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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

This paper was originally submitted on July 12 as required and had been posted on the 17th WCPFC Scientific Committee meeting website.
The updated version submitted on September only revise table 21 to clear editorial errors in the table.

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 2021	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 2020, the total catches of main tuna and tuna-like species for these three fleets were 13,929 MT for LTLL, 150,371 MT for DWPS and 28,780 MT for STLL, respectively. In 2020, 56 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: 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 active fishing vessel of LTLL, DWPS and STLL fleets in recent five years (2016-2020) in the WCPFC Convention Area.

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 82 with an average of 78 in the last 5 years. The number of active LTLL fishing vessels was 82 in 2020.

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 fleet further reduced to 34 authorized in 2004 which was maintained at this level ever since. There were 28 active purse seiners operating in the WCPFC Convention Area in 2020.

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 with similar operations as that of the LTLL fleet. In 2020, there were 710 STLL fishing vessels operating in the WCPFC Convention Area.

1.2 Annual Catch in the WCPFC Convention Area

1.2.1 LTLL

The catch of primary species caught by LTLL fishery over the last 5 years (2016-2020) in the WCPFC Convention Area is shown in Table 2. The distribution of species composition of LTLL in recent 5 years (2016-2020) is shown in Figure 1. Composition

ratio of primary species of our LTLL fishery in the WCPFC Convention area in recent 5 years is shown in Figure 2, and it observed that the dominant species of catch were albacore (38%), followed by bigeye tuna (27%) and yellowfin tuna (18%).

1.2.2 DWPS

The catch of primary species in the WCPFC Convention Area during 2016-2020 is shown in Table 3. Skipjack remained the most dominant species, accounting for about 81% of the total catch, followed by yellowfin tuna and bigeye tuna, which accounts for 17% and 2% of the total catch respectively (Figure 3). Composition ratio of primary species in recent 5 years (2016-2020) is shown in Figure 4.

1.2.3 STLL

The total catch of primary species caught by STLL fleet in 2020 was 28,780 MT with albacore accounting 29% of the total catch. Other major catches were yellowfin tuna (23%), billfish (9%) and bigeye tuna (8%). The total catch of primary species of STLL from 2016 to 2020 in WCPFC Convention Area is shown in Table 4. Composition ratio of species during 2016-2020 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 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 effort in recent 5 years (2016-2020) is shown in Figure 6.

1.3.2 DWPS

The DWPS vessels mainly operate in the tropical waters close to the equator area targeting skipjack. 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 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 becoming the most prevailing fishing method and it observed that there were 67.8% sets were deployed on free school in 2020. The distribution of fishing effort in recent 5 years (2016-2020) is shown in Figure 7. In the years where El Niño phenomena occur, the fish tends to move more eastwards and the fishing activities follow the pattern of this movement. In contrary, in 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 (2016-2020) is shown in Figure 8.

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

Annual catches of key shark species of LTLL, STLL and DWPS in 2020 is shown

in Table 5.

In 2019, our observers had recorded 71 sea turtles (1 Leatherback turtle, 43 Olive ridley turtles, 1 Kemp's ridley turtle, 2 Loggerhead turtles, 5 Hawksbill turtles, 13 Green turtles and 6 Unidentified Turtle), 21 seabirds (3 Buller' S albatross, 1 Grey Headed albatross, 2 Black-Browed albatross, 4 Wandering albatross, 1 Laysan albatross, 1 Black-footed albatross, 2 Antipodean albatross, 1 Westland petrel, 1 Short-Tailed shearwater, 1 White-chinned petrel, 1 Parasitic jaeger, 2 Campbell albatross and 1 Shy albatross) and 4 cetacean (1 Risso's dolphin and 3 False-killer whales) hooked with sightings of 4,644 seabirds, and 111 cetaceans. In 2020, our observers had recorded 28 sea turtles (5 Olive ridley turtles, 1 Kemp's ridley turtle, 1 Hawksbill turtle, 14 Loggerhead turtles, 3 Green turtles and 4 unidentified turtles) and 46 seabirds (1 Northern royal albatross, 2 Wandering albatross, 33 Laysan albatross, 8 Black-footed albatross, 1 Westland petrel, and 1 other petrel) hooked with sightings of 19,680 seabirds and 111 cetaceans. Because some observation trips of 2020 extended to 2021, the observer data of 2020 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 3.7 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 2016-2020 is shown in Table 6. 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. Total number of observers deployed on longline vessels in 2020 was 56, including 14 observers for LTLL vessels and 42 observers for STLL vessels respectively.

Our observer program had received interim authorization in 2009 and received full authorization after auditing in November 2011 and October 2017, 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 2020 as follows：

- Study on abundance index and HS/MS elements for WCPO tropical tunas.
- A study on the elements of the harvest strategy/management strategy developments of the south Pacific albacore tuna and the biology and stock assessment of Pacific blue marlin.
- 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 2020 to 2021 were as follows:

- Blue marlin (Makaira nigricans) catch and size data of Taiwanese fisheries in the Pacific Ocean. (ISC/20/BILLWG-01/08)
- Movement patterns and habitat preferences of five species of billfish in northwestern Pacific Ocean. (ISC/20/BILLWG-01/09)
- Considering age uncertainty and two stanzas of growth for the Pacific blue marlin (Makaira nigricans). (ISC/20/BILLWG-01/11)
- Abundance index of Taiwanese PBF fisheries based on traditional and spatiotemporal delta-generalized linear mixed models. (ISC/20/PBFWG-1/03)
- Length-Based Proportional Sampling for Life History Research: Establishing Uniform Sampling for North Pacific Billfish Species. (ISC/20/BILLWG-02/01)
- Estimation of the two-stanza growth curves with ageing uncertainty for the Pacific blue marlin (Makaira nigricans). (ISC/20/BILLWG-02/03)
- CPUE standardization of blue marlin (Makaira nigricans) for the Taiwanese distant-water tuna longline fishery in the Pacific Ocean during 1971 - 2019. (ISC/20/BILLWG-03/03)
- 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/21/SHARKWG-1/01)
- Updated size composition of shortfin mako shark caught by the Taiwanese tuna longline fishery in the North Pacific Ocean. (ISC/21/SHARKWG-1/02)
- Movement ecology of swordfish (Xiphias gladius) in the northwestern Pacific Ocean using electronic tags and stable isotope analysis. (ISC/21/BILLWG-01/06 rev1)

The scientific papers published on scientific journal during 2020 to 2021 were as follows:

- Chang, Y.J., Winker, H., Sculley, M.,Hsu, J. (2020). Evaluation of the status and risk of overexploitation of the Pacific billfish stocks considering non-stationary population processes. Deep-Sea Research Part II, 175, 104707.
- Chien H. W.*, X. Y. Chen and W. P. Tsai. (2020) Poly (methyl methacrylate)/titanium dioxide (PMMA/TiO2) nanocomposite with shark-skin structure for preventing biofilm formation. Materials Letters, 285 (2021) 129098. (SCI)
- Chien H. W.*, X. Y. Chen, W. P. Tsai and M. S. Lee. (2020) Inhibition of biofilm formation by rough shark skin-patterned surfaces. Colloids and Surfaces B: Biointerfaces 186: 110738 (SCI)
- Lee, Y.J., Su, N.J., Liao, C.H., Chiang, W.C., Li, C.H. (2020) A two-stage approach to integrate vessel geo-tracking data and logbooks for monitoring fishing activity of coastal fisheries in waters off northwestern Taiwan. Journal of Marine Science and Technology, In press.
- Lin, S.J., Chiang, W.C., Musyl, M.K., Wang, S.P., Su, N.J., Chang, Q.X., Ho, Y.S., Nakamura, I., Tseng, C.T., Kawabe, R. (2020) Movements and habitat use of dolphinfish (Coryphaena hippurus) in the East China Sea. Sustainability, 12: 5793.
- Lin, S.J., Musyl, M.K., Chiang, W.C., Wang, S.P., Su, N.J., Chang, C.T., Chang, Q.X., Ho, Y.S., Kawabe, R., Yeh, H.M., Tseng, C.T. (2020) Vertical and horizontal

movements of bigeye tuna (Thunnus obesus) in southeastern Taiwan. Marine and Freshwater Behaviour and Physiology, 54(1): 1-21.

