Seychelles National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2019

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 15/02, final scientific data for the previous year was provided to the IOTC Secretariat by 30 June of the current year, **for all fleets other than longline** [e.g. for a National Report submitted to the IOTC Secretariat in 2019, final data for the 2018 calendar year must be provided to the Secretariat by 30 June 2019)	YES 30/06/2019
In accordance with IOTC Resolution 15/02, provisional **longline data** for the previous year was provided to the IOTC Secretariat by 30 June of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2019, preliminary data for the 2018 calendar year was provided to the IOTC Secretariat by 30 June 2019). **REMINDER:** Final longline data for the previous year is due to the IOTC Secretariat by 30 Dec of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2019, final data for the 2018 calendar year must be provided to the Secretariat by 30 December 2019).	YES 30/06/2019
If no, please indicate the reason(s) and intended actions:	

EXECUTIVE SUMMARY

The Seychelles National Report summarizes activities of the Seychelles' fishing fleet targeting tuna and tuna-like species in the WIO for the year 2018 in comparison with previous years. It also summarizes research, and data collection related activities as well as actions undertaken in 2018 to implement Scientific Committee recommendations and IOTC Conservation and Management Measures.

The Seychelles purse seine fleet increased from 8 vessels in 2012 to 13 vessels in 2018. The number of supply vessels also increased from 4 to 8 vessels in 2017 and was then reduced to 7 vessels in 2018. In 2018 the nominal effort decreased by 485 days (15%) when compared to the previous year to reach a total of 2,786 days fished whilst the catches increased by % from 122,202 MT in 2017 to 123,310 MT in 2018 resulting in a mean catch rate of 44.25 MT/Fishing day. Skipjack was the dominant caught species, accounting for 66% of the total catch whilst yellowfin tuna made up 28% of the total catch of the Seychelles flagged purse seiners in WIO. Catches of yellowfin tuna and bigeye tuna decreased by 16% and 34% respectively whilst catches of skipjack increased by 16% when compared to the previous year.

The Seychelles Industrial longline fleet comprised of 54 vessels in 2018 like 2017. The total catch reported by the industrial longline fleet for 2018 was estimated at 11,066 MT representing a decrease of 25% in catches, when compared to 2017 corresponding to the 28% decrease in fishing effort.

In term of species composition, yellowfin tuna and the NEI category comprising of mostly 'oilfish' were the dominant species caught by this fleet in 2018 accounting for 29% and 24% respectively, followed by bigeye tuna and swordfish, representing 20% and 13% respectively. The estimated catch rate has remained more or less similar to the previous year estimated at 0.43 Mt/1000 hooks for the year 2018.

In 2018, the Semi industrial fishery recorded the highest catch since the beginning of the fishery with a reported total catch of 1,266 Mt representing an 9% increase compared to the previous year catches. The fishing effort also increased by 5% from 2.05 million hooks set in 2017 to 2.15 million hooks in 2018. The catch rate decreased from 0.57 MT/1000 hooks in the previous year to 0.59 MT/1000 hooks.

Similar to previous years, the SFA is implementing various actions to improve the quantity and quality of data collected from its fleet targeting tuna and tuna-like species in the Indian Ocean. Actions include improved logbook for data capture, review and upgrade of data collection and management system and implementation of National Scientific Observer Programme, including piloting Electronic Monitoring system and Electronic Reporting.

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1. BACKGROUND/GENERAL FISHERY INFORMATION

The Republic of Seychelles is an archipelago of around 115 islands scattered over an exclusive economic zone of 1.37 million km^2 in the WIO. Typical of small-island developing states, marine resources are of significant social, economic and cultural importance. Apart from tourism, the country has limited opportunities for land-based development, and as a result, the fishing industry is a major contributor to the economic development of the country. The economic importance is derived from its role as a source of employment, contribution to production, food security and income generation, trade and foreign exchange generation and government revenue.

Since the mid 1980's the Seychelles have been granting access to foreign flagged vessels to fish for tuna and tuna like species inside of the Seychelles EEZ through various access agreements. Seychelles registered vessels, initially purse seiners, started operating in 1997, followed in 1999 with industrial longliners. A small scale local fresh tuna longline fleet also started operation in 1995.

The Seychelles Fishing Authority (SFA) was incorporated in August 1984, and since it was set up, the SFA has been implementing data collection programme, mainly to collect catch and effort information via logbook system, as well as port sampling programmes to collect data on transhipments, landings, size frequencies and species composition.

Port Victoria is the home base for the WIO purse seiners and the Seychelles small scale longline fleet, hence the activities of those fleet are covered almost 100%. On the other hand, distant water industrial longline vessels seldom use Port Victoria as their port of transhipment, making it difficult to obtain good logbook coverage, transhipment/ landings as well as size frequency data. The Seychelles is however participating in the regional Observer Scheme to monitor transhipment at sea. Furthermore at sea scientific observer programme on the purse seine fleet and self sampling programme on the industrial longline fleet is currently being implemented.

The Seychelles National Report summarizes activities of the Seychelles' industrial purse seine and longline (industrial and small scale longline) fleet in the WIO, reported over the past 5 years. It also summarizes research, and data collection related activities as well as actions undertaken in 2018 to implement Scientific Committee recommendations and IOTC resolution.

