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

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REPUBLIC OF KOREA

2020 ANNUAL REPORT TO THE COMMISSON

Part 1. INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

Republic of Korea

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Scientific data was provided to the Commission in accordance with the decision relating to the provision of scientific data to the Commission by 30 April 2020	**YES**

1. SUMMARY

Korea has two types of fishing gears, purse seine and longline, that engage in fishing for tuna and tuna-like species in the WCPFC Convention Area. These fisheries are managed by the Distant Water Fisheries Development Act of Korea. Total catch in the WCPFC convention area by the Korean fisheries in 2019 was 347,508 mt, which accounted for 16% and 19% greater than that of average for recent 5 years (2015-2019) and 2018, respectively. The catch of purse seine fishery with 26 vessels active was 314,572 mt in 2019, which was 14% and 18% greater than that of average for recent 5 years (2015-2019) and 2018. The catch of longline fishery with 97 vessels active in 2019 was 32,936 mt, which was 29% and 33% greater than that of average for recent 5 years (2015-2019) and 2018. In purse seine fishery, skipjack and yellowfin catches in 2019 were 20% and 9% greater, and bigeye catch was 36% less than those of 2018, respectively. In longline fishery, yellowfin and albacore catches in 2019 were 112% and 55% greater than those of 2018, respectively. Purse seine fishing efforts ranged from 5,790 to 7,525 sets during 5 recent years (2015-2019), which showed the highest in 2019 and the lowest in 2016. Longline fishing efforts ranged from 47,157 to 60,445 thousand hooks during 5 recent years (2015-2019), which showed the highest in 2019 and the lowest in 2015. The logsheet coverages in 2019 were 100% for both purse seine and longline, and the observer coverage in 2019 was 100% for purse seine and 7.1% for longline.

2. Tabular Annual Fisheries Information

Table 1(a). Annual catch and effort estimates for the Korean purse seine fishery by primary species in the WCPFC Convention Area, 2015-2019

Year	No. of sets	Catch (mt)				
		Total	SKJ	BET	YFT	OTH
2015	6,113	268,277	231,695	1,857	34,695	30
2016	5,790	278,514	233,014	4,401	41,040	59
2017	6,796	246,849	192,922	3,235	50,675	18
2018	6,866	267,558	233,729	4,339	29,480	9
2019	7,527	314,572	279,553	2,767	32,249	3

* Data for 2019 are preliminary.

Table 1(b). Annual catch and effort estimates for the Korean longline fishery by primary species in the WCPFC Convention Area, 2015-2019

Year	No. of hooks ($\times 10^3$)	Catch (mt)										
		Total	ALB	YFT	BET	BFT	SKJ	BLM	BUM	MLS	SWO	OTH
2015	47,157	24,437	1,042	9,352	10,689	0	104	137	1,782	50	724	557
2016	55,238	24,201	1,481	8,054	11,018	0	166	100	2,235	89	697	363
2017	48,294	21,639	1,294	7,008	10,220	0	186	14	1,880	62	570	406
2018	58,201	24,788	1,225	6,519	13,828	0	202	39	1,740	67	791	377
2019	60,445	32,936	1,902	13,847	13,711	0	390	53	2,007	58	602	365

* Data for 2019 are preliminary.

Table 1(c). Average annual fishing effort for 2002-2004 and annual fishing effort for subsequent years for the Korean longline fishery directed at North Pacific albacore in the North Pacific Ocean

Area	Fishery	2002-04 Average		2014		2015		2016	
		No. of vessel	Vessel days	No .of vessel	Vessel days	No .of vessel	Vessel days	No. of vessel	Vessel days
Convention area	Longline	*	1,072	*	1,184	*	852	*	943
Area	Fishery	2017		2018		2019			
		No. of vessel	Vessel days	No. of vessel	Vessel days	No. of vessel	Vessel days		
Convention area	Longline	*	1,999	*	1,347	*	1,209		

* Korea does not have any vessels targeting directly North Pacific albacore in the North Pacific Ocean.

Table 1(d). Annual catch and effort of southwest striped marlin by the Korean longline fishery in the south of 15°S, 2015-2019

Year	Catch (mt)	Effort (number of fishing vessels)
2015	0	0
2016	0	0
2017	0	0
2018	0	0
2019	0	0

* Korea does not have any vessels fishing for southwest striped marlin, and any southwest striped marlin catch is bycatch.

Table 1(e). Annual catch of swordfish by the Korean longline fishery in the south of 20°S, 2015-2019

Year	CMM-flagged vessels south of 20°S		Chartered vessels		Other vessels fishing within the CCM's waters south of 20°S		
	Catch (mt)	Vessel numbers	Catch (mt)	Vessel numbers	Flag	Catch (mt)	Vessel numbers
2015	<1	2	0	0	0	0	0
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0

* Korea does not have any vessels fishing for swordfish in the Convention Area south of 20°S, and any swordfish catch is bycatch.

