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**OVERVIEW OF TAIWAN FISHING OF SOUTH PACIFIC ALBACORE**

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# Recent status of Taiwan's south Pacific albacore fisheries

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## 1. INTRODUCTION

Two papers described far seas tuna longline fisheries in the south Pacific albacore stocks in detail (Wang et. al 1988; Wang 1988). Those papers tried to assess the south Pacific albacore stocks and to describe the seasonal variations of longline fishing grounds based mainly on catch and effort data of Taiwanese far seas tuna longline fishery before 1985.

Recent decade, the changes of fishery structures are very clear. Rapid increasing of trollings, disappearance of large drift net fisheries and the growth of traditional local fisheries, all of these changes will influence the south Pacific albacore stocks more or less. Hence, it is necessary for re-assessing albacore fish stocks based on all catch and effort data.

Fortunately, all of these catch and effort data are prepared and available by the effort of SPAR members. Although these data reveal that fishing gears, fishing methods, target species and fishing grounds are very different however, re-assessment of south Pacific albacore stock becomes possible.

In this paper, I try to describe the recent status of Taiwan's albacore fisheries in south Pacific Ocean. All of Taiwan's catch and effort data are adapted from official publications including TRC's and TFB's annual reports.

Update, two types of fishery of Taiwan are operating in south Pacific Ocean; distant waters tuna longline fishery (target on albacore) and large purse seiners (target on skipjack and yellowfin).

## 2. Far seas tuna longline fishery

South Pacific albacore stocks are mainly exploited by tuna longline fishery. As shown in Table 1, two data sources are available. One is from TRC annual reports, and the other one provided by TFB. TRC's data are collected from

logbook reported by fishermen. Total catches and efforts are accumulated from raised 5-degree square data. Generally, these data can be separated by time and oceans clearly. Because the coverage rates are always rather low, and usually, no reports can be obtained from some 5-squares, TRC's estimates are always a little under estimates. However, TFB's catches include landings data only. All of these data are reported by the agent systems. They may contain catches of other seasons and other oceans. And, if catches are not auctioned at base ports, then they are not included in the landings. Generally, it is unreasonable for separating landings data by oceans and time clearly. Table 1 listed both data to be compared.

1971-1985's effective fishing efforts are adjusted by Wang et. al (1988) by Honma's method (1974). Because of insufficient time, budget support and that more reasonable method are considered and should be induced to the estimate of the effective fishing efforts, final reports of re-estimating the effective fishing efforts and re-assessing south Pacific albacore stock can not be obtained in these papers.

In order to get the recent trend of CPUE variations, 1986-1991's effective fishing efforts are estimated provisionally based on the same adjusted factors as Wang et. al (1988) and based on the catch and effort data of Taiwan's tuna longline fishery only.

As shown in Figure 1, total hooks used by Taiwan's longline fishery reveal an increasing trend since 1988. On the other hand, catch per unit of fishing effort (CPUE by ind/100 hooks by effective efforts) reveal a decreasing trend. The fluctuations may be related to the reduction of drift net fishery. Detail analyses are necessary in future.

### 3. Large purse seiners

In Taiwan, there are two types of large purse seiners: mackerel purse seiners (since 1977) and skipjack purse seiners (since 1982). According to TFB's annual reports of catch statistics, landings data are pooling together

before 1990. From 1990, they are processed according to the types of fishery. Before May 1992, a few of purse seine boats also entered the Indian Ocean to exploit tunalike fishes. Table 2 shows the variations of the catch and effort of Pacific skipjack purse seiner since 1982.

Large purse seiners inducted to Taiwan since 1982. May be due to the unproficient technique of fishing method, the development of this fishery seems not so good at first stage. Before 1985, the percentages of target species: skipjack and yellowfin tuna, are lower than or near to 10% only. Recently, the percentage of skipjack are always larger than 50%. In 1992, total catch is about 106,798 MT (adapted from TFB's landings data; catch of mackerel purse seiners and which from Indian Ocean have been excluded). Among them, there are 14,407 MT of yellowfin and 58,197 MT of skipjack. Total percentage of both species is about 68% with skipjack 54.49% and yellowfin 13.49%. No albacore catch are reported. However, fishermen said that sometimes a few of albacore are caught when exploiting the target species: skipjack and yellowfin tuna. In catch statistics, albacore are always included in the catches of miscellaneous fishes.