2. FLEET STRUCTURE

Table 1a. Shows the number of Seychelles registered purse seiners, supply vessels, industrial and semi-industrial longliners for the period 2014 to 2018. The number of Seychelles registered purse seiners increased from 11 vessels in 2014 to 13 vessels in 2015 and has remained the same for the period 2016 to 2018. The number of supply vessel increased from 6 vessels to 9 vessels, from 2014 to 2016 and then decreased to 7 vessels in 2018. The Seychelles registered longliners increased from 38 vessels to 54 vessels during the period 2014 to 2018. An increasing trend was also observed in the number of registered small scale (semi-industrial) longline vessels from 9 vessels in 2014 to 30 vessels in 2018.

Table1a. Number of Seychelles registered vessel for the period 2014 to 2018

Year	Purse seiners	Supply vessels	Longliners	Semi-Industrial
2014	11	6	38	9
2015	13	7	45	11
2016	13	9	46	29
2017	13	8	54	31
2018	13	7	54	30

Table 1b. Seychelles registered vessels by size (GT) as reported to IOTC in 2018

GT	Purse seiners	Supply vessels	Longliners	Semi-Industrial
<50	-		-	24
51-100	-		-	6
101-500	-	7	34	-
501-1000	-		20	-
>1000	13		-	-

3. CATCH AND EFFORT

3.1 Purse Seine Fishery

Table 2a summarizes the total annual catches by species, fishing effort and catch rates for the Seychelles purse seine fleet reported over the 2014 to 2018 period. Trend analysis of the purse seine catches in Seychelles over the last 5 years shows that catches has been on an increasing trend since 2014. In 2018, the catch increased slightly by only 1% from 122,202 MT in 2017 to 123,310 MT in 2018 (Table 2a and Figure 1a)

The fishing effort in term of fishing days, has been on an increasing trend since 2014. Fishing effort increase from 2,109 days fished in 2014 to reach a total of 4,092 days fished in 2016. In 2017, the effort decreased by 821 days (20%), when compared to the previous year to reach a total of 3,271 days fished. The fishing effort continue to decrease in 2018 to reach a total of 2,786 days fished.

Historically skipjack tuna dominated the catches of the Seychelles flagged purse seiners in the Western Indian Ocean (WIO). In 2018, skipjack was the dominant caught species, accounting for 66% of the total catch whilst yellowfin tuna made up 28% of the total catch of the Seychelles flagged purse seiners in WIO. Catches of yellowfin tuna decreased by 16% from 41,171 MT in 2017 to 35,023 MT in 2018, catches of skipjack tuna increased by 16% from 69,994 MT in 2017 to 81,451 MT in 2018 and catches of bigeye ,decreased by 34% from 9,761 MT to 6,450MT.

Catch rate has been on a decreasing trend since 2014.Between the period 2014 to 2016, the catch rate decreased from 28.57 Mt/Fishing days to 26.55 Mt/Fishing days. In 2017, the catch rate increased to reach 37.36 Mt/Fishing days and catch rate continue to increase to reach 44.25 Mt/Fishing days in 2018

Table 2a. Seychelles flag purse seine annual catch, fishing effort and catch rates reported between 2014 and 2018.

Year	Days Fished	Catch Rate	YFT	SKJ	BET	ALB	NEI	Total
2014	2,109	28.57	23,463	32,104	4,636	45.094	7.435	60,255
2015	3,264	27.19	39,072	42,426	7,168	60.388	13.146	88,740
2016	4,092	26.55	40,121	60,991	7,325	110.15	65.255	108,613
2017	3,271	37.36	41,711	69,994	9,761	55.756	681.162	122,202
2018	2,786	44.25	35,023	81,451	6,450	13.128	372.754	123,310

