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Korean National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2012

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 10/02, final scientific data for the previous year was provided to the Secretariat by 30 June of the current year, **for all fleets other than longline** [e.g. for a National report submitted to the Secretariat in 2012 final data for the 2011 calendar year must be provided to the Secretariat by 30 June 2012)	YES 29/06/2012
In accordance with IOTC Resolution 10/02, provisional **longline data** for the previous year was provided to the Secretariat by 30 June of the current year [e.g. for a National report submitted to the Secretariat in 2012, preliminary data for the 2011 calendar year was provided to the Secretariat by 30 June 2012). **REMINDER:** Final longline data for the previous year is due to the Secretariat by 30 Dec of the current year [e.g. for a National report submitted to the Secretariat in 2012, final data for the 2011 calendar year must be provided to the Secretariat by 30 December 2012).	YES 29/06/2012
If no, please indicate the reason(s) and intended actions:	

Executive Summary

Longline is the only type of fishing gear for Korean fishing for tuna species in the Indian Ocean. Korean longline fishery in the Indian Ocean commenced in 1957. 7 longliners were operated in 2011, which were the lowest in number of vessels as it ranged from 31 to 13 during previous 5 years. With this fishing capacity, Korean longliners caught 1,985 mt in 2011, which was 30.4% decreasing of the catch in 2010. In 2011, fishing effort was 5,362 thousand hooks and distributed higher in the western and eastern areas around 20-40°S, while the fishing efforts averaged for 2007-2011 were 8,140 thousand hooks and distributed higher in the western areas around 20°N-20°S, as well as in the western and eastern areas around 20-40°S. It was noted that fishing efforts had not been deployed in the western Indian Ocean around 20°N-20°S in recent years. As results, the catch of bigeye tuna and yellowfin tuna significantly decreased, and albacore tuna became important in catch. Due to some operational difficulties in Korean observer programs including safety incidents, no observer was placed on board Korean longline vessels in 2011. In relation to this matter, Korea improved the scientific observer program, and in 2012 three observers had been deployed on board for a period of 60-70 days to implement the coverage of 2012 as well as to cover that of 2011.

Contents

1. BACKGROUND/GENERAL FISHERY INFORMATION

Longline is the only type of fishing gear for Korean fishing for tuna species in the Indian Ocean. Korean longline fishery in the Indian Ocean commenced in 1957. Its target species were yellowfin tuna, bigeye tuna and albacore tuna from the beginning. Southern bluefin tuna has been included since 1991 because of the highest value in market. The traditional fishing grounds of Korean tuna longline fishery were mainly the central tropical area between 20°N and 20°S, and extended south to higher latitude of 45°S and east to 115°E. The number of active vessels peaked at 185 in 1975, and then has gradually decreased to 21 in 2009, 13 in 2010 and 7 in 2011, respectively. The catch recorded the highest with about 70 thousands mt in 1978, and then also has gradually decreased to 2,723 mt in 2010 and 1,985 in 2011, respectively.

2. FLEET STRUCTURE

Korean fishing fleet in the Indian Ocean are all deep freezing tuna longliners. The size ranges from 200 to 500 gross tonnage classes (Table 1). Total number of vessels has decreased from 185 in 1975 to 7 in 2011, and especially it showed the rapid decreasing in recent years (Tables 1 and 2a).

Table 1: Number of Korean longline vessels operating in the IOTC area of competence, by size

GRT	2005	2006	2007	2008	2009	2012	2011
201-500	28	26	31	24	21	13	7

3. CATCH AND EFFORT (BY SPECIES AND GEAR)

Total annual catch of Korean longline fleet steeply increased from the mid-1960s, and peaked at 69,978 mt in 1978, and then has decreased with large fluctuation, where the decadal average of catch was about 39 thousands mt in the 1970's, 33 thousands mt in the 1980's, 12 thousands mt in the 1990's and 5 thousands mt in the 2000's, respectively (Table 2a, Fig. 1). In 2011, the total catch was 1,985 mt in round weight which was 30.4% decreasing from the catch in 2010 (2,723 mt) and 97.3% decreasing from the highest catch in 1978 (Table 2a). The changes in the number of active vessels closely coincided with the catch trend throughout the periods, in which the number were 185 vessels in 1975 and then decreased to 7 vessels in 2011 (Table 2a). The fishing efforts in the number of hooks were the highest at 64,797 thousands in 1978, but significantly decreased with fluctuation to 7,786 thousand hooks until 1999, and stable around 5,000-12,000 thousands in recent years (Table 2b). In 2011, fishing efforts were 5,362 thousand hooks and distributed higher in the western and eastern areas around 20-40°S, while the fishing efforts averaged for 2007-2011 were 8,140 thousand hooks and distributed higher in the western areas around 20°N-20°S, as well as in the western and eastern areas around 20-40°S (Table 2b, Figs. 2a and 2b). It was appeared that fishing efforts had not been deployed in the western Indian Ocean around 20°N-20°S in recent years. As results, the catch of bigeye tuna and yellowfin tuna significantly decreased and albacore tuna became important in catch (Figs. 3a and 3b).

