Western and Central Pacific Fisheries Commission

SCIENTIFIC COMMITTEE
TWENTIETH REGULAR SESSION

Manila, Philippines
14 – 21 August 2024

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

WCPFC-SC20-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*, 2024
This paper is prepared for the 20th WCPFC Scientific Committee, from 14 to 21 August, 2024.

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 2024	Yes

Summary

Three Taiwanese tuna fishing fleets are currently operating in the WCPFC Convention Area, namely large-scale tuna longline fleet (LTLL, previous named FTLL), distant-water purse seine fleet (DWPS) and small-scale tuna longline fleet (STLL, previous named CTLL). In 2023, the total catches of main tuna and tuna-like species for these three fleets were 18,734 MT for LTLL, 168,637 MT for DWPS and 27,808 MT for STLL, respectively. In 2023, 44 observers were deployed on our tuna longline fishing vessels operating in the Pacific Ocean.

1. Annual fisheries' information

The Pacific Ocean is the earliest fishing ground for Taiwanese tuna fisheries. Currently, there are three tuna fishing fleets operating in the WCPFC Convention Area: LTLL, DWPS and 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 active fishing vessel of LTLL, DWPS and STLL fleets in recent five years (2019-2023) in the WCPFC Convention Area.

Tuna longliners are categorized by gross Tonnage (GT) in Taiwan: LTLL have a GT of 100 or more, and STLL have less than 100. To comply with ILO C188 regulations for crew safety and rights such as installing bulbous bow, bow planes, rear fins or improving conditions on accommodation of crew members, the Taiwan Fisheries Agency amended vessel structure regulations. As a result, some STLL increased their GT above 100, reclassifying them as LTLL while maintaining their original operation pattern. Consequently, the provisional number of LTLL for 2023 has slightly increased, changing the fishing area distribution of LTLL. Although the actual number of STLL decreased in 2023, favorable fishing conditions offshore Taiwan led to a slight increase in active STLL compared to 2022, though still fewer than in 2021 and earlier years. The reporting method is under review to prevent confusion and may be adjusted for better clarity in the future.

1.1.1 LTLL

The LTLL vessels refer to those vessels larger than 100 GRT, and most of them operate in the high sea areas. The numbers of active fishing vessels of LTLL ranged between 75 and 124 with an average of 95 in the last 5 years. The number of active LTLL fishing vessels was 124 in 2023.

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 reduced to 42 due to an adjustment of business strategy of some companies. The number of vessels further reduced to 34 authorized in 2004 which was maintained at this level ever since. There were 24 active purse seiners operating in the WCPFC

Convention Area in 2023.

1.1.3 STLL

The STLL fleet operates both within and beyond Taiwan's EEZ. Some STLL fishing vessels with freezing capacity extend their fishing grounds with similar operations to those of the LTLL fleet. In 2023, there were 685 STLL fishing vessels operating in the WCPFC Convention Area.

1.2 Annual Catch in the WCPFC Convention Area

1.2.1 LTLL

The catch estimate of primary species by LTLL fishery over the last five years (2019-2023) in the WCPFC Convention Area is shown in Table 2. The distribution of species composition of LTLL in the recent five years (2019-2023) is shown in Figure 1. The composition of primary species of our LTLL fishery in the WCPFC Convention area in the five years is shown in Figure 2, and it observed that the dominant species of catch were albacore (39%), followed by bigeye tuna (30%) and yellowfin tuna (16%).

1.2.2 DWPS

The catch of primary species in the WCPFC Convention Area during 2019-2023 is shown in Table 3. Skipjack remained the most dominant species, accounting for about 83% of the total catch, followed by yellowfin tuna and bigeye tuna, which account for 14% and 3% of the total catch, respectively (Figure 3). The composition of primary species in the recent 5 years (2019-2023) is shown in Figure 4.

1.2.3 STLL

The total catch of primary species caught by the STLL fleet in 2023 was 27,808 MT, with albacore accounting for 33% of the total catch. Other major catches of yellowfin tuna were (32%), bigeye tuna (11%), and billfish (12%). The total catch of primary species of STLL from 2019 to 2023 in the WCPFC Convention Area is shown in Table 4. The composition of species during 2019-2023 is shown in Figure 5.

1.3 Fishing Patterns

1.3.1 LTLL

The LTLL fleet can be divided into two subgroups in accordance with their targeting 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 conducts a year-round operation with transshipping catch, refueling, and receiving supplies at sea. Those vessels fishing for albacore usually enter fishing ports in the Pacific Ocean twice a year for catch landing, refueling, and supply receiving. The distribution of fishing efforts in the recent five years (2019-2023) is shown in Figure 6.

1.3.2 DWPS

The DWPS vessels mainly operate in tropical waters close to the equator area and target skipjacks. 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, Tuvalu, and Kiribati.

In the 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 of free-swimming schools in the mid-1990s has made free school settings the most prevailing fishing method, and it was observed that 71.4% of sets were deployed on free schools in 2023. The distribution of fishing efforts in the recent five years (2019-2023) is shown in Figure 7. In the years when El Niño phenomena occur, the fish tend to move more eastwards, and the fishing

activities follow the pattern of this movement. On the contrary, in the years of La Niña, fish schools tend to concentrate more in the western part of the Pacific, and the fishing activities move likewise.

1.3.3 STLL

Most of STLL based at domestic or foreign ports mainly target YFT for fresh tuna sashimi markets, while some target billfish or albacore. Flake ice is commonly used as coolant on the STLL vessels, while some equip with freezer to store catch in frozen form. The distribution of fishing effort in recent 5 years (2019-2023) is shown in Figure 8.

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

In 2022, our observers had recorded 71 sea turtles (58 Olive ridley turtles, 5 Leatherback turtles, 4 Loggerhead turtles, 3 Green turtles and 1 Hawksbill turtle), 96 seabirds (65 Laysan albatross, 24 Black-footed albatross, 2 Boobies and gannets nei, 1 Wandering albatross, 1 Antipodean albatross, 1 Grey petrel, 1 Great shearwater and 1 Other seabird) and 13 Marine Mammals (6 Dolphins nei, 5 False killer whale, 1 Beaked whales nei and 1 Bottlenose dolphin) hooked with sightings of 10,979 seabirds and 289 cetaceans. In 2023, our observers had recorded 12 sea turtles (5 Olive ridley turtles, 3 Kemp's ridley turtles, 3 Green turtles and 1 Leatherback turtle), 10 seabirds (5 Black-browed albatross, 1 Grey-headed albatross, 1 Wandering albatross, 1 Westland petrel, 1 Great shearwater and 1 Other seabird) and 1 cetacean (1 Risso's dolphin) hooked with sightings of 4,769 seabirds and 68 cetaceans. Because some observation trips of 2023 extended to 2024, the observer data of 2023 is still in preliminary for data not being retrieved completely. As for the information on cetaceans and whale sharks encircled by our purse seiners is related in section 3.4 of this report.

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

The number of observers deployed on LTLL, STLL and DWPS fleets in Pacific Ocean during 2019-2023 is shown in Table 5. In accordance with the government’s policy in establishing an observer program and supporting the increase of observers, in 2012 the observer program was extended to the STLL fleets. In 2023, there were 8 observers being deployed on LTLL vessels, while 37 observers being deployed on STLL vessels.

Our observer program had received interim authorization in 2009 and received full authorization after auditing in November 2011, October 2017 and May 2024, respectively. The forms used in our observer program are fully conformed to the standards set by WCPFC 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 2023 as follows：

- Study on the stock assessment of WCPO tropical tunas and the management strategy developments of the Pacific bluefin tuna.
- A study on the management strategy developments of the Pacific albacore and swordfish.
- Study on the stock assessment of North Pacific shortfin mako shark and stock status and NDF assessment of sharks in the Pacific Ocean.
- The impacts of mitigation measures on the bycatch species in Taiwanese distant water vessels.

