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CHINESE TAIPEI

National Report

Tuna Fisheries Status Report of Chinese Taipei in the Western and Central Pacific Region

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and
Overseas Fisheries Development Council, Chinese Taipei

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Scientific data was provided to the Commission in accordance with the decision relating to the provision of scientific data to the	Yes

Summary

There are three types of Taiwanese tuna fishing vessels operating in WCPFC Convention Area: large tuna longline (LTLL, previous named FTLL) fishery, distant-water purse seine (DWPS) fishery and small tuna longline (STLL, previous named CTLL) fishery. In 2009, total catches of LTLL and DWPS were 22,318 MT and 192,075 MT, respectively. The total catches of tuna and tuna-like species of the STLL fishery was 38,704 MT in 2009. In 2009, 21 observers were dispatched to Pacific Ocean for onboard observation on LTLL or DWPS vessels and collection of fishing and biological data.

1 Annual fisheries' information

The Pacific Ocean is one of the earliest fishing grounds exploited by Taiwanese tuna fisheries. Currently, there are three types of tuna fisheries operating in WCPFC Convention Area: large tuna longline (LTLL, previous named FTLL) fishery, distant-water purse seine (DWPS) fishery and small tuna longline (STLL, previous named CTLL) fishery. All LTLL and DWPS vessels operate outside its EEZ; most of the STLL vessels operate in its EEZ, some of them operate in the high sea or in the PICS' EEZ through relevant agreements.

1.1 Fleet structure

The fishing vessel number of three types fisheries operating in WCPFC Convention Area during 2005-2009 is as tabled in Table 1.

1.1.1 LTLL

The LTLL vessels refer to those vessels larger than 100 GRT. The LTLL vessels length over all (LOA) are greater than 24 meters LOA and mostly operating in the waters of foreign EEZ and high seas. The number of LTLL vessels authorized to fish in WCPFC

Convention Area in 2009 was 88, a steeply decrease from 133 in 2005, which is mostly because of the compulsory fleet reduction program carried out by the government. In 2009 there were only 75 vessels operating actively in WCPFC Convention Area.

1.1.2 DWPS

Tuna purse seine fishery was introduced into Taiwan in 1982 and has become one of the major fleet operating in WCPO. In 1992 the fleet reached its peak of 45 vessels, and reduced to 42 due to adjustment of business strategy of some companies. The fleet further reduced to 34 authorized vessels in 2004, and maintained at this level ever since. Table1 shows the number of active purse seine vessel from 2005 to 2009. It's noted that the number of active purse seine vessel kept at 34 between 2005 and 2008, and decreased to 33 of 2009 for one purse seiner sunk in the end of 2008.

1.1.3 STLL

The STLL vessels operate both within and beyond the EEZ of Taiwan. Vessels with freezing equipment extended their fishing grounds to more distant waters operating in a similar pattern as LTLL vessels. They change their fishing grounds and target species based on fishing season and market price. In 2009 there were about 1,220 STLL vessels operating actively in WCPFC Convention Area. Parts of these vessels are seasonally operating between the Indian Ocean or the Eastern Pacific Ocean and the Western and Central Pacific Ocean, which were only reflected in reports in 2007.

1.2 Annual Catch in the WCPFC Convention Area

1.2.1 LTLL

The major fishing grounds of LTLL fleet are located in the central and southern regions (Figure 1). Historically, most of the LTLL fleets targeted on albacore for canning, but in recent years, a higher proportion targeted on tropical species for Japanese frozen sashimi market (Figure 2). Since middle of 1990s a seasonal fishing ground has been developed in the northern Pacific for northern albacore. Table 2 shows the catch estimate of major tuna and tuna-like species caught by LTLL fishery in the recent five years (2005-2009) in WCPFC Convention Area.

1.2.2 DWPS

Total catch and major species caught by this fishery in WCPFC Convention Area during

2005-2009 are shown in Table 3. The most dominant species remained to be skipjack, accounting for about 90.45% of the total catch, followed by yellowfin tuna 8.45%, and bigeye 1.1%. In 2009, catches of skipjack, yellowfin and bigeye tunas were 173,725 MT, 16,237 MT and 2,113 MT, respectively. (Figure 3)

1.2.3 STLL

The STLL fishing vessels land their catches both in Taiwan and foreign ports. Considering the geographical location of Taiwan, catches landed in domestic ports are believed to be mostly from WCPO including the EEZ of Taiwan. Total catch of tuna and tuna-like species landed in Taiwan by this fleet was stable in recent five years (2005-2009) with an average of about 17,188 MT. The dominant species caught included yellowfin tuna (45%), billfish (26%) and swordfish (7%). As to those landed in foreign ports, yellowfin and bigeye are the main species caught. Catches of main species by STLL from 2005 to 2009 in WCPFC Convention Area were shown in Table 4.