Table 1(f). Annual catch and effort of south Pacific albacore by the Korean longline fishery in the south of 20°S, 2015-2019

Year	Catch (mt)	Effort (number of fishing vessels)
2015	<1	2
2016	0	0
2017	0	0
2018	0	0
2019	0	0

* Korea does not have any vessels fishing for south Pacific albacore in the Convention Area south of 20°S, and any south Pacific albacore catch is bycatch.

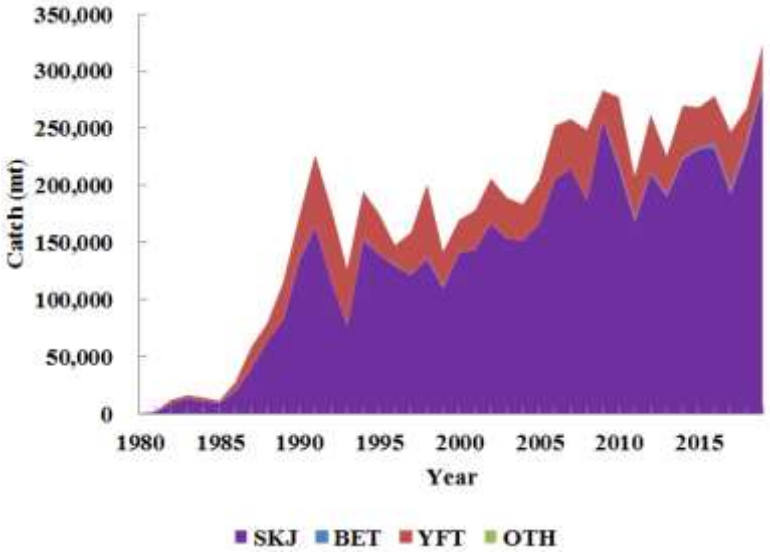

Fig. 1(a). Historical annual catch for the Korean purse seine fishery by primary species in the WCPFC Convention Area during 1980-2019.

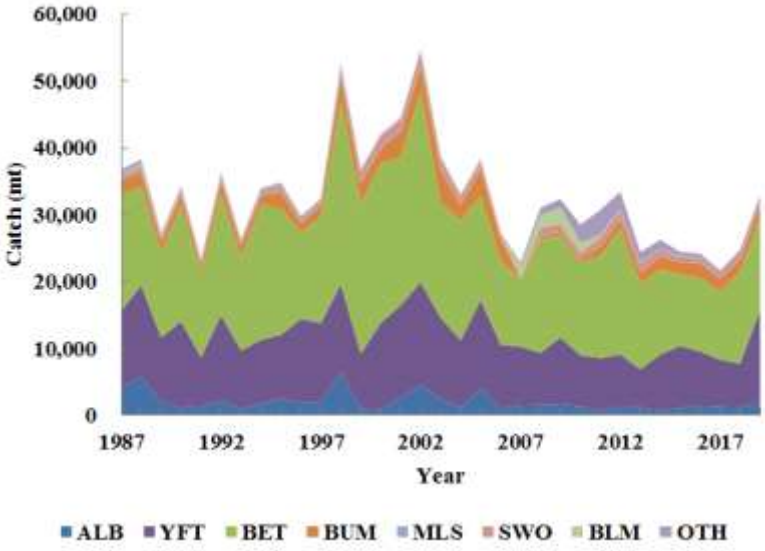

Fig. 1(b). Historical annual catch for the Korean longline fishery by primary species in the WCPFC Convention Area during 1987-2019.

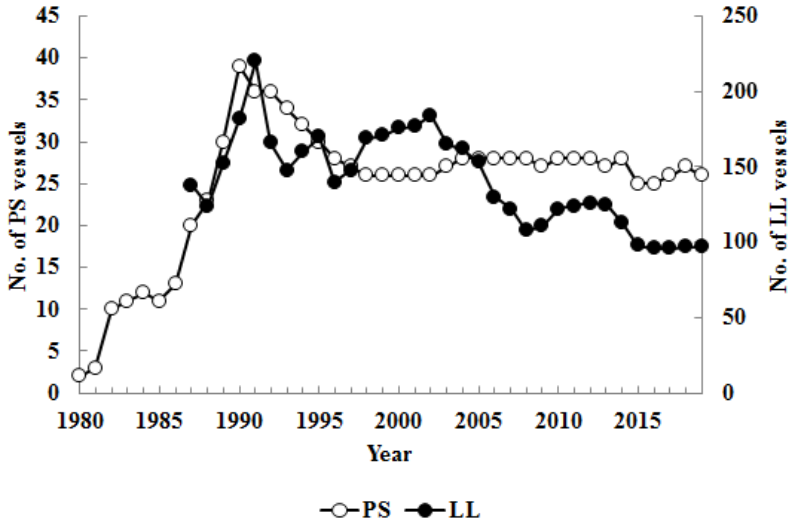

Fig. 2. Historical annual vessel numbers for the Korean tuna fisheries by gear in the WCPFC Convention Area during 1980-2019.

