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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

August*, 2019
This paper is prepared for the 15th meeting of the WCPFC Scientific Committee held in Pohnpei, Federated States of Micronesia, from 12 to 20 August, 2019.

*Version issued on August 28 only update the 2018 transshipment information contained in Table 10.

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 2019	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 2018, the total catches of main tuna and tuna-like species for these three fleets were 14,783 MT for LTLL, 193,682 MT for DWPS and 35,372 MT for STLL, respectively. In 2018, 74 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 (2014-2018) 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 or in the EEZs of coastal countries under access agreements. The numbers of active LTLL fishing vessels were in a range between 73 and 82 in the last 5 years. The lowest number of active LTLL fishing vessels was 73 in 2014, due to a temporarily cease of operation out of financial loss. The number of active LTLL fishing vessels are 75 in 2018.

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 27 active purse seiners operating in the WCPFC Convention Area in 2018.

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 2018 there were 843 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 (2014-2018)

in the WCPFC Convention Area is shown in Table 2. The distribution of species composition of LTLL in recent 5 years (2014-2018) 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 (36%), followed by bigeye tuna (28%) and yellowfin tuna (17%).

1.2.2 DWPS

The catch of primary species in the WCPFC Convention Area during 2014-2018 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 accounts for 15% and 2% of the total catch respectively (Figure 3). Composition ratio of primary species in recent 5 years (2014-2018) is shown in Figure 4.

1.2.3 STLL

The total catch of primary species caught by STLL fleet in 2018 was 35,372 MT with yellowfin tuna accounting 39% of the total catch. Other major catches were albacore (28%), billfish (14%) and bigeye tuna (13%). The total catch of primary species of STLL from 2014 to 2018 in WCPFC Convention Area is shown in Table 4. Composition ratio of species during 2016-2018 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 (2014-2018) 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 62.3% sets were deployed on free school in 2018. The distribution of fishing effort in recent 5 years (2014-2018) is shown in Figure 7. In the years where El Niño phenomena occur (e.g., 2015), 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 3 years (2016-2018) 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 2018 is shown in Table 5.

In 2017, our observers had recorded 49 seaturtles (2 Leatherback turtles, 33 Olive ridley turtles, 4 Loggerhead turtles and 10 Green turtles), 5 seabirds (2 Laysan albatross, 2 Black-footed albatross and 1 Campbell albatross) and 1 cetacean (Bottlenose dolphin) hooked with 3,072 seabirds and 254 cetaceans sighted. In 2018, our observers had recorded 120 seaturtles (3 Leatherback turtles, 96 Olive ridley turtles, 1 Kemp's ridley turtle, 3 Loggerhead turtles, 12 Green turtles and 5 unidentified turtles), 11 seabirds (6 Laysan albatross and 5 Salvin's albatross) and 1 cetacean (Toothed whales nei) hooked with 2 seaturtles, 13,305 seabirds and 44 cetaceans sighted. Because some observation trips of 2018 extended to 2019, the observer data of 2018 is still in preliminary for data not been retrieved complete. 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 2014-2018is shown in Table 6. In accordance with the government’s policy in establishing an observers program and supporting the increase of observers, in 2012 the observer program was extended to the STLL fleets. Totally the number of observers deployed on longline vessels in 2018 was 74, including 11 observers for LTLL vessels and 63 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 recent years as follows：

- Studies on Major Tuna and Tuna-like Resources in the Pacific Ocean.
- Stock status and NDF assessment of sharks in the Pacific Ocean.
- South Pacific albacore tuna and Pacific billfishes CPUE standardizations and advices of their harvest strategies and management strategy evaluations.
- Study on abundance index of WCPO skipjack and development of HS/MS elements for tropical tunas.
- Study on abundance index of Pacific bluefin tuna and development of HS/MS elements.
- Study on the North Pacific albacore resource and the progress of

Management Strategy Evaluation.

- The feasibility analysis on purse seine fishing condition of skipjack tuna in the western and central Pacific Ocean.

The scientific papers presented at recent Pacific Ocean RFMOs meetings during 2018 to 2019 were as follows:

- Catch and length data of swordfish (*Xiphias gladius*) for the WCNPO and EPO areas from the Taiwanese fisheries. (ISC/18/BILLWG-01/04)
- Standardized catch-rates of swordfish (*Xiphias gladius*) for the Taiwanese distant-water tuna longline fishery in the North Pacific Ocean for 1964-2016. (ISC/18/BILLWG-01/06)
- Standardized PBF CPUE Series and size frequency for Taiwanese longline fishery up to 2017 calendar year. (ISC/18/PBFWG-1/02)
- Estimation of initial equilibrium catch for North Pacific shortfin mako. (ISC/18/SHARKWG-2/01)
- A base case model in Stock Synthesis 3.30 for the 2018 North Pacific swordfish (*Xiphias gladius*) stock assessment.(ISC/18/BILLWG-02/02)
- Development and characterization of polymorphic microsatellite loci for the scalloped hammerhead shark (*Sphyrna lewini*) using shotgun sequencing.(ISC/18/SHARKWG-3/04)
- Catch and size data of striped marlin (*Kajikia audax*) by the Taiwanese fisheries in the western and central North Pacific Ocean during 1958-2017.(ISC/19/BILLWG-1/03)
- Catch rate standardization of striped marlin in the Western and Central North Pacific Ocean by the Taiwanese tuna longline fisheries during 1995-2017. (ISC/19/BILLWG-1/08)
- CPUE standardizations of Taiwanese PBF fisheries with/without geostatistical consideration.(ISC/19/PBFWG-1/02)

The scientific papers published on scientific journal during 2018 to 2019 were as follows:

- Chang, H. Y., Sun, C. L., Yeh, S. Z., Chang, Y. J., Su, N. J., & DiNardo, G. (2018). Reproductive biology of female striped marlin Kajikia audax in the western Pacific Ocean. Journal of fish biology, 92(1), 105-130.
- Chang, H. Y., Sun, C. L., Yeh, S. Z., Chang, Y. J., Su, N. J., & DiNardo, G. (2018). Reproductive biology of female striped marlin Kajikia audax in the western Pacific Ocean. Journal of fish biology, 92(1), 105-130.
- Chang, Y.J., Hsu, J., Shiao, J.C., & Chang, S.K. (2019) Evaluation of the effects of otolith sampling strategies and ageing error on estimation of the age composition and growth curve for Pacific bluefin tuna Thunnus orientalis. Marine and Freshwater Research.
- Joung, S. J., Lyu, G. T., Hsu, H. H., Liu, K. M., & Wang, S. B. (2018). Age and growth estimates of the blue shark Prionace glauca in the central South Pacific Ocean. Marine and Freshwater Research, 69(9), 1346-1354.
- Tsai, W. P., Chang, Y. J., & Liu, K. M. Development and testing of a Bayesian population model for the bigeye thresher shark, Alopias superciliosus, in an area subset of the western North Pacific. Fisheries Management and Ecology.

