

**Tropical tunas from Foreign Tuna Fleets Unloading in Phuket,
Thailand During 1995-2011**

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ABSTRACT

Two types of foreign tuna fleets have unloaded in Phuket, Thailand since 1995 to present, namely surface tuna longliner and tuna purse seiner.

Surface tuna longline caught the mainly as yellowfin tuna, bigeye tuna, miscellaneous species and bill fish, which the proportion were 63, 21, 7 and 5% of total landing during 1995 to 2011. The main fishing ground was in the north-east Indian Ocean. In 2011, the total landing of yellowfin tuna, miscellaneous species, bigeye tuna and bill fish were 3,810, 1,135, 507 and 66 mts. Taking in to account of the percentage of main target species, yellowfin tuna fluctuated during 1995 to 2002 with the peak of 80.8% of total landing in 1998, while the percentage of bigeye tuna fluctuated opposite with yellowfin tuna during 1995 to 2002 with the peak of 49.7% of total landing in 2002, after then, it continued downward trend to 11.8% of total landing in 2007, increased to 22.9% in 2008 and decreased lowest to 4% in 2010. Taiwanese longliner was the mainly unloaded at Phuket fishing port, followed by Indonesian longliner.

Tuna purse seiner caught mainly skipjack, yellowfin tuna and bigeye tuna during 2003 to 2011 were 18,797 (62.4%), 4,837 (16.1%) and 6,339 mts (21.5%). The total catch of the three species during 2003 to 2011 were varied from 1,735 to 29,973 mts. There was a few of bycatch which the most frequented observed species was triggerfish, *Abalistes stellaris*. The main fishing ground of this gear was the eastern Indian Ocean.

Size distribution of yellowfin tuna (40 to 190 cm) and big eye (30 to 170 cm) from both fleets in 2011 showed small size of tuna caught from purse seine and large size caught from surface longliner. One mode of size distribution show from both fleets. Large size (110 to 190 cm) of yellowfin tuna caught from surface longliner during January to March and October to December, whereas bigeye tuna caught large size (100 to 120 cm). Size distribution of skipjack ranged from 31 to 65 cm caught from purse seiner, small size recruited to fishing ground in the eastern Indian Ocean during July to September.

INTRODUCTION

Tropical tunas are among the largest, most specialized and commercially important of all fishes (Collette and Nauen, 1983). Belonging to the genus *Thunnus* of the family Scombridae, they are found in temperate and tropical oceans around the world and account for a major proportion of the world fishery products. Tunas are in great demand throughout the world market due to their excellent meat quality (FAO, 1997). The tuna industry has been a successful operation in the past. However, problems on the fishing stock status have occurred due to the recently increased intensity.

There is an urgency to conserve the tuna resources due to the awareness of decreasing tuna stocks (Fonteneau, 1995, 1997; Hsu, 1994, 1998). Although the data for the tropical tuna species have been accumulated for a long time, uncertainties exist, especially in the Eastern Indian Ocean. Information on where and when tunas occur can be critical for resource management and practical for fishery vessels. To better conserve and maintain a sustainable yield of these species, there is a need to understand large-scale patterns of tuna stocks in all the Indian Ocean.

The tuna longliners and tuna purse seine landed in Singapore, Malaysia and Indonesia until 1994, after then, tuna catch production were unloaded at the Phuket fishing port which has well-developed infrastructures such as the landing port, processing plant, as well as the facility of international airport. In addition, the tuna purse seiners landed in Phuket for supplying tuna canning factories industrial in Thailand.

MATERIALS AND METHODS

For longliner landing survey were conducted monthly at the Phuket fishing port to collect data of tuna, tuna-like and by-catch species: e.g., landing catch (metric ton, mt), effort (number of trips), fishes were random to be measured the individual body weight (kg) and folk length (FL) were conducted.

For purse seiners landing survey, the fishing master was interviewed and logbook was asked for to acquire the data of catch (metric ton, mt), effort (number of operating sets), fishing ground and etc. Port-sampling were conducted to measure the individual body weight (kg), folk length (FL) (cm).

The unloaded quantity and value of fish from each vessel was verified with the data from customs office in Phuket.

RESULT AND DISCUSSION

1. Fresh Tuna Longliners

The fishing effort increased steadily from 187 trips in 1995 to the peak of 883 trips in 1999, after then it fluctuated in narrow scope and continuously decreased into 375 trips in 2011. The whole figure of total landing catch during 1995 to 2011 showed the increasing trend (1,416 to 5,543 mts) although it showed some distinct decreased in between, which decreased from 4,373 mts in 1999 to 3,118 mts in 2000 and decreased from 5,953 in 2005 to 4,830 mts in 2006. The landing per trip decreased opposite with the total landing catch and the fishing effort during 1995 to 1996 (from 8 into 5 mts/trip) after then it's steady until 2001 and increased continuously into 13 mts in 2009 (Figure 1 and 2). Due to fuel crisis since July 2003 to 2011, the longliners reduced their cost by transshipment at sea with other contracting fishing vessel, for this reason the fishing vessel could stay and fish longer at sea.

The main species composition were yellowfin tuna (YFT), bigeye tuna (BET), miscellaneous species (MSC) (Sharks, *Lepidocybium* spp., *Coryphaena* spp., *Thunnus alalunga*, *Molar* spp., *Ruretlus pretiosus*, *Sphyrna* spp. and *Taractichtis* spp.) and bill fish (BILLs) (*Makaira* spp., *Tetrapturus* spp, *Istiophorus* spp.) with the average composition 63 21 7 and 5% of total landing respectively, while swordfish (SWO) contributed 4% of the total landing during 1995 to 2011. The total landing of yellowfin tuna, miscellaneous species, bigeye tuna and bill fish in 2011 were 3,810 1,135 507 and 66 mts, respectively (Figure 3). Taking in to account of the percentage of main target species, yellowfin tuna fluctuated during 1995 to 2002 with the peak of 80.8% of total landing in 1998, while the percentage of bigeye tuna fluctuated opposite with yellowfin tuna during 1995 to 2002 with the peak of 49.7% of total landing in 2002, after then, it continued downward trend to 11.8% of total landing in 2007, increased to 22.9% in 2008 and decreased lowest to 4% in 2010. It was to be remarked that the declaration of sharks were disappear since 2000 while the miscellaneous fish was declared as frozen mixed fish and indicated more significant. In 2011, the frozen mixed fish accounted 20.5% of the total landing catch (Figure 4).

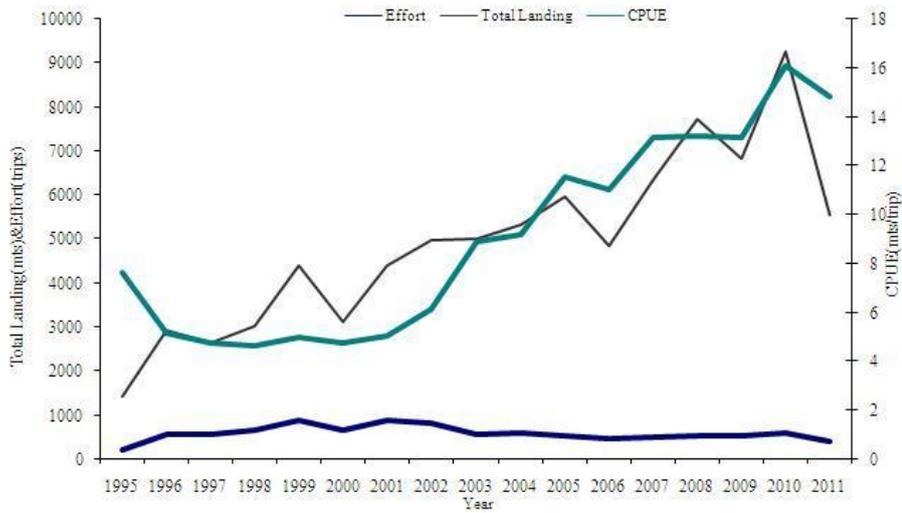


Figure 1 Change of fishing effort, total landing catch (mts), and CPUE (mts/trip) of longliner from 1995 to 2011.