Table 2. Number of Korean vessels by gear and size, active in the WCPFC Convention Area, 2015-2019

Year	GRT class by gear									
	Longline					Purse seine				
	Total	0-50	51-200	201-500	500+	Total	0-500	501-1,000	1,001-1,500	1,500+
2015	98	0	1	97	0	25	0	7	13	5
2016	96	0	1	95	0	25	0	7	14	4
2017	96	0	1	95	0	26	0	7	15	4
2018	97	0	1	96	0	27	0	6	15	6
2019	97	0	1	96	0	26	0	5	15	6

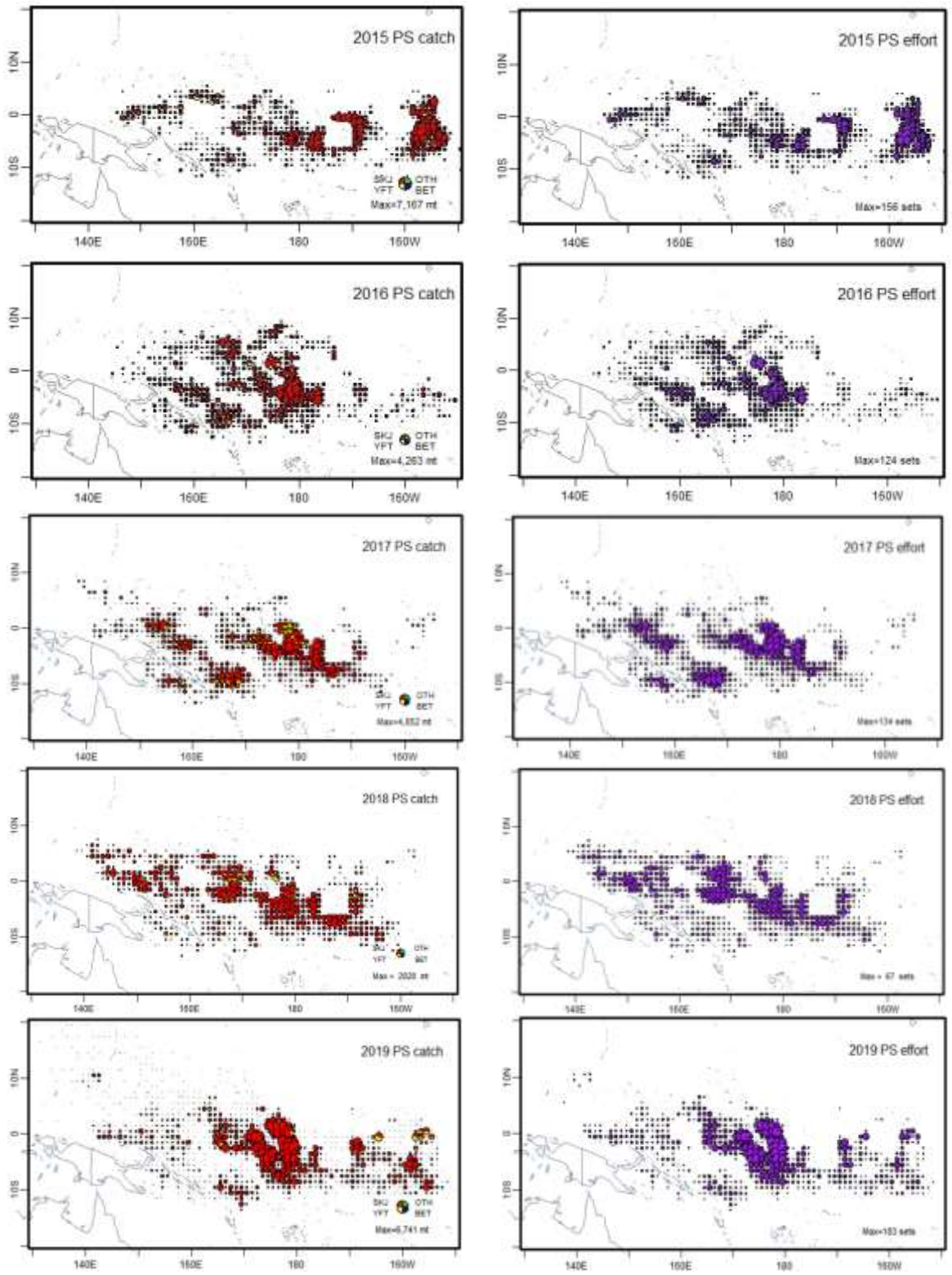

Fig. 3(a). Annual catch and effort distributions of target species by the Korean purse seine fishery active in the WCPFC Convention Area, 2015-2019.