- Liu, K. M.*, Y. H. Lin, S. K. Chang, S. J. Joung, and K. Y. Su. (2020) Examining an ontogenetic shift in diet of the whitespotted bamboo shark Chiloscyllium plagiosum in northern Taiwanese waters based on stomach content and stable isotope analyses. Regional Studies in Marine Science 35: 101234. doi.org/10.1016/j.rsma.2020.101234. (SCI)
- Liu, S. Y. V.*, W. P. Tsai, M. S. Lee and H. W. Chien. (2020) Accessing Multiple Paternity in the Shortfin Mako Shark (Isurus oxyrinchus). Zoological Studies, 59:49 (2020) (doi:10.6620/ZS.2020.59-49) (SCI)
- Maunder*, M.N., Thorson, J.T., Xu, H., Oliveros-Ramos, R., Hoyle, S.D., Tremblay-Boyer, L., Lee, H.H. Kai, M., Chang, S.-K., Kitakado, T, Albertsen, C.M., Minte-Vera, C.V., Lennert-Cody, C.E., Aires-da-Silva, A.M., Piner K.R. (2020) The need for spatio-temporal modeling to determine catch-per-unit effort based indices of abundance and associated composition data for inclusion in stock assessment models. Fisheries Research, 229: 105594. doi:10.1016/j.fishres.2020.105594
- Su, S. H., S. Y. V. Liu, K. M. Liu, and W. P. Tsai*. (2020) Development and characterization of novel microsatellite loci for an endangered hammerhead shark Sphyrna lewini by using shotgun sequencing. Taiwania 65(2): 261-263. doi: 10.6165/tai.2020.65. (SCI)
- Tsai, W. P.*, K. M. Liu, and Y. J. Chang. (2020) Evaluation of biological reference points for conservation and management of the bigeye thresher shark, Alopias superciliosus, in the Northwest Pacific. Sustainability 12(20): 8646; doi:10.3390/su12208646. (SSCI)
- Hsu, J., Chang, Y.J.*, Kitakado, T., Kai, M., Li, B., Hashimoto, M., Hsieh, C.H., Kulik, V., Park, K.J. (2021) Evaluating the spatiotemporal dynamics of Pacific saury in the Northwestern Pacific Ocean by using a geostatistical modelling approach. Fisheries Research, 235, 105821.
- Huang, C.-C., S.-K. Chang*, S.-W. Shyue. 2021. Sustain or phase out: transformation of Taiwan's management scheme on distant water tuna longline fisheries. Marine Policy, 123: 104297. doi:10.1016/j.marpol.2020.104297
- Liu, K. M.*, C. B. Wu, S. J. Joung, W. P. Tsai, and K. Y. Su. (2021) Multi-model approach on the growth estimate and association with life history y trait for elasmobranchs. Frontiers in Marine Science 8: 591692. doi: 10.3389/fmars.2021.591692. (SCI).
- Pacoureau, N.*, C. L. Rigby, P. M. Kyne, R. Sherley*, Henning Winker, J. C. Carlson, S. V. Fordham, R. Borreto, D. Fernando, M. Francis, R. W. Jabado, K. B. Herman, K. M. Liu, A. Marshall, R. Pollom, E. Romanov, C. A. Simpfendorfer, J. S. Yin, H. K. Kindsvater and N. K. Dulvy. (2021) Half a century of decline in oceanic pelagic sharks and rays. Nature 589: 567-571. doi.org/10.1038/s41586-020-03173-9 (SCI)
- Ju, Y. R., C. F. Chen, C. W. Chen, M. H. Wang, S. J. Joung, C. J. Yu, K. M. Liu, W. P. Tsai, S. Y. V. Liu, C. D. Dong*. (2021) Profile and consumption risk assessment of trace elements in megamouth sharks (Megachasma pelagios) captured from the Pacific Ocean to the east of Taiwan. Environmental Pollution 269:116161. doi.org/10.1016/j.envpol.2020.116161. (SCI)

2.3 Statistics data collection system

To collect fishery data complete and in a real time manner, Taiwan implemented

electronic logbook reporting on LTLL and DWPS fleets in 2014, and on STLL fleet in 2015, and now all fishing vessels operating outside the EEZ of Taiwan 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 are mandatory to submit the Landing/Transshipment Declaration to the competent authority so that the competent authority could 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-logbook, and the catch and effort data is compiled from e-logbook data. The size data, length and weight of individual catch, of all species is also compiled from the first 30 fish caught for each setting recorded on e-logbook. A port-sampling program conducted in domestic ports aims at collecting the size data of tuna and tuna-like species. The observer program has been collecting size data for all species. These data have already been used in 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. The sizing data of Thai canneries has been collected for estimating 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 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 2020, the total catch of north Pacific albacore made by our fishing fleets was 3,809 MT with 3,307 MT in the north Convention area. There were 25 LTLL vessels directed at north Pacific albacore with 2,079 fishing days in the north Pacific Ocean, and with 1,725 days deployed in the north Convention area. The annual fishing efforts of LTLL vessels directed at North Pacific albacore for 2016-2020 provided was provided through Annual Report Part 2.

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 2016-2020 is shown in Table 7. None of our fishing vessel targets on striped marlin.

3.3 CMM 2015-05 (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 8 provides the information of observer coverage rate estimates for LTLL and STLL of 2020.

3.4 CMM 2009-03

In accordance with CMM 2009-03, the number of the 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 9 and updated to 2020.

3.5 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 10 shows the information of transshipment activities of our fishing fleets in 2020.

3.6 CMM 2010-07

In accordance with CMM 2010-07, 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, in accordance with the WCPF Convention and agreed reporting procedures. The total catches of key shark species by fishery in 2020 shows 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 detailed information on cetaceans and whale shark encircled during operation reported in 2020 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 2020, our observers recorded 16 dead, 38 alive and 8 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 858 (507 dead and 351 alive) for LTLL and 926 (69 dead, 672 alive and 185 unknown) for STLL. The discard information of oceanic whitetip shark of DWPS is related in Table 5.

3.9 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 2020, there were 61 dead, 117 alive and 83 status unknown of released silky shark recorded in our observer data in the WCPFC Convention Area, and the silky shark bycatch estimate of LTLL and STLL fisheries were 3,120 (334 dead and 2,786 alive) and 5,525 (854 dead, 2,703 alive and 1,968 unknown), respectively, which were raised on the catch rate calculated from observer data. Discard of silky shark of DWPS is related in Table 5.

3.10 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.

3.11 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 12-21.

Table 1. The number of active fishing vessel by fishery in the WCPFC Convention Area during 2016-2020.

Year	LTLL	DWPS	STLL
2016	79	34	1,303
2017	82	28	1,079
2018	75	27	843
2019	75	30	723
2020	82	28	710

Table 2. The catch (in MT, round weight) of major tuna and tuna-like species of LTLL fishery in the WCPFC Convention Area during 2016-2020.

