

## Review of Taiwan SBT Fishery of 2014/2015

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### 1. Introduction

Southern bluefin tuna (*Thunnus maccoyii*, SBT) was not a targeting tuna species of Taiwanese tuna longline fleet targeting albacore until fishing vessels equipped with deep-frozen freezers started fishing SBT seasonally in early 1990s. Some tropical tuna fishing vessels shift southward and mainly operate in the central south Indian Ocean (Area 2 and 14) for SBT during April to September, and some operate in the high seas area off South Africa (Area 14 and 9) for SBT during October to February of next year.

The annual catches of SBT were less than 250 tons in early 1980s; after then, with the increase of fishing fleet size and the expansion of fishing grounds, the catches of SBT fluctuated between about 900 tons to 1,600 tons from 1990 to 2002. Since 2002, Taiwan has become a member of the Extend Commission of CCSBT and its national allocation has been set at 1,140 tons. The annual catches of SBT fluctuated between 500 tons and 1,300 tons from 2002 to 2014. In 2015, 72 fishing vessels were authorized to catch SBT and the SBT catch was 1,161 tons for calendar year and 1,143 tons for quota year.

### 2. Catch and Effort

Taiwanese SBT longline fishery mainly operates in Areas 2, 14, 8 and 9 seasonally. The catches and efforts by calendar year are provided in Table 1 and Fig. 1.

The annual catches of SBT ranged from 494 to 1,298 tons between 2002 and 2015 (Table 1) with the highest catch in number and weight in 2004. The catch declined significantly to about 530 tons in 2011 for the shared quota of 2010 and 2011 which had been mostly used in 2010 and less fishing vessels engaging in SBT. The low catch in 2012 was because of good catch rate in tropical Indian Ocean, so most of fishing vessels shifted to target bigeye tuna. The annual catches of SBT resumed from 2013 to 2015 because of the return of fishing vessels for SBT.

Fig. 1 shows the variation of annual catches in number between 2002 and 2015. Most of the catches were made in Area 2 and 14. The aggregated number of SBT, which were caught in major areas including Areas 2, Areas 14, Areas 8 and Areas 9, fluctuated between 28,000 and 41,000 during 2002-2010. After that, the total number declined rapidly in the next two years (2011-2012) and resumed to the level of 26,000-33,000 from 2013 to 2015.

The fishing efforts of 2002 and 2003 shown in Table 1 were aggregated all fishing efforts made by SBT fishing vessels, including the fishing efforts deployed in the tropical areas for bigeye tuna. After 2004 (inclusive), only the fishing efforts of SBT vessels operated in the area of south 20°S were included as fishing efforts for SBT.

The area-specific and monthly catches and fishing efforts of Taiwanese SBT longline fishing vessels in recent 5 years (2011-2015) are provided in Tables 2 and 3. It is observed that most of fishing efforts and catch were made in Areas 2, 14, 8 and 9, and it should be noted that the fishing efforts made in Area 9 were mainly from the fishing vessels targeting oil fish in Indian Ocean, and the fishing efforts made in Area 15 were mainly from fishing vessels targeting albacore with bycatch of SBT.

### **3. Nominal CPUE**

The annual nominal CPUE of calendar years is shown in Table 1 and Fig. 1. The nominal CPUE aggregated by the data from all areas reached the highest level in 2005, while the nominal CPUE aggregated by the data from major areas (Areas 2, 14, 8 and 9) reached the highest level in 2012.

It was noted that catches were mainly made in Areas 2 and 14 (Table 2), but the fishing efforts were mainly deployed in Area 9 except for 2014 (Table 3). The area-specific and monthly nominal CPUE in recent 5 years are provided in Table 4 and Fig. 2. It was observed that the nominal CPUEs in Area 2 were generally higher than those in other areas and reached the highest level in 2012.

### **4. Size composition**

Before 2002 SBT fishing vessels had to report their operation position, weights of SBT catches on weekly basis, they were requested to report the length of individual

SBT catch between 2002 to 2009, and the CDS scheme applied to Taiwanese SBT fishery and the length data of all SBT were collected through CDS scheme after 2010.

The annual area-specific size compositions are shown in Fig.3 and Fig.4. It was observed that the size composition mainly concentrated at the range of 110 cm to 125 cm among all areas of 2010s, and the mode at 150 cm was observed in other areas. (Fig. 3).

In recent 5 years (2011-2015), the size composition generally concentrated at the range of 106 cm to 130 cm among all areas (Fig. 4). However, it was observed that a mode at 130 cm occurred in 2011, modes of 106 cm to 116 cm occurred between 2012 and 2014, and a mode at 126 cm occurred in 2015.

### **5. Fleet size and fishing efforts distributions**

According to the weekly reports and trading documents, there were more than 100 fishing vessels were engaged in SBT fishery during 1998 to 2001. Since Taiwan became a member to CCSBT in 2002, all SBT fishing vessels have to be authorized to access this fishery, and Fisheries Agency of Taiwan reviews and renews their authorizations annually.

The numbers of fishing vessels engaged in SBT fishery ranged from 30 to 100 during 2002 to 2015 (Table 5). During 2005 to 2008, the number of fishing vessels decreased significantly because some of fishing vessels shifted to the waters off South Africa for targeting oil fish. In 2009 and 2010, the number of fishing vessels increased due to Somalian piracy. The number of fishing vessels decreased to 56 in 2011 as national SBT allocation was set at 578 tons, and decreased further to 36 in 2012 because most of fishing vessels remained in tropical area for bigeye tuna. Owing to poor catch of tropical tuna, fishing vessels returned to SBT fishing ground and the number of SBT longline fishing vessel increased substantially to 76 in 2013 with a slight decrease to 71 in 2014. In 2015, the number of SBT fishing vessel was 72 because of continuous poor catch of tropical tuna.

Taiwanese SBT fishing vessels seasonally targeting SBT mainly operate in the waters of 20°S - 40°S in the Indian Ocean and the areas adjacent to the Atlantic Ocean. The distributions of fishing efforts and SBT catch in number are shown in Fig. 5 to Fig.8. There are two major fishing grounds in general with one in the southern central

Indian Ocean around 50°E-105°E, 20°S-40°S, and one in the high seas area off South Africa around 20°E-50°E, 25°S-45°S. The fishing season for Taiwanese SBT fishery in the southern central Indian Ocean is from April to September, and the fishing season in the southwest Indian Ocean is from October to February of following year. It was observed that the fishing efforts and SBT catches were mainly made in Areas 2, 14 and 9 in the second and the third quarters, and it was also observed that the catches and efforts in Areas 2 and 14 decreased in 2011 and 2012. The fishing efforts deployed in Area 9 are mainly from the fishing vessels targeting oil fish with some targeting SBT in the first and the fourth quarters.

#### **6. Development and implementation of scientific observer programs**

Appendix 1 provides the summary report on the implementation of scientific observer program.

#### **7. Other relevant information**

The collaboration between Taiwan and Australia on SBT archival tagging program had been conducted during 2004 to 2007. The observers dispatched to Taiwanese SBT fishing vessels carried out the SBT tagging program. There were 37, 48, 25 and 50 archival tags successfully settled during 2004 to 2007. The results were incorporated into the documents of CCSBT-ESC/0709/20 and CCSBT-ESC/0809/23.

Table 1. Annual catches of SBT in weight and in number, fishing efforts and nominal CPUE of Taiwanese SBT longline fishery

Unit : Hooks\_N : thousand hooks ;  
SBT\_W: round weight in ton. ;  
CPUE : SBT catch in number /total hooks;

Calendar year	Hooks_N		SBT_N		SBT_W		CPUE	
	All Area	Area 2、 14、8、9	All Area	Area 2、 14、8、9	All Area	Area 2、 14、8、9	All Area	Area 2、 14、8、9
2002	102,908	39,188	34,841	34,754	1,137	1,132	0.34	0.89
2003	144,620	44,570	31,606	28,768	1,129	1,045	0.22	0.65
2004	36,055	34,993	42,151	41,733	1,298	1,279	1.17	1.19
2005	20,471	19,375	33,319	33,266	941	937	1.63	1.72
2006	20,444	18,919	30,667	30,660	846	845	1.50	1.62
2007	26,185	25,532	33,776	33,772	841	841	1.29	1.32
2008	28,724	26,656	35,144	35,082	913	911	1.22	1.32
2009	37,236	32,380	31,801	31,639	921	913	0.85	0.98
2010	40,916	33,897	33,407	33,263	1,208	1,201	0.82	0.98
2011	27,062	20,327	15,156	14,884	533	520	0.56	0.73
2012	18,414	9,702	17,578	17,198	494	472	0.95	1.77
2013	34,817	25,188	33,583	33,186	1,004	980	0.96	1.33
2014	30,823	21,067	26,659	26,300	944	922	0.86	1.27
2015	32,397	22,873	33,018	32,663	1,161	1,140	1.02	1.44

Table 2. SBT catch in number by area, by month and by year of Taiwanese SBT longline fishery

Year	Month	Area1	Area2	Area3	Area4	Area5	Area6	Area7	Area8	Area9	Area10	Area11	Area12	Area13	Area14	Area15
<b>2011</b>	<b>Total</b>	-	<b>8228</b>	-	<b>73</b>	-	-	<b>0</b>	<b>816</b>	<b>4357</b>	<b>0</b>	<b>0</b>	<b>0</b>	-	<b>1483</b>	<b>199</b>
	1	-	-	-	-	-	-	-	-	597	-	-	0	-	0	-
	2	-	-	-	0	-	-	0	-	757	0	0	0	-	0	-
	3	-	0	-	0	-	-	-	0	0	0	0	-	-	0	0
	4	-	32	-	0	-	-	0	304	25	0	-	0	-	-	0
	5	-	1084	-	65	-	-	0	511	32	0	0	-	-	7	33
	6	-	1941	-	8	-	-	-	1	188	0	0	0	-	374	73
	7	-	3442	-	0	-	-	-	-	897	-	0	0	-	640	8
	8	-	1726	-	-	-	-	-	-	1099	-	-	0	-	296	57
	9	-	3	-	-	-	-	-	-	263	-	-	-	-	166	28
	10	-	-	-	-	-	-	-	-	91	-	-	-	-	-	0
	11	-	-	-	-	-	-	-	-	275	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	133	-	-	-	-	0	-
<b>2012</b>	<b>Total</b>	-	<b>12192</b>	-	<b>110</b>	-	-	<b>10</b>	<b>50</b>	<b>1312</b>	<b>0</b>	<b>0</b>	<b>0</b>	-	<b>3644</b>	<b>260</b>
	1	-	-	-	-	-	-	-	-	0	0	-	-	-	0	0
	2	-	-	-	-	-	-	-	-	98	0	-	-	-	0	-
	3	-	-	-	-	-	-	-	0	8	0	0	-	-	0	-
	4	-	4	-	0	-	-	5	5	41	0	-	-	-	0	0
	5	-	352	-	48	-	-	5	43	5	0	0	-	-	11	26
	6	-	2122	-	26	-	-	-	2	89	-	0	0	-	0	29
	7	-	6347	-	36	0	-	-	-	261	-	0	0	-	263	43
	8	-	2894	-	0	0	-	-	-	27	-	-	0	-	2050	122
	9	-	473	-	-	-	-	-	-	72	-	-	-	-	1320	40
	10	-	-	-	-	-	-	-	-	0	-	0	-	-	-	0
	11	-	-	-	-	-	-	-	-	217	-	-	-	-	-	0
	12	-	-	-	-	-	-	-	-	494	-	0	-	-	-	0
<b>2013</b>	<b>Total</b>	-	<b>19504</b>	-	<b>158</b>	-	-	<b>13</b>	<b>252</b>	<b>1284</b>	<b>0</b>	<b>42</b>	<b>0</b>	-	<b>12146</b>	<b>184</b>
	1	-	-	-	-	-	-	-	-	386	0	-	-	-	-	0
	2	-	-	-	-	-	-	-	-	0	0	0	-	-	0	-
	3	-	-	-	-	-	-	-	0	0	0	0	-	-	0	-
	4	-	1	-	0	-	-	13	13	9	0	0	-	-	0	0
	5	-	442	-	30	-	-	0	207	87	0	0	0	-	177	0
	6	-	2905	-	98	-	-	-	32	136	0	6	0	-	1073	109
	7	-	7145	-	27	-	-	-	-	212	0	4	0	-	3641	0
	8	-	6775	-	3	-	-	-	-	262	-	14	0	-	4529	9
	9	-	2236	-	-	-	-	-	-	154	-	18	0	-	2726	44
	10	-	-	-	-	-	-	-	-	1	-	-	-	-	0	0
	11	-	-	-	-	-	-	-	-	22	-	-	-	-	0	21
	12	-	-	-	-	-	-	-	-	15	-	-	-	-	0	1
<b>2014</b>	<b>Total</b>	-	<b>15872</b>	-	<b>151</b>	-	<b>7</b>	<b>61</b>	<b>453</b>	<b>1041</b>	<b>15</b>	<b>18</b>	<b>0</b>	-	<b>8934</b>	<b>107</b>
	1	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	0	0	0	-	-	0	-
	3	-	-	-	-	-	-	-	0	0	0	0	-	-	0	-
	4	-	0	-	18	-	4	17	74	38	0	0	-	-	0	-
	5	-	521	-	53	-	3	44	361	136	6	-	0	-	48	0
	6	-	2645	-	49	-	-	0	18	61	4	0	-	-	1143	26
	7	-	4275	-	30	-	-	-	-	16	5	11	0	-	1882	36
	8	-	6583	-	1	-	-	-	-	31	-	7	0	-	4030	5
	9	-	1785	-	-	-	-	-	-	0	-	0	-	-	1831	40
	10	-	63	-	-	-	-	-	-	0	-	-	-	-	0	-
	11	-	-	-	-	-	-	-	-	388	-	-	-	-	0	-
	12	-	-	-	-	-	-	-	-	371	-	-	-	-	0	-
<b>2015</b>	<b>Total</b>	-	<b>15049</b>	-	<b>179</b>	<b>1</b>	-	<b>24</b>	<b>7595</b>	<b>895</b>	<b>1</b>	<b>14</b>	<b>18</b>	-	<b>9124</b>	<b>118</b>
	1	-	-	-	-	-	-	-	-	288	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	0	138	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	0	0	-	0	-	-	0	-
	4	-	-	-	18	-	-	2	1332	0	0	0	0	-	10	0
	5	-	379	-	140	0	-	22	4667	38	1	-	0	-	8	32
	6	-	6247	-	21	1	-	-	1596	39	0	0	0	-	1507	23
	7	-	5394	-	0	0	-	-	-	21	0	0	10	-	4830	0
	8	-	1753	-	0	0	-	-	-	44	0	0	2	-	2133	59
	9	-	1276	-	0	-	-	-	-	0	-	0	3	-	636	4
	10	-	-	-	-	-	-	-	-	0	-	14	3	-	0	0
	11	-	-	-	-	-	-	-	-	159	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	168	-	0	-	-	-	0

Table 3 Number of hooks (thousand hooks) deployed by area, by month and by year of Taiwanese SBT longline fishery

