

**REPORT OF JAPAN'S SCIENTIFIC
OBSERVER PROGRAM FOR TUNA LONGLINE FISHERY
IN THE ATLANTIC OCEAN IN THE FISHING YEARS 2012 AND 2013**

Japan¹

SUMMARY

Japan's scientific observer program for longline fishery in the Atlantic Ocean has been continuously carried out in 2013 fishing years (FY). This document mainly provides the summary of collected data by observers in 2013 FY, and the summary in 2012 FY were also updated. In 2013 FY, 14 observer trips were conducted on Japanese tuna longline vessels in the entire Atlantic Ocean, while observers had 22 trips in 2012 FY. Total number of fishing operations with observers was 555 (1,636,879 hooks) in 2013 FY, while 1010 (3,129,490 hooks) were monitored in 2012 FY. In each FY, more than 23,000 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. Japan's observer programs covered 7.2% fishing activities in the entire Atlantic Ocean in 2013 calendar year, and also monitored 36.8% of the operations by Japanese longline vessels targeting Atlantic bluefin tuna in 2013 FY. The nominal CPUE (number of fish caught per 1000 hooks) by fishing area for major species were also calculated.

RÉSUMÉ

Le programme d'observateurs scientifiques du Japon encadrant la pêche palangrière de l'océan Atlantique a été mené sans interruption tout au long de l'année de pêche 2013. Le présent document fournit principalement un résumé des données collectées par les observateurs pendant l'année de pêche 2013 ; le résumé de l'année de pêche 2012 a également été mis à jour. Au cours de l'année de pêche 2013, 14 sorties d'observateurs ont été réalisées sur des palangriers thoniers japonais dans l'ensemble de l'océan Atlantique, tandis que les observateurs ont effectué 22 sorties au cours de l'année de pêche 2012. Le nombre total d'opérations de pêche avec observateurs était de 555 (1.636.879 hameçons) pendant l'année de pêche 2013, alors que 1.010 opérations de pêche (3.129.490 hameçons) avaient fait l'objet d'un suivi pendant l'année de pêche 2012. Au cours de chaque année de pêche, plus de 23.000 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. En 2013, les programmes d'observateurs du Japon couvraient 7,2% des activités de pêche dans l'ensemble de l'océan Atlantique pendant l'année civile 2013 et ils contrôlaient également 36,8% des opérations des palangriers japonais qui ciblaient le thon rouge de l'Atlantique pendant l'année de pêche 2013. 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) 2013. Este documento proporciona sobre todo un resumen de los datos recopilados por los observadores en el año pesquero 2013; también se ha actualizado el resumen del año pesquero 2012. En el año pesquero 2013, se realizaron 14 mareas con observadores en los buques atuneros de palangre japoneses en todo el océano Atlántico, mientras que en el año pesquero 2012 hubo 22 mareas con observadores. El número total de operaciones de pesca con observadores ascendió a 555 (1.636.879 anzuelos) en el año pesquero de 2013, mientras que en el año pesquero 2012 se observaron 1010 operaciones de pesca (3.129.490 anzuelos). En cada año pesquero, los observadores científicos consignaron más de 23.000 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. El programa de observadores de Japón cubrió el 7,2% de las actividades pesqueras en todo el Atlántico en el año civil 2013, y también hizo un seguimiento del 36,8% de las operaciones de los palangreros japoneses que se dirigen al atún rojo del Atlántico en el año de pesca 2013. 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, Observer coverage level

¹ National Research Institute of Far Seas Fisheries, Fisheries Research Agency, 5-7-1, Orido, Shimizu, Shizuoka, 424-8633, Japan

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 2013, 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; Anon., 2012; Japan, 2013a and 2014).

This document overviews Japan's scientific observer programs conducted in the entire Atlantic Ocean, and provides the summary of collected data mainly from August 2013 to January 2014 which were in 2013 fishing years (FY, thereafter, fishing year starts from August to next July). The summary which were already reported in 2013 (Japan, 2014) was revised, because many additional observer data in 2012 FY, mostly in the south Atlantic monitored a part of fishing activities for southern bluefin tuna, 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. The coverage level for Atlantic bluefin tuna fishery were also provided in accordance with the Recommendations [Rec. 12-03/ 13-07].

