

**REPORT OF JAPAN'S SCIENTIFIC OBSERVER PROGRAM  
FOR TUNA LONGLINE FISHERY IN THE ATLANTIC OCEAN IN THE  
FISHING YEARS 2011 AND 2012**

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*SUMMARY*

*Japan's scientific observer program for longline fishery in the Atlantic Ocean has been continuously carried out in 2012 fishing years (FY). This document mainly provides the summary of collected data by observers in 2012 FY, and the summary in 2011 FY were also updated. In 2012 FY, 12 observer trips were conducted on Japanese tuna longline vessels in the entire Atlantic Ocean, while observers had 18 trips in 2011 FY. Total number of fishing operations with observers was 582 (1,083,195 hooks) in 2012 FY, whereas 620 (1,711,834 hooks) were monitored in 2011 FY. In each FY, more than 19,000 individuals were recorded by scientific observers. Details of trips and catch records were shown, and the coverage level based on the number of operating days was provided. The nominal CPUE (number of fish caught per 1000 hooks) by fishing area for major species were also calculated.*

*RESUME*

*Le programme japonais d'observateurs scientifiques pour la pêche palangrière de l'océan Atlantique a été réalisé sans interruption tout au long de l'année de pêche 2012. Le présent document fournit principalement un résumé des données collectées par les observateurs pendant l'année de pêche 2012 ; le résumé de l'année de pêche 2011 a également été mis à jour. Au cours de l'année de pêche 2012, 12 sorties d'observateurs ont été réalisées sur des palangriers thoniers japonais dans l'ensemble de l'océan Atlantique, tandis que les observateurs ont effectué 18 sorties au cours de l'année de pêche 2011. Le nombre total d'opérations de pêche avec observateurs était de 582 (1.083.195 hameçons) pendant l'année de pêche 2012, alors que 620 opérations de pêche (1.711.834 hameçons) avaient fait l'objet d'un suivi pendant l'année de pêche 2011. Au cours de chaque année de pêche, plus de 19.000 spécimens ont été enregistrés par des observateurs scientifiques. Des informations détaillées sur les sorties et les registres de capture ont été présentées et le niveau de couverture basé sur le nombre de jours d'opérations a été fourni. La CPUE nominale (nombre de poissons capturés pour 1.000 hameçons) par zone de pêche pour les principales espèces a également été calculée.*

*RESUMEN*

*El programa de observadores científicos de Japón para la pesquería de palangre en el océano Atlántico se desarrolló de forma continua durante el año pesquero (FY) 2012. Este documento proporciona sobre todo un resumen de los datos recopilados por los observadores en el año pesquero 2012; también se ha actualizado el resumen del año pesquero 2011. En el año pesquero 2012, se realizaron 12 mareas con observadores en los buques de palangre de atún japoneses en todo el océano Atlántico, mientras que en el año pesquero 2011 hubo 18 mareas con observadores. El número total de operaciones de pesca con observadores ascendió a 582 (1.083.195 anzuelos) en el año pesquero de 2012, mientras que en el año pesquero 2011 se observaron 620 operaciones de pesca (1.711.834 anzuelos). En cada año pesquero, los observadores científicos registraron más de 19.000 ejemplares. Se presenta información detallada sobre las mareas y registros de captura, así como el nivel de cobertura basado en el número de días operativos. También se ha calculado la CPUE nominal (número de ejemplares capturados por 1.000 anzuelos) por zona de pesca para las principales especies.*

*KEYWORDS*

*Longline, Japan, Observer CPUE, Scientific observer, Tuna fisheries*

## **Introduction**

Japan has continuously conducted its national scientific observer programs on Japanese tuna longline vessels in the Atlantic Ocean since the mid 1990s, and this program have played a major role in response to the recommendations made by ICCAT since 1996. Various data have been collected through the observer programs, and that includes vessel attributes, gear configuration, species identification, biological sampling and various measurements on all observed catches. These collected data have been summarized until 2012, and been reported to SCRS meetings (Matsumoto and Miyabe, 1997, 1998, 1999, 2000, 2001; Matsumoto *et al.*, 2002, 2003, 2004, 2005; Matsumoto, 2006; Semba *et al.* 2007, 2008; Japan, 2011; Japan, 2012).