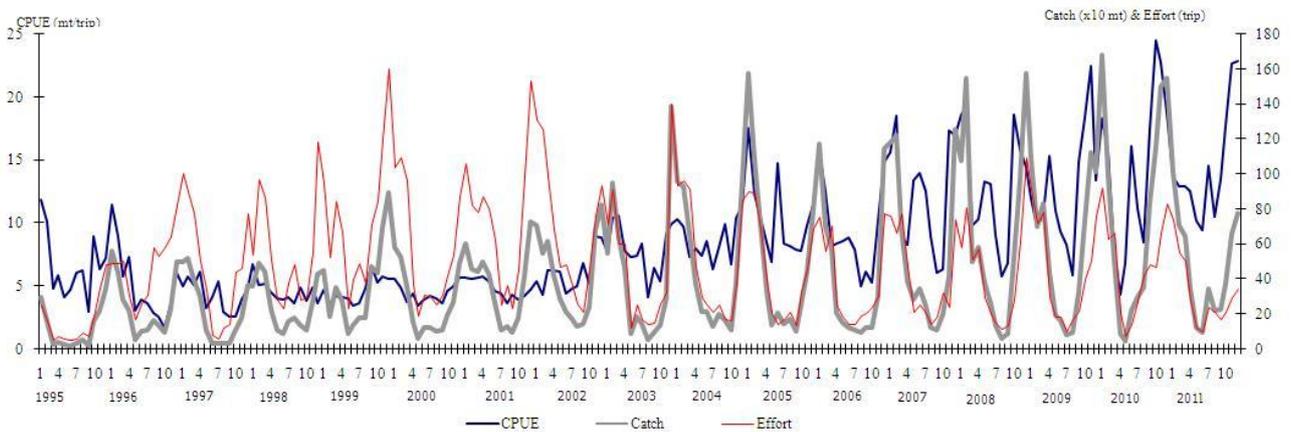


Figure 2 Changes of CPUE (mts/trip), total landing catch (mts) and fishing effort (trip) of longline fleets from 1995 to 2011.

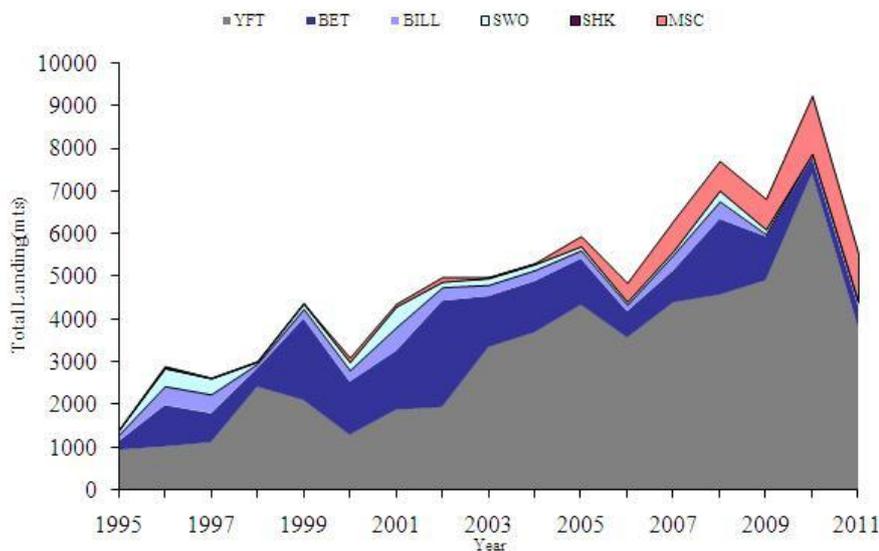


Figure 3 Total landing catch from long liners categorized by species, during 1995 to 2011.

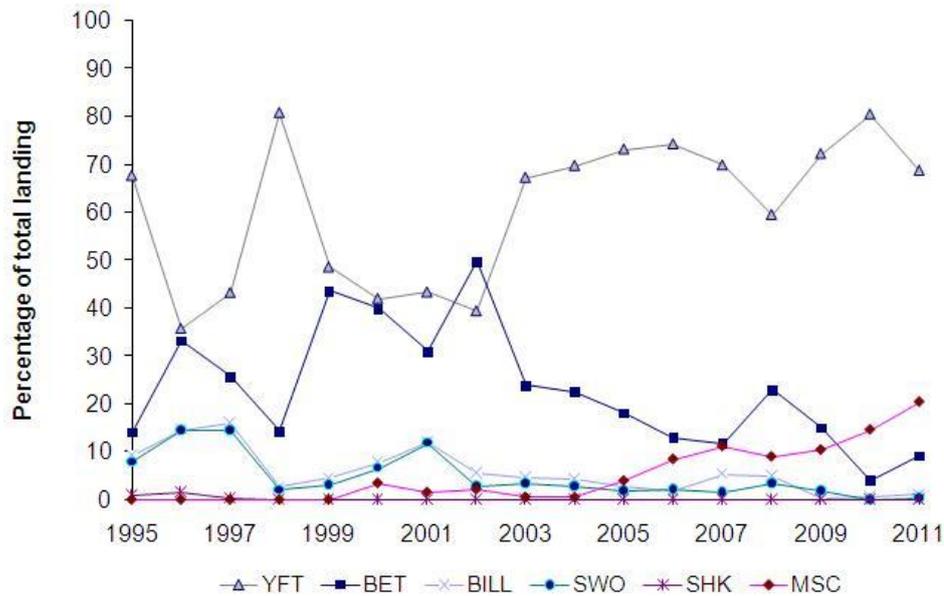


Figure 4 Total landing catch from long liners categorized by main target species, during 1995 to 2011.

Table 1 presented total landing and effort statistics by each vessel nationality (Taiwanese, Chinese, Indonesian, Thai, Vanuatu, Malaysian Belizean and Indian) during January in 2000 to December in 2011. The main fishing fleet still was Taiwanese followed by Indonesian. In January to November of 2003, there was no landing of Chinese longliner because some of the fleet resigned the contract and moved back to their own country and some of the remainder vessels were repaired at the dock in Phuket then shifted to operate in the Oman water. Although the Chinese longliners came back to landing in Phuket again in 2004, after that year there were few and far between of landing. In 2007, the Thai longliner landed for five trips and there was one trip of landing from Vanuatu vessel, In 2008, 2009 the Malaysian longliner was landed one trips per years and 9 trips in 2011. The Belizean was landed 65, 63 trips from 2010 to 2011, and 2 trips of the Indian longliner was landed in 2011 (Table 1-8).

Figure 5 showed pie graphs of species composition during 2000-2011 from each vessel nationality which yellowfin tuna and bigeye were the main composition. In 2011, the main composition was yellowfin tuna followed by bigeye tuna and swordfish, respectively. As it was mentioned previously, the unidentified miscellaneous species were significant increasing, 29% from Taiwanese, 11% from Malaysian, and 9% from Indonesian were unloaded.

Table 1 Fishing effort (no.of trip), catch (mt) and CPUE (mt/trip) by Taiwanese longliners landed at Phuket Province during January 2000 to December 2011.

Taiwanese									
Year	Month	effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2000	Jan	84	484	299	146	24	15	0	5.76
	Feb	86	431	209	187	21	14	0	5.01
	Mar	64	248	167	67	6	7	1	3.88
	Apr	16	84	36	35	8	4	1	5.25
	May	8	29	12	8	5	2	2	3.63
	Jun	15	70	23	23	15	9	0	4.67
	Jul	16	79	21	29	9	11	9	4.94
	Aug	8	41	13	18	3	3	4	5.13
	Sep	12	53	12	22	6	9	4	4.42
	Oct	20	108	11	84	1	11	1	5.40
	Nov	39	223	37	105	30	27	24	5.72
	Dec	71	435	60	277	39	32	27	6.13
	Total	439	2,285	900	1,001	167	144	73	5.21
2001	Jan	81	474	64	240	66	86	18	5.85
	Feb	64	352	99	177	27	49	0	5.50
	Mar	45	264	77	118	31	37	1	5.87
	Apr	51	354	86	137	54	74	3	6.94
	May	37	226	74	101	32	17	2	6.11
	Jun	34	168	83	59	13	9	4	4.94
	Jul	7	63	29	30	1	1	2	9.00
	Aug	15	76	26	39	7	4	0	5.07
	Sep	15	82	18	29	9	24	2	5.47
	Oct	23	118	58	35	14	7	4	5.13
	Nov	66	310	88	171	37	12	2	4.70
	Dec	111	553	200	248	56	46	3	4.98
	Total	549	3,040	902	1,384	347	366	41	5.54
2002	Jan	98	541	311	171	30	13	16	5.52
	Feb	97	437	197	210	18	12	0	4.51
	Mar	60	440	213	198	19	9	1	7.33
	Apr	36	243	114	119	6	3	1	6.75
	May	26	191	83	93	11	3	1	7.35
	Jun	24	140	82	46	11	1	0	5.83
	Jul	20	109	67	22	12	6	2	5.45
	Aug	18	90	45	28	10	6	1	5.00
	Sep	15	116	61	26	7	6	16	7.73
	Oct	20	134	73	42	6	5	8	6.70
	Nov	64	584	237	257	39	16	35	9.13
	Dec	78	740	294	359	56	27	4	9.49
	Total	556	3,765	1,777	1,571	225	107	85	6.77

Table 1 Cont.