The scientific papers presented at recent Pacific Ocean RFMOs meetings during 2023 to 2024 were as follows:

- Updated standardized CPUE and historical catch estimate of the shortfin mako shark caught by Taiwanese large-scale tuna longline fishery in the North Pacific Ocean. (ISC/23/SHARKWG-1/12)
- Updated size composition of shortfin mako shark caught by the Taiwanese tuna longline fishery in the North Pacific Ocean. (ISC/23/SHARKWG-1/13)
- Spatiotemporal definitions of Taiwanese albacore longline fishery in the North Pacific Ocean based on a regression tree analysis of size data. (ISC/23/ALBWG-01/06)
- Movements and vertical habitat of black marlin (*Istiompax indica*) and swordfish (*Xiphias gladius*) in the northwestern Pacific Ocean. (ISC/23/BILLWG-01/04)
- CPUE standardization for Taiwanese PBF fisheries using delta-GLMM and VAST, incorporating SST and size data. (ISC/23/PBFWG-2/04)
- PBF abundance indices from Taiwanese offshore longline fisheries using delta-GLMM and VAST, incorporating SST and size data. (ISC/23/PBFWG-1/02)

The scientific papers published on scientific journal during 2023 to 2024 were as follows:

- Liu, K. M.*, K. Y. Su, and C. P. Chin. 2023. Estimate of Cetacean and Shark Depredations in the Small-Scale Longline Fishery in the Southeastern Waters of Taiwan. Journal of Marine Science and Engineering 11: 1233. (SCI)
- Francis, M. P., W. S. Lyon, S. C. Clarke, B. Finucci, M. R. Hutchinson, S. E. Campana, M. K. Musy, K. M. Schaefer, S. D. Hoyle, T. Peatman, D. Bernal, K. Bigelow, J. Carlson, R. Coelho, C. Heberer, D. Itano, E. Jones, B. Leroy, K. M. Liu, H. Murua, F. Poisson, P. Rogers, C. Sanchez, Y. Semba, T. Sippel, N. Smith. Post-release survival of shortfin mako (*Isurus oxyrinchus*) and silky (*Carcharhinus falciformis*) sharks released from surface longlines in the Pacific Ocean. Aquatic Conservation: Marine and Freshwater Ecosystems 2023: 1–13. (SCI).
- Ng, S. L., K. M. Liu, and S. J. Joung*. Occurrence of the milk-eye catshark *Apristurus nakayai* (*Carcharhiniformes: Pentanchidae*) from the South China Sea. Zootaxa 5244 (1): 51–60. (SCI).
- Li, C. Y. J., Tsai, W.P., Ranatunga, R. R. M. K. P., Samidon, M., and Liu, S. Y. V*. 2023. Genetic stock structure of the silky shark *Carcharhinus falciformis* in the Indo-Pacific Ocean. PLOS ONE, 18(10), e0292743. (SCI)
- Huynh, H. H., and Tsai, W.P*. 2023. Estimation of the population status of smooth hammerhead shark (*Sphyrna zygaena*) and scalloped hammerhead shark (Sphyrna lewini) in the Northwest Pacific Ocean: A data-limited approach. Journal of Sea

Research, 195, 102434. (SCI)

- Wu, X.H., Chang, Y., Liao, T.Y., Ding, M.M., Ke, C.C. Real-time multi-month forecasting of skipjack tuna (*Katsuwonus pelamis*) habitat in the western and central Pacific Ocean for improved fishing efficiency and fisheries management. ICES Journal of Marine Science, 2023, 80(10), 2490 – 2503
- Pan, Ruo-Yu, Ke-Yang Chang, and Ting-Chun Kuo. "Bycatch information complements the understanding of spatial distribution for commercially important fish species." Fisheries Research 266 (2023): 106773.
- Ijima, H., Minte-Vera, C., Chang, Y.J., Ochi, D., Tsuda, Y., Jusup, M. (2023) Inferring the ecology of north-Pacific albacore tuna from catch-and-effort data. Scientific Reports, 13: 8742.
- Ma, T.H., Chang, Y.J., Shiao, J.C., Jin, C.B., Kuo, Y.F.* (2024) Enhancing machine learning-based age estimation for Pacific bluefin tuna: An approach with data imputation and image augmentation strategies. Fisheries Research, 274, 106992.

2.3 Statistics data collection system

To collect fishery data completely and in real-time, Taiwan implemented electronic logbook reporting on LTLL and DWPS fleets in 2014 and on the STLL fleet in 2015. Now, all fishing vessels operating outside Taiwan's EEZ are required to report their fishing data via e-logbook daily.

The operator or the captain of any fishing vessel intending to land or transship has been mandatory to fill in the Landing/Transshipment Notice and submit it to the competent authority for approval. Moreover, after the completion of landing or transshipment, the operator or the captain is required to submit the Landing/Transshipment Declaration to the competent authority so that the competent authority can verify the catches with e-logbook data and other relevant data so as to ensure the catches are legal and traceable.

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

2.4.1 Longline fisheries

All tuna longliners have been reporting their fishery data through e-logbooks, and the catch and effort data is compiled from e-logbook data. The size data, length, and weight of individual catches of all species are also compiled from the first 30 fish caught for each set recorded on the e-logbook. A port-sampling program conducted in domestic ports aims to collect data on the size of tuna and tuna-like species. The observer program has been collecting size data for all species. These data have already been used for scientific purposes and reported to WCPFC.

2.4.2 DWPS fishery

The iFIMS e-logbook data is compiled into catch and effort data of our purse seine fleet. Thai canneries' sizing data have been collected to estimate the catch composition of skipjack, bigeye tuna, and yellowfin tuna. Length data was collected from fishing vessels' reporting.

3. Implementation of Conservation and Management Measure

3.1 CMM 2009-03

In accordance with CMM 2009-03, the number of fishing vessels 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 6 and updated to 2023.

3.2 CMM 2018-05 (replace CMM 2007-01)

In order to estimate observer coverage rates on longline vessels fishing according CMM 2007-01 and in accordance with the decision of WCPFC11, Table 7 provides the information of observer coverage rate estimates for LTLL and STLL of 2023.

3.3 CMM 2009-06

In accordance with CMM 2009-06, CCMs shall report on all transshipment activities (including transshipment activities that occur in ports or EEZs) in Part 1 of its Annual Report. Table 8 shows the information of transshipment activities of our fishing fleets in 2023.

3.4 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 9 shows detailed information on cetaceans and whale shark encircled during operation reported in 2023 by fishing masters of our purse seine fleet.

3.5 CMM 2018-03

In accordance with CMM 2018-03, 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 to enable the estimation of seabird mortality in all fisheries to which the 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, namely 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, all Taiwanese longliners operating in the area between 25°S to 30°S are required to deploy a tori line as seabird mitigation measure since January 1, 2020. Furthermore, 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 are shown in Tables 10-19.

3.6 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 2019-2023 is shown in Table 20. None of our fishing vessel targets on striped marlin.

3.7 CMM 2015-02

In accordance with CMM 2015-02, CCMs shall report annually to the Commission the annual catch levels taken by each of their fishing vessels that has taken South Pacific albacore, as well as the number of vessels actively fishing for South Pacific albacore, in the Convention area south of 20°S. Catch by vessel shall be reported according to the following species groups: albacore tuna, bigeye tuna,

yellowfin tuna, swordfish, other billfish, and sharks. The information required for this measure has been provided through Annual Report Part 2.

3.8 CMM 2019-03 (replace CMM 2005-03)

In accordance with CMM 2019-03, 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 2023, the total catch of north Pacific albacore made by our fishing fleets was 6,654 MT with 6,020 MT in the north Convention area. There were 25 LTLL vessels directed at north Pacific albacore with 1,907 fishing days in the north Pacific Ocean, and with 1,457 days deployed in the north Convention area. The annual fishing efforts of LTLL vessels directed at North Pacific albacore for 2019-2023 was provided through Annual Report Part 2.

3.9 CMM 2022-02

In accordance with CMM 2022-02, all CCMs shall report annually to the WCPFC Commission all catches of North Pacific swordfish in the area (defined as Convention area north of 20°N) and all fishing effort in those fisheries. The required information is provided in Table 21 and was submitted to the Northern Committee. In 2023, the total catch of north Pacific swordfish made by our fishing fleets were 1,125 MT which including 489 MT by 383 coastal artisanal longline vessels and 636 MT with 14,279 fishing days by Longline vessels.

Table 1. The number of active fishing vessel by fishery in the WCPFC Convention Area during 2019-2023.