This document overviews Japan's scientific observer programs conducted in the entire Atlantic Ocean, and provides the summary of collected data mainly from September 2012 to December 2012 which were in 2012 fishing years (FY, thereafter, fishing year starts from August to next July). The summary which were already reported in 2012 (Japan, 2012) was revised, because some additional observer data in 2011 FY were newly compiled. In accordance with the 2010 Recommendation [Rec. 10-10] on minimum standards for fishing vessel scientific observer programs, catch rates, the coverage level, and its details were also contained in this document.

## **Outline of the observer program**

In principal, all observers attended a training class held by National Research Institute of Far Seas Fisheries before the departure for the cruises. The observer training program included keys for species identification, data recording protocols for information on fishing operation and catches, and protocols for taking various measurements for catches. During fishing operations the observers recorded various information and collected as many data and biological samples as possible. When there were substantial numbers of catch, priority on the observers' records was given to tunas and billfishes but the number of catch was counted for all species.

## **Contents of observers' records**

### ***i) General information of fishing operations***

Various information of observed fishing activities were recorded. The name and attributes of the observed fishing vessel, and oceanographic and weather condition were recorded. At each fishing operation, date, location, the number of radio-buoys, hooks, gear configuration and bait used were also recorded. In addition, the number of sea birds flown during line setting were observed once in several days.

### ***ii) Identification of species and related information***

All catches taken on the deck were identified its species and recorded while the observers were on the deck for their research. The catches which were not hauled up on the deck were also recorded. For double check of species identification, digital photos of observed catches were sometimes taken.

For each catch, retrieving time, the branch number on which the catch was hooked, and the life status of the catch (alive or dead; "alive" was further separated into "no details", "vigorous", "sluggish" or "injured") were recorded as much as possible. The life status was immediately identified on the deck or at the deck side for releasing.

### ***iii) Measurement of catch***

Lengths were measured for all intact catches by 1cm interval (round up) and the following measurements were applied for different fish groups; fork length for tunas, post-orbit fork length (POFL) for billfishes, precaudal length for sharks, disk length for rays, total or fork length for other teleosts. A caliper was used for the measurement. Clasper inner length (between the anterior margin of the cloaca and the posterior clasper tip) was measured and recorded for male sharks by 0.1 cm interval.

Whole body weight (to the nearest 0.1kg in principal), processed weight (to the nearest 1 kg) and gonad weight (for tunas and billfishes; to the nearest 0.1kg) were measured as much as possible.

#### *iv) Sex determination and biological sampling*

Sex determination was conducted through the observation of genital gland for teleosts and with or without of clasper for sharks and rays. Biological sampling mainly for tunas and sharks was sometimes conducted for muscle, stomach contents, otolith and hard parts.

### **Results**

#### *i) Trip and observer coverage*

Japan's observer program has been continuously carried out through 2012 FYs. Details of observer trips, which were defined equal to the number of vessels with observers, by fishing year were shown in **Table 1**. In 2011 FY, five trips in the southern Atlantic Ocean and two trips in the tropical Atlantic Ocean were newly complied and added to the original results in the previous report (Japan, 2012). In 2011 and 2012 FYs, observers had 18 and 12 trips on Japanese tuna longline vessels in the entire Atlantic Ocean (the ICCAT convention area), respectively. In the north Atlantic, 12 and 12 trips were observed in 2011 and 2012 FYs, respectively. The trips in the south Atlantic monitored a part of fishing activities for southern bluefin tuna, and 5 trips were carried out in 2011 FY. The data in 2012 FY are not available at present.

The coverage level achieved within Japanese longline vessels was estimated based on the number of operating days. The ratio was calculated by dividing the number of operating days with observers by the total number of operating days which were from the available latest logbook data in August, 2013. Japan's observer programs covered 3.9% fishing activities in the entire Atlantic Ocean in 2012 calendar year (638 days with observers/ 16175 days), while it was 3.2% in 2011 calendar year (656 days with observers/ 20226 days). The coverage level for the Japanese longline vessels targeting Atlantic bluefin tuna achieved 34.4% (408 days with observers/1187 days) and 35.5% (253 days with observers/713 days) in 2011 and 2012 FYs, respectively.

