

Review on the status of small tunas along the Andaman Sea Coast of Thailand

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Abstract

The annual production of small tunas in the Andaman Sea varies from 13,093 to 49,243 tons during 1996-2008. It was contributed 10-36 % in total small tunas production in Thai Waters. After 2005, the production decreased rapidly from 40,488 to 13,093 tons in 2008. The percentage of small tunas in pelagic catches during 1985-1993 was about 10 percent by purse seine and king mackerel gill net. The peak fishing season for small tunas in the Andaman Sea took place during Northeast monsoon period. Main species of small tunas commercially caught are bullet tuna, kawakawa, longtail tuna, frigate tuna and skipjack. The size of longtail tuna, kawakawa and frigate tuna caught by light luring purse seine were smaller compared with those caught by Thai purse seine and king mackerel gill net. It is clear that small tunas resources are satisfactory. The stock size of tuna can not be estimated from limited area only in the Thai waters because tunas are highly migratory species. They migrate beyond the Thai waters to the entire Malacca Strait or throughout the Andaman Sea. More studies are required to explain their distributions. To assess the stock size of tuna, an appropriate production analysis should be carried out based on data from whole areas.

Introduction

Rapid development of Thailand's fisheries in the past two decades has successfully put the country into the world's frontrunner in fishery industry. In 2008, marine fishery accounted for 77% of the total fishery production, of which some the Gulf of Thailand had 60% share and the Andaman Sea contributed 40% of the catch. Nevertheless, the leap and bound of fishery development has led to fishery resources over exploitation particularly demersal fishes and invertebrates. At the same time, The catch of pelagic population has increased significantly as well. The share of pelagic catch accounted for 10-36% of the marine fishery harvest during 1996-2008. At the time the catch of pelagic in the Andaman Sea was about 182,373-288,195 metric tonnes (mt) in 1995-2008. Among these, small tunas are gaining more important economically species. They had become the main target species for Thai fishermen since 1982 because of attractive prices offered by tuna canneries. According to Department of Fisheries (DOF) statistics, the total catches of small tunas in Thailand was 25,623 tons in 2008, down four times compared with 101,148 tons in 2007 (DOF, 2010 and 2009). Presently, Thailand is the main supplier of canned tuna to foreign markets throughout the world. Anyhow, the rapid development may lead to the deterioration of tuna fisheries in Thailand. Thus, the studies on tuna stock urgent in finding out the current problems, situation occurred and status of small tunas in Thailand.

Development of small tunas fisheries in Thailand

Development of pelagic fisheries in Thailand was resulted from high efficiency purse seines; expansion of new fishing ground both onshore and offshore; new fish luring techniques. For example, drifting or coconut fronds are applied for day-time catching Payao or fish aggregating device, FAD) while lighting techniques especially light luring

purse seine (LPS) were developed in 1973 by installing a power generator on board. The technique has become a predominant fishing gear for mixed target pelagic species since 1982. Besides from catching the target species, the technique is applicable to catch mixed small pelagic fish at night. Subsequently, larger purse seine boats (Tuna purse-seine, TUN) were developed to raise their fishing capacity for catching coastal tunas in deeper water. Since 1985, the vessels had been fitted with electronic equipment such as depth recorder, sonar, and other equipment. In 1990, an installation of labor saving devices on board has been very popular among fishing vessels. The development resulted in a spectacular increase in small tunas captures from approximately 1,887 tons in 1971 to 43,361 tons in 1996. The small tunas along the Andaman Sea have been caught by purse seine and king mackerel gill net. Boonragsa and Boonsuk (1998) reported that small tunas were exploited by LPS, TPS, GPS, TUN and Chinese purse seine approximately 65 %, 21%, 6 %, and 2 % respectively. In 1979 the fishermen utilize modern fishing gears and have capacity to fish both inshore and offshore. Moreover, the ships are capable of taking a day or several days journey. It is common for them to use ice to preserve their catch.