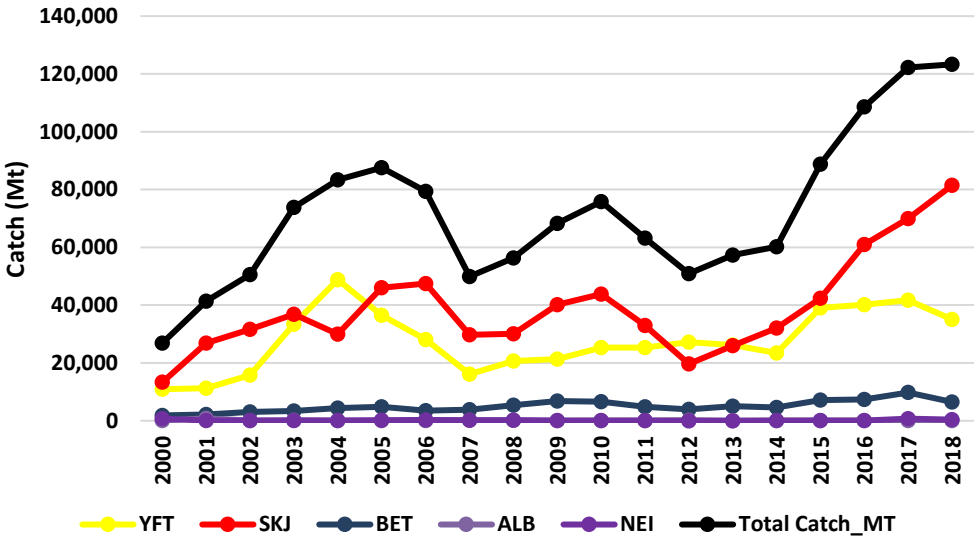
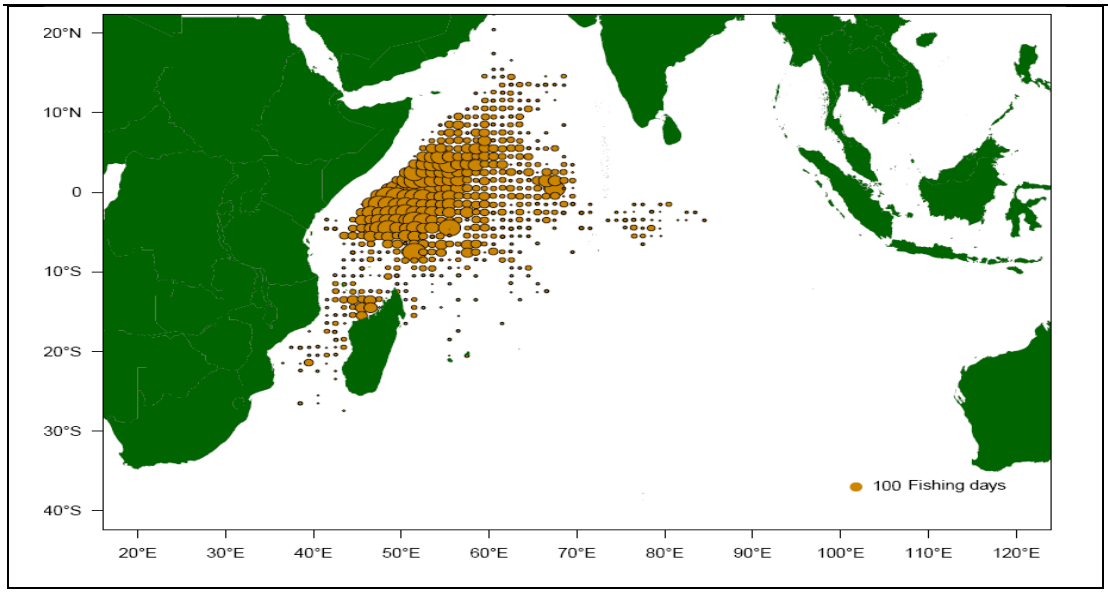


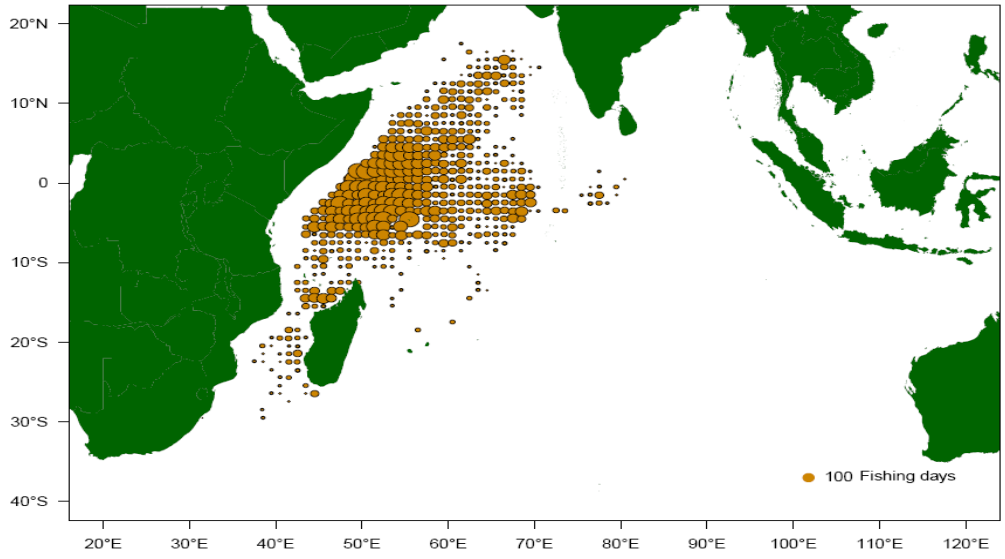
Figure 1a.Trends in annual catches by species for Seychelles' purse seine fleet reported for the period 2000-2018

Maps 3.1 *a(i), a(ii)* and *a(iii)* show the distribution of fishing effort by 1° square reported by Seychelles purse seine fleet for 2017, 2018 and for the previous 5 years (2014 – 2018) respectively.