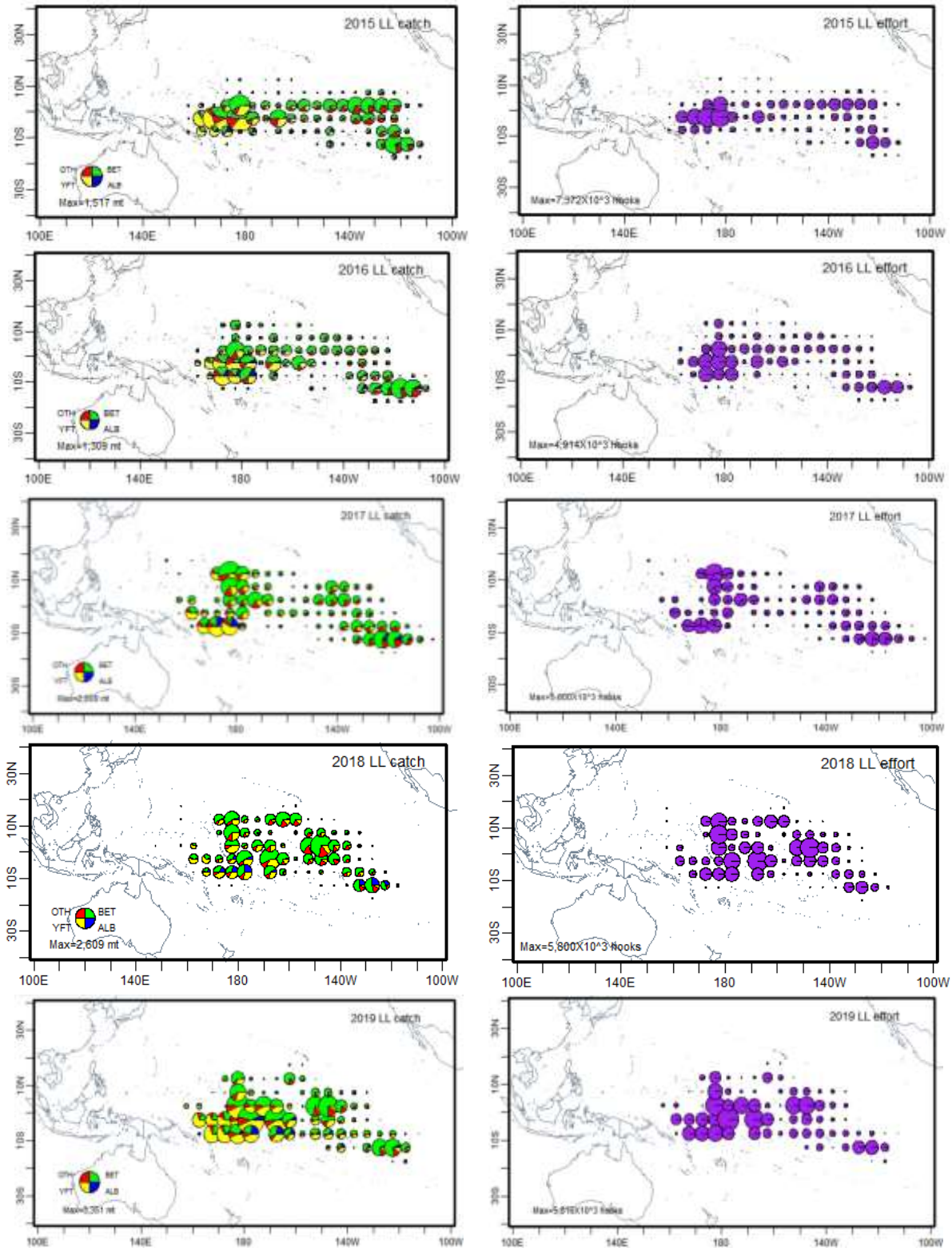

Fig. 3(b). Annual catch and effort distributions of target species by the Korean longline fishery active in the Pacific Ocean, 2015-2019.

Table 3(a). Annual estimated catch or encounter of species of special interest (seabird, turtle, marine mammals, etc.) by the Korean fisheries in the WCPFC Convention Area, 2015-2019

Fishery	Year	Number by species									
		Whale shark	Leather-back turtle	Olive ridley turtle	Logger-head turtle	Green turtle	Other marine turtles	False killer whale	Hump-back whale	Pygmy killer whale	Other whales
PS	2015	21	-	-	12	-	-	-	-	-	-
	2016	D:0, A:1	-	-	-	D:0, A:1	D:1, A:7	D:0, A:1[1)]	-	-	-
	2017	D:0, A:11	-	D:0, A:1	D:0, A:1	-	D:1, A:1	D:0, A:3[2)]	D:1, A:2[3)]	D:0, A:1[4)]	D:0, A:6[5)]
	2018	D:0, A:9	-	-	-	D:0, A:1	D:1, A:10	-	-	D:0, A:7[6)]	D:0, A:12[7)]
	2019	D:0, A:33	-	D:1, A:0	D:2, A:0	D:0, A:1	-	D:0, A:12[8)]	-	D:0, A:7[9)]	D:0, A:24[10)]
LL	2015	-	34	9	-	-	5	-	-	-	-
	2016	-	D:0, A:1	D:27, A:5	-	D:9, A:1	D:3, A:1	-	-	-	-
	2017	-	-	-	-	-	D:0, A:3	-	-	-	-
	2018	-	D:1, A:0	-	-	-		-	-	-	-
	2019	-	D:1, A:2	D:1, A:0	-	-	-	-	-	-	-

* D and A indicate “dead” and “alive”, respectively.