Fishing gears and fishing ground

Purse seines : Purse seines along the Andaman Sea Coast are basically classified into regular purse seines (RPS) consist of Thai purse seine (TPS), green purse seine (GPS), fish aggregating device (FAD), light luring purse seine (LPS) and tuna purse seine (TUN). Purse seiners whose length is between 18-25 m in length (LOA) have been most popular equipment in the Andaman coast since 1994. The common mesh size use in TPS,LPS, FAD are approximately 2.5 cm; while the length and depth of the net range from 500-1,200 m and 50-150 m respectively, and number of crew is in the range 25-40 persons. The length, depth and mesh size of GPS net are 500-1,300 m, 60-140 m and 3.8-4.3 cm respectively, and number of crew is range 25-40 persons. For the TUN, the boat length is longer than 24 m; the length of the net is between 1,200-1,600 m, 120-150 m depth, and 9.4 cm mesh size. The number of crew is between 35-45 persons. Normally, TUN operates further offshore in November to May during the Northeast monsoon. The gear is substitutable to both LPS and TPS in catching other pelagic species in coastal or offshore areas by using the net with mesh size of 2.5 cm. During the past 6 years (2004-2009) the registered RPS in Andaman Sea coast showed a steady stable as 208-270 unit (DOF, 2011) showed in Table 1.

Table 1 Number of purse seiner registered by province in Andaman Sea coast 2004-2009

Year/Province	Ranong	Phang-nga	Phuket	Krabi	Trang	Satun	Total
2004	46	58	23	33	53	76	289
2005	38	18	32	15	72	82	257
2006	34	24	34	8	67	80	247
2007	22	21	22	7	67	73	212
2008	15	45	17	3	66	62	208
2009	26	46	29	8	82	79	270

The fishing grounds were distributed along the Andaman Sea Coast. Whereas, the main fishing ground of LPS and TPS were found along the cost of Phang-nga, Phuket and Krabi provinces, while TUN was operated in Ranong province and fishing ground of FADs was Trang and Satun provinces at 30-80 m depth (Figure 1). Boonragsa (1990) reported, fishing ground of small tunas have been expended extensively over the offshore and along the coast, water depth more than 40 m. The fishing seasons are all year round

where the highest season is during November to May when the Northeast monsoon season.

