THE SECOND REGIONAL WORKSHOP ON SHARED STOCK
IN THE SOUTH CHINA SEA AREA

Kuala Terengganu, Malaysia, 18 – 20 July , 1995

SEAFDEC / MFRDMD / WS/95 / CR. 7

COUNTRY STATUS REPORT
THAILAND

(1) GULF OF THAILAND

THE OCCURRENCE OF NERITIC TUNAS *(Auxis thazard AND Euthynus affinis)* AND OCEANOGRAPHIC PARAMETERS OBSERVED FROM PURSE SEINE SURVEY 1991 — 1993

By

Dhammasak Poreeyanond

Oceanic Fisheries Division,
Department of Fisheries, Smuthprakaran,
Thailand

THE OCCURRENCE OF NERITIC TUNAS *(Auxis thazard AND Euthynus affinis)* AND OCEANOGRAPHIC PARAMETERS OBSERVED FROM PURSE SEINE SURVEY 1991 — 1993

1. INTRODUCTION

The neritic tuna is the most economically important pelagic fish in the Gulf of Thailand and Andaman Sea. During the year 1983 to 1992, the total catch of tuna had raised from 69,218 to 169,072 mt. which mostly caught by purse seiners. Tuna catch from the Andaman Sea contributed only 8% of the total production (Annual Fisheries Statistic 1992). The main species were frigate tuna *(Auxis thazard)*, Kawakawa *(Euthynnus affinis)* and longtail tuna *(Thunnus tongol)*.

In 1991 – 1993, during the period of pre-monsoon season (March–May) R/V "CHULABHORN" made the cruises to carry out tuna purse seine survey with the employment of anchored FADs in the Andaman Sea EEZ of Thailand. The operations were made along the continental area at 300–900 m depth between Latitude 6°–9° N and Longitude 96°–99° E which aiming to obtain the information of tuna catch data and oceanographic conditions for describing the variation of the availability and distribution of tuna resources **(Fig. 1).**

This paper attemps to highlight some finding on catch, species and size composition of two common small tuna including the oceanographic aspects found in the waters off the West Coast of Thailand.

2. CATCH AND SPECIES COMPOSITION

Based on the data collected during the year 1991–1993, the results of purse seine survey generally gave a moderate catch. The average catch rate was about 800 Kg./set, mainly consisting of skipjack (SKJ), yellowfin tuna (YFT), frigate tuna (FRI) and kawakawa (KAW). The summary of the survey on the occurrance of FRI *(A. thazard)* and KAW *(E. affinis)* is shown as below:–

Year	*Average catch rate (Kg. set)*	*Average comp. (%)*	
		FRI	*KAW*
1991	786	2.4	0.1
1992	710	10.5	12.2
1993	943	1.8	0.2

The occurrence of percentage composition of these two species found to be rather low for the offshore survey and only one peak observed in 1992. Normally, they were found to be high component from coastal fishery and to be abundant in the continental shelf area at the depth of 50–80 m (Boonragsa 1986) However, it showed some interesting of migration to the deeper area, being far away from the shore at the depth of 300–900 m.

3. SIZE DISTRIBUTION

The data collected on size distribution from the purse seine catches is summarised for FRI and KAW as shown in **Fig. 2a and b.**

Frigate tuna; as can be seen in Fig. 2a it contributed the small part of the catches during the month of March to May. The length of fish ranged from 24 to 35 cm and expressed in one size group with its mode 26.3 cm.

Kawakawa; it represented in high amount in 1992 and occurred by specimens in size range of 27–33 cm with one size group of its mode 30.1 cm **(Fig. 2b).**

The average size distribution of FRI and KAW showed that they occurred in size range not more than 40 cm which were rather bigger than those reported in 1986 (Boonragsa 1986) for the same period but to be smaller than the catches in the Gulf of Thailand in 1989 (Churnpan 1993).

4. OCEANOGRAPHIC OBSERVATION

The oceanographic survey was also conducted simultaneously with fishing survey throughout the cruises in order to collect environmental data for describing the variation of the availability and distribution of tuna resources as the destail given in **table 1–3.**

4.1 Temperature

	1991		*1992*		*1993*	
	March	*May*	*March*	*April–May*	*April*	*May*
Av. surface temp. (C°)	29.18	30.96	28.70	30.72	29.98	30.72
Av. temp. at 200 m depth.	12.39	13.73	13.48	15.60	15.36	15.56

From the above information of the Andaman Sea survey related to fishing, were found that tuna catch rate on May was higher than March and April due to the increased temperature about 1–2°C.

4.2 Salinity

	1991		*1992*		*1993*	
	March	*May*	*March*	*April–May*	*April*	*May*
Av. surface sal. (ppt.)	32.68	32.31	32.57	34.92	32.66	32.88
Av. sal. at 200 m depth.	34.92	34.89	33.01	34.82	34.80	34.62

From the above data, it could be seen that during March to May the salinity in the Andaman Sea varied not more than 1 ppt. and the difference in vertical to 200 m depth was about 2 ppt. So, such appearent parameter might not affect to tuna distribution and abundance in this area.

4.3 Dissolved oxygen

	1991		*1992*		*1993*	
	March	*May*	*March*	*April–May*	*April*	*May*
Av. surface dis. oxy. (ml/L)	5.40	5.39	5.41	5.47	5.56	5.43
Av. dis. oxy. at 200 m depth	1.58	1.83	1.46	1.60	1.56	1.57

Dissolved oxygen reading during the months were rather consistent for the surface but there were little variation trend at 200m depth on May of those three years. This was probably due to well mixing of water mass in the season which made a widely spreading out of dissolved oxygen, affected to the abudance and to be more tuna catch in this month.

