Received: 26 November, 2011
IOTC-2011-SC14-NR14

Indian Ocean Tuna Commission
Commission des Thons de l'Ocean Indien
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Korean National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2011

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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 2010, final data for the 2009 calendar year must be provided to the Secretariat by 30 June 2010)]	YES 30/06/2011
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 2010, preliminary data for the 2009 calendar year was provided to the Secretariat by 30 June 2010). **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 2010, final data for the 2009 calendar year must be provided to the Secretariat by 30 December 2010).	YES 30/06/2011
If no, please indicate the reason(s) and intended actions:	

Executive Summary [Mandatory]

Longline is the only type of fishing gear for Korea fishing for tuna species in the Indian Ocean. Korean longline fishery in the Indian Ocean commenced in 1957. 13 longliners were operated in 2010, which were the lowest in number of vessels as it ranged from 31 to 21 during previous 5 years. With this fishing capacity, Korean longloners caught 2,723 mt in 2010, which was 8.6% decreasing of the catch in 2009. In 2010, fishing efforts were 5,079 thousand hooks and distributed higher in the western and eastern areas around 20-40 ^{o}S, while the fishing efforts averaged for 2005-2009 were 9,214 thousand hooks and distributed higher in the western areas around 20 ^{o}N -20 ^{o}S, as well as in the western and eastern areas around 20-40 ^{o}S. It was noted that fishing efforts had not been deployed in the western Indian Ocean around 20 ^{o}N -20 ^{o}S in recent years. As results, the catch of bigeye tuna and yellowfin tuna significantly decreased and albacore became important in catch. In 2010, 2 scientific observers were dispatched for monitoring compliance and scientific data collection and, as results, carried out 7.5 % of observer coverage in terms of the number of hooks.

CONTENTS

1. BACKGROUND/GENERAL FISHERY INFORMATION [MANDATORY]

Longline is the only type of fishing gear for Korea 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 tunas from the begining. 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 and 13 in 2010, respectively. The catch culaminated in 71,100 mt in 1978 and also has gradually decreased to 2,978mt in 2009 and 2,723mt in 2010.

2. FLEET STRUCTURE [MANDATORY]

Korean fishing fleet in the Indian Ocean are all deep freezing tuna longliners. The size ranges from 258 to 424 gross tonnage classes. Total number of vessels has decreased from 187 in 1975 to 31 in 2007, 21 in 2009 and 13 in 2010.

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

GRT	2005	2006	2007	2008	2009	2010
201-500	28	26	31	24	21	13

3. CATCH AND EFFORT (BY SPECIES AND GEAR) [Mandatory]

In 2010, the total catch of tuna and tuna-like species by Korean longline fleet was 2,723 mt in round weight which was 8.6% decreasing from 2,978 mt in 2009 and 96.1% decreasing from the highest catch in 1978. Total annual catches steeply increased from the begining of 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 41,618 mt in the 1970's, 30,752 mt in the 1980's, 10,966 mt in the 1990's and 4,485 mt in the 2000's, respectively (Table 2a, Fig. 1). The catch trend closely coincided with the changes in the number of vessels active throughout the periods, in which the number were 185 vessels in 1975 and then decreased to 13 vessels in 2010 (Table 1). 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 5000-12000 thousands in recent years (Table 2b). In 2010, fishing efforts were 5,079 thousand hooks and distributed higher in the western and eastern areas around 20-40 °S, while the fishing efforts averaged for 2005-2009 were 9,214 thousand hooks and distributed were 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, Fig. 2 and 3). 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 became important in catch (Fig 3a and b).

