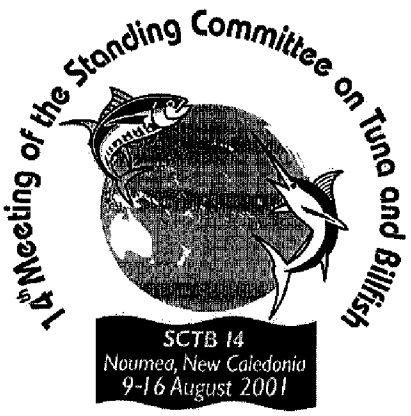
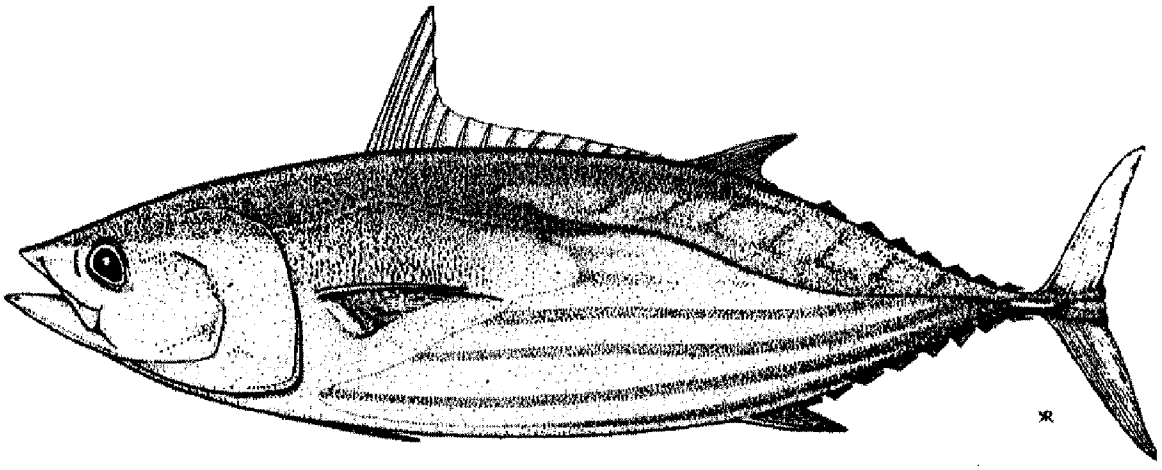


SCTB14 Working Paper

NFR–13

Update on tuna Fisheries of Taiwan in the Pacific Region



Wang, S-B, & C-L. Kuo

Overseas Fisheries Development Council of the Republic of China and
Fisheries Administration, Council of Agriculture, R.O.C.

National Report

Update on Tuna Fisheries of Taiwan in the Pacific Region

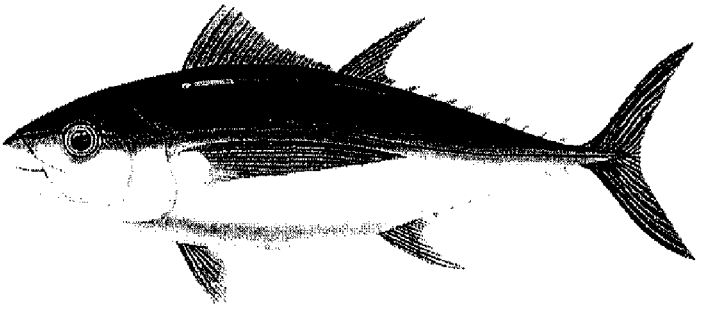
Shyh-Bin Wang

Overseas Fisheries Development Council
of the Republic of China

and

Chin-Lau Kuo

Fisheries Administration,
Council of Agriculture, R.O.C.



August, 2001

This paper is prepared for the 14th meeting of the Standing Committee on Tuna and Billfish (SCTB) held in Noumea, New Caledonia, August 8-16, 2001. Document not to be cited without permission of the authors.

Introduction

The Pacific Ocean is one of the earliest fishing grounds exploited by Taiwanese tuna fishery. Currently, there are three major fisheries operated in this region: the distant water longline (DWLL) fishery, the distant-water purse seine (DWPS) fishery and the offshore longline (OSLL) fishery based upon gear types and the vessel sizes or the operation scales specified.

In the following sections, we will update information on these fisheries in the Pacific region in more details.

Distant water longline fishery

The DWLL vessels refer to those vessels operate in distant waters and in general, their sizes are greater than 100 GRT. Number of DWLL vessel operated in the Pacific Ocean in 2000 was estimated to be about 78. Most of them targeted on albacore for canning, but some of them also targeted on bigeye and yellowfin tunas for Japanese frozen sashimi market.

The major fishing ground of DWLL vessels located in the South Pacific and the tropical region (Figure 1). However, in recent years, the North Pacific has become increasingly important as some of the vessels start to target on northern albacore on seasonal basis.