Taiwanese									
Year	Month	effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2003	Jan	68	522	168	309	27	17	1	7.68
	Feb	88	923	190	656	30	29	18	10.49
	Mar	58	609	105	445	33	26	0	10.50
	Apr	53	390	123	253	6	8	0	7.36
	May	9	65	30	29	3	3	0	7.22
	Jun	24	184	81	88	9	6	0	7.67
	Jul	15	137	60	52	11	6	8	9.13
	Aug	12	51	29	15	4	3	0	4.25
	Sep	12	88	20	56	7	5	0	7.33
	Oct	19	117	52	42	20	3	0	6.16
	Nov	23	215	23	155	22	15	0	9.35
	Dec	115	1,098	187	838	39	34	0	9.55
	Total		496	4,399	1,068	2,938	211	155	27
2004	Jan	70	726	119	556	27	24	0	10.37
	Feb	80	726	146	518	30	32	0	9.08
	Mar	75	517	88	379	22	28	0	6.89
	Apr	29	220	53	153	12	2	0	7.59
	May	22	155	49	99	6	1	0	7.05
	Jun	17	155	39	103	12	1	0	9.12
	Jul	14	104	24	77	2	1	0	7.43
	Aug	25	202	73	110	14	5	0	8.08
	Sep	15	119	33	77	8	1	0	7.93
	Oct	14	104	12	81	9	2	0	7.43
	Nov	29	287	73	169	11	10	24	9.90
	Dec	73	716	202	479	27	8	0	9.81
	Total		463	4,031	911	2,801	180	115	24
2005	Jan	80	1,272	298	883	51	40	0	15.90
	Feb	80	930	194	691	20	25	0	11.63
	Mar	62	602	96	449	9	2	46	9.71
	Apr	31	285	50	223	10	2	0	9.19
	May	16	128	22	91	12	2	1	8.00
	Jun	13	199	61	133	5	0	0	15.31
	Jul	15	132	33	66	3	0	30	8.80
	Aug	20	169	34	77	16	18	24	8.45
	Sep	10	87	19	64	3	1	0	8.70
	Oct	26	216	7	164	5	5	35	8.31
	Nov	34	363	8	301	5	5	44	10.68
	Dec	57	677	54	546	15	9	53	11.88
	Total		444	5,060	876	3,688	154	109	233

Table 1 Cont.

Taiwanese									
Year	Month	effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2006	Jan	47	779	45	631	8	3	92	16.57
	Feb	33	449	69	324	7	5	44	13.61
	Mar	58	515	73	399	14	6	23	8.88
	Apr	16	134	17	81	4	3	29	8.38
	May	11	100	11	63	1	1	24	9.09
	Jun	9	101	12	51	2	1	35	11.22
	Jul	8	88	10	41	11	2	24	11.00
	Aug	15	75	7	47	11	10	0	5.00
	Sep	15	102	5	40	1	4	52	6.80
	Oct	20	102	5	83	5	9	0	5.10
	Nov	26	216	13	176	15	12	0	8.31
	Dec	57	560	46	478	21	8	7	9.82
	Total	315	3,221	313	2,414	100	64	330	10.23
2007	Jan	64	820	56	670	29	2	63	12.81
	Feb	59	890	50	690	56	20	74	15.08
	Mar	70	621	54	481	22	9	55	8.87
	Apr	42	331	38	251	21	5	16	7.88
	May	15	170	14	117	21	6	12	11.33
	Jun	19	241	14	139	11	22	55	12.68
	Jul	19	223	56	113	3	1	50	11.74
	Aug	13	123	6	55	6	9	47	9.46
	Sep	15	96	9	61	5	1	20	6.40
	Oct	26	158	10	113	11	2	22	6.08
	Nov	17	318	13	170	30	5	100	18.71
	Dec	68	1,137	248	660	79	9	141	16.72
	Total	427	5,128	568	3,520	294	91	655	12.01
2008	Jan	50	764	158	508	35	29	34	15.28
	Feb	69	1,159	391	629	20	18	101	16.80
	Mar	49	477	173	197	6	30	71	9.73
	Apr	55	542	215	255	5	4	63	9.85
	May	25	266	42	130	5	4	85	10.64
	Jun	10	139	2	76	13	5	43	13.90
	Jul	10	77	10	43	15	5	4	7.70
	Aug	7	36	0	17	1	2	16	5.14
	Sep	8	48	1	21	4	2	20	6.00
	Oct	20	288	3	213	10	14	48	14.40
	Nov	51	642	40	479	37	26	60	12.59
	Dec	92	1,124	153	767	111	50	43	12.22
	Total	446	5,562	1,188	3,335	262	189	588	12.47

Table 1 Cont.

Taiwanese									
Year	Month	effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2009	Jan	70	651	48	510	3	50	40	9.30
	Feb	58	509	86	415	0	0	8	8.78
	Mar	64	552	183	316	1	11	41	8.63
	Apr	22	279	36	168	0	26	49	12.68
	May	11	116	35	69	0	0	12	10.55
	Jun	13	107	13	28	5	8	53	8.23
	Jul	6	42	0	27	0	0	15	7.00
	Aug	12	59	0	4	0	0	55	4.92
	Sep	13	140	2	77	0	0	61	10.77
	Oct	22	232	47	131	3	0	51	10.55
	Nov	31	377	13	271	0	0	93	12.16
	Dec	61	729	44	586	1	1	97	11.95
	Total		383	3,793	507	2,602	13	96	575
2010	Jan	72	984	27	792	0	1	164	13.67
	Feb	51	657	20	560	0	1	76	12.88
	Mar	57	411	29	326	0	0	56	7.21
	Apr	15	47	8	29	0	0	10	3.13
	May	5	29	0	3	0	0	26	5.80
	Jun	9	122	21	44	0	0	57	13.56
	Jul	20	220	3	86	0	0	131	11.00
	Aug	34	220	25	104	3	1	87	6.47
	Sep	35	449	31	179	11	0	228	12.83
	Oct	31	517	21	461	16	0	19	16.68
	Nov	42	731	2	658	8	0	63	17.40
	Dec	54	751	9	619	2	0	121	13.91
	Total		425	5,138	196	3,861	40	3	1,038
2011	Jan	51	559	62	374	2	0	121	10.96
	Feb	42	453	67	331	6	1	48	10.79
	Mar	35	422	42	307	16	0	57	12.06
	Apr	16	182	19	68	0	0	95	11.38
	May	8	57	12	37	2	0	6	7.13
	Jun	3	8	3	5	0	0	0	2.67
	Jul	16	204	12	36	8	0	148	12.75
	Aug	13	128	22	20	0	0	86	9.85
	Sep	12	137	3	28	6	0	100	11.42
	Oct	10	95	8	75	2	3	7	9.50
	Nov	16	293	1	208	6	0	78	18.31
	Dec	19	290	1	217	2	0	70	15.26
	Total		241	2,828	252	1,706	50	4	816

Table 2 Fishing effort (no.of trip), catch (mt) and CPUE (mt/trip) by Chinese longliners landed at Phuket Province during 2000 to 2008.