Table 2a. Total catch (mt) and number of longline vessels of Korea in the IOTC area of competence

Year	No. of longline vessels	Total Catch (mt)	Year	No. of longline vessels	Total Catch (mt)	Year	No. of longline vessels	Total Catch (mt)
1965		800	1981	142	35,764	1997	58	18,100
1966	3	961	1982	146	42,304	1998	59	8,408
1967	46	7,194	1983	115	36,868	1999	31	3,836
1968	33	13,196	1984	75	24,544	2000	38	6,945
1969	41	21,612	1985	62	28,115	2001	23	4,023
1970	36	11,807	1986	66	30,628	2002	11	1,259
1971	52	16,411	1987	81	30,904	2003	25	3,840
1972	75	20,585	1988	112	34,462	2004	36	7,735
1973	112	29,176	1989	87	23,597	2005	28	6,957
1974	173	41,167	1990	77	20,335	2006	26	7,369
1975	185	47,298	1991	19	6,458	2007	31	5,848
1976	128	43,146	1992	50	10,514	2008	24	2,762
1977	165	65,198	1993	50	10,811	2009	21	2,972
1978	151	69,978	1994	52	14,913	2010	13	2,723
1979	169	45,415	1995	52	10,906	2011	7	1,895
1980	174	37,805	1996	62	18,772			

Table 2b. Annual catch (number) and effort by Korean longliners and primary species in the IOTC area of competence

Year	No. of hooks (X1000)	Albacore	Bigeye	Bluefin	Yellowfin	Swordfish	Black Marlin	Blue Marlin	Striped Marlin	Sailfish	NEI	TOTAL
1971	79	7	885	0	98	32	3	2	6	0	5	1,038
1972	1,661	21,365	13,598	3	45,121	28	13	8	2,664	10	1,183	83,993
1973	1,627	39,377	4,954	28	5,776	286	116	99	152	262	1,047	52,097
1974	5,293	23,056	27,021	6	28,763	419	275	1,113	1,355	1,491	8,187	91,686
1975	17,671	42,916	129,470	307	85,222	4,112	1,089	3,256	5,023	3,858	26,617	301,870
1976	132	118	2,184	3	497	23	21	44	33	0	41	2,964
1977	10,558	6,602	178,239	188	201,397	3,987	1,202	5,906	7,839	1,386	9,918	416,664
1978	64,797	158,202	737,389	1,092	549,599	14,397	5,513	20,815	28,188	5,702	39,575	1,560,472
1979	29,356	19,221	238,735	2,872	181,461	6,647	2,586	10,598	14,136	2,549	12,783	491,588
1980	58,876	44,929	459,342	1,562	268,284	11,917	6,064	14,325	30,763	6,770	31,645	875,601
1981	46,420	31,474	314,174	12	276,757	10,244	3,543	9,717	15,412	2,925	18,059	682,317
1982	52,142	18,652	347,864	579	398,117	11,547	3,787	9,171	14,425	3,482	22,329	829,953
1983	62,686	32,170	377,765	428	403,107	15,105	4,342	11,977	16,106	3,839	21,843	886,682
1984	23,255	8,513	132,089	87	137,481	5,751	1,870	4,080	8,292	1,813	13,652	313,628
1985	34,090	16,836	203,611	347	239,350	10,897	2,437	7,341	12,271	2,676	21,024	516,790
1986	43,007	31,807	262,185	128	374,860	16,968	3,341	8,400	19,824	4,487	24,648	746,648
1987	44,001	21,452	314,791	8	348,284	18,665	4,212	7,168	17,294	3,113	23,012	757,999
1988	51,054	21,134	326,871	9	336,845	22,840	3,237	8,279	14,801	5,123	21,812	760,951
1989	52,985	12,288	233,556	28	215,512	20,076	3,193	6,873	10,738	6,722	19,414	528,400
1990	39,112	8,735	187,772	19	151,121	17,280	1,551	4,713	5,367	2,736	14,556	393,850
1991	11,731	1,850	53,688	6	82,503	6,370	1,415	2,440	8,037	1,740	3,844	161,893
1992	17,644	7,694	103,915	0	104,469	13,205	1,488	4,924	7,531	1,877	5,285	250,388
1993	24,837	6,137	129,332	0	113,676	23,548	2,160	5,876	8,539	1,975	7,373	298,616
1994	25,739	8,167	151,616	0	71,189	25,214	1,219	6,240	8,359	789	6,427	279,220
1995	18,554	6,936	123,113	0	55,989	18,008	1,103	4,901	10,638	443	3,224	224,355
1996	30,397	8,398	227,280	14,689	76,621	21,815	888	7,109	12,809	949	2,746	373,304
1997	35,644	11,825	192,780	24,460	89,719	19,256	625	7,102	6,075	838	4,788	357,468
1998	14,150	6,820	46,875	7,791	41,529	7,965	261	4,183	2,642	518	1,718	120,302
1999	7,786	923	18,374	16,144	10,358	1,019	75	521	385	32	199	48,030
2000	9,694	3,507	41,255	5,497	21,475	3,666	80	3,028	1,713	63	170	80,454
2001	9,736	3,228	21,185	11,202	36,543	5,198	26	1,918	833	57	9,112	89,302
2002	5,245	2,462	1,880	15,150	4,868	318	16	97	36	31	1,171	26,029
2003	7,510	6,046	29,526	2,835	48,247	2,974	51	806	226	15	285	91,011
2004	12,202	11,088	43,430	1,915	107,307	7,468	139	2,018	1,356	30	1,507	176,258
2005	6,522	9,701	24,220	900	56,474	5,751	119	1,270	457	9	406	99,307
2006	11,053	12,517	30,284	3,787	54,543	3,820	105	1,367	1,040	1,291	1,134	109,888
2007	9,508	16,271	15,687	6,707	57,626	3,106	60	919	321	3,278	2,449	106,424
2008	7,279	10,291	6,809	17,051	16,359	827	39	414	276	897	4,838	57,801
2009	11,724	31,257	13,138	22,975	25,466	1,465	81	738	244	1,231	19,295	115,890
2010	6,827	30,282	7,940	13,201	21,920	816	25	417	466	710	21,721	97,498
2011	5,362	33,870	6,738	12,689	5,442	422	9	154	210	50	29,055	88,639