Outline of the observer program

In principle, all observers attended a training class held by National Research Institute of Far Seas Fisheries and observer providers 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 2013 FYs. Details of observer trips, which were defined equal to the number of vessels with observers, by fishing year were shown in **Table 2**. In 2012 FY, eleven trips in the Atlantic Ocean were newly complied and added to the original results in the previous report (Japan, 2014). In 2012 and 2013 FYs, observers had 22 and 14 trips on Japanese tuna longline vessels in the entire Atlantic Ocean (the ICCAT Convention area), respectively at present (July 2014). In the north Atlantic, 11 and 10 trips were observed the operations targeting Atlantic bluefin tuna in 2011 and 2012 FYs, respectively. Some trips were monitored the operations targeting bigeye tuna in the tropical area, mostly after the Japanese longline vessels finished their quota for Atlantic bluefin tuna. The trips in the south Atlantic monitored a part of fishing activities for southern bluefin tuna, and 8 and 4 trips were complied in 2012 and 2013 FYs, respectively.

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 July, 2014. Japan's observer programs covered 7.2% fishing activities in the entire Atlantic Ocean in 2013 calendar year, while it was 3.4% in 2012 calendar year (**Table 1a**). The coverage level for the Japanese longline vessels targeting Atlantic bluefin tuna achieved 36.8% and 34.5% in 2012 and 2013 FYs, respectively (**Table 1b**). Both coverage level in [Rec. 10-10] which requires 5% in the entire Atlantic Ocean and in [Rec. 12-03/13-07] which specifies 20% for the operations of Atlantic bluefin tuna by longline were accomplished.

ii) Observed operations

Total number of observed fishing operations was 618 and 1010 during 1399 and 899 days in which observers were on board in 2012 and 2013 FYs, respectively. Total hooks in all operations with observers were 3,129,490 and 1,636,879 hooks in 2012 and 2013 FYs, respectively. The number of observers has been increased since 2012 FY to achieve the observer coverage level by the [Rec. 10-10].

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 14 and 10 in 2012 and 2013 FYs, respectively. Since 2010 FY, there are a few operations in off Florida. The area off Cape Town and tropical area were observed by around 8 vessels every year.

iii) Catch records

The lists of species recorded by scientific observers in 2012 and 2013 FYs were shown in **Table 3**. The lists were compiled mainly for tunas and billfishes. The number of observed individuals was 23,640 in 2013 FY, while 42,716 were recorded in 2012 FY. In 2012 FY, 72% of individuals were observed in the tropical area or the area off Cape Town, whereas 62% of individuals were recorded in 2012 FY. This is mainly due to the shorter fishing season of Atlantic bluefin with a higher catch rate since 2011 FY (**Table 5**), 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 62% and 38% of total catch of main 6 species in terms of number of fish in 2013 FY, and 45% and 55% in 2012 FY. The occurrence of other species was few (0%). In the central north, blue shark was the most dominant species and accounted for 83% in 2012 FY, while this area was not monitored in 2013 FY. In the area off Grand Bank, blue shark was the dominant species in both 2012 (66%) and 2013 FYs (52%).

In the tropical area, bigeye was the most dominant species in 2012 (45%) and 2013 FYs (58%), and albacore was the most dominant species (48-69%) in the area off Cape Town. Southern bluefin tuna accounted for 26% of the total catch of main 6 species in 2012 FY. The data has been collecting in 2013 FY, and the information would be updated in 2015.

The number of fish measured, recorded or sampled by species through 2012 to 2013 FYs was indicated for each item in **Table 4**. Lengths of tunas and billfishes were measured for 92% and 97% of the total observed catch in number in 2012 and 2013 FYs, respectively. More than 91% 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 2012 and 2013 FYs (**Table 5**). 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 area off Cape Town in 2013 FY, while the high CPUE was observed both in the off Cape Town and tropical area in 2012 FY. For tropical tunas, the CPUEs of bigeye and yellowfin were the highest in the tropical area in 2012 and 2013 FYs.