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 2005-03

In accordance with CMM 2005-03, all CCMs shall report annually to the WCPFC Commission all catches of albacore north of the equator and all fishing effort north of the equator in fisheries directed at albacore. In 2018, the total catch of north Pacific albacore made by our fishing fleet was 4,513 MT with 3,936 MT in the north Convention area, and 25 LTLL vessels directed at albacore in the North Pacific Ocean with 2,943 fishing days; 2,403 days was deployed in the north Convention area.

3.2 CMM 2006-04

In accordance with CMM 2006-04, CCMs shall report annually to the Commission the catch levels of their fishing vessels that have taken striped marlin as a bycatch as well as the number and catch levels of vessels fishing for striped marlin in the Convention Area south of 15°S. The bycatch of striped marlin in the Convention area south of 15°s during the period 2014-2018 is shown in Table 7. None of our fishing vessel targets on striped marlin.

3.3 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 2018.

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.

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 2018.

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 catch of key shark species by fishery in 2018 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 the cetaceans and whale shark encircled during operation reported in 2018 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 2018, our observers recorded 26 dead, 105 alive and 19 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 304 (214 dead, 64 alive and 26 unknown) for LTLL and 2,016 (237 dead, 1,512 alive and 267 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 2018, there were 331 dead, 822 alive and 554 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 1,053 (749 dead, 128 alive and 176 unknown) and 24,574 (4,387 dead, 12,094 alive and 8,093 unknown) respectively in 2018, 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 will be reported to the Secretariat before the end of this year.

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 2014-2018.

Year	LTLL	DWPS	STLL
2014	73	34	1,275
2015	76	34	1,306
2016	79	34	1,303
2017	82	28	1,079
2018	75	27	843

Table 2. The catch (in MT, round weight) of major tuna and tuna-like species of LTLL fishery in the WCPFC Convention Area during 2014-2018.

Year	N-ALB	S-ALB	BET	YFT	SWO	MLS	BUM	BLM	SKJ	TOTAL
2014	1,730	3,757	6,005	2,057	1,621	275	1063	5	120	16,633
2015	2,251	3,275	5,331	2,848	1,781	243	1,670	8	162	17,569
2016	1,697	5,834	4,707	4,230	1,904	260	1,456	5	165	20,258
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

* Preliminary estimate

Table 3. The catch (in MT, round weight) of major tuna species of DWPS fishery in the WCPFC Convention Area during 2014-2018.

Year	SKJ	YFT	BET	Total
2014	213,154	20,548	3,418	237,120
2015	160,597	28,593	5,059	194,249
2016	146,204	34,494	4,994	185,693
2017	126,960	35,345	4,934	167,239
2018*	160,599	28,427	4,656	193,682

* 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 2014-2018.

Year	ALB	BET	YFT	PBF	SWO	BILL
2014	5,264	4,013	10,200	483	2,214	6,625
2015	5,673	4,103	11,270	552	2,574	5,739
2016	7,998	4,781	13,586	454	1,581	4,904
2017	10,711	5,232	19,147	415	1,778	5,472
2018*	9,989	4,698	13,837	381	1,654	4,813

* 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 2018 (preliminary estimate).

	BSH	FAL	MAK		OCS	PTH	BTH	ALV	SPZ	SPL	SPK	EUB	POR	SHK	RMB	RMV
			SMA	LMA												
LTLL	4350	0	481	15	0	6	74	0	19	0	0	0	0	3	0	0
STLL	9703	0	634		0	176	347	9	96	194	0	0	0	2787	0	0
DWPS**	0	224	0	1	3	0	0	0	0	0	0	0	0	63	3	12

* 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 2014-2018.

	LTLL	STLL	DWPS
2014	13	11	-*
2015	12	20	-*
2016	10	18	-*
2017	18	51	-*
2018	11	63	-*

* 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 2014-2018.

Year	Catch (MT)
2014	38
2015	97
2016	116
2017	142
2018*	154

* Preliminary estimate

Table 8. The estimate of observer coverage rate for Taiwanese longline fisheries in 2018.

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							20,820	1,793	8.6%				
	STLL							108,883	8,950	8.2%				

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 2000-2018.

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

* Preliminary estimate

Table 10. The summary of transshipment operations by fishery of 2018: (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	3,228	3,722	4,045	9	371	649	49	397	1,353
offloaded	beyond EEZs	inside	inside*	Frozen	Longliner	2,014	2,007	690	0	604	298	34	374	519
offloaded	beyond EEZs	inside	outside*	Frozen	Longliner	1,063	1,263	278	0	348	126	15	178	253
offloaded	beyond EEZs	inside	outside	Frozen	Longliner	71	105	15	0	29	0	0	0	0
offloaded	beyond EEZs	outside	inside	Frozen	Longliner	26	29	5	0	6	0	0	0	0
offloaded	beyond EEZs	outside	inside*	Frozen	Longliner	643	60	93	0	372	67	13	108	175
offloaded	beyond EEZs	outside	outside*	Frozen	Longliner	717	57	85	0	306	36	16	33	127
offloaded	beyond EEZs	outside	outside	Frozen	Longliner	42	1	4	0	7	0	1	0	0
offloaded	in port	inside	inside	Frozen	Purse seiner	2,179	1	18,363	172,274	0	0	0	0	0
offloaded	in port	inside	inside	Frozen	Longliner	460	196	1,818	1	74	337	3	88	450
offloaded	in port	inside	inside*	Frozen	Longliner	0	0	1	0	5	4	0	1	6
offloaded	in port	inside	outside*	Frozen	Longliner	0	2	0	0	20	3	0	2	13
received	beyond EEZs	inside	inside	Frozen	Longliner	793	690	2,527	0	72	450	17	174	885
received	beyond EEZs	inside	inside*	Frozen	Longliner	59	179	125	0	56	149	5	146	233
received	beyond EEZs	inside	outside*	Frozen	Longliner	27	77	43	0	31	60	2	58	105
received	beyond EEZs	outside	inside*	Frozen	Longliner	8	28	7	0	27	58	3	96	132
received	beyond EEZs	outside	outside*	Frozen	Longliner	7	16	5	0	8	27	1	26	55
received	in port	inside	inside	Frozen	Longliner	302	167	1,229	1	59	299	1	76	412
received	in port	inside	inside*	Frozen	Longliner	0	0	1	0	4	4	0	1	5

received	in port	inside	outside*	Frozen	Longliner	0	0	0	0	2	2	0	1	3

* Catches from both inside and outside of the convention area involved in one transshipment event will be separated into two rows in this table.