** Date/Location: 1) ’16.4.23 / 4°N 154°E, 2) ’17.3.8 / 6°S 176°W, ’17.3.15 / 8°S 176°E, 3) ’17.3.21 / 8°S 166°E, ’17.3.18 / 8°S 166°W, ’17.3.21 / 8°S 166°W, 4) ’17.11.16 / 9°S 155°E, 5) ’17.7.17 / 0°S 154°E, ’17.5.16 / 2°S 175°W, 6) ’18.11.14 / 1°N175°E, ’18.11.19 / 0°S179°E, ’18.11.20 / 0°S179°E, ’18.12.13 / 9°S155°E, ’18.12.14 / 9°S155°E, ’18.12.24 / 6°S152°E, 7) ’18.1.4 / 0°N153°E, ’18.1.20 / 5°S153°E, ’18.3.10 / 9°S157°E, ’18.4.29 / 2°N144°E, ’18.5.18 / 0°S146°E, ‘18.5.29 / 2°N156°E, ’18.6.2 / 5°N144°E, ’18.12.17 / 8°S154°E, ’18.12.23 / 7°S176°W, 8) ’19.6.26 / 0°S172°E, ’19.10.6 / 0°S177°E, ’19.11.6 / 5°S176°E, ’19.11.24 / 3°S173°E, 9) ’19.3.3 / 0°S143°E, ’19.3.11 / 4°S156°E, ’19.3.19 / 10°S168°E, ’19.5.24 / 1°N175°E, ’19.5.6 / 1°N177°E, 10) ’19.01.12 /0°N144°E, ’19.2.8 / 1°S169°W, ’19.3.21 / 0°S165°W, ’19.3.26 / 1°S151°E, ’19.4.30 / 5°S179°W, ’19.5.4 / 2°S170°E, ’19.5.15 / 0°S172°E, ’19.8.30 / 3°N161°E, ’19.9.29 / 1°S179°E, ’19.10.3 / 1°S177°E, ’19.10.3 / 1°S177°E, ’19.10.14 / 2°S177°E, ’19.11.25 / 3°S173°E, ’19.12.4 / 3°S174°E, ’19.12.10 / 3°S174°E, ’19.12.17 / 8°S154°E, ’19.12.23 / 11°S159°E .

Table 3(b). Effort, observed and estimated seabird captures by fishing year for Korean longline fishery in the area of 23°N - 25°S, 2015-2019

Year	Fishing effort				Observed seabird captures	
	Number of vessels	Number of hooks(X1,000)	Observed hooks(X1,000)	% hooks observed	Number	Rate
2015	98	47,157	-	-	-	-
2016	96	55,238	962	1.7	0	0
2017	96	48,294	1,417	2.9	0	0
2018	97	58,201	1,919	3.3	0	0
2019	97	60,445	2,246	3.7	0	0

* Korea does not have any vessels operating in the Convention Area north of 23 ^{o}N and in the south of 30 ^{o}S.

Table 3(c). Proportion of mitigation types[1] used by Korean 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 to 23°N	North of 23°N
	No mitigation measure			94.8	
Options required south of 25°S	TL+NS				
	TL+WB				
	NS+WB				
	TL+WB+NS				
	HS				
Other options 25°S-30°S	WB				
	TL				
Other options north of 23°N	SS/BC/WB/DSLS				
	SS/BC/WB/(MOD or BDB)				
Provide any other combination of mitigation measures here	TL+MOD			5.2	
	Totals			100	

[1] 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.
* This data comes from scientific observer data.

Table 4(a). Annual estimates of retained and discarded catch of key sharks by the Korean longline fishery in the WPCFC Convention Area, 2015-2019

Year	Retained catch (mt) by key shark species						
	Blue shark	Thresher sharks	Hammerhead sharks	Mako sharks	Silky shark	Oceanic whitetip shark	Others
2015	85	55	3	4	0	0	220
2016	<1	1	0	<1	0	0	<1
2017	<1	1	0	0	0	0	<1
2018	<1	3	0	<1	0	0	<1
2019	5	<1	<1	<1	0	0	11

* No shark catch retained by the Korean purse seine fishery.