Year	LTLL	DWPS	STLL
2019	75	30	723
2020	82	28	710
2021	85	29	787
2022	108	26	608
2023	124	24	685

Table 2. The catch (in MT, round weight) of major tuna and tuna-like species of LTLL fishery in the WCPFC Convention Area during 2019-2023.

Year	N-ALB	S-ALB	BET	YFT	SWO	MLS	BUM	BLM	SKJ	TOTAL
2019	1,074	4,082	4,961	2,826	1,554	169	556	3	131	15,356
2020	1,081	4,860	4,138	1,685	1,576	182	307	2	98	13,929
2021	1,755	2,622	3,652	1,898	1,217	191	335	3	174	11,847
2022	2,201	5,660	5,591	3,187	1,588	216	452	7	193	19,095
2023*	2,249	5,339	5,632	3,092	1,181	354	716	6	165	18,734

* Preliminary estimate

Table 3. The catch (in MT, round weight) of major tuna species of DWPS fishery in the WCPFC Convention Area during 2019-2023.

Year	SKJ	YFT	BET	Total
2019	201,731	33,761	3,584	239,076
2020	123,154	23,533	3,684	150,371
2021	179,187	25,110	11,057	215,354
2022	176,368	26,703	7,807	210,878
2023*	137,560	27,131	3,946	168,637

* 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 2019-2023.

Year	ALB	BET	YFT	PBF	SWO	BILL**	TOTAL
2019	11,581	3,887	14,898	491	1,774	5,037	37,668
2020	11,111	3,005	8,527	1,150	1,654	3,333	28,780
2021	6,708	3,663	9,408	1,478	866	3,000	25,123
2022	6,387	3,899	12,279	1,496	907	3,177	28,145
2023*	9,061	3,122	8,847	2,117	1,195	3,466	27,808

** Preliminary estimate

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

Table 5. The number of observers deployed on LTLL, STLL and DWPS fisheries in the Pacific Ocean during 2019-2023.

	LTLL	STLL	DWPS*
2019	14	32	-
2020	14	42	-
2021	19	35	-
2022	21	33	-
2023	8	37	-

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

Table 6. The catch of swordfish and the number of the tuna longline fishing vessels operating in the area of south of 20°S during 2000-2023.

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	62
2014	105	0	52
2015	116	0	45
2016	124	0	44
2017	231	0	56
2018	307	0	67
2019	249	0	56
2020	330	0	84
2021	99	0	43
2022	111	0	42
2023*	137	0	41

* Preliminary estimate

Table 7. The estimate of observer coverage rate for Taiwanese longline fisheries in 2023.

CCM Fleet	Fishery	No. of Hooks			Days Fished			Days at Sea			No. of Trips			See NOTEs
		Total estimated	Observer	%	Total estimated	Observer	%	Total estimated	Observer	%	Total estimated	Observer	%	
Chinese Taipei	LTLL							14,722	1,705	11.54%				
	STLL							67,059	4,003	5.97%				

Table 8. The summary of transshipment operations by fishery of 2023

Offloaded and received	Transhipped in port, transhipped at sea in areas of national jurisdiction, and transhipped beyond areas of national jurisdiction	Transhipped inside the Convention Area and transhipped outside the Convention Area	Caught inside the Convention Area and caught outside the Convention Area	Product Form	Fishing gear	Number of Transshipments	Species (MT)								
							BET	ALB	YFT	SKJ	SWO	BUM	MLS	SKX	OTH
offloaded	beyond EEZs	inside	inside	Frozen	Longliner	300	1,859	1,803	3,066	241	108	323	35	62	375
offloaded	beyond EEZs	inside	both	Frozen	Longliner	159	2,325	1,379	782	140	371	255	96	290	395
offloaded	beyond EEZs	inside	outside	Frozen	Longliner	0	0	0	0	0	0	0	0	0	0
offloaded	beyond EEZs	outside	inside	Frozen	Longliner	0	0	0	0	0	0	0	0	0	0
offloaded	beyond EEZs	outside	both	Frozen	Longliner	14	420	3	105	0	266	17	6	24	42
offloaded	inside EEZs	inside	inside	Frozen	Purse seiner	0	0	0	0	0	0	0	0	0	0
offloaded	in port	inside	inside	Frozen	Purse seiner	237	2,101	0	31,425	123,742	0	0	0	0	0
offloaded	in port	inside	inside	Frozen	Longliner	131	606	8	2,713	0	38	247	2	13	361
offloaded	in port	inside	both	Frozen	Longliner	12	82	0	217	0	3	37	1	2	36
offloaded	in port	inside	outside	Frozen	Longliner	0	0	0	0	0	0	0	0	0	0
received	beyond EEZs	inside	inside	Frozen	Longliner	226	1,229	919	2,451	230	57	271	24	38	280
received	beyond EEZs	inside	both	Frozen	Longliner	74	513	442	347	113	129	139	57	146	211
received	beyond EEZs	inside	outside	Frozen	Longliner	0	0	0	0	0	0	0	0	0	0
received	beyond EEZs	outside	inside	Frozen	Longliner	0	0	0	0	0	0	0	0	0	0
received	beyond EEZs	outside	both	Frozen	Longliner	2	0	0	0	0	37	7	1	4	12
received	in port	inside	inside	Frozen	Longliner	131	606	8	2,713	0	38	247	2	13	361
received	in port	inside	both	Frozen	Longliner	12	82	0	217	0	3	37	1	2	36
received	in port	inside	outside	Frozen	Longliner	0	0	0	0	0	0	0	0	0	0

Table 9. The summary on cetaceans/whale sharks encircled incidentally in purse seine fishing operation in 2023.

Date	Longitude	Latitude	Species	Number	Reason	Measure for ensure safe release	Status on release
2023-01-05	E157°12'	S02°28'	Whale shark	1	not deliberately encircled	stop hauling	Alive1
2023-01-06	E153°49'	N00°16'	Whale shark	1	not deliberately encircled	stop hauling	Alive1
2023-01-10	E160°33'	S06°40'	False killer whale	1	not deliberately encircled	stop operating	Alive1
2023-01-12	E153°54'	S02°29'	False killer whale	1	not deliberately encircled	stop operating	Alive1
2023-01-13	E155°56'	N02°13'	Sei whale	2	not deliberately encircled	stop hauling	Alive1
2023-01-14	E156°30'	N01°20'	Sei whale	2	not deliberately encircled	stop hauling	Alive1
2023-01-18	E156°29'	N00°36'	Whale shark	1	not deliberately encircled	stop hauling	Alive1
2023-01-25	E154°52'	S01°29'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive1
2023-01-28	E154°16'	N02°02'	Cuvier's beaked whale	1	not deliberately encircled	stop hauling and operating	Alive1
2023-02-02	E157°37'	S02°55'	Whale shark	1	not deliberately encircled	stop hauling	Alive1
2023-02-11	E152°45'	S01°17'	Short-finned pilot whale	1	not deliberately encircled	stop hauling and operating	Alive1
2023-02-11	E152°45'	S01°17'	Short-finned pilot whale	1	not deliberately encircled	stop hauling and operating	Alive1
2023-02-12	E153°46'	S00°10'	Rough-toothed dolphin	3	not deliberately encircled	stop hauling	Alive1
2023-03-03	E150°17'	N01°20'	Bottlenose dolphin	6	not deliberately encircled	stop hauling	Alive0
2023-03-05	E153°07'	N02°04'	Spinner dolphin	22	not deliberately encircled	stop hauling and operating	Alive0
2023-04-25	E167°30'	N01°55'	Whale shark	1	not deliberately encircled	stop operating	Alive1
2023-05-09	E148°34'	S01°09'	Whale shark	1	not deliberately encircled	stop hauling	Alive1
2023-05-10	E148°33'	S01°12'	Whale shark	1	not deliberately encircled	stop operating	Alive1
2023-08-19	E169°28'	N01°37'	Whale shark	1	not deliberately encircled	stop hauling	Alive1
2023-09-25	E175°00'	S02°25'	Whale shark	1	not deliberately encircled	stop hauling	Alive1
2023-11-07	E171°36'	N02°41'	False killer whale	1	not deliberately encircled	stop hauling and operating	Alive1
2023-11-07	E171°36'	N02°41'	False killer whale	1	not deliberately encircled	stop hauling and operating	Alive1
2023-12-18	E154°29'	S08°04'	Whale shark	1	not deliberately encircled	stop operating	Alive1
2023-12-18	E154°22'	S08°16'	Whale shark	1	not deliberately encircled	stop operating	Alive1