(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	532
offloaded	beyond EEZs	inside	both	Longliner	205
offloaded	beyond EEZs	inside	outside	Longliner	4
offloaded	beyond EEZs	outside	inside	Longliner	2
offloaded	beyond EEZs	outside	both	Longliner	56
offloaded	beyond EEZs	outside	outside	Longliner	1
offloaded	in port	inside	inside	Purse seiner	313
offloaded	in port	inside	inside	Longliner	183
offloaded	in port	inside	both	Longliner	4
received	beyond EEZs	inside	inside	Longliner	295
received	beyond EEZs	inside	both	Longliner	49
received	beyond EEZs	inside	both	Longliner	16
received	in port	inside	inside	Longliner	142
received	in port	inside	both	Longliner	2

Table 11. The summary on cetaceans/whale sharks encircled incidentally in purse seine fishing operation in 2018.

Date	Longitude	Latitude	Species	Number	Reason	Measure for ensure safe release	Status on release
2018/1/8	E148°15'	N07°12'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2018/1/12	E141°39'	N04°55'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2018/1/15	E148°17'	N00°19'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/1/18	E148°03'	S00°12'	Whale shark	2	not deliberately encircled	stop operating	Alive
2018/1/21	E149°35'	S00°10'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/1/23	E151°30'	S01°26'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/1/23	E149°19'	S00°15'	Sei whale	2	not deliberately encircled	stop operating	Alive
2018/2/16	E145°21'	N02°16'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/2/16	E145°18'	N02°16'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/2/19	E142°50'	N04°10'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/2/26	E154°04'	S01°06'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2018/3/9	E162°44'	S07°02'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2018/3/9	E149°58'	S07°45'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/3/13	E168°06'	N00°07'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/3/16	E167°20'	N00°14'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/3/21	E167°46'	N00°33'	Dolphins nei	4	not deliberately encircled	stop operating	Alive
2018/3/22	E168°27'	S00°34'	Pygmy killer whale	9	not deliberately encircled	stop operating	Alive
2018/3/24	E169°13'	N00°32'	Pygmy killer whale	1	not deliberately encircled	stop hauling	Alive
2018/4/1	E150°09'	S01°11'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/4/5	E169°02'	S02°33'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2018/4/9	E169°19'	S02°10'	False killer whale	3	not deliberately encircled	stop operating	Alive
2018/4/23	E147°27'	N01°30'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/4/26	E168°46'	N01°43'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/4/29	E153°43'	S00°44'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/5/4	E167°50'	N01°01'	Whale shark	1	not deliberately encircled	stop operating	Alive

2018/5/9	E155°05'	S02°06'	Dolphins nei	4	not deliberately encircled	stop operating	Alive
2018/5/21	E168°18'	S00°36'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/5/27	E157°25'	N03°02'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2018/5/31	E156°04'	N03°37'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/5/31	E156°01'	N03°39'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/6/3	E165°10'	S00°54'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/6/4	E165°30'	S02°11'	False killer whale	4	not deliberately encircled	stop operating	Alive
2018/6/14	E155°59'	N01°06'	Short-finned pilot whale	1	not deliberately encircled	stop operating	Alive
2018/6/18	E156°10'	N01°28'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/6/21	E154°35'	N00°17'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/6/30	E154°57'	S00°18'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2018/7/6	E144°55'	N01°17'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/7/27	E164°42'	N05°00'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/8/7	W167°17'	S03°25'	Aquatic mammals nei	1	not deliberately encircled	stop operating	Alive
2018/8/28	E166°58'	S03°05'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/8/31	E169°12'	N01°40'	Bryde's whale	1	not deliberately encircled	stop operating	Alive
2018/8/31	E169°10'	N01°41'	Aquatic mammals nei	1	not deliberately encircled	stop hauling	Alive
2018/8/31	E169°12'	N01°38'	Aquatic mammals nei	1	not deliberately encircled	stop hauling	Alive
2018/9/12	E171°05'	N02°40'	False killer whale	1	not deliberately encircled	stop hauling	Alive
2018/10/3	E169°22'	S02°06'	Risso's dolphin	7	not deliberately encircled	stop operating	Alive
2018/10/13	E156°39'	N01°12'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2018/10/17	E149°08'	N00°44'	Whale shark	1	not deliberately encircled	stop hauling	Alive
2018/10/18	E144°02'	S00°34'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/10/27	E152°52'	S00°54'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2018/11/3	E153°28'	N00°30'	False killer whale	4	not deliberately encircled	stop operating	Alive
2018/12/3	E145°04'	N02°02'	Whale shark	1	not deliberately encircled	stop operating	Alive
2018/12/6	N175°49'	E01°37'	Dolphins nei	6	not deliberately encircled	stop operating	Alive
2018/12/6	N175°49'	E01°37'	Dolphins nei	9	not deliberately encircled	stop operating	Dead

2018/12/9	E146°52'	N00°25'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2018/12/15	E154°27'	S08°39'	Whale shark	1	not deliberately encircled	stop hauling and operating	Alive
2018/12/16	E179°28'	S01°39'	Spotted dolphins nei	15	not deliberately encircled	stop operating	Dead
2018/12/26	E156°06'	N00°23'	False killer whale	2	not deliberately encircled	stop operating	Alive
2018/12/28	E174°21'	S03°34'	Long-beaked common dolphin	12	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 2014-2018.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2014	22	5,054,026	353,543	7.0%	3	0.008
2015	27	3,965,911	419,452	10.6%	4	0.010
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	214,070	3.3%	0	0.000

* Preliminary

Table 13. Effort, observed and estimated seabird captures of longline fishery in the area of 25°S - 30°S during 2014-2018.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2014	34	4,117,317	626,211	15.2%	0	0.000
2015	33	4,700,071	81,008	1.7%	0	0.000
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	370,794	3.1%	5	0.013

* Preliminary

Table 14. Effort, observed and estimated seabird captures of longline fishery in the area of north of 23°N during 2014-2018.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2014	442	37,985,919	343,550	0.9%	16	0.047
2015	470	35,582,655	208,703	0.6%	0	0.000
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	1,429,663	5.5%	3	0.002

* Preliminary

Table 15. Effort, observed and estimated seabird captures of longline fishery in the area of 23°N - 25°S during 2014-2018.