Table 1 shows the catch estimate of major tuna and tuna-like species during 1996-2000 period. The most dominant species caught in this fishery

was albacore, accounting for about 84% of the total catch during this period (Figure 2). Bigeye and yellowfin tunas together accounted for another 11%. Catches on other species were negligible (in terms of quantity). The average catch in recent 5 years (1996-2000) was about 19,000 mt for albacore, 1,500 mt for bigeye, and 1,200 mt for yellowfin tuna. There was also an obvious increase in catch of the three major tuna species in 2000 presumably resulting from an increase in number of vessels in the region.

Distant water purse seine fishery

Purse seine fishery was introduced into Taiwan in 1982. Since then, it has become one of the major fishing gears used in Taiwanese tuna fishery. Total number of purse seine vessel in 2000 remained the same as the previous year and maintained at 42, of which 19 are greater than 1000 GRT and 23 between 500 and 1000 GRT.

Total catch and major species caught in this fishery during 1996-2000 period are shown in Table 2. The most dominant species remained to be the skipjack accounting for about 79% of the total (Figure 3). The yellowfin tuna was the 2nd dominant species accounted for another 20%, and the bigeye tuna only accounted for 1% of the total catch. Average catch during this period was about 165,000 mt for skipjack, 43,000 mt for yellowfin and 1,200 mt for bigeye tuna (Note: catch composition of bigeye and yellowfin tunas during 1996-1998 period has not been adjusted for mis-identification). In addition, catch of skipjack in 2000 increased significantly (by about 20%, 32,000 mt), but catch of yellowfin and bigeye tunas decreased by about 10%

(3800 mt) and 40% (1500 mt) respectively. Such a change may have been related to differences in fishing grounds located.

The major fishing ground of DWPS fishery varied dynamically within this period. In 1997, it extended to as far as the east of the 160°W due possibly to the impact of El'Nino (Figure 4-1A). After 1997, fishing ground started to move westward and mainly located in the western and central part of the tropical Pacific (135-175°E, 8°N-8°S) with sporadic efforts found in areas east of 180°E (Figure 4-1B, 4-2A). The fishing ground in 2000 essentially located only in areas west of 180°E (Figure 4-2B).

Comparisons of CPUE (mt/set) and annual catch percentage among fishing areas (Figure 5) show that there seems to be no consistent pattern between years. In 1996, the highest CPUE and the lowest catch percentage were both found in the Indonesia region while a consistent pattern of high catch percentage in the high CPUE areas (i.e., in PNG, highsea and Kiribai) was evident in 1997. Limited entrance for vessels greater than 800 GRT in the 2nd half of the year in 1996 may explain the low catch percentage found in the Indonesian waters.

In 1998, CPUE were similar in all areas while the highest catch was found in the highsea region. In 1999, high catch percentages were found in both FSM and highsea areas while the highest CPUE was in the PNG waters. For 2000, the highest CPUE was found in the Solomon Islands, Kiribati and Tuvalu, while high catch percentages were found in PNG, FSM and highseas. In addition, two new fishing grounds in waters off Marshall Islands and

Nauru in 1998 and one in waters off Tuvalu were found during 1999-2000 period.

The major catch in DWPS fishery was from the "free or unassociated schools" and/or the 2nd from the log-associated schools (Figure 6). This pattern is consistent for all years between 1996 and 2000. The feeding (on bait fish) schools also accounted for a substantial catch in 1996 but not evident for other years. Although the nominal CPUE was the highest in feeding associated schools for all years, such a school was in general, difficult to find, as a result, the percentage of fish caught in this type of school only accounted for a small percentage of the annual catch in most years.

The offshore longline fishery

The OSLL vessels include those vessels operate in coastal and offshore waters of Taiwan and is in general, smaller than 100 GRT. However, in recent decades, the fishing pattern of this fleet has been changed. Some of the vessels are now operating not only in the coastal and offshore regions but also in distant waters (or EEZ of foreign countries) depending upon size and facilities equipped.

Number of registered OSLL vessels (0-100 mt) was similar during 1996-2000 period, and estimated to be about 1700 (included vessels operated in both the Pacific and the Indian Oceans). Total catch of tuna and tuna-like species landed in Taiwan by this fleet was stable and averaged at

about 46,000 mt during 1996-2000 period (Table 3). The dominant species caught include: yellowfin, bigeye, billfishes (i.e., striped marlin, blue marlin, black marlin and other marlins), skipjack and other tuna species (Figure 7).

In addition to catches landed at domestic ports, catches of bigeye and yellowfin tunas unloaded in the foreign base, ports of Pacific and Indian Oceans, were estimated to be about 12,000 to 15,000 mt and about 14,000 to 22,000 mt, respectively during 1996-2000 period (Table 4).

With limited logbook recovered, it was found that the major fishing grounds of OSLL vessels based at domestic ports were located in area of 110-160 °E/10-35 °N, especially waters south and east of Taiwan and northeast of the Philippine Islands (i.e., 110-130 °E/15-26 °N), and in areas around 131-138 °E/14-20 °N (Figure 8). Catches in the east of 150°E were very small. However, this figure may not be well represented due to low recovery of logbook in the fishery.