Date	Longitude	Latitude	Species	Number	Reason	Measure for ensure safe release	Status on release
2023-12-20	E156°11'	S08°43'	Whale shark	1	not deliberately encircled	stop operating	Alive1
2023-12-20	E156°11'	S08°43'	Whale shark	1	not deliberately encircled	stop operating	Alive1
2023-12-22	E156°33'	S10°49'	Whale shark	1	not deliberately encircled	stop operating	Alive1
2023-12-22	E156°41'	S10°41'	Whale shark	1	not deliberately encircled	stop operating	Alive1
2023-12-24	E156°03'	S11°02'	Whale shark	1	not deliberately encircled	stop operating	Alive1
2023-12-24	E157°04'	S09°34'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive1
2023-12-24	E155°48'	S11°04'	Whale shark	1	not deliberately encircled	stop operating	Alive0

Table 10. Effort, observed and estimated seabird captures of longline fishery in the area of south of 30°S during 2019-2023.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	41	9,577,026	575,433	6.0%	7	0.012
2020	58	10,171,657	661,591	6.5%	4	0.006
2021	32	4,852,414	305,557	6.3%	0	0.000
2022	21	5,393,630	578,181	10.7%	3	0.005
2023*	22	6,061,462	217,866	3.6%	8	0.037

* Preliminary

Table 11. Effort, observed and estimated seabird captures of longline fishery in the area of 25°S - 30°S during 2019-2023.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	45	6,636,576	828,365	12.5%	11	0.013
2020	99	15,392,455	1,503,987	9.8%	0	0.000
2021	38	4,671,972	308,049	6.6%	1	0.003
2022	27	3,775,512	184,777	4.9%	0	0.000
2023*	27	3,326,436	146,391	4.4%	0	0.000

* Preliminary

Table 12. Effort, observed and estimated seabird captures of longline fishery in the area of north of 23°N during 2019-2023.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	603	31,792,234	830,129	2.6%	2	0.002
2020	205	28,842,954	1,527,417	5.3%	46	0.030
2021	109	16,723,505	868,928	5.2%	59	0.068
2022	122	18,134,154	1,175,641	6.5%	89	0.076
2023*	161	23,315,483	106,130	0.5%	0	0.000

* Preliminary

Table 13. Effort, observed and estimated seabird captures of longline fishery in the area of 23°N - 25°S during 2019-2023.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2019	755	133,657,853	7,042,816	5.3%	1	0.000
2020	488	107,115,471	5,001,143	4.7%	0	0.000
2021	392	107,274,154	7,441,365	6.9%	0	0.000
2022	394	122,650,563	7,913,557	6.5%	4	0.001
2023*	380	107,117,805	4,207,931	3.9%	2	0.000

* Preliminary

Table 14. Proportion of mitigation types used by longline fishery in 2019.

	Combination of Mitigation Measures*	Proportion of observed effort using mitigation measures			
		South of 30°S	25°S - 30°S	25°S - 23°N	North of 23°N
	No mitigation measures	0.0%	0.0%	0.0%	0.0%
Options required south of 25°S	TL + NS	0.0%	0.0%	0.0%	0.0%
	TL + WB	7.9%	7.3%	0.6%	1.8%
	NS + WB	0.3%	16.2%	71.8%	46.4%
	TL + WB + NS	63.1%	53.8%	1.2%	40.2%
	HS				
Other options 25°S-30°S	WB	0.0%	5.6%	26.4%	5.5%
	TL	0.0%	0.0%	0.0%	0.0%
Other options north of 230N	SS/BC/WB/DSLS				
	SS/BC/WB/(MOD or BDB)				
Provide any other combination of mitigation measures here	TL+TL	28.7%	17.1%	0.0%	6.1%
	NS	0.0%	0.0%	0.0%	0.0%
	Totals	100.0%	100.0%	100.0%	100.0%

*TL = tori line, NS = night setting, WB = weighted branch lines, SS = side setting, BC = bird curtain, BDB = blue dyed bait, DSLS = deep setting line shooter, MOD = management of offal discharge, HS = hook-shielding device.

Table 15. Proportion of mitigation types used by longline fishery in 2020.

	Combination of Mitigation Measures*	Proportion of observed effort using mitigation measures			
		South of 30°S	25°S - 30°S	25°S - 23°N	North of 23°N
	No mitigation measures	0.0%	0.0%	0.0%	0.0%
Options required south of 25°S	TL + NS	0.0%	0.0%	0.0%	0.0%
	TL + WB	2.2%	4.5%	0.4%	5.5%
	NS + WB	5.0%	29.9%	82.4%	30.2%
	TL + WB + NS	49.3%	43.1%	0.9%	52.6%
	HS				
Other options 25°S-30°S	WB	2.0%	9.5%	16.2%	2.8%
	TL	0.0%	0.0%	0.0%	0.0%
Other options north of 230N	SS/BC/WB/DSLS				
	SS/BC/WB/(MOD or BDB)				
Provide any other combination of mitigation measures here	TL+TL	41.5%	13.0%	0.1%	8.9%
	NS	0.0%	0.0%	0.0%	0.0%
	Totals	100.0%	100.0%	100.0%	100.0%

*TL = tori line, NS = night setting, WB = weighted branch lines, SS = side setting, BC = bird curtain, BDB = blue dyed bait, DSLS = deep setting line shooter, MOD = management of offal discharge, HS = hook-shielding device.

Table 16. Proportion of mitigation types used by longline fishery in 2021.

	Combination of Mitigation Measures*	Proportion of observed effort using mitigation measures			
		South of 30°S	25°S - 30°S	25°S - 23°N	North of 23°N
	No mitigation measures	0.0%	0.0%	0.0%	0.0%
Options required south of 25°S	TL + NS	0.0%	0.0%	0.0%	0.0%
	TL + WB	8.7%	11.3%	0.2%	2.9%
	NS + WB	2.7%	16.9%	70.2%	19.6%
	TL + WB + NS	87.9%	69.3%	0.7%	58.4%
	HS				
Other options 25°S-30°S	WB	0.7%	2.5%	28.9%	0.3%
	TL	0.0%	0.0%	0.0%	0.0%
Other options north of 230N	SS/BC/WB/DSLS				
	SS/BC/WB/(MOD or BDB)				
Provide any other combination of mitigation measures here	TL+TL	0.0%	0.0%	0.0%	18.8%
	NS	0.0%	0.0%	0.0%	0.0%
	Totals	100.0%	100.0%	100.0%	100.0%

*TL = tori line, NS = night setting, WB = weighted branch lines, SS = side setting, BC = bird curtain, BDB = blue dyed bait, DSLS = deep setting line shooter, MOD = management of offal discharge, HS = hook-shielding device.

Table 17. Proportion of mitigation types used by longline fishery in 2022.

	Combination of Mitigation Measures*	Proportion of observed effort using mitigation measures			
		South of 30°S	25°S - 30°S	25°S - 23°N	North of 23°N
	No mitigation measures	0.0%	0.0%	0.0%	0.0%
Options required south of 25°S	TL + NS	0.0%	0.0%	0.0%	0.0%
	TL + WB	0.8%	0.0%	0.0%	2.6%
	NS + WB	11.5%	2.5%	76.0%	0.0%
	TL + WB + NS	35.4%	47.5%	0.0%	79.9%
	HS				
Other options 25°S-30°S	WB	16.0%	2.5%	24.0%	0.2%
	TL	0.0%	0.0%	0.0%	0.0%
Other options north of 230N	SS/BC/WB/DSLS				
	SS/BC/WB/(MOD or BDB)				
Provide any other combination of mitigation measures here	TL+TL	36.3%	47.5%	0.0%	17.3%
	NS	0.0%	0.0%	0.0%	0.0%
	Totals	100.0%	100.0%	100.0%	100.0%

*TL = tori line, NS = night setting, WB = weighted branch lines, SS = side setting, BC = bird curtain, BDB = blue dyed bait, DSLS = deep setting line shooter, MOD = management of offal discharge, HS = hook-shielding device.