Year	Fishing effort				Observed seabird hooked	
	Number of vessels	Number of hooks	Observed hooks	% hooks observed	Number	Rate
2014	442	37,985,919	343,550	0.9%	16	0.047
2015	470	35,582,655	208,703	0.6%	0	0.000
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	1,429,663	5.5%	3	0.002

* Preliminary

Table 16. Proportion of mitigation types used by longline fishery in 2014.

	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%	0.2%	8.9%	0.0%
Options required south of 25°S	TL + NS	18.5%	17.7%	0.2%	15.0%
	TL + WB	7.9%	7.9%	0.2%	10.4%
	NS + WB	6.0%	7.3%	24.4%	7.4%
	TL + WB + NS	6.0%	7.3%	0.2%	7.4%
	HS				
Other options 25°S-30°S	WB	7.9%	7.9%	27.1%	10.4%
	TL	21.0%	18.6%	0.2%	19.3%
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	14.1%	13.4%	0.0%	14.3%
	NS	18.5%	19.7%	38.9%	15.7%
	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 17. Proportion of mitigation types used by longline fishery in 2015.

	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%	5.9%	3.3%
Options required south of 25°S	TL + NS	18.9%	14.4%	0.0%	23.7%
	TL + WB	8.2%	6.2%	0.0%	0.9%
	NS + WB	8.2%	6.2%	11.0%	0.9%
	TL + WB + NS	8.2%	6.2%	0.0%	0.9%
	HS				
Other options 25°S-30°S	WB	8.2%	6.2%	12.7%	0.9%
	TL	18.9%	15.5%	0.0%	26.6%
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	10.7%	9.3%	0.0%	16.2%
	NS	18.9%	36.1%	70.4%	26.6%
	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 18. 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	32.5%	36.3%	73.2%	23.7%
	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 19. 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	20.9%	39.9%	68.4%	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 20. 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%	6.3%	16.2%	7.1%
Options required south of 25°S	TL + NS	32.6%	4.7%	0.0%	20.7%
	TL + WB	0.0%	0.0%	0.0%	0.0%
	NS + WB	0.0%	0.0%	0.0%	0.0%
	TL + WB + NS	0.0%	0.0%	0.0%	0.0%
	HS				
Other options 25°S-30°S	WB	0.0%	0.0%	0.1%	0.0%
	TL	34.8%	5.3%	0.0%	35.3%
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%	6.8%
	NS	32.6%	83.7%	83.7%	30.0%
	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 2014-2018.

Year	Species	South of 30°S	25°S - 30°S	North of 23°N	23°N - 25°S	Total
2014	Albatrosses nei	0	0	11	0	11
	Black-footed albatross	0	0	1	0	1
	Laysan albatross	0	0	4	0	4
	White-chinned petrel	3	0	0	0	3
	Total	3	0	16	0	19
2015	Buller's albatross	1	0	0	0	1
	Christmas island frigatebrid	0	0	0	1	1
	Shy albatross	2	0	0	0	2
	Sooty shearwater	0	0	0	1	1
	Wandering albatross	1	0	0	0	1
	Total	4	0	0	2	6
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
	Total	0	5	3	3	11