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	2,085
1979	169	45,415	1995	52	10,906			
1980	174	37,805	1996	62	18,772			

Table 2b. Annual catch and effort by Korean longliners and primary species in the IOTC area of competence (NEI-'not elsewhere for all other catch. [Mandatory]

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	9,500	16,153	15,675	6,703	57,602	3,104	60	914	321	3,278	2,443	106,253
2008	7,279	10,291	6,809	17,051	16,359	827	39	414	276	897	4,838	57,801
2009	11,718	31,256	13,138	22,957	25,466	1,464	81	738	244	1,231	19,290	115,865
2010	5,079	27,249	5,136	9,806	17,421	639	25	345	346	650	16,823	78,440

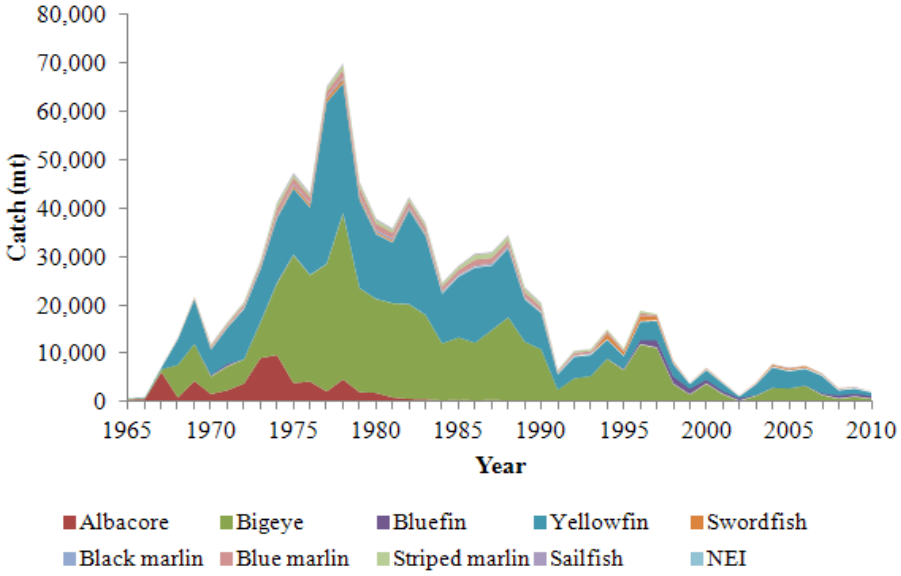

Figure 1. Historical annual catch for Korean longline fleet by species in the IOTC area of competence.

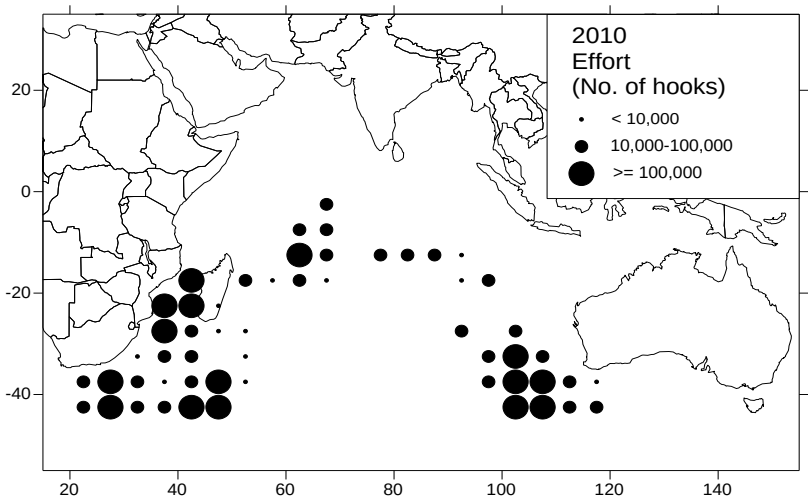

Figure 2a. Map of the distribution of fishing effort, by Korean longline fleet in the IOTC area of competence for 2010. [Mandatory]