Chaineese									
Year	Month	Effort	Total	BE	YF	MAR	SWO	MSC	CPUE
2000	Jan	20	99	61	30	5	3	0	4.95
	Feb	23	100	48	43	6	3	0	4.35
	Mar	31	105	73	29	2	1	0	3.39
	Apr	14	63	30	23	5	3	2	4.50
	May	10	28	15	9	1	1	2	2.80
	Jun	15	51	19	9	9	8	6	3.40
	Jul	11	38	10	11	5	7	5	3.45
	Aug	15	51	16	22	4	4	5	3.40
	Sep	17	56	14	25	5	8	4	3.29
	Oct	20	74	14	31	15	13	1	3.70
	Nov	13	36	14	15	3	1	3	2.77
	Dec	10	37	4	16	14	1	2	3.70
	Total	199	738	318	263	74	53	30	3.71
2001	Jan	13	41	6	19	6	8	2	3.15
	Feb	10	43	9	18	8	8	0	4.30
	Mar	20	91	36	35	8	11	1	4.55
	Apr	31	111	57	32	16	4	2	3.58
	May	42	203	73	57	38	27	8	4.83
	Jun	25	84	44	22	12	4	2	3.36
	Jul	16	40	23	9	2	4	2	2.50
	Aug	19	48	17	18	8	5	0	2.53
	Sep	5	12	3	6	1	2	0	2.40
	Oct	17	50	20	14	8	5	3	2.94
	Nov	31	104	38	40	19	5	2	3.35
	Dec	29	91	45	27	10	9	0	3.14
	Total	258	918	371	297	136	92	22	3.56
2002	Jan	22	71	47	17	3	2	2	3.23
	Feb	21	82	59	18	3	2	0	3.90
	Mar	32	129	83	36	6	4	0	4.03
	Apr	27	106	62	38	4	2	0	3.93
	May	19	87	53	30	3	1	0	4.58
	Jun	22	65	41	16	6	2	0	2.95
	Jul	15	62	44	8	3	1	6	4.13
	Aug	5	23	13	5	1	4	0	4.60
	Sep	4	20	11	3	2	2	2	5.00
	Oct	24	91	57	23	3	3	5	3.79
	Nov	7	27	15	7	2	1	2	3.86
	Dec	12	57	31	12	10	4	0	4.75
	Total	210	820	516	213	46	28	17	3.90

Table 2 Cont.

Chaineese									
Year	Month	Effort	Total	BE	YF	MAR	SWO	MSC	CPUE
2003	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	0	0	0	0	0	0	0	0.00
	Apr	0	0	0	0	0	0	0	0.00
	May	0	0	0	0	0	0	0	0.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	5	25	9	11	1	4	0	5.00
Total	5	25	9	11	1	4	0	5.00	
2004	Jan	9	68	13	50	2	3	0	7.56
	Feb	7	94	67	20	4	3	0	13.43
	Mar	7	48	20	23	2	3	0	6.86
	Apr	11	70	14	45	6	5	0	6.36
	May	1	19	0	17	1	1	0	19.00
	Jun	7	47	18	15	11	3	0	6.71
	Jul	5	11	5	2	2	2	0	2.20
	Aug	0	0	0	0	0	0	0	0.00
	Sep	1	46	25	19	2	0	0	46.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	0	0	0	0	0	0	0	0.00
Total	48	403	162	191	30	20	0	8.40	
2005	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	2	4	3	1	0	0	0	2.00
	Apr	0	0	0	0	0	0	0	0.00
	May	0	0	0	0	0	0	0	0.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	0	0	0	0	0	0	0	0.00
Total	2	4	3	1	0	0	0	2.00	

Table 2 Cont.

Chainese									
Year	Month	Effort	Total	BE	YF	MAR	SWO	MSC	CPUE
2006	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	0	0	0	0	0	0	0	0.00
	Apr	0	0	0	0	0	0	0	0.00
	May	0	0	0	0	0	0	0	0.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	0	0	0	0	0	0	0	0.00
	Total	0	0.00						
2007	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	0	0	0	0	0	0	0	0.00
	Apr	1	5	0	5	0	0	0	5.00
	May	0	0	0	0	0	0	0	0.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	0	0	0	0	0	0	0	0.00
	Total	1	5	0	5	0	0	0	5.00
2008	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	0	0	0	0	0	0	0	0.00
	Apr	0	0	0	0	0	0	0	0.00
	May	0	0	0	0	0	0	0	0.00
	Jun	1	1	0	1	0	0	0	1.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	0	0	0	0	0	0	0	0.00
	Total	1	1	0	1	0	0	0	1.00

Table 3 Fishing effort (no.of trip), catch (mt) and CPUE (mt/trip) by Indonesian longliners landed at Phuket Province during January 2000 to December 2011.

Indonesian									
Year	Month	Effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2000	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	1	5	4	1	0	0	0	5.00
	Apr	7	15	4	9	1	1	0	2.14
	May	1	8	4	1	1	1	1	8.00
	Jun	1	2	1	1	0	0	0	2.00
	Jul	3	11	3	4	1	2	1	3.67
	Aug	2	9	3	4	0	1	1	4.50
	Sep	2	4	1	2	0	1	0	2.00
	Oct	2	10	1	6	1	2	0	5.00
	Nov	2	12	1	8	1	1	1	6.00
	Dec	6	19	4	10	1	3	1	3.17
	Total		27	95	26	46	6	12	5
2001	Jan	12	87	13	51	10	10	3	7.25
	Feb	8	66	11	48	2	4	1	8.25
	Mar	13	91	16	47	12	16	0	7.00
	Apr	5	38	9	21	4	3	1	7.60
	May	1	2	1	1	0	0	0	2.00
	Jun	3	10	4	4	1	1	0	3.33
	Jul	2	8	4	3	0	1	0	4.00
	Aug	2	6	2	3	1	0	0	3.00
	Sep	3	6	2	3	1	0	0	2.00
	Oct	5	10	4	4	2	0	0	2.00
	Nov	2	6	1	3	2	0	0	3.00
	Dec	13	84	38	26	13	7	0	6.46
	Total		69	414	105	214	48	42	5
2002	Jan	11	98	55	31	6	3	3	8.91
	Feb	7	27	10	16	1	0	0	3.86
	Mar	7	47	22	22	2	1	0	6.71
	Apr	5	74	33	38	2	1	0	14.80
	May	2	12	3	9	0	0	0	6.00
	Jun	2	9	4	5	0	0	0	4.50
	Jul	1	2	1	1	0	0	0	2.00
	Aug	3	17	6	6	4	1	0	5.67
	Sep	2	7	3	2	0	1	1	3.50
	Oct	2	6	4	2	0	0	0	3.00
	Nov	5	71	30	30	5	2	4	14.20
	Dec	3	31	11	14	5	1	0	10.33
	Total		50	401	182	176	25	10	8

Table 3 Cont.

Indonesian									
Year	Month	Effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2003	Jan	3	28	9	17	1	1	0	9.33
	Feb	3	27	7	18	1	0	1	9.00
	Mar	2	29	4	23	1	1	0	14.50
	Apr	7	77	18	56	1	2	0	11.00
	May	3	23	10	11	1	1	0	7.67
	Jun	1	1	0.50	0.50	0	0	0	1.00
	Jul	2	6	3	3	0	0	0	3.00
	Aug	2	7	2	5	0	0	0	3.50
	Sep	3	8	3	4	1	0	0	2.67
	Oct	7	22	10	10	2	0	0	3.14
	Nov	9	78	9	59	7	3	0	8.67
	Dec	20	266	41	204	13	8	0	13.30
	Total	62	571	116	410	28	16	1	9.21
2004	Jan	14	167	18	140	5	4	0	11.93
	Feb	9	109	7	92	5	5	0	12.11
	Mar	9	98	19	71	3	5	0	10.89
	Apr	7	86	3	77	5	1	0	12.29
	May	6	42	3	38	1	0	0	7.00
	Jun	1	13	0	12	1	0	0	13.00
	Jul	2	18	7	11	0	0	0	9.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	1	3	0	3	0	0	0	3.00
	Oct	2	4	1	3	0	0	0	2.00
	Nov	8	97	17	77	1	2	0	12.13
	Dec	12	246	49	192	4	1	0	20.50
	Total	71	883	124	716	25	18	0	12.44
2005	Jan	10	306	77	227	2	0	0	30.60
	Feb	9	164	41	121	1	1	0	18.22
	Mar	6	104	9	94	1	0	0	17.33
	Apr	8	45	9	33	2	1	0	5.63
	May	2	7	3	4	0	0	0	3.50
	Jun	1	8	2	6	0	0	0	8.00
	Jul	2	11	2	8	1	0	0	5.50
	Aug	1	2	0	2	0	0	0	2.00
	Sep	3	16	3	12	1	0	0	5.33
	Oct	6	33	7	25	1	0	0	5.50
	Nov	11	81	14	57	5	0	5	7.36
	Dec	12	112	31	76	3	2	0	9.33
	Total	71	889	198	665	17	4	5	12.52

Table 3 Cont.