1.3 Fishing Patterns

1.3.1 LTLL

LTLL fleet can be divided into two groups in accordance with the target species: those operate mainly in tropical area (between 15°N and 15°S) targeting on bigeye tuna, and those operate in subtropical and temperate waters targeting on albacore. Vessels targeting on bigeye tuna usually conduct a year round operation, and transship their catches to transport vessels and receive fuel and supplies during transshipment. Those fishing for albacore usually entered fishing ports in the Pacific twice a year for landing, fuel and supply. The fishing effort distribution in recent 5 years (2005-2009) is shown in Figure 1.

1.3.2 DWPS

The DWPS vessels mainly operate in the tropical waters close to the equator area targeting on SKJ. Since most of the fishing grounds are located in the EEZs of PICs, these vessels acquire fishing permits through access agreements with PICs, including PNG, FSM, Nauru, Marshall Islands, Solomon Islands and Kiribati.

In early 1980s, logs were used as fish aggregation objects and sets were made on schools associated with these floating objects. This practice continued throughout the 80s and

early 90s. Successful exploitation on free-swimming schools in the mid 1990s has made free school setting to be the most prevailing fishing method. In 2009, more than 43% sets were deployed on free school.

The fishing effort distribution in recent 5 years (2005-2009) is shown in Figure 4. The fishing effort is more concentrated in the western Pacific Ocean.

1.3.3 STLL

Fishing days per trip are usually less than 30 days owing to smaller fishing capacity for STLL vessels. Most of them, whether based at domestic or foreign ports (e.g. Davao in Philippine), target on YFT for fresh sashimi markets, while a few Suva based STLL vessels target on albacore for canning. Flake ice is used as coolant on the STLL vessels, but some have equipped with freezing equipment for better preservation of their catches.

1.4 Estimated total catches of non-target, associated and dependent species

Additional columns have been included in the logbook for recording catches of non-target species since 2003 (for the use of 2004 trips), including 4 shark species (Blue Shark, Silky Shark, Shortfin Mako Shark, and other sharks), sea birds, sea turtles and marine mammals. And in 2009, the logbook applied to the DWLL fishery had modified and included more shark specie (Thresher shark, Tiger shark, White shark, Probeagle, Crocodile shark, Hammerhead shark and Oceanic white tip shark) into logbook recording items. The scientific observer program has been collecting the catches data of non-target, associated and dependent since 2002 in the Pacific. Annual catch of main shark species of LTLL and STLL in 2009 showed in Table 5.Eleven trips observer data on Taiwanese LTLL fishing vessels in Pacific Ocean in 2008 were used to analysis the scale of discard and bycatch species. Regarding other ecological species, 2 species of seabirds, and 1 species of cetaceans were sighted during these observations. As for the bycatch, 9 seabirds and 6 sea turtles were bycatch, which the major species were other albatross and Loggerhead turtles and Leatherback sea turtles. No cetaceans were bycatch in these trips.

1.5. Trends in the fishery and future prospects of the fishery

The government has implemented a compulsory fleet reduction program in 2005 and 2006 for scrapping 160 LTLL vessels, among them there are 25 from Pacific Ocean, a reduction of 26% from 614 vessels in the early 2005. In 2007, 23 LTLL vessels have been scraped, among which 10 were from the Pacific Ocean.

In view of conservation of tuna species, it is the policy of the government to maintain the size of its LTLL fleet to a level that is commensurate with the availability of fishing possibilities. The government will continue implementing the policy of limited entry in tuna fisheries. In addition, in order to monitor and control the fishing activity of its vessels, LTLL vessels are requested to install Vessel Monitoring Systems with a workable spare set.

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2 Research and statistic

2.1 Summary of observer programs

For the purposes of better understanding the fishing activities of the longline fishery, including target and non-target fish species and to be in line with the international requirement for conserving marine resources, FA has launched a pilot observer program since 2001 in the Indian Ocean. Carry out the observer program in Pacific Ocean since 2002. During 2002-2004, 2 observers were dispatched to Pacific Ocean in each year. After then, the number of observer dispatched to the Pacific Ocean increased to 5 of 2005 and 6 of 2006 and further increased to 20 of 2007 and 16 of 2008. In 2009, the number of observer was increased to 21 and there were 31 observation trips had been conducted.. The observer coverage rate for tropical and albacore DWLL fisheries, and DWPS fishery reached 8.3%, 8% and 23% by fishing days.