For Atlantic bluefin tuna, significant CPUE values (CPUE>5 fish per 1000 hooks) were observed in the areas off Ireland both in 2012 and 2013 FYs, while a high CPUE value was also observed in the central north in 2012 FY. Compared to the east Atlantic in the areas off Ireland and central north, the CPUE values were lower in the area off Grand Bank. Southern bluefin tuna was caught in the area off Cape Town, and the CPUE in 2012 FY was 2.43, while the data in 2013 FY is now collecting. The CPUE of blue shark was significant mainly in the area off Ireland and the central north, especially in 2012FY with 24.32.

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.

References

- Anon. 2012. Report of Japan's scientific observer program for tuna longline fishery in the Atlantic Ocean in the fishing years of 2008 to 2010. Col. Vol. Sci. Pap. ICCAT, 68(5): 2025-2039.
- Japan. 2013a. Report of Japan's scientific observer program for tuna longline fishery in the Atlantic Ocean in the fishing years of 2010 to 2011. Col. Vol. Sci. Pap. ICCAT, 69(5): 2239-2248.
- Japan. 2014 Report of Japan's scientific observer program for tuna longline fishery in the Atlantic Ocean in the fishing years of 2011 to 2012. Col. Vol. Sci. Pap. ICCAT, 70(6):2845-2855. SCRS/2013/186.
- Matsumoto, T. and Miyabe, N. 1998. Report of 1997 observer program for Japanese tuna longline fishery in the Atlantic Ocean. Col. Vol. Sci. Pap. ICCAT, 48(3): 263-276.
- Matsumoto, T. and Miyabe, N. 1999. Report of 1998 observer program for Japanese tuna longline fishery in the Atlantic Ocean. Col. Vol. Sci. Pap. ICCAT, 49(4): 412-421.
- Matsumoto, T. and Miyabe, N. 2000. Report of 1999 observer program for Japanese tuna longline fishery in the Atlantic Ocean. Col. Vol. Sci. Pap. ICCAT, 51(2): 729-749.
- Matsumoto, T. and Miyabe, N. 2001. Report of observer program for Japanese tuna longline fishery in the Atlantic Ocean in 2000 (until July). Col. Vol. Sci. Pap. ICCAT, 52(5): 1948-1961.
- Matsumoto, T. and Miyabe, N. 2002. Report of observer program for Japanese tuna longline fishery in the Atlantic Ocean from August 2000 to July 2001. Col. Vol. Sci. Pap. ICCAT, 54(5): 1741-1762.
- Matsumoto, T., Saito, H. and Miyabe, N. 2003. Report of observer program for Japanese tuna longline fishery in the Atlantic Ocean from September 2001 to March 2002. Col. Vol. Sci. Pap. ICCAT, 55(5): 1679-1718.
- Matsumoto, T., Saito, H. and Miyabe, N. 2004. Report of observer program for Japanese tuna longline fishery in the Atlantic Ocean from September 2002 to January 2003. Col. Vol. Sci. Pap. ICCAT, 56(1): 254-281.
- Matsumoto, T., Saito, H. and Miyabe, N. 2005. Report of observer program for Japanese tuna longline fishery in the Atlantic Ocean from August 2003 to January 2004. Col. Vol. Sci. Pap. ICCAT, 58(5): 1694-1714.
- Matsumoto, T. 2006. Report of observer program for Japanese tuna longline fishery in the Atlantic Ocean from August 2004 to January 2005. Col. Vol. Sci. Pap. ICCAT, 59(2): 663-681.
- Pratt, H. W. Jr. 1979. Reproduction in the blue shark, *Prionace glauca*. Fish. Bull., 77(2): 445-470.
- Semba, Y., Matsumoto, T., Okamoto, H. and Tanabe, T. 2008. Report of Japan's scientific observer program for tuna longline fishery in the Atlantic Ocean in the fishing year of 2005 and 2006. Col. Vol. Sci. Pap. ICCAT, 62(6): 2123-2145.
- Semba, Y., Matsumoto, T., Okamoto, H. and Tanabe, T. 2009. Report of Japan's scientific observer program for tuna longline fishery in the Atlantic Ocean in the 2007 fishing year. Col. Vol. Sci. Pap. ICCAT, 64(7): 2674-2694.