Year	N-ALB	S-ALB	BET	YFT	SWO	MLS	BUM	BLM	SKJ	TOTAL
2016	1,697	5,834	4,707	4,230	1,904	260	1,456	5	165	20,258
2017	1,520	6,313	4,440	3,809	2,015	224	915	11	303	19,550
2018	1,326	4,143	4,371	2,213	1,798	164	634	43	91	14,783
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

* Preliminary estimate

Table 3. The catch (in MT, round weight) of major tuna species of DWPS fishery in the WCPFC Convention Area during 2016-2020.

Year	SKJ	YFT	BET	Total
2016	146,204	34,494	4,994	185,692
2017	126,960	35,345	4,934	167,239
2018	160,599	28,427	4,656	193,682
2019	201,731	33,761	3,584	239,076
2020*	123,154	23,533	3,684	150,371

* 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 2016-2020.

Year	ALB	BET	YFT	PBF	SWO	BILL**	TOTAL
2016	7,998	4,781	13,586	454	1,581	4,904	33,304
2017	10,711	5,232	19,147	415	1,778	5,472	42,755
2018	9,989	4,698	13,837	381	1,654	4,813	35,372
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

* 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 2020 (preliminary estimate).

	BSH	FAL	MAK		OCS	PTH	BTH	ALV	SPZ	SPL	SPK	EUB	POR	SHK	RMB	RMV
			SMA	LMA												
LTLL	4370	0	475	3	0	1	20	0	4	1	0	0	0	4	0	0
STLL	13771	0	1150	36	0	150	299	0	92	256	1	1	5	597	0	0
DWPS**	0	112	0	0	2	0	0	0	0	0	0	0	0	1	2	4

* 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 2016-2020.

	LTLL	STLL	DWPS*
2016	10	18	-
2017	18	51	-
2018	11	63	-
2019	14	32	-
2020	14	42	-

* 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 7. The catch of striped marlin of tuna longline fisheries in the area of south of 15°S during 2016-2020.

Year	Catch (MT)
2015	97
2016	116
2017	142
2018	154
2019	207
2020*	306

* Preliminary estimate

Table 8. The estimate of observer coverage rate for Taiwanese longline fisheries in 2020.

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							18,418	2,092	11.36%				
	STLL							84,179	7,333	8.71%				

Table 9. The catch of swordfish and the number of the tuna longline fishing vessels operating in the area of south of 20°S during 2000-2020.

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

* Preliminary estimate

Table 10. The summary of transshipment operations by fishery of 2020: (1) the total quantities, by weight (M.T.); (2) the number of transshipments.
(1)

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	Species								
						BET	ALB	YFT	SKJ	SWO	BUM	MLS	SKX	OTH
offloaded	beyond EEZs	inside	inside	Frozen	Longliner	1,380	4,132	2,214	70	156	443	111	517	969
offloaded	beyond EEZs	inside	both	Frozen	Longliner	2,578	4,344	1,102	25	778	456	140	682	965
offloaded	beyond EEZs	inside	outside	Frozen	Longliner	0	44	0	0	0	0	0	0	0
offloaded	beyond EEZs	outside	inside	Frozen	Longliner	0	0	0	0	0	2	0	5	6
offloaded	beyond EEZs	outside	both	Frozen	Longliner	1,316	132	414	3	400	166	25	304	345
offloaded	inside EEZs	inside	inside	Frozen	Purse seiner	998	0	5,168	30,611	0	0	0	0	0
offloaded	in port	inside	inside	Frozen	Purse seiner	3,864	0	20,718	120,499	0	0	0	0	0
offloaded	in port	inside	inside	Frozen	Longliner	218	254	1,318	5	39	144	0	70	278
offloaded	in port	inside	both	Frozen	Longliner	41	0	11	0	60	1	3	4	3
offloaded	in port	inside	outside	Frozen	Longliner	0	0	0	0	0	0	0	0	0
received	beyond EEZs	inside	inside	Frozen	Longliner	825	1,382	1805	41	73	370	83	382	797
received	beyond EEZs	inside	both	Frozen	Longliner	279	2,140	343	10	139	322	59	260	566
received	beyond EEZs	inside	outside	Frozen	Longliner	0	0	0	0	0	0	0	0	0
received	beyond EEZs	outside	inside	Frozen	Longliner	0	0	0	0	0	2	0	5	6
received	beyond EEZs	outside	both	Frozen	Longliner	3	37	5	3	8	158	3	280	323
received	in port	inside	inside	Frozen	Longliner	218	254	1,318	5	39	144	0	70	278
received	in port	inside	both	Frozen	Longliner	2	3	14	0	0	1	0	4	3
received	in port	inside	outside	Frozen	Longliner	0	0	0	0	0	0	0	0	0

(2)

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	Fishing gear	Number of Transshipments
offloaded	beyond EEZs	inside	inside	Longliner	372
offloaded	beyond EEZs	inside	both	Longliner	236
offloaded	beyond EEZs	inside	outside	Longliner	0
offloaded	beyond EEZs	outside	inside	Longliner	1
offloaded	beyond EEZs	outside	both	Longliner	58
offloaded	inside EEZs	inside	inside	Purse seiner	48
offloaded	in port	inside	inside	Purse seiner	209
offloaded	in port	inside	inside	Longliner	82
offloaded	in port	inside	both	Longliner	2
offloaded	in port	inside	outside	Longliner	0
received	beyond EEZs	inside	inside	Longliner	250
received	beyond EEZs	inside	both	Longliner	118
received	beyond EEZs	inside	outside	Longliner	0
received	beyond EEZs	outside	inside	Longliner	1
received	beyond EEZs	outside	both	Longliner	26
received	in port	inside	inside	Longliner	82
received	in port	inside	both	Longliner	1
received	in port	inside	outside	Longliner	0

Table 11. The summary on cetaceans/whale sharks encircled incidentally in purse seine fishing operation in 2020.

Date	Longitude	Latitude	Species	Number	Reason	Measure for ensure safe release	Status on release
2020-01-02	E159°55'	S06°46'	Aquatic mammals nei	1	not deliberately encircled	stop hauling	Alive
2020-01-07	E174°02'	S02°25'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-01-18	E163°54'	S11°01'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-01-22	E160°12'	N03°56'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-01-23	E175°24'	N01°05'	False killer whale	1	not deliberately encircled	stop operating	Alive
2020-01-25	E153°44'	N01°39'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-01-25	E176°00'	N00°02'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-01-26	E173°59'	S03°40'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-01-27	E164°59'	S09°06'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2020-01-28	E173°39'	S05°11'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-01-28	E174°16'	S04°53'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-01-28	E174°15'	S04°52'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-01-29	E173°39'	S05°14'	Whale shark	2	not deliberately encircled	stop hauling	Alive
2020-01-29	E174°09'	S04°52'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-01-29	E174°12'	S04°48'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-01-30	E173°40'	S04°50'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-01-31	E171°36'	N01°07'	Spinner dolphin	7	not deliberately encircled	stop operating	Alive
2020-01-31	E171°36'	N01°07'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-01-31	E173°48'	S04°48'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-02-09	E178°01'	S03°21'	Bottlenose dolphin	6	not deliberately encircled	stop hauling	4Alive,2Dead
2020-02-17	E171°10'	N00°08'	Dolphins nei	6	not deliberately encircled	stop hauling	3Alive,3Dead
2020-02-18	E117°06'	N00°44'	False killer whale	9	not deliberately encircled	stop operating	Alive
2020-02-20	E178°18'	S01°31'	Rough-toothed dolphin	2	not deliberately encircled	stop operating	1Alive,1Dead
2020-02-21	E156°59'	S02°28'	Whale shark	1	not deliberately encircled	stop operating	Alive