Year	Month	Area1	Area2	Area3	Area4	Area5	Area6	Area7	Area8	Area9	Area10	Area11	Area12	Area13	Area14	Area15
<b>2011</b>	<b>Total</b>	-	<b>5303</b>	-	<b>1078</b>	-	-	<b>271</b>	<b>1716</b>	<b>12383</b>	<b>600</b>	<b>180</b>	<b>629</b>	-	<b>926</b>	<b>3977</b>
	1	-	-	-	-	-	-	-	-	674	-	-	124	-	95	-
	2	-	-	-	76	-	-	8	-	547	83	76	12	-	17	-
	3	-	8	-	116	-	-	-	269	1007	100	4	-	-	6	4
	4	-	141	-	21	-	-	259	862	1962	188	-	4	-	-	39
	5	-	939	-	420	-	-	4	582	2180	191	4	-	-	62	415
	6	-	1525	-	297	-	-	-	3	1785	39	62	50	-	239	1053
	7	-	1659	-	149	-	-	-	-	1811	-	35	190	-	208	1082
	8	-	1012	-	-	-	-	-	-	1355	-	-	248	-	201	901
	9	-	18	-	-	-	-	-	-	362	-	-	-	-	83	393
	10	-	-	-	-	-	-	-	-	311	-	-	-	-	-	90
	11	-	-	-	-	-	-	-	-	241	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	147	-	-	-	-	13	-
<b>2012</b>	<b>Total</b>	-	<b>1916</b>	-	<b>1671</b>	<b>16</b>	-	<b>243</b>	<b>397</b>	<b>6301</b>	<b>1364</b>	<b>285</b>	<b>676</b>	-	<b>1088</b>	<b>4459</b>
	1	-	-	-	-	-	-	-	-	508	142	-	-	-	17	16
	2	-	-	-	-	-	-	-	-	798	343	-	-	-	19	-
	3	-	-	-	-	-	-	-	40	1222	215	11	-	-	37	-
	4	-	22	-	54	-	-	109	216	1283	330	-	-	-	14	8
	5	-	168	-	561	-	-	134	137	813	333	18	-	-	79	647
	6	-	420	-	691	-	-	-	4	490	-	245	13	-	36	768
	7	-	724	-	338	10	-	-	-	232	-	4	278	-	206	1293
	8	-	476	-	27	6	-	-	-	168	-	-	385	-	433	823
	9	-	106	-	-	-	-	-	-	177	-	-	-	-	247	703
	10	-	-	-	-	-	-	-	-	240	-	4	-	-	-	144
	11	-	-	-	-	-	-	-	-	179	-	-	-	-	-	7
	12	-	-	-	-	-	-	-	-	192	-	4	-	-	-	51
<b>2013</b>	<b>Total</b>	<b>0</b>	<b>5554</b>	<b>0</b>	<b>2556</b>	<b>0</b>	<b>0</b>	<b>405</b>	<b>1102</b>	<b>12097</b>	<b>1186</b>	<b>1343</b>	<b>992</b>	<b>0</b>	<b>6436</b>	<b>3149</b>
	1	-	-	-	-	-	-	-	-	561	165	-	-	-	-	4
	2	-	-	-	-	-	-	-	-	1048	75	125	-	-	18	-
	3	-	-	-	-	-	-	-	117	1346	73	165	-	-	12	-
	4	-	55	-	39	-	-	156	478	1655	353	58	-	-	50	3
	5	-	360	-	668	-	-	249	475	2042	471	17	4	-	551	94
	6	-	1170	-	1023	-	-	-	32	1086	46	237	9	-	1552	765
	7	-	1666	-	669	-	-	-	-	1180	3	309	493	-	1630	729
	8	-	1750	-	157	-	-	-	-	964	-	249	477	-	1763	441
	9	-	553	-	-	-	-	-	-	807	-	183	9	-	697	438
	10	-	-	-	-	-	-	-	-	656	-	-	-	-	25	328
	11	-	-	-	-	-	-	-	-	415	-	-	-	-	81	271
	12	-	-	-	-	-	-	-	-	337	-	-	-	-	57	76
<b>2014</b>	<b>Total</b>	-	<b>6337</b>	-	<b>3212</b>	-	<b>51</b>	<b>756</b>	<b>1753</b>	<b>6318</b>	<b>1030</b>	<b>876</b>	<b>1366</b>	-	<b>6659</b>	<b>2466</b>
	1	-	-	-	-	-	-	-	-	88	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	300	7	97	-	-	12	-
	3	-	-	-	-	-	-	-	54	490	164	70	-	-	22	-
	4	-	9	-	105	-	27	314	755	823	338	39	-	-	17	-
	5	-	554	-	992	-	24	317	930	857	409	-	4	-	499	303
	6	-	1490	-	1238	-	-	125	14	921	104	172	-	-	1402	732
	7	-	1822	-	775	-	-	-	-	486	8	223	631	-	2120	691
	8	-	1950	-	102	-	-	-	-	481	-	185	731	-	1742	473
	9	-	492	-	-	-	-	-	-	507	-	90	-	-	746	267
	10	-	20	-	-	-	-	-	-	581	-	-	-	-	15	-
	11	-	-	-	-	-	-	-	-	437	-	-	-	-	39	-
	12	-	-	-	-	-	-	-	-	347	-	-	-	-	45	-
<b>2015</b>	<b>Total</b>	-	<b>6291</b>	-	<b>2270</b>	<b>341</b>	-	<b>88</b>	<b>3700</b>	<b>7144</b>	<b>897</b>	<b>779</b>	<b>2827</b>	-	<b>5738</b>	<b>2321</b>
	1	-	-	-	-	-	-	-	-	375	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	25	376	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	94	458	-	99	-	-	114	-
	4	-	-	-	141	-	-	27	1164	913	116	34	4	-	43	126
	5	-	163	-	500	56	-	61	1848	851	404	-	169	-	637	379
	6	-	1795	-	296	118	-	-	569	891	219	186	881	-	813	353
	7	-	2058	-	698	159	-	-	-	648	115	229	561	-	2033	365
	8	-	1700	-	600	8	-	-	-	869	43	31	798	-	1726	463
	9	-	575	-	35	-	-	-	-	659	-	120	344	-	327	506
	10	-	-	-	-	-	-	-	-	481	-	60	70	-	45	122
	11	-	-	-	-	-	-	-	-	209	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	414	-	20	-	-	-	7

Table 4 Nominal CPUE by area, by month and by year of Taiwanese SBT longline fishery

Unit: CPUE=Numbers/Thousand hooks

Year	Month	Area1	Area2	Area3	Area4	Area5	Area6	Area7	Area8	Area9	Area10	Area11	Area12	Area13	Area14	Area15
<b>2011</b>	<b>Total</b>	-	<b>1.55</b>	-	<b>0.07</b>	-	-	<b>0.00</b>	<b>0.48</b>	<b>0.35</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	-	<b>1.60</b>	<b>0.05</b>
	1	-	-	-	-	-	-	-	-	0.89	-	-	0.00	-	0.00	-
	2	-	-	-	0.00	-	-	0.00	-	1.38	0.00	0.00	0.00	-	0.00	-
	3	-	0.00	-	0.00	-	-	-	0.00	0.00	0.00	0.00	-	-	0.00	0.00
	4	-	0.23	-	0.00	-	-	0.00	0.35	0.01	0.00	-	0.00	-	-	0.00
	5	-	1.15	-	0.15	-	-	0.00	0.88	0.01	0.00	0.00	-	-	0.11	0.08
	6	-	1.27	-	0.03	-	-	-	0.31	0.11	0.00	0.00	0.00	-	1.56	0.07
	7	-	2.07	-	0.00	-	-	-	-	0.50	-	0.00	0.00	-	3.08	0.01
	8	-	1.70	-	-	-	-	-	-	0.81	-	-	0.00	-	1.47	0.06
	9	-	0.17	-	-	-	-	-	-	0.73	-	-	-	-	2.00	0.07
	10	-	-	-	-	-	-	-	-	0.29	-	-	-	-	-	0.00
	11	-	-	-	-	-	-	-	-	1.14	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	0.90	-	-	-	-	0.00	-
<b>2012</b>	<b>Total</b>	-	<b>6.36</b>	-	<b>0.07</b>	-	-	<b>0.04</b>	<b>0.13</b>	<b>0.22</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	-	<b>3.35</b>	<b>0.06</b>
	1	-	-	-	-	-	-	-	-	0.00	0.00	-	-	-	0.00	0.00
	2	-	-	-	-	-	-	-	-	0.12	0.00	-	-	-	0.00	-
	3	-	-	-	-	-	-	-	0.00	0.01	0.00	0.00	-	-	0.00	-
	4	-	0.18	-	0.00	-	-	0.05	0.02	0.03	0.00	-	-	-	0.00	0.00
	5	-	2.10	-	0.09	-	-	0.04	0.31	0.01	0.00	0.00	-	-	0.14	0.04
	6	-	5.05	-	0.04	-	-	-	0.45	0.18	-	0.00	0.00	-	0.00	0.04
	7	-	8.77	-	0.11	0.00	-	-	-	1.13	-	0.00	0.00	-	1.27	0.03
	8	-	6.08	-	0.00	0.00	-	-	-	0.16	-	-	0.00	-	4.73	0.15
	9	-	4.48	-	-	-	-	-	-	0.41	-	-	-	-	5.34	0.06
	10	-	-	-	-	-	-	-	-	0.00	-	0.00	-	-	-	0.00
	11	-	-	-	-	-	-	-	-	1.21	-	-	-	-	-	0.00
	12	-	-	-	-	-	-	-	-	2.57	-	0.00	-	-	-	0.00
<b>2013</b>	<b>Total</b>	-	<b>3.51</b>	-	<b>0.06</b>	-	-	<b>0.03</b>	<b>0.23</b>	<b>0.11</b>	<b>0</b>	<b>0.03</b>	<b>0</b>	-	<b>1.89</b>	<b>0.06</b>
	1	-	-	-	-	-	-	-	-	0.69	0	-	-	-	-	0
	2	-	-	-	-	-	-	-	-	0	0	0	-	-	0	-
	3	-	-	-	-	-	-	-	0	0	0	0	-	-	0	-
	4	-	0.02	-	0	-	-	0.08	0.03	0.01	0	0	-	-	0	0
	5	-	1.23	-	0.04	-	-	0	0.44	0.04	0	0	0	-	0.32	0
	6	-	2.48	-	0.1	-	-	-	1	0.13	0	0.03	0	-	0.69	0.14
	7	-	4.29	-	0.04	-	-	-	-	0.18	0	0.01	0	-	2.23	0
	8	-	3.87	-	0.02	-	-	-	-	0.27	-	0.06	0	-	2.57	0.02
	9	-	4.04	-	-	-	-	-	-	0.19	-	0.1	0	-	3.91	0.1
	10	-	-	-	-	-	-	-	-	0	-	-	-	-	0	0
	11	-	-	-	-	-	-	-	-	0.05	-	-	-	-	0	0.08
	12	-	-	-	-	-	-	-	-	0.04	-	-	-	-	0	0.01
<b>2014</b>	<b>Total</b>	-	<b>2.5</b>	-	<b>0.05</b>	-	<b>0.14</b>	<b>0.08</b>	<b>0.26</b>	<b>0.16</b>	<b>0.01</b>	<b>0.02</b>	<b>0</b>	-	<b>1.34</b>	<b>0.04</b>
	1	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	0	0	0	-	-	0	-
	3	-	-	-	-	-	-	-	0	0	0	0	-	-	0	-
	4	-	0	-	0.17	-	0.15	0.05	0.1	0.05	0	0	-	-	0	-
	5	-	0.94	-	0.05	-	0.12	0.14	0.39	0.16	0.01	-	0	-	0.1	0
	6	-	1.78	-	0.04	-	-	0	1.29	0.07	0.04	0	-	-	0.82	0.04
	7	-	2.35	-	0.04	-	-	-	-	0.03	0.62	0.05	0	-	0.89	0.05
	8	-	3.38	-	0.01	-	-	-	-	0.06	-	0.04	0	-	2.31	0.01
	9	-	3.63	-	-	-	-	-	-	0	-	0	-	-	2.45	0.15
	10	-	3.15	-	-	-	-	-	-	0	-	-	-	-	0	-
	11	-	-	-	-	-	-	-	-	0.89	-	-	-	-	0	-
	12	-	-	-	-	-	-	-	-	1.07	-	-	-	-	0	-
<b>2015</b>	<b>Total</b>	-	<b>2.39</b>	-	<b>0.08</b>	<b>0</b>	-	<b>0.27</b>	<b>2.05</b>	<b>0.13</b>	<b>0</b>	<b>0.02</b>	<b>0.01</b>	-	<b>1.59</b>	<b>0.05</b>
	1	-	-	-	-	-	-	-	-	0.77	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	0	0.37	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	0	0	0	0	-	-	0	-
	4	-	-	-	0.13	-	-	0.07	1.14	0	0	0	0	-	0.23	0
	5	-	2.33	-	0.28	0	-	0.36	2.53	0.04	0	-	0	-	0.01	0.08
	6	-	3.48	-	0.07	0.01	-	-	2.8	0.04	0	0	0	-	1.85	0.07
	7	-	2.62	-	0	0	-	-	-	0.03	0	0	0.02	-	2.38	0
	8	-	1.03	-	0	0	-	-	-	0.05	0	0	0	-	1.24	0.13
	9	-	2.22	-	0	-	-	-	-	0	-	0	0.01	-	1.94	0.01
	10	-	-	-	-	-	-	-	-	0	-	0.23	0.04	-	0	0
	11	-	-	-	-	-	-	-	-	0.76	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	0.41	-	-	0	-	-	0



Table 5 Number of fishing vessel engaged in SBT fishery during 2002-2015

Year	No. of seasonal target vessels	No. of by-catch vessels	Total vessels
2002	21	50	71
2003	76	24	100
2004	79	18	97
2005	49	8	57
2006	33	3	36
2007	27	3	30
2008	35	6	41
2009	34	33	67
2010	65	17	82
2011	28	28	56
2012	12	24	36
2013	39	37	76*
2014	37	34	71
2015	45	27	72

\* There was one vessel shipwreck.

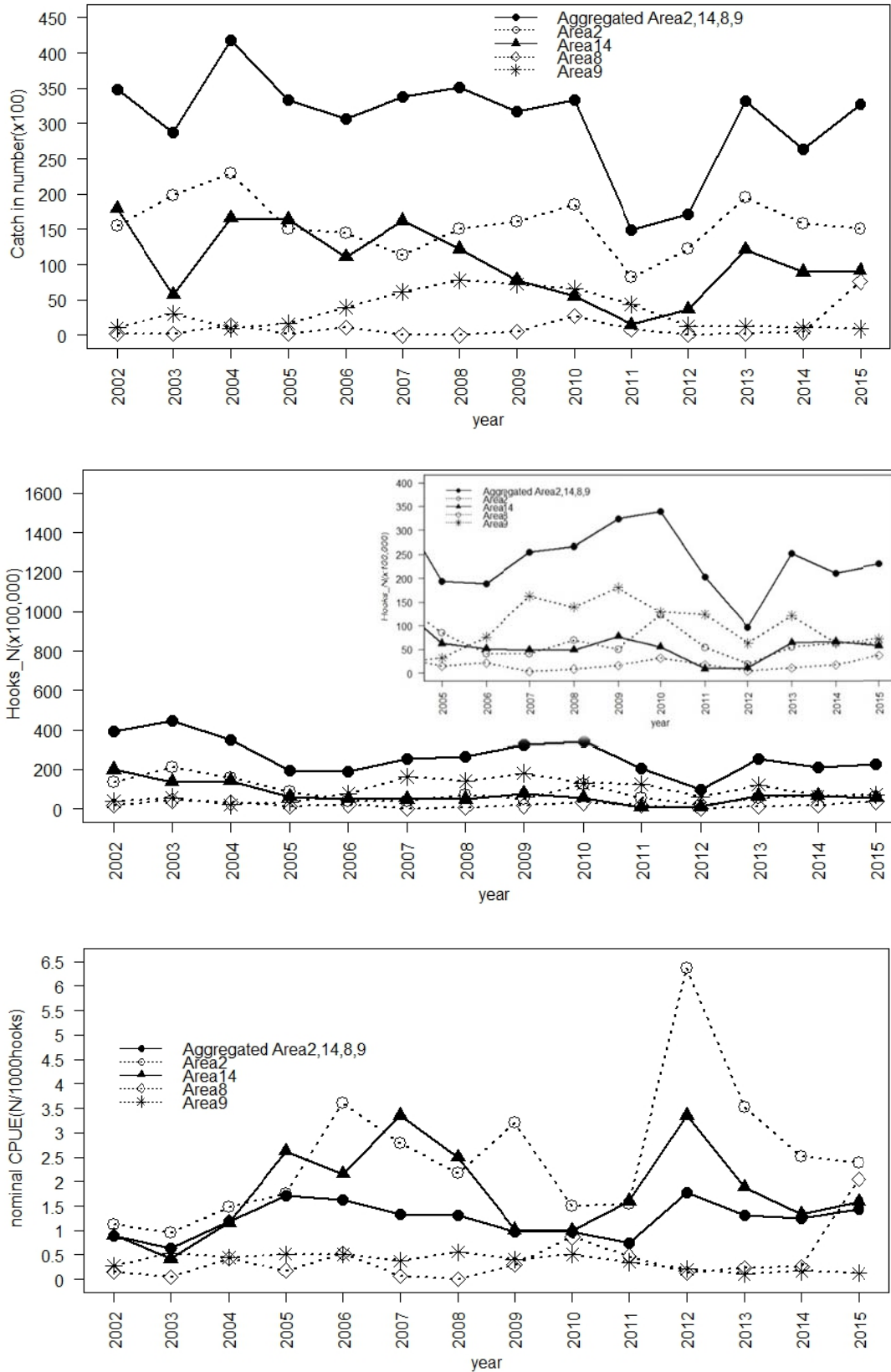


Fig. 1 Annual SBT catch in number, fishing effort and nominal CPUE of Taiwanese SBT longline fishery in main fishing ground

