



**SCIENTIFIC COMMITTEE
THIRTEENTH REGULAR SESSION**

**Rarotonga, Cook Islands
9 – 17 August 2017**

**ANNUAL REPORT TO THE COMMISSION
PART 1: INFORMATION ON FISHERIES, RESEARCH, AND STATISTICS**

WCPFC-SC13-AR/CCM-23

CHINESE TAIPEI

National Report

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

Fisheries Agency, Council of Agriculture and
Overseas Fisheries Development Council

August, 2017

This paper is prepared for the 13th meeting of the WCPFC Scientific Committee held in Rarotonga, Cook Islands, from 9 to 17 August, 2017. Document should not to be cited without permission of the authors.

| | |
|--|------------|
| <p><i>Scientific data was provided to the Commission in accordance with the decision relating to the provision of scientific data to the Commission by 30 April 2017</i></p> | <p>Yes</p> |
|--|------------|

Summary

Three Taiwanese tuna fishing fleets are currently operating in the WCPFC Convention Area, namely large scale tuna longline fleet (LTLL, previously named FTLL), distant-water purse seine fleet (DWPS) and small scale tuna longline fleet (STLL, previously named CTLL). In 2016, the total catches of main tuna and tuna-like species for the three fleets were 20,258 MT for LTLL, 185,693 MT for DWPS and 33,304 MT for STLL, respectively. In 2016, 30 observers were deployed on the tuna longline fishing vessels operating in the Pacific Ocean.

1. Annual fisheries' information

The Pacific Ocean is the traditional fishing ground for Taiwanese tuna fisheries. Currently, there are three tuna fishing fleets operating in the WCPFC Convention Area: large scale tuna longliners (LTLL), distant-water purse seiners (DWPS) and small scale tuna longliners (STLL). All LTLL and DWPS vessels operate outside the EEZ of Taiwan; most of the STLL vessels operate in the EEZ of Taiwan with some operate on the high seas or in the PICS' EEZ through relevant agreements.

1.1 Fleet structure

Table 1 shows the numbers of vessel of LTLL, DWPS and STLL fleets in the recent five years (2012-2016) in the WCPFC Convention Area.

1.1.1 LTLL

The LTLL vessels refer to the vessels larger than 100 GRT. Most of them operate in the high seas or in the EEZs of coastal countries under access agreements. The number of active LTLL fishing vessels reached 95 in 2011 for some vessels from the Indian Ocean shifted to the WCPFC Convention Area due to piracy issue. The number of active LTLL vessels decreased as these vessels returned to the Indian Ocean, and further decreased to 73 in 2014 due to that 9 LTLLs temporarily ceased operation out of financial loss. However, the number of active LTLL fishing vessels was 79 in 2016.

1.1.2 DWPS

Tuna purse seine fishery was introduced into Taiwan in 1982 and has become one of our major fishing fleet operating in WCPO. In 1992 the fleet reached its peak of 45 vessels, and then 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. In the middle of 2016, 4 purse seiners were damaged by typhoon in Kaohsiung and 2 old ones were retired.

1.1.3 STLL

The STLL fleet operates both within and beyond the EEZ of Taiwan. Some STLL fishing vessels with freezing capacity extend their fishing grounds and operate in a similar pattern as that of the LTLL fleet. In 2016 there were 1,303 STLL vessels operating in the WCPFC Convention Area.

1.2 Annual Catch in the WCPFC Convention Area

1.2.1 LTLL

The catch of major tuna and tuna-like species caught by LTLL fishery over the last 5 years (2012-2016) in the WCPFC Convention Area is shown in Table 2. The distribution of species composition of LTLL in the recent 5 years (2012-2016) is shown in Figure 1. Mean catch composition of major tuna and tuna-like species of our LTLL fishery in the WCPFC Convention Area in the recent 5 years is shown in Figure 2, and it observed that the dominant species of catch were albacore (35%), bigeye tuna (31%) and yellowfin tuna (15%).

1.2.2 DWPS

The catch of major tuna species in the WCPFC Convention Area during 2012-2016 is shown in Table 3. Skipjack remained the most dominant species, accounting for about 85% of the total catch, followed by yellowfin tuna and bigeye tuna, which accounts for 13% and 2% of the total catch, respectively (Figure 3). The distribution of species composition in recent 5 years (2012-2016) is shown in Figure 4.

1.2.3 STLL

The total catch of major tuna and tuna-like species caught by STLL vessels in 2016 was 33,304 MT with yellowfin tuna accounting 41% of the total catch. Other dominant catches are albacore (24%), billfish (15%) and bigeye tuna (14%). The total catch of main species of STLL from 2012 to 2016 in WCPFC Convention Area is shown in Table 4. The distribution of species composition during 2014-2016 is shown in Figure 5.

1.3 Fishing Patterns

1.3.1 LTLL

The LTLL fleet can be divided into two groups in accordance with the target species, namely bigeye tuna targeting longline fleet, operating mainly in tropical area (between 15°N and 15°S) and albacore targeting longline fleet, operating in subtropical and temperate waters. The fleet targeting bigeye tuna usually conduct year-round operation, and transship catch, refuel and receive supplies at sea. Those fishing for albacore usually enter fishing ports in the Pacific Ocean twice a year for landing, refueling and resupplying. The distribution of fishing effort in the recent 5 years (2012-2016) is shown in Figure 6.

1.3.2 DWPS

The DWPS vessels mainly operate in the tropical waters close to the equator area targeting on skipjack. Since most of the fishing grounds are located in the EEZs of PICs, these vessels will acquire fishing permits through access agreements with PICs, including PNG, FSM, Nauru, Marshall Islands, Solomon Islands, Tuvalu 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 mid 1990s has made free school setting to be the most prevailing fishing method and it is observed that there were 63.9% sets deployed on free schools in 2016. The distribution of fishing effort in the recent 5 years (2012-2016) is shown in Figure 7. It is noted that the fishing effort distribution of 2015 extended more eastward than that of other years, which was due to El Nino.

1.3.3 STLL

Most of STLL based at domestic or foreign ports mainly target for YFT for fresh sashimi markets, while some STLL vessels target for billfish or albacore. Flake ice is commonly used as coolant on the STLL vessels, other STLL vessels are equipped

with freezing equipment for better preservation of their catches. The distribution of fishing effort in the recent 3 years (2014-2016) is shown in Figure 8.

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

The LTLL logbook format had been revised in 2003 to accommodate the bycatch recording of 4 more shark species (blue shark, silky shark, shortfin mako, and other sharks), sea birds, sea turtles and marine mammals. To be compliant with CMM 2008-06 and CMM 2009-04, the logbook format had been revised again and included more shark species (thresher shark, tiger shark, white shark, porbeagle shark, crocodile shark, hammerhead shark and oceanic white tip shark) into logbook recording items. Annual catch of key shark species of LTLL, STLL and DWPS in 2016 is shown in Table 5.

In 2015, our observers had recorded 13 seaturtles (10 Green, 1 Leatherback and 2 Olive ridley turtles), 6 seabirds (1 Buller's albatross, 1 Christmas Island frigatebird, 1 Sooty shearwater, 1 Wandering albatross and 2 White capped albatross) and 1 cetaceans (1 False-killer whale) hooked, and 3,738 seabirds and 82 cetaceans were sighted. In 2016, our observers had recorded 19 seaturtles (1 Loggerhead, 16 Olive ridley turtles and 2 unidentified), 37 seabirds (1 Great frigatebird, 2 Grey petrel, 1 Westland petrel, 8 White-chinned petrel, 4 Antipodean albatross, 2 Black-browed albatross, 1 Black-footed albatross, 8 Campbell albatross, 2 Grey headed albatross, 4 Laysan albatross, 1 Light-mantled albatross and 3 Wandering albatross) hooked, and 6,196 seabirds and 181 cetaceans were sighted. Because some observation trips of 2016 will be completed in 2017, the observer data of 2016 is preliminary. As for cetaceans and whale sharks encircled by our purse seiners, the information is shown in section 3.7.

1.5 Trends in the fishery and future prospects of the fishery

In view of conservation of tuna species, it is the policy of the government to maintain the size of its fleets 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.