Date	Longitude	Latitude	Species	Number	Reason	Measure for ensure safe release	Status on release
2020-02-23	E167°27'	S08°56'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-02-26	E177°42'	S02°49'	Dolphins nei	2	not deliberately encircled	stop hauling	Dead
2020-02-28	E177°38'	S03°22'	Dolphins nei	2	not deliberately encircled	stop hauling	Alive
2020-03-04	E167°52'	S02°16'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-03-06	E168°19'	S03°04'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-03-07	E173°01'	S02°30'	Fraser's dolphin	4	not deliberately encircled	stop hauling and operating	Alive
2020-03-08	E141°41'	S00°31'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-03-16	E149°37'	N05°07'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2020-03-22	E164°50'	S02°32'	Bottlenose dolphin	4	not deliberately encircled	stop hauling	2Alive,2Dead
2020-03-22	E166°33'	S00°04'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2020-03-24	E173°28'	S04°33'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-03-24	E157°27'	S02°28'	Aquatic mammals nei	1	not deliberately encircled	stop operating	Alive
2020-03-25	E155°40'	S04°09'	Aquatic mammals nei	1	not deliberately encircled	stop operating	Alive
2020-03-28	E164°06'	S01°53'	Dolphins nei	12	not deliberately encircled	stop hauling	7Alive,5Dead
2020-04-01	E142°04'	S00°16'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2020-04-02	E165°53'	N01°18'	Bryde's whale	1	not deliberately encircled	stop operating	Alive
2020-04-06	E164°16'	S00°38'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2020-04-07	E163°57'	S00°30'	Rough-toothed dolphin	11	not deliberately encircled	stop hauling	6Alive,5Dead
2020-04-08	E163°59'	N00°11'	Rough-toothed dolphin	4	not deliberately encircled	stop hauling and operating	Dead
2020-04-09	E164°36'	S00°00'	Bottlenose dolphin	4	not deliberately encircled	stop hauling	3Alive,1Dead
2020-04-12	E157°40'	N00°55'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-04-13	E165°32'	N00°43'	Aquatic mammals nei	1	not deliberately encircled	stop operating	Alive
2020-04-17	E168°54'	N01°58'	Aquatic mammals nei	1	not deliberately encircled	stop operating	Alive
2020-04-18	E168°54'	N01°55'	Aquatic mammals nei	1	not deliberately encircled	stop operating	Alive

Date	Longitude	Latitude	Species	Number	Reason	Measure for ensure safe release	Status on release
2020-04-27	E016°18'	S02°04'	Sei whale	1	not deliberately encircled	stop hauling	Alive
2020-05-05	E154°56'	S00°41'	Rough-toothed dolphin	1	not deliberately encircled	stop hauling	Dead
2020-05-09	E160°48'	S03°17'	Bryde's whale	1	not deliberately encircled	stop hauling and operating	Alive
2020-05-15	E154°53'	N01°52'	Bottlenose dolphin	10	not deliberately encircled	stop operating	Alive
2020-05-16	E155°51'	N02°19'	Dolphins nei	5	not deliberately encircled	stop hauling	Alive
2020-05-16	E157°42'	N01°59'	Dolphins nei	7	not deliberately encircled	stop hauling	4Alive,3Dead
2020-05-25	E153°01'	N01°11'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-05-26	E152°44'	N01°11'	Dolphins nei	8	not deliberately encircled	stop operating	Alive
2020-05-29	E152°43'	N00°12'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-06-03	E154°43'	S00°30'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-06-05	E155°41'	N00°35'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-06-15	E146°10'	N01°20'	Dolphins nei	1	not deliberately encircled	stop hauling	Dead
2020-06-25	E146°34'	N01°31'	Dolphins nei	15	not deliberately encircled	stop hauling	9Alive,6Dead
2020-06-29	E156°44'	N02°33'	Dolphins nei	2	not deliberately encircled	stop hauling	Alive
2020-07-09	E153°02'	S00°12'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-07-11	E152°21'	S00°28'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-07-19	E147°08'	S00°56'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2020-07-23	E146°57'	S00°19'	Whale shark	1	not deliberately encircled	stop operating	Alive
2020-07-31	E153°44'	S02°14'	Aquatic mammals nei	1	not deliberately encircled	stop hauling and operating	Alive
2020-07-31	E153°43'	S02°14'	Aquatic mammals nei	1	not deliberately encircled	stop hauling and operating	Alive
2020-08-13	E153°23'	S00°36'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2020-08-15	E154°05'	S00°09'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2020-08-18	E159°36'	S01°52'	Aquatic mammals nei	1	not deliberately encircled	stop operating	Alive
2020-09-18	E176°58'	S05°41'	Whale shark	1	not deliberately encircled	stop operating	Alive

Date	Longitude	Latitude	Species	Number	Reason	Measure for ensure safe release	Status on release
2020-10-03	E157°50'	S04°21'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2020-10-07	E159°56'	S04°44'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2020-11-19	W156°56'	S05°27'	Aquatic mammals nei	1	not deliberately encircled	stop operating	Alive

Table 12. Effort, observed and estimated seabird captures of longline fishery in the area of south of 30°S during 2016-2020.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2016	23	4,831,867	337,517	7.0%	18	0.053
2017	30	5,619,981	111,998	2.0%	1	0.009
2018	44	6,507,969	232,382	3.6%	0	0.000
2019	41	9,577,026	575,433	6.0%	7	0.012
2020*	58	10,171,657	506,887	5.0%	4	0.008

* Preliminary

Table 13. Effort, observed and estimated seabird captures of longline fishery in the area of 25°S - 30°S during 2016-2020.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2016	37	5,871,799	298,988	5.1%	13	0.043
2017	53	9,608,376	539,831	5.6%	0	0.000
2018	61	11,982,174	610,145	5.1%	5	0.008
2019	45	6,636,576	828,365	12.5%	11	0.013
2020*	99	15,392,455	1,140,587	7.4%	0	0

* Preliminary

Table 14. Effort, observed and estimated seabird captures of longline fishery in the area of north of 23°N during 2016-2020.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2016	470	38,839,250	322,373	0.8%	5	0.016
2017	493	21,305,415	795,342	3.7%	2	0.003
2018	521	26,173,362	1,662,153	6.4%	5	0.003
2019	603	31,792,234	830,129	2.6%	2	0.002
2020*	205	28,842,954	1,239,646	4.3%	42	0.034

* Preliminary

Table 15. Effort, observed and estimated seabird captures of longline fishery in the area of 23°N - 25°S during 2016-2020.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2016	825	171,523,502	2,811,133	1.6%	1	0.000
2017	844	168,219,294	7,603,286	4.5%	2	0.000
2018	809	136,875,068	9,011,089	6.6%	4	0.000
2019	755	133,657,853	7,042,816	5.3%	1	0.000
2020*	488	107,115,471	3,375,189	3.2%	0	0.000

* Preliminary

Table 16. Proportion of mitigation types used by longline fishery in 2016.

	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%	1.2%	10.8%	0.0%
Options required south of 25°S	TL + NS	28.4%	13.2%	0.1%	23.3%
	TL + WB	0.0%	0.0%	0.0%	5.7%
	NS + WB	4.1%	17.4%	7.3%	5.9%
	TL + WB + NS	0.0%	0.0%	0.0%	5.5%
	HS				
Other options 25°S-30°S	WB	4.1%	17.4%	8.6%	6.1%
	TL	30.8%	14.4%	0.1%	24.2%
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%	5.7%
	NS	32.6%	36.4%	73.1%	23.6%
	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 2017.