* Preliminary

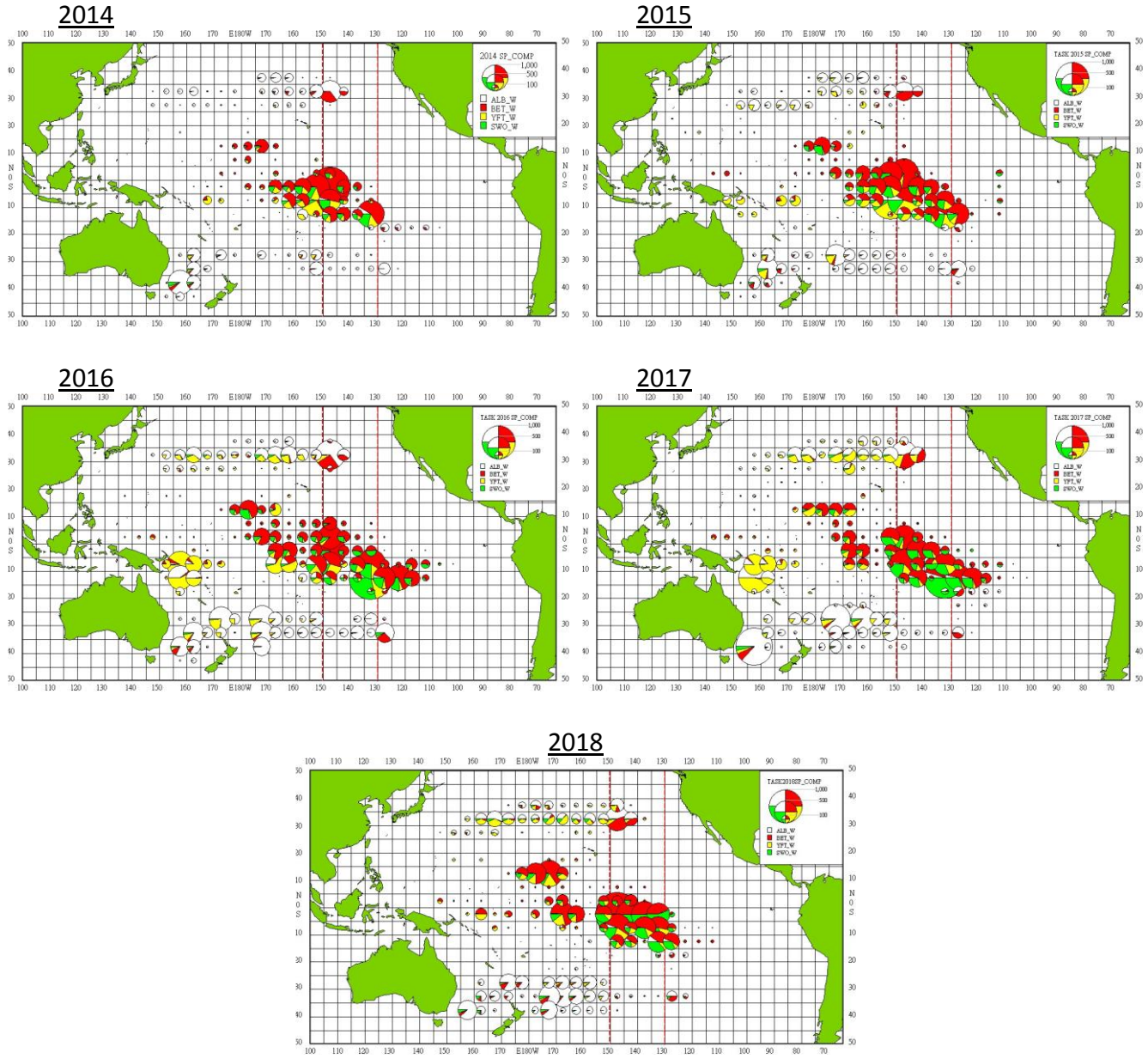


Figure 1. The catch composition distributions of tuna and tuna-like species of LTLL fishery during 2014-2018. Figures of 2017 and 2018 are still in preliminary.

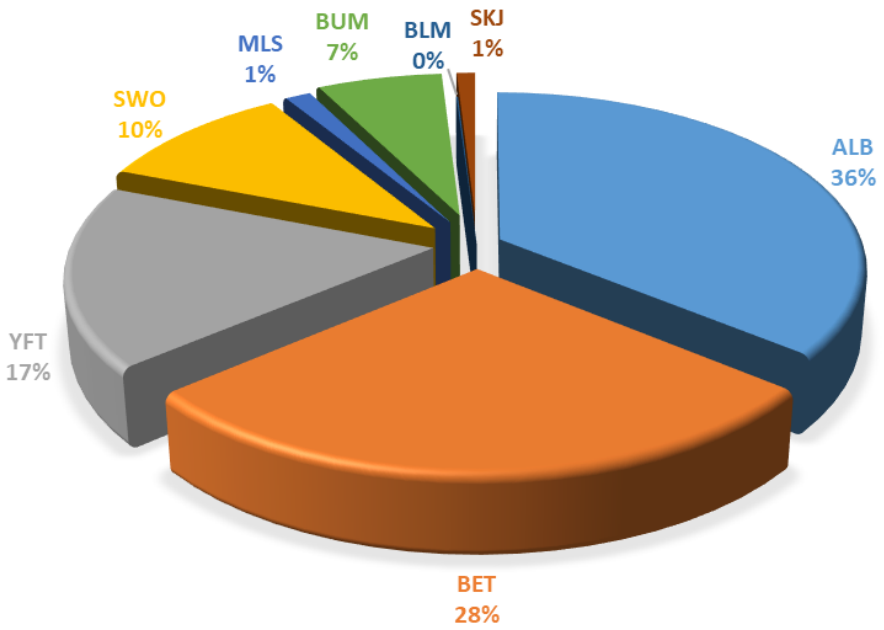


Figure 2. The catch composition of major tuna and tuna-like species for LTLL fishery in the WCPFC Convention area during 2014-2018.

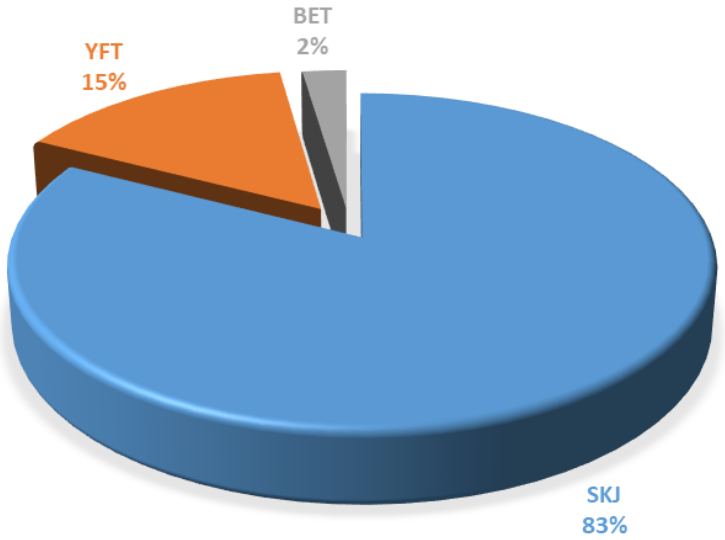


Figure 3. The catch composition of major tuna species for DWPS fishery in the WCPFC Convention area during 2014-2018.