2. Research and statistic

2.1 Summary of observer programs

For better understanding the fishing activities and bycatch of the longline fishery, FA launched a pilot observer program in 2002. The number of observers deployed on LTLL, STLL and DWPS fleets in Pacific Ocean during 2012-2016 is shown in Table 6. In accordance with the government's policy in establishing an observers program and supporting the recruitment of observers, the observer program was extended to the STLL fleets in 2012. The total number of observers deployed on longline vessels in 2016 was 30, including 10 observers for LTLL vessels and 20 observers for STLL vessels respectively.

Our observer program had received interim authorization in 2009 and received full authorization after auditing in November 2011. The forms used in our observer program are fully conformed to the WCPFC standards which include the fishing activities, catch number and weight, species identification, bycatch species and status. In addition, length frequency of major species and the sighting and incidental catch of ecological species were recorded, and biological samplings were collected for biological research.

2.2 Research activities

For the purpose of improving stock assessment of highly migratory species in the Pacific Ocean, government of Taiwan has commissioned scientists to conduct a series of researches in 2016 as follows :

- Studies on abundance index and stock assessment of tropical tuna in the Western and Central Pacific and bluefin tuna in the Pacific Ocean.
- A study on CPUE standardization and stock status for billfishes in three oceans.
- Study on age composition of southern bluefin tuna and Pacific bluefin tuna in the longline fishery.
- Study on the Pacific albacore stock status.
- Studies of shark by-catch, abundance index and non-detriment findings in three Oceans.
- Research on Incidental Catch of Ecological Related Species by Taiwanese Distant Water Tuna Longline Fisheries
- Study of reducing seabird bycatch of small-scale longline vessels in the Western and Central Pacific.
- Feasibility analysis on the fishing condition forecast of albacore tunas for the Taiwanese tuna longline fishery in three oceans.
- Feasibility analysis on the fishing condition forecast of yellowfin and bigeye tunas for the Taiwanese tuna longline fishery in three oceans.
- Feasibility analysis on the fishing condition forecast of swordfish for the Taiwanese tuna longline fishery in three oceans.
- The feasibility analysis on purse seine fishing condition of skipjack tuna in the western and central Pacific Ocean.

The scientific papers presented at recent Pacific Ocean RFMOs meetings during 2016 and 2017 were as follows:

- Catch, size and distribution pattern of blue sharks by Taiwanese small-scale longline fleets in the North Pacific in 2001-2015. (ISC/16/SHARKWG-1/20)
- Size and spatial distribution of the blue shark, *Prionace glauca*, caught by Taiwanese large-scale longline fishery in the North Pacific Ocean. (ISC/16/SHARKWG-1/21)
- Catch estimate and CPUE standardization of the blue shark based on observers' records of Taiwanese large-scale tuna longline fisheries in the North Pacific Ocean. (ISC/16/SHARKWG-1/22)
- Size and sex structure of blue sharks in the North Pacific Ocean. (ISC/16/SHARKWG-1/14)
- Estimation of sexual maturity-at-length of the North Pacific albacore. (ISC/16/ALBWG-02/10)
- The development of Taiwanese longline fishery in the North Pacific Ocean and estimation of albacore CPUE exploited by albacore-targeting fishery, 1995-2015. (ISC/16/ALBWG-02/09)
- Catch estimates and size compositions of blue marlin (*Makaira nigricans*) from the Taiwanese fisheries in the Pacific Ocean. (ISC/16/BILLWG-2/02)
- Update of Standardized PBF CPUE Series for Taiwanese Longline Fishery. (ISC/16/PBFWG-1/02)
- CPUE Standardization of Blue Marlin (*Makaira nigricans*) for the Taiwanese Distant- Water Tuna Longline Fishery in the Pacific Ocean. (ISC/16/BILLWG-1/10)
- Standardized PBF CPUE Series for Taiwanese Longline Fishery.

(ISC/17/PBFWG-1/02)

- Length distributions of albacore catch made by Taiwanese albacore-targeting longline fishery in the Pacific Ocean north of 25°N, 2003-2015. (ISC/17/ALBWG/02)

The scientific papers published on scientific journals during 2016 and 2017 were as follows:

- Chuang, P. S., Chang, H. A., Chiang, W. C., & Shiao, J. C. (2017). Rapid identification of the north-western Pacific billfish species using quantitative real-time polymerase chain reaction techniques. *Marine Biology Research*, 1-13.
- Chuang, P. S., Hung, T. C., Chang, H. A., Huang, C. K., & Shiao, J. C. (2016). The Species and Origin of Shark Fins in Taiwan's Fishing Ports, Markets, and Customs Detention: A DNA Barcoding Analysis. *PloS one*, 11(1), e0147290.
- Gilman, E., & Huang, H. W. (2017). Review of effects of pelagic longline hook and bait type on sea turtle catch rate, anatomical hooking position and at-vessel mortality rate. *Reviews in Fish Biology and Fisheries*, 27(1), 43-52.
- Joung, S. J., Chen, N. F., Hsu, H. H., & Liu, K. M. (2016). Estimates of life history parameters of the oceanic whitetip shark, *Carcharhinus longimanus*, in the Western North Pacific Ocean. *Marine Biology Research*, 12(7), 758-768.
- Lan, K. W., Shimada, T., Lee, M. A., Su, N. J., & Chang, Y. (2017). Using Remote-Sensing Environmental and Fishery Data to Map Potential Yellowfin Tuna Habitats in the Tropical Pacific Ocean. *Remote Sensing*, 9(5), 444.
- Shiao, J. C., Lu, H. B., Hsu, J., Wang, H. Y., Chang, S. K., Huang, M. Y., & Ishihara, T. (2016). Changes in size, age, and sex ratio composition of Pacific bluefin tuna (*Thunnus orientalis*) on the northwestern Pacific Ocean spawning grounds. *ICES Journal of Marine Science: Journal du Conseil*, fsw142.
- Su, N. J., Sun, C. L., Tai, C. Y., & Yeh, S. Z. (2016). Length-based estimates of growth and natural mortality for blue marlin (*Makaira nigricans*) in the northwest Pacific Ocean. *Journal of Marine Science and Technology*, 24(2), 370-378.
- Yen, K. W., Su, N. J., Teemari, T., Lee, M. A., & Lu, H. J. (2016). Predicting the catch potential of skipjack tuna in the western and central Pacific Ocean under different climate change scenarios. *Journal of Marine Science and Technology*, 24(6), 1053-1062.

2.3 Statistics data collection system

Logbooks of LTLL, STLL and DWPS fishing vessels authorized to operate in WCPFC Convention Area are collected while calling port or transshipping. Besides, all fleets are required to submit catch reports periodically while fishing: fishing vessels of LTLL and DWPS report weekly and the STLL fishing vessels operating outside of our EEZ report monthly.

To improve the efficiency of data collection, Taiwan has implemented electronic logbook reporting for LTLL, DWPS, and STLL vessels operating beyond our EEZ on a step-by-step basis.

In addition, the fishing vessels and the fish traders have to report the trade and transshipment data. So several sources of commercial information are available including traders' sale records, write-off records, exporting records provided by

Taiwan Tuna Association, certified weight reports provided by the Organization for the Promotion of Responsible Tuna Fisheries (OPRT), statistical documents and so on. After cross-checking and compilation, the commercial data were used for the catch estimation.

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

2.4.1 Longline fisheries

The logbook is the main data source 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 recorded on logbook. A port-sampling program conducted in domestic ports aims at collecting the length data of tuna and tuna-like catch. The observer program has been collecting size data for all species. These data have already been used and reported in some researches.

2.4.2 DWPS fishery

The logbook is the source of catch and effort data. Trade data has been collected for estimating the catch composition of bigeye tuna and yellowfin tuna. Length data was collected from fishing vessels. To strengthen length data collection of DWPS fishery, the fishing fleet started collecting length data from December, 2013. At least 10 fish per set, mainly skipjack and tuna species, have their fork length measured randomly.

3. Implementation of Conservation and Management Measure

3.1 CMM 2005-03

In accordance with CMM 2005-03, all CCMs shall report annually to the WCPFC Commission all catches of albacore north of the equator and all fishing effort north of the equator in fisheries directed at albacore. In 2016, the total catch of north Pacific albacore made by our fishing fleet was 3,405 MT with 2,635 MT in the north Convention area, and 24 LTLL vessels directed at albacore in the North Pacific Ocean with 2,259 fishing days; 1,920 days was deployed in the north Convention area.