	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%	2.5%	9.3%	8.2%
Options required south of 25°S	TL + NS	20.9%	20.6%	1.2%	17.6%
	TL + WB	5.5%	0.5%	0.0%	4.3%
	NS + WB	4.7%	0.5%	8.4%	4.3%
	TL + WB + NS	4.7%	0.5%	0.0%	4.3%
	HS				
Other options 25°S-30°S	WB	5.5%	0.5%	10.5%	4.3%
	TL	22.0%	23.5%	1.8%	24.4%
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	15.7%	11.6%	0.3%	7.9%
	NS	21.0%	39.8%	68.5%	24.7%
	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 2018.

	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	10.5%	1.1%	0.0%	0.9%
	NS + WB	0.0%	81.5%	69.6%	29.3%
	TL + WB + NS	83.1%	2.6%	0.0%	57.5%
	HS				
Other options 25°S-30°S	WB	0.0%	14.9%	30.4%	1.5%
	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	6.5%	0.0%	0.0%	10.9%
	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 19. 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	8.0%	7.3%	0.7%	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 20. 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	2.1%	5.6%	0.0%	5.6%
	NS + WB	7.1%	17.9%	83.7%	31.9%
	TL + WB + NS	50.0%	54.1%	0.1%	50.5%
	HS				
Other options 25°S-30°S	WB	2.9%	6.2%	16.1%	3.2%
	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	38.0%	16.3%	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 21. Number of observed seabird captures of tuna longline fishery by species and by area during 2016-2020.

Year	Species	South of 30°S	25°S - 30°S	North of 23°N	23°N - 25°S	Total
2016	Antipodean albatross	3	1	0	0	4
	Black-browed albatross	1	1	0	0	2
	Black-footed albatross	0	0	1	0	1
	Campbell albatross	6	2	0	0	8
	Great frigatebird	0	0	0	1	1
	Grey headed albatross	1	1	0	0	2
	Grey petrel	1	1	0	0	2
	Laysan albatross	0	0	4	0	4
	Light-mantled albatross	1	0	0	0	1
	Wandering albatross	3	0	0	0	3
	Westland petrel	0	1	0	0	1
	White-chinned petrel	2	6	0	0	8
	Total	18	13	5	1	37
2017	Black-footed albatross	0	0	0	2	2
	Campbell albatross	1	0	0	0	1
	Laysan albatross	0	0	2	0	2
	Total	1	0	2	2	5
2018	Laysan albatross	0	0	3	3	6
	Salvin's albatross	0	5	0	0	5
	Black-footed Albatross	0	0	2	1	3
	Total	0	5	5	4	14
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	8	0	8
	Laysan Albatross	0	0	33	0	33
	Northern royal Albatross	1	0	0	0	1
	Other Petrel	0	0	1	0	1
	Wandering Albatross	2	0	0	0	2
	Westland Petrel	1	0	0	0	1
	Total	4	0	42	0	46

* Preliminary

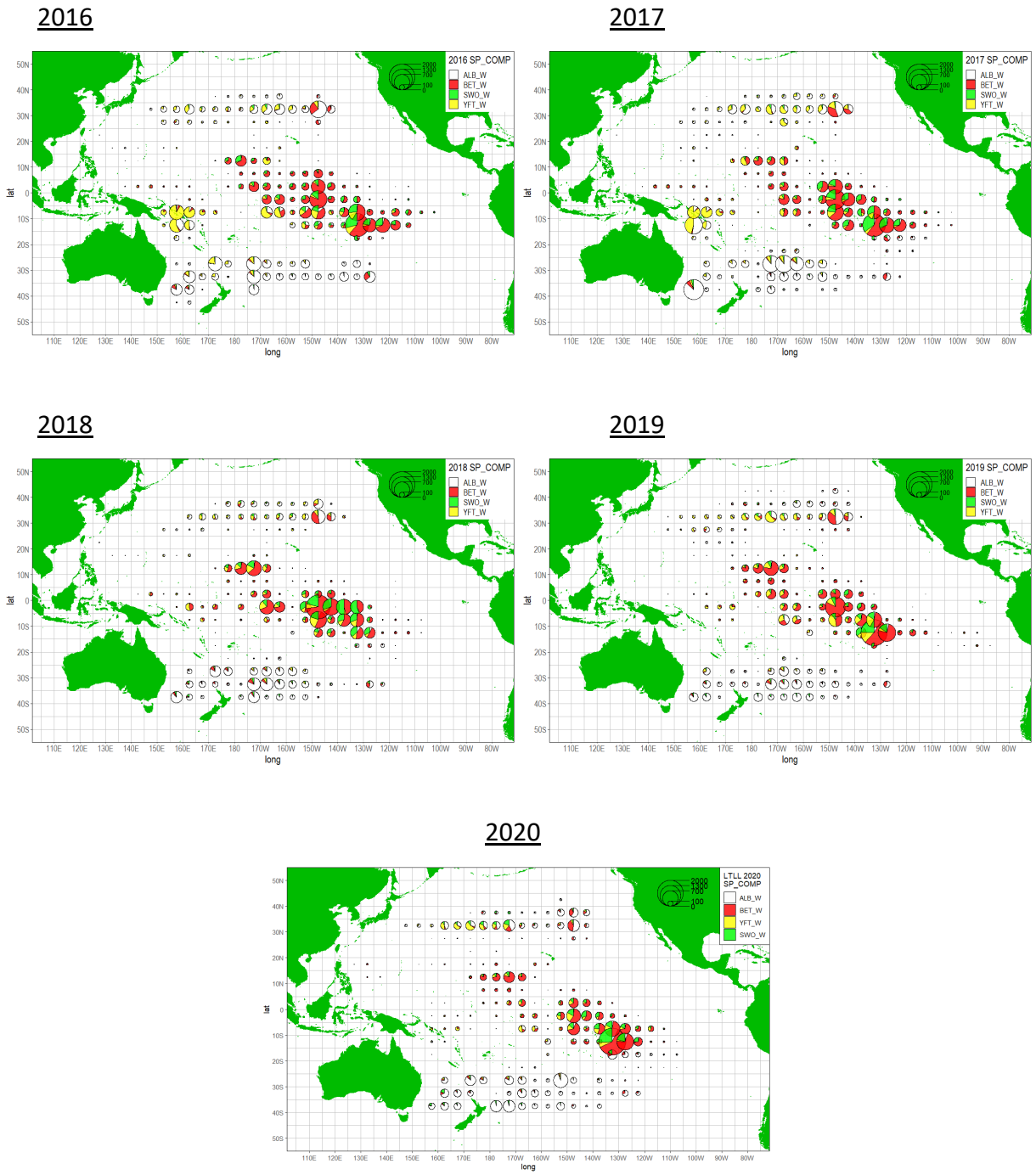


Figure 1. The catch composition distributions of tuna and tuna-like species of LTLL fishery during 2016-2020. The figures of 2019 and 2020 are still in preliminary.