Number of boats are estimated by accumulating the new building boat in each year (Sun 1993). Because of that these new boats entered purse seine fishery haven't operating around the year, hence, CPUE expressed by catch per vessel (MT/V) may be having a little lower estimate.

As shown in Figure 2, CPUE (MT/V) fluctuate in the ranges of two to four thousand metric tons. The peak is 3,907 MT/V appeared in 1988. In 1992, it is decreasing to 2,322 MT only.

#### 4. data proceeding and future research

Except the routine work of processing catch and effort data of far sea tuna longline fishery, three other projects are also carrying out in Taiwan:

- (1). improving inshore and coastal catch and effort data collection system

(2). research of the large purse seine fishery

(3). research of the south Pacific albacore stock

Recently, many domestic tuna longline boats try to base on foreign base ports like as Guam, Singapore, or Indonesia. Most of them haven't back to Taiwan. Hundreds(?) of those boats get the necessary supplies from the overseas ports and catches are landings over there. We have noticed this problem and tried to collect these data through the agent system and by sampling vessels.

Mr Sun is the sponsor of the research of large purse seiners.

According to SPC dbase, there are three types of fishing gears which are target on the south Pacific albacore stocks. As shown in Figure 3-1 to 3-3, although distributions of fishing grounds are very different, they also overlap each other. Although the distributions of fishing grounds of three main distant waters tuna longline countries are very similar, target species are very different.

Compared to the distant far seas tuna longline fisheries, New Caledonia's longline fishery (marked by L-NC ?) always show very very high hooking rates.

Of course, different fishing gears may target on different size of fish, and hence they always operating on the different seasons and the different fishing grounds. How to standardize the different fishing gears, different methods, different target sizes and different fishing grounds to the same to adjusted the effective fishing effort is an very important work. In order to maintain the sustainable exploitation of the south Pacific albacore stock, it is necessary to assess the fish stocks more correct. If it is possible, we also try to assess the optimal structure of fisheries used to exploit the south Pacific albacore stocks in future.

<<REFERENCES>>

Honma, M 1974

Estimation of overall effective fishing intensity of tuna longline fishery.

Far seas Fish. Res. Lab. Bull. 10:63-85.

Sun, C.L. and S.Z. Yeh 1993

Recent status of Taiwanese purse seiners in the western Pacific Ocean.

China Fisheries Monthly, No.480, pp. 5-19.

Wang, Chien-hsiung, Mei-shu Chang and Ming-cheng Lin, 1988

Estimating the maximum sustainable yield of south Pacific albacore, 1971-1985.

· ACTA Oceanographica Taiwanica, No.21, pp.67-81.

Wang, Chien-hsiung 1988

Seasonal changes of the distribution of south Pacific albacore based on Taiwan's tuna longline fisheries, 1971-1985.

ACTA Oceanographica Taiwanica, No.20, pp.13-40.

Table 1. Catch statistic of Taiwan's tuna longline fishery in south Pacific fishing grounds, 1971-

year	catch MT	from TRC*			TFB** data alb. MT	total data total MT	CPUE		cov rate %
		No. x100	NH x1000	EH x1000			by EH MT N/100H	mean kg	
1971	19677	12322	35773	43023	13928	26573	2.86	15.97	32.77
1972	21965	13568	40134	41378	13666	26805	3.28	16.19	24.74
1973	26795	16285	54211	52585	28974	46564	3.10	16.45	16.80
1974	19009	13217	50456	48740	19638	33428	2.71	14.38	10.92
1975	13343	8853	35452	32368	14580	25625	2.74	15.07	16.27
1976	18129	11223	36927	29984	18642	31753	3.74	16.15	10.41
1977	24620	16939	46214	45567	27211	42254	3.72	14.53	26.04
1978	18732	13487	33418	36927	18617	28355	3.65	13.89	47.54
1979	12376	8289	28945	32939	16178	28357	2.52	14.93	68.71
1980	27007	18889	66288	88615	18190	29582	2.13	14.30	53.33
1981	12041	8530	36496	43467	14595	19448	1.96	14.12	83.02
1982	10157	6918	26011	29575	12680	15827	2.34	14.68	78.17
1983	7822	5513	17175	15183	12082	14556	3.63	14.19	81.53
1984	6771	4637	19779	18118	11155	14770	2.56	14.60	69.58
1985	6095	4189	14210	13201	9601	12357	3.17	14.55	67.93
1986	6530	4658	11696	11829	11913	14583	3.94	14.02	56.81
1987	7428	5061	16526	15735	15009	17734	3.22	14.68	71.55
1988	14056	9535	33437	32240	17120	22029	2.96	14.74	30.57
1989	8567	6022	34380	33552	10867	13416	1.79	14.22	16.00
1990	8486	5108	32197	31040	9689	12987	1.65	16.61	12.59
1991	9840	7121	38100	36883	14030	16662	1.93	13.82	?
1992	?	?	?	?	?	?	?	?	?