Table 1a). The estimated coverage level achieved within Japanese longline vessels in the entire Atlantic Ocean in 2012 and 2013 calendar years, in accordance with the Recommendation [Rec. 10-10].

Year	Period	Total number of operations	Number of operations with observer	Coverage level	Notes
2012	01Jan2012-31Dec2012	19887	673	3.4%	
2013	01Jan2013-31Dec2013	14035	1009	7.2%	Provisional: 92% coverage of logbooks

Table 1b). The estimated coverage level for the Japanese longline vessels targeting Atlantic bluefin tuna in 2012 and 2013 fishing years, in accordance with the Recommendation [Rec. 12-03/ 13-07].

Fishing Year	Period	Total number of operations	Number of operations with observer	Coverage level	Notes
2012	01Aug2012-31July2013	877	323	36.8%	
2013	01Aug2013-31July2014	626	216	34.5%	Provisional: 1 observer trip will be added

Table 2a). Updated information on the trip of the scientific observer for Japanese tuna longline in the Atlantic Ocean during 2012FY. The trips: AT1213 to RT1205 were newly compiled and added, and other trips, which was already provided in 2013, were updated.

Trip ID	Main fishing ground	Range of latitude	Range of longitude	Start date of operation	End date of operation	Number of operation	Number of hooks observed
AT1201	off Ireland	10.4-60N	25.6-78.9W	2012/9/15	2012/11/1	15	36,712
AT1202	off Ireland, tropical area	7.8-59.9N	15.6-26.8W	2012/8/1	2012/11/8	64	172,910
AT1203	off Grand Bank	8.9-47.5N	46.5-79.6W	2012/8/11	2012/11/5	69	195,375
AT1204	off Grand Bank	28.1-46.4N	15.4-52.7W	2012/8/24	2012/11/7	64	187,386
AT1205	off Ireland	28.1-59.8N	15.1-28.5W	2012/9/21	2012/10/30	20	57,576
AT1206	off Ireland	32.1-59.7N	19.8-23.7W	2012/9/22	2012/11/3	19	50,512
AT1207	off Ireland, central north	8.9-58.4N	15.4-79.9W	2012/9/30	2012/11/21	23	65,520
AT1208	off Ireland, central north, tropical area	10.3-55.2N	15.4-75.5W	2012/10/14	2013/1/28	64	203,370
AT1209	off Ireland	28.1-58.9N	15.4-25.2W	2012/10/21	2012/11/18	12	36,000
AT1210	tropical area	5.1-28.1N	15.4-36.3W	2012/10/31	2012/12/28	45	144,180
AT1211	tropical area	12.2-24.7N	16-33.9W	2012/11/4	2013/1/23	66	198,360
AT1212	off Ireland	9.4-59.9N	17.4-79.9W	2012/9/24	2012/11/7	18	52,148
AT1213	off Ireland, tropical area	6.9-64.2N	26.1-36.9W	2012/9/29	2012/12/24	58	201,440
AT1214	tropical area	4.9-28.1N	15.4-33.3W	2013/1/2	2013/4/19	91	282,978
RT1201	off Cape Town	38.3-38.3S	19.8-19.9E	2012/10/2	2012/10/3	2	5,700
RT1202	tropical area, off Cape Town	18.6-44.7S	13.9-0.9W	2013/4/20	2013/7/7	62	189,975
RT1203	tropical area, off Cape Town	18.1-44.9S	28.3-2.3W	2013/4/24	2013/7/22	76	232,620
RT1204	off Cape Town	19-39.1S	5.8-18.4E	2013/5/13	2013/7/31	77	356,100
RT1205	tropical area, off Cape Town	17.2-44.8S	18.4-2.3W	2013/5/15	2013/7/31	73	167,705
RT1206	off Cape Town	19.2-45.3S	18.4-8.2W	2013/5/17	2013/6/27	28	86,449
RT1207	tropical area, off Cape Town	16.1-44.7S	14.8-3.4W	2013/6/6	2013/7/31	43	143,505
RT1208	off Cape Town	26.1-44S	2.9-3.5W	2013/7/1	2013/7/31	21	62,969

Table 2b). Information on the trip of the scientific observer for Japanese tuna longline in the Atlantic Ocean during 2013 FY.