4.4 pH

	1991		*1992*		*1993*	
	March	*May*	*March*	*April–May*	*April*	*May*
Av. surface pH	7.76	7.98	8.06	7.98	7.41	7.98
Av. pH at 200 m depth.	7.60	7.34	7.70	7.66	7.29	7.72

Generally, the pH values obtained from all observation were almost the same ranging from 7.34 to 8.06. It was found that the value at 200 m depth on March 1993 was obviously low down from normal level of 7.5 and it would affect to the distribution of tuna resources. However this difference had recovered to the normal condition on May.

4.5 Thermocline zone

	1991		*1992*		*1993*	
	March	*May*	*March*	*April–May*	*April*	*May*
Uper layer (m)	30	16	10–20	20–30	20–30	10–30
Lower layer (m)	170	160	180	150	160	160

From the result of the Andaman Sea survey (Fig. 3–5) the thermocline zone which mostly effected to fish behavion occurred at the average layer from 20 to 170 m depth with the temperature ranging 30.15° to 15.68° C. The top layer was rater shallow of 10–30 m in this pre-monsoon period, affected to the moving of tuna school close to the surface. Such condition made a high tuna catch of all fishing survey, particularly the sharp thermal gradient, occuring on April–May 1992 **(Fig. 6).**

Table 1: General hydrological conditions observed in the Andaman Sea EEZ of Thailand, March and May 1991

Data		*March*		*May*	
		Range	*Average*	*Range*	*Average*
Temperature	Surface	28.70–30.30 C	29.18 C	30.55–31.59 C	30.96 C
	200 m depth	11.69–14.12 C	12.39 C	13.24–14.54 C	13.73 C
Salinity	Surface	30.75–33.35 ppt.	32.68 ppt.	31.11–32.50 ppt.	32.31 ppt.
	200 m depth	34.84–34.96 ppt.	34.92 ppt.	34.88–34.91 ppt.	34.89 ppt.
Dis. oxygen	Surface	5.29–5.50 ml/L	5.40 ml/L	5.35–5.42 ml/L	5.39 ml/L
	200 m depth	1.42–1.99 ml/L	1.58 ml/L	1.78–1.91 ml/L	1.83 ml/L
pH	Surface	7.74–7.88	7.76	7.38–8.06	7.98
	200 m depth	7.74–7.88	7.60	7.29–7.38	7.34
Current	10 m	0.0–0.2 kts.	0.1 kts.	0.0–0.1 kts.	0.1 kts.
	50 m	0.5–0.8 kts.	0.5 kts.	0.2–0.5 kts.	0.2 kts.
	120 m	0.2–0.9 kts.	0.6 kts.	0.1–0.6 kts.	0.6 kts.
Thermocline	Top depth	10–90 m	40 m	10–70 m	50 m

Table 2: General hydrological conditions observed in the Andaman Sea EEZ of Thailand, March and April – May 1992

Data		*March*		*April – May*	
		Range	*Average*	*Range*	*Average*
Temperature	Surface	28.52–28.92 C	28.70 C	30.05–32.13 C	30.72 C
	200 m depth	13.09–13.86 C	13.48 C	14.79–16.91 C	15.60 C
Salinity	Surface	32.47–32.66 ppt.	32.57 ppt.	34.40–33.44 ppt.	33.01 ppt.
	200 m depth	34.86–34.97 ppt.	34.92 ppt.	34.58–34.97 ppt.	34.82 ppt.
Dis. oxygen	Surface	5.30–5.51 ml/L	5.41 ml/L	5.35–5.64 ml/L	5.47 ml/L
	200 m depth	1.44–1.48 ml/L	1.46 ml/L	1.46–1.89 ml/L	1.60 ml/L
pH	Surface	7.92–8.20	8.06	7.82–8.07	7.98
	200 m depth	7.58–7.81	7.70	7.53–7.75	7.66
Current	10 m	0.0–0.1 kts.	0.1 kts.	0.0–0.3 kts.	0.1 kts.
	50 m	0.2–0.6 kts.	0.4 kts.	0.1–0.9 kts.	0.5 kts.
	120 m	0.3–0.9 kts.	0.6 kts.	0.1–1.4 kts.	0.6 kts.
Thermocline	Top depth	10–20 m	15 m	20–30 m	30 m

Table 3: General hydrological conditions observed in the Andaman Sea EEZ of Thailand, April and May 1993

Data		*April*		*May*	
		Range	*Average*	*Range*	*Average*
Temperature	Surface	29.85–30.14 C	29.98 C	30.54–30.79 C	30.72 C
	200 m depth	13.31–17.52 C	15.36 C	12.96–21.31 C	15.56 C
Salinity	Surface	32.39–33.05 ppt.	32.66 ppt.	32.10–33.22 ppt.	33.88 ppt.
	200 m depth	34.84–34.95 ppt.	34.80 ppt.	34.09–34.90 ppt.	34.62 ppt.
Dis. oxygen	Surface	5.29–5.84 ml/L	5.56 ml/L	5.34–5.55 ml/L	5.43 ml/L
	200 m depth	1.43–1.81 ml/L	1.56 ml/L	1.36–2.44 ml/L	1.57 ml/L
pH	Surface	7.04–7.61	7.41	7.90–8.04	7.98
	200 m depth	7.25–7.38	7.29	7.62–7.93	7.72
Current	15 m	0.0–0.9 kts.	0.17 kts.	0.1–0.2 kts.	0.13 kts.
	50 m	0.1–0.3 kts.	0.33 kts.	0.1–0.5 kts.	0.31 kts.
	100 m	0.1–2.2 kts.	0.61 kts.	0.1–0.9 kts.	0.67 kts.
Thermocline	Top depth	10–30 m	27 m	10–30 m	17 m