Market destination of catches

Most of the catches of DWLL vessels were landed at American Somoa and Fiji or transshipped to Thailand for canning. Similarly, catches of DWPS fishery were also transshipped to Thailand for canning, except for a very small percentage, which might be sold to Japan for Katsuobushi. Fishes caught by OSLL vessels however, were mostly sold in the local fresh-fish market of Taiwan for sashimi or transshipped to Japan - the

sashimi market for a better price.

Future prospects and development

A possibility of incorporation of new data source into the Taiwanese Pacific longline dataset

A preliminary effort on possibility of incorporation of NMFS data set into Taiwanese Pacific longline dataset was completed and reported to the statistic working group meeting separately (see SWG for details).

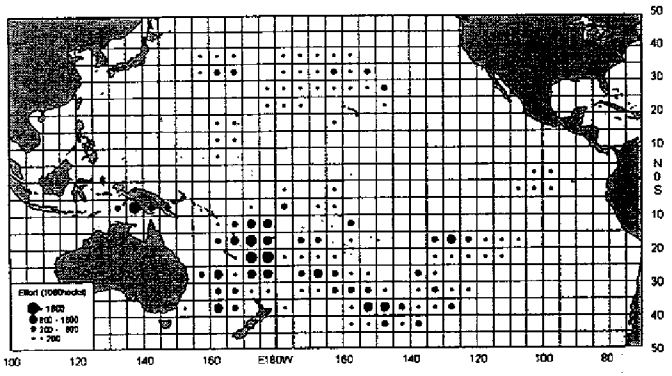
Vessel Monitoring System

For the purpose of better management of our distant water longline fishing vessels, the government has encouraged DWLL vessels to install the vessel monitoring system (VMS) since 1996. Although installation of this system and reporting of vessel position through VMS are not compulsory at this time, the government recognizes that as a major fishing nation, it is our obligation to play a leading role in the region not only to be in line with the international trend in management of fishery resources in the Pacific Ocean, but also to achieve the goal of the sustainable use of these resources in the region.

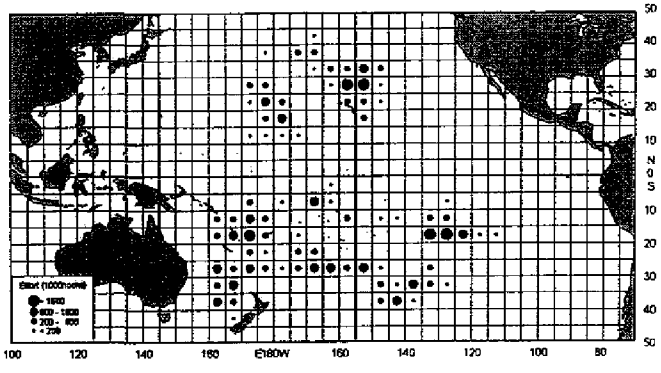
Observer Program

In addition to the vessel monitoring system, for purposes of better understanding bycatch from longline fishery and in line with the

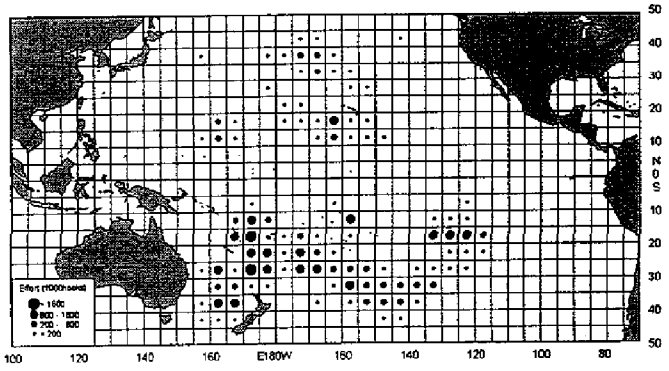
international trend on conservation of marine living resources, the government has launched an experimental observer program in 2001 and complementary legislation is expected to follow. Observations covered by this program include: bycatch, sharks, seabirds, sea turtles, discards et al. The government fisheries authority, together with scientists from different fields, will evaluate the result of this program in the next year, and may further expand the coverage of this program if the results of this experimental program are proven to be feasible.



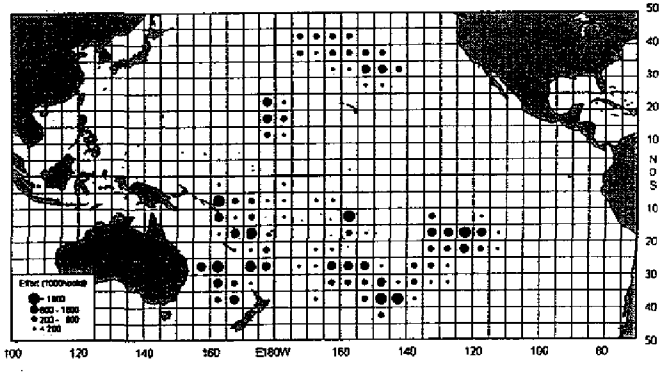
(A) 1996



(C) 1998



(B) 1997



(D) 1999

Figure 1. Effort distribution of Taiwanese distant water longline fleet operated in the Pacific Ocean during 1996-1999 period.