Trip ID	Main fishing ground	Range of latitude	Range of longitude	Start date of operation	End date of operation	Number of operation	Number of hooks observed
RT1301	tropical area	13.5-16S	5-8.1E	2013/8/1	2013/8/16	15	49,270
RT1302	tropical area, off Cape Town	11.1-33.2S	17.7-1.9W	2013/8/1	2013/8/30	20	68,900
RT1303	off Cape Town	24.4-26.5S	0.6-3.2E	2013/8/1	2013/8/24	19	63,171
RT1304	off Cape Town	19-33.9S	5.4-18.4E	2013/8/1	2013/8/15	8	37,200
AT1301	off Grand Bank	10.2-47.5N	47.2-79W	2013/8/14	2013/10/27	51	149,584
AT1302	off Grand Bank	10.6-45.4N	47.7-78.5W	2013/8/21	2013/11/16	64	176,424
AT1303	off Ireland, tropical area	7.8-59.7N	12.6-79.6W	2013/10/6	2013/12/31	48	137,260
AT1304	off Ireland	8.9-59.8N	23.3-79.6W	2013/9/11	2013/11/1	15	39,517
AT1305	off Ireland, tropical area	17.3-59.9N	8.4-29.1W	2013/9/22	2013/12/16	54	158,982
AT1306	off Ireland, tropical area	8-59.7N	18.3-31.6W	2013/9/24	2014/1/17	75	218,240
AT1307	off Ireland, tropical area	14.7-59.7N	14.6-31.7W	2013/10/2	2013/12/7	38	116,568
AT1308	off Ireland	32.3-59.5N	15.1-22.8W	2013/10/5	2013/11/2	12	25,872
AT1309	off Ireland, tropical area	9.2-59.7N	15.3-36W	2013/10/8	2014/1/26	78	227,258
AT1310	off Ireland, tropical area	8.6-58.4N	16.2-35.2W	2013/10/25	2014/1/19	58	168,633

Table 3a). Updated 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	-	4182	4686	8881
Bigeye tuna	0	0	169	-	6703	884	7756
Bluefin tuna	2315	214	221	-	12	0	2762
Southern bluefin tuna	-	-	-	-	-	2550	2550
Yellowfin tuna	0	0	5	-	2214	894	3113
Other tunas	0	0	0	-	62	1804	1866
Blue marlin	0	0	1	-	83	3	87
Longbill spearfish	0	0	2	-	79	11	92
Sailfish	0	0	0	-	49	0	49
Swordfish	0	0	197	-	321	168	686
White marlin	0	0	3	-	37	34	74
Other teleosts	82	6	49	-	3558	2180	5875
Blue shark	2865	1078	769	-	1795	842	7349
Other sharks	9	3	147	-	641	525	1325
Sea birds	0	0	6	-	13	158	177
Sea turtles	0	0	2	-	64	3	69
Dolphins	1	0	0	-	0	0	1
Unidentified	0	0	1	-	2	1	4
Total	5272	1305	1581	-	19815	14743	42716

Table 3b). List of species recorded by the Japanese tuna longline observer in the Atlantic Ocean during 2013 FY.

Species	off Ireland	central north	off Grand Bank	off Florida	tropical area	off Cape Town	Total
Albacore	0	-	5	-	1605	1221	2831
Bigeye tuna	0	-	28	-	8168	261	8457
Bluefin tuna	2013	-	462	-	2	0	2477
Southern bluefin tuna	-	-	-	-	-	0	0
Yellowfin tuna	0	-	0	-	1220	190	1410
Other tunas	0	-	0	-	51	2	53
Blue marlin	0	-	0	-	46	0	46
Longbill spearfish	0	-	0	-	54	25	79
Sailfish	0	-	0	-	5	0	5
Swordfish	0	-	78	-	206	27	311
White marlin	0	-	0	-	6	6	12
Other teleosts	156	-	11	-	1912	129	2208
Blue shark	1254	-	543	-	3067	85	4949
Other sharks	28	-	142	-	546	37	753
Sea birds	0	-	0	-	2	0	2
Sea turtles	0	-	0	-	41	0	41
Dolphins	0	-	0	-	0	0	0
Unidentified	0	-	3	-	3	0	6
Total	3451	-	1272	-	16934	1983	23640