#### *ii) Observed operations*

Total number of observed fishing operations was 620 and 582 during 904 and 1784 days in which observers were on board in 2011 and 2012 FYs, respectively. Total hooks in all operations with observers were 1,083,195 and 1,711,834 hooks in 2011 and 2012 FYs, respectively.

The distribution of hooks in all operations with observer was shown in Figure 1. The area of operation was divided into six areas; off Ireland, central north, off Grand Bank, off Florida, tropical area, and off Cape Town. Main observed areas were off Ireland and tropical area, and the numbers of trips were 11 and 10 in 2011 and 2012 FYs, respectively. Since 2010 FY, off Florida were not monitored. The area off Cape Town were observed by 5-6 vessels every year.

#### *iii) Catch records*

The lists of species recorded by scientific observers in 2011 and 2012 FYs were shown in **Table 2**. The lists were compiled mainly for tunas, and billfishes. The number of observed individuals was 25,233 in 2012 FY, while 19,014 were recorded in 2011 FY. In 2011 FY, about 30% of individuals were observed in the area off Ireland, central north, or off Grand Bank, whereas about 55% of individuals were recorded in the tropical area in 2011 FY. This is mainly due to the shorter fishing season of Atlantic bluefin with a higher catch rate since 2011 FY (**Table 4**), thus more operations in the tropical areas were monitored by observers compared to other fishing years.

Figure 2 shows that species composition in each area by fishing year for 6 main species which constituted the majority of total observed catch: albacore, yellowfin, bigeye, Atlantic bluefin, southern bluefin, and blue shark. In the area off Ireland, Atlantic bluefin and blue shark were the dominant species, which accounted for 42% and 58% of total catch of main 6 species in terms of number of fish in 2012 FY, and 91% and 9% in 2011 FY. The occurrence of other species was few (less than 1%). In the central north, blue shark was the most dominant species and accounted for 54-84%.

In the area off Grand Bank, blue shark was the dominant species in both 2011 (35%) and 2012 FYs (66%). Atlantic bluefin were consistently observed and accounted for 20% of the total catch of main 6 species. Bigeye was also dominant species in 2011 FY (43%). In the area off Florida, there was no trip with observers since 2010 FY.

In the tropical area, bigeye was also the most dominant species in 2011 (30%) and 2012 FYs (47%), while albacore, yellowfin, and blue shark were similarly observed, which accounted for 13-27%. In the area off Cape Town, southern bluefin tuna was the most dominant species (34%), while albacore (31%) and bigeye (19%) were also observed. The data has been collecting in 2012 FY, and the information would be updated in 2014.

The number of fish measured, recorded or sampled by species through 2011 to 2012 FYs was indicated for each item in **Table 3**. Lengths of tunas and billfishes were measured for 89% and 98% of total observed catch in number in 2011 and 2012 FYs, respectively. More than 86% of tunas and billfishes were measured its processed weight. Biological sampling was made mainly for bluefin, southern bluefin and sharks.

#### *iv) Catch ratio of main species*

CPUE (catch number per 1000 hooks) of 6 main species by area was calculated for the period between 2011 and 2012 FYs (**Table 4**). Total hooks in all operations with observers by area by fishing year were used as effort for the calculation. The CPUE of albacore was the highest in the tropical area in 2012 FY, whereas the high CPUE was observed both in the off Cape Town and tropical area in 2011 FY. For tropical tunas, the CPUEs of bigeye and yellowfin were the highest in the tropical area in 2011 and 2012 FYs, while a high CPUE was observed for bigeye in the area off Grand Bank in 2011 FY.