* NEI indicates a 'not elsewhere included' category.

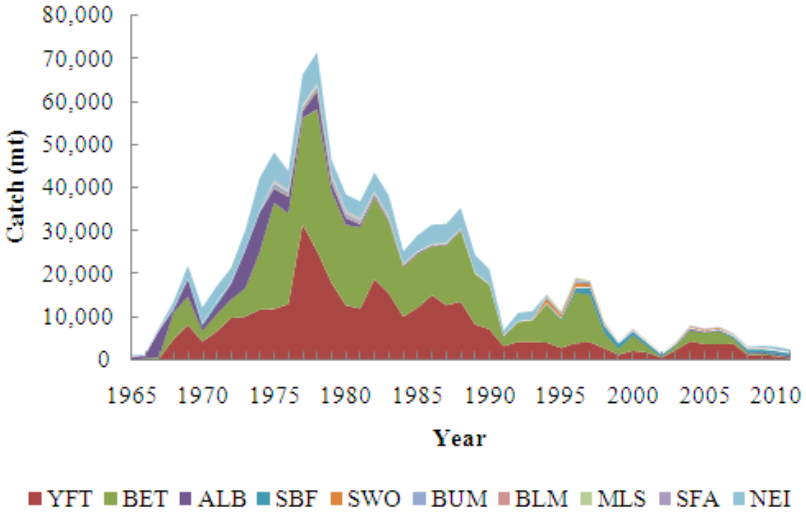

Figure 1. Historical annual catch for Korean longline fleet by species in the IOTC area of competence.