Table 4a). Updated 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	8578	8532	-	2644	0	4	0	12	14	0
Bigeye tuna	7050	6943	-	6362	0	918	89	214	707	0
Bluefin tuna	2184	2119	-	2393	6	399	300	395	1	0
Southern bluefin tuna	2511	2401	-	2386	11	382	113	224	966	0
Yellowfin tuna	2855	2857	-	2547	0	395	52	114	462	0
Other tunas	1569	1769	-	1489	0	97	0	97	707	0
Blue marlin	59	58	-	47	0	3	0	15	3	0
Longbill spearfish	90	90	-	84	0	2	0	7	19	0
Sailfish	48	48	-	32	0	0	0	10	0	0
Swordfish	610	545	-	503	3	15	0	91	24	0
White marlin	70	69	-	60	0	1	0	7	3	0
Other teleosts	3094	2422	-	1310	0	11	0	29	153	0
Blue shark	4038	3764	-	4255	2	629	-	120	76	0
Other sharks	980	692	-	952	0	73	-	105	34	0
Sea birds	162	107	-	76	0	0	-	0	1	0
Sea turtles	4	2	-	4	0	0	-	0	0	0
Dolphins	0	0	-	0	0	0	-	0	0	0
Unidentified	0	0	-	0	0	0	-	0	0	0
Total	33902	32418	-	25144	22	2929	554	1440	3170	0

Table 4b). The number of individuals measured or sampled by species in 2013 FY.

Species	Number of observed/measured individuals						Biological sampling			
	Length	Processed weight	Whole weight	Sex	Gonad weight	Maturity	Otolith	Muscle	Stomach	Gonad
Albacore	2784	2773	0	151	0	0	0	2	3	0
Bigeye tuna	8293	8221	0	7533	0	376	114	184	1098	0
Bluefin tuna	2388	2403	1	2328	2	198	293	268	751	0
Southern bluefin tuna	0	0	0	0	0	0	0	0	0	0
Yellowfin tuna	1372	1345	0	1087	0	72	48	98	279	0
Other tunas	42	17	0	4	0	0	0	0	0	0
Blue marlin	35	25	0	15	0	0	0	1	1	0
Longbill spearfish	57	33	0	24	0	6	0	3	5	0
Sailfish	5	5	0	5	0	0	0	0	0	0
Swordfish	278	244	0	212	1	23	2	51	62	0
White marlin	10	10	0	9	0	0	0	0	1	0
Other teleosts	669	526	0	295	0	28	0	21	4	0
Blue shark	3455	3381	0	3756	0	444	-	15	5	0
Other sharks	298	127	0	343	0	21	-	17	4	0
Sea birds	2	1	0	1	0	0	-	0	0	0
Sea turtles	1	0	0	1	0	0	-	0	0	0
Dolphins	0	0	0	0	0	0	-	0	0	0
Unidentified	0	0	0	0	0	0	-	0	0	0
Total	19689	19111	1	15764	3	1168	457	660	2213	0

Table 5a). Updated catch ratio (/1000hooks) of main species in 2012 FY.

	Albacore	Yellowfin tuna	Bigeye tuna	Bluefin tuna	Southern bluefin tuna	Blue shark
off Ireland	0.00	0.00	0.00	5.17	-	6.40
central north	0.09	0.00	0.00	4.83	-	24.32
off Grand Bank	0.02	0.01	0.44	0.58	-	2.01
off Florida	-	-	-	-	-	-
tropical area	3.47	1.84	5.56	0.01	-	1.49
off Cape Town	4.46	0.85	0.84	-	2.43	0.80

Table 5b). Catch ratio (/1000hooks) of main species in 2013 FY.