Indonesian									
Year	Month	Effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2006	Jan	28	398	61	285	6	1	45	14.21
	Feb	23	255	61	175	4	3	12	11.09
	Mar	12	58	13	44	1	0	0	4.83
	Apr	9	76	16	55	3	2	0	8.44
	May	7	55	22	17	1	0	15	7.86
	Jun	5	23	5	12	0	1	5	4.60
	Jul	6	23	0	14	4	1	4	3.83
	Aug	4	20	5	13	2	0	0	5.00
	Sep	5	22	2	18	1	1	0	4.40
	Oct	4	26	8	14	2	2	0	6.50
	Nov	4	89	19	68	1	1	0	22.25
	Dec	20	564	90	455	8	11	0	28.20
	Total	127	1,609	302	1,170	33	23	81	12.67
2007	Jan	11	362	50	312	0	0	0	32.91
	Feb	7	177	14	150	9	4	0	25.29
	Mar	5	68	15	50	2	1	0	13.60
	Apr	3	50	8	36	3	1	2	16.67
	May	5	108	15	74	11	3	5	21.60
	Jun	5	104	6	76	6	1	15	20.80
	Jul	1	29	10	19	0	0	0	29.00
	Aug	1	3	0	0	0	0	3	3.00
	Sep	3	13	2	8	1	0	2	4.33
	Oct	6	46	7	35	2	0	2	7.67
	Nov	7	99	21	53	10	3	12	14.14
	Dec	6	103	28	61	8	1	5	17.17
	Total	60	1,162	176	874	52	14	46	19.37
2008	Jan	8	312	136	143	13	12	8	39.00
	Feb	12	392	215	163	8	4	2	32.67
	Mar	2	22	12	7	0	0	3	11.00
	Apr	2	43	22	18	0	1	2	21.50
	May	4	119	50	53	3	3	10	29.75
	Jun	9	122	2	85	17	6	12	13.56
	Jul	5	59	0	40	11	8	0	11.80
	Aug	4	27	0	22	3	2	0	6.75
	Sep	5	41	0	34	2	1	4	8.20
	Oct	8	233	0	185	11	12	25	29.13
	Nov	9	283	34	202	12	10	25	31.44
	Dec	17	456	113	266	43	18	16	26.82
	Total	85	2,109	584	1,218	123	77	107	24.81

Table 3 Cont.

Indonesian									
Year	Month	Effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2009	Jan	21	437	163	256	9	1	8	20.81
	Feb	14	190	31	156	1	1	1	13.57
	Mar	14	284	142	138	2	2	0	20.29
	Apr	7	166	64	100	1	1	0	23.71
	May	7	81	23	54	0	0	4	11.57
	Jun	5	62	0	44	0	0	18	12.40
	Jul	4	41	0	40	1	0	0	10.25
	Aug	5	41	3	37	0	1	0	8.20
	Sep	9	187	25	141	0	0	21	20.78
	Oct	18	506	47	437	0	0	22	28.11
	Nov	18	707	3	646	0	25	33	39.28
	Dec	15	286	17	250	0	2	17	19.07
	Total	137	2,988	518	2,299	14	33	124	21.81
2010	Jan	20	698	25	589	2	1	81	34.90
	Feb	10	213	13	176	0	0	24	21.30
	Mar	7	81	39	40	1	0	1	11.57
	Apr	4	36	10	21	0	0	5	9.00
	May	0	0	0	0	0	0	0	0.00
	Jun	3	62	4	57	0	0	1	20.67
	Jul	5	60	12	44	3	0	1	12.00
	Aug	8	136	43	61	0	0	32	17.00
	Sep	6	119	2	107	0	0	10	19.83
	Oct	5	164	0	157	1	0	6	32.80
	Nov	8	188	0	179	1	0	8	23.50
	Dec	9	168	0	158	1	1	8	18.67
	Total	85	1,925	148	1,589	9	2	177	22.65
2011	Jan	11	188	0	179	0	0	9	17.09
	Feb	4	68	2	55	0	0	11	17.00
	Mar	6	80	33	38	1	0	8	13.33
	Apr	6	116	34	73	0	1	8	19.33
	May	3	53	0	41	0	0	12	17.67
	Jun	2	20	0	19	0	0	1	10.00
	Jul	6	102	0	90	0	0	12	17.00
	Aug	8	93	8	78	0	0	7	11.63
	Sep	2	33	0	18	0	9	6	16.50
	Oct	2	61	0	56	0	0	5	30.50
	Nov	5	74	0	70	0	0	4	14.80
	Dec	5	138	6	115	5	0	12	27.60
	Total	60	1,026	83	832	6	10	95	17.10

Table 4 Fishing effort (no.of trip), catch (mt) and CPUE (mt/trip) by Thai longliners landed at Phuket Province in 2007.

Thai									
Year	Month	Effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2007	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	2	6	3	0	0	0	3	3.00
	Apr	1	4	0	4	0	0	0	4.00
	May	1	4	0	4	0	0	0	4.00
	Jun	1	5	0	3	0	0	2	5.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	0	0	0	0	0	0	0	0.00
	Total		5	19	3	11	0	0	5

Table 5 Fishing effort (no.of trip), catch (mt) and CPUE (mt/trip) by Vanuatu longliners landed at Phuket Province in 2007.

Vanuatu									
Year	Month	effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2007	Jan	1	1	1	0	0	0	0	1.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	0	0	0	0	0	0	0	0.00
	Apr	0	0	0	0	0	0	0	0.00
	May	0	0	0	0	0	0	0	0.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	0	0	0	0	0	0	0	0.00
	Total		1	1	1	0	0	0	0

Table 6 Fishing effort (no.of trip), catch (mt) and CPUE (mt/trip) by Malaysian longliners landed at Phuket Province during 2008 to 2011.

Malaysian									
Year	Month	effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2008	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	0	0	0	0	0	0	0	0.00
	Apr	0	0	0	0	0	0	0	0.00
	May	0	0	0	0	0	0	0	0.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	1	38	0	33	2	2	1	0.00
	Dec	0	0	0	0	0	0	0	0.00
	Total	1	38	0	33	2	2	1	38.00
2009	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	0	0	0	0	0	0	0	0.00
	Apr	0	0	0	0	0	0	0	0.00
	May	0	0	0	0	0	0	0	0.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	1	40	0	25	0	0	15	0.00
	Dec	0	0	0	0	0	0	0	0.00
	Total	1	40	0	25	0	0	15	40.00
2010	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	0	0	0	0	0	0	0	0.00
	Apr	0	0	0	0	0	0	0	0.00
	May	0	0	0	0	0	0	0	0.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	0	0	0	0	0	0	0	0.00
	Total	0	0	0	0	0	0	0	0.00

Table 6 Cont.

Malaysian									
Year	Month	effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2011	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	4	62	45	13	0	0	4	15.50
	Apr	4	40	22	12	0	0	6	10.00
	May	1	12	8	2	0	0	2	12.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	0	0	0	0	0	0	0	0.00
	Dec	0	0	0	0	0	0	0	0.00
Total		9	114	75	27	0	0	12	12.67

Table 7 Fishing effort (no.of trip), catch (mt) and CPUE (mt/trip) by Belizean longliners landed at Phuket Province during 2010 to 2011.

Belizean									
Year	Month	effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2010	Jan	0	0	0	0	0	0	0	0.00
	Feb	2	115	0	82	0	0	33	57.50
	Mar	2	17	3	10	0	0	4	8.50
	Apr	1	4	2	2	0	0	0	4.00
	May	2	19	5	13	0	0	1	9.50
	Jun	2	41	3	38	0	0	0	20.50
	Jul	2	22	0	21	0	0	1	11.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	7	263	0	247	4	0	12	37.57
	Oct	11	470	0	448	6	0	16	42.73
	Nov	16	584	0	537	8	0	39	36.50
	Dec	20	633	14	577	9	0	33	31.65
Total		65	2,168	27	1,975	27	0	139	33.35

Table 7 Cont.

Belizean									
Year	Month	effort	Total	BET	YFT	MAR	SWO	MSC	CPUE
2011	Jan	12	265	38	210	2	0	15	22.08
	Feb	9	187	50	125	0	0	12	20.78
	Mar	5	82	0	73	1	1	7	16.40
	Apr	2	14	0	11	0	0	3	7.00
	May	0	0	0	0	0	0	0	0.00
	Jun	5	66	1	44	0	10	11	13.20
	Jul	2	43	1	1	0	0	41	21.50
	Aug	0	0	0	0	0	0	0	0.00
	Sep	3	60	0	40	0	0	20	20.00
	Oct	9	217	1	185	0	0	31	24.11
	Nov	7	287	0	269	1	0	17	41.00
	Dec	9	336	6	277	6	0	47	37.33
Total		63	1,557	97	1,235	10	11	204	24.71

Table 8 Fishing effort (no.of trip), catch (mt) and CPUE (mt/trip) by Indian longliners landed at Phuket Province in 2011.