Table 1. Catch (in mt, round weight) statistics of major tuna and tuna-like species caught in distant water longline fishery in the Pacific region during 1996-2000 period.

YEAR	ALB	BET	YFT	SWO	BILL	SKJ
1996	18454	373	941	150	346	115
1997	19524	726	1108	182	322	266
1998	18416	1395	904	228	585	499
1999	18245	1993	1181	315	503	779
2000*	20981	2901	2123	372	320	274

* a preliminary result

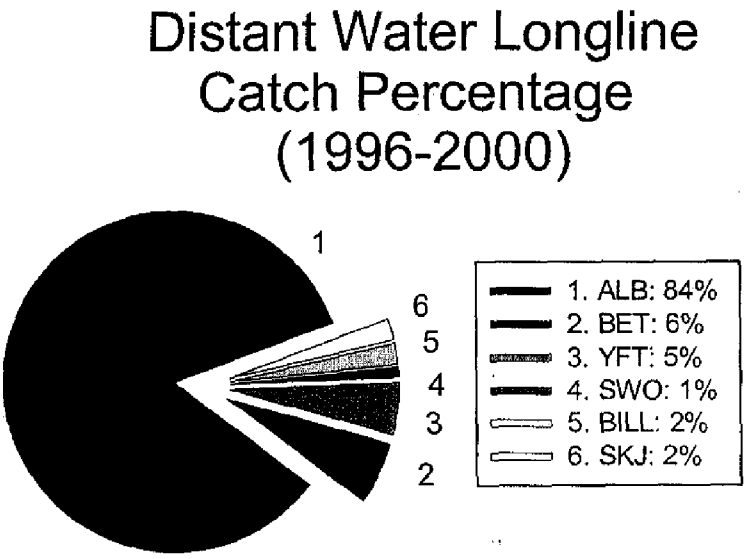


Figure 2

Table 2. Catch (in mt, round weight) statistics of major tuna species caught in distant water purse seine fishery in the Pacific region during 1996-2000 period.

	1996	1997	1998	1999	2000*
SKJ	161,407	116,073	193,728	160,453	192,456
YFT	17,389	50,722	64,764	41,905	38,072
BET	359	401	201	3,372	1,900
Total	179,155	167,196	258,693	205,730	232,428

* a preliminary result

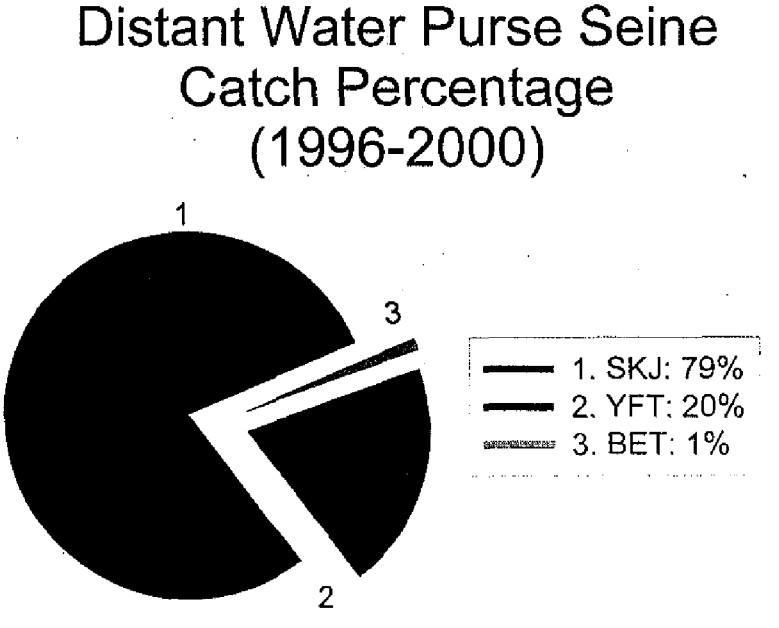
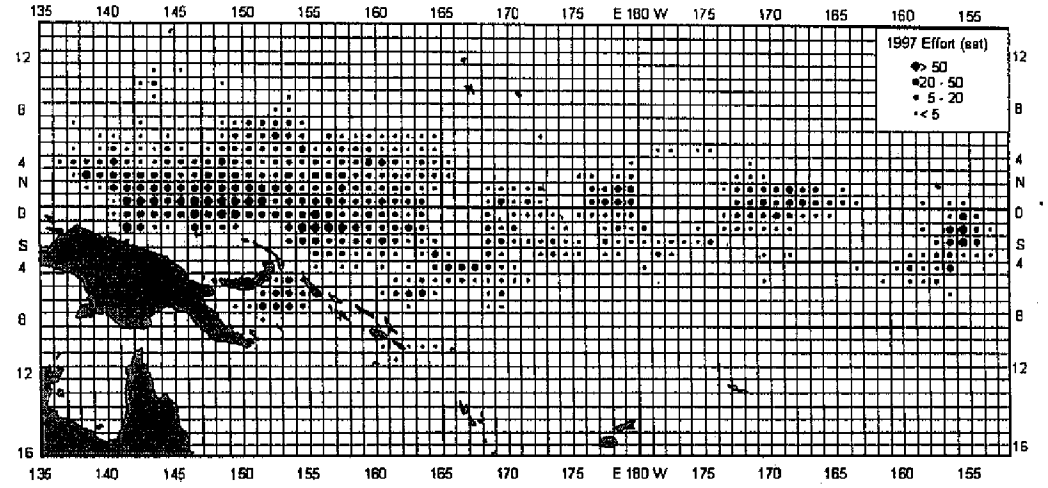