Table 18. Proportion of mitigation types used by longline fishery in 2023.

	Combination of Mitigation Measures*	Proportion of observed effort using mitigation measures			
		South of 30°S	25°S - 30°S	25°S - 23°N	North of 23°N
	No mitigation measures	0.0%	0.0%	0.0%	0.0%
Options required south of 25°S	TL + NS	0.0%	0.0%	0.0%	0.0%
	TL + WB	3.6%	0.0%	0.0%	3.8%
	NS + WB	0.0%	52.5%	76.4%	63.5%
	TL + WB + NS	46.4%	13.2%	3.1%	32.7%
	HS				
Other options 25°S-30°S	WB	0.0%	21.1%	20.5%	0.0%
	TL	0.0%	0.0%	0.0%	0.0%
Other options north of 230N	SS/BC/WB/DSLS				
	SS/BC/WB/(MOD or BDB)				
Provide any other combination of mitigation measures here	TL+TL	50.0%	13.2%	0.0%	0.0%
	NS	0.0%	0.0%	0.0%	0.0%
	Totals	100.0%	100.0%	100.0%	100.0%

*TL = tori line, NS = night setting, WB = weighted branch lines, SS = side setting, BC = bird curtain, BDB = blue dyed bait, DSLS = deep setting line shooter, MOD = management of offal discharge, HS = hook-shielding device.

Table 19. Number of observed seabird captures of tuna longline fishery by species and by area during 2019-2023. (* Preliminary)

Year	Species	South of 30°S	25°S - 30°S	North of 23°N	23°N - 25°S	Total
2019	Antipodean Albatross	0	2	0	0	2
	Black-Browed Albatross	1	1	0	0	2
	Black-footed Albatross	0	0	1	0	1
	Buller' S Albatross	0	3	0	0	3
	Campbell Albatross	1	1	0	0	2
	Grey Headed Albatross	1	0	0	0	1
	Laysan Albatross	0	0	1	0	1
	Parasitic Jaeger	0	1	0	0	1
	Shy Albatross	1	0	0	0	1
	Wandering Albatross	3	1	0	0	4
	Wedge-Tailed Shearwater	0	1	0	0	1
	Westland Petrel	0	0	0	1	1
	White-chinned Petrel	0	1	0	0	1
	Total	7	11	2	1	21

Year	Species	South of 30°S	25°S - 30°S	North of 23°N	23°N - 25°S	Total
2020	Black-footed albatross	0	0	9	0	9
	Laysan albatross	0	0	36	0	36
	Northern royal albatross	1	0	0	0	1
	Petrels nei	0	0	1	0	1
	Wandering albatross	2	0	0	0	2
	Westland petrel	1	0	0	0	1
	Total	4	0	46	0	50
2021	Black-browed albatross	0	1	0	0	1
	Black-footed albatross	0	0	1	0	1
	Laysan albatross	0	0	58	0	58
	Total	0	1	59	0	60
2022	Antipodean albatross	1	0	0	0	1
	Black-footed albatross	0	0	24	0	24
	Boobies and gannets nei	0	0	0	2	2
	Great shearwater	0	0	0	1	1
	Grey petrel	1	0	0	0	1
	Laysan albatross	0	0	65	0	65
	Wandering albatross	1	0	0	0	1
	Other seabird	0	0	0	1	1
	Total	3	0	89	4	96
2023*	Black-browed albatross	5	0	0	0	5
	Great shearwater	0	0	0	1	1
	Grey-headed albatross	1	0	0	0	1
	Wandering albatross	1	0	0	0	1
	Westland petrel	1	0	0	0	1
	Other seabird	0	0	0	1	1
	Total	8	0	0	2	10

Table 20. The catch of striped marlin of tuna longline fisheries in the area of south of 15°S during 2019-2023.

Year	Catch (MT)
2019	207
2020	306
2021	154
2022	149
2023*	176

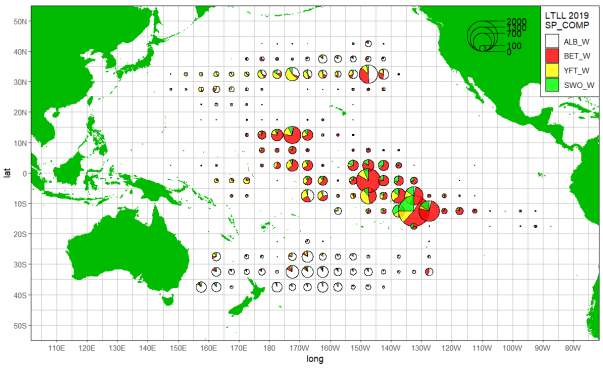
* Preliminary estimate

Table 21. Average annual fishing effort for 2008-2010 and annual fishing effort for subsequent years for fisheries taking North Pacific swordfish for the previous 3-years.

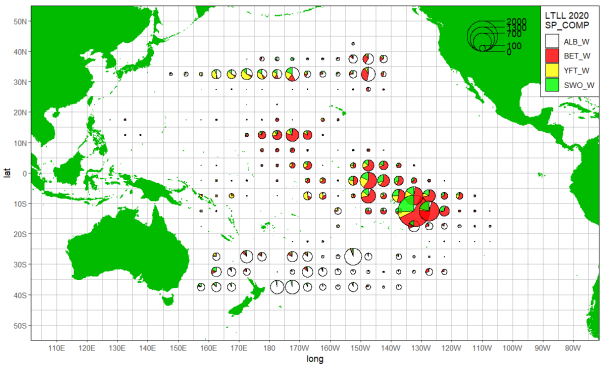
Area	Fishery (gear type)	2008-2010 Average			2021			2022			2023*		
		Catch (t)	No. of vessels	Fishing days	Catch (t)	No. of vessels	Fishing days	Catch (t)	No. of vessels	Fishing days	Catch (t)	No. of vessels	Fishing days
CA north of 20°N (The area)	Setnet	31			3								
	Gillnet	6			<0.5								
	Harpoon	37			0								
	Coastal artisanal longline	610	673		264	442		279	227		489	383	
	Longline	611	633	30,031	438	214	9,290	403	190	10,522	636	231	14,279
	Total	**1,295**			**705**			**682**					

* All swordfish were bycatch. Data of 2023 are still preliminary.

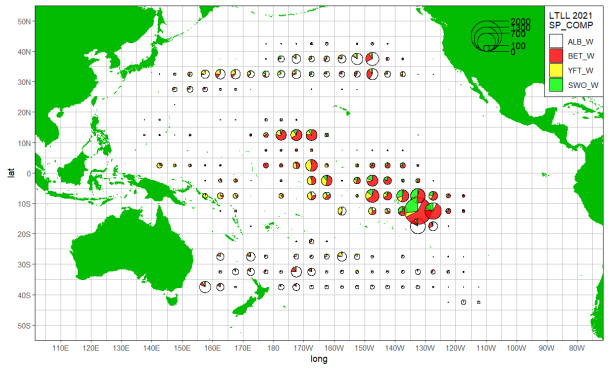
2019



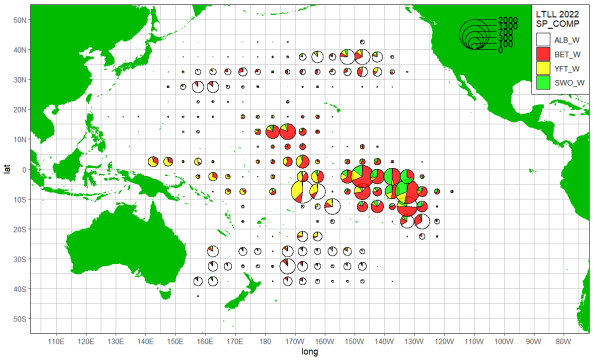
2020



2021



2022



2023

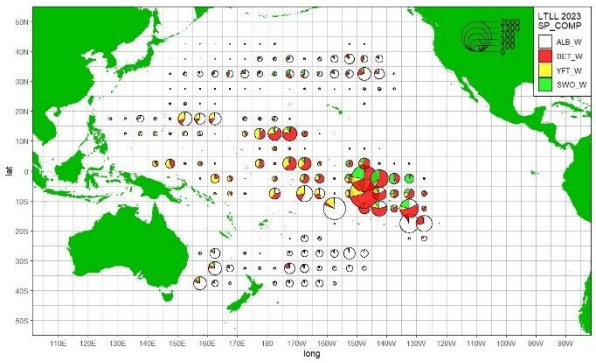


Figure 1. The catch composition distributions of tuna and tuna-like species of LTLL fishery during 2019-2023. The figures of 2022 and 2023 are still in preliminary.