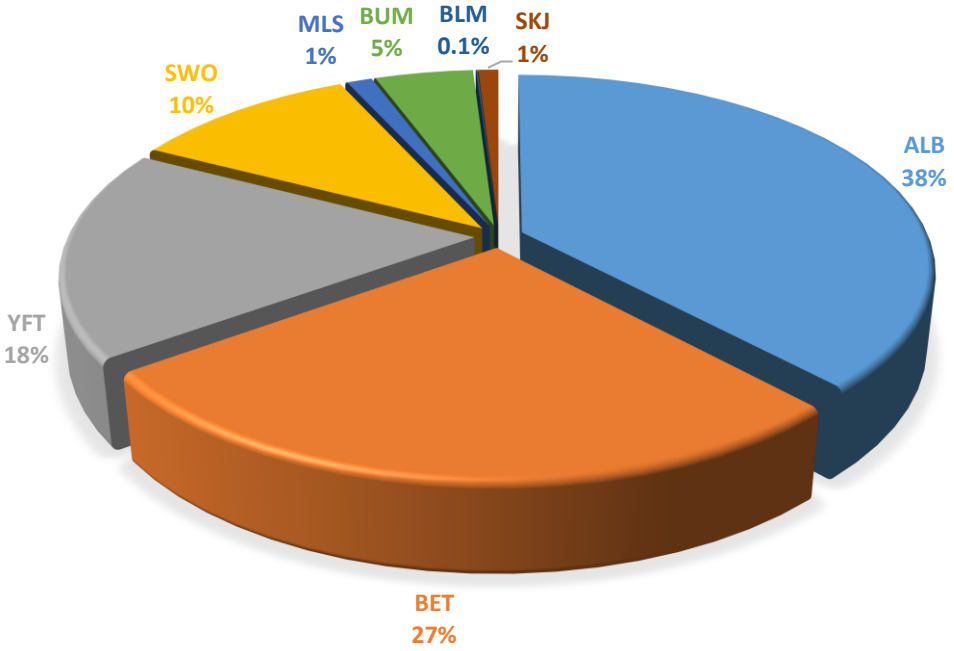


Figure 2. The catch composition of major tuna and tuna-like species for LTLL fishery in the WCPFC Convention area during 2016-2020.

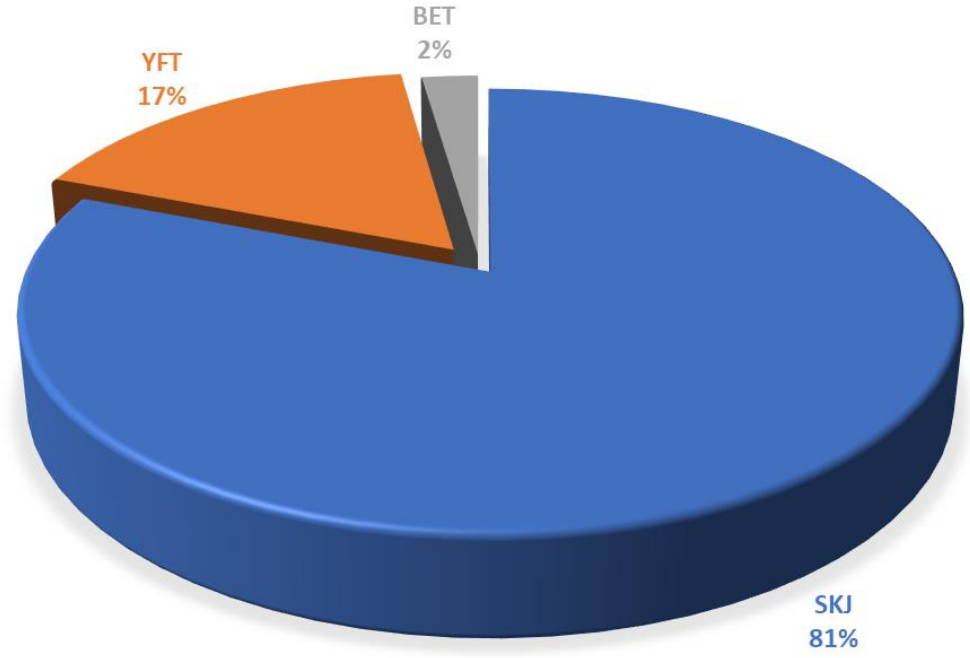


Figure 3. The catch composition of major tuna species for DWPS fishery in the WCPFC Convention area during 2016-2020.

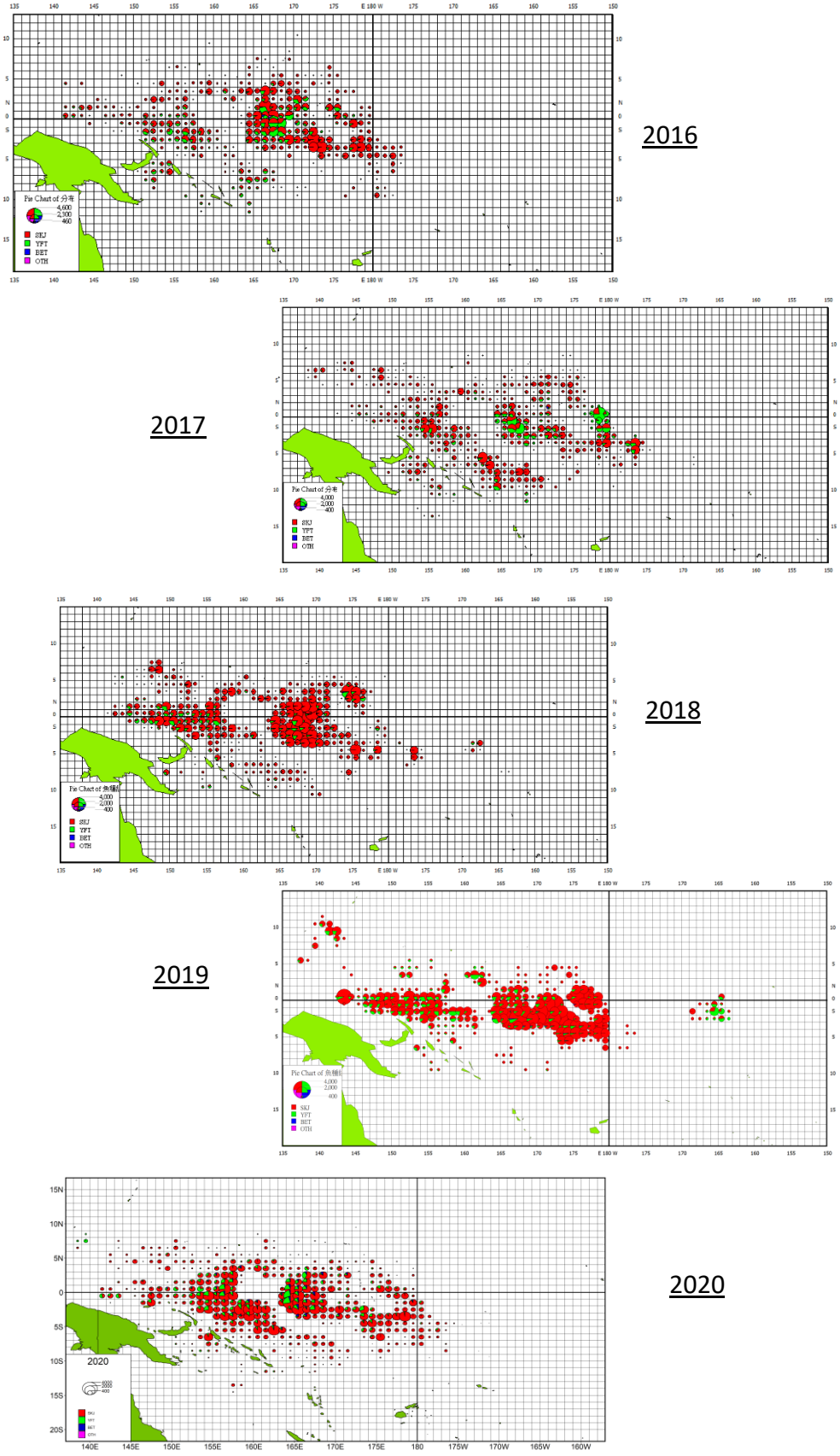
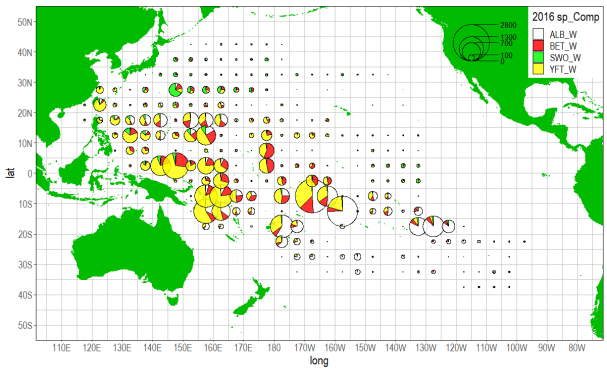
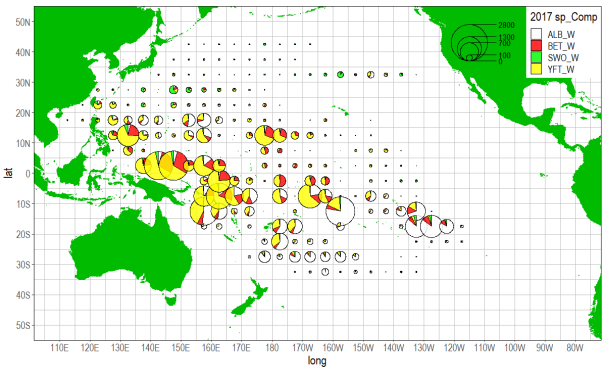