India									
Year	Month	effort	Total	BE	YF	MAR	SWO	MSC	CPUE
2011	Jan	0	0	0	0	0	0	0	0.00
	Feb	0	0	0	0	0	0	0	0.00
	Mar	0	0	0	0	0	0	0	0.00
	Apr	0	0	0	0	0	0	0	0.00
	May	0	0	0	0	0	0	0	0.00
	Jun	0	0	0	0	0	0	0	0.00
	Jul	0	0	0	0	0	0	0	0.00
	Aug	0	0	0	0	0	0	0	0.00
	Sep	0	0	0	0	0	0	0	0.00
	Oct	0	0	0	0	0	0	0	0.00
	Nov	1	4	4	0	4	0	0	4.00
	Dec	1	14	14	0	6	0	0	8
Total		2	18	0	10	0	0	8	9.00

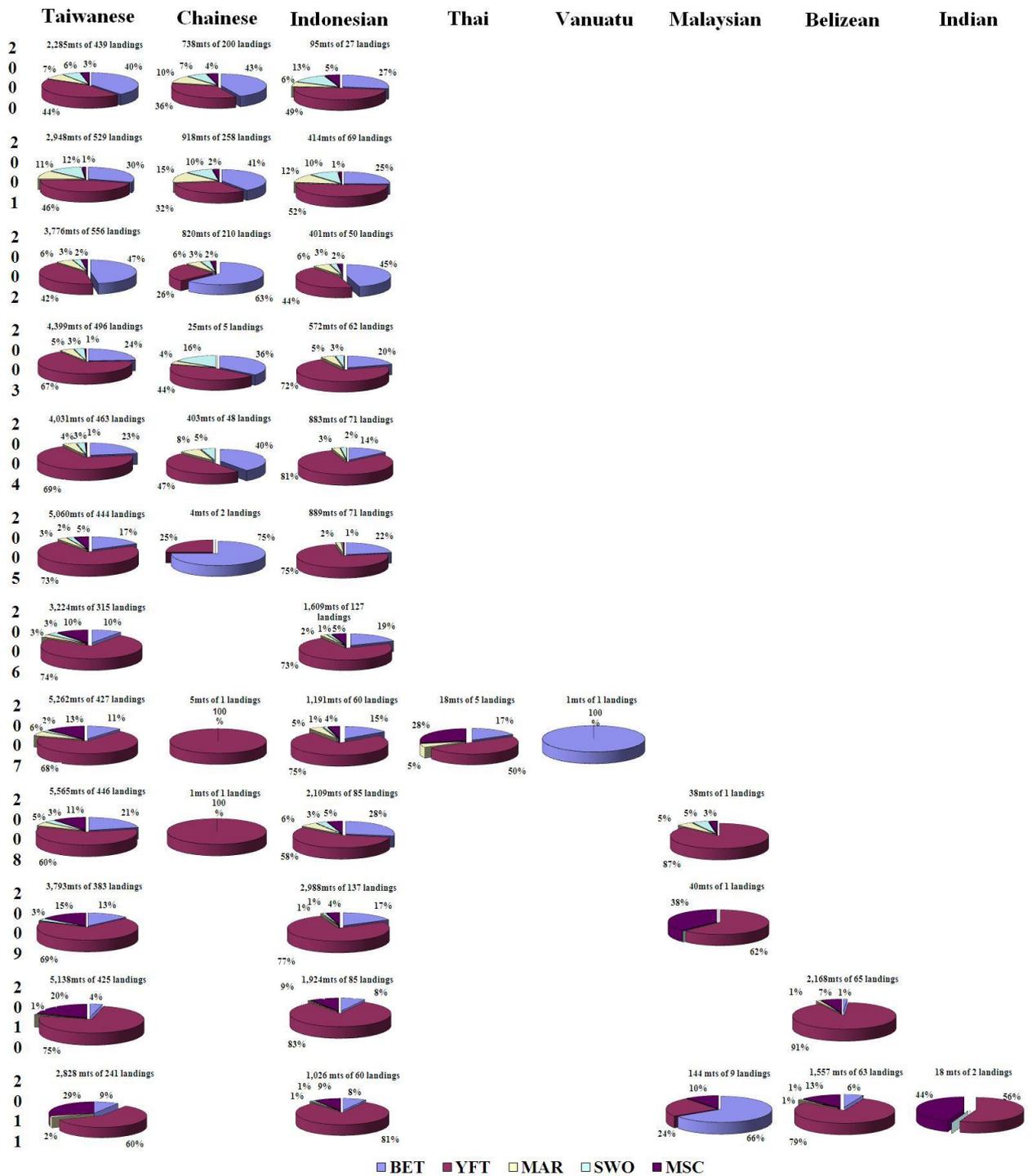


Figure 5 Species composition from tuna longliners landing in Phuket during 2000-2011, categorized by flag countries.

2. Tuna Purse Seiners

There were only Japanese tuna purse seiners landed in Phuket during the last six years which were the six vessels of the size range 349-477 (GRT, Gross Ton Net) 63.24-75.97 m (LOA, length overall). Type of preservation was brine and fish was kept as frozen. During 2003 to 2006, there was only Nippon Maru landed for 2-6 trips/year. In the later year, 2007, they were five vessels with totally landed of 12 trips. In 2008 there were five vessels with totally landed of 10 trips. In 2009 there were five vessels with totally landed of 8 trips. During 2010 to 2011 Nippon Maru was landed of 4 and 6 trips respectively (Table 9).

Table 9 Number of foreign tuna purse seines landed in Phuket during 2003 - 2011.

Type of vessel	Number of landing									
	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Tuna purse seiners	4	3	6	2	12	10	8	4	6	55

Fishing Ground

The tuna purse seiners operated in the fishing grounds between latitude $05^{\circ} 00' N$ to $10^{\circ} 41' S$ and longitude $59^{\circ} 12' E$ to $98^{\circ} 48' E$. The most intensive fishing effort were operated in the West of Indonesia and the areas around Maldives and Chagos while there were scantily fishing in the East of Somalia and around Seychelles. During 2003 to 2011 the tuna purse seiners operated only the fishing grounds where were near by the landing site, West of Indonesia and the areas around Maldives and Chagos. Thus it saved the cost of fuel (Figure 6).

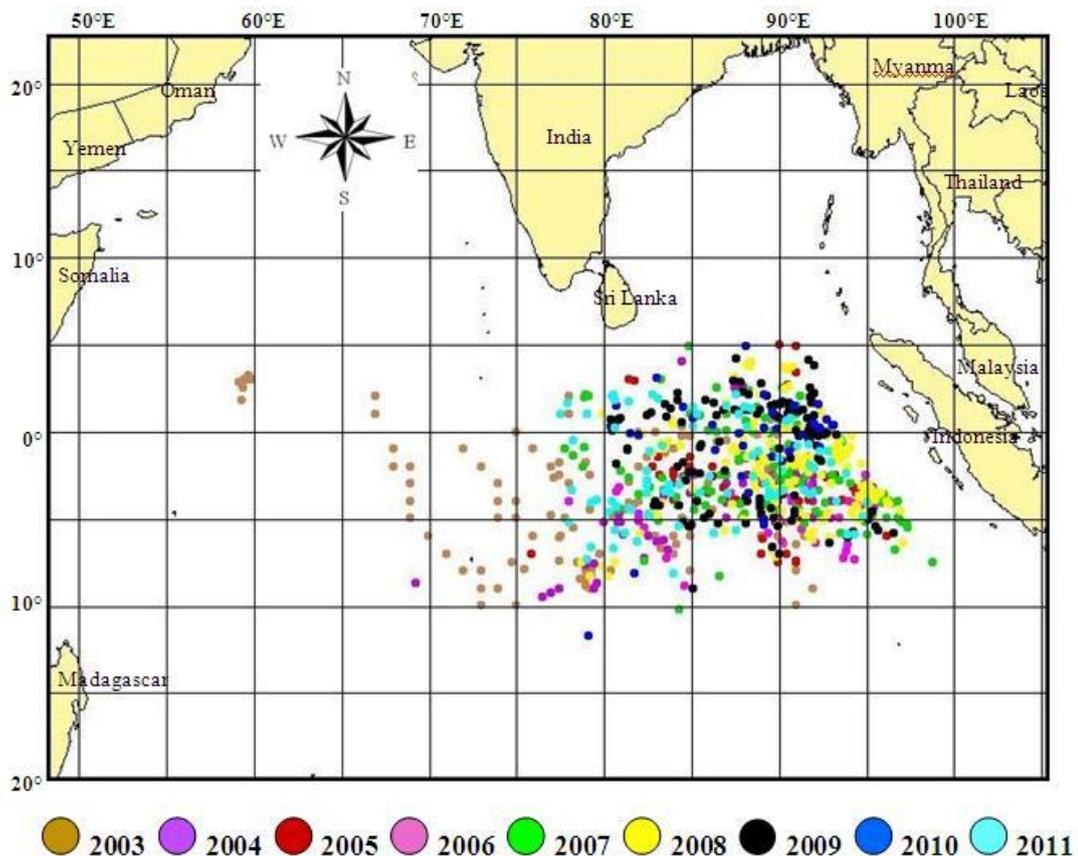


Figure 6 Fishing grounds of tuna purse seiners which landing in Phuket, 2003- 2011.