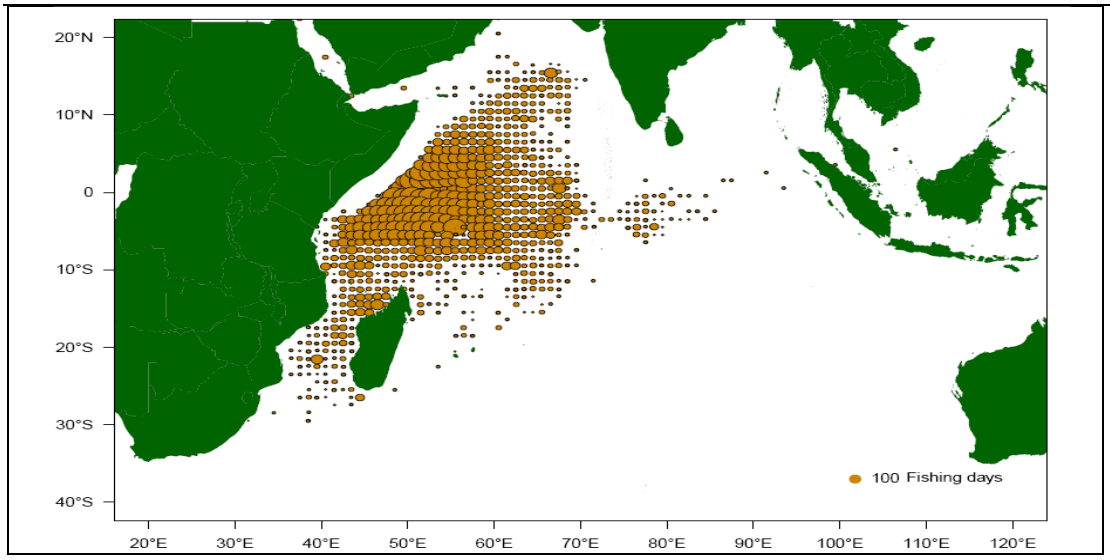
Map 3.1 a(i). Distribution of fishing effort (purse seine fleet) by 1º square, reported in 2017.



Map 3.1 a(ii). Distribution of fishing effort (purse seine fleet) by 1º square, reported in 2018.

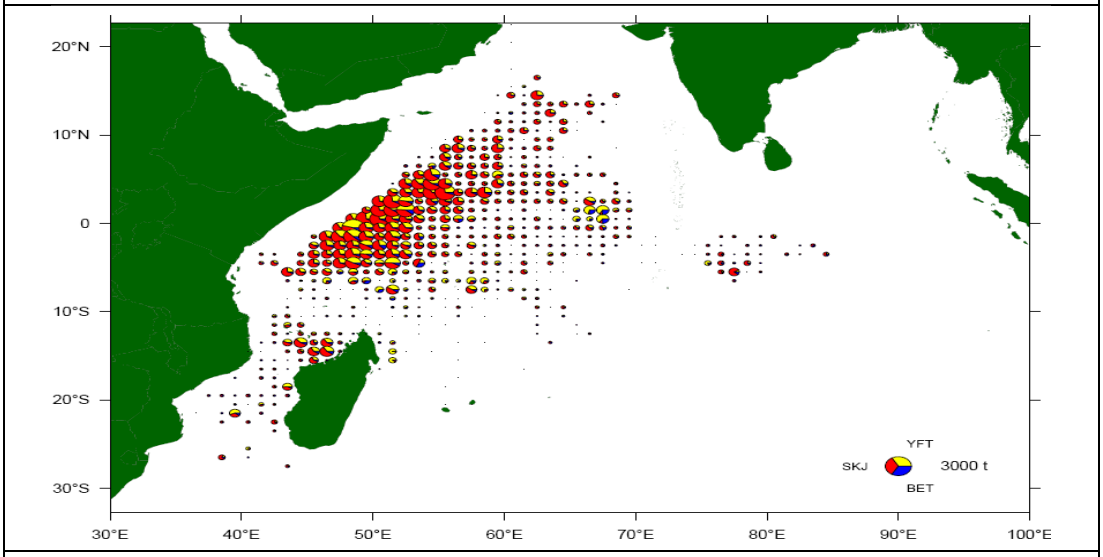


Map 3.1 a(iii). Distribution of fishing effort (purse seine fleet) by 1º square, previous 5 years (2014–2018).