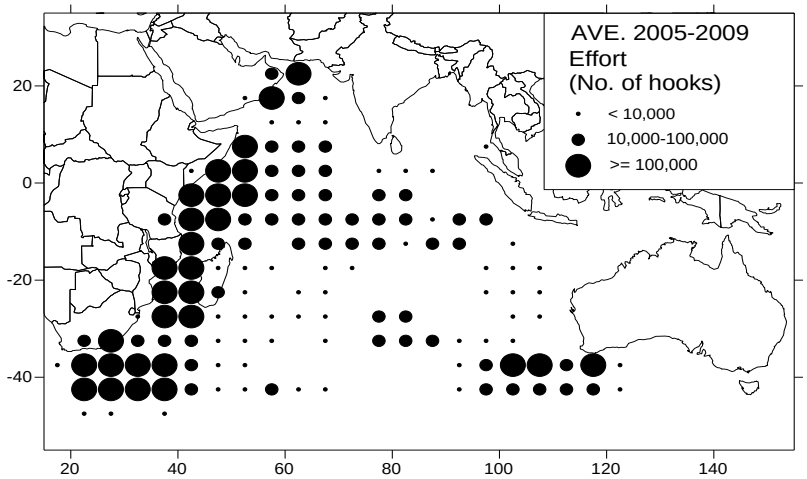

Figure 2b. Map of the distribution of fishing effort, by Korean longline fleet in the IOTC area of competence, for average of 2005-2009. [Mandatory]

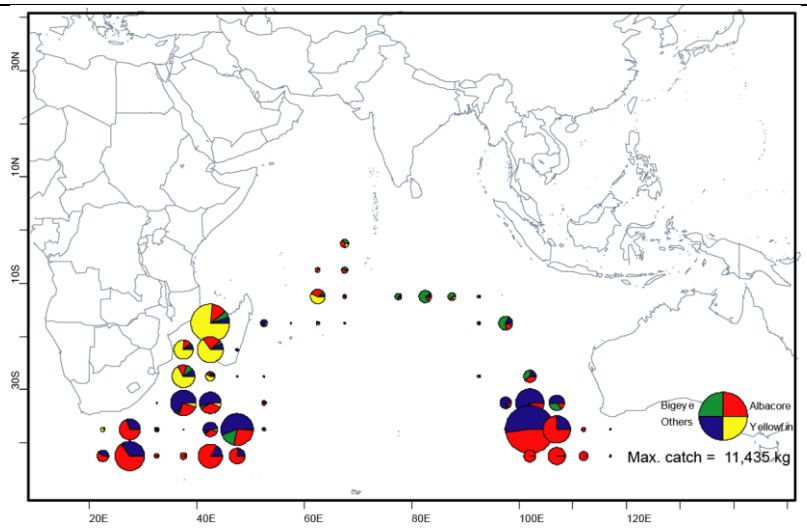

Figure 3a. Map of distribution of fishing catch, by species for Korean longline fleet in the IOTC area of competence for 2010. [Mandatory]

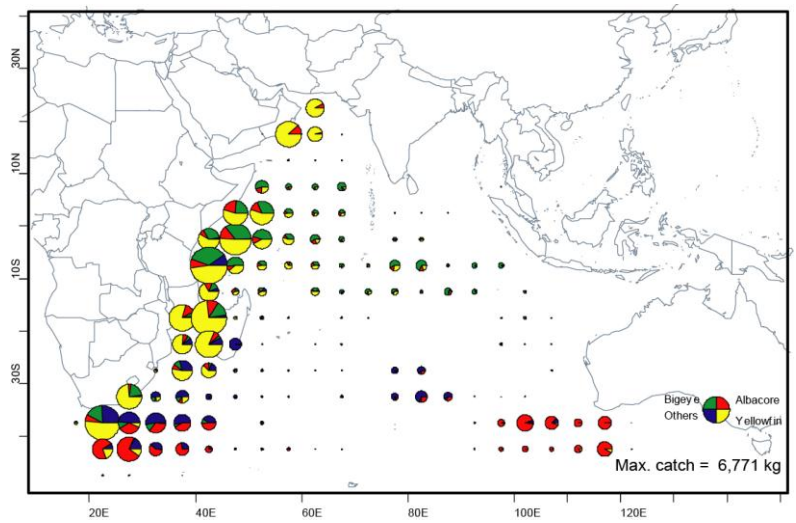

Figure 3b. Map of distribution of fishing catch, by primary species for Korean longline fleet in the IOTC area of competence for 2005-2009. [Mandatory]