2.2 Research activities

For the purpose of improving stock assessment of species in the Pacific Ocean, government of Taiwan has commissioned scientists to conduct a series of researches as follows：

— Age and growth study with its applications of albacore resources.
— Research on stock assessment of Pacific bluefin tuna.
— Studies on population dynamics and stock assessment for swordfish, sailfish, and blue marlin.
— A billfish tagging program.
— Abundance indices estimations and stock status assessments of yellowfin and bigeye tunas in the Pacific Ocean using stock synthesis models.
— Abundance and catch at size versus age conversion of South Pacific albacore caught by Taiwanese longline fisheries.
— Abundance and catch-at-size versus catch-at-age conversion of North Pacific albacore caught by Taiwan longline fisheries.
— Stock research for the Pacific skipjack tuna.

2.3 Statistics data collection system in use

To collect complete catch data, the fishing vessels and the fish traders have to report the trade and transshipment data. Market State data on LTLL are collected from the Organization for the Promotion of Responsible Tuna Fishery (OPRT) and from fish traders at foreign ports; as to the landed of STLL fishery in foreign ports, information on the fishing activities of the fishery was obtained from port States trading companies and such information together with available commercial trade data was used for the catch estimation.

We collect the logbooks of LTLL and DWPS fishing vessels authorized to operate in WCPFC Convention Area at the time of their unloading in port. These logbook data will be crosschecked with VMS location records for verifying the fishing activities. Besides the LTLL logbook system, the LTLL fishing vessels are required to submit weekly catch reports.

2.4 Data coverage of catches, effort and size data for all species

2.4.1 Longline fisheries

The logbook is the main data sources of catch and effort for all species, supplemented by

trade data. The size data of all species is mainly from the first 30 fish caught for each setting recording on logbook. Port-sampling program which is only in its experimental stage, has a low sampling coverage, and insufficient for use as source of data. The observer program has been collecting size data for all species. The coverage has gradually increased. These data have already been used and reported in some researches.

2.4.2 DWPS fishery

The logbook is the sources of catches of SKJ, YFT and BET and effort data. Trade data has been collected for estimating the catch composition of BET and YFT.

Table 1. The fishing vessel number by fishery operating in WCPFC Convention Area during 2005-2009.

Year \ Fishery	LTLL	DWPS	STLL
2005	133	34	1,420
2006	104	34	1,490
2007	90	34	1,750
2008	84	34	1,260
2009	75	33	1,220

Table 2. Catch (in MT, round weight) statistics of major tuna and tuna-like species caught by LTLL fishery in WCPFC Convention Area during 2005-2009.

	N-ALB**	S-ALB***	BET	YFT	SWO	MLS	BUM	BLM	SKJ	TOTAL
2005	3,990	9,468	10,083	5,755	1,057	404	1196	54	438	32,445
2006	3,848	6,365	7,841	3,583	863	304	1,255	19	207	24,285
2007	2,465	5,021	9,108	2,657	1,134	351	1,061	5	65	21,867
2008	2,490	3,071	8,777	1,759	1,079	173	812	5	174	18,340
2009*	1,866	5,384	8,863	3,111	1,278	187	1,111	12	506	22,318

* Preliminary estimate
** from northern Pacific Ocean
*** from southern Pacific Ocean

Table 3. Catch (in MT, round weight) statistics of major tuna species caught by DWPS fishery in WCPFC Convention Area during 2005-2009.

year \ species	SKJ	YFT	BET	Total
2005	165,289	27,572	2,178	195,039
2006	189,392	19,793	978	210,163
2007	209,002	21,147	2,386	232,535
2008	165,007	35,770	3,196	203,973
2009*	173,725	16,237	2,113	192,075

* Preliminary estimate

Table 4. The catches (in MT, round weight) of tuna and tuna-like species of the STLL fishery in WCPFC Convention Area during 2005-2009.