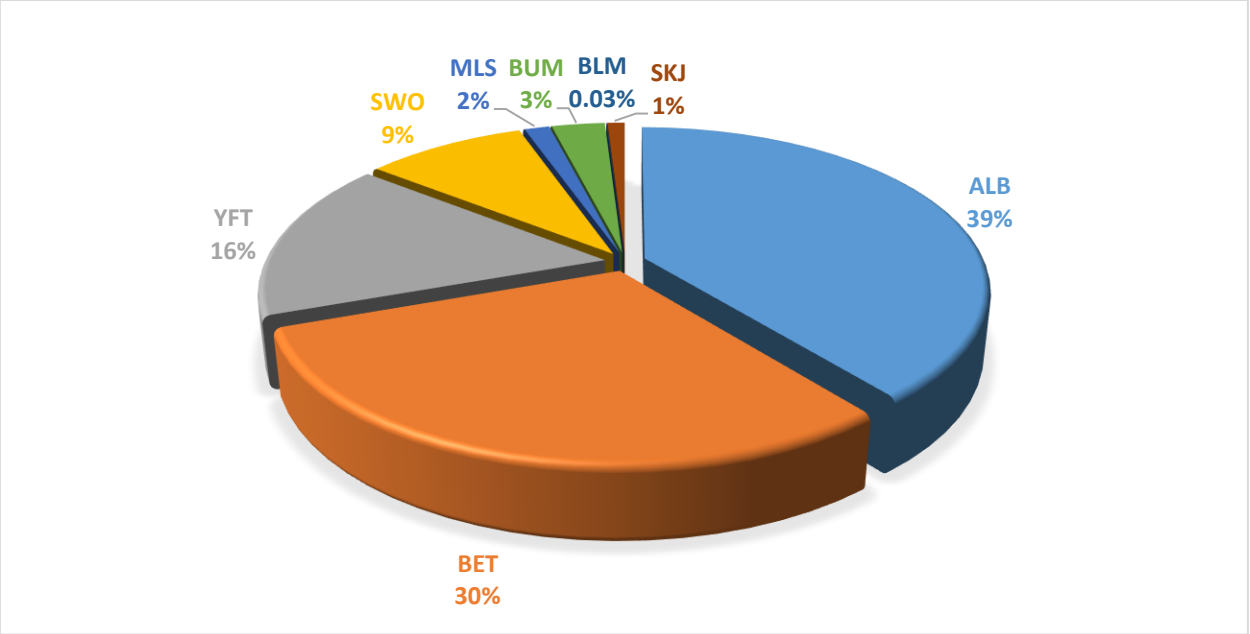


Figure 2. The catch composition of major tuna and tuna-like species for LTLL fishery in the WCPFC Convention area during 2019-2023.

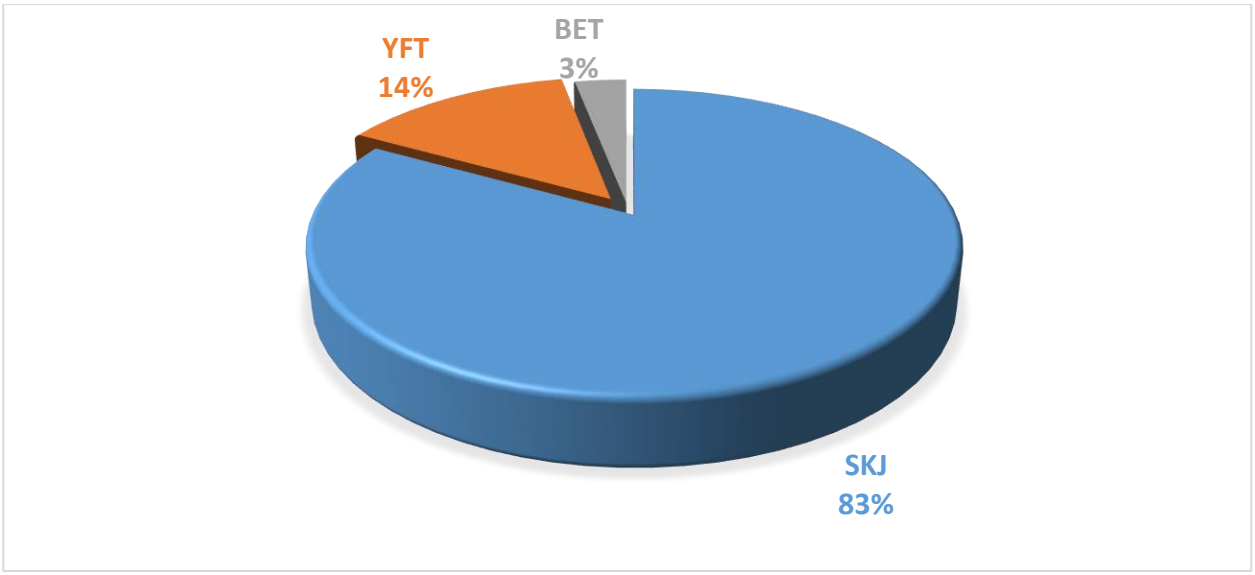
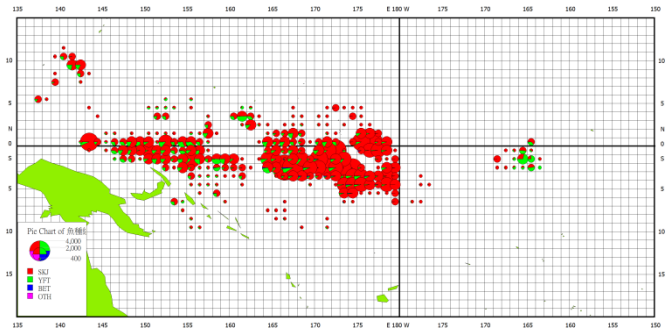
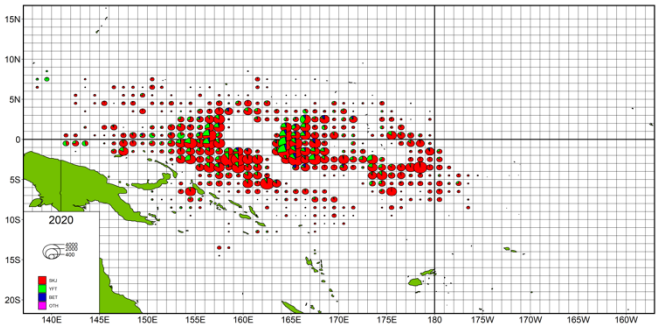


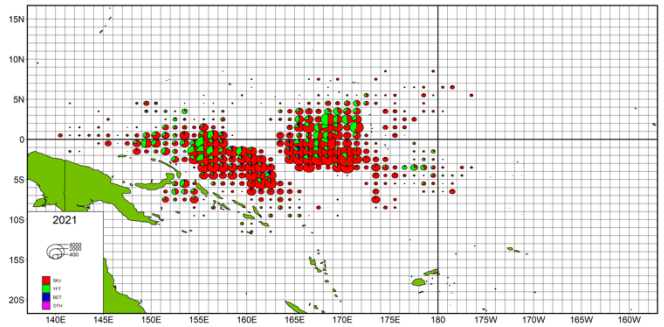
Figure 3. The catch composition of major tuna species for DWPS fishery in the WCPFC Convention area during 2019-2023.