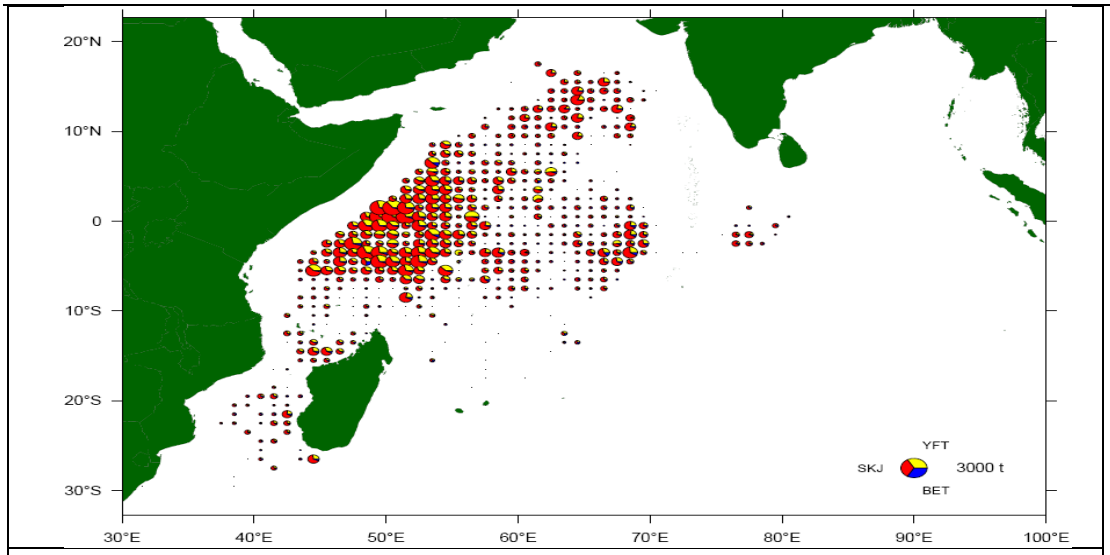


Maps 3.1 *b(i)* , *b(ii)* and *b(iii)* show the distribution of catches by 1° square reported by Seychelles purse seine fleet for 2017, 2018 and for the previous 5 years (2014 – 2018) respectively.

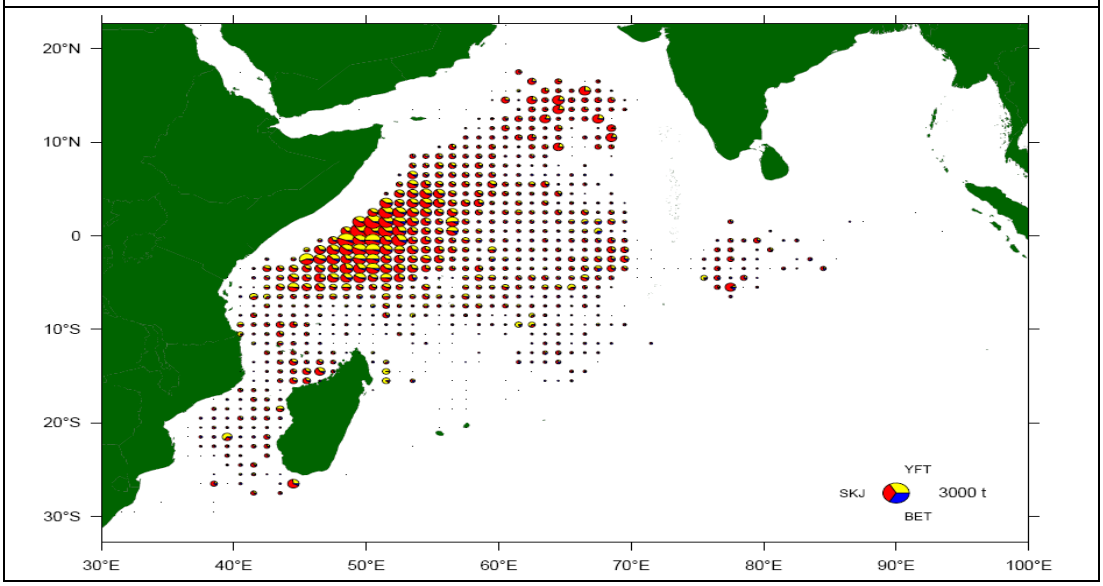
Map 3.1 b(i). Distribution of catch (purse seine fleet) by species by 1º square, reported in 2017.



Map 3.1 b(ii). Distribution of catch (purse seine fleet) by species by 1º square, reported in 2018.



Map 3.1 b(iii). Distribution of catch (purse seine fleet) by species by 1º square, previous 5 years (2014 – 2018).



3.2 Industrial Longline Fishery

Table 2b summarizes total yearly catch by species, fishing effort and catch rates reported by the Seychelles industrial longline fleet during period 2014 to 2018.

The reported fishing effort in terms of the number of hooks set has been on an increasing trend since 2014 to 2017. In 2018, a 28 % decreased was recorded in the number of hooks set from 35.28 million hooks set in 2017 to 25.45 million hooks in 2018.

The total catch increased from 10,689MT in 2014 to 14,704 MT in 2017. For the year 2018, the Seychelles registered industrial longliners reported an estimated catch of 11,066 MT, representing a decrease of 25% in catches, when compared to 2017 corresponding to the 28% decrease in fishing effort.

In term of species composition, yellowfin tuna replaces the NEI category as the dominant species caught by this fleet in 2018 accounting for 29% of the total catch, followed the NEI category and bigeye tuna, representing 24% and 20% respectively. NEI consist of albacore, sailfish, skipjack, and oil fish. The reported catch of bigeye, NEI category, marlin and yellowfin tuna decreased by 42%, 40%, 13% and 5% respectively when compared to the previous year.

Following an increase in catch rate from 0.50 MT/1000 hooks in 2014 to 0.55 MT/1000 hooks in 2015, the catch rate has since then been decreasing gradually to reach 0.43MT/1000 hooks in 2018.