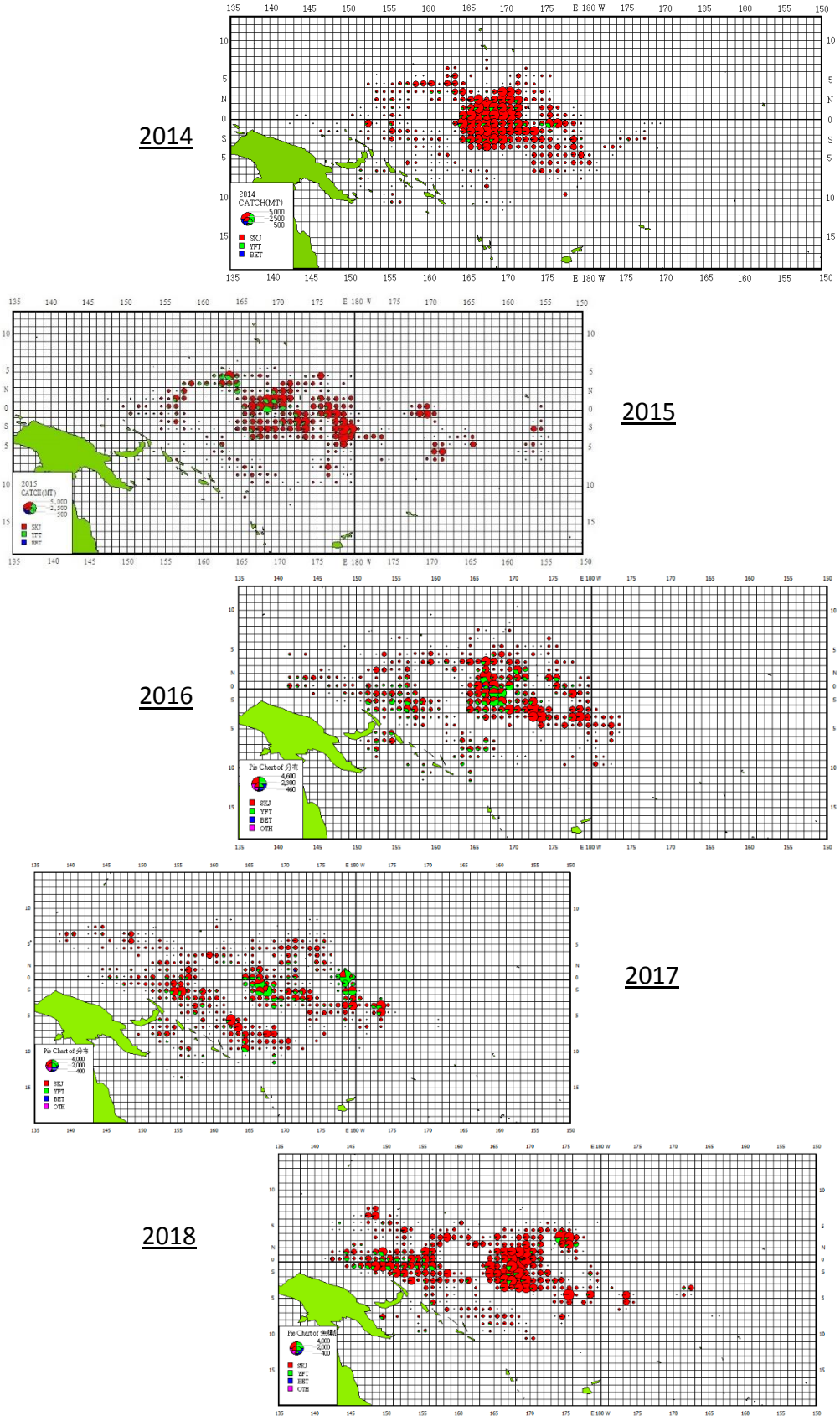
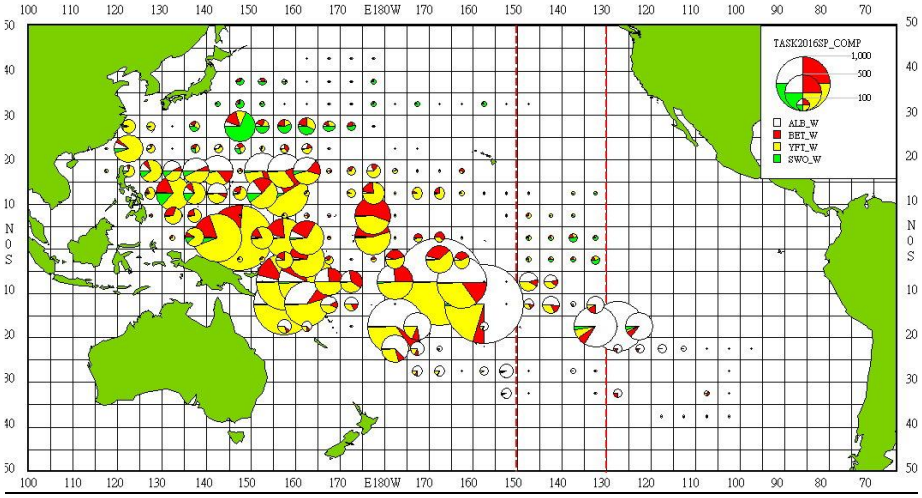
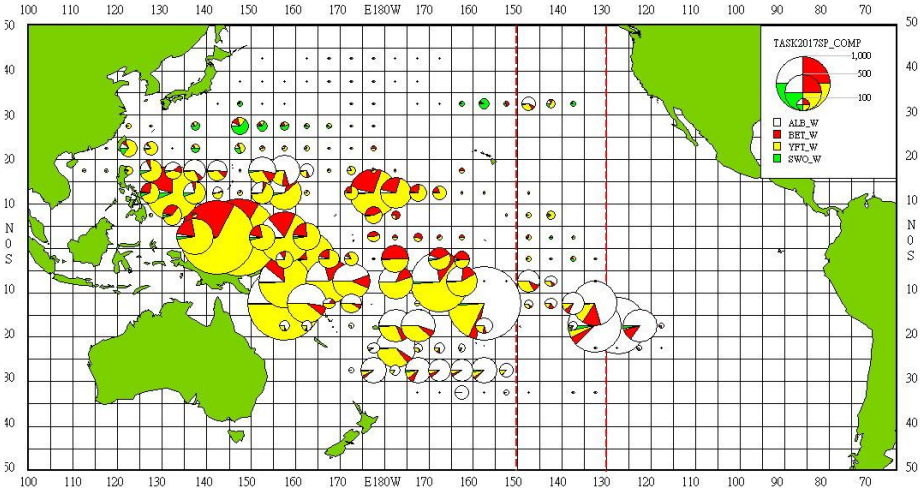


Figure 4. The catch composition distributions of DWPS fleet during 2014-2018.

2016



2017



2018

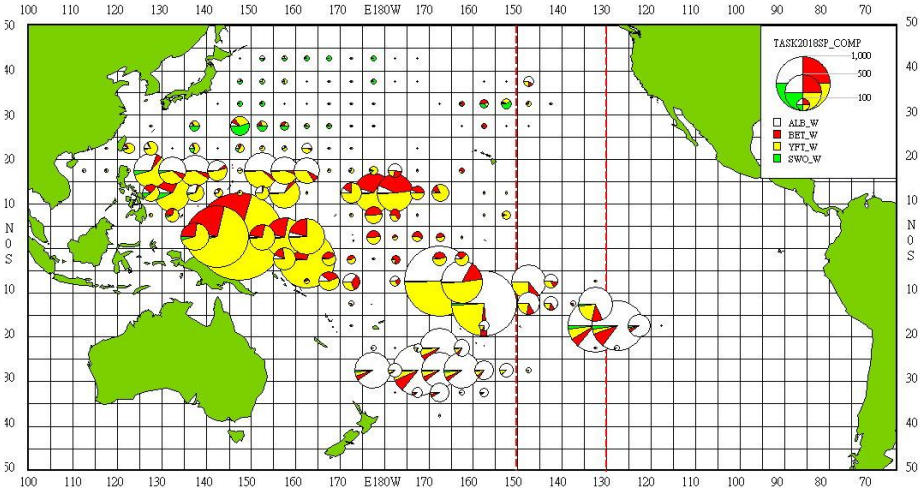
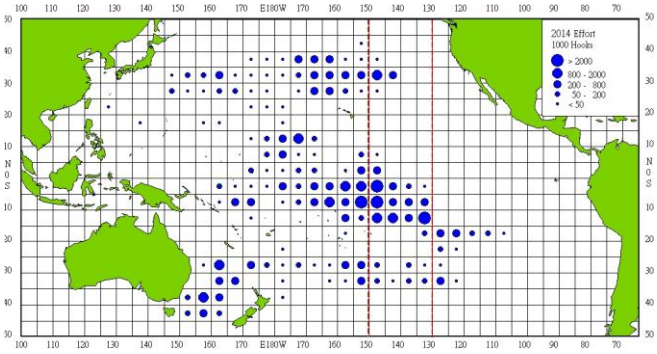
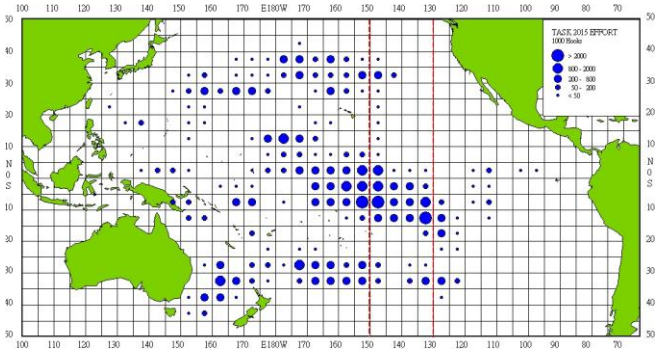