3.2 CMM 2006-04

In accordance with CMM 2006-04, CCMs shall report annually to the Commission the catch levels of their fishing vessels that have taken striped marlin as a bycatch as well as the number and catch levels of vessels fishing for striped marlin in the Convention Area south of 15°S. The bycatch of striped marlin in the Convention area south of 15°s during the period 2012-2016 is shown in Table 7. None of our fishing vessel targets on striped marlin.

3.3 CMM 2007-01

The information of observer coverage rates for LTLL and STLL in 2016 is estimate according to CMM 2007-01 and in accordance with the decision of WCPFC11, and shown in Table 8.

3.4 CMM 2009-03

In accordance with CMM 2009-03, the number of the fishing vessels fishing for swordfish in the Convention Area south of 20°S was limited to the number in any year during 2000-2005, and the catch of swordfish caught in the Convention Area south of 20°S is limited to the amount caught in any year during the period 2000-2006. The information mentioned above is shown in Table 9.

3.5 CMM 2009-06

In accordance with CMM 2009-06, CCMs shall report all transshipment activities (including transshipment activities that occur in ports or EEZs) in Part 1 of its Annual Report. Table 10 shows the information of transshipment activities of our fishing fleets in 2016.

3.6 CMM 2010-07

In accordance with CMM 2010-07, the WCPFC Convention and agreed reporting procedures, each CCM shall include key shark species, as identified by the Scientific Committee, in their annual reporting to the Commission of annual catch and fishing effort statistics by gear type, including available historical data. The total catch of key shark species by fishery in 2016 is shown in Table 5.

3.7 CMM 2011-03 and CMM 2012-04

In accordance with CMM 2011-03 and CMM 2012-04, CCMs shall advise in their Part 1 Annual Report of any instances in which cetaceans and whale sharks have been encircled by the purse seine nets of their flagged vessels, respectively. Table 11 shows the detailed information on the cetaceans and whale shark encircled during operation reported by fishing masters of our purse seine fleet.

3.8 CMM 2011-04

In accordance with CMM 2011-04, each CCM shall estimate, through data collected from observer programs and other means, the number of releases of oceanic whitetip shark, including the status upon release (dead or alive), and report this information to the WCPFC in Part 1 of their Annual Reports. In 2016, our observers recorded 7 dead, 8 alive and 39 unknown status of released oceanic whitetip shark in the WCPFC Convention Area, and we used this information to estimate the number of released oceanic whitetip shark taken by our longline fleets which was 459 (138 dead, 115 alive and 206 unknown) for LTLL and 3,008 (88 dead, 265 alive and 2,655 unknown) for STLL. The discard information of oceanic whitetip shark of DWPS is shown in Table 5.

3.9 CMM 2012-07

In accordance with CMM 2012-07, CCMs shall annually provide to the Commission, in Part 1 of their Annual Reports, all available information on interactions with seabirds reported or collected by observers, including mitigation used, observed and reported species specific seabird bycatch rates and numbers, to enable the Scientific Committee to estimate seabird mortality in all fisheries to which the WCPFC Convention applies. All Taiwanese longliners operating in the area south of 30°S are required to deploy at least two of the following seabird mitigation measures: tori lines, weighted branch lines and night setting with minimum deck lighting. For Taiwanese longliners larger than 24m operating in the Convention Area north of 23°N are required to employ tori lines and one of the following seabird mitigation measures, namely tori lines, weighted branch lines night setting with minimum deck lighting, line shooter or management of offal discharge. In addition, fishing vessels are required to carry de-hookers and line cutters on board for the purpose of releasing seabirds alive. The information regarding interactions with seabirds is shown in Tables 12-15.

3.10 CMM 2013-08

In accordance with CMM 2013-08, CCMs shall estimate, through data collected from observer programs and other means, the number of releases of silky shark caught in the Convention Area, including the status upon release (dead or alive), and report this information to the WCPFC in Part 1 of their Annual Reports. In 2016, there were 83 dead, 183 alive and 215 unknown status of released silky shark recorded in our observer data in the WCPFC Convention Area. And the silky shark bycatch estimates for LTLL and STLL fisheries in 2016 were 3,347 (550 dead, 1,875 alive and 940 unknown) and 29,645 (5,521 dead, 9,026 alive and 15,398 unknown) respectively, which were raised on the catch rate calculated from observer data. Discard of silky shark of DWPS is shown in Table 5.

Table 1. The number of fishing vessel by fishery in the WCPFC Convention Area during 2012-2016.

| Year | LTLL | DWPS | STLL |
|------|------|------|-------|
| 2012 | 87 | 34 | 1,326 |
| 2013 | 82 | 34 | 1,296 |
| 2014 | 73 | 34 | 1,275 |
| 2015 | 76 | 34 | 1,306 |
| 2016 | 79 | 34 | 1,303 |

Table 2. The catch (in MT, round weight) of major tuna and tuna-like species of LTLL fishery in the WCPFC Convention Area during 2012-2016.

| Year | N-ALB | S-ALB | BET | YFT | SWO | MLS | BUM | BLM | SKJ | TOTAL |
|-------|-------|-------|-------|-------|-------|-----|-------|-----|-----|--------|
| 2012 | 1,592 | 4,064 | 5,770 | 2,059 | 1,319 | 249 | 975 | 7 | 214 | 16,249 |
| 2013 | 2,035 | 4,498 | 5,486 | 1,441 | 1,386 | 222 | 934 | 1 | 179 | 16,182 |
| 2014 | 1,730 | 3,757 | 6,005 | 2,057 | 1,621 | 275 | 1,063 | 5 | 120 | 16,633 |
| 2015 | 2,251 | 3,275 | 5,331 | 2,848 | 1,781 | 243 | 1,670 | 8 | 162 | 17,569 |
| 2016* | 1,697 | 5,834 | 4,707 | 4,230 | 1,904 | 260 | 1,456 | 5 | 165 | 20,258 |

* Preliminary estimate

Table 3. The catch (in MT, round weight) of major tuna species of DWPS fishery in the WCPFC Convention Area during 2012-2016.

| Year | SKJ | YFT | BET | Total |
|-------|---------|--------|-------|---------|
| 2012 | 172,664 | 25,750 | 2,239 | 200,653 |
| 2013 | 186,330 | 22,659 | 3,491 | 212,480 |
| 2014 | 213,154 | 20,548 | 3,418 | 237,120 |
| 2015 | 160,597 | 28,593 | 5,059 | 194,249 |
| 2016* | 146,204 | 34,494 | 4,994 | 185,693 |

* Preliminary estimate

Table 4. The catch (in MT, round weight) of major tuna and tuna-like species of the STLL fishery in WCPFC Convention Area during 2012-2016.

| Year | ALB | BET | YFT | PBF | SWO | BILL |
|-------|--------|-------|--------|-----|-------|-------|
| 2012 | 8,505 | 5,224 | 14,889 | 210 | 3,430 | 6,430 |
| 2013 | 10,870 | 5,114 | 13,558 | 331 | 2,932 | 7,337 |
| 2014 | 5,264 | 4,013 | 10,200 | 483 | 2,214 | 6,625 |
| 2015 | 5,673 | 4,103 | 11,270 | 552 | 2,574 | 5,739 |
| 2016* | 7,998 | 4,781 | 13,586 | 454 | 1,581 | 4,904 |

* Preliminary estimate

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

Table 5. The catches (in MT, round weight) of key shark species* of LTLL, STLL and DWPS fisheries in the WCPFC Convention Area in 2016 (preliminary estimate).

| | BSH | FAL | MAK | | OCS | PTH | BTH | ALV | SPZ | SPL | SPK | EUB | POR | SHK |
|--------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| | | | SMA | LMA | | | | | | | | | | |
| LTLL | 3,145 | 0 | 571 | 30 | 0 | 89 | 67 | 0 | 16 | 2 | 0 | 0 | 0 | 51 |
| STLL | 7,946 | 0 | 472 | | 0 | 157 | 273 | 0 | 59 | 113 | 0 | 0 | 0 | 1,360 |
| DWPS** | 0 | 67 | 0 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

* Our domestic law had ban all fisheries from catching whale sharks since 2008. Therefore, the table excludes whale shark.