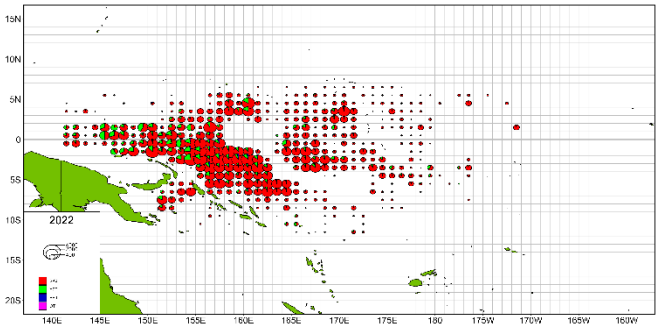
2019



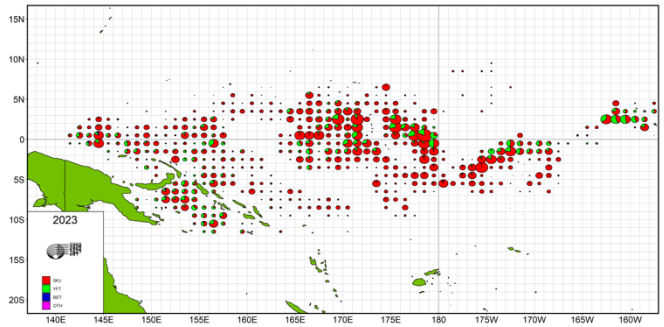
2020



2021



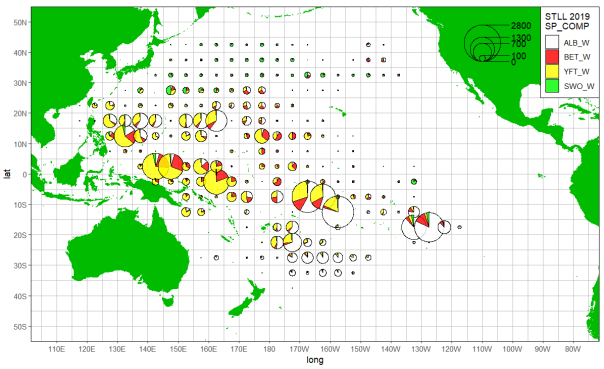
2022



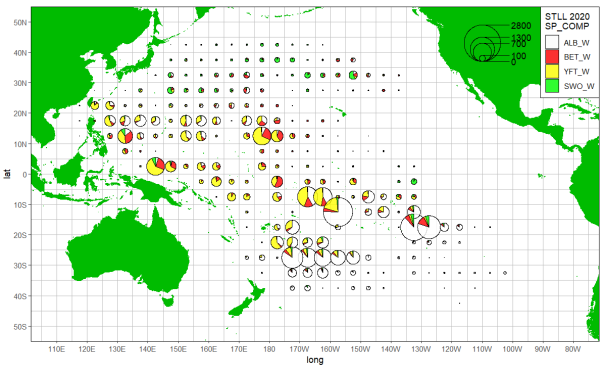
2023

Figure 4. The catch composition distributions of DWPS fleet during 2019-2023.

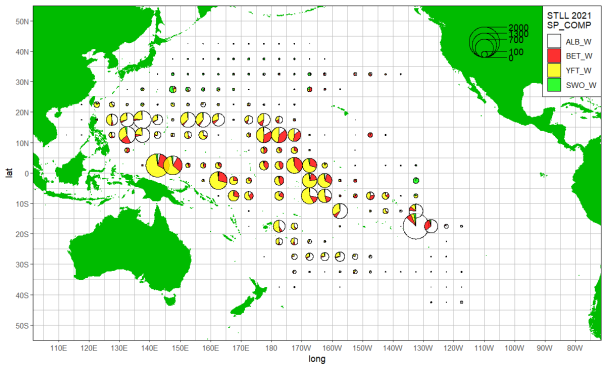
2019



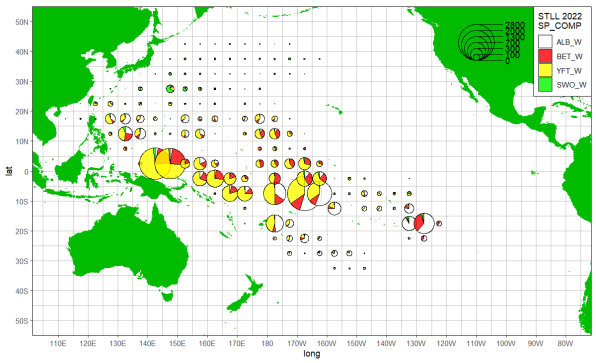
2020



2021



2022



2023

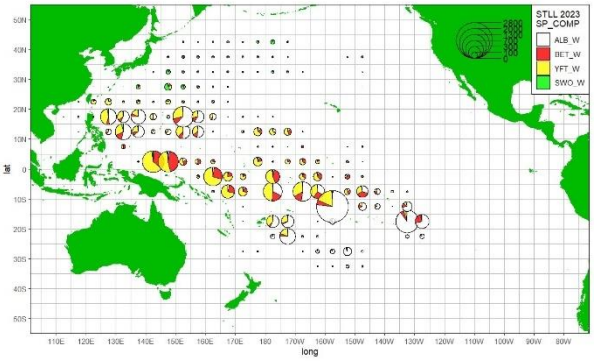
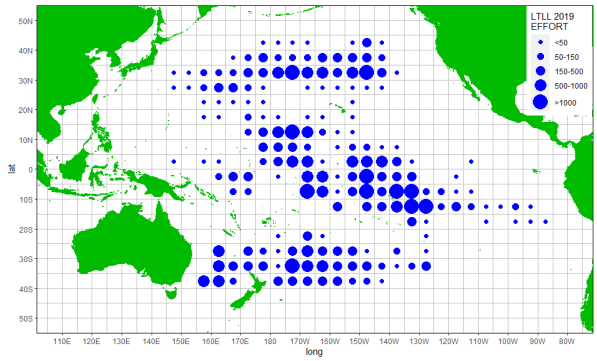
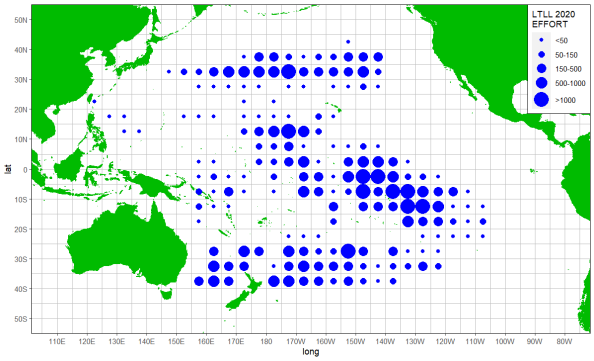


Figure 5. The catch composition distributions of tuna and tuna-like species of STLL fishery during 2019-2023. The figures of 2022 and 2023 are still in preliminary.