4. RECREATIONAL FISHERY [Mandatory]

No recreational fishery for Korea.

5. ECOSYSTEM AND BYCATCH ISSUES [Mandatory]

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 distant water fisheries act (2008).

Sharks [Mandatory]

Korean National Action Plan for the Conservation and Management of Sharks was drafted 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 fishermen have been educated and requested to implement revised logbook with great emphasis on ERS and mitigation in close cooperation with the NFRDI.

Table 3: Total number and weight of sharks, by species, retained by Korean longline fleet in the IOTC area of competence for 2006-2010. [Mandatory]

Year	Catch (mt)	Observer data (kg/Inds.)							
	Sharks	Blue shark	Mako sharks	Porbeagle shark	Oceaninc whitetip shark	Hammerhead sharks	Thresher sharks	Others	Total
2006	6	2,349 / 39	777 / 10	0 / 0	794 / 17	426 / 16	70 / 1	6,244 / 105	10,660 / 188
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

** No observer's activity in 2008

Seabirds [Mandatory]

Korean National Action Plan for the Conservation and Management of Searbirds will have been drafted in 2012. 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 fishermen have been educated and requested to implement revised logbook with great emphasis on ERS and mitigation in close cooperation with the NFRDI.

Marine Turtles [Mandatory]

Korean National Action Plan for the Conservation and Management of Marine turtles will have been drafted in 2012. Interaction and mortality of marine turtles have been collected through national observer program (Table 5).

Other ecologically related species (*e.g.* marine mammals, whale sharks) [Desirable]

Interaction and mortality of marine turtles 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 gear for the national fleet, in the IOTC area of competence for 2006-2010

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
2006										
2007	1	1								
2008	-	-	-	-	-	-	-	-	-	-
2009										94
2010	15		24	9	1	2	1	11	3	6

Year	Marine turtles		Marine mammals	
	Loggerhead turtle	Olive ridley sea turtle	Spinner dolphin	Pygmy killer whale
2006				
2007				
2008	-	-	-	-
2009	7	29	1	1
2010				

** No observer's activity in 2008

6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS [Mandatory]

6.1. Logsheet data collection and verification (including date commenced and status of implementation)

National Fisheries Research and Development Institute (NFRDI) has the datadase of Korean tuna fisheries. Data from logsheet are available from 1971. Korean domestic law requests the data submission to National Fisheries Research and Development Institute (NFRDI) within 6 months after the fishing vessel returns to the home-base 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.

6.2. Vessel Monitoring System (including date commenced and status of implementation)

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 distant water fisheries act (2008).

6.3. Observer programme (including date commenced and status; number of observer, include percentage coverage by gear type)

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. Candidate 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% overall in the two tests and attended 100% of the course timetable can be qualified and deployed on board as a scientific observer.

Scientific Observer Program Design and Coverage

In 2010, 2 observers were placed onboard 2 longline vessels.They observed the catch of 95 mt and the effort of 389,042 hooks in 119 sets during 143 sea days. The observer coverage rate was 7.5% in effort (Table 1).

Observer Data Collected

The observers collected the data required by the IOTC scientific observer program standards. The data collected were i) vessel and gear attributes, ii) setting and catch details, incidental catch of ERS and sighting of marine mammals. The biological measurements were conducted on all SBT and other tunas and ERS. Biological samplings carried out were stomach content and gonads of SBT and other tunas.