\* 1971-1985: adapt from Wang et. al (1988, Table 1)  
 NH=nominal efforts, EH=effective efforts  
 1986-1990: estimated by Wang, based on Taiwan's data only  
 1991- : unpublished data, provisional estimates by Wang  
 \*\* 1971-1991: landings data, provided by TFB.  
 entire Pacific Ocean,

Table 2. Catch statistics of Taiwan's skipjack purse seiners in Pacific Ocean, 1982-

Unit: metric tons								
year	vessel	skj#	OH	yel#	OH	others	sum@	MT/V
1982	1	190	8.73	298	13.69	1689	2177	2177
1983	3	35	0.46	972	12.77	6604	7611	2537
1984	3	43	0.56	741	9.65	6894	7678	2559
1985	6	2603	11.16	1357	5.82	19355	23315	3886
1986	6	7710	34.74	2718	12.25	11767	22195	3699
1987	10	15928	48.07	4599	13.88	12610	33137	3314
1988	14	26798	48.99	6782	12.40	21118	54698	3907
1989	23	40228	53.69	9961	13.29	24736	74925	3258
1990	32	62249	57.09	12510	11.47	34274	109033	3407
1991	43	50422	52.69	15024	15.70	30241	95687	2225
1992	46	58197	54.49	14407	13.49	34194	106798	2322

Data:# adapted from TFB annual reports, 1982-91.  
 @ 1982-90 separated from mackerel PS  
 \* provided by TFB

6

Fig 1 Variations of hooking rates  
and effective fishing efforts.