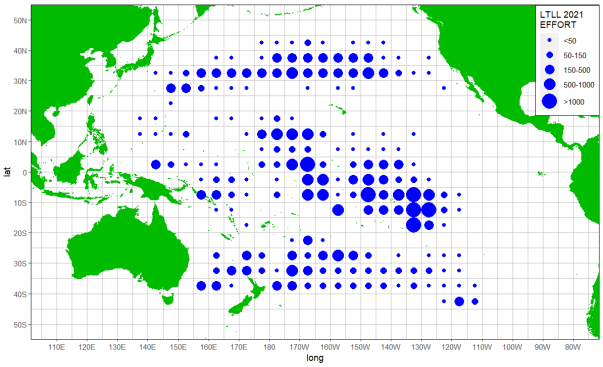
2019



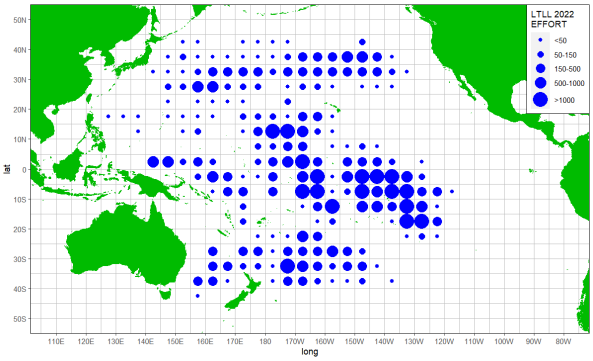
2020



2021



2022



2023

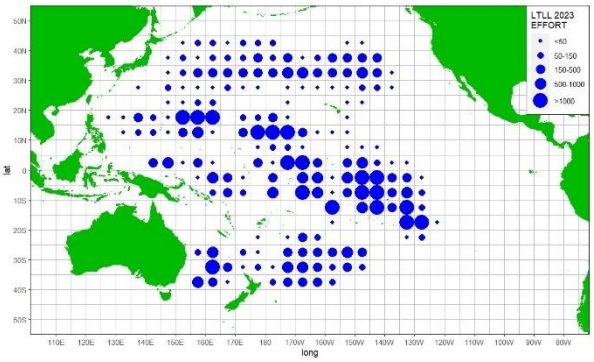
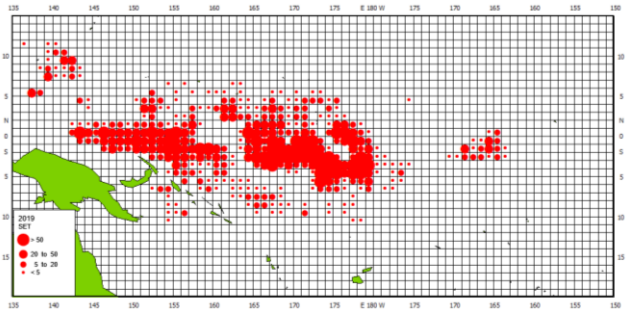
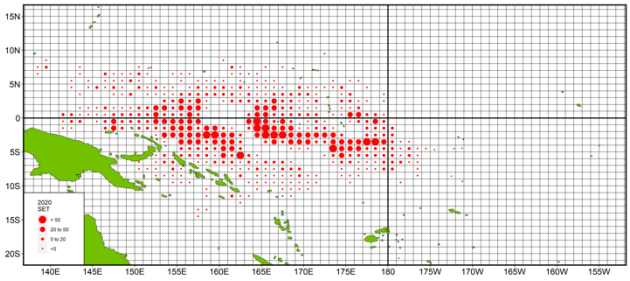


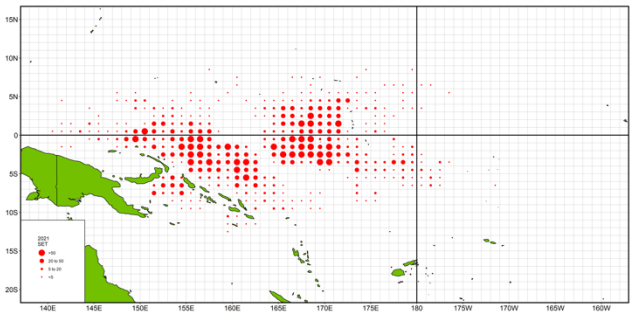
Figure 6. The fishing effort distributions of LTLL fishery during 2019-2023. The figures of 2022 and 2023 are still in preliminary.



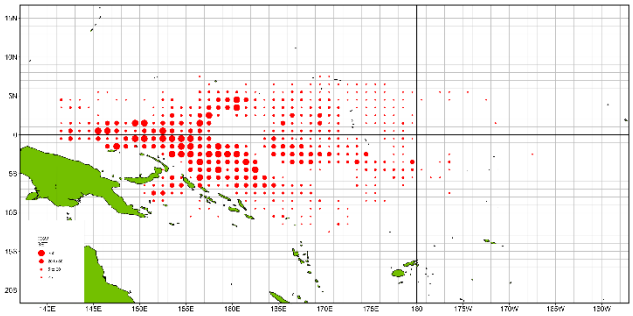
2019



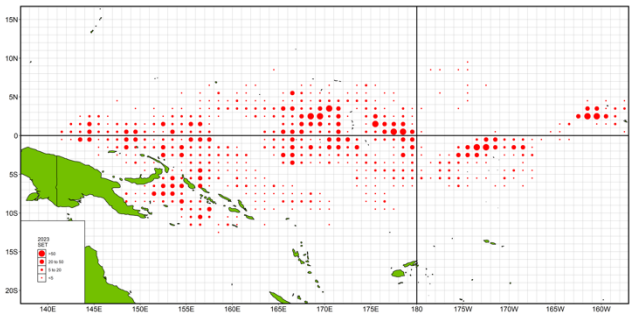
2020



2021



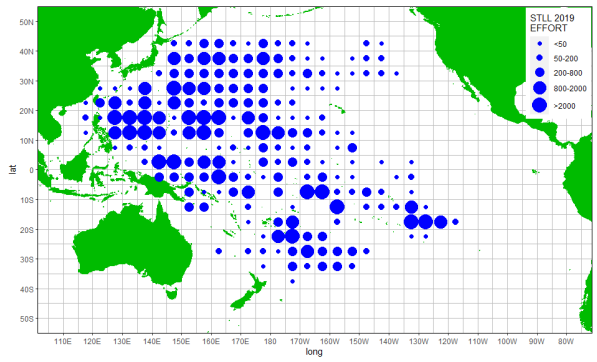
2022



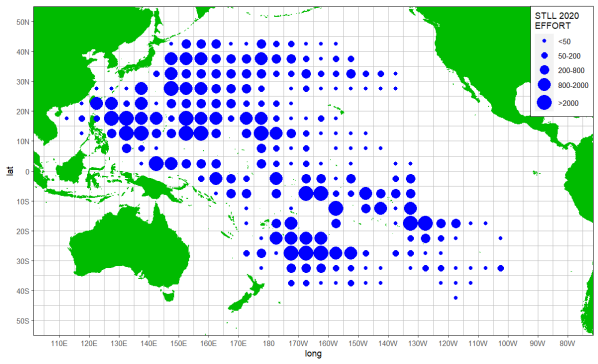
2023

Figure 7. The fishing effort distributions of DWPS fleet during 2019-2023.

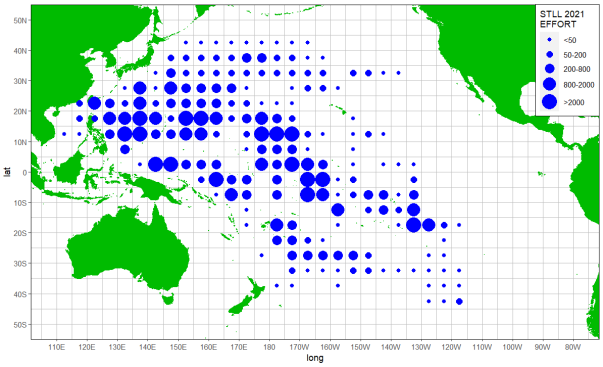
2019



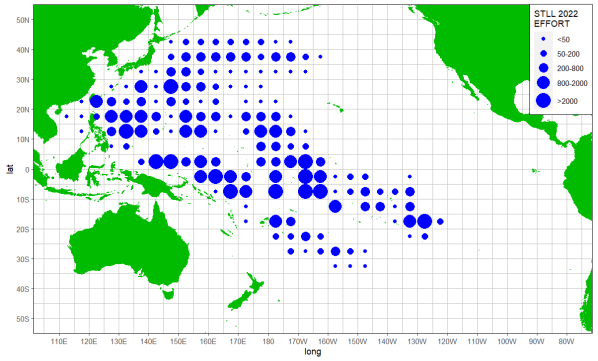
2020



2021



2022



2023

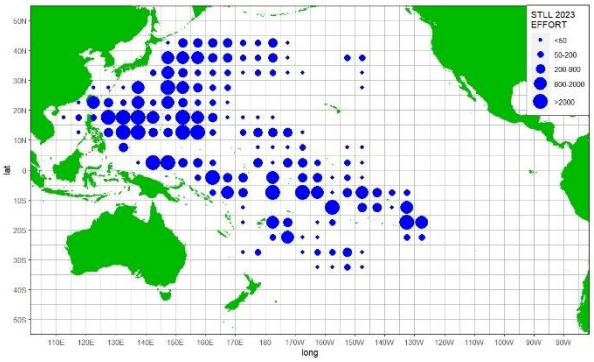


Figure 8. The fishing effort distributions of STLL fishery during 2019-2023. The figures of 2022 and 2023 are still in preliminary.