Figure 5. The catch composition distributions of tuna and tuna-like species of STLL fishery during 2016-2018. The figures of 2017 and 2018 are still in preliminary.

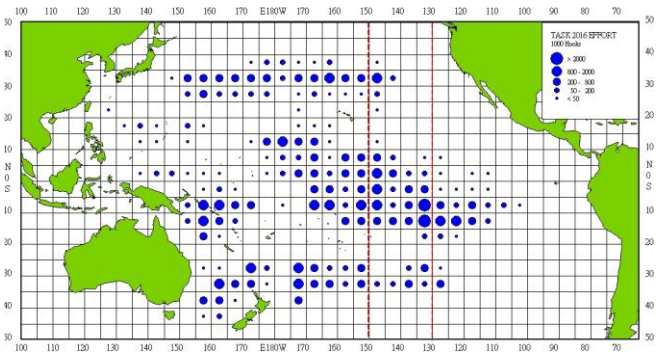
2014



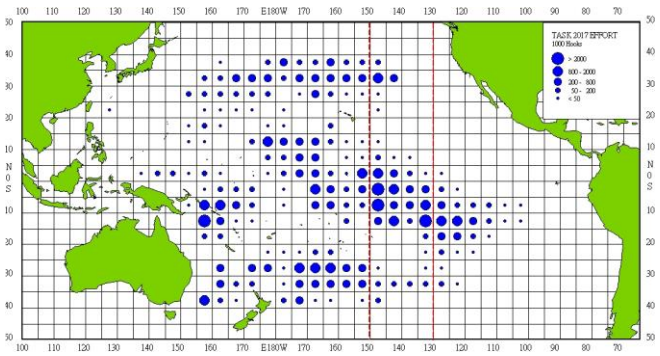
2015



2016



2017



2018

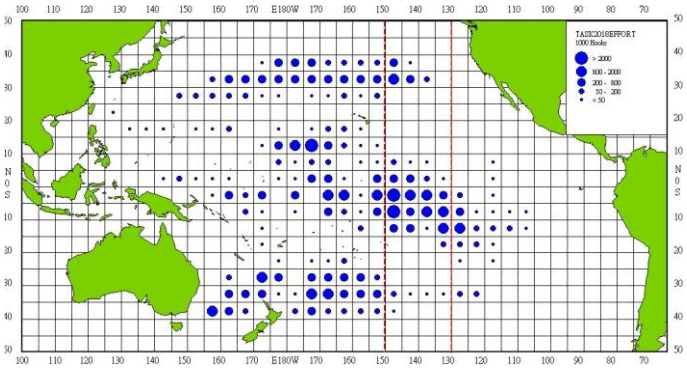


Figure 6. The fishing effort distributions of LTLL fishery during 2014-2018. The figures of 2017 and 2018 are still in preliminary.