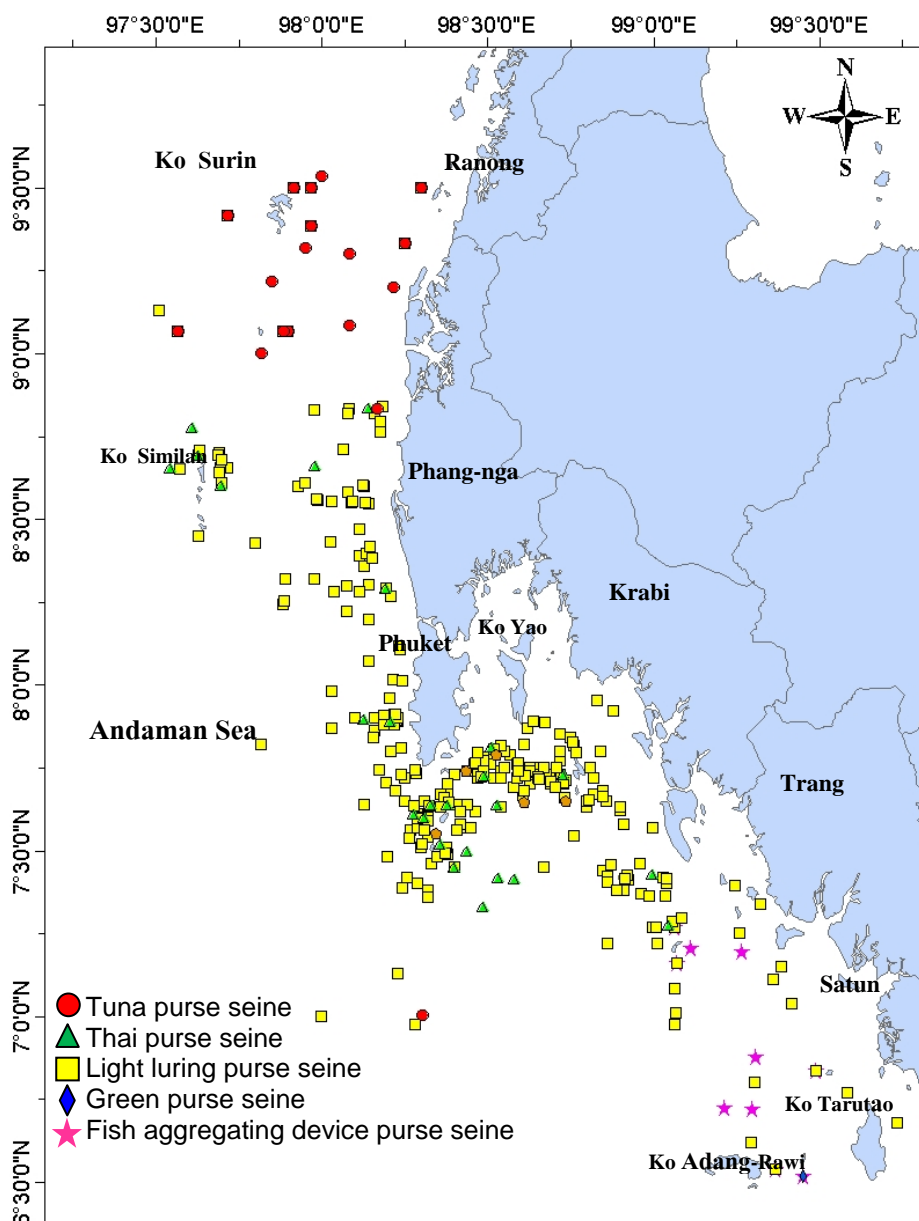


Figure 1 Fishing grounds of small tunas by type of gears along the Andaman Sea Coast

Species composition

The small tunas are pelagic species which are widely distributed throughout tropical waters. The species commonly found in the Andaman Sea are five species as bullet tuna (*Auxis rochei*), kawakawa or eastern little tuna (*Euthunnus affinis*), longtail tuna (*Thunnus tonggol*), frigate tuna (*Auxis thazard*) all year round, which was found the oceanic tuna as skipjack tuna (*Katsuwonus pelamis*) during January to September in 2010. The percentage of catch was showed in Figure 2.

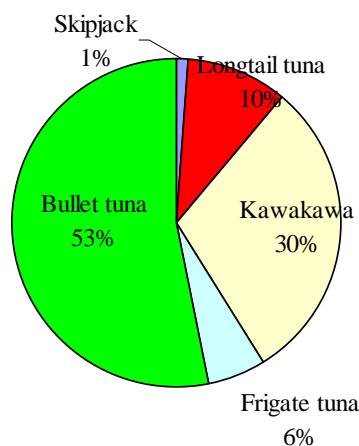


Figure 2 Percentage of small tunas caught along the Andaman Sea Coast in 2010

Production and catch rate

The annual production showed an increasing trend with a fluctuated in some period from the lowest of 4,208 mt in 1985 to the peak of 19,034 mt in 1991, then declined to 11,767 mt in 1992, and production shot up twice times from 1994 to 1996. Then, the production was decreasing since 1966 (43,361 mt) to 2002 (9,334 mt), and the trend was standing around 10,711 to 13,176 mt during 2003 to 2008 (Table 2).