	Albacore	Yellowfin tuna	Bigeye tuna	Bluefin tuna	Southern bluefin tuna	Blue shark
off Ireland	0.00	0.00	0.00	6.90	-	4.30
central north	-	-	-	-	-	-
off Grand Bank	0.02	0.00	0.09	1.42	-	1.67
off Florida	-	-	-	-	-	-
tropical area	1.82	1.39	9.29	0.00	-	3.49
off Cape Town	8.76	1.36	1.87	-	0.00	0.61

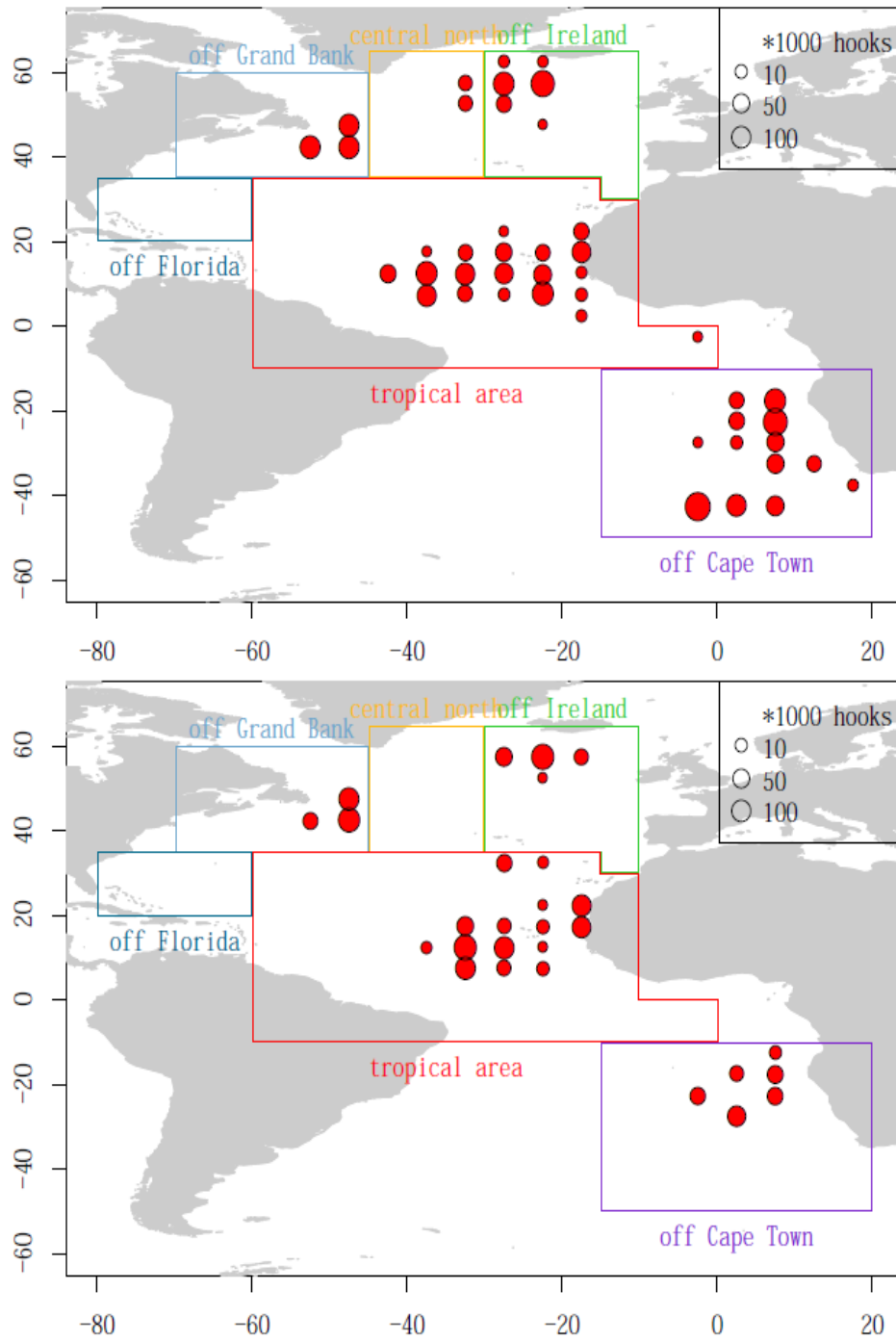


Figure 1. Distribution of total hooks with observers in the Atlantic Ocean by fishing year, and definition of 6 areas: off Ireland, central north, off Grand Bank, off Florida, tropical area, off Cape Town. Upper panel shows 2012FY, and lower panel shows 2013 FY.