Year	Fishing Effort (million hooks)	Catch rate (Mt/1000 hooks)	YFT	BET	SWO	MAR	SHK	NEI	Total
2014	21.59	0.50	1,643	5,260	965	687	583	1,551	10,689
2015	22.83	0.55	2,306	5,835	1,621	1,238	436	1,083	12,520
2016	34.62	0.43	2,634	5,267	1,863	1,548	496	3,200	15,009
2017	35.28	0.42	3,423	3,897	1,468	908	607	4,400	14,704
2018	25.45	0.43	3,253	2,259	1,455	788	691	2,620	11,066

Table 2b. Annual catch, fishing effort and catch rates reported by Seychelles industrial longline fleet from the years 2014 - 2018

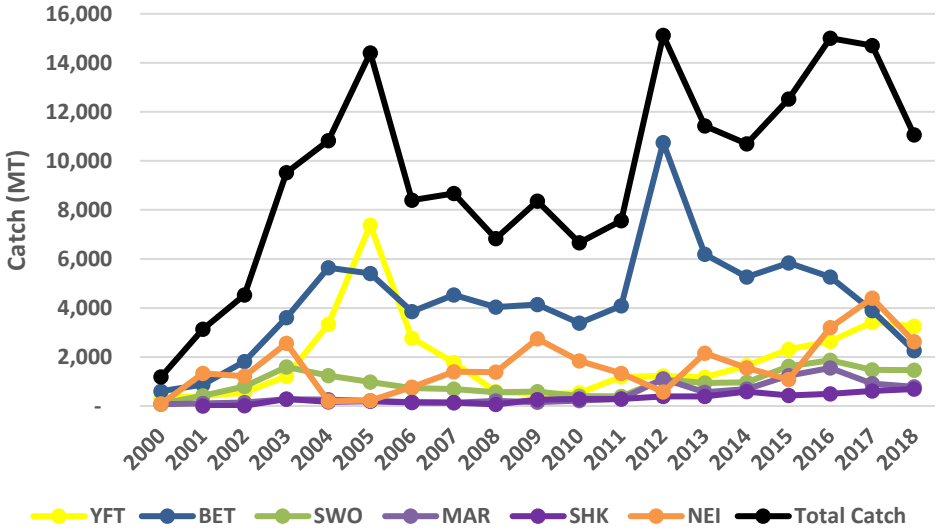
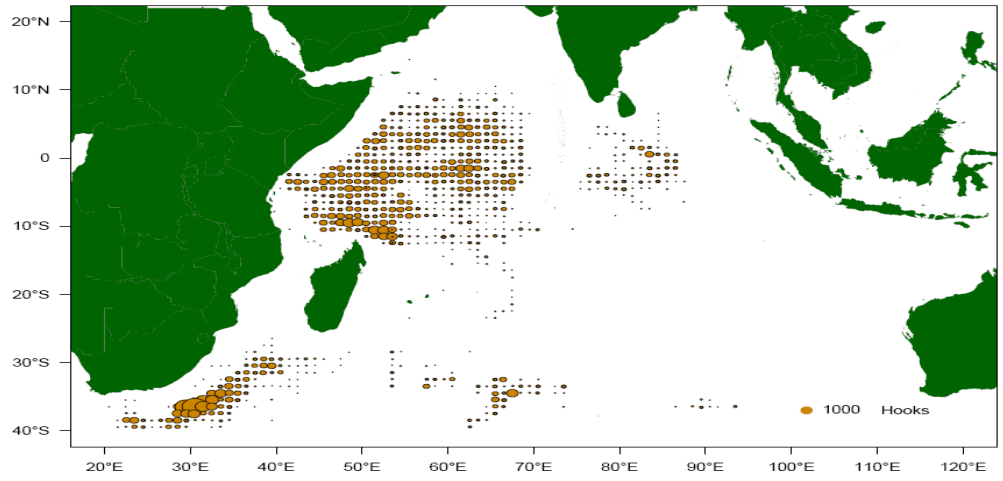


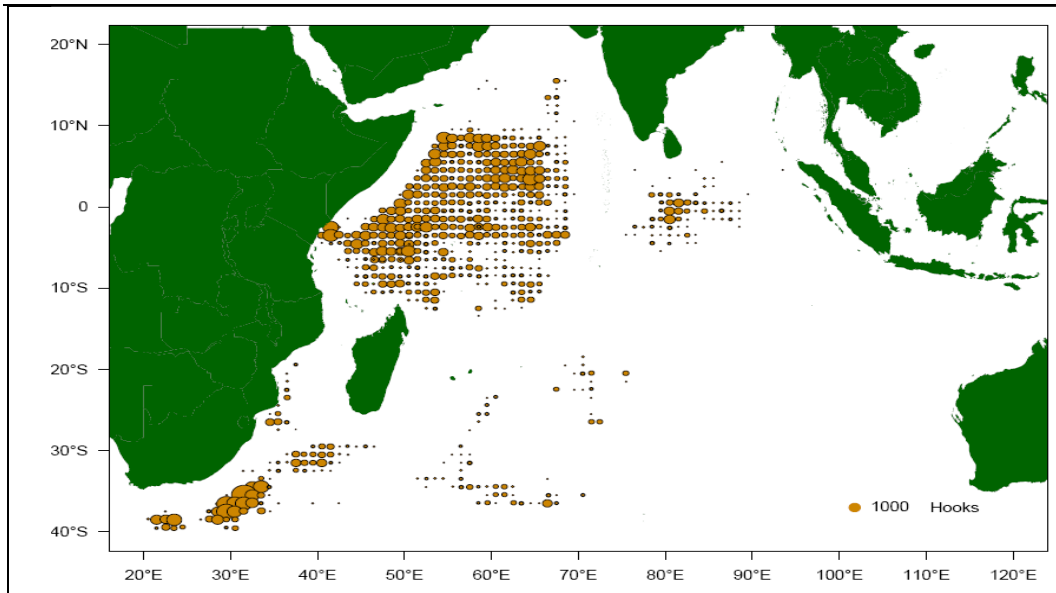
Figure 2a.Trends in annual catch by species reported by the Seychelles industrial longline fleet for period 2000-2018