Fishery	Year	Discard catch (number) by key shark species				
		Blue shark	Thresher sharks	Hammerhead sharks	Mako sharks	Others
Purse seine	2017	0	2	3	1	769
	2018	0	0	2	0	69
	2019	0	1	1	0	50
Longline	2017	2,826	1,050	1	13	4,323
	2018	3,121	1,839	6	263	3,695
	2019	2,640	1,063	6	183	2,479

* These data include all of status of “dead” and “alive”.
** See Table 4(b) for oceanic whitetip shark and silky shark.

Table 4(b). Annual number of releases of oceanic whitetip shark and silky shark by the Korean fishery in the WPCFC Convention Area, 2015-2019

Fishery	Year	Number of releases	
		Oceanic whitetip shark	Silky shark
Purse seine	2015	-	13*
	2016	D: 7, A: 96	D: 977, A: 327
	2017	D: 6, A: 1	D: 1,683, A: 332
	2018	D: 8, A: 14	D: 1,704, A: 625
	2019	D: 5, A: 1	D: 1,675, A: 767
Longline	2015	356	942
	2016	D: 44, A: 65	D: 897, A: 1,095
	2017	D: 48, A: 137	D: 675, A: 615
	2018	D: 19, A: 12	D: 726, A: 43
	2019	D: 32, A: 45	D: 733, A: 370

* indicates that the unit is weight (mt).

** D and A indicate “dead” and “alive”, respectively.

Table 5. Estimated annual coverage of operational catch/effort and observer data for the Korean fisheries by gear, active in the WCPFC Convention Area, 2015-2019

Year	Gear	Logsheet coverage (%)	Observer coverage (%)
2015	Purse seine	100	100
	Longline	100	6.6
2016	Purse seine	100	100
	Longline	100	6.9
2017	Purse seine	100	100
	Longline	100	4.14
2018	Purse seine	100	100
	Longline	100	6.3
2019	Purse seine	100	100
	Longline	100	7.1

∗ 2019 observer coverage for Korean longline fishery

Fishery	No. of Hooks			Days Fished			Days at Sea			No. of Trips		
	Total Estimated	Observed	%	Total Estimated	Observed	%	Total Estimated	Observed	%	Total Estimated	Observed	%
Longline							26,959	1,919	7.1			

Table 6. Information on the transhipment of Korean fleets in 2019

(1) Amount (kg) of transshipped fish

a);	b) transshipped in port, transshipped at sea in areas of national jurisdiction, and transshipped beyond areas of national jurisdiction			c) transshipped inside the Convention Area and transshipped outside the Convention Area		d) caught inside the Convention Area and caught outside the Convention Area	
offloaded and received	Transshipped in port	Transshipped at sea in areas of national jurisdiction	Transshipped beyond areas of national jurisdiction	Transshipped inside the Convention Area	Transshipped outside the Convention Area	Caught inside the Convention Area	Caught outside the Convention Area
Offloaded	414,035	0	17,901,916	15,917,105	2,398,846	15,014,849	3,301,102
	306,885,022	0	0	306,885,022	0	306,885,022	0
Received	304,046,865	0	18,916,565	321,318,549	1,644,881	319,833,467	3,129,963

e) Species											
BET	YFT	SKJ	ALB	BUM	SWO	MLS	WHM	WHH	OSH	Shark fin	OTH
8,357,475	6,765,222	107,420	1,356,054	893,252	446,264	41,294	2,869	6,455	6,507	201	332,938
3,548,300	30,531,500	272,804,500	0	0	0	0	0	0	0	0	722
11,892,582	43,035,949	259,432,645	1,874,878	706,783	779,759	67,118	14,858	0	97,134	0	5,061,724

f) Product Form				g) Fishing gear
GG	Dress	Round	Others	
15,184,407	1,542,878	1,502,921	85,745	Longline
1,080,900	0	305,804,122	0	Purse seine
14,508,355	2,663,411	305,639,628	152,036	Carrier Vessel

(2) Number of transshipments

a) offloaded and received;	b) transshipped in port, transshipped at sea in areas of national jurisdiction, and transshipped beyond areas of national jurisdiction			c) transshipped inside the Convention Area and transshipped outside the Convention Area		d) caught inside the Convention Area and caught outside the Convention Area		e) Fishing gear
	Transshipped in port	Transshipped at sea in areas of national jurisdiction	Transshipped beyond areas of national jurisdiction	Transshipped inside the Convention Area	Transshipped outside the Convention Area	Caught inside the Convention Area	Caught outside the Convention Area	
Offloaded	2	0	127	115	14	106	23	Longline
	303	0	0	303	0	303	0	Purse seine
Received	459	0	203	645	17	614	48	Carrier Vessel

3. Background

About 60 year-old Korean distant water tuna longline fishery that stepped up the first fishing in the Indian Ocean in 1957, has explored the Pacific Ocean since 1958 and the Atlantic Ocean since 1967. The high seas and the waters within coastal states in the South Pacific Ocean have been the main fishing grounds for Korean longline fishery. There was a change in the longline fishing operation types. Longline vessels used foreign ports for fishing base near the fishing grounds from the beginning but they have gradually equipped with deep freezing facilities and used home ports for fishing base since 1972. All longline vessels have based domestic ports since 1999. This change gave advantages in exporting the products to Japanese markets and others. In domestic markets, tuna sashimi demands have been increasing year by year.