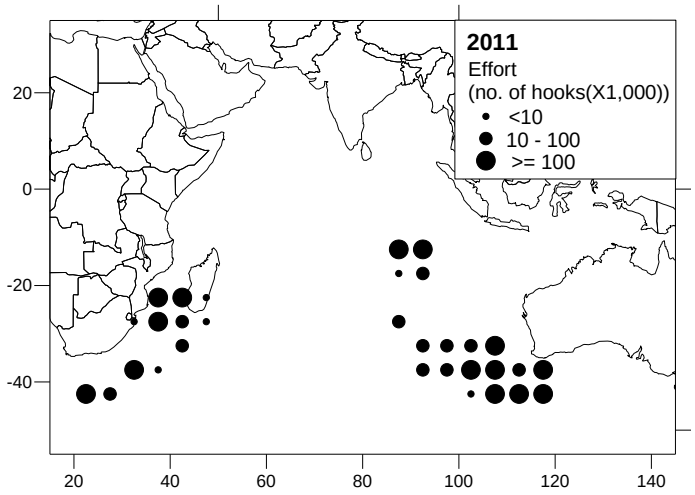

Figure 2a. Map of the distribution of fishing effort by Korean longline fleet in the IOTC area of competence for 2011.

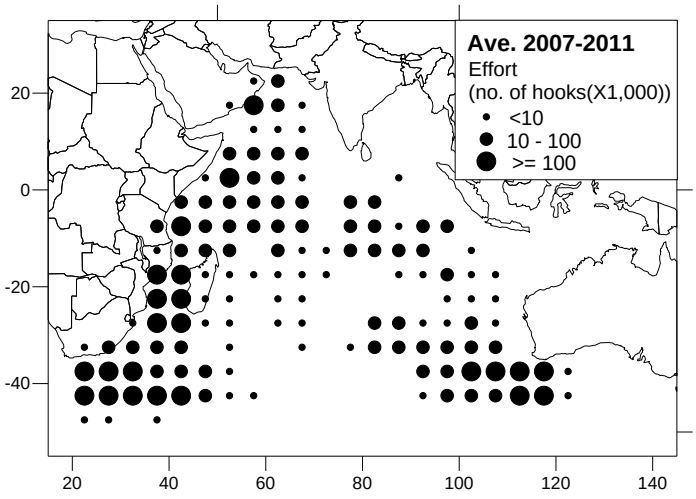

Figure 2b. Map of the distribution of fishing effort by Korean longline fleet in the IOTC area of competence for average of 2007-2011.

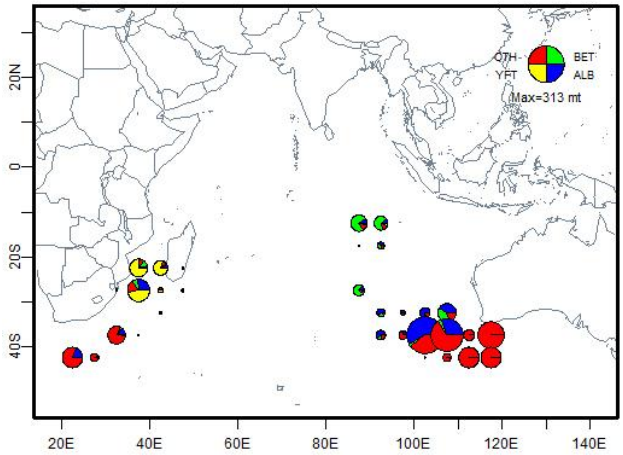

Figure 3a. Map of distribution of fishing catch by species for Korean longline fleet in the IOTC area of competence for 2011.

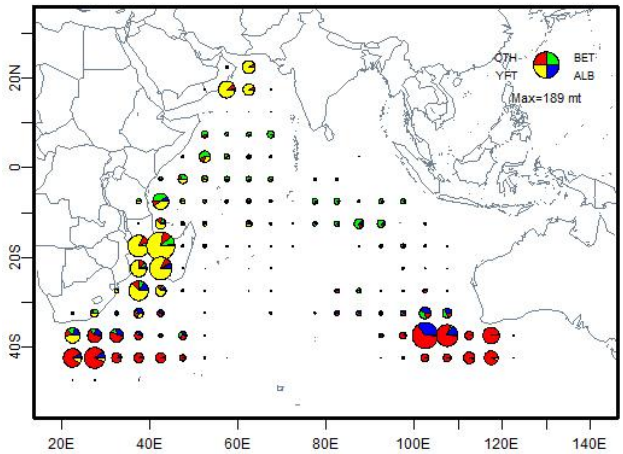

Figure 3b. Map of distribution of fishing catch by species for Korean longline fleet in the IOTC area of competence for average of 2007–2011.

4. RECREATIONAL FISHERY

No recreational fishery for Korea.

