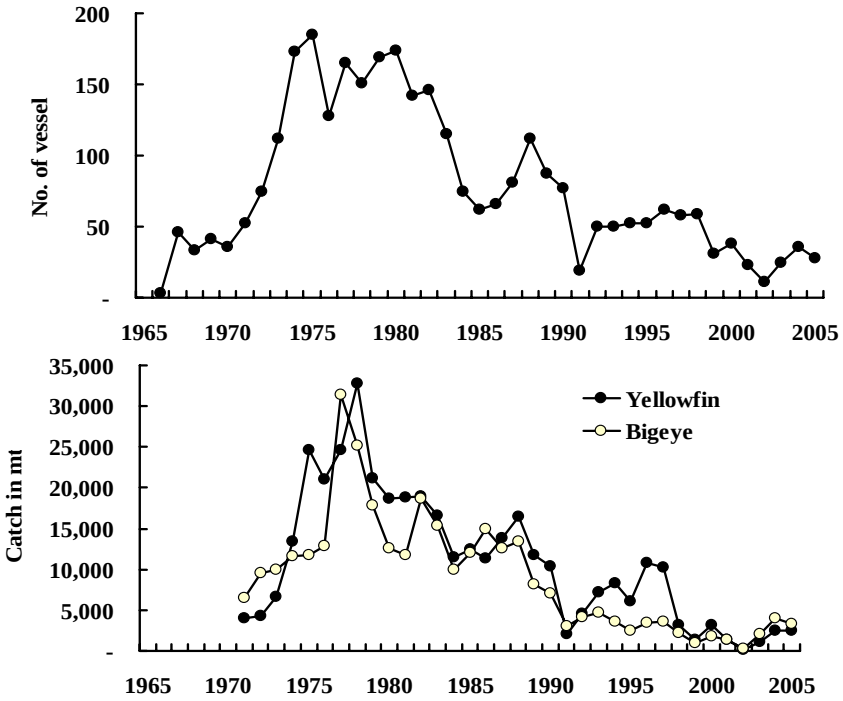

Fig. 1. Annual number of fishing vessels and nominal catch for the Korean tuna longline fishery in the Indian Ocean, 1966-2005.