For Atlantic bluefin tuna, significant CPUE values (CPUE>5 fish per 1000 hooks) were observed in the areas off Ireland and central north both in 2011 and 2012 FYs. In the area off Grand Bank. Southern bluefin tuna was caught in the area off Cape Town, and the CPUE in 2011 FY was 1.22. The CPUE of blue shark was significant mainly in the central north in both FYs, especially in 2012FY with 28.56.

#### **Acknowledgement**

We greatly appreciate all scientific observers for their efforts in order to collect valuable data and samples on the Japanese longline vessels. We would also like to express special thanks to all crews of the longline vessels for their understanding and cooperation to the observer program.

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**Table 1-a).** Updated information on the trip of the scientific observer for Japanese tuna longline in the Atlantic Ocean during 2011FY. The trips: RT1101 to AT1114 were newly compiled and added, and other trips, which was already provided in 2012, were updated.

Trip ID	Main fishing ground	Range of latitude	Range of longitude	Start date of operation	End date of operation	Number of operation observed	Number of hooks observed
AT1101	off Grand Bank	28.2-47.6N	15.4-53.6W	2011/9/8	2011/11/30	70	192848
AT1102	off Ireland	45.9-60N	24.3-44.7W	2011/9/25	2011/10/15	15	43744
AT1103	off Ireland	8.9-60N	22-79.9W	2011/9/28	2011/10/24	20	59168
AT1104	off Ireland, tropical area	10-60N	5.8-35W	2011/10/1	2011/12/9	56	174020
AT1105	off Ireland, tropical area	5.6-59.1N	10-35.1W	2011/10/8	2011/12/12	50	152190
AT1106	off Ireland, tropical area	9.4-59.4N	15.4-31.1W	2011/10/9	2011/12/7	39	115430
AT1107	off Ireland, tropical area	6.3-59.7N	14.8-35.6W	2011/10/13	2011/12/6	38	108916
AT1108	off Ireland, tropical area	10.6-59.9N	18.2-76W	2011/10/20	2011/12/18	44	133450
AT1109	off Ireland, central north, tropical area	10-56.9N	17.2-32.1W	2011/10/20	2011/12/10	37	101027
AT1110	off Grand Bank	10.4-42.7N	47.7-78.7W	2011/10/22	2011/12/25	55	141294
AT1111	off Ireland, tropical area	10.2-55.5N	15.3-33.9W	2011/10/30	2011/12/10	27	85914
RT1101	off Cape Town	42.6-44.1S	7.5-15.9E	2012/3/14	2012/5/2	25	75350
RT1102	off Cape Town	35-44.1S	6.3-16.1E	2012/4/16	2012/5/28	39	122183
RT1103	off Cape Town	36.4-44.6S	7.3-15.5E	2012/4/19	2012/6/29	27	80250
RT1104	off Cape Town	17.1-43.9S	5.9-9.4E	2012/5/5	2012/7/7	47	151864
RT1105	off Cape Town	36.8-41.8S	19.9-27.8E	2012/5/16	2012/7/8	2	5578
AT1113	tropical area	14.2-16.2N	25.3-27.4W	2012/7/12	2012/7/31	16	43571
AT1114	tropical area	14.1-17.3S	92.4-94.8W	2012/7/15	2012/7/31	13	33798

**Table 1-b).** Information on the trip of the scientific observer for Japanese tuna longline in the Atlantic Ocean during 2012 FY.