Figure 3

(A)



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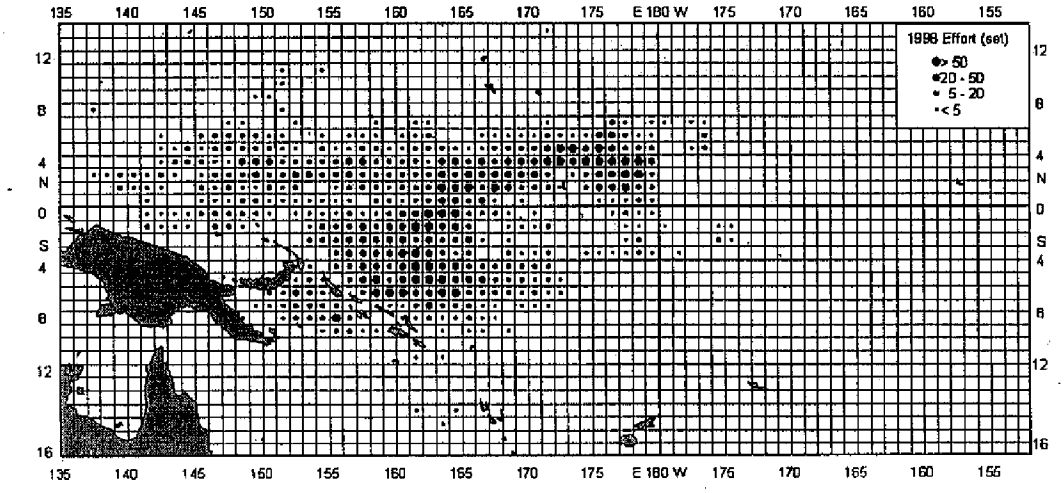
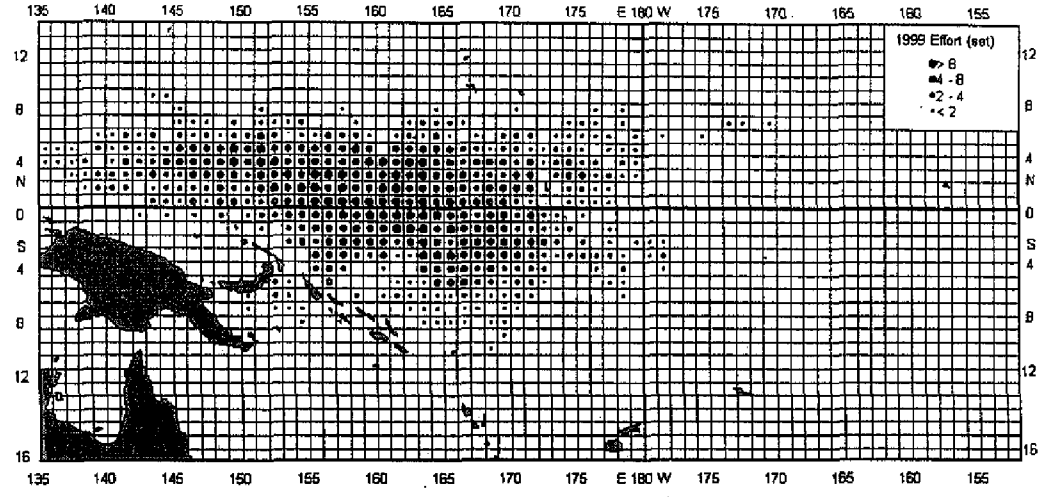


Figure 4-1. Effort distribution of Taiwanese distant water purse seine fleet operated in the Pacific Ocean in (A) 1997 and (B) 1998.