** Discards

Table 6. The number of observers deployed on LTLL, STLL and DWPS fisheries in the Pacific Ocean during 2012-2016.

| | LTLL | STLL | DWPS |
|------|------|------|------|
| 2012 | 20 | 12 | -* |
| 2013 | 15 | 9 | -* |
| 2014 | 13 | 11 | -* |
| 2015 | 12 | 20 | -* |
| 2016 | 10 | 20 | -* |

* In accordance with CMM 2008-01, all our DWPS fishing vessels have to be deployed PIC observer on board and the observer coverage of for DWPS reached 100%.

Table 7. The catch of striped marlin in the area of south of 15°S during 2012-2016.

| Year | Catch (MT) |
|-------|------------|
| 2012 | 82 |
| 2013 | 64 |
| 2014 | 38 |
| 2015 | 97 |
| 2016* | 116 |

* Preliminary estimate

Table 8. The estimate of observer coverage rate for Taiwanese longline fisheries in 2016.

| Fishery | Days at Sea | | |
|---------|-----------------|----------|---------------|
| | Total estimated | Observer | Coverage rate |
| LTLL | 21,508 | 1,755 | 8.2% |
| STLL | 103,269 | 1,912 | 1.9% |

Table 9. The catch of swordfish and the number of the longliner operating in the area of south of 20°S during 2001-2016.

| Year | Catch (MT) | Number of fishing vessel | |
|-------|------------|--------------------------|---------|
| | | Seasonal Target | Bycatch |
| 2000 | 54 | 10 | 58 |
| 2001 | 208 | 10 | 58 |
| 2002 | 233 | 10 | 59 |
| 2003 | 248 | 12 | 72 |
| 2004 | 466 | 8 | 56 |
| 2005 | 202 | 6 | 59 |
| 2006 | 198 | 4 | 53 |
| 2007 | 217 | 3 | 46 |
| 2008 | 61 | 0 | 53 |
| 2009 | 133 | 7 | 46 |
| 2010 | 105 | 4 | 40 |
| 2011 | 98 | 3 | 66 |
| 2012 | 119 | 0 | 57 |
| 2013 | 140 | 0 | 72 |
| 2014 | 105 | 0 | 48 |
| 2015 | 116 | 0 | 45 |
| 2016* | 124 | 0 | 44 |

* Preliminary estimate

Table 10. The aggregated transshipment information in 2016.

| Offloaded / Received | Location of transshipment | Area of transshipment | Product Form | Gear Type | Number of Transshipments | Area of Catch | BET | ALB | YFT | SKJ | SWO | BUM | MLS | SKX | OTH |
|----------------------|---------------------------|-----------------------|--------------|-----------|--------------------------|------------------------|-------|-------|-------|-----|-----|-----|-----|-----|-----|
| Offloaded | High sea | WCPFC area | Frozen | Longliner | 107 | Catch in WCPFC area | 1,001 | 1,338 | 870 | 0 | 124 | 222 | 15 | 110 | 198 |
| | | | | | 91 | Catch in WCPFC area | 2,198 | 515 | 349 | 0 | 503 | 343 | 40 | 92 | 201 |
| | | | | | | Catch in other Pacific | 730 | 73 | 93 | 0 | 174 | 112 | 11 | 28 | 45 |
| | | 1 | | | Catch in other Pacific | 40 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Other Pacific | 24 | | | Catch in WCPFC area | 161 | 595 | 126 | 0 | 69 | 28 | 9 | 42 | 128 | |
| | | 83 | | | Catch in WCPFC area | 844 | 959 | 252 | 0 | 180 | 130 | 24 | 225 | 273 | |
| | | | | | Catch in other Pacific | 472 | 735 | 124 | 0 | 150 | 128 | 18 | 150 | 189 | |
| | Port | WCPFC area | | | 174 | Catch in WCPFC area | 1,067 | 2,991 | 1,719 | 0 | 223 | 274 | 59 | 62 | 340 |
| | | | | | 51 | Catch in WCPFC area | 477 | 1,439 | 248 | 0 | 65 | 65 | 16 | 1 | 95 |

| | | | | | | | | | | | | | | |
|--|--|--|--------------|-----|------------------------------|-------|-----|--------|---------|----|-----|---|-----|-----|
| | | | | | Catch in other Pacific | 82 | 196 | 51 | 0 | 19 | 29 | 3 | 3 | 29 |
| | | | | 260 | Catch in EEZ of WCPFC member | 587 | 255 | 2,572 | 3 | 56 | 346 | 7 | 222 | 828 |
| | | | Purse seiner | 243 | Catch in WCPFC area | 3,129 | 1 | 31,116 | 135,708 | 0 | 0 | 0 | 0 | 0 |
| | | | | 8 | Catch in EEZ of WCPFC member | 19 | 0 | 1,098 | 4,480 | 0 | 0 | 0 | 0 | 0 |

Table 11. The fishing master reports on cetaceans/whale sharks encircled incidentally in operation of purse seine fishery in 2016.

| DATE | Longitude | Latitude | Species | Number | Reason | Measure for ensure safe release | Status on release |
|------------|-----------|----------|------------------------------|--------|----------------------------|---------------------------------|-------------------|
| 2016/1/14 | E167°49' | N01°39' | Aquatic mammals nei | 1 | not deliberately encircled | stop operating | alive |
| 2016/1/19 | E167°11' | N01°24' | False killer whale | 1 | not deliberately encircled | stop operating | alive |
| 2016/1/20 | E167°38' | N00°49' | Aquatic mammals nei | 1 | not deliberately encircled | stop operating | alive |
| 2016/1/25 | E168°31' | S03°0' | Whale shark | 1 | not deliberately encircled | stop operating | alive |
| 2016/2/26 | E159°39' | S02°53' | Whale shark | 1 | not deliberately encircled | stop operating | alive |
| 2016/3/3 | E164°19' | S02°12' | Whale shark | 1 | not deliberately encircled | stop operating | alive |
| 2016/3/5 | E166°7' | S02°49' | Whale shark | 1 | not deliberately encircled | stop operating | alive |
| 2016/4/10 | E153°50' | S02°53' | Aquatic mammals nei | 1 | not deliberately encircled | stop operating | alive |
| 2016/4/14 | E153°26' | S02°34' | Whale shark | 1 | not deliberately encircled | stop operating | alive |
| 2016/5/9 | E166°5' | S04°50' | Whale shark | 1 | not deliberately encircled | stop operating | alive |
| 2016/6/11 | E151°18' | S00°27' | Whale shark | 1 | not deliberately encircled | stop hauling | alive |
| 2016/10/8 | E169°42' | S02°32' | Pygmy killer whale | 6 | not deliberately encircled | stop hauling | alive |
| 2016/10/23 | E166°13' | S01°19' | Whale shark | 1 | not deliberately encircled | stop hauling | alive |
| 2016/10/28 | E164°1' | S07°38' | Blainville's beaked whale | 2 | not deliberately encircled | stop operating | alive |
| 2016/11/25 | E158°38' | S01°12' | Whale shark | 1 | not deliberately encircled | stop operating | alive |
| 2016/11/25 | E158°39' | S01°21' | Whale shark | 1 | not deliberately encircled | stop operating | alive |
| 2016/11/24 | E158°31' | S01°25' | Whale shark | 1 | not deliberately encircled | stop operating | alive |
| 2016/11/28 | E164°0' | S00°12' | Pygmy killer whale | 2 | not deliberately encircled | stop hauling | alive |
| 2016/11/28 | E163°51' | N00°5' | Whale shark | 1 | not deliberately encircled | stop hauling | alive |
| 2016/12/5 | E153°2' | S06°25' | Whale shark | 1 | not deliberately encircled | stop hauling | alive |
| 2016/12/18 | E160°45' | S03°16' | Whale shark | 1 | not deliberately encircled | stop operating | alive |

Table 12. The seabird bycatch information of longline fishery in the area of south of 30°S during 2012-2016.