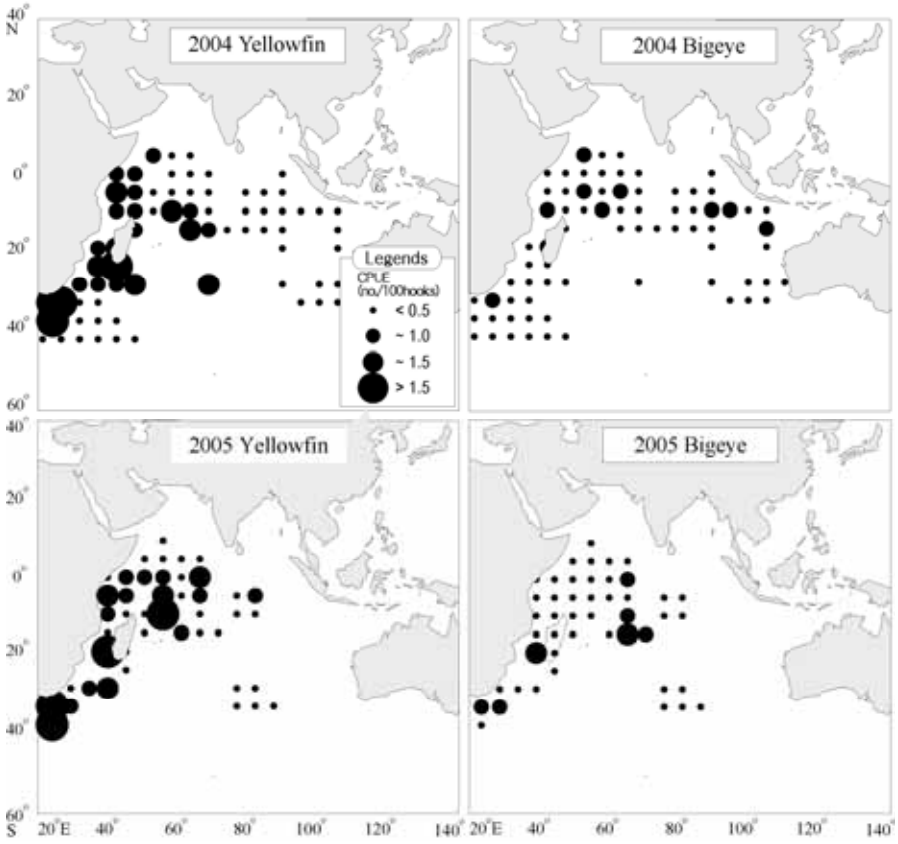

Fig. 2. Catch distribution of yellowfin and bigeye tuna in the Indian Ocean by Korean tuna longline fishery in 2004 and 2005.

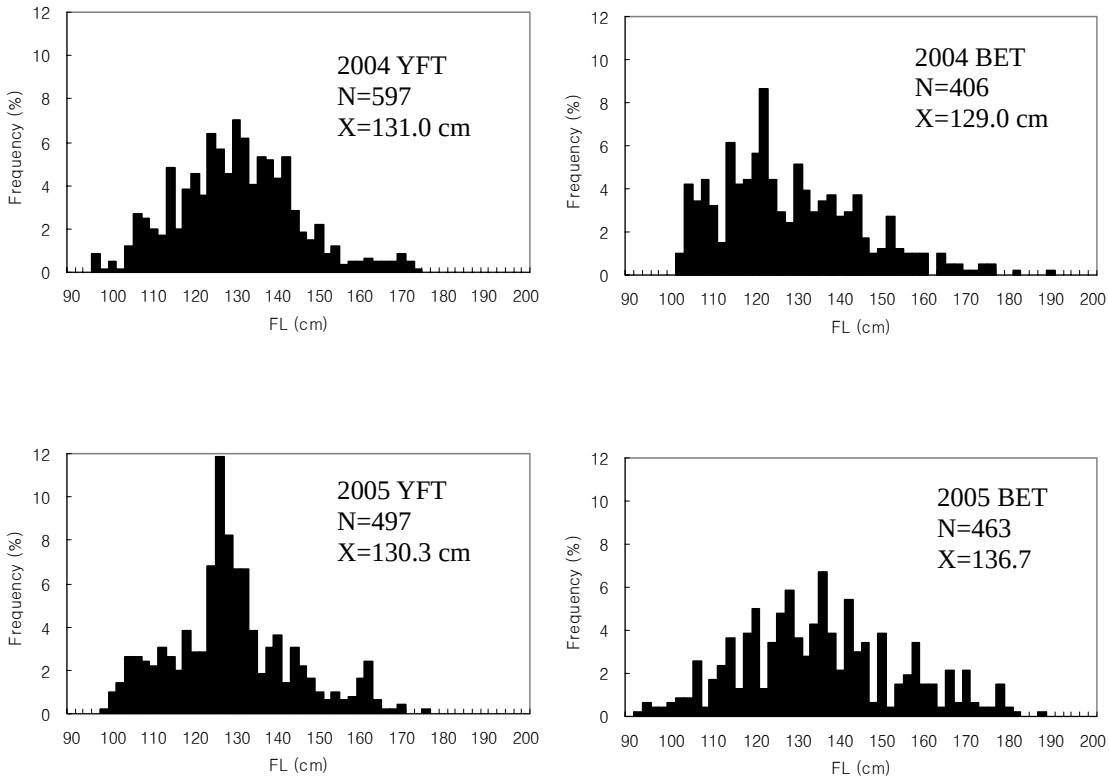

Fig. 3. Size composition of yellowfin tuna (YFT) and bigeye tuna (BET) caught by Korean tuna longliners from 2004 to 2005 in the Indian Ocean.