5. ECOSYSTEM AND BYCATCH ISSUES

Environmental issues have been administrated with various individual laws since the 1960's. In relation to Korean national fisheries, there are the law of preservation and management of marine ecosystem (2007), the framework act on marine fishery development (2009) and the law of fisheries management (2010). In special, with regard to Korean distant-water fisheries, they comply with the measures related to ecosystem and bycatch, taken by the 5 regional tuna fisheries management bodies to which Korea acceded, in accordance with Article 16 of the Act of the Distant Sea Fisheries Development (2008).

5.1 Sharks

Korean National Action Plan for the Conservation and Management of Sharks was developed and approved in August, 2011. Biological and ecological information on sharks have been collected through national observer program. It appeared that the status of implementation by Korean fleet was significantly poor to meet scientific requirement as of now. It was observed that fishermen had not yet been familiar with provisions and associated works on data collection and reporting for sharks such as species identification, biological information and interaction. In 2011, logbook was revised with addition of columns for ecologically-important species, and since then fishermen have been educated and requested to implement revised logbook with great emphasis on ERS and mitigation in close cooperation with the National Fisheries Research and Development Institute (NFRDI). And in 2012, the field guide for identifying sharks was distributed on board as well.

Table 3: Total number and weight of sharks, by species, retained by Korean longline fleet in the IOTC area of competence for 2007–2011

Year	Catch (mt)	Catch by species (kg/Inds.)[1)]							
	Sharks	Blue shark	Mako sharks	Porbeagle shark	Oceanic whitetip shark	Hammerhead sharks	Thresher sharks	Others	Total
2007	12	14,385 / 613	2,842 / 66	418 / 53	5 / 1	0 / 0	0 / 0	449 / 16	18,099 / 749
2008	-	-	-	-	-	-	-	-	-
2009	6	94,507 5,007	3,635 79	3,356 / 259	1,378 / 26	696 / 18	2,938 / 56	10,166 / 201	116,676 / 5,646
2010	11	54,358 3,351	1,796 50	- -	- -	- -	- -	3,002 / 402	59,156 / 3,803
2011	234	97,000	4,000	-	-	-	-	133,000	-

1) Data were complied by observer in 2007, 2009 and 2010, and from logsheet by fisherman in 2011.
* No observer's activity in 2008 and 2011.

5.2 Seabirds

Korean National Action Plan for the Conservation and Management of Seabirds will have been drafted in 2013. Interaction and mortality of seabirds have been collected through national observer program (Table 5). It was observed that the status of implementation by Korean fleet was significantly poor to meet scientific requirement as of now. It was appeared that fishermen had not yet been familiar with provisions and associated works on data collection and reporting for seabirds such as species identification and interaction. In 2011, logbook was revised with addition of columns for ecologically-important species, and since then fishermen have been educated and requested to implement revised logbook with great emphasis on ERS and mitigation in close cooperation with the NFRDI. And in 2012, the field guide for identifying seabirds was distributed on board as well.

5.3 Marine Turtles

Interaction and mortality of marine turtles have been collected through national observer program (Table 5). And in 2012, the field guide for identifying marine turtles was distributed on board to encourage fishermen to collect and report the data for marine turtles.

5.4 Other ecologically related species

Interaction and mortality of marine mammals have been collected through national observer program (Table 5).

Table 5. Observed annual catches of species of special interest by species (seabirds, marine turtles and marine mammals) by Korean longline fleet in the IOTC area of competence for 2007–2011

Year	Seabirds									
	Yellow nosed albatross	Royal albatross	Black browed Albatross	Buller's albatross	Cape petrel	Grey headed Albatross	Southern Giant Albatross	Wandering Albatross	Shy albatross	Unident -ified
2007	1	1								
2008	-	-	-	-	-	-	-	-	-	-
2009										94
2010	15		24	9	1	2	1	11	3	6
2011	-	-	-	-	-	-	-	-	-	-

Year	Marine turtles		Marine mammals	
	Loggerhead turtle	Olive ridley sea turtle	Spinner dolphin	Pygmy killer whale
2007				
2008	-	-	-	-
2009	7	29	1	1
2010				
2011	-	-	-	-

* No observer's activity in 2008 and 2011.

6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS

6.1. Logsheet data collection and verification

National Fisheries Research and Development Institute (NFRDI) has collected the data of Korean tuna fisheries. Data from logsheet are available from 1971. In 2012, Korean domestic law (Act of the Distant Sea Fisheries Development) has been revised that the time for data submission was changed from within 30 days (home-based) or 60 days (foreign-based) after completion of their operations to monthly report in electronic format for improving the data collection system to meet the timely submission of data and to have a chance to review the collected data. 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.