Trip ID	Main fishing ground	Range of latitude	Range of longitude	Start date of operation	End date of operation	Number of operation observed	Number of hooks observed
AT1201	off Ireland, tropical area	60.1N-16.6S	25.6-93.2W	2012/8/1	2012/11/1	45	117667
AT1202	off Ireland, tropical area	7.8-59.9N	19.5E-26.8W	2012/8/1	2012/11/8	64	172910
AT1203	off Grand Bank	40.9-46.6N	46.5-52.6W	2012/8/11	2012/11/5	69	195375
AT1204	off Grand Bank	41.1-46.4N	46.1-52.7W	2012/8/24	2012/11/7	64	187386
AT1205	off Ireland	58.3-59.7N	24.6-28.5W	2012/9/21	2012/10/30	20	57576
AT1206	off Ireland	58.1-59.7N	21.1E-23.7W	2012/9/22	2012/11/3	19	50512
AT1207	off Ireland, central north	54.2-58.4N	24-32.4W	2012/9/30	2012/11/21	23	65520
AT1208	off Ireland, central north, tropical area	10.3-55.2N	26.5-44.9W	2012/10/14	2013/1/28	64	203370
AT1209	off Ireland	56.4-58.9N	22.3-25.2W	2012/10/21	2012/11/18	12	36000
AT1210	tropical area	5.1-16.3N	31.2-36.3W	2012/10/31	2012/12/28	45	144180
AT1211	tropical area	12.2-22.9N	17.4-33.9W	2012/11/4	2013/1/23	66	198360
AT1212	tropical area	4.8N-15.3N	17.9E-33.3W	2013/1/2	2013/4/19	91	282978

**Table 2-a).** Updated list of species recorded by the Japanese tuna longline observer in the Atlantic Ocean during 2011 FY.

Species	off Ireland	central north	off Grand Bank	off Florida	tropical area	off Cape Town	Total
Albacore	0	5	33	-	1695	884	2617
Bigeye tuna	0	0	914	-	2034	544	3492
Bluefin tuna	2453	148	441	-	-	0	3042
Southern bluefin tuna	-	-	-	-	-	971	971
Yellowfin tuna	0	0	13	-	1536	115	1664
Other tunas	0	0	0	-	77	335	412
Blue marlin	0	0	0	-	131	0	131
Longbill spearfish	0	0	2	-	35	0	37
Sailfish	0	0	0	-	41	0	41
Swordfish	0	1	172	-	195	19	387
White marlin	0	0	1	-	21	2	24
Other teleosts	54	1	26	-	1683	319	2083
Blue shark	238	179	749	-	1618	376	3160
Other sharks	17	1	114	-	395	373	900
Sea birds	0	0	0	-	1	12	13
Sea turtles	0	0	1	-	33	0	34
Dolphins	0	0	0	-	0	1	1
Unidentified	0	0	3	-	2	0	5
<b>Total</b>	<b>2762</b>	<b>335</b>	<b>2469</b>	<b>-</b>	<b>9497</b>	<b>3951</b>	<b>19014</b>

**Table 2-b).** List of species recorded by the Japanese tuna longline observer in the Atlantic Ocean during 2012 FY.

Species	off Ireland	central north	off Grand Bank	off Florida	tropical area	off Cape Town	Total
Albacore	0	4	9	-	2968	-	2981
Bigeye tuna	0	0	169	-	5113	-	5282
Bluefin tuna	1811	200	221	-	0	-	2232
Southern bluefin tuna	-	-	-	-	-	-	0
Yellowfin tuna	0	0	5	-	1397	-	1402
Other tunas	0	0	0	-	149	-	149
Blue marlin	0	0	1	-	66	-	67
Longbill spearfish	0	0	2	-	46	-	48
Sailfish	0	0	0	-	49	-	49
Swordfish	0	0	197	-	231	-	428
White marlin	0	0	3	-	47	-	50
Other teleosts	74	6	49	-	3829	-	3958
Blue shark	2491	1055	769	-	1409	-	5724
Other sharks	6	3	147	-	636	-	792
Sea birds	0	0	6	-	13	-	19
Sea turtles	0	0	2	-	46	-	48
Pinnipedia	1	0	0	-	0	-	1
Dolphins	0	0	1	-	2	-	3
<b>Total</b>	<b>4383</b>	<b>1268</b>	<b>1581</b>	<b>-</b>	<b>16001</b>	<b>-</b>	<b>23233</b>