Table 2 Total catch (mt) of small small tunas in the Andaman Sea, 1971-2008

Year	Kawakawa & frigate	Longtail tuna	Total
1971			1,887
1972			1,691
1973			1,704
1974			1,210
1975			3,017
1976			1,827
1977			1,511
1978			2,095
1979			2,133
1980	605	183	788
1981	477	1,606	2,076
1982	2,534	7,110	9,644
1983	472	3,356	3,828
1984	1,460	5,909	7,369
1985	3,249	959	4,208
1986	4,167	737	4,904
1987	11,451	1,384	12,835
1988	5,531	2,483	8,014
1989	9,222	4,351	13,573
1990	14,145	2,638	16,783
1991	11,531	7,503	19,034
1992	9,627	2,140	11,767
1993	6,164	6,551	12,715
1994	16,442	14,740	31,182
1995	26,322	16,289	42,611
1996	21,325	22,036	43,361
1997	19,423	20,035	39,458
1998	17,120	17,599	34,719
1999	2,935	5,799	8,784
2000	7,374	4,838	12,212
2001	7,250	1,726	8,976
2001	5,789	3,536	9,334
2003	8,249	3,916	12,165
2004	8,256	2,874	11,130
2005	11,357	1,819	13,176
2006	8,385	2,056	10,411
2007	6,524	4,974	11,498
2008	7,088	3,623	10,711

Remark: In 1979 DOF catches statistics of Thailand classified small tunas as “bonito” without breakdown into species.

Size composition

-Longtail tuna (*Thunnus tonggol*) was caught throughout the year with the length was varied from 7.0-55.0 cm. The main fishing gears were LPS, FADs, and TPS that small fish was caught in February to June and October to December. Whereas, TUN caught the bigger size of fish in February, May and September. However all of longtail tuna caught in the Andaman Sea Coast of Thailand were smaller than Lm (56.9 cm from www.fishbase.org) showed in Figure 3.

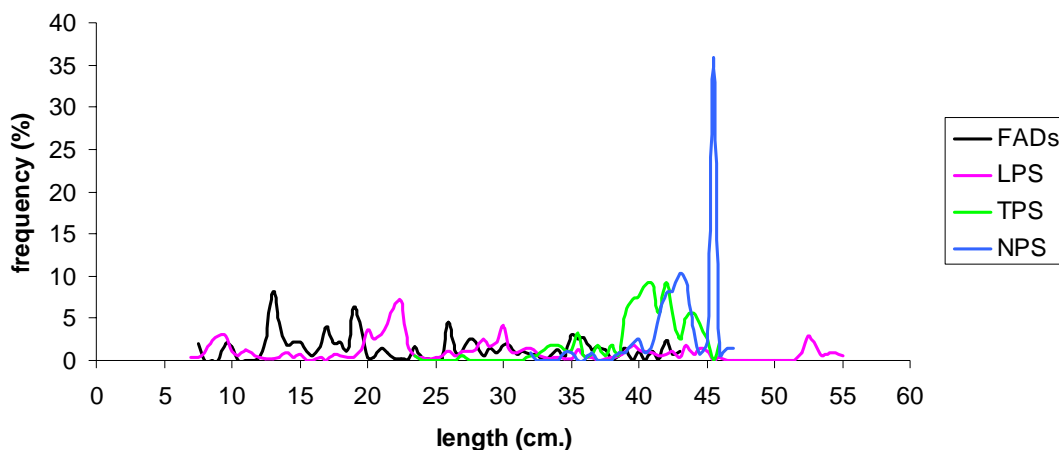


Figure 3 Length frequency of longtail tuna (*Thunnus tonggol*)

-Kanakawa (*Euthunnus affinis*) were found throughout the year with the lengths varied from 4.5-55.0 cm. The main gears were LPS and FADs. The small fish caught by LPS in January to July and FADs in January to June. The bigger size caught by TUN in February, March and May while TPS caught during August to September, GPS caught in July. All types of gear caught the small size than Lm (47.5 cm) (www.fishbase.org) as Figure 4.