The Korean purse seine fishery was initiated by accessing into the Eastern Pacific fishing ground with 3 vessels in 1971. Helicopter-aided mass operations were introduced in 1979 for the first time, and the number of active vessels was the highest of 39 in 1990, but has decreased to 25-27 in recent years. Most of the catches are supplied to the packers for domestic consumption and are exported to foreign canneries.

These fisheries are managed by the Distant Water Fisheries Development Act put into effect on the 4 February, 2008, and the Act was revised for improving the data collection on 5 December, 2012 and the electronic reporting system has been implemented since 1 September, 2015.

4. Flag State Reporting

4.1. Annual catch and effort

Annual catch and effort for Korean tuna fisheries by gear and primary species are shown in Table 1(a)-(f) and Fig. 1(a)-(b). The average of total catch in the WCPO by Koran tuna fisheries was 300,754 mt in recent 5 years (2015-2019). Total catch in 2019 was 347,508 mt, which accounted for 16% and 19% greater than that of average for 5 recent years and 2018, respectively.

The average catch of purse seine fishery was 276,918 mt during 5 recent years (2015-2019). The purse seine catch in 2019 was 314,572 mt with 26 vessels active, which was 14% and 18% greater than that of average for 5 recent years and 2018. In purse seine fishery, skipjack, yellowfin and bigeye catches in 2019 were 279,553 mt, 32,249 mt and 2,767 mt, respectively. The catches of skipjack and yellowfin were 20%, 9% greater and the catch of bigeye was 36% less than those of 2018, respectively. Purse seine fishing efforts ranged from 5,790 to 7,527 sets during 5 recent years, which showed the highest in 2019 and the lowest in 2016.

The average catch of longline fishery was 25,600 mt during recent 5 years (2015-2019). The longline catch in 2019 was 32,936 mt with 97 vessels active, which was 29% and 33% greater than that of averages for 5 recent years and 2018. Catches of bigeye and yellowfin

caught by longline in 2019, which are target species by the Korean tuna longline fishery, were 13,711 mt and 13,847 mt, respectively. Longline fishing efforts ranged from 47,157 to 60,445 thousand hooks, which showed the lowest in 2015 and the highest in 2019.

Catches of north Pacific albacore, southwest striped marlin, south swordfish and south Pacific albacore are shown in Table 1(c)-(f).

4.2. Fleet structure

The number of vessels active by gear and size is represented in Fig. 2 and Table 2. The number of purse seine vessels, once peaked at 39 in 1990, reduced to 28 in 1996, and after that maintained around 25-28 to recent years. In 2019, the number of fishing vessels was 26, of which 5 vessels were of 501-1,000 class, 15 vessels of 1,001-1,500 class and 6 vessels of over 1,500 class. The number of longline vessels reduced from 220 in 1991 to 108 in 2008, and slightly increased and ranged from 111 to 126 thereafter. Since 2015 it has decreased to less than 100. In 2019, the number of active fishing vessels was 97, of which 1 vessel was of 51-200 class and 96 vessels of 201-500 class.

4.3. Fishing patterns

The distributions of catch and effort of target species by gear are shown in Fig. 3(a)-(b). Korean tuna purse seine fishery has generally been operating throughout the year in the tropical area of the WCPO between 140^{o}E-170^{o}W and from time to time extended to the east subject to oceanographic conditions. Purse seine fishing efforts in 2015 moved eastward further and concentrated on the eastern areas. In 2016 and 2017, they mainly operated in the western and central areas, and again extended eastward since 2018. In 2019, it was highly concentrated on the central tropical area of 170 ^{o}E-180 ^{o} compared to the previous years.

Longline fishery efforts were normally higher in the central and eastern Pacific Ocean. The efforts from 2015 to 2017 were concentrated in the central Pacific Ocean, while in 2018 and 2019 were relatively higher in the eastern Pacific Ocean than previous years.

4.4. Annual estimated catches of species of special interest

The species of special interest (seabird, turtle, marine mammal, etc.) encountered or caught incidentally by Korean purse seine and longline fisheries are presented in Table 3. The data were compiled from logsheet recorded by captain onboard. In 2019, 33 individuals of whale shark, 4 marine turtle, and 43 whales were encircled by purse seine nets, and 4 marine turtle were bycaught by longline fishery, respectively. All these species were encircled by purse seine nets or bycaught incidentally by longline and were released promptly. Especially, when whales and whale shark were observed during fishing operation of purse seine, the vessels stopped rolling net until they had been released safely. All Korean fishing vessels operated the areas between 20^{o}N and 20^{o}S (Fig. 3), and there was no seabird captured during 2015-2019 (Table 3).