(A)



(B)

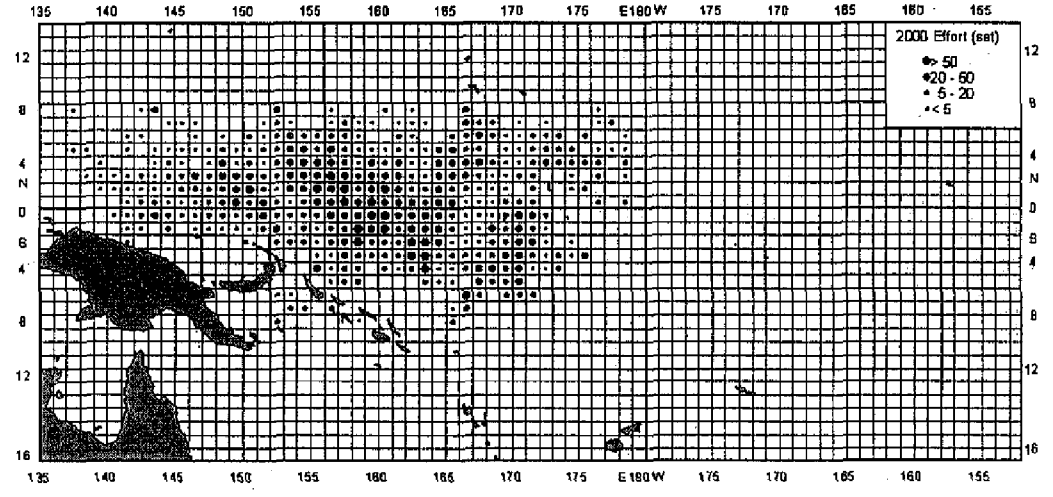


Figure 4-2. Effort distribution of Taiwanese distant water purse seine fleet operated in the Pacific Ocean in (A) 1999 and (B) 2000.

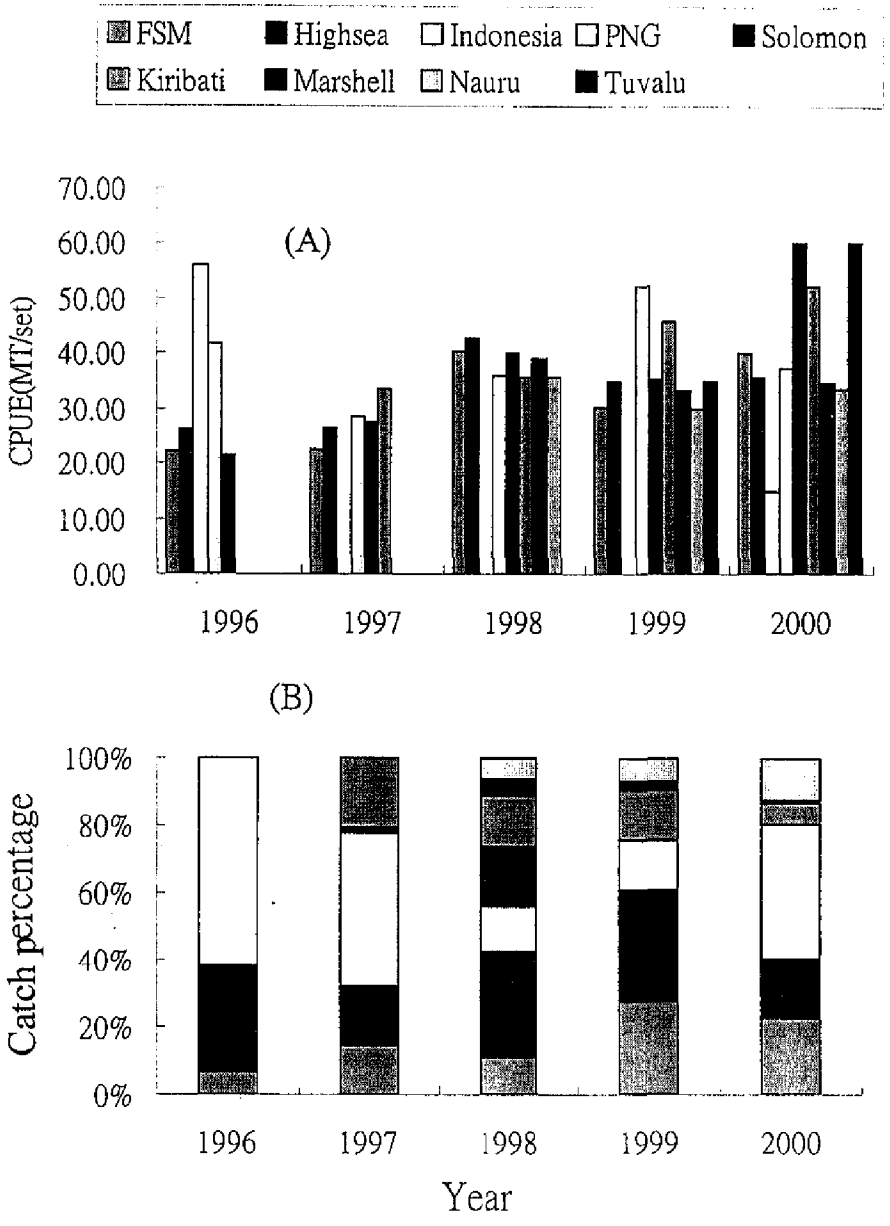


Figure 5. Comparisons of (A) CPUE (mt/set) and (B) annual catch percentage among fishing areas in Taiwanese distant water purse seine fishery operated in the Pacific region during 1996-2000 period.