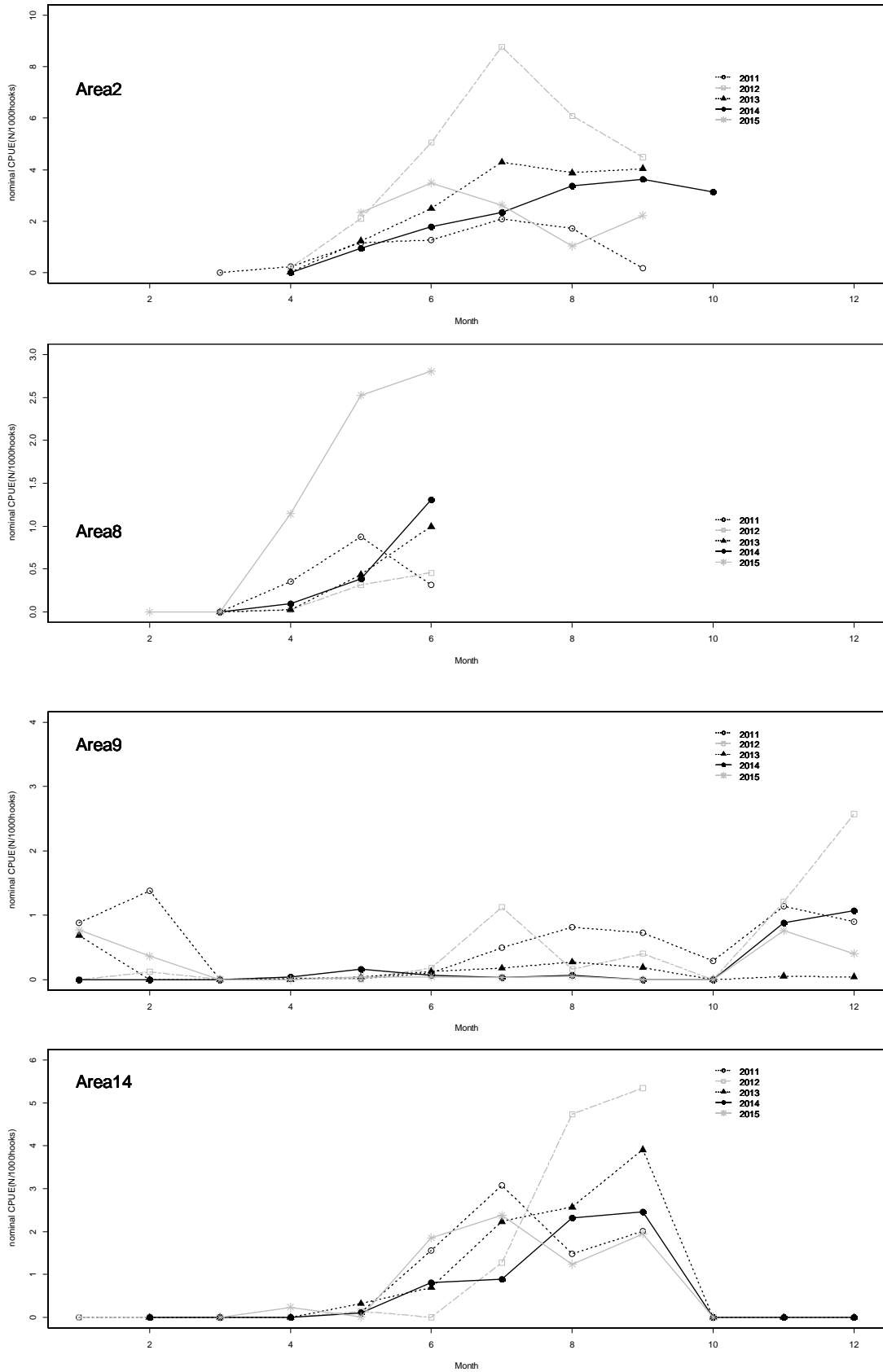


Fig. 2 Annual nominal CPUE by area, by month and by year of Taiwanese SBT longline fishery in main fishing ground

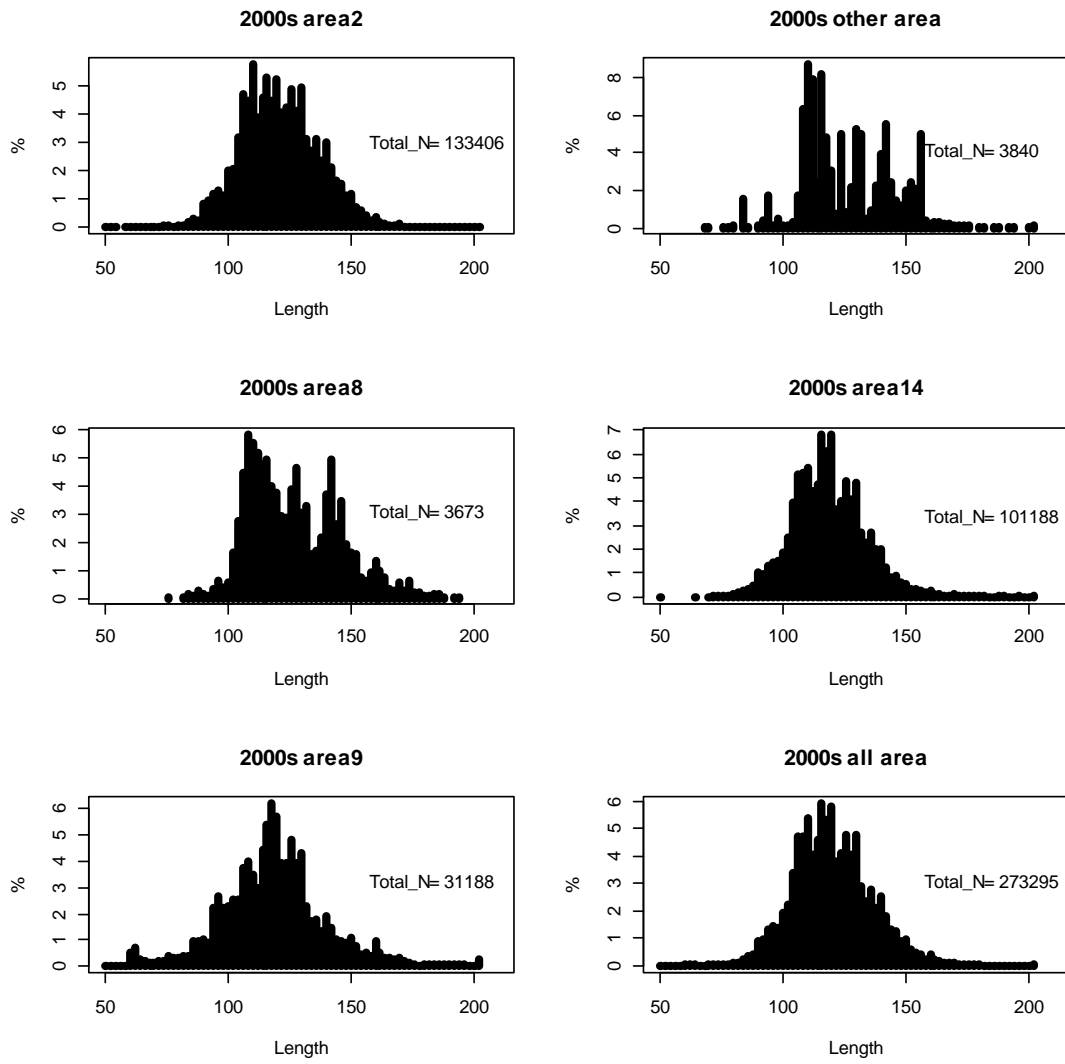


Fig.3 (1) SBT catch length frequency by area of Taiwanese SBT longline fishery in 2000s

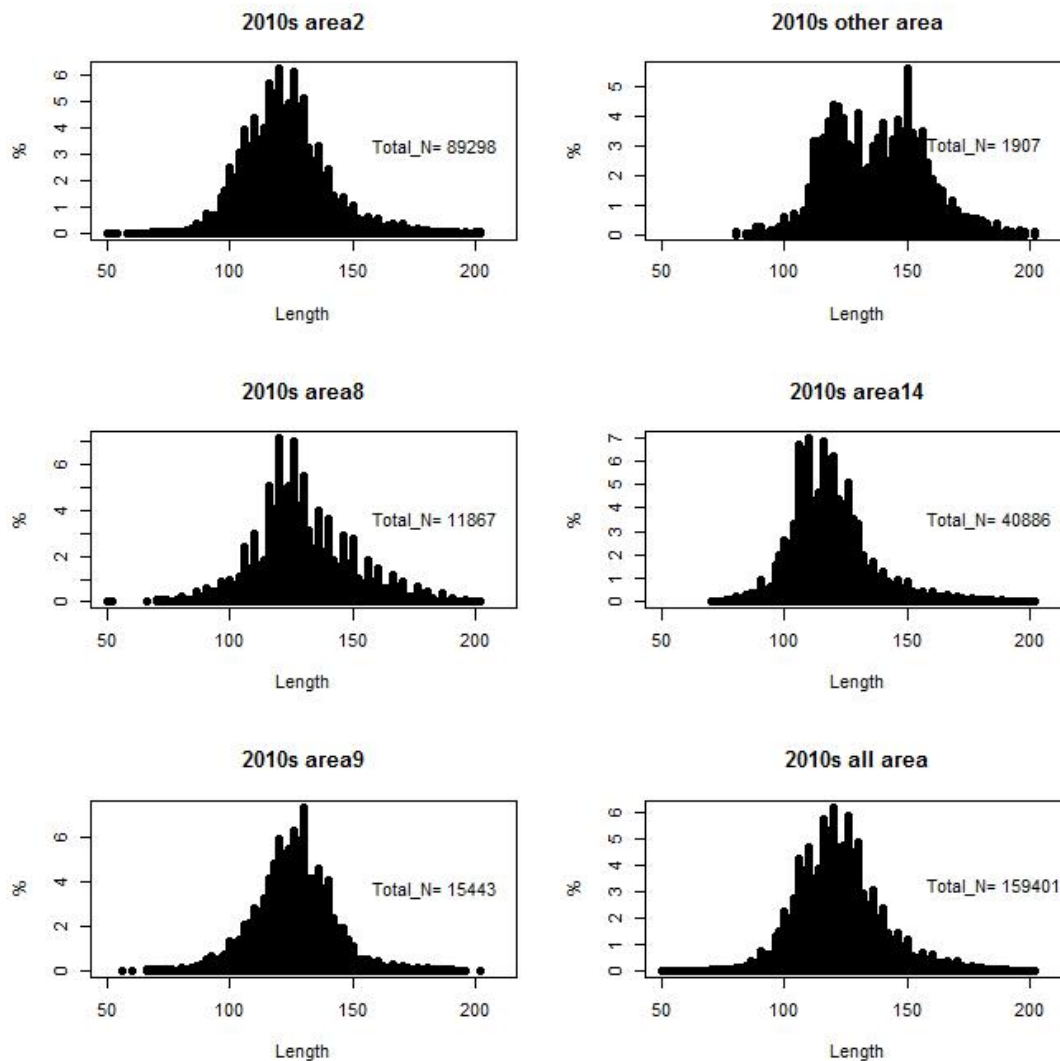


Fig.3 (2) SBT catch length frequency by area of Taiwanese SBT longline fishery during 2010-2015

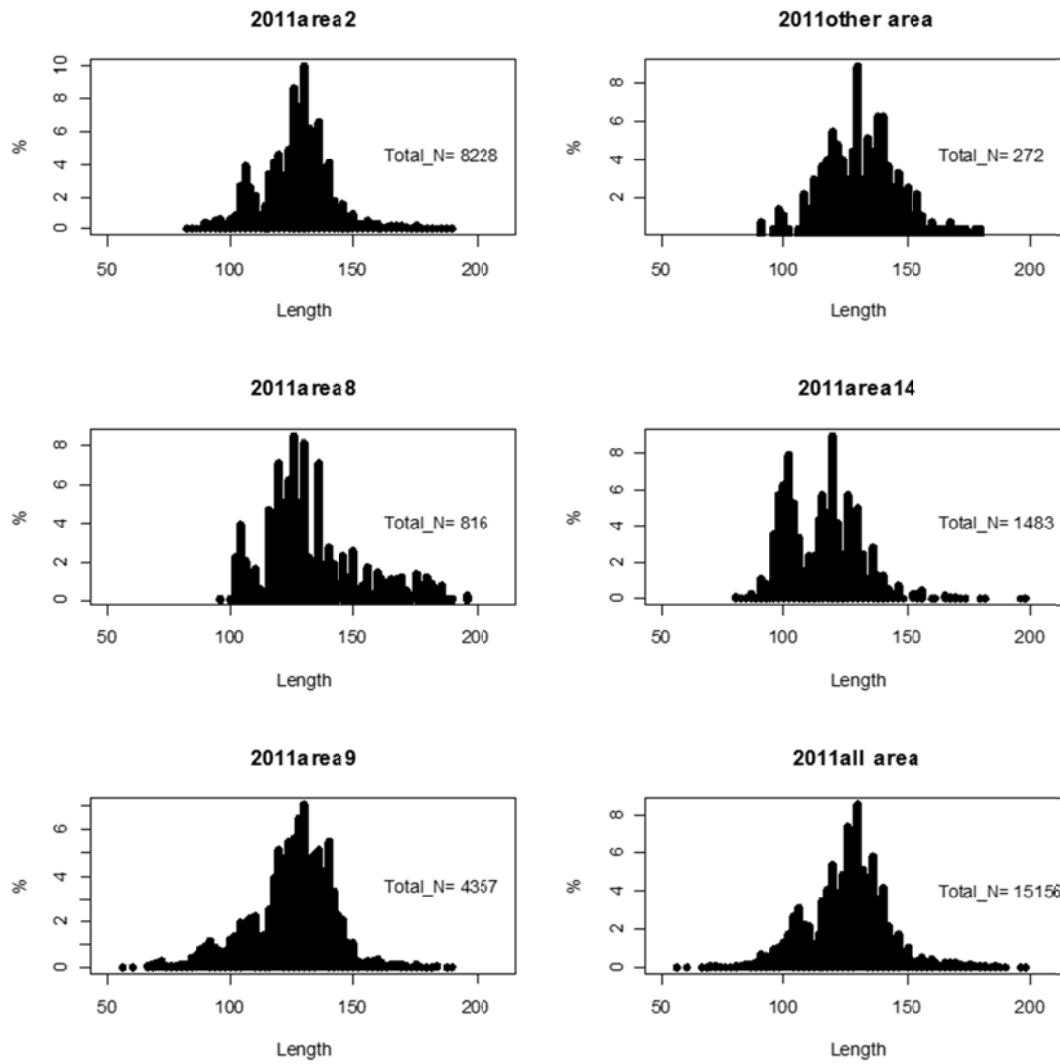


Fig.4 (1) SBT catch length frequency by area of Taiwanese SBT longline fishery in 2011

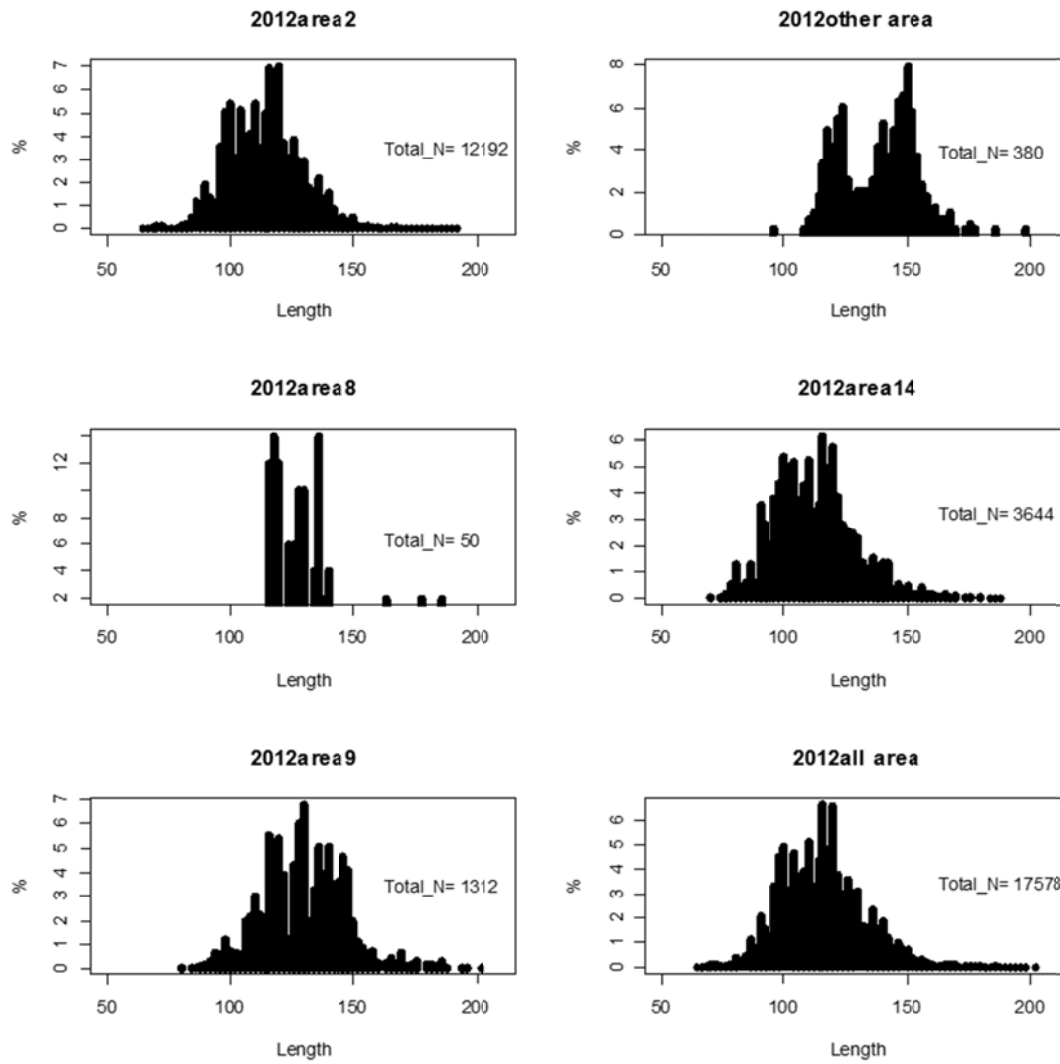


Fig.4 (2) SBT catch length frequency by area of Taiwanese SBT longline fishery in 2012