Maps 3.2 a(i), a(ii) and a(iii) show the distribution of fishing effort by 1° square reported by Seychelles' industrial longline fleet for 2017, 2018 and the previous 5 years (2014 – 2018) respectively.

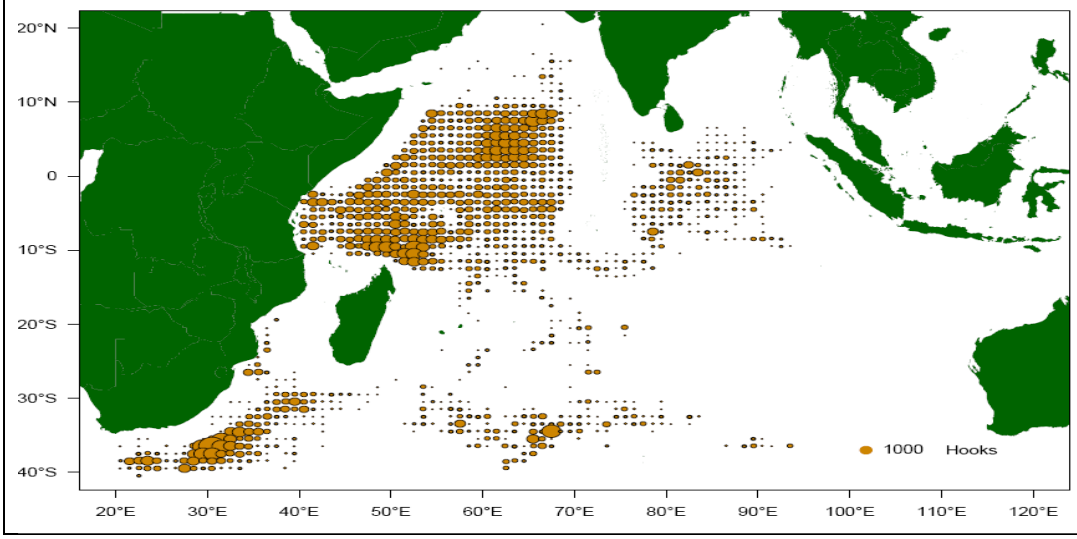
Map 3.2 a(i). Distribution of fishing effort (industrial LL fleet) by 1º square, reported in 2017.



Map 3.2 a(ii). Distribution of fishing effort (industrial LL fleet) by 1º square, reported in 2018.

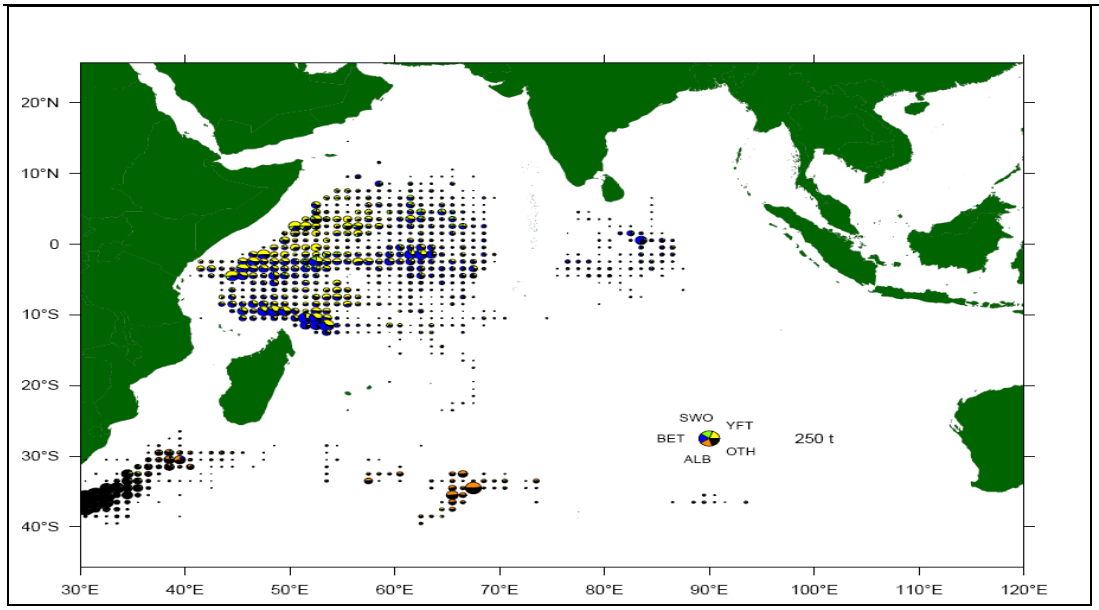


Map 3.2 a(iii). Distribution of fishing effort (industrial LL fleet) by 1º square, previous 5 years (2014 – 2018).