**Table 3-a).** Updated the number of individuals measured or sampled by species in 2011 FY.

Species	Number of observed/measured individuals						Biological sampling			
	Length	Processed weight	Whole weight	Sex	Gonad weight	Maturity	Otolith	Muscle	Stomach	Gonad
Albacore	2561	1974	0	464	408	405	0	17	0	21
Bigeye tuna	3208	3368	0	3298	17	217	106	270	97	1
Bluefin tuna	2827	2812	0	2631	0	190	130	376	82	0
Southern bluefin tuna	1433	1434	0	1428	0	0	0	0	0	0
Yellowfin tuna	1643	1630	0	1590	4	46	65	71	1	0
Other tunas	237	403	0	351	0	0	0	0	0	0
Blue marlin	123	123	0	118	0	3	0	1	1	0
Longbill spearfish	37	36	0	33	0	1	0	0	0	0
Sailfish	40	38	0	30	0	0	0	0	0	0
Swordfish	358	357	0	329	3	20	0	22	20	1
White marlin	66	63	0	54	0	5	0	2	0	0
Other teleosts	1131	1129	0	687	118	113	0	0	0	0
Blue shark	2707	2646	0	2797	204	729	1	317	6	3
Other sharks	590	348	0	401	213	234	0	61	23	89
Sea birds	1	7	0	1	0	0	0	0	0	0
Sea turtles	2	0	0	2	0	0	0	0	0	0
Dolphins	0	0	0	0	0	0	0	0	0	0
Unidentified	0	0	0	0	0	0	0	0	0	0
Total	16964	16368	0	14214	967	1963	302	1137	230	115

**Table 3-b).** The number of individuals measured or sampled by species in 2012 FY.

Species	Number of observed/measured individuals						Biological sampling			
	Length	Processed weight	Whole weight	Sex	Gonad weight	Maturity	Otolith	Muscle	Stomach	Gonad
Albacore	2728	2732	0	391	0	1	0	1	0	0
Bigeye tuna	5011	4947	0	4554	0	832	87	204	0	0
Bluefin tuna	2175	2111	0	2107	6	395	300	395	1	0
Southern bluefin tuna	-	-	-	-	-	-	-	-	-	-
Yellowfin tuna	1302	1322	0	1039	0	242	40	99	0	0
Other tunas	110	81	0	17	0	0	0	0	0	0
Blue marlin	60	59	0	49	0	4	0	17	0	0
Longbill spearfish	46	47	0	43	0	0	0	5	0	0
Sailfish	49	49	0	32	0	0	0	10	0	0
Swordfish	378	352	0	319	3	15	0	101	0	0
White marlin	48	47	0	39	0	9	0	8	0	0
Other teleosts	1505	1378	0	633	0	6	0	3	0	0
Blue shark	3170	3231	0	3342	1	462	2	112	0	0
Other sharks	444	372	0	422	0	26	0	85	0	0
Sea birds	12	12	0	6	0	0	0	0	0	0
Sea turtles	2	2	0	2	0	0	0	0	0	0
Pinnipedia	0	0	0	0	0	0	0	0	0	0
Dolphins	0	0	0	0	0	0	0	0	0	0
Total	17040	16742	0	12995	10	1992	429	1040	1	0