4.5. Annual estimated catches of non-target, associated and dependent

The shark species caught by longline fishery are presented in Table 4(a). These data were compiled from logsheet recorded by captain onboard. As key shark species, the catches in 2019 were 5 mt for blue shark, thresher sharks <1 mt, mako sharks <1 mt, and other sharks 11 mt, respectively. In accordance with CMM 2011-04 and 2013-08, the number of releases of oceanic whitetip shark and silky shark are presented in Table 4(b). All these bycaught were released promptly in a manner that results in as little harm to the shark as possible.

4.6. Estimated annual coverage of catch and effort and observer data

Estimated annual coverages of logsheet (catch and effort data) and observer data are shown in Table 5. The coverage of logsheet data has been 100% for both purse seine and longline since 2013. The observer coverage in 2019 was 100% for purse seine and 7.1% for longline.

5. Coastal State Reporting

N/A

6. Onshore developments

Korea consistently promotes investment plans on land facility in the coastal states where its distant waters fleets are operating.

7. Future Prospects of the fishery

The fleet power of purse seine and longline is expected to keep the current level, and production seems to be affected by fisheries resources trend in the oceans, conservation and management measures of RFMOs and permission policy of the coastal states. Meanwhile recognizing that demand at international and domestic market is increasing on production caught from responsible and sustainable fishing activity, Korea strives to strengthen on MCS, scientific survey and education relating to bycatch for fishermen.

8. Status of tuna fishery data collection systems

8.1. Logsheet data collection and verification

Catch statistics of Korean distant water fisheries are obtained from two sources of data reporting. The Korea Overseas Fisheries Association (KOFA) collects monthly catch by gear and species from the Korean tuna industries. The National Institute of Fisheries Science (NIFS) collects logsheet data from vessels filled out by captain onboard. In accordance with data reporting and submission requirement by the RFMOs, necessary improvements have

been continuously made in data coverage, accuracy and verification through cross-checking between NIFS and KOFA. Since 1st September 2015, the Act on Fisheries Information and Data Reporting has obliged fishers of distant-water fisheries to report catch information to the National Institute of Fisheries Science (NIFS) in real time through the Electronic Reporting (ER) system. The coverage of data reporting by ER is 100%. It includes data collection and reporting requirements recently adopted by the all tuna RFMOs regarding especially ecologically important species, discard/release and bycatch mitigation, etc.

8.2. Observer programme

The scientific observer program of distant-water fisheries of Korea was started in 2002. The National Institute of Fisheries Science (NIFS) is responsible for implementing and developing the program. The basic requirement for observers is college graduated with the major field of nature science or fisheries high school graduated with at least 1-year experience on board and certificate of qualification to deck officer. Candidates for observer who have passed the paper review (including medical check) and oral interview have to take training programs for 3 weeks. Observer training programs include basic safety training for seafaring, operations of navigation devices, biological information training for target and non-target species and data collecting/reporting method for fishing activities. During the training program they have two kinds of test. First is the test for a technical term of fisheries and biology, and the other is the test for species identification. The person who scored 70% overall in the two tests and attended 100% of the course timetable can be qualified for a scientific observer and deployed on board. Korea has a total of 55 scientific observers at present.

8.3. Port sampling programme

In Korea, there are 4 domestic landing ports for tunas caught in WCPO, which are Busan, Masan, Tonyeong and Mokpo, all located along the southern coast of Korea, nearby the landing port, there are 5 canneries owned by 4 companies in which about 100,000 tons of tunas from WCPO are landing.

The National Institute of Fisheries Science (NIFS) used to conduct biological sampling in the domestic cannery of Dongwon industry from 1997 to 2006. A preliminary study for species identification from the catch of purse seine was conducted in a cannery of Korea in 2011 and the result was provided to the WCPFC SC7 (ST-IP-09).

8.4. Unloading/Transhipment

In accordance with Article 13 of the Distant Water Fisheries Development Act, all distant water fishermen shall comply with procedures and regulations established by Regional Fisheries Management Organizations. Therefore, all transhipments by Korean vessels fishing all high migratory fish stocks covered by the WCPFC Convention take place in accordance with WCPFC CMM 2009-06. Also, vessel operators are encouraged to assist the WCPFC ROP observers in having full access to both the unloading and the receiving vessels to verify that the transhipped quantities of fish are consistent with other information available to observers. After the completion of transhipment, the transhipment declaration is subject to

verification against fishing vessel's monthly catch report, logsheets and observer reports (if available). The information on the transhipment of Korean fleets in 2019 is summarized in Table 6.

9. Research activities covering target and non-target species

Korea carried out a sea trial to mitigate bycatch of seabird in the Korean tuna longline fisheries with BirdLife International, 2013-2016, and conducted a project in the Indian Ocean for developing FAD to the extent possible minimize the capture of small bigeye and yellowfin and to reduce the entanglement of bycatch, 2016-2018.