| Year | Fishing effort | | | | Observed seabird hooked | |
|-------|-------------------|-----------------|----------------|------------------|-------------------------|-------|
| | Number of vessels | Number of hooks | Observed hooks | % hooks observed | Number | Rate |
| 2012 | 27 | 3,142,654 | 641,731 | 20.4% | 8 | 0.012 |
| 2013 | 24 | 3,921,402 | 390,427 | 10.0% | 4 | 0.010 |
| 2014 | 22 | 5,054,026 | 350,827 | 6.9% | 3 | 0.009 |
| 2015* | 27 | 3,967,911 | 419,452 | 10.6% | 4 | 0.010 |
| 2016* | 22 | 4,365,157 | 337,517 | 7.7% | 18 | 0.053 |

* Preliminary

Table 13. The seabird bycatch information of longline fishery in the area of north of 23°N during 2012-2016.

| Year | Fishing effort | | | | Observed seabird hooked | |
|-------|-------------------|-----------------|----------------|------------------|-------------------------|-------|
| | Number of vessels | Number of hooks | Observed hooks | % hooks observed | Number | Rate |
| 2012 | 495 | 51,349,311 | 122,160 | 0.2% | 3 | 0.025 |
| 2013 | 442 | 21,338,293 | 385,993 | 1.8% | 6 | 0.016 |
| 2014 | 442 | 37,985,919 | 354,224 | 0.9% | 16 | 0.045 |
| 2015* | 473 | 36,524,258 | 208,703 | 0.6% | 0 | 0.000 |
| 2016* | 439 | 38,401,269 | 322,373 | 0.8% | 5 | 0.016 |

* Preliminary

Table 14. The seabird bycatch information of longline fishery in the area of 23°N - 30°S during 2012-2016.

| Year | Fishing effort | | | | Observed seabird hooked | |
|-------|-------------------|-----------------|----------------|------------------|-------------------------|-------|
| | Number of vessels | Number of hooks | Observed hooks | % hooks observed | Number | Rate |
| 2012 | 929 | 200,889,530 | 4,220,207 | 2.1% | 5 | 0.001 |
| 2013 | 876 | 176,278,326 | 4,010,888 | 2.3% | 0 | 0.000 |
| 2014 | 797 | 147,782,404 | 2,547,934 | 1.7% | 0 | 0.000 |
| 2015* | 807 | 159,841,501 | 3,521,069 | 2.2% | 2 | 0.001 |
| 2016* | 813 | 177,278,402 | 3,099,217 | 1.7% | 14 | 0.005 |

* Preliminary

Table 15. The number of observed seabird bycatch of longline fishery by species and by area during 2012-2016.

| Year | Species | South of 30°S | North of 23°N | 23°N - 30°S |
|--------------|------------------------------|---------------|---------------|-------------|
| 2012 | Black-footed albatross | | 2 | |
| | Campbell albatross | 1 | | |
| | Wandering albatross | 2 | | |
| | Unidentified albatross | 5 | 1 | |
| | Frigatebird | | | 4 |
| | Masked booby | | | 1 |
| | Total | 8 | 3 | 5 |
| 2013 | Black-footed albatross | | 2 | |
| | Unidentified albatross | 3 | 4 | |
| | White-chinned petrel | 1 | | |
| | Total | 4 | 6 | 0 |
| 2014 | Black-footed albatross | | 1 | |
| | Laysan albatross | | 4 | |
| | Unidentified albatross | | 11 | |
| | White-chinned petrel | 3 | | |
| | Total | 3 | 16 | 0 |
| 2015 | Buller's albatross | 1 | | |
| | Christmas Island frigatebird | | | 1 |
| | Sooty shearwater | | | 1 |
| | Wandering albatross | 1 | | |
| | White capped albatross | 2 | | |
| | Total | 4 | 0 | 2 |
| 2016* | Antipodean albatross | 3 | | 1 |
| | Black-browed albatross | 1 | | 1 |
| | Black-footed albatross | | 1 | |
| | Campbell albatross | 6 | | 2 |
| | Great frigatebird | | | 1 |
| | Grey headed albatross | 1 | | 1 |
| | Grey petrel | 1 | | 1 |
| | Laysan albatross | | 4 | |
| | Light-mantled albatross | 1 | | |
| | Wandering albatross | 3 | | |
| | Westland petrel | | | 1 |
| | White-chinned petrel | 2 | | 6 |
| Total | 18 | 5 | 14 | |

* Preliminary

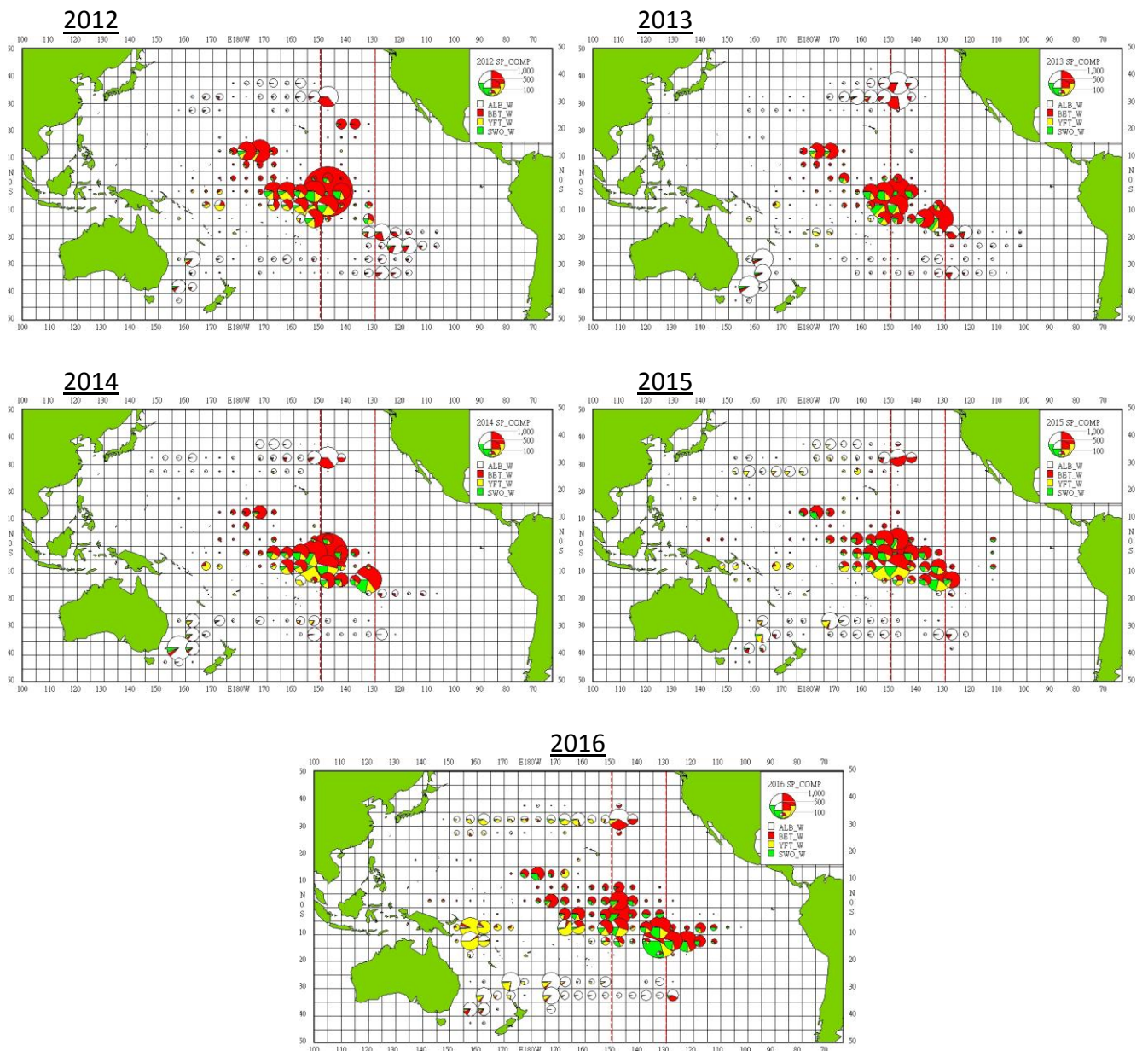


Figure 1. The catch composition distributions of tuna and tuna-like species of LTLF fishery during 2012-2016. Figures of 2015 and 2016 are still in preliminary.