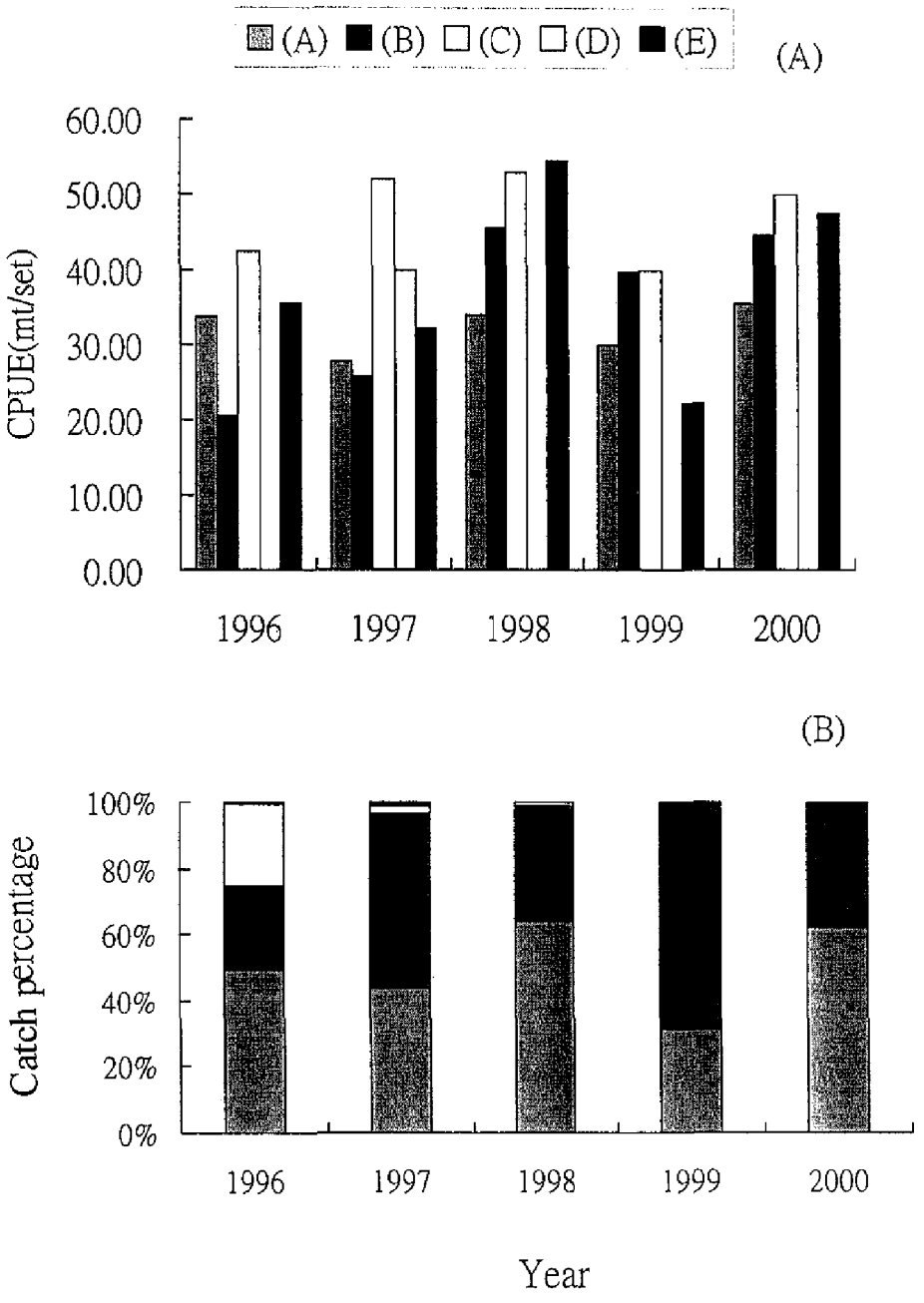


Figure 6. Comparison of (A) CPUE (mt/set) and (B) annual catch percentage by school types in Taiwanese distant water purse seine fishery operated in the Pacific region during 1996-2000 period. (A) free-school or unassociated school; (B) log school (including FAD); (C) feeding on bait fish school; (D) life-whale-shark school; (E) others (unspecified).

Table 3. Catch (in mt, round weight) of tuna and tuna-like species in the offshore longline fishery landed in Taiwan (including vessels operated in the distant water) during 1996-2000 period.