Species composition, Catch

Catch and percentage composition of skipjack, yellowfin tuna and bigeye tuna during 2003 to 2011 were 18,797 (62.4%), 4,837 (16.1%) and 6,339 mts (21.5%) respectively. The total catch of the three species during 2003 to 2011 were 29,973 mts (Table 10). There was a few of bycatch which the most frequented observed species was triggerfish, *Abalistes stellaris* (Bloch & Schneider, 1801).

Table 10 Catch and value of tunas caught by foreigners purse seine landed in Phuket Province during 2003 - 2011.

Year	SKJ		YFT		BET		Total Mts
	Mts	%	Mts	%	Mts	%	
2003	1,755	61.6	465	16.3	630	22.1	2,850
2004	1,602	66.8	324	13.5	474	19.8	2,400
2005	3,246	65.7	998	20.2	696	14.1	4,940
2006	895	66.3	220	16.3	235	17.4	1,350
2007	3,074	62.8	754	15.4	1,066	21.8	4,894
2008	2,435	60.7	874	21.8	703	17.5	4,012
2009	3,170	62.9	529	10.5	1,343	26.6	5,042
2010	912	52.6	311	17.9	512	29.5	1,735
2011	1,708	62.1	362	13.2	680	24.7	2,750
Total	18,797	62.4	4,837	16.1	6,339	21.5	29,973

3. Size Distribution of Tropical tunas

Size distribution of yellowfin tuna from both fleets in 2011 showed in the Figure 7. Small size of yellowfin tuna caught from purse seine range from 30 to 90 cm, mode of size as 40 cm and large size caught from surface longliner varied from 60 to 190 cm, mode of size showed 120-150 cm.

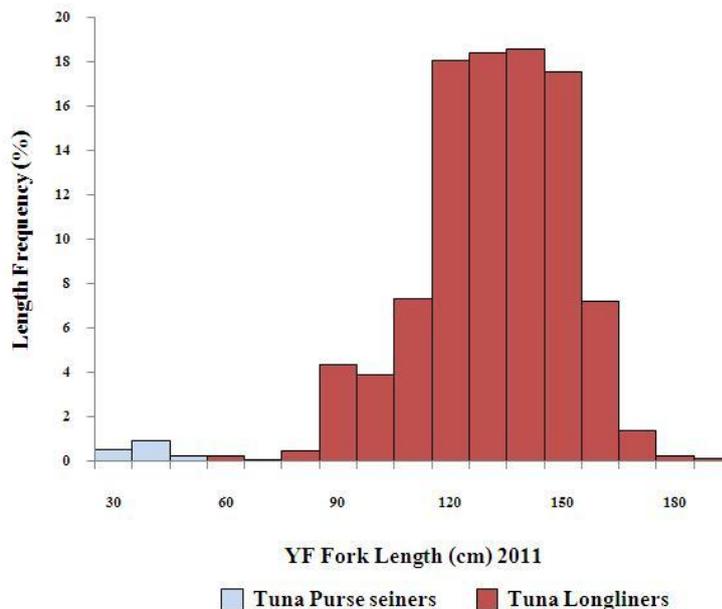


Figure 7 Size distribution of yellowfin tuna from purse seine and surface longline in 2011.

Size distribution of yellowfin tuna in monthly from both fleets in 2011 showed in the Figure 8. One mode of size distribution show from both fleets. Large size of yellowfin tuna caught from

surface longliner, especially range from 110 to 190 cm during January to March and October to December.

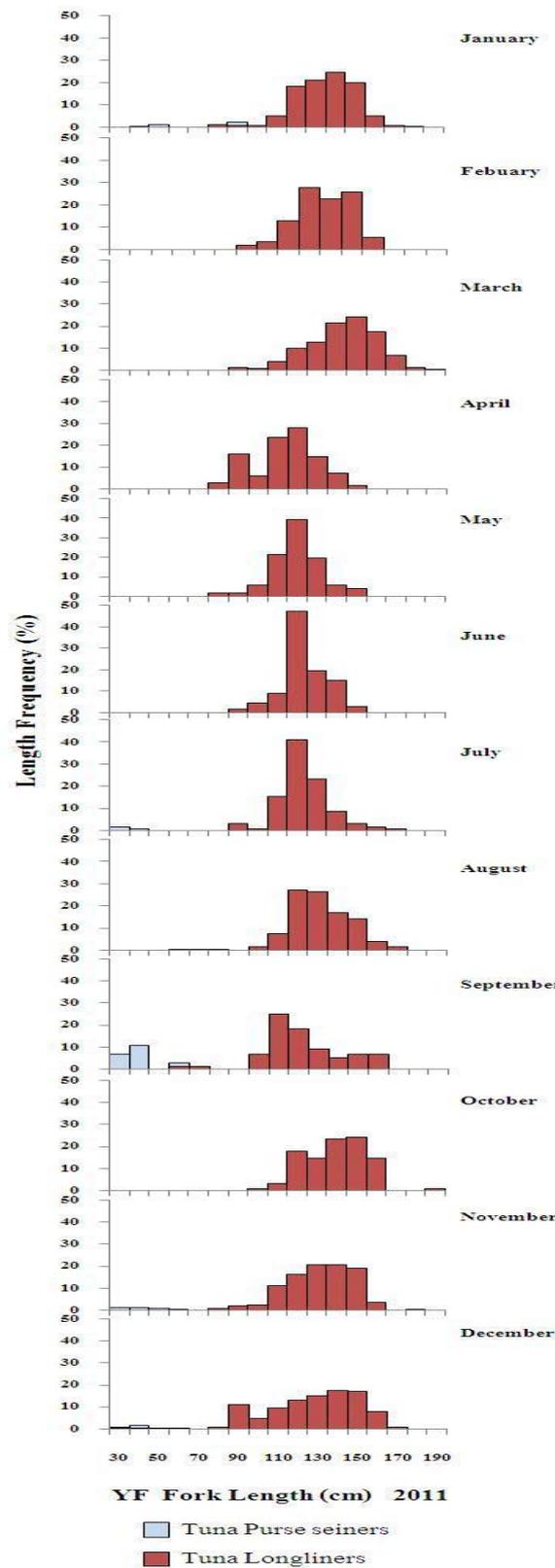


Figure 8 Size distribution of yellowfin tuna from purse seiner and surface longliner by monthly in 2011.

Size distribution of bigeye tuna from both fleets in 2011 showed in the Figure 9. Small size of bigeye tuna caught from purse seine range from 30 to 70 cm, mode of size as 40 cm and big size caught from surface longliner varied from 60 to 170 cm, mode of size showed 100-120 cm.

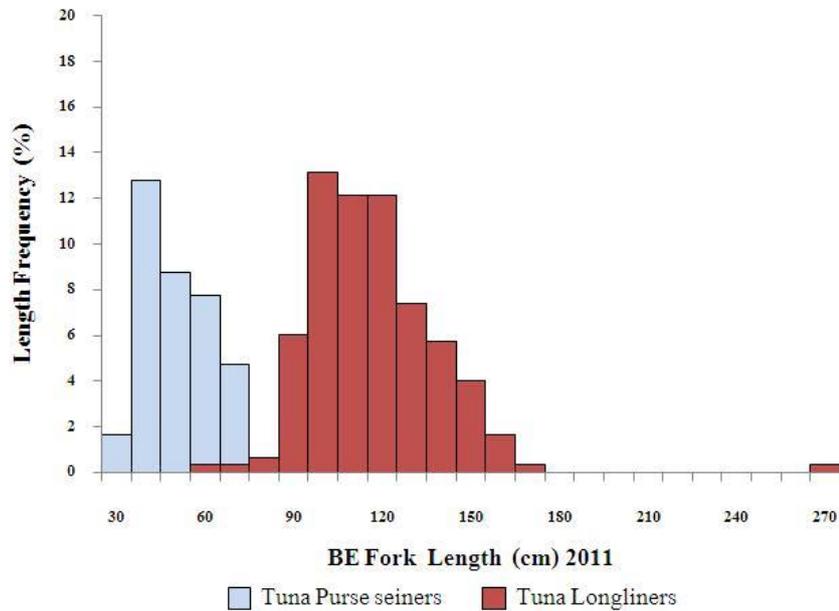


Figure 9 Size distribution of bigeye tuna from purse seine and surface longline in 2011.