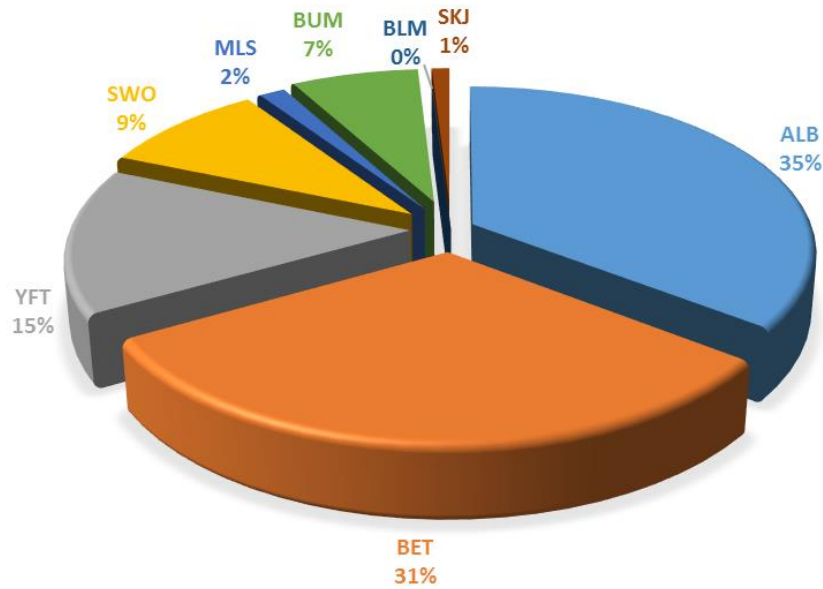


Figure 2. The catch composition of major tuna and tuna-like species for LTLL fishery in the WCPFC Convention area during 2012-2016.

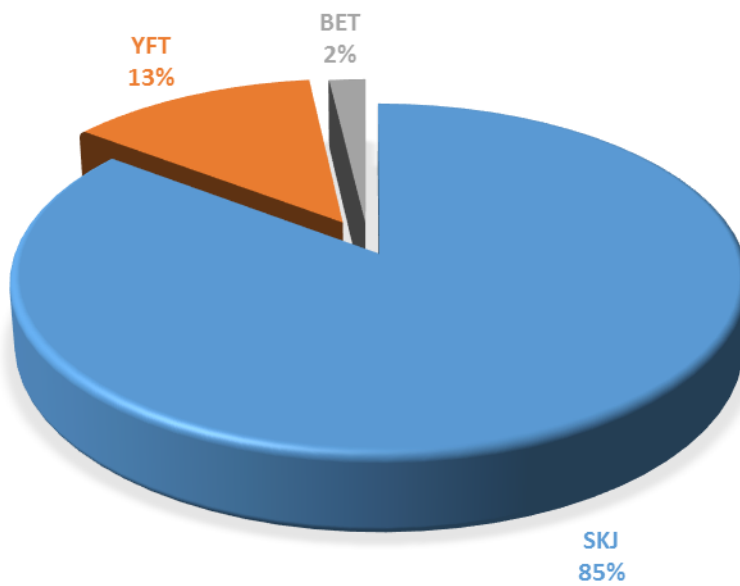
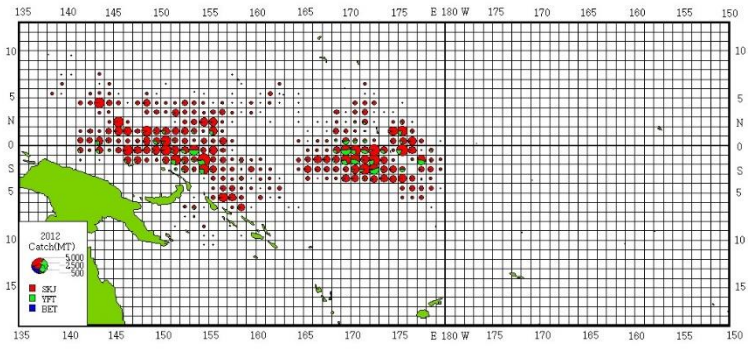
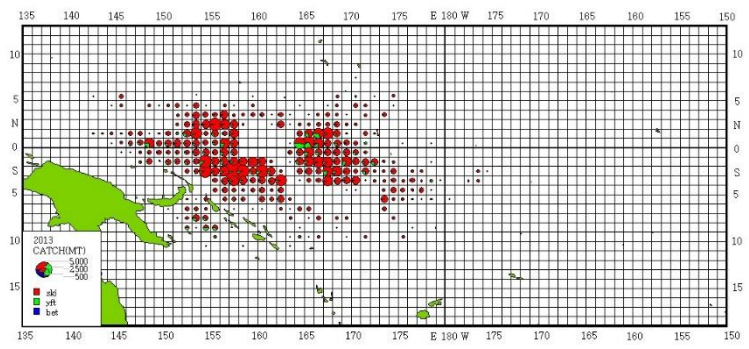


Figure 3. The catch composition of major tuna species for DWPS fishery in the WCPFC Convention area during 2012-2016.