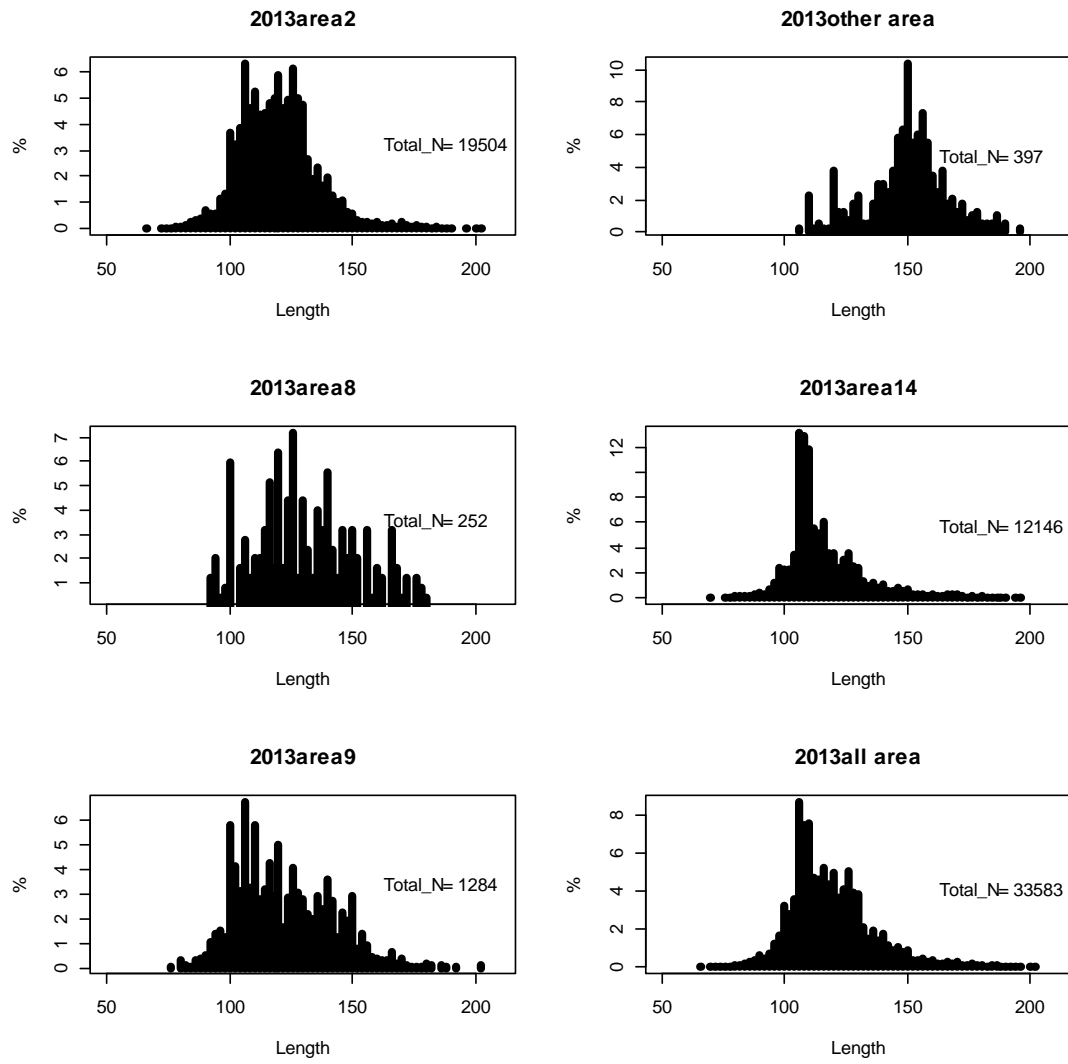


Fig.4 (3) SBT catch length frequency by area of Taiwanese SBT longline fishery in 2013



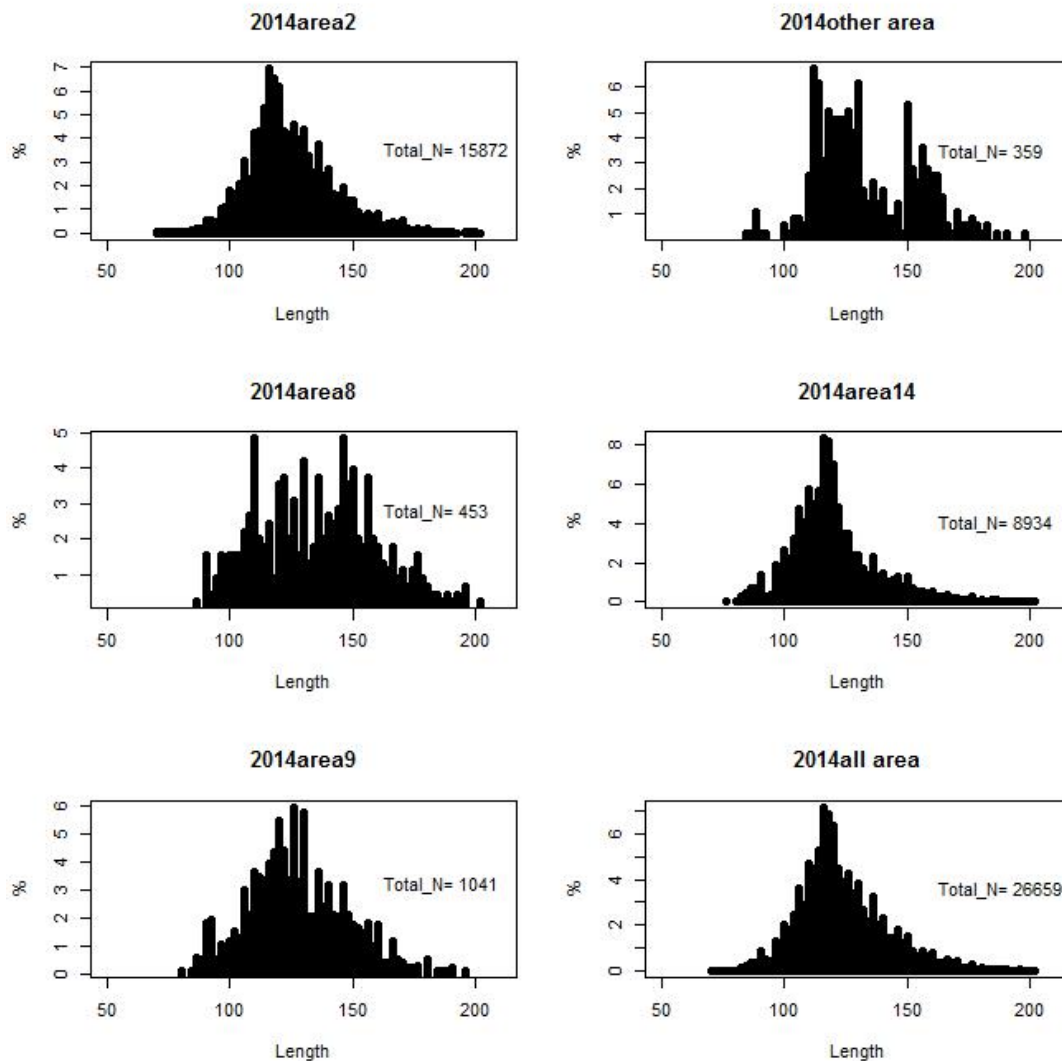


Fig.4 (4) SBT catch length frequency by area of Taiwanese SBT longline fishery in 2014

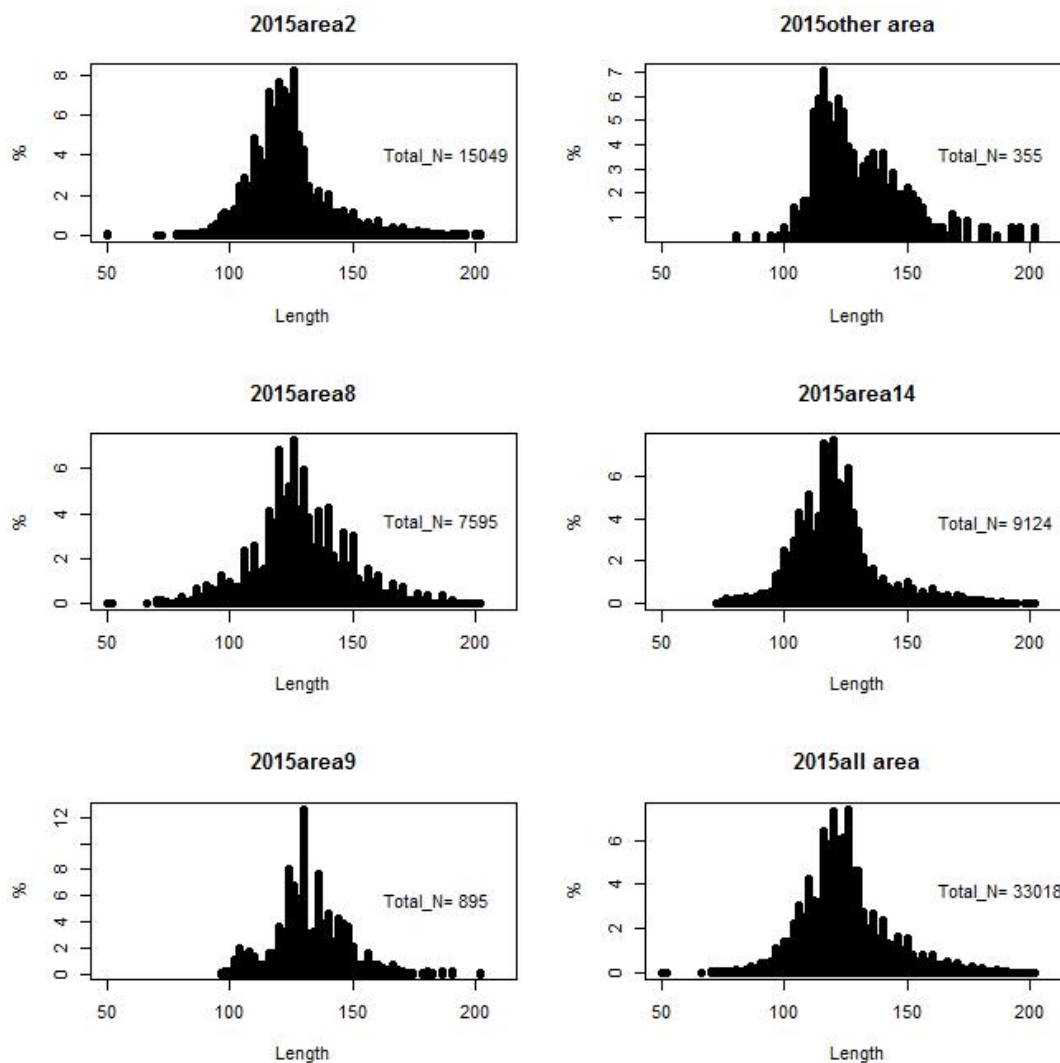


Fig.4 (5) SBT catch length frequency by area of Taiwanese SBT longline fishery in 2015

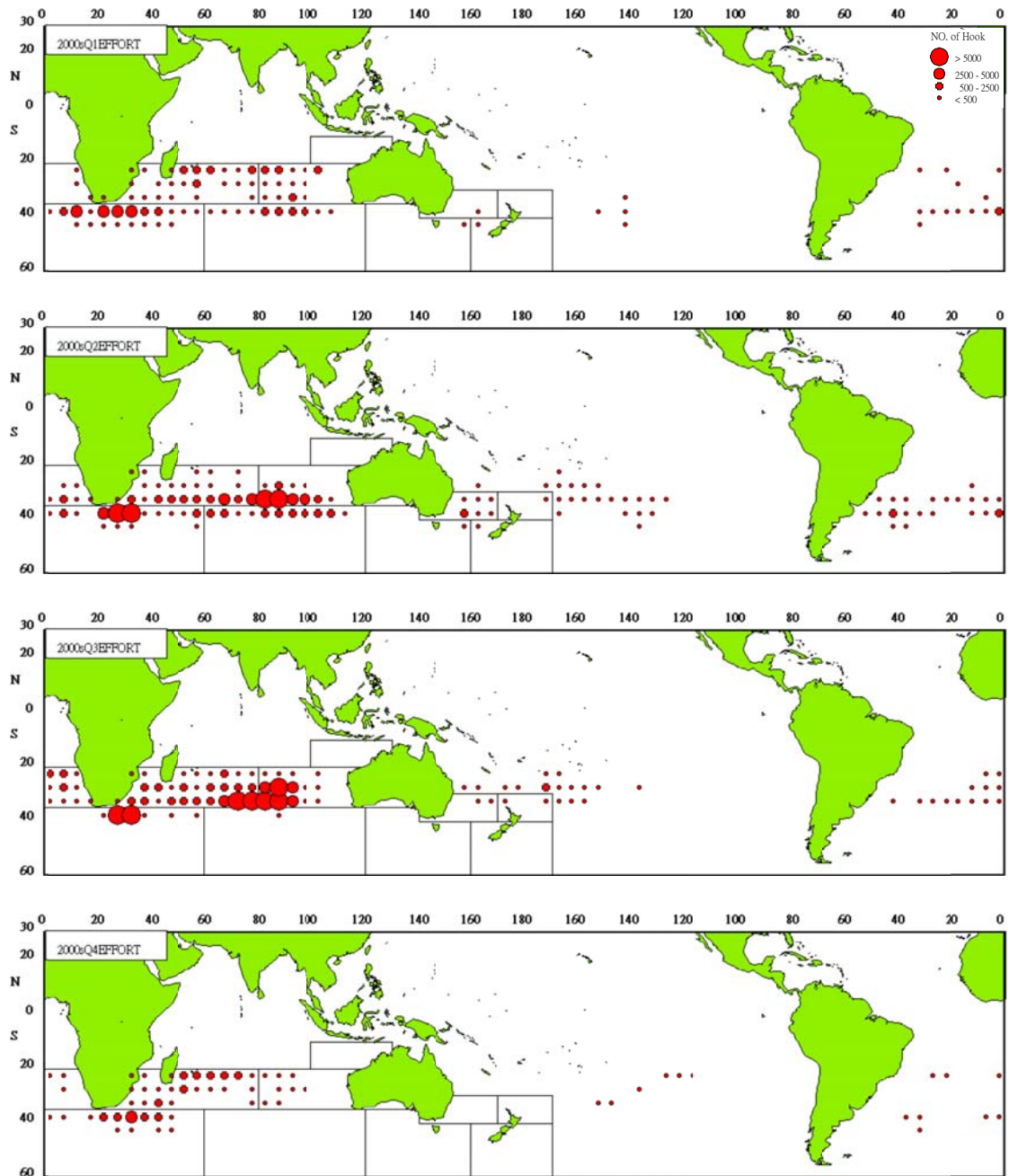


Fig.5 (1) Fishing efforts distributions by quarter of Taiwanese SBT longline fishery in 2000s