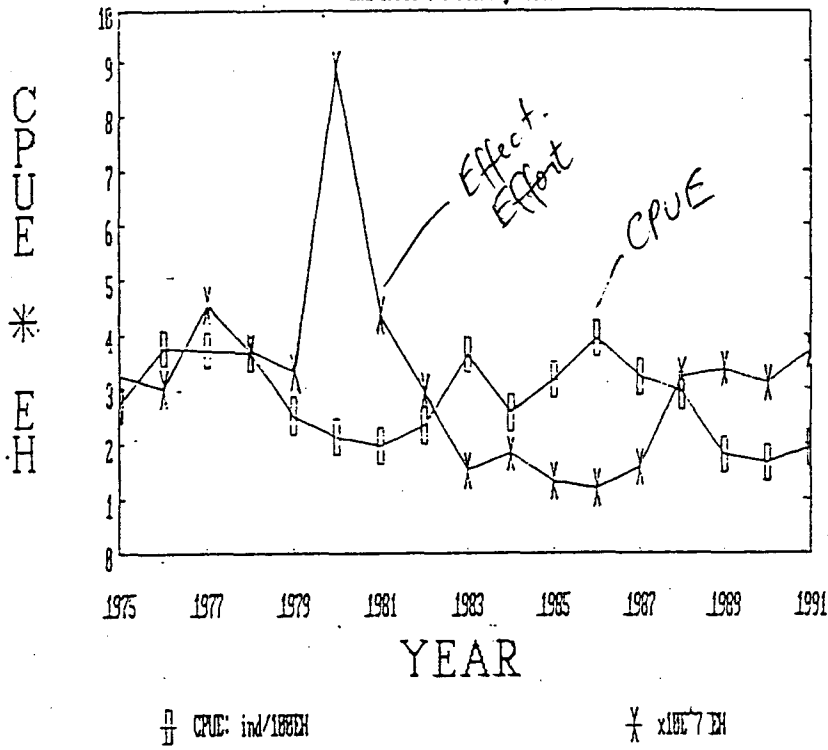
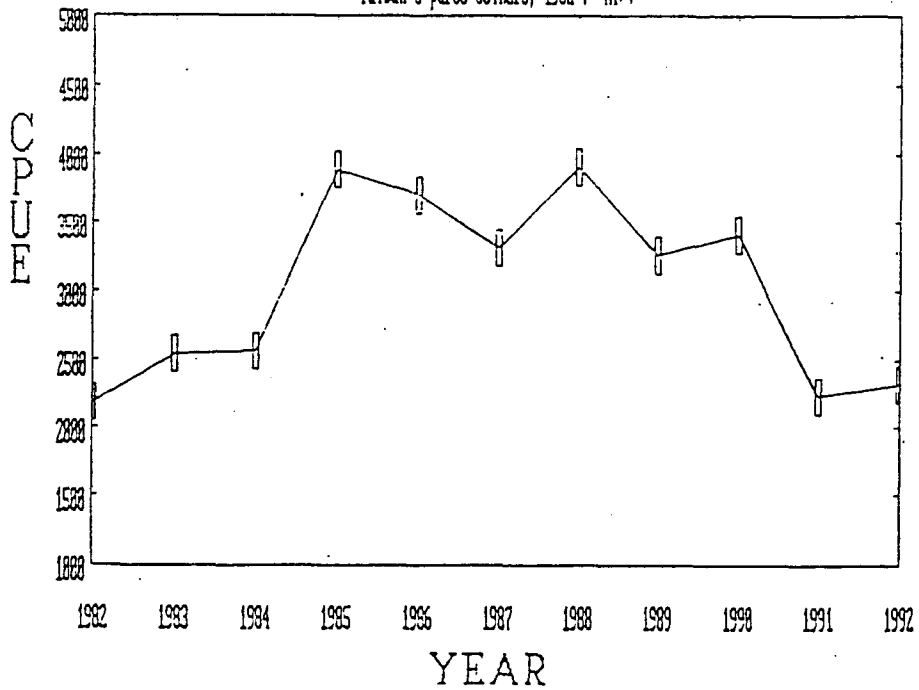


Fig 2. Variations of CPUE of

Taiwan's purse seiners, 1982- NT/V





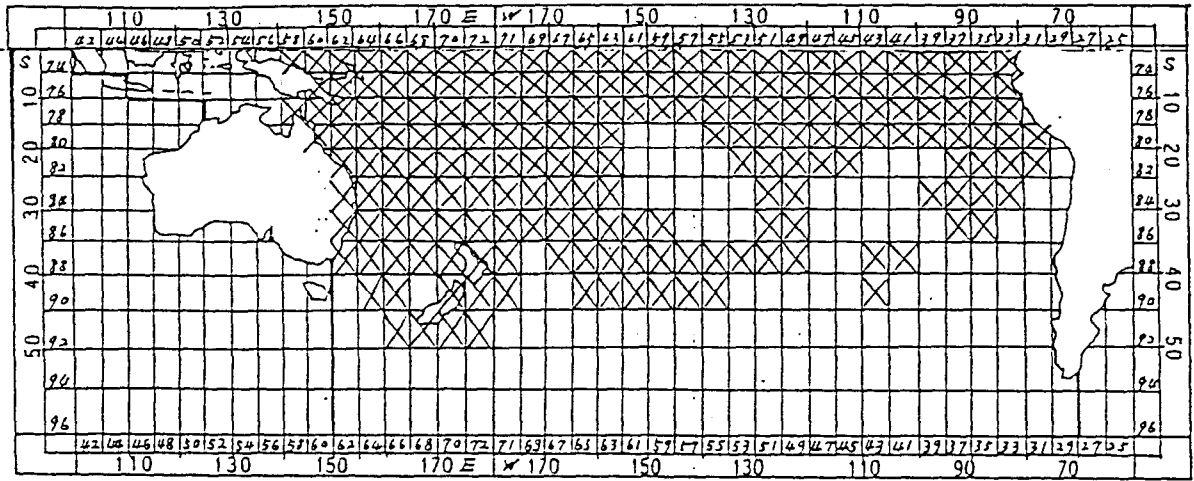


Fig 3-1. Distributions of longline fishing grounds, 1985-1991.