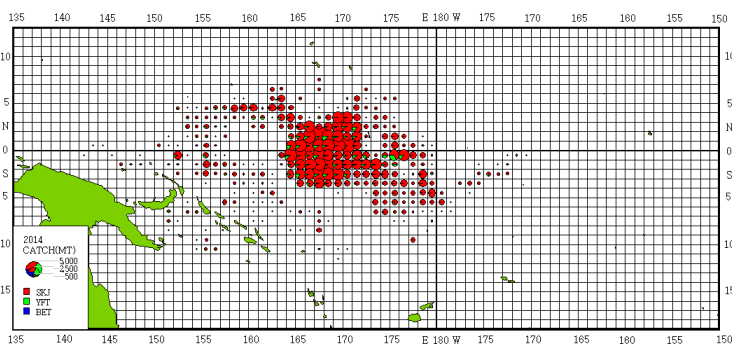


2012

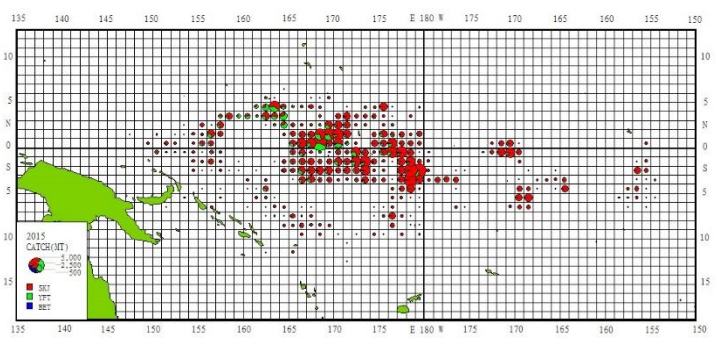
2013



2014



2015



2016

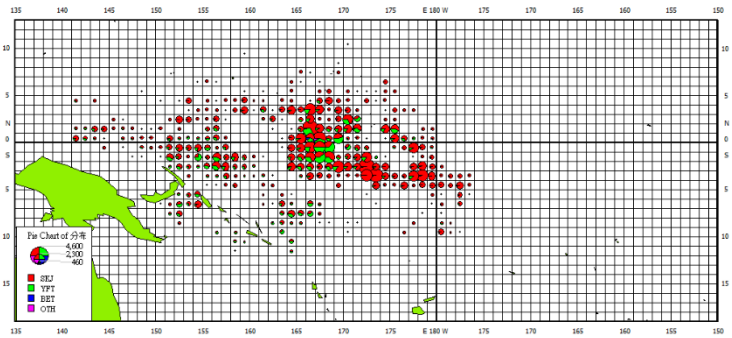
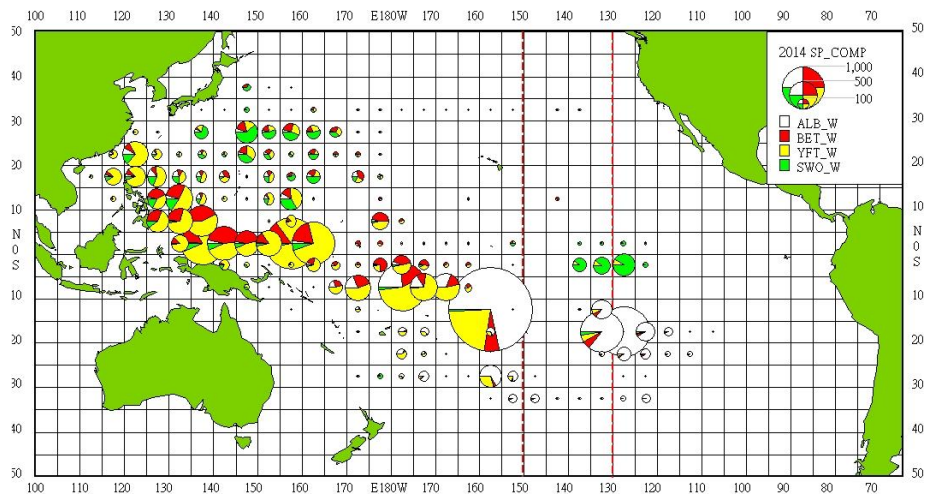
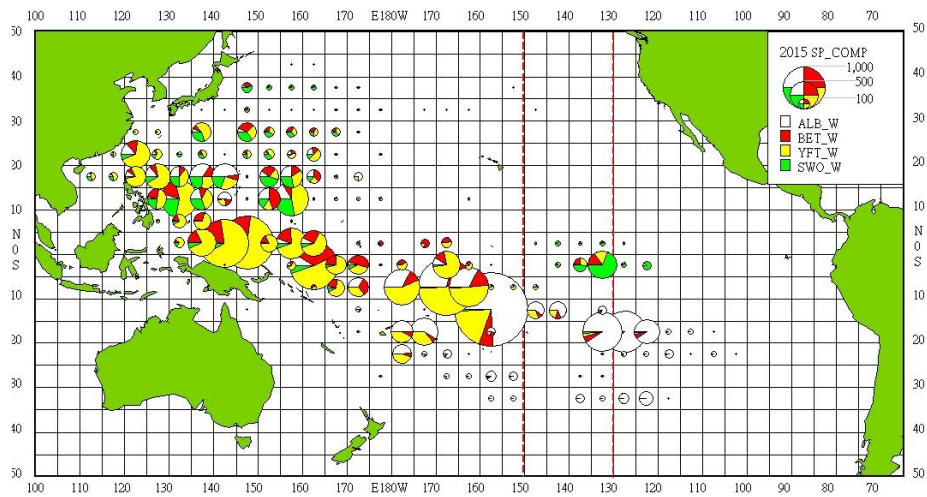


Figure 4. The catch composition distributions of DWPS fleet during 2012-2016.

2014



2015



2016

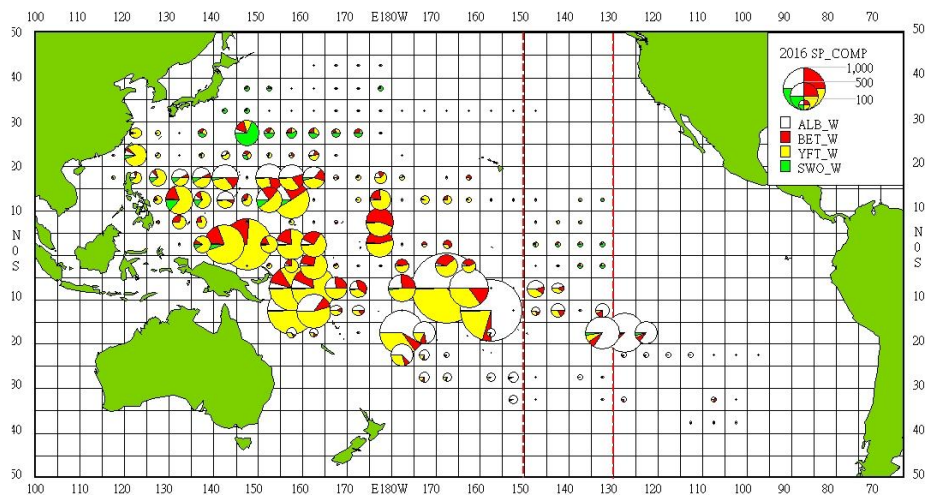
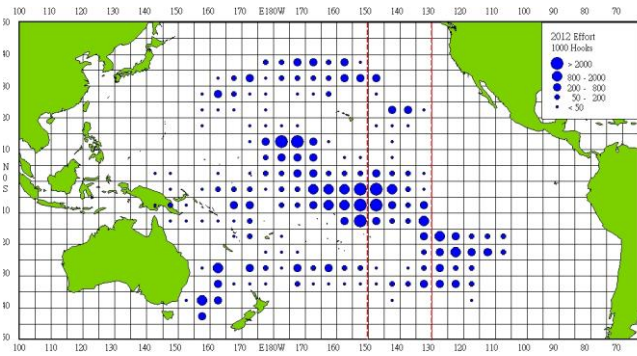
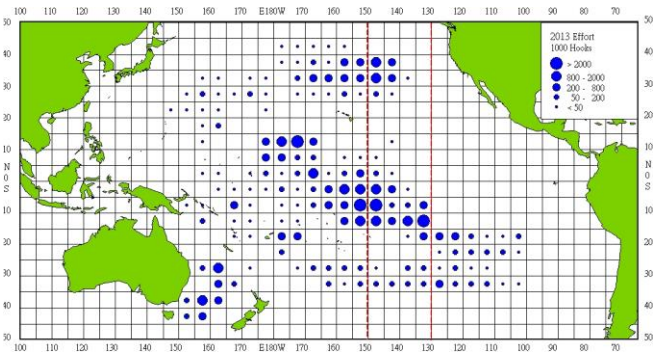


Figure 5. The catch composition distributions of tuna and tuna-like species of STLL fishery during 2014-2016. The figures of 2015 and 2016 are still in preliminary.