Year \ Species	ALB	BET	YFT	SWO	BILL
2005	2,177	5,415	13,816	3,523	10,353
2006	4,550	6,454	15,071	4,045	7,811
2007	5,308	5,652	14,011	3,983	7,670
2008	5,337	6,452	14,652	3,638	7,460
2009*	8,288	4,456	16,582	3,261	6,117

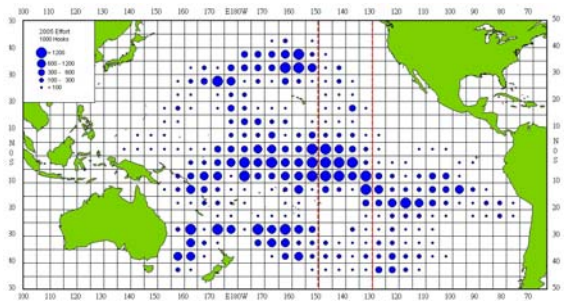
BILL: striped marlin, blue marlin, black marlin, and other billfish

. * Preliminary estimate

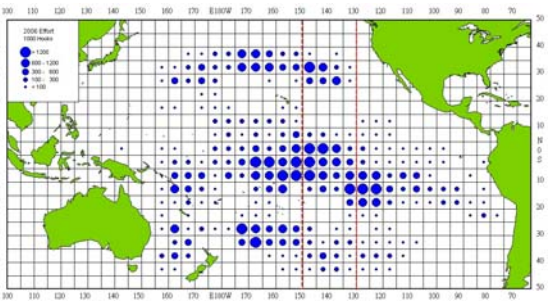
Table 5. The catches (in MT, round weight) of main shark species were caught by LTLL and STLL fishery in WCPFC Convention Area in 2009 (preliminary estimate).

	blue shark	silky shark	mako shark	oceanic whitetip shark	thresher shark	other sharks
LTLL	1,059	394	199	82	24	74
STLL	12,908	309	416	8	515	5,063

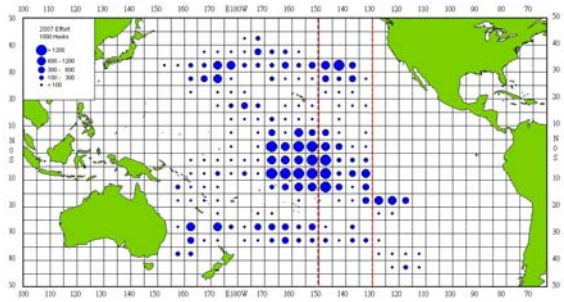
2005



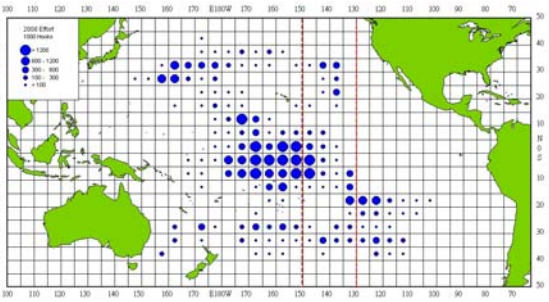
2006



2007



2008* preliminary



2009* preliminary

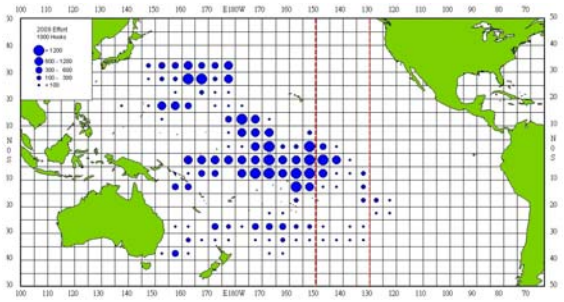


Figure 1. The effort distribution of Taiwanese LTLL fleet operating in Pacific Ocean during 2005-2009 period. Map of 2008 and 2009 is still preliminary and will be revised shortly.