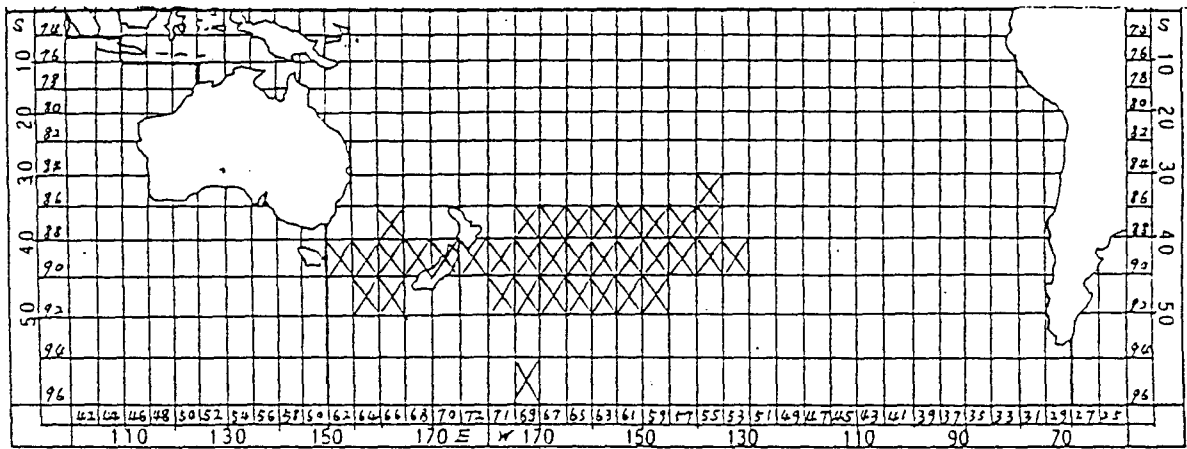


Fig 3-2. Distributions of drift net fishing grounds, 1988-1990.

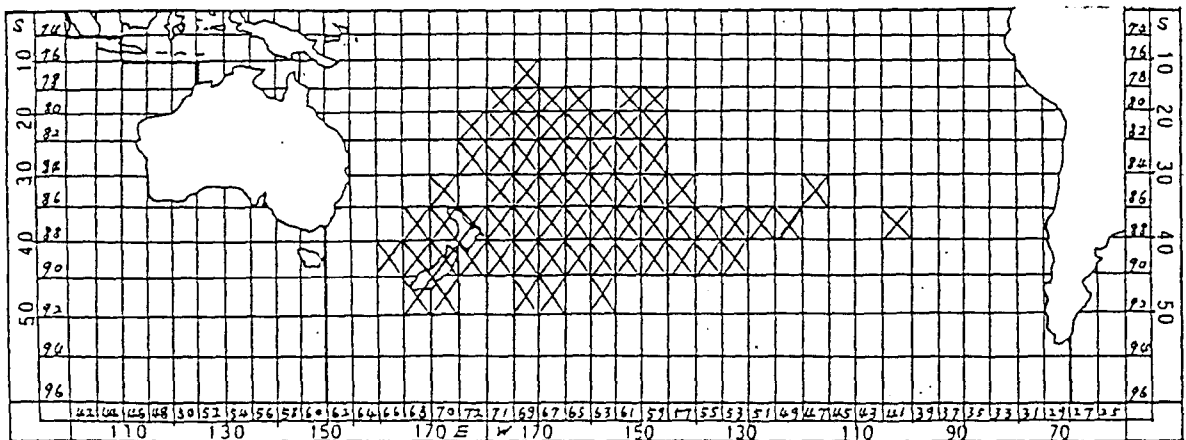


Fig 3-3. Distributions of trolling fishing grounds, 1986-1991.