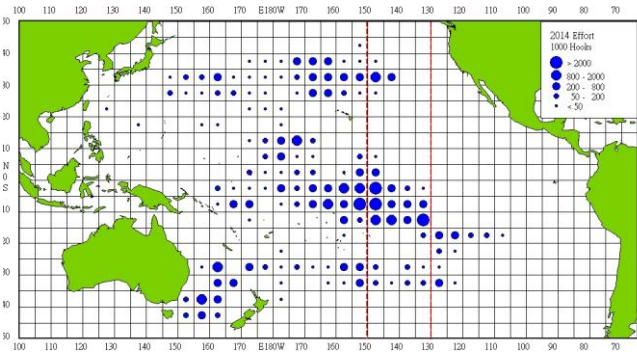
2012



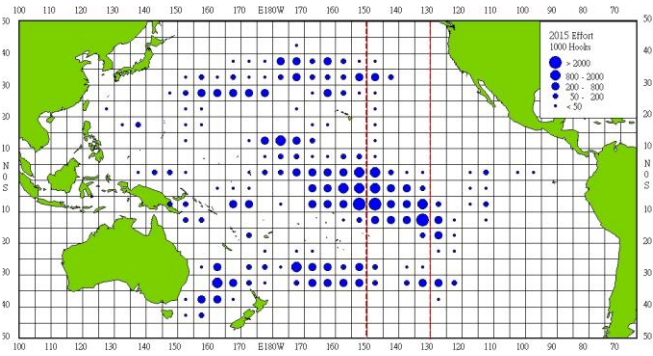
2013



2014



2015



2016

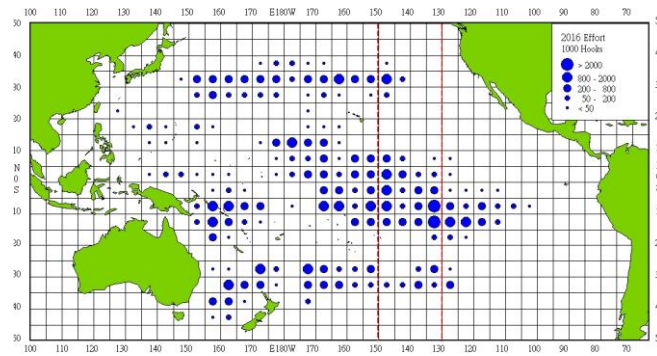
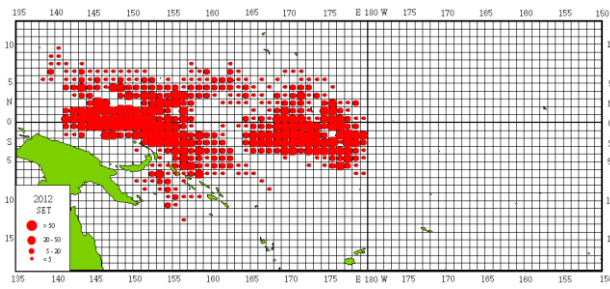
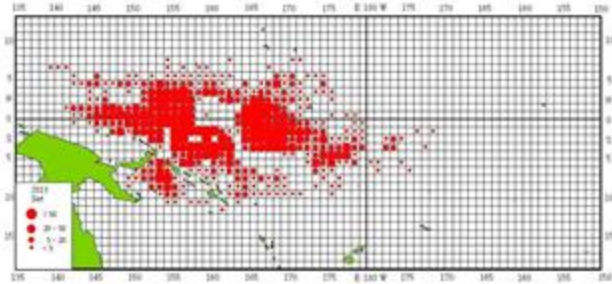


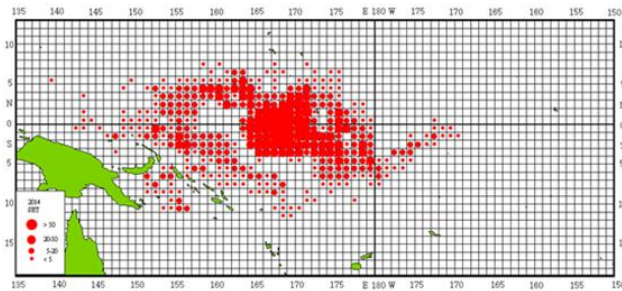
Figure 6. The effort distributions of LTLL fishery during 2012-2016. The figures of 2015 and 2016 are still in preliminary.



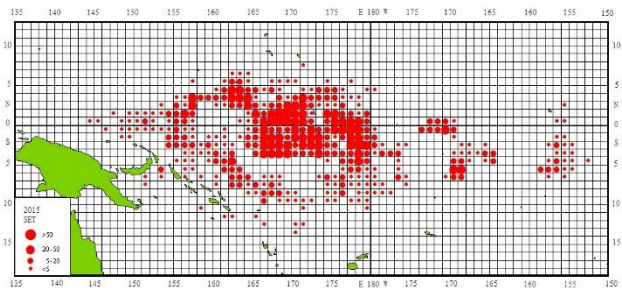
2012



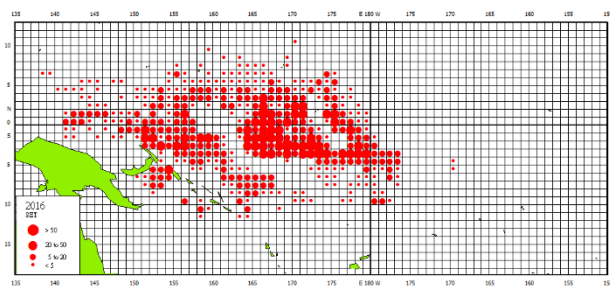
2013



2014



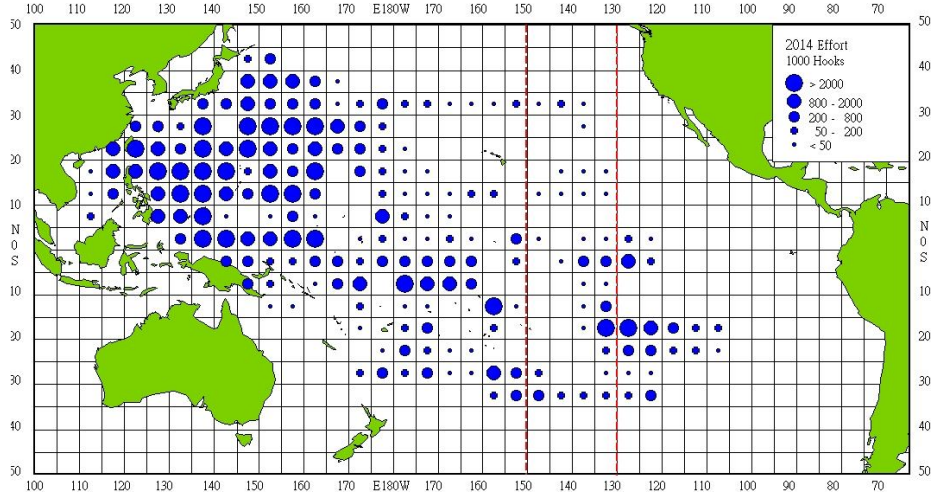
2015



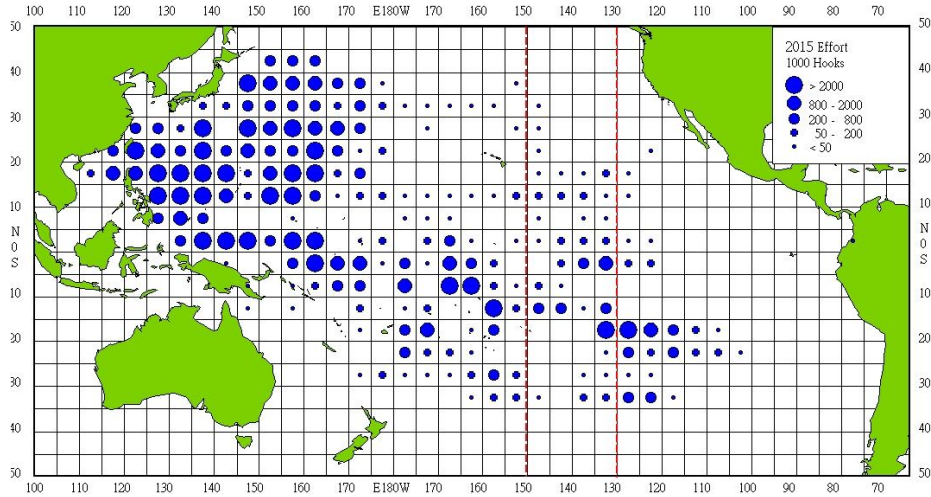
2016

Figure 7. The effort distributions of DWPS fleet during 2012-2016.

2014



2015



2016

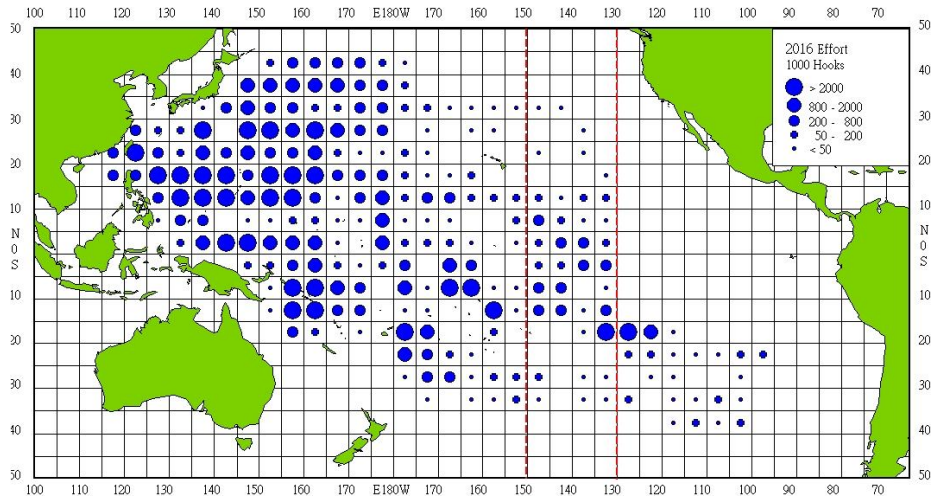


Figure 8. The effort distributions of STLL fishery during 2014-2016. The figures of 2015 and 2016 are still in preliminary.