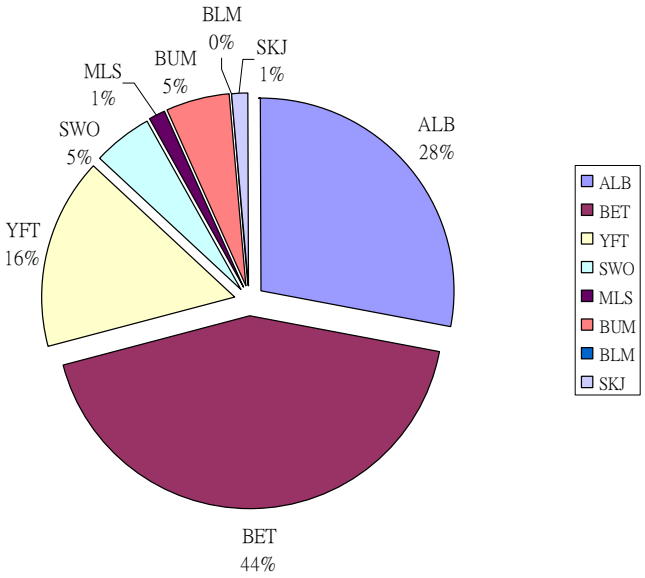


Figure 2. Mean catch percentage of major tuna and tuna-like species caught by Taiwanese LTLL fishery in the WCPFC Convention area during 2005-2009 period.

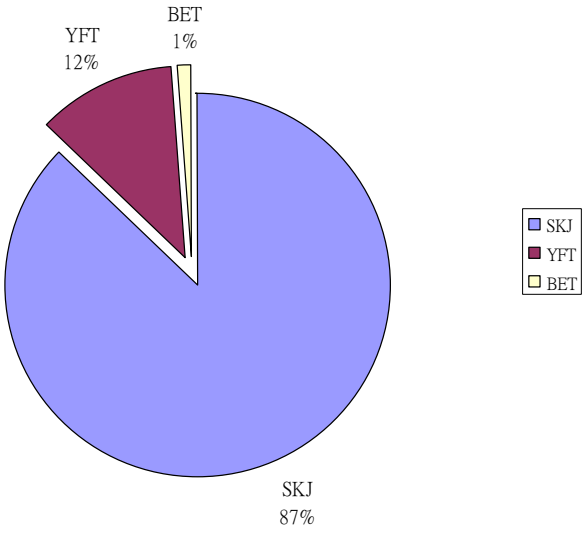
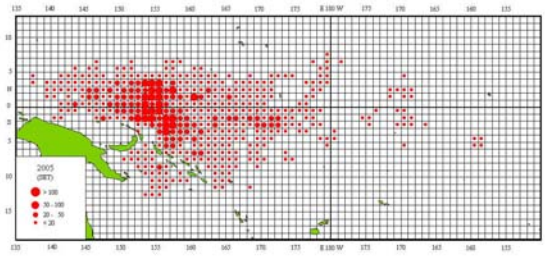
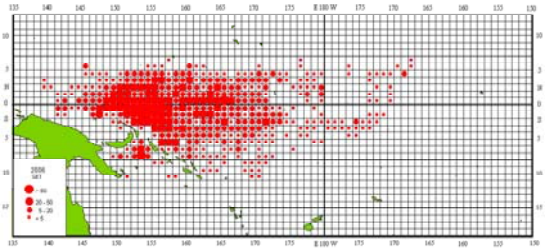


Figure 3. Mean catch percentage of major tuna and tuna-like species caught by Taiwanese DWPS fishery in the WCPFC Convention area during 2005-2009 period.

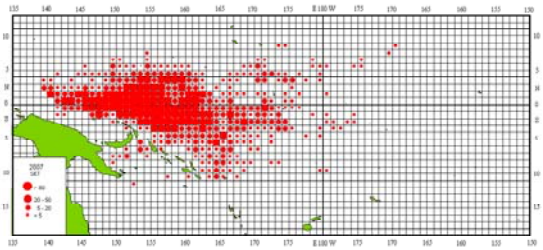
2005



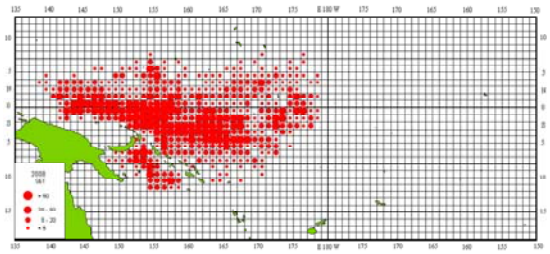
2006



2007



2008



2009

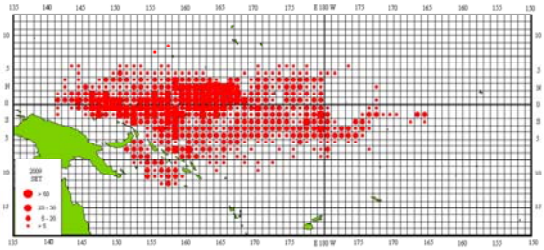


Figure 4. The effort distribution of Taiwanese DWPS fleet operating in WCPFC Convention area during 2005-2009 period