Figure 4. The catch composition distributions of DWPS fleet during 2016-2020.

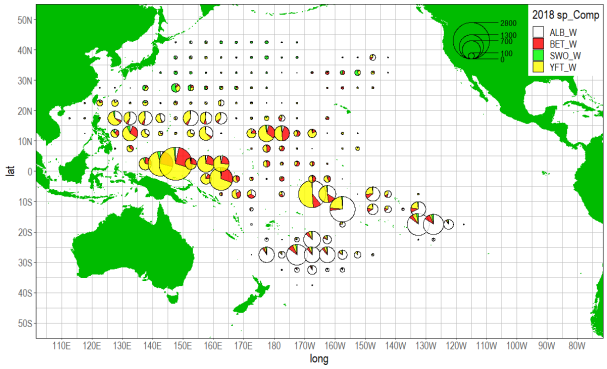
2016



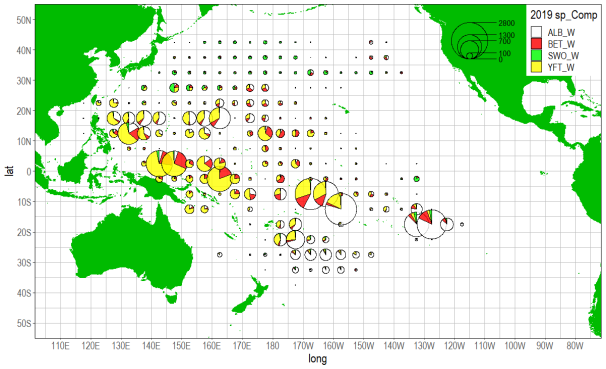
2017



2018



2019



2020

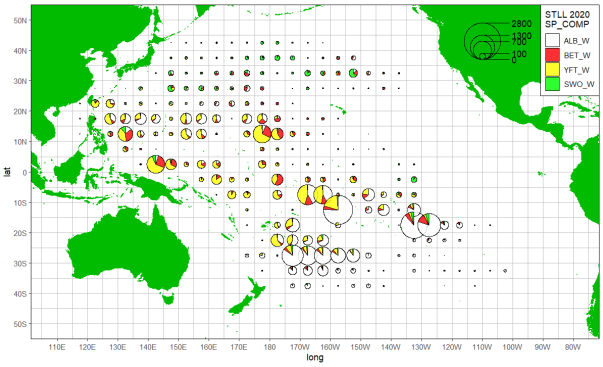
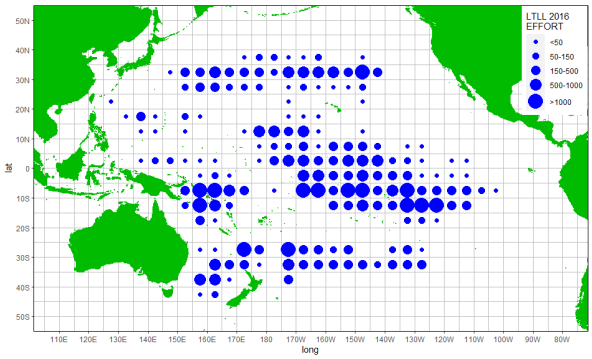
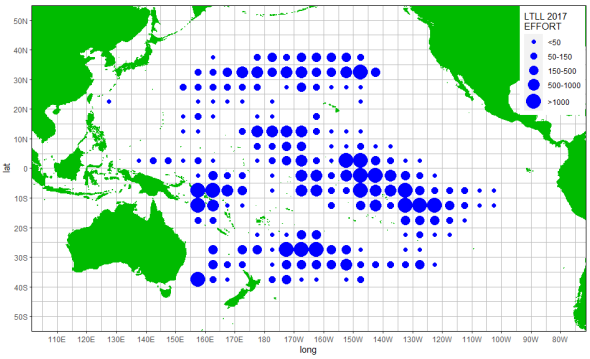


Figure 5. The catch composition distributions of tuna and tuna-like species of STLL fishery during 2016-2020. The figures of 2019 and 2020 are still in preliminary.

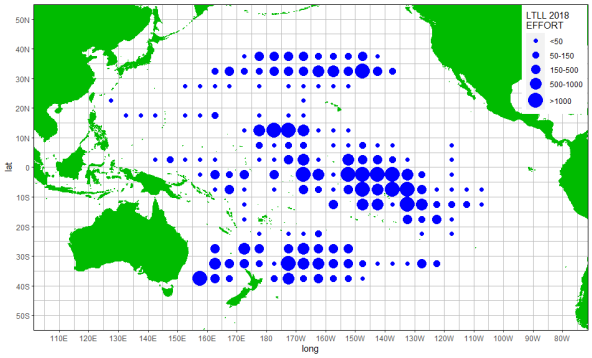
2016



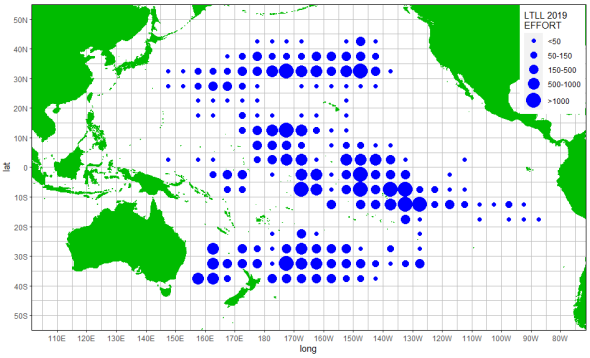
2017



2018



2019



2020

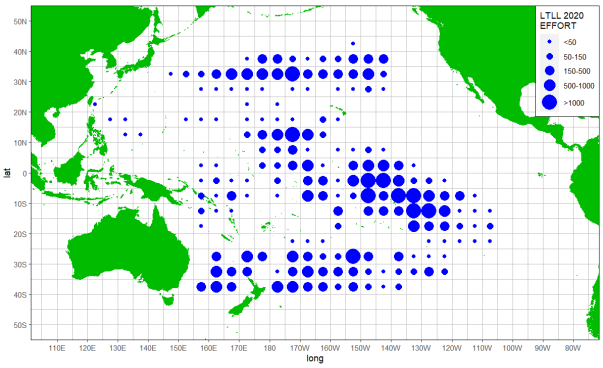


Figure 6. The fishing effort distributions of LTLL fishery during 2016-2020. The figures of 2019 and 2020 are still in preliminary.