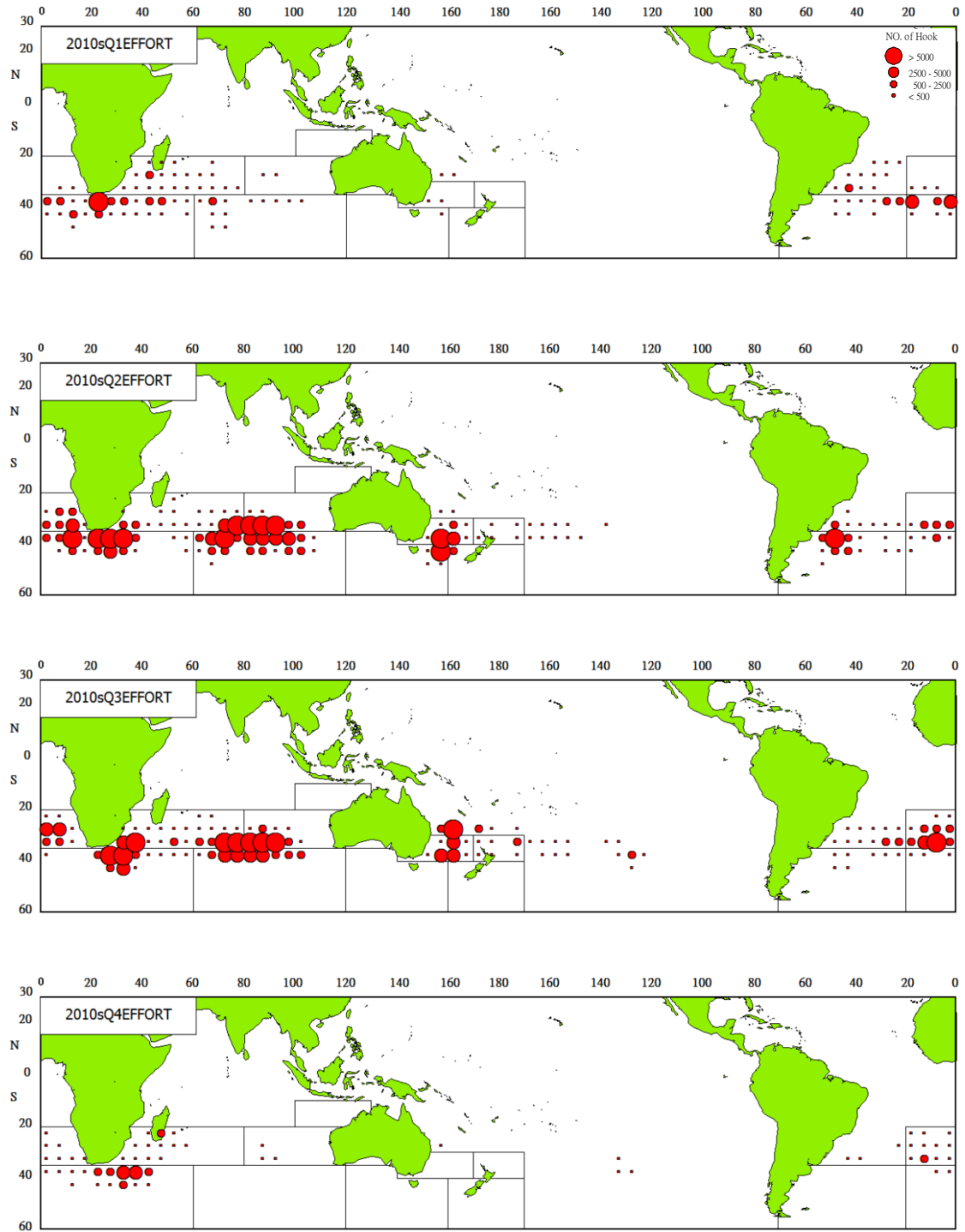


Fig.5 (2) Fishing efforts distributions by quarter of Taiwanese SBT longline fishery during 2010-2015

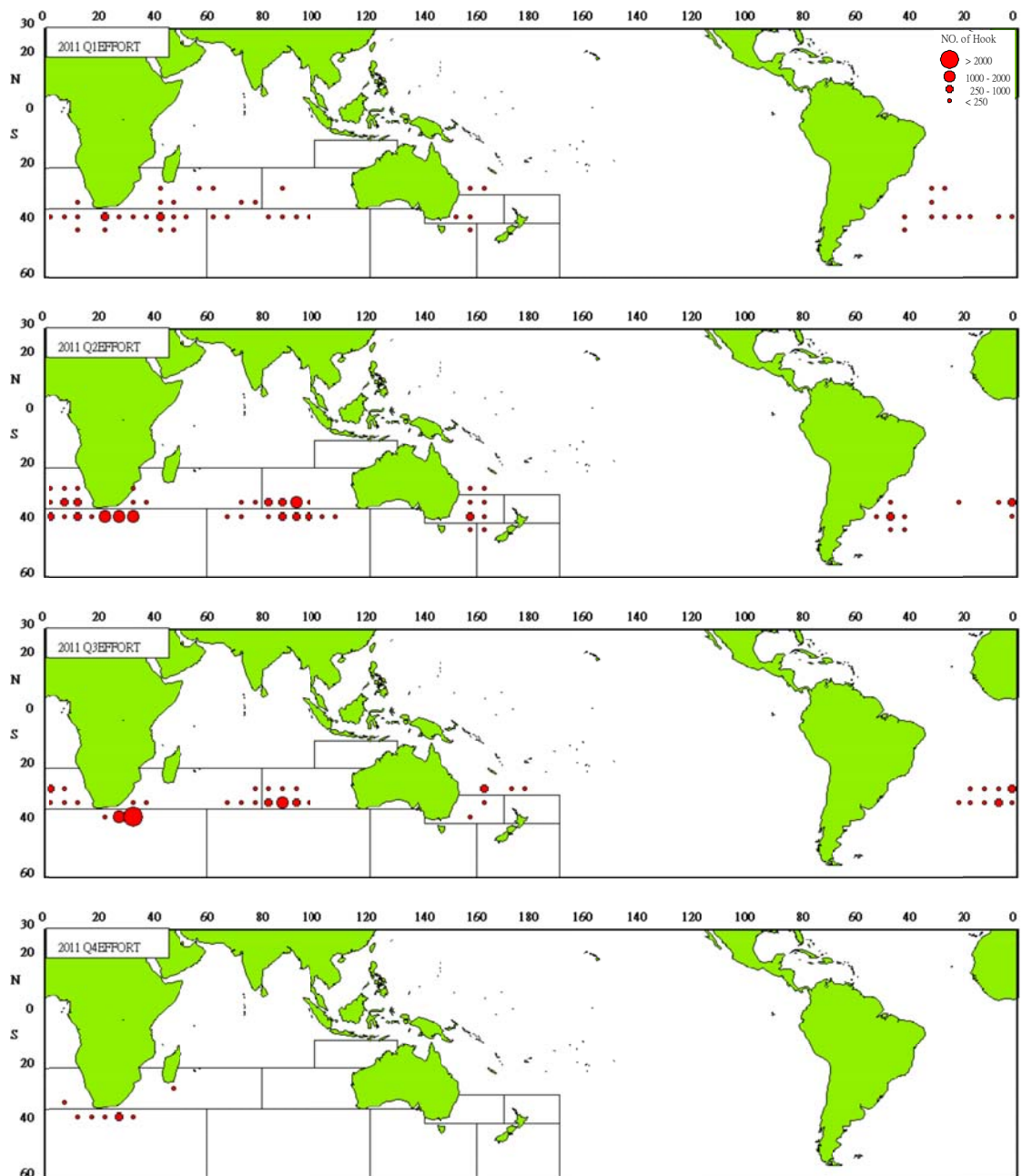


Fig.6 (1) Fishing efforts distributions by quarter of Taiwanese SBT longline fishery in 2011

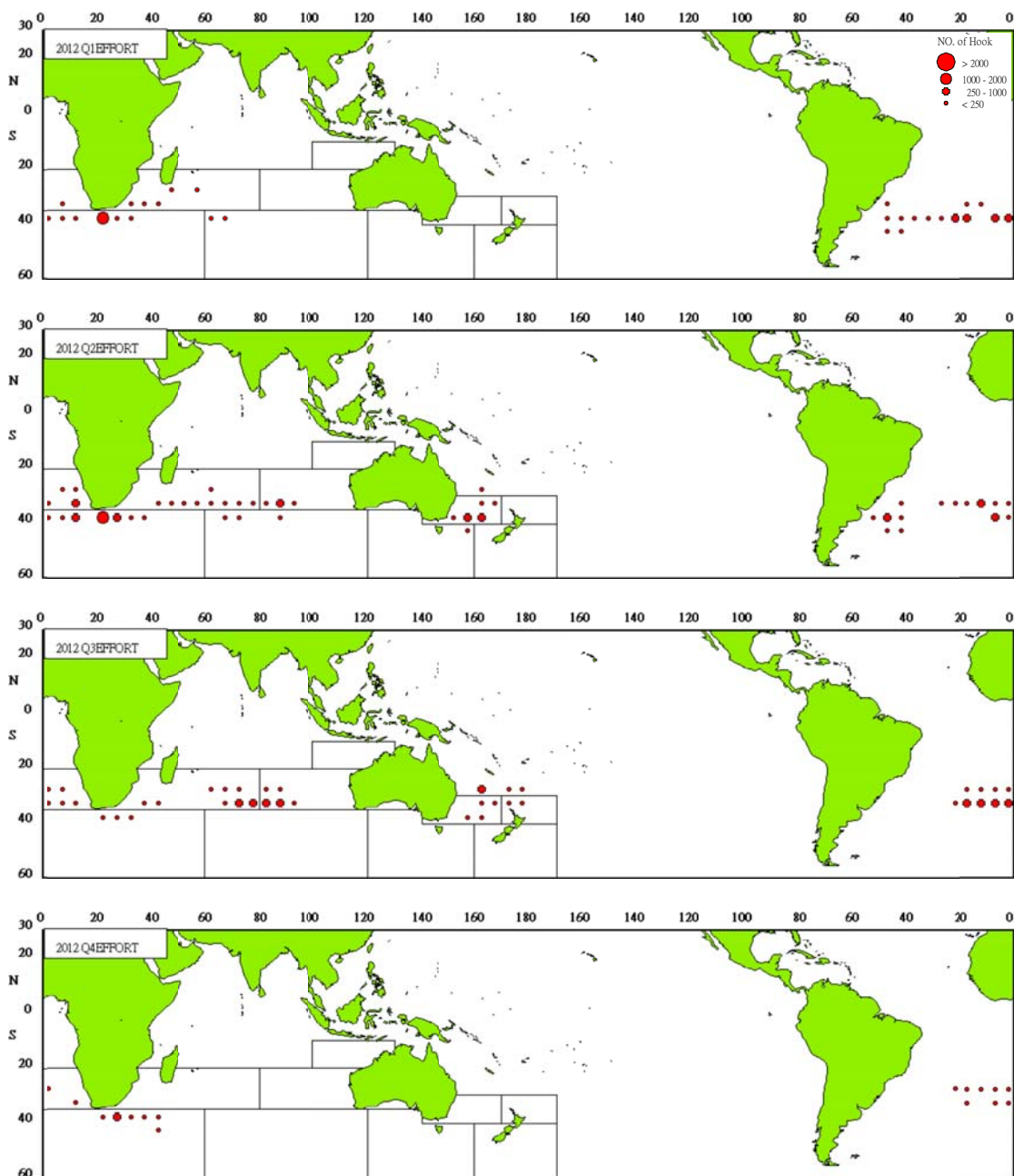


Fig.6 (2) Fishing efforts distributions by quarter of Taiwanese SBT longline fishery in 2012

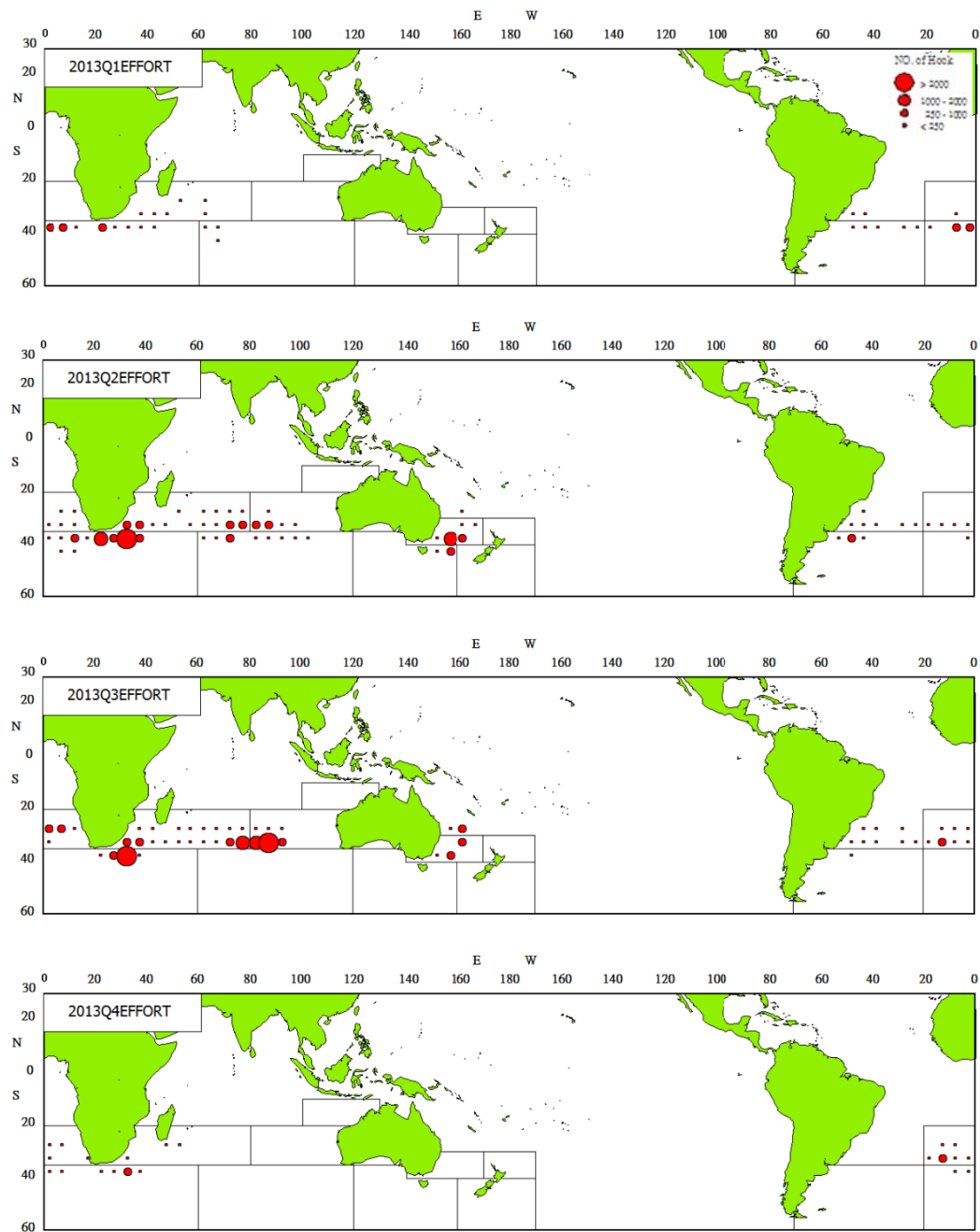


Fig.6 (3) Fishing efforts distributions by quarter of Taiwanese SBT longline fishery in 2013