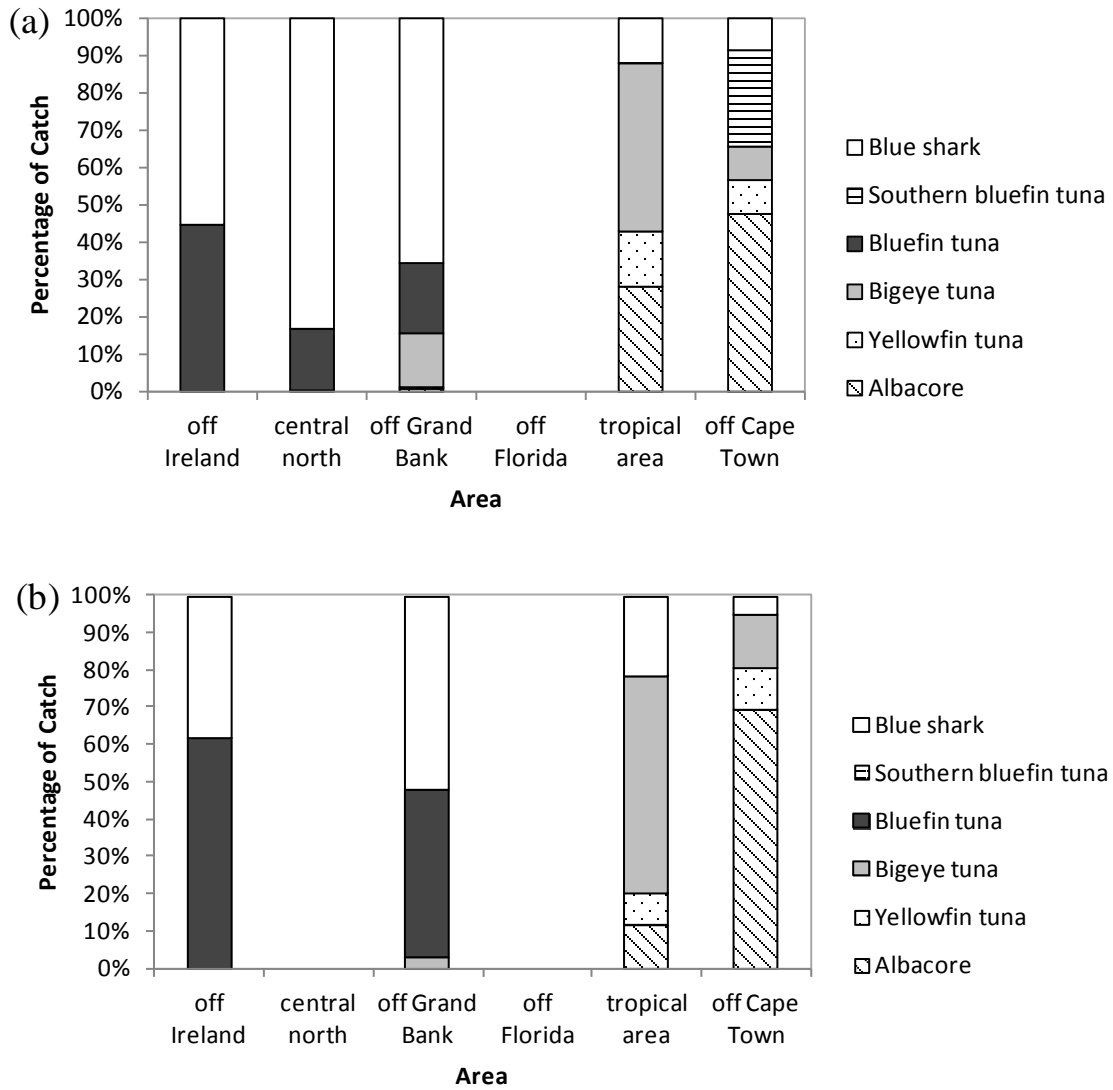


Figure 2. Catch composition of main species in the 6 areas by fishing year ((a) updated 2012 and (b) 2013FYs).