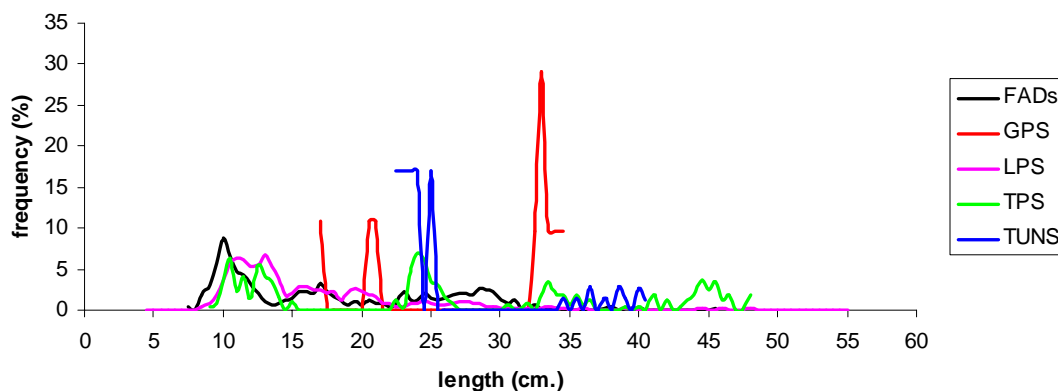


Figure 4 Length frequency of kanakawa (*Euthunnus affinis*)

-Frigate tuna (*Auxis thazard*) was caught throughout the year with the length varied from 8.0-47.0 cm by LPS and FADs. Small size of this species was recruited to fishing ground during January to May that caught from both gears. TUN caught the bigger size in February, March, May and September, while TPS caught in January, March and April. Comparing to Lm found the percentage of length frequency caught by TPS, TUN, LPS and FADs were bigger than Lm (28.8 cm) (www.fishbase.org) 68.56 28.29 18.68 and 5.32% respectively (Figure 5).

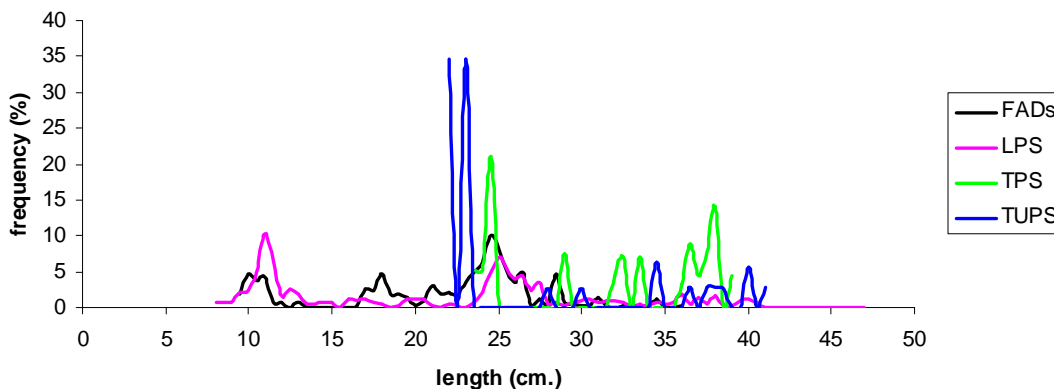


Figure 5 Length frequency of frigate tuna (*Auxis thazard*)

- Bullet tuna (*Auxis rochei*) was the main gears as LPS, TPS, FADs and TUN operated throughout the year with the size ranged from 7.0 – 27.5 cm. All of caught were smaller than Lm (26.5 cm) from www.fishbase.org in every months (Figure 5).

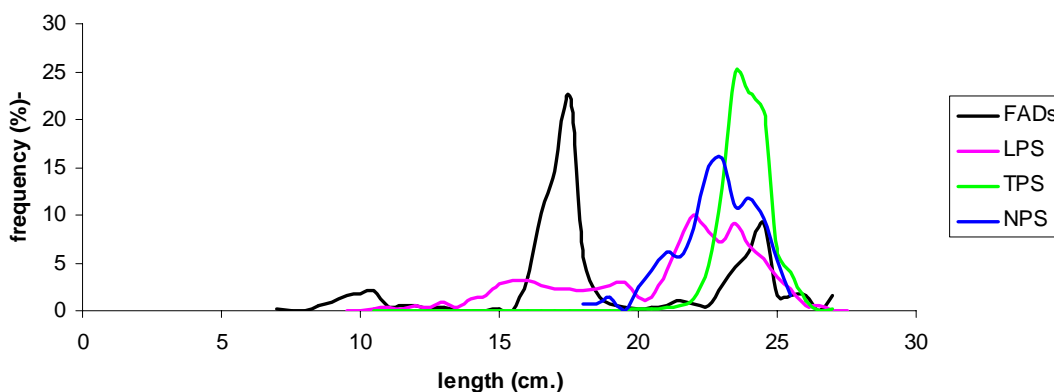


Figure 5 Length frequency of bullet tuna (*Auxis rochei*)