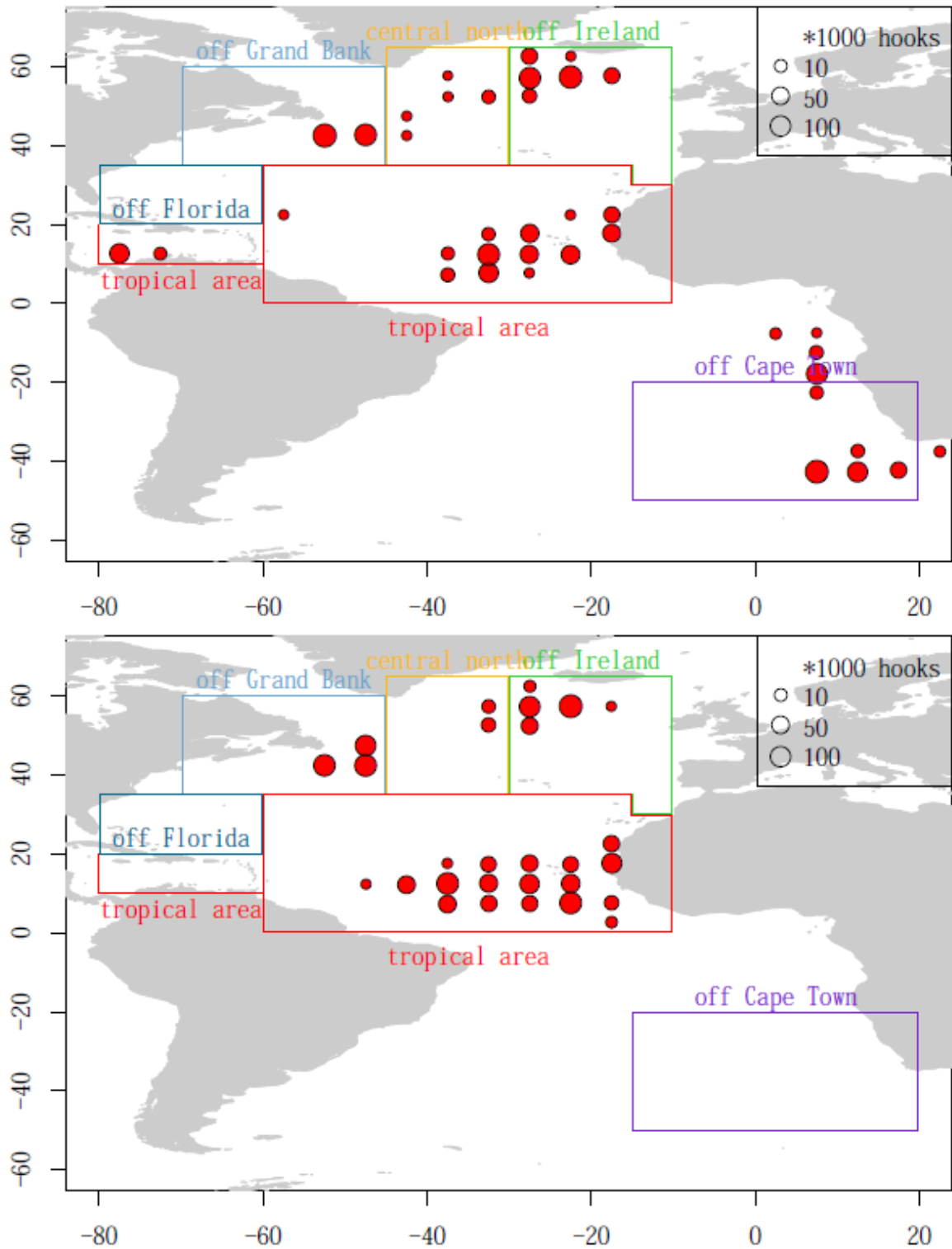


**Table 4-a).** Updated catch ratio (/1000hooks) of main species in 2011 FY.

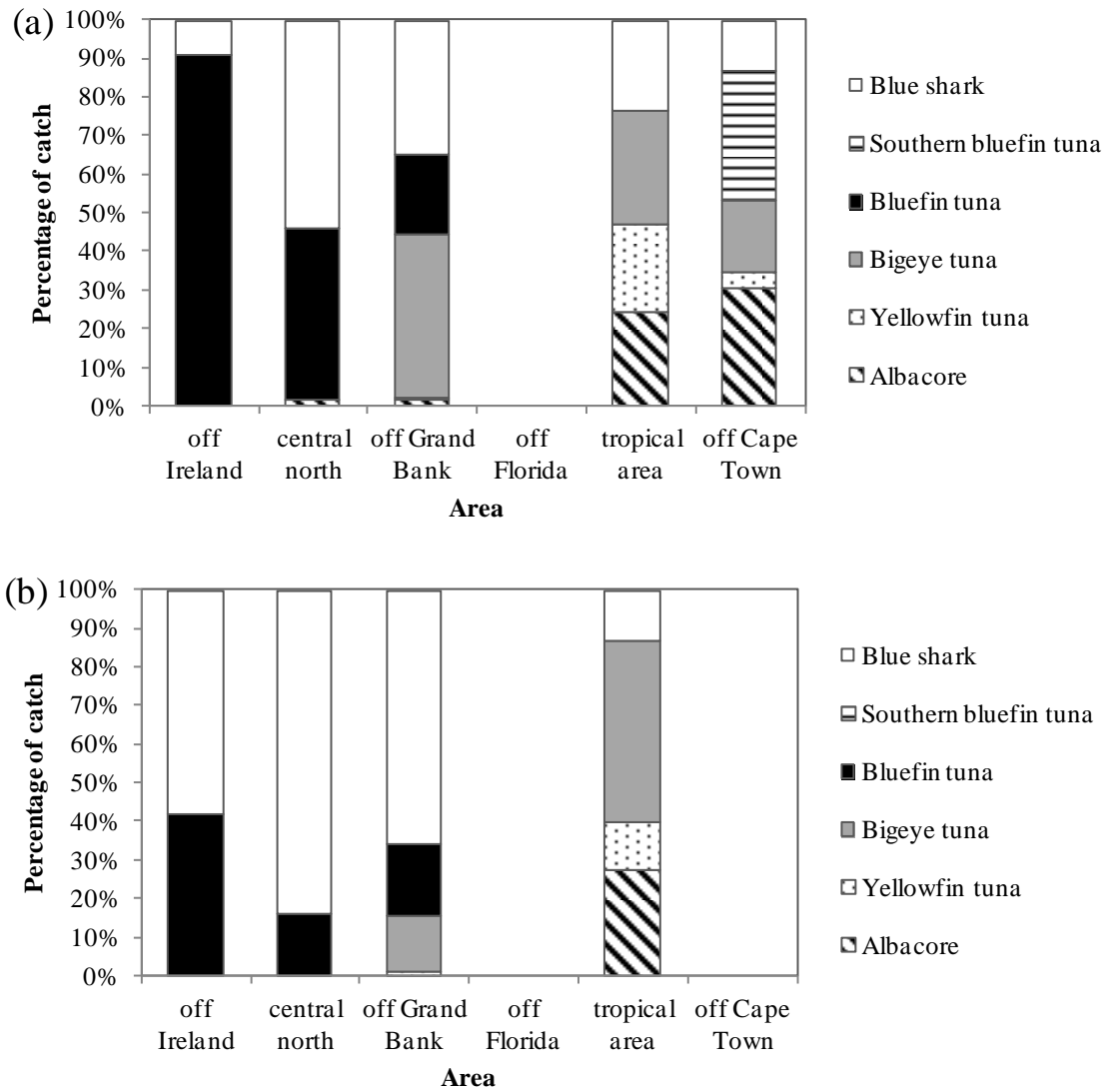
	Albacore	Yellowfin tuna	Bigeeye tuna	Bluefin tuna	Southern bluefin tuna	Blue shark
off Ireland	0.00	0.00	0.00	7.42	-	0.72
central north	0.24	0.00	0.00	7.12	-	8.61
off Grand Bank	0.10	0.04	2.74	1.32	-	2.24
off Florida	-	-	-	-	-	-
tropical area	2.42	2.20	2.91	-	-	2.31
off Cape Town	2.06	0.27	1.27	-	2.26	0.88

**Table 4-b).** Catch ratio (/1000hooks) of main species in 2012 FY.

	Albacore	Yellowfin tuna	Bigeeye tuna	Bluefin tuna	Southern bluefin tuna	Blue shark
off Ireland	0.00	0.00	0.00	6.26	-	8.61
central north	0.11	0.00	0.00	5.41	-	28.56
off Grand Bank	0.02	0.01	0.44	0.58	-	2.01
off Florida	-	-	-	-	-	-
tropical area	4.34	2.04	7.48	-	-	2.06
off Cape Town	-	-	-	-	-	-



**Figure 1.** Distribution of total hooks with observers in the Atlantic Ocean by fishing year, and definition of 6 areas: off Ireland, central north, off Grand Bank, off Florida, tropical area, off Cape Town. Upper panel shows 2011 FY, and lower panel shows 2012 FY.



**Figure 2.** Catch composition of main species in the 6 areas by fishing year ((a) updated 2011 and (b) 2012FYs).