YEAR	ALB	BET	YFT	SWO	BILL	SKJ	TUN	Total
1996	398	1,587	10,364	1,662	14,989	3,575	9,844	42,420
1997	973	3,772	9,994	2,604	16,771	3,494	8,576	46,183
1998	613	3,669	9,456	2,450	16,524	2,991	10,683	46,385
1999	382	2,673	10,347	2,720	14,486	2,663	14,355	47,626
2000	944	2,092	8,376	3,147	16,456	4,046	11,326	46,387

TUN: other tuna and tuna-like species.
* a preliminary result

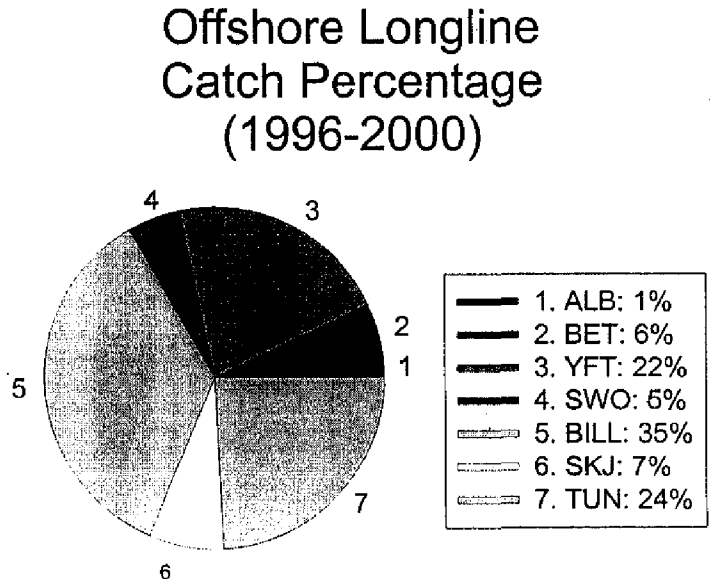


Figure 7

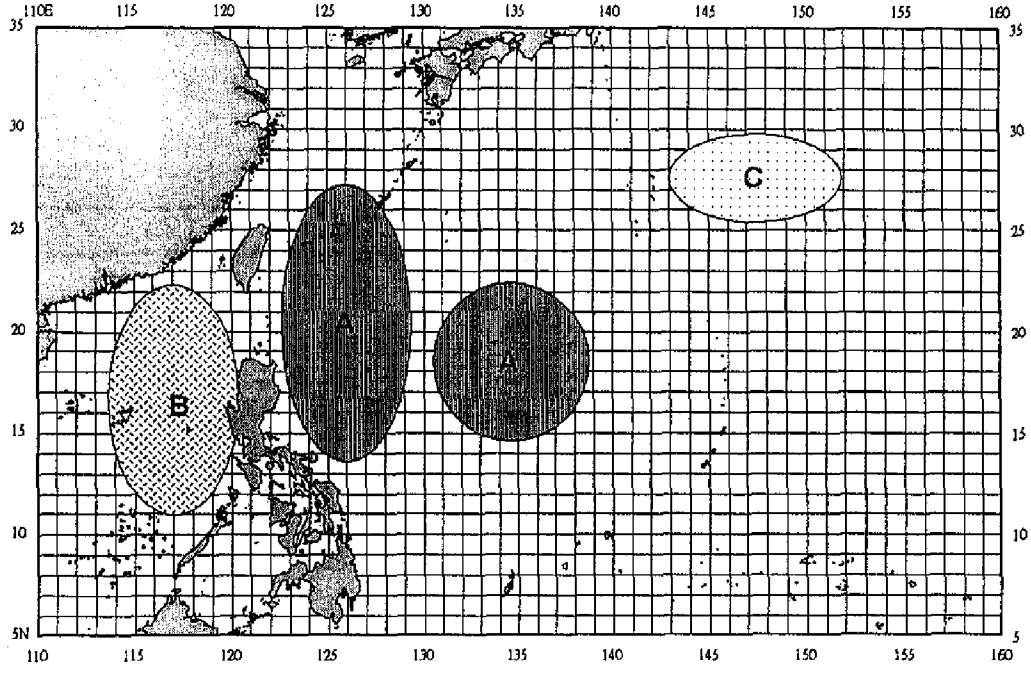


Figure 8. Effort distribution of domestic longline fleet operated in the Pacific Ocean during 1998-2000 period. A, B and C represent for high, medium and low effort area, respectively.

Table 4. Catch (in mt, round weight) of bigeye and yellowfin tunas in the offshore longline fishery landed in foreign (including Pacific and Indian Oceans) countries during 1996-2000 period.

SPECIES	1996	1997	1998	1999	2000
BET	11,662	14,948	14,974	14,794	13,016
YFT	14,811	19,149	18,617	19,473	22,192
Total	26,473	34,097	33,591	34,267	35,208

* a preliminary result