-Skipjack tuna (*Katsuwonus pelamis*) was found only in particular time in year. It was caught by LPS in January to May while TPS were caught in March and September. The size was varied from 27.0-46.5 cm that was smaller than Lm (47.5 cm) from www.fishbase.org showed in Figure 6.

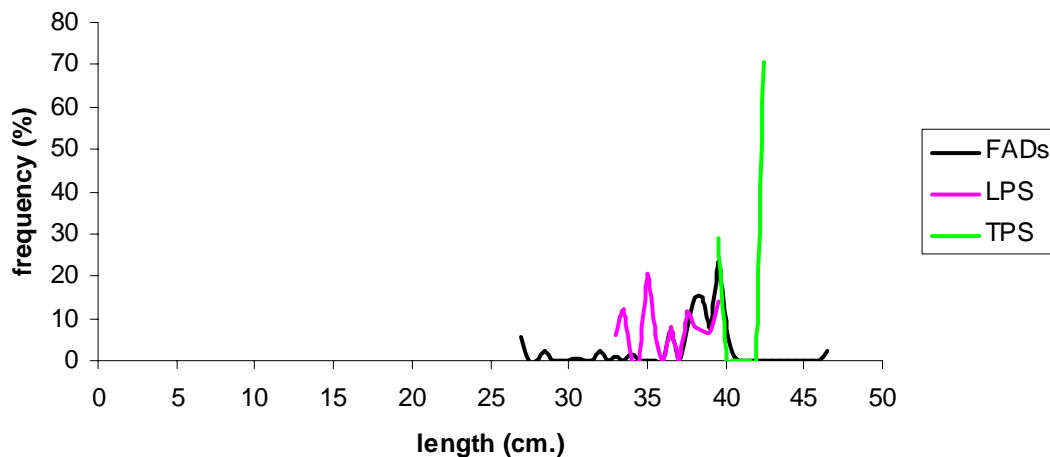


Figure 5 Length frequency of skipjack tuna (*Katsuwonus pelamis*)

The result from size composition of small tunas was showed general caught small size less than Lm from LPS and FADs. Same as the previous study from Boonragsa (1990) reported small tunas caught by LPS appeared to be smaller than those caught by TPS.

Maximum sustainable yield and optimum fishing effort

Boonragsa and Boonsuk (1998) reported the annual production, catch rate of standard gear and standard fishing effort of small tunas during 1985-1993. By applying Schaefer model to estimate the maximum sustainable yield (MSY) and the optimum fishing effort, the result showed those small tunas has not been overfished. In addition, small tunas are widely migratory species.

Recommendation on the future work

Thailand will be conducting the project “Nertic Tuna Resources in Thai Waters” during 2011 to 2013. The project will study on fisheries biology and stock assessment of neritic tuna in Thai waters. This project will fulfill the constrain on up-to-date information and neritic tuna status in the Andaman Sea.

References

- Boonragsa, V. 1990. Present status of small tunas fisheries and resources on the west coast of Thailand, Andaman Sea. Paper presented at the Expert Consultation on Stock Assessment of tunas in the Indian Ocean, 2-6 July 1990, Bangkok, Thailand. 25 p.
- Boonragsa, V. and S. Boonsuk. 1998. Pelagic fisheries and resources along the Andaman Sea Coast of Thailand. Andaman Sea Fisheries Development center, Marine Division, Department of Fisheries. 52 p.
- Department of Fisheries. 2009-2010. Fisheries Statistics of Thailand 2008. Information Technology Center, Department of Fisheries. (in Thai).
- Department of Fisheries. 2010. Thai Fishing Vessels Statistics 2008 . Fishery Information Technology Center, Department of Fisheries. (in Thai)
- www.fishbase.org