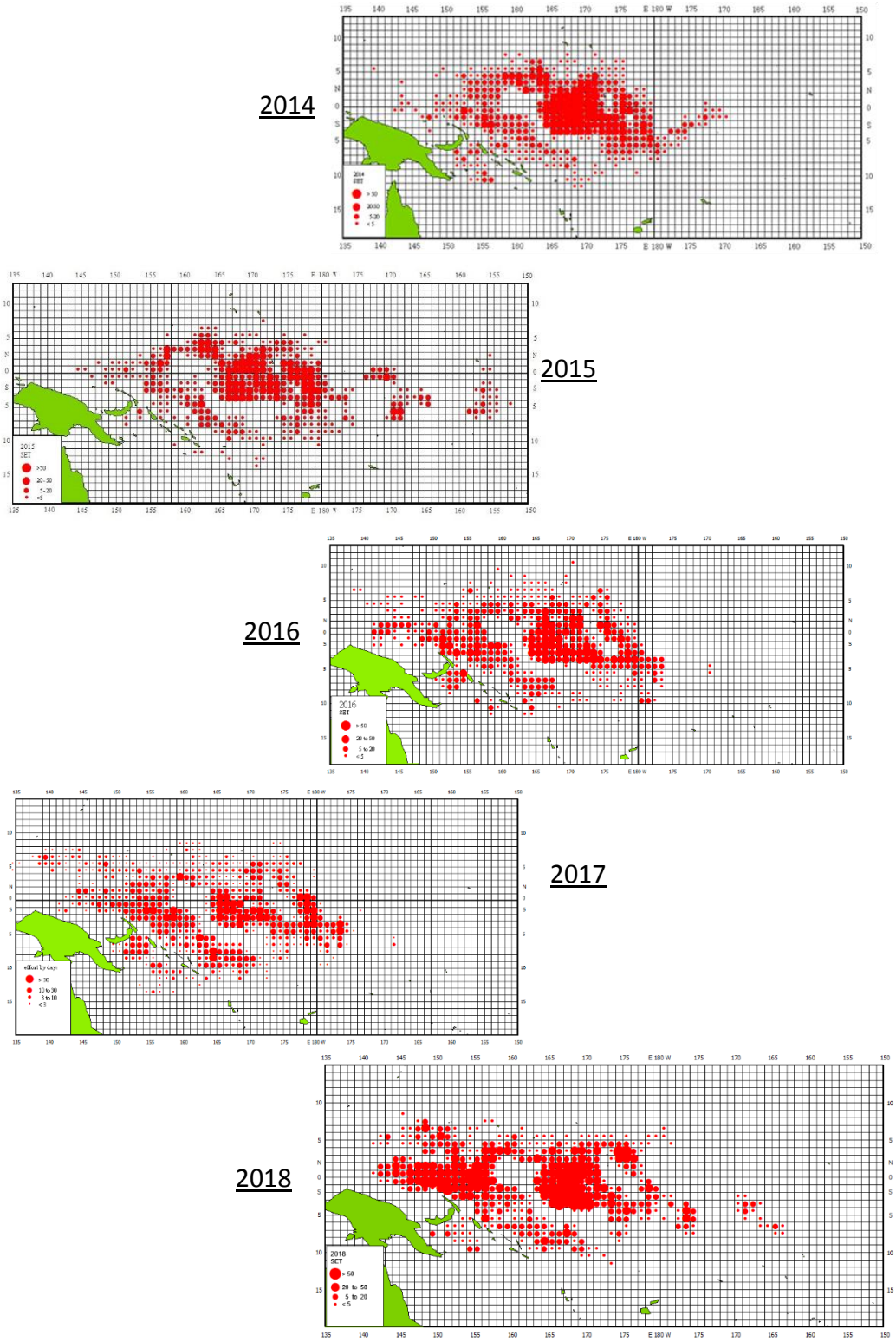
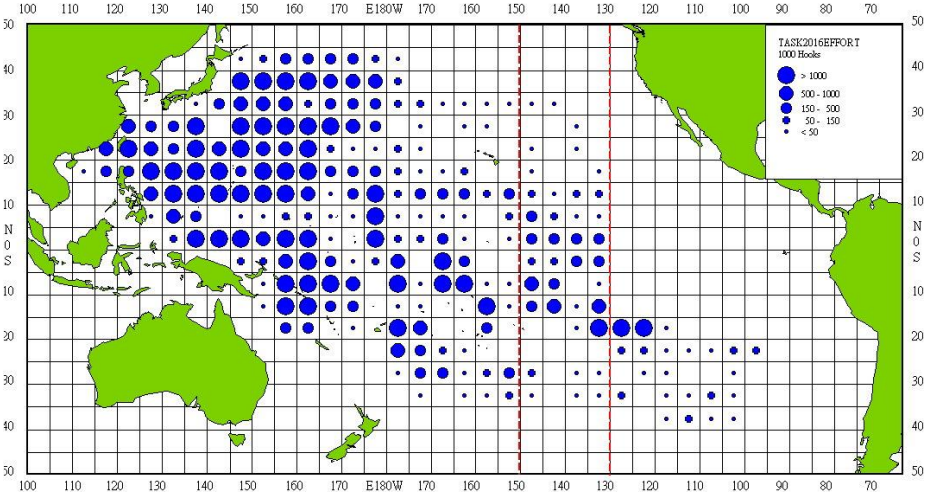
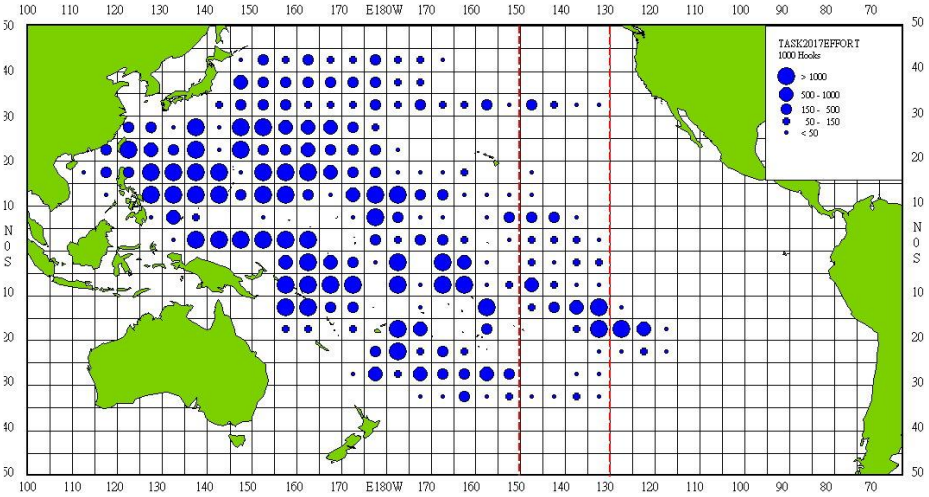


Figure 7. The fishing effort distributions of DWPS fleet during 2014-2018.

2016



2017



2018

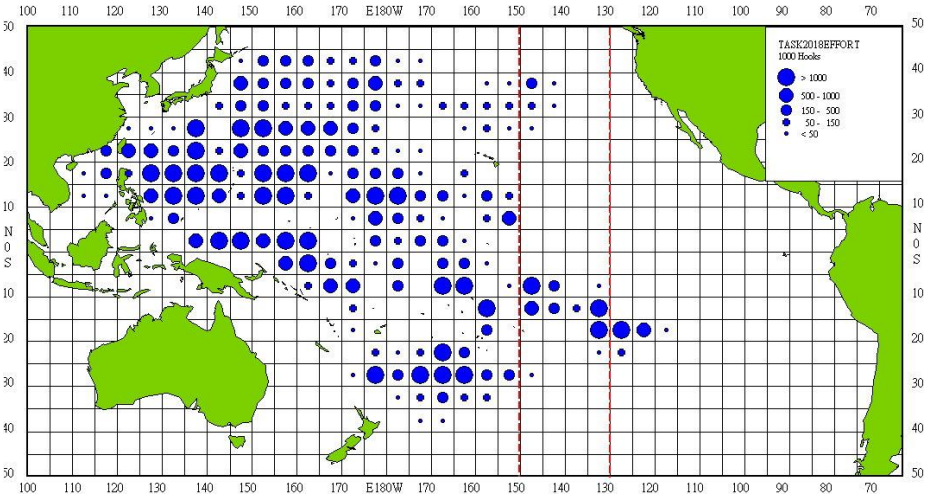


Figure 8. The fishing effort distributions of STLL fishery during 2016-2018. The figures of 2017 and 2018 are still in preliminary.