6.2. Vessel Monitoring System

Korea operates VMS program to comply with the requirement of the RFMO's vessel monitoring system. It slightly differs in commencement which was by the late 1990's in the Pacific Ocean but in the early 2000's in the Indian Ocean. All Korean flagged longliners and carrier vessels are equipped with VMS and implemented in compliance with the IOTC resolution 06/03 and the Korean Act of the Distant Sea Fisheries Development (2008).

6.3. Observer programme

1) Observer Training

The scientific observer program of distant-water fisheries of Korea was started in 2002. National Fisheries Research and Development Institute (NFRDI) is responsible for implementing and developing the program. The qualification for observers is college graduated where major field is nature science or fisheries high school graduated with at least 1-year experience on board and certificate of qualification to deck officer. Candidates for observer who have passed the paper review (including medical check) and oral interview have to take training programs for 3 weeks. Observer training programs include basic safety training for seafaring, operations of navigation devices, biological information training for target and non-target species and data collection method for fishing activities. During the training program they have two kinds of test. First is the test for a technical term of fisheries and biology, and the other is the test for species identification. The person who scored 70 above in the two tests and attended 100% of the course timetable can be qualified and deployed on board as a scientific observer.

2) Scientific Observer Program Design and Coverage

Due to some operational difficulties in Korean observer programs including safety incidents, no observer was placed on board Korean longline vessels in 2011. In relation to this matter, Korea improved the scientific observer program and has trained 11 observers. In 2012, three observers had been deployed on board for a period of 60-70 days to implement the coverage of 2012 as well as to cover that of 2011.

3) Observer Data Collected

The observers collected the data which are required by the IOTC scientific observer program standards. The data collected were vessel and gear characteristics, setting and catch details, incidental catch of ERS and sighting of marine mammals. The biological measurements were conducted on all species, if possible.

Table 6. Annual observer coverage of longline hooks for 2007–2011

Year	2007	2008	2009	2010	2011
Observer coverage (%)	1.5	-	10.3	7.5	-

6.4. Port sampling programme

Korea has not conducted any port sampling programs within the IOTC Convention Area.

6.4. Unloading/Transhipment

Korea has not conducted any data collection during unloading/transhipment within the IOTC Convention Area.

7. NATIONAL RESEARCH PROGRAMS

Korea has not conducted any research programs within the IOTC Convention Area.

8. IMPLEMENTATION OF SCIENTIFIC COMMITTEE RECOMMENDATIONS AND RESOLUTIONS OF THE IOTC RELEVANT TO THE SC

Table 9. Respond with progress made to recommendations of the SC and specific Resolutions relevant to the work of the Scientific Committee

Res. No.	Resolution	Scientific requirement	CPC progress
05/05	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 1–12	Fishermen should record and report by species in accordance with IOTC logbook template under the revised Korean domestic law in 2012. Sharks bycaught are treated for use, except thresher sharks. Comply with 5% ratio.
10/02	Mandatory statistical requirements for IOTC members and cooperating non contracting parties	Paragraphs 1–7	Korean longliners comply with 2, 3, 4 and 6. Fishermen should measure and record biological information per 1 ton of catch and submit them to NFRDI.
10/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3–7	Korean longliners operate night setting, use bird-scaring line, and control offal disposal when setting.
11/04	On a regional observer scheme	Paragraph 9	Korea reports annually the number of vessels monitored and observer coverage.
12/03	On the recording of catch and effort by fishing vessels in the IOTC area of competence	Paragraphs 1–9	Korean longliners record data in logbook from the early 1970's. Fishermen should record and monthly report catch and effort by species, including bycatch species, in electronic format in accordance with IOTC logbook template under the revised Korean domestic law in 2012. The logsheet data is provided by the fishing masters to the NFRDI which provided all the data for any given year to the IOTC Secretariat and the Scientific Committee by June 30th of the following year on an aggregated basis.
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	Observer program collects data and interaction but fishermen are requested to record them from 2011. Study on use of circle hook was conducted in Pacific longline fishing in 2006. Application to Indian Ocean will be tried in the near future. NFRDI conducts education for conservation of marine turtles, and vessels carry the device for handling and releasing marine turtles on board.
12/09	On the conservation of thresher sharks (family alopiidae) caught in association with fisheries in the IOTC area of competence	Paragraphs 4–8	Thresher sharks are prohibited to retain onboard Korean longliners. If bycatch occurred, fishermen should cut the line, live release them with proper handling and record interaction in the logbook.

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