Size distribution of bigeye tuna by monthly from both fleets in 2011 showed in the Figure 10. One mode shows from both fleets. Large size of bigeye tuna caught from surface longliner, especially range from 110 to 170 cm during January to March and October to November.

Size distribution of skipjack from purse siener in 2011 showed in the Figure 11. Small size ranged from 31 to 65 cm, one mode of size was 35-55 cm. Size distribution of skipjack by monthly in 2011 showed in the Figure 12. Small size of skipjack (31-44 cm) recruited to fishing ground in the eastern Indian Ocean during July to September.

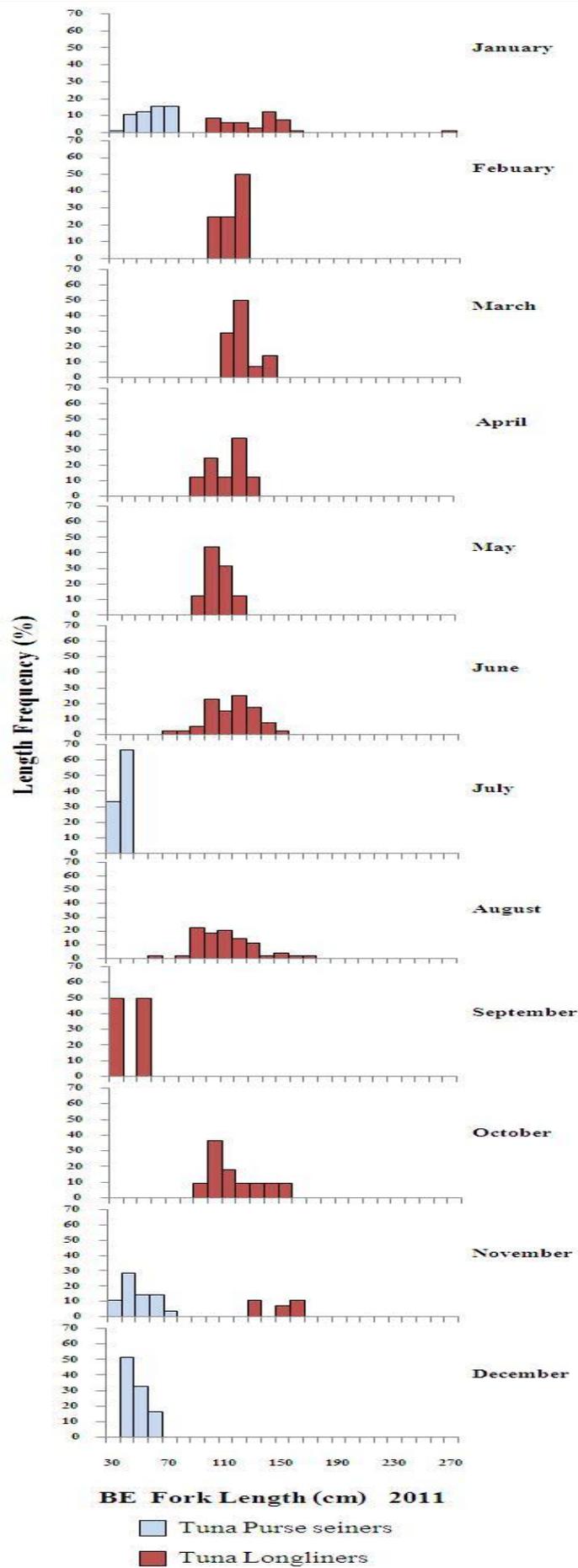


Figure 10 Size distribution of bigeye tuna from purse seine and surface longline by monthly in 2011.

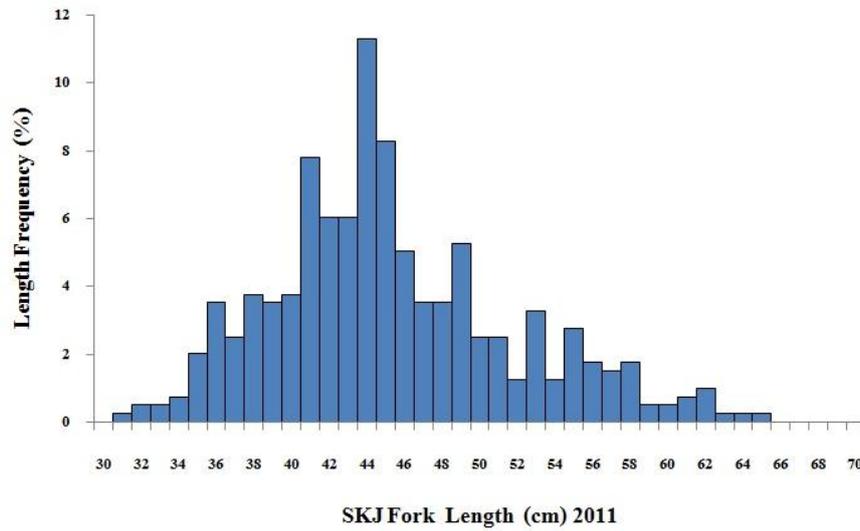


Figure 11 Size distribution of skipjack from purse seine in 2011.

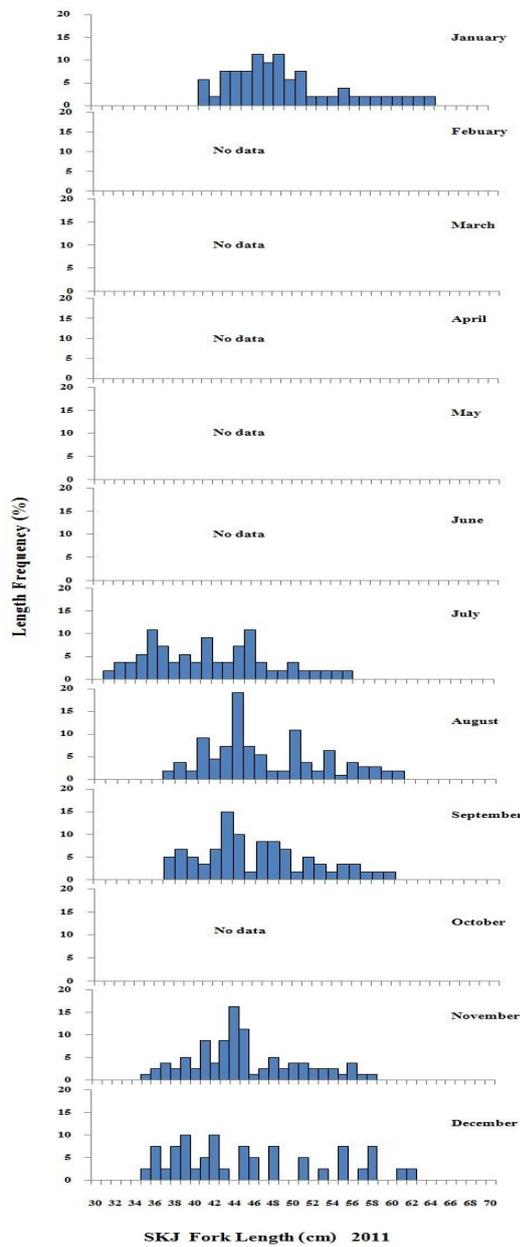


Figure 12 Size distribution of skipjack from purse seine by monthly in 2011.

ENCOUNTERED PROBLEMS AND RECOMMENDATION

Although the port sampling and surveying have been carried on, it seems to have some problems in connection with data collection and statistics these include.

1. Outcome of Sampling Program on Fresh Tuna Longline Vessels Unloading in Phuket during April 2000 to December 2006 had improved a lot of knowledge on the activities, total landing, species breakdown and size composition for each species caught by surface longliner for IOTC, OFCF and AFRDEC, DOF Thailand. The sampling program have been continuous monitoring, which support fund from relevant countries or IOTC.

2. The lack of logsheet of foreigner longliner unloaded at Phuket fishing port, only the interview data have been taken from the export company and master fishermen. Then, the data collection system of longliner has to be better established, so that all data users (such as the IOTC) researcher and fishermen may be satisfied.

3. The data collection and statistics address of tuna and billfish should have cooperated between the fleet nations and the port nations have been unloaded or transshipped (such as log sheet for foreigner tuna purse seine and lonliner fisheries in the Eastern Indian Ocean).

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