Problems Experienced

Most of observers commonly report to have experienced hardship in their life onboard vessel. The NFRDI, as responsible for observer program, is suffering from a lack of observers because applicants are getting less. It related to some recent observer accident as well as their poor socio-economic security. In relation to biological sampling, skippers and crew were not fully supportive of otolith sampling as it required time and skill in both side.

Table 6. Annual observer coverage by operation in number hooks for 2006-2010 [Mandatory]

Year	2006	2007	2008	2009	2010
Observer coverage (%)	0.4	1.5	-	10.3	7.5

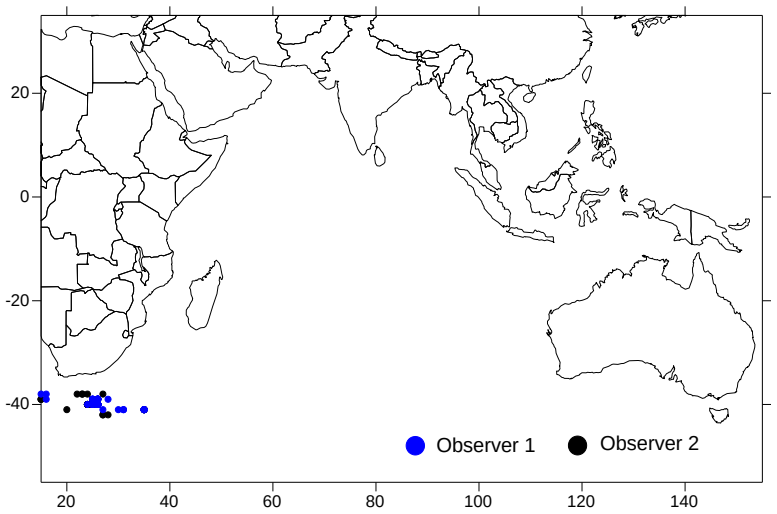

Figure 4. Map showing the spatial distribution of observer coverage. [Mandatory]

6.4. Port sampling programme [including date commenced and status of implementation]

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

6.4. Unloading/Transhipment [including date commenced and status of implementation] [Mandatory]

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

7. NATIONAL RESEARCH PROGRAMS [Desirable]

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. [Mandatory]

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

No.	Resolution	Scientific requirement	Progress
05/05	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 1–12.	1. Data reported without by species. In 2011, fishermen were requested to record and report by species in accordance with IOTC logbook template. 3. Sharks bycaught are treated for use, except thresher sharks. 4. Comply with 5% ratio.
08/04	Concerning the recording of catch by longline fishing vessels in the IOTC area	Paragraph 1–3.	1. Korean longliners record data in logbook from the early 1970's. In 2011, fishermen were requested to record and montly report in electronic format by species, including bycatch species, in accordance with IOTC logbook template. 2. Annex I information are written once for each trip and Annex II filled for each set. 3. The logbook 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.
09/06	On marine turtles	Paragraphs 2, 8, 11, 12, 13 and 14.	2. Observer program collects data and interaction but fishermen are requested to record them from 2011. 8. 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. 13 and 14. Collaboration will be sought when Korean scientific manpower is enough.
10/02	Mandatory statistical requirements for IOTC members and cooperating non contracting parties	Paragraphs 1–7.	Korean longliners comply with 3, 4 and 6. In 2011, fishermen were requested to measure and take biological samples per 1 ton of catch and submit them to NFRDI.
10/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraph 7.	7. Korean longliners operate night setting and use bird-scaring line and control offal disposal when setting.
10/12	On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of agreement	Paragraphs 6 and 7.	Thresher sharks are prohibited to retain onboard Korean longliners. If bycatch occurred, fishermen cut the line and live reases with proper handling and record interaction in the logbook..
11/04	On a regional observer scheme	Paragraph 9.	Korea reported annually the number of vessels monitored and observer coverage.

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