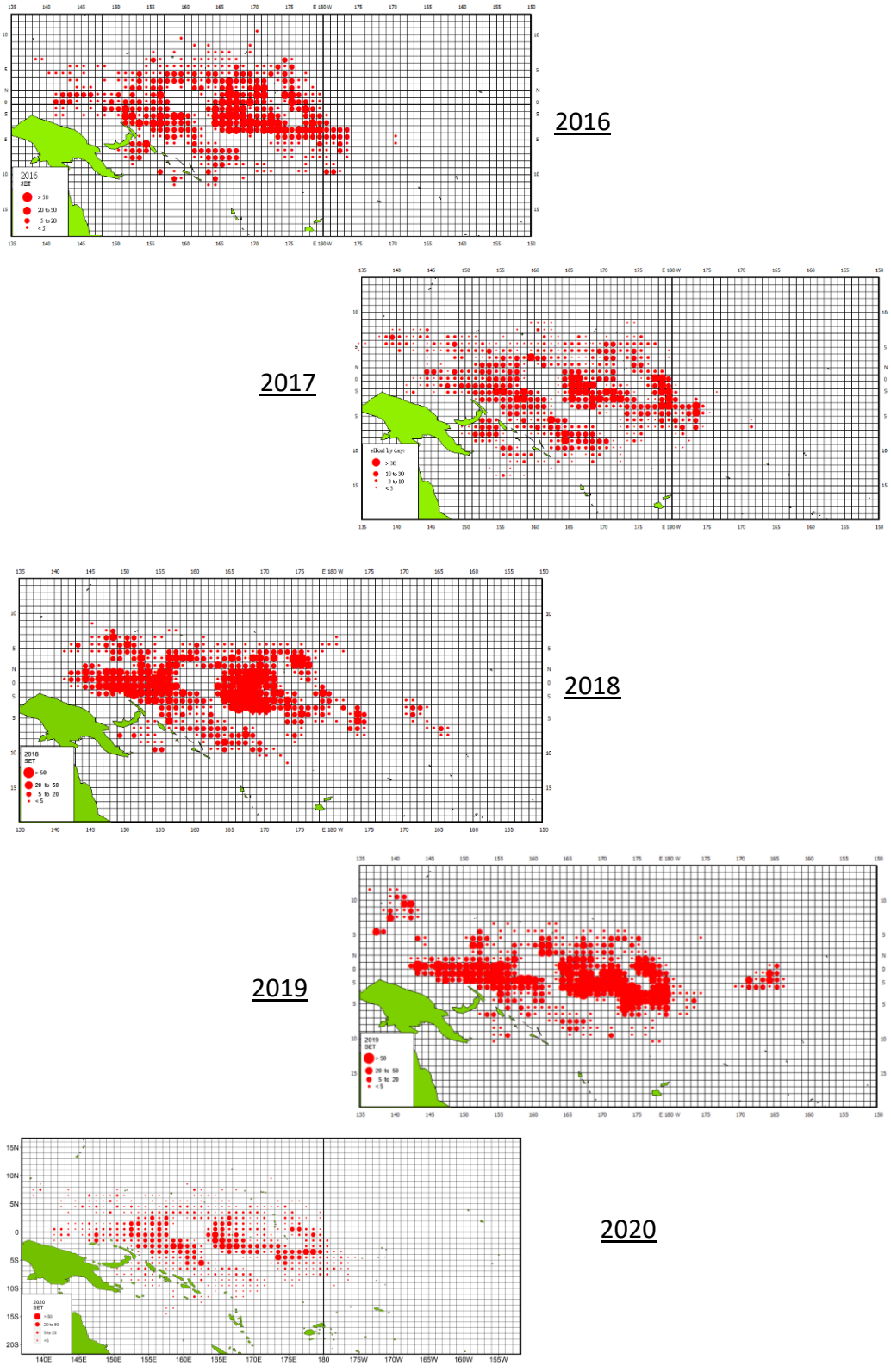
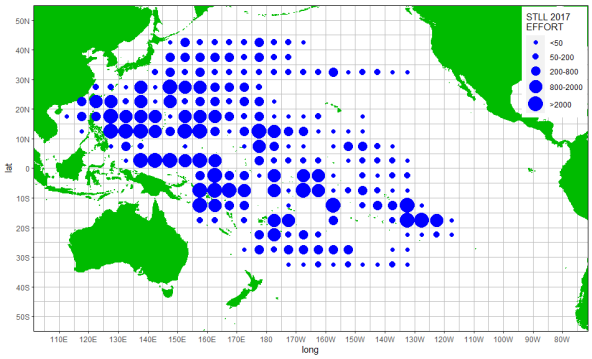
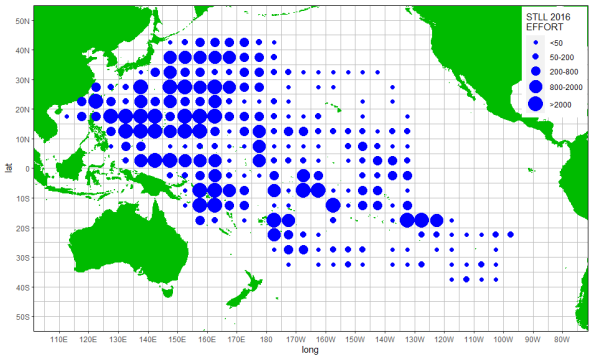


Figure 7. The fishing effort distributions of DWPS fleet during 2016-2020.

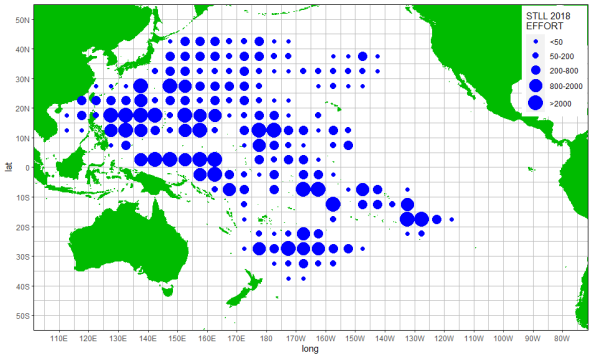
2016



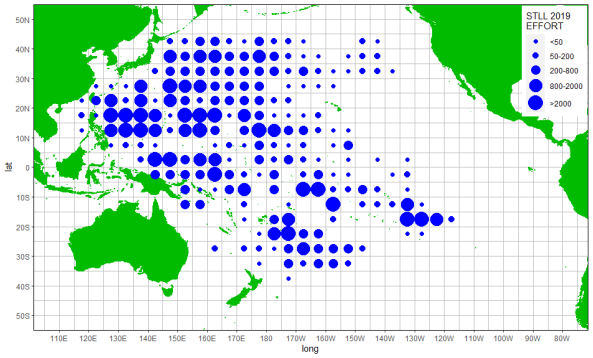
2017



2018



2019



2020

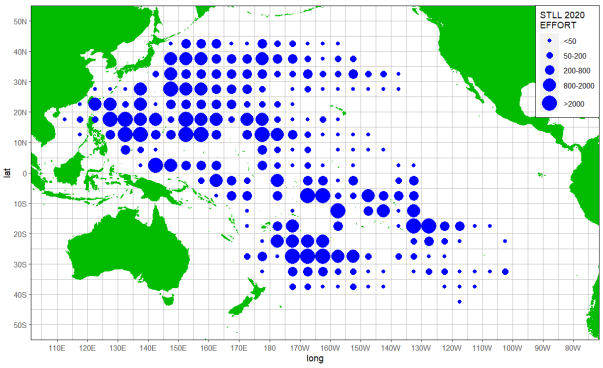


Figure 8. The fishing effort distributions of STLL fishery during 2016-2020. The figures of 2019 and 2020 are still in preliminary.