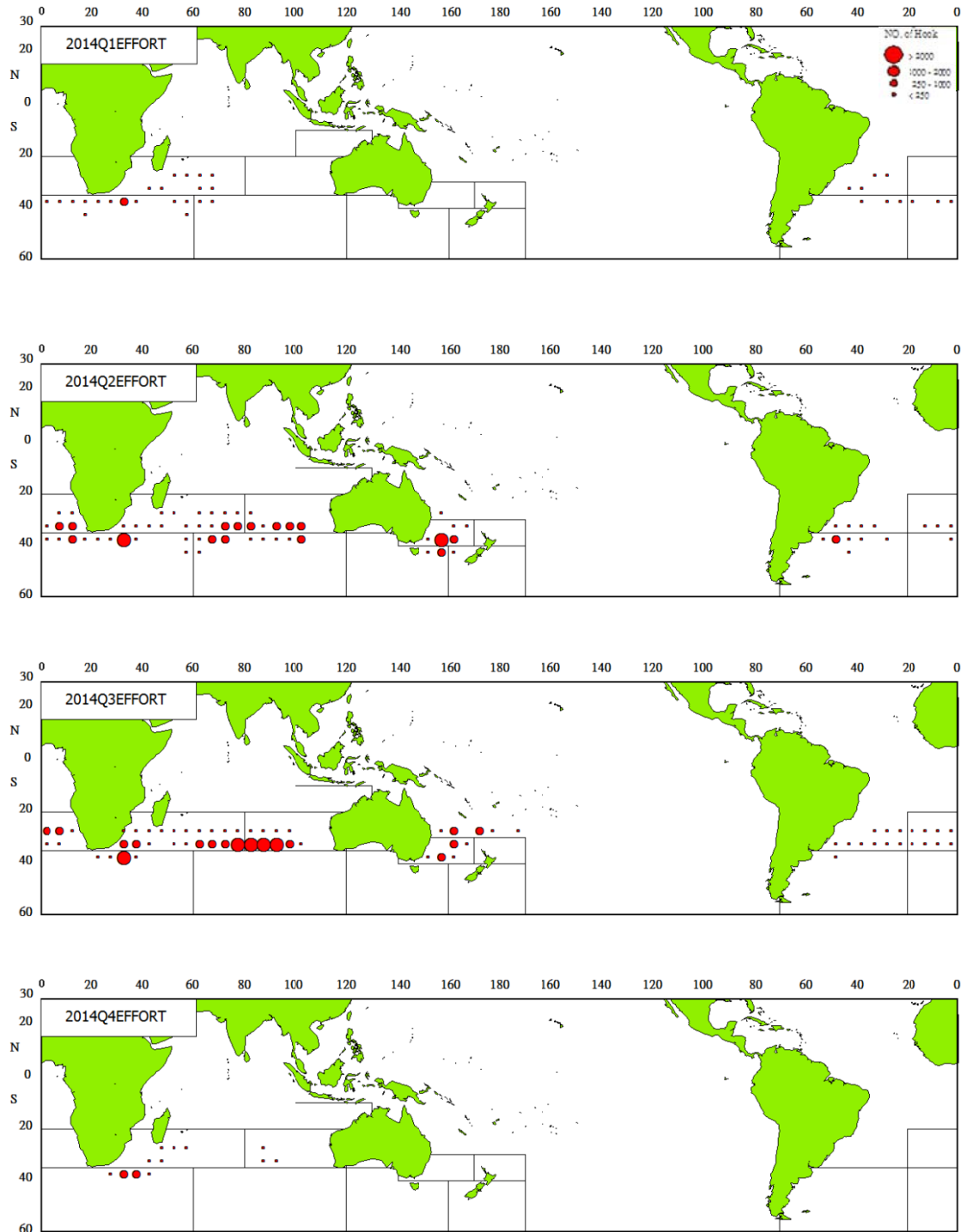


Fig.6 (4) Fishing efforts distributions by quarter of Taiwanese SBT longline fishery in 2014



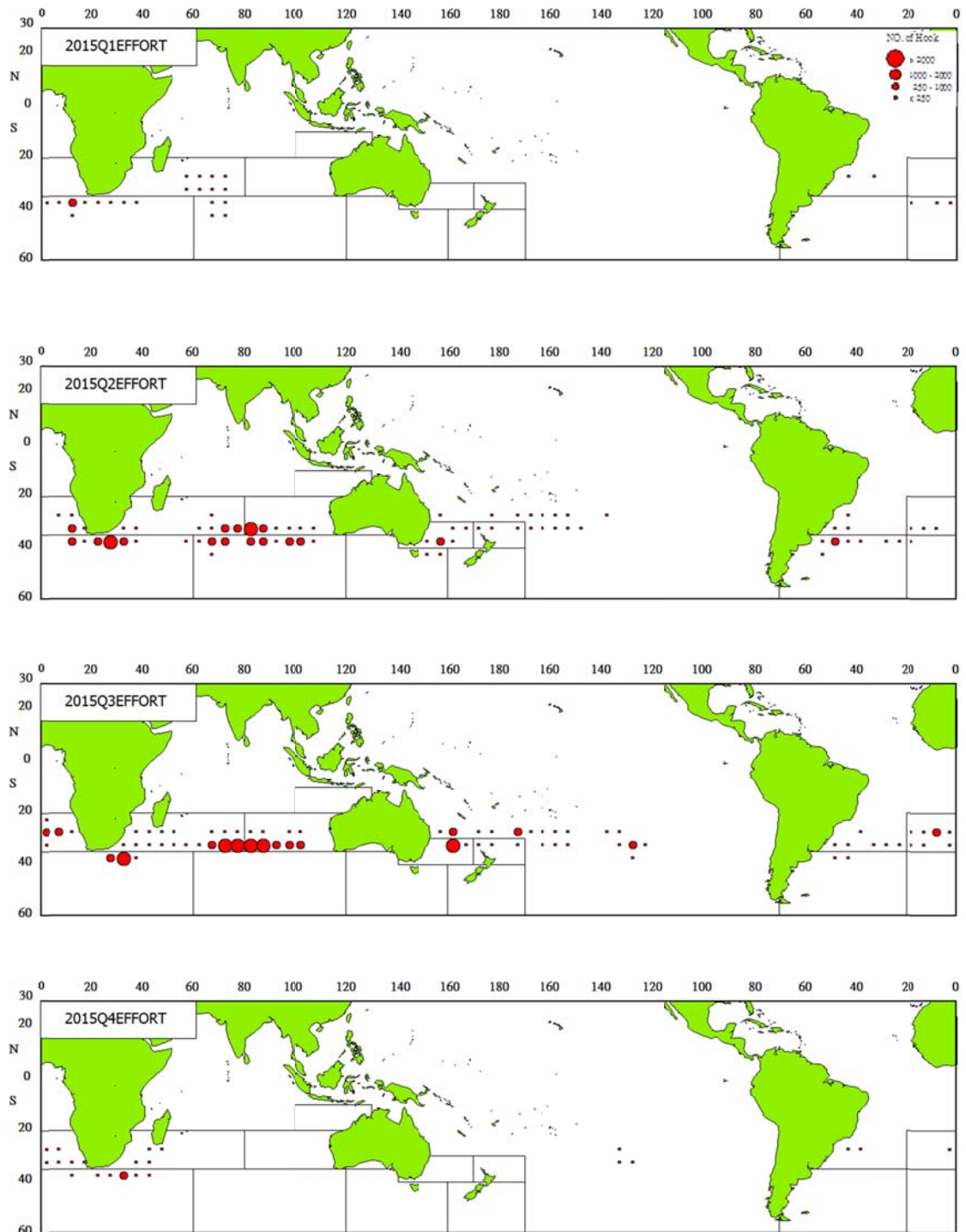


Fig.6 (5) Fishing efforts distributions by quarter of Taiwanese SBT longline fishery in 2015

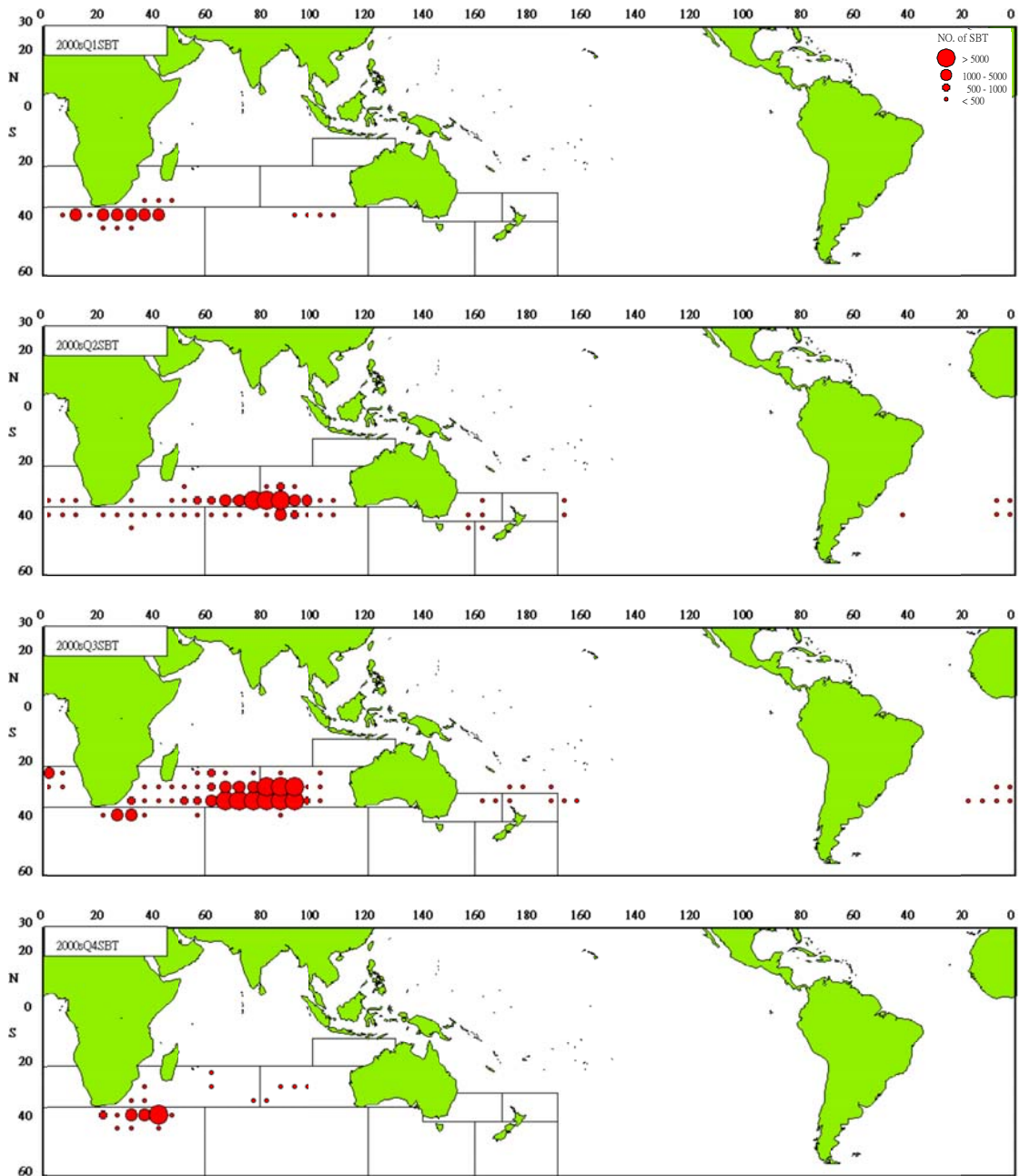


Fig.7 (1) SBT catch (in number) distributions by quarter of Taiwanese SBT longline fishery in 2000s

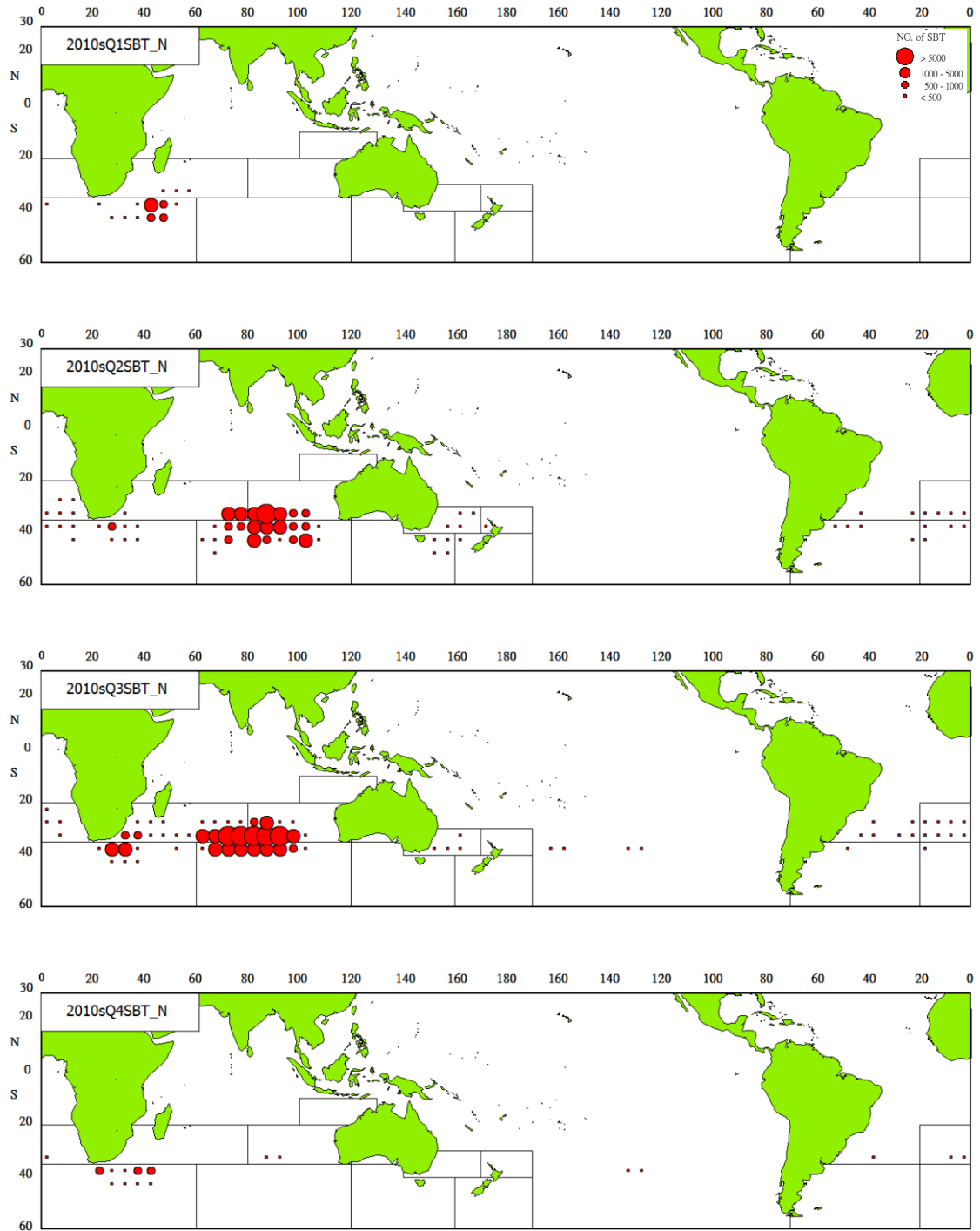


Fig.7 (2) SBT catch (in number) distributions by quarter of Taiwanese SBT longline fishery during 2010-2015

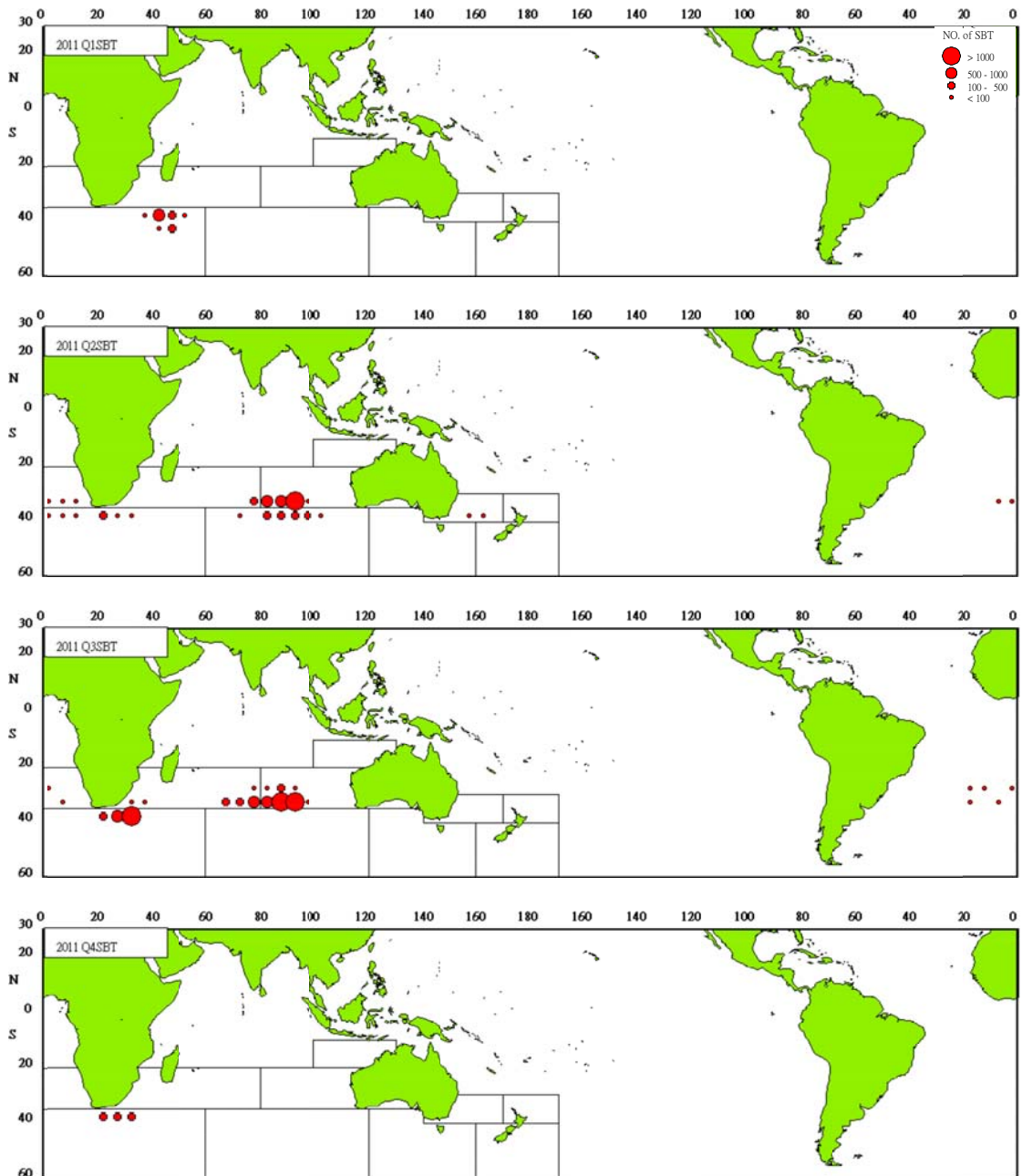


Fig.8 (1) SBT catch (in number) distributions by quarter of Taiwanese SBT longline fishery in 2011