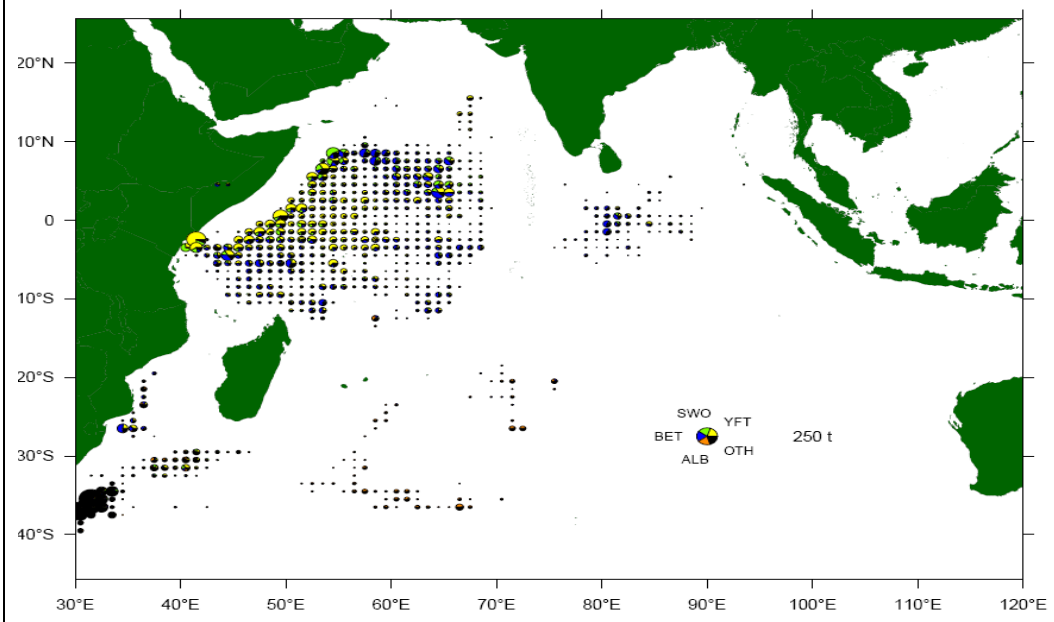


Map 3.2 b(i), b(ii) and b(iii) show the distribution of catches by species by 1° square reported by Seychelles' industrial longline fleet for 2017, 2018 and the previous 5 years (2014 – 2018) respectively.

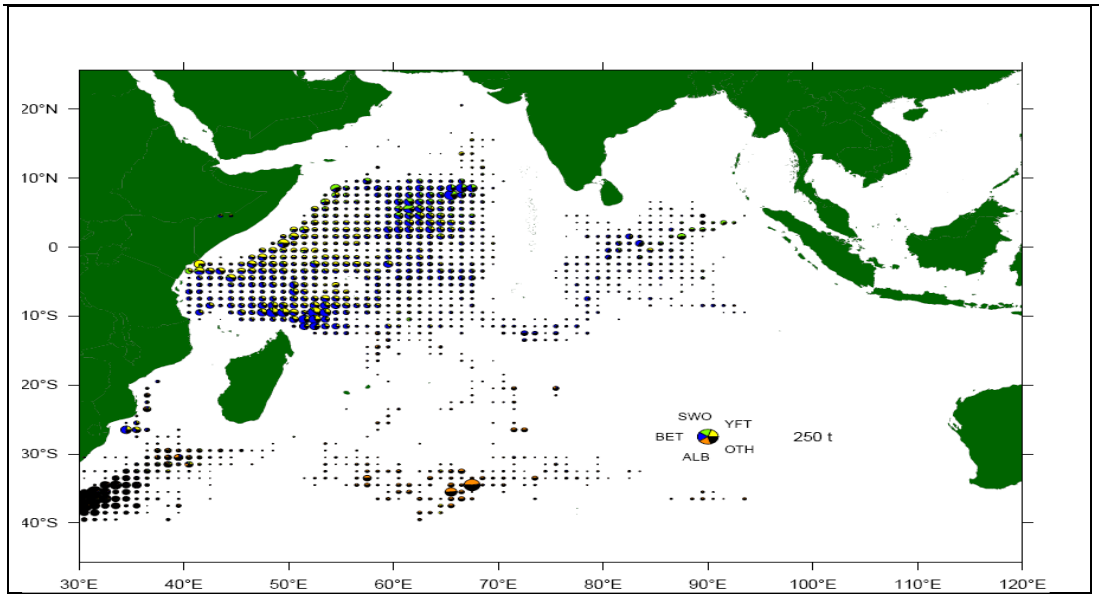
Map 3.2 b(i). Distribution of catch (industrial LL fleet) by species by 1º square, reported in 2017.



Map 3.2 b(ii). Distribution of catch (industrial LL fleet) by species