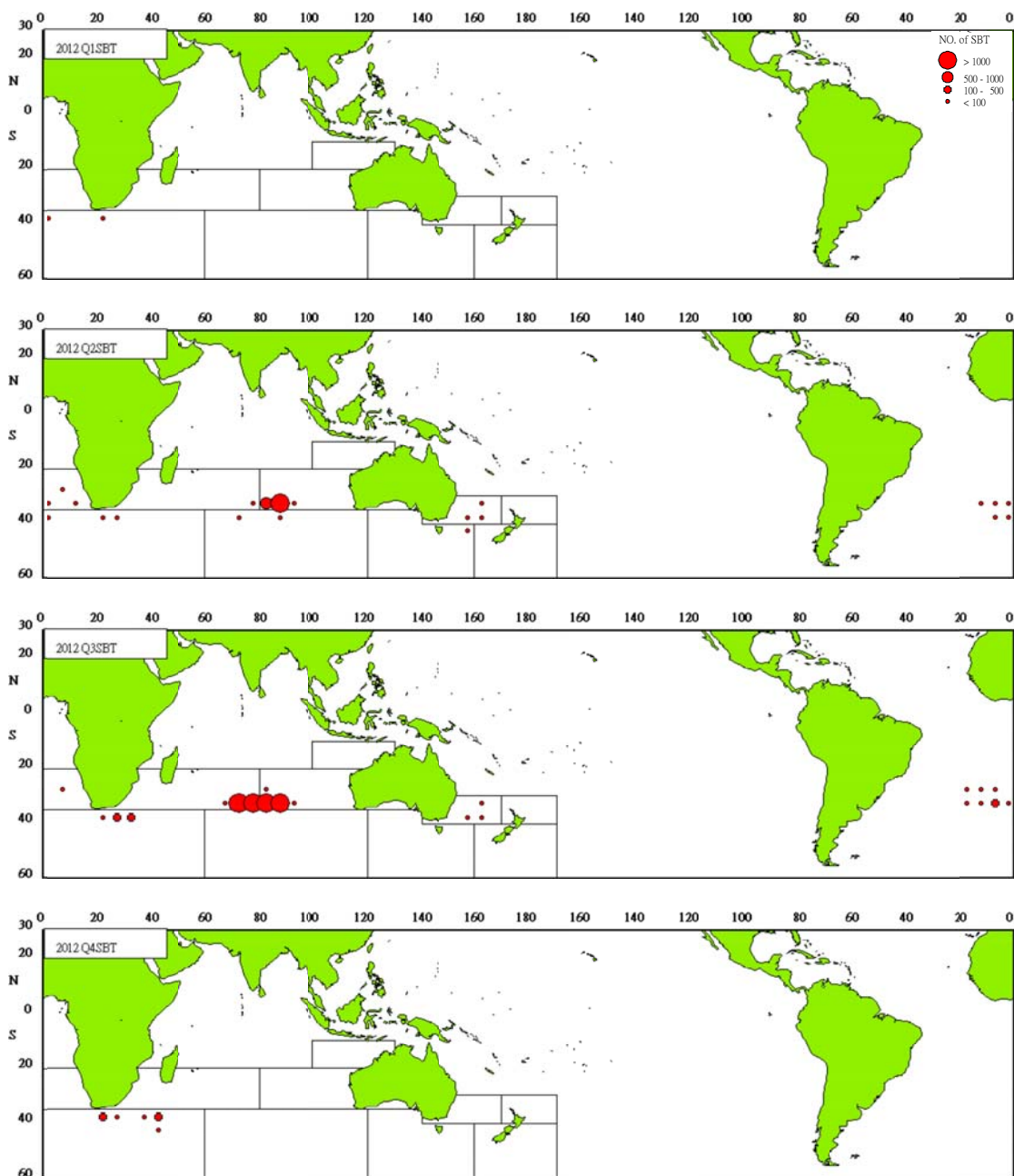


Fig.8 (2) SBT catch (in number) distributions by quarter of Taiwanese SBT longline fishery in 2012

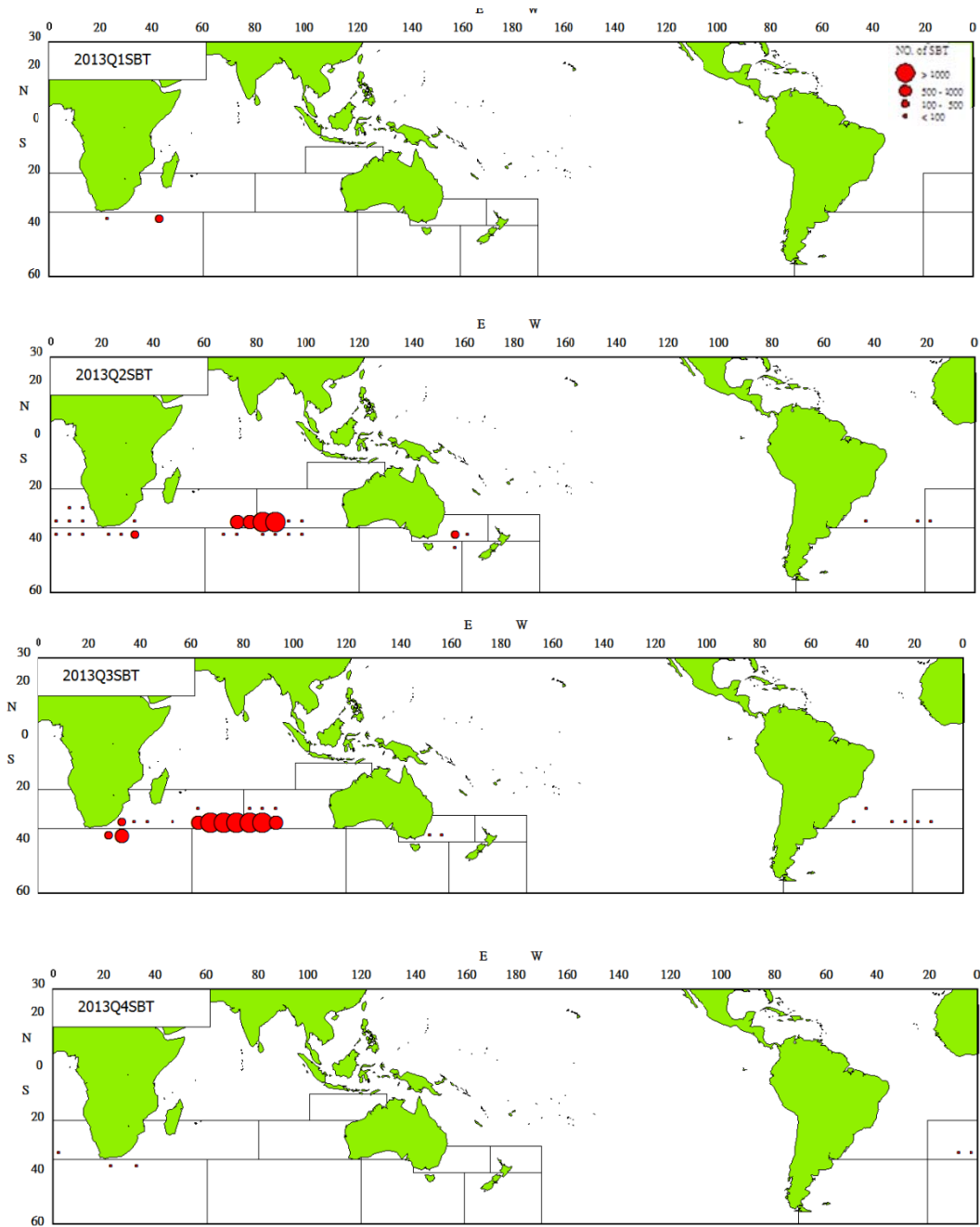


Fig.8 (3) SBT catch (in number) distributions by quarter of Taiwanese SBT longline fishery in 2013

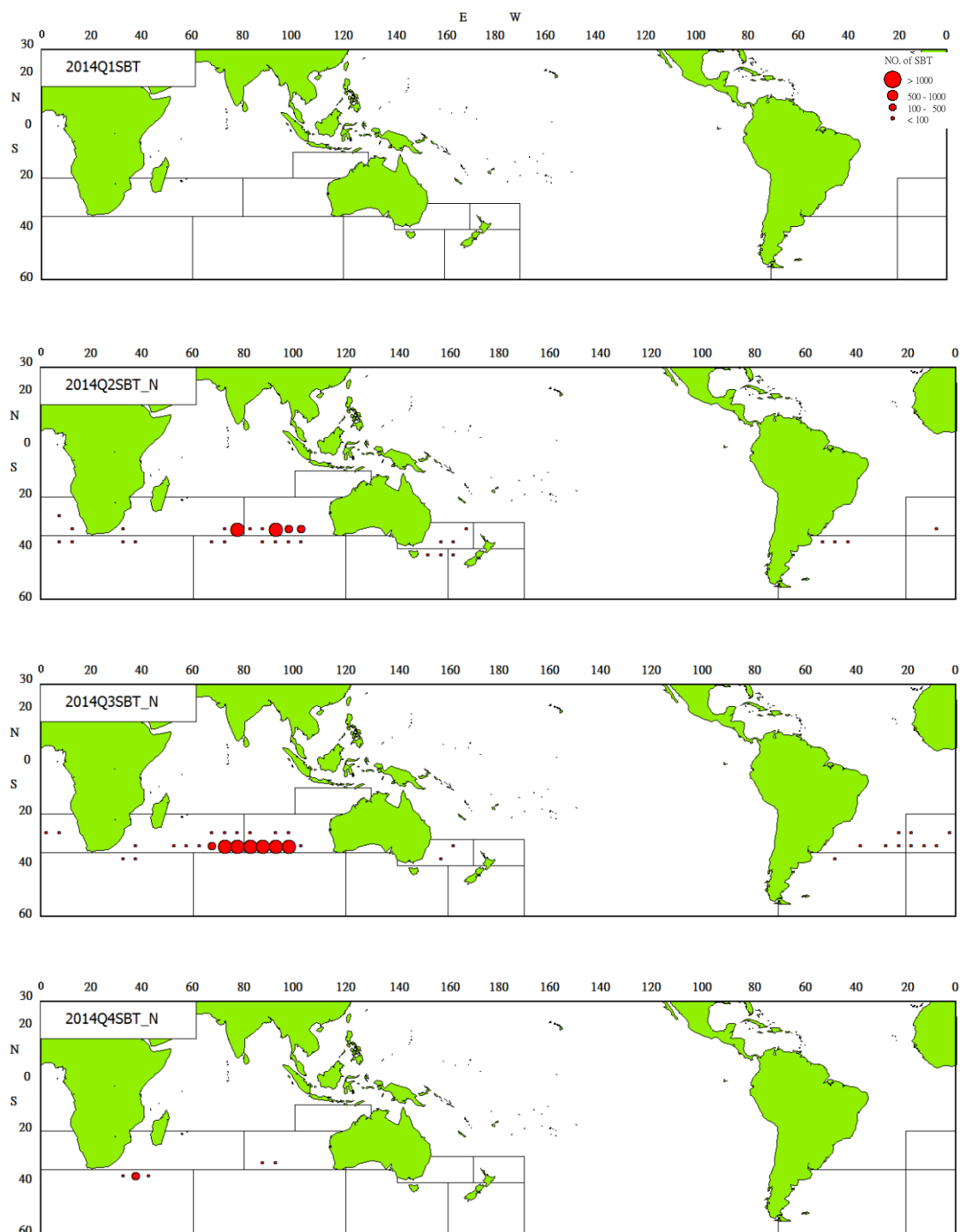


Fig.8 (4) SBT catch (in number) distributions by quarter of Taiwanese SBT longline fishery in 2014

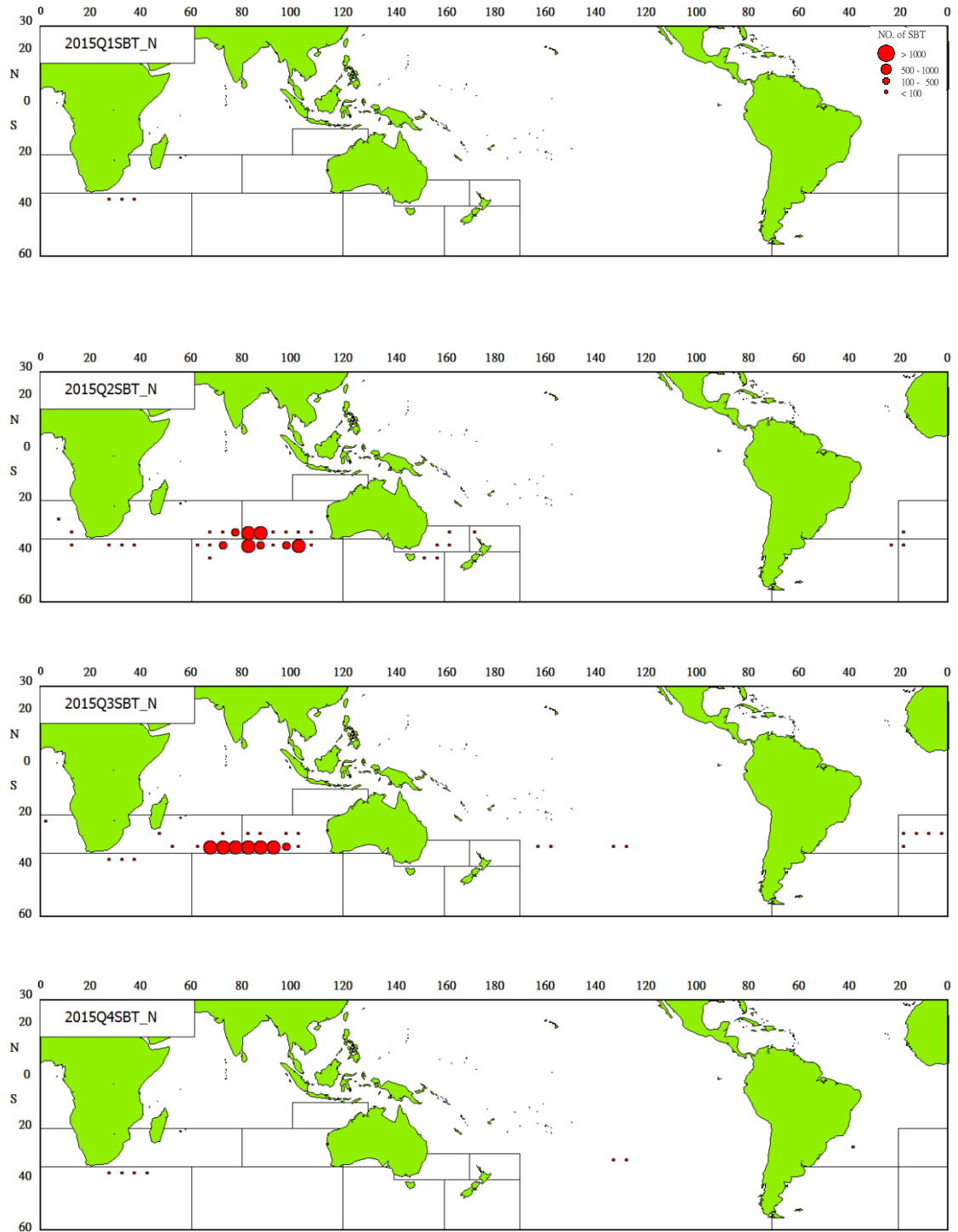


Fig.8 (5) SBT catch (in number) distributions by quarter of Taiwanese SBT longline fishery in 2015



## Appendix 1

### Scientific observer program

#### **Observer Training**

To collect scientific information of tuna longliners, the scientific observer program of large scale tuna longline fishery of Taiwan was launched in 2001. However, observers started being deployed on board and conducting the observation program of SBT in the next year.

Fisheries Agency (FA) is responsible for implementing the program and recruiting scientific observers. FA also invited researchers on fishery sciences and senior observers (with 2-years' experience) to form a special panel for designing the observer training program, items of observation, biological and by-catch information to be collected for scientific researches and the format of data records.

The qualification for observers is college graduated or senior high school graduated with at least 5-year experience on-board, and they are required the competence to live and work at sea. Candidate observers who have passed the oral examination will have to take a 3-week training program, and only those who pass the training program and medical check will be qualified and deployed on board as scientific observers.

Observer training program includes basic safety training for seafaring, operations of navigation devices, mini-log thermometer and VMS system, identification of tunas, tuna-like species, sea turtles, seabirds, sharks and marine mammals, sampling skill for muscle tissue, otolith, stomach content and gonad, and data collection for fishing activities, catches and locations. Besides, there would be a reeducation program for observers to support the scientific investigation. After the training program, they are required to undergo at sea training on a training ship for one week and have a test in identifying tuna and tuna-like species at local fish market. In 2014 and 2015, 66 and 58 employed observers have finished the program respectively.

## **Scientific Observer Program Design and Coverage**

At the initial stage, for the purpose of encouraging industries to join the observer program, the observed vessels were offered reward catch quota after completing the observation cruise, if they fully cooperated with the observer's duties. However, this measure has been put an end since 2007. It is regarded as the obligation of industries to accept observer on board and the vessels were selected to carry observer by lotting. Since 2008, observers have been requested to accept a debriefing after completing the trip.

Table 1 shows the summary of observed catch and effort by area and month during 2014-2015. The threat of Somalia piracy still exists in the tropical Indian Ocean. For the safety of observer, most of our observers deployed on fishing vessels which operate in the southern Indian Ocean, so that the observer coverage rate for SBT fishing vessels increased significantly. In 2014 calendar year, 11 observers were deployed on 11 fishing vessels authorized to target SBT seasonally and there were 1,737 fishing days and observed days were 1,696. There were 13 observers being deployed on 13 fishing vessels authorized in 2015 and there were 1,520 fishing days and observed days were 1,343. In 2014, the coverage rates accounted for 15.49% by vessels, 14.20% by hooks and 13.10% by catch. The coverage rates by vessels increased to 18.06% in 2015, by hooks and by catch have declined as 10.34% and 11.67% separately.

## **Observer Data Collected**

The data recorded by observer on board includes 3 categories: vessel and gear attributes, set details and by-catch/incidental catch information (including sighting of marine mammals, sea turtles and sea birds).

The biological samples, including measurement of weight, length of all fishes during observed time, and collection of otoliths, muscle tissues, stomach and gonads of SBT, were carried out by observers on board. Table2 shows the summary of biological samples by species collected by observers from 2014 to 2015. Total number of the length measured for SBT in 2014 and 2015 were 3,313 and 3,804 respectively. Number of otolith collected for SBT by observer was increased to 213 in

2015. In 2014 and 2015, numbers of the length measured for per species were summarized by area and month as Table3.

### **Tag Return Monitoring**

Since 2008, there was no tagged SBT recaptured during the presence of observer on board except in 2012. In 2012, there was one tagged SBT recaptured during the presence of observer on board and there was no tagged SBT recaptured in 2013 and 2014. In 2015, there was one tagged SBT recaptured by the vessel targeting SBT seasonally. The tags returned by Taiwanese fishing vessels are 778 in total among which 692 were released by the CCSBT and 86 tagged by CSIRO during 2002-2015. The details of tag recaptures for each year are shown in Table 4. The returned tags and the related information were sent to the CCSBT Secretariat.

### **Problems Experienced**

Although the program was fully supported by boat owners and skippers of SBT observed vessels, there are still some difficulties that could not be resolved technically. Since the homeport is far from the fishing ground, it will take more than 1 month to transport the supplies and equipment needed for sampling from Taiwan to fishing ground, and sometimes the supplies could not reach to observers on board in time. Besides, samples collected by observers are sometimes lost when they are transferred by transshipping vessels. In addition, it is also difficult to arrange interviews with skippers for collecting information on fishing activities since these SBT fishing vessels seldom return to Taiwan when they finished SBT fishing.

Table 1 Summary of observed catch and effort by area and by month

## (a) 2014 (calendar year)

Area	Month	Number s of vessels observed	Number s of all vessels	Cover rate for the number of vessels	Number of hooks used by observed vessels	Number of hooks by all vessels	Cover rate for the number of hooks	Number of SBT observed	Number of SBT by all vessels	Cover rate for the number of SBT
<b>Area2</b>	<b>Total</b>	<b>7</b>	<b>24</b>	<b>29.17%</b>	<b>1032278</b>	<b>6336522</b>	<b>16.29%</b>	<b>2263</b>	<b>15872</b>	<b>14.26%</b>
	4	1	1	100%	2025	8700	23%	0	0	-
	5	6	13	46%	158349	553927	29%	157	521	30%
	6	6	20	30.00%	276660	1489796	18.57%	507	2645	19.17%
	7	6	21	29%	286649	1822292	16%	793	4275	19%
	8	6	22	27.27%	302479	1949549	15.52%	778	6583	11.82%
	9	1	9	11.11%	6116	492138	1.24%	28	1785	1.57%
	10	-	1	-	-	20120	-	-	63	-
<b>Area8</b>	<b>Total</b>	<b>10</b>	<b>23</b>	<b>43.48%</b>	<b>437689</b>	<b>1752979</b>	<b>24.97%</b>	<b>106</b>	<b>453</b>	<b>23.40%</b>
	3	-	2	-	-	54080	-	-	0	-
	4	8	16	50.00%	206519	755407	27.34%	13	74	17.57%
	5	10	23	43.48%	231170	929692	24.87%	93	361	25.76%
	6	-	2	-	-	13800	-	-	18	-
<b>Area9</b>	<b>Total</b>	<b>2</b>	<b>17</b>	<b>11.76%</b>	<b>42995</b>	<b>4270561</b>	<b>1.01%</b>	<b>9</b>	<b>1041</b>	<b>0.86%</b>
	1	-	2	-	-	87750	-	-	0	-
	2	-	1	-	-	108880	-	-	0	-
	3	1	5	20.00%	17520	314606	5.57%	0	0	-
	4	1	9	11.11%	7440	454172	1.64%	0	38	0.00%
	5	1	12	8.33%	1935	496926	0.39%	0	136	0.00%
	6	1	10	10%	16100	573912	3%	9	61	15%
	7	-	7	-	-	255659	-	-	16	-
	8	-	6	-	-	225771	-	-	31	-
	9	-	4	-	-	387745	-	-	0	-
	10	-	5	-	-	580990	-	-	0	-
	11	-	5	-	-	437445	-	-	388	-
	12	-	4	-	-	346705	-	-	371	-
<b>Area14</b>	<b>Total</b>	<b>8</b>	<b>32</b>	<b>25%</b>	<b>1024450</b>	<b>5508930</b>	<b>19%</b>	<b>1067</b>	<b>8934</b>	<b>12%</b>
	1	-	1	-	-	12000	-	-	0	-
	2	-	3	-	-	22030	-	-	0	-
	3	1	2	50.00%	1890	16940	11.16%	0	0	-
	4	6	17	35.29%	112405	449717	24.99%	10	48	20.83%
	5	6	20	30.00%	284652	1284659	22.16%	241	1143	21.08%
	6	7	25	28.00%	306592	1672318	18.33%	308	1882	16.37%
	7	7	28	25.00%	247001	1348327	18.32%	488	4030	12.11%
	8	4	18	22.22%	71910	618939	11.62%	20	1831	1.09%
	9	-	2	-	-	39000	-	-	0	-
	10	-	1	-	-	45000	-	-	0	-
	11	8	32	25%	1024450	5508930	19%	1067	8934	12%
	12	-	1	-	-	12000	-	-	0	-
<b>Grand Total</b>		<b>11</b>	<b>71</b>	<b>15.49%</b>	<b>2537412</b>	<b>17868992</b>	<b>14.20%</b>	<b>3445</b>	<b>26300</b>	<b>13.10%</b>

\*The areas which had observer deployed were appeared.

**(b) 2015 (calendar year)**

Area	Month	Number s of vessels observed	Number s of all vessels	Cover rate for the number of vessels	Number of hooks used by observed vessels	Number of hooks by all vessels	Cover rate for the number of hooks	Number of SBT observed	Number of SBT by all vessels	Cover rate for the number of SBT
<b>Area2</b>	<b>Total</b>	10	40	25%	629551	6291714	10.01%	2411	15049	16.02%
	5	2	10	20%	8070	162880	4.95%	-	379	-
	6	10	37	27.03%	251993	1795007	14.04%	796	6247	12.74%
	7	8	31	25.81%	254003	2058390	12.34%	1208	5394	22.40%
	8	2	18	11.11%	97320	1700420	5.72%	367	1753	20.94%
	9	2	14	14.29%	18165	575017	3.16%	40	1276	3.13%
<b>Area8</b>	<b>Total</b>	8	33	24.24%	314793	3699830	8.51%	347	7595	4.57%
	2	-	2	-	-	24702	-	-	0	-
	3	-	3	-	-	94494	-	-	0	-
	4	4	23	17.39%	103477	1163918	8.89%	38	1332	2.85%
	5	8	29	27.59%	187573	1847746	10.15%	222	4667	4.76%
	6	4	22	18.18%	23743	568970	4.17%	87	1596	5.45%
<b>Area9</b>	<b>Total</b>	3	15	20.00%	174149	3146410	5.53%	25	895	2.79%
	1	-	2	-	-	234565	-	-	288	-
	2	-	2	-	-	99336	-	-	138	-
	3	-	1	-	-	7600	-	-	0	-
	4	1	5	20%	12630	169442	7.45%	-	0	-
	5	-	8	-	-	291025	-	-	38	-
	6	-	9	-	-	420550	-	-	39	-
	7	-	7	-	-	256480	-	-	21	-
	8	-	7	-	-	433280	-	-	44	-
	9	-	4	-	-	391070	-	-	0	-
	10	1	4	25%	20385	388740	5.24%	-	0	-
	11	2	5	40%	61247	184260	33.24%	14	159	8.81%
	12	2	3	66.67%	79887	270062	29.58%	11	168	6.55%
<b>Area14</b>	<b>Total</b>	9	35	25.71%	822119	5634930	14.59%	1028	9124	11.27%
	3	2	6	33.33%	21246	113784	18.67%	-	0	-
	4	1	5	20%	2115	43000	4.92%	-	10	-
	5	5	15	33.33%	128752	636916	20.21%	5	8	62.50%
	6	7	22	31.82%	123610	805120	15.35%	80	1507	5.31%
	7	7	29	24.14%	222392	1963660	11.33%	590	4830	12.22%
	8	7	26	26.92%	277821	1718760	16.16%	338	2133	15.89%
	9	3	14	21.43%	46183	308830	14.95%	15	636	2.36%
	10	-	2	-	-	44860	-	-	0	-
<b>Grand Total</b>		13	72	18.06%	1940612	18772884	10.34%	3811	32663	11.67%

\*The areas which had observer deployed were appeared.

Table 2 Number of biological samples collected by observers in 2014 and 2015

Year		2014	2015
SBT catch data recorded		3445	3811
SBT length measured		3313	3804
Otolith	SBT	148	213
Gonad	SBT	162	149
Head	SBT	83	72
Muscle	Albacore	130	105
	Marlin	0	1
	Sharks	12	51
	Butterfly kingfish	0	1
	Tunas	0	1
Vertebra	Sharks	51	77
	Albacore	145	0
	Marlin	0	1
First dorsal fin spine	Albacore	165	128
Clasper	Sharks	7	0
Embryo	Sharks	0	1
Scales	Albacore	24	960

Table 3 Number of the length measured for per species by area and by month  
(a) 2014

Area	Area 2						Area 8		Area 9				Area 14					
	4	5	6	7	8	9	4	5	3	4	5	6	4	5	6	7	8	9
Albacore	25	3182	5352	4130	2718	40	6048	7821	370	163	37	812	12	2727	6335	7509	3473	719
Bigeye tuna	-	39	87	224	263	6	76	133	8	6	-	17	-	372	917	740	389	123
Black marlin	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Pomfrets	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-	-	-
Blue shark	-	13	18	34	44	-	59	51	13	4	1	-	1	15	18	10	11	25
Butterfly kingfish	-	5	5	1	-	-	6	3	1	-	-	-	-	-	4	-	-	-
Rudderfish	-	-	1	-	-	-	7	6	-	-	-	-	-	1	4	3	2	-
Common dolphinfish	3	1	6	1	1	-	41	1	2	-	-	-	-	6	5	3	1	2
Opah	-	503	515	700	671	27	535	731	18	7	3	143	-	113	208	188	99	20
Escolar	-	69	105	124	83	-	28	85	4	3	-	6	1	36	160	254	130	21
Longfin mako	-	-	1	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Striped marlin	-	-	-	-	1	-	1	-	-	-	-	-	-	-	3	2	-	-
Ocean sunfis	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Oilfish	-	1	2	3	-	-	3	1	2	1	-	2	-	1	10	13	18	3
OTH	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Southern bluefin tuna	-	156	507	791	778	28	13	93	-	-	-	9	-	10	111	312	485	20
Skipjack tuna	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shortfin mako	-	5	4	11	6	-	4	4	1	-	-	-	-	-	-	-	-	-
Longbill Spearfish	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Shortbill Spearfish	-	-	3	-	5	-	2	4	1	-	1	-	-	9	3	7	9	-
Swordfish	-	18	45	45	33	1	4	21	-	-	-	2	-	7	36	45	13	2
Tunas nei	-	-	-	2	-	-	1	-	-	-	-	-	-	-	-	1	3	-
Wahoo	-	-	7	1	7	-	2	24	-	-	-	-	-	68	46	30	57	6
Yellowfin tuna	-	-	1	-	-	-	3	7	3	1	1	1	-	31	21	51	11	3

\*The areas which had observer deployed were appeared.

**(b) 2015**

Area	Area 2					Area 8			Area 9				Area 14						
	4	5	6	7	8	4	5	6	4	10	11	12	3	4	5	6	7	8	9
<b>Albacore</b>	93	2513	1779	492	67	971	2174	344	86	0	11	51	54	13	1947	1436	2016	2305	301
<b>Bigeye tuna</b>	8	95	55	24	7	28	104	5	1	2	19	27	2	-	209	208	216	420	86
<b>Black marlin</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
<b>Pomfrets</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-
<b>Blue shark</b>	-	13	2	-	-	54	15	7	3	6	1	15	14	1	23	8	18	64	68
<b>Butterfly kingfish</b>	-	2	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	-
<b>BUM</b>	-	-	-	1	-	-	1	-	-	-	-	-	-	-	2	-	-	-	-
<b>Rudderfish</b>	-	2	1	-	-	-	1	-	-	-	-	-	-	-	-	-	1	7	-
<b>Common dolphinfish</b>	-	3	1	-	-	2	2	-	6	-	1	-	17	-	13	1	1	12	-
<b>Opah</b>	-	281	383	149	31	154	399	69	6	2	13	5	1	-	34	60	105	134	30
<b>Escolar</b>	4	72	90	47	11	13	12	18	-	61	215	273	1	-	74	78	184	203	17
<b>Longfin mako</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
<b>Striped marlin</b>	-	1	1	-	-	-	-	1	-	-	-	-	2	1	15	3	2	-	-
<b>Oilfish</b>	-	3	9	-	-	1	4	-	-	536	926	1259	-	-	2	4	7	8	-
<b>Southern bluefin tuna</b>	-	796	1208	367	40	38	222	87	-	-	9	9	-	-	5	80	590	338	15
<b>Shortfin mako</b>	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-
<b>Skipjack tuna</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<b>Shortfin mako</b>	-	10	2	7	-	2	4	4	-	-	1	1	-	-	8	3	4	4	-
<b>Longbill spearfish</b>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Shortbill spearfish</b>	-	4	3	-	1	1	3	-	-	-	-	-	-	-	5	6	4	16	-
<b>Swordfish</b>	-	20	10	5	1	6	5	6	-	1	-	1	-	-	17	25	51	56	2
<b>Tunas nei</b>	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Wahoo</b>	2	12	3	2	-	1	22	6	-	-	-	-	-	-	165	73	3	73	6
<b>Yellowfin tuna</b>	-	2	-	-	-	-	9	-	1	1	1	-	2	-	59	42	20	70	9

\*The areas which had observer deployed were appeared.



Table 4 Number of SBT tag returned during 2002-2015

Year	Total	
	CCSBT	CSIRO
2002	18	16
2003	42	18
2004	133	21
2005	229	25
2006	259	6
2007	40	0
2008	5	0
2009	0	0
2010	27	0
2011	13	0
2012	5	0
2013	5	0
2014	1	0
2015	1	0
<b>Grand Total</b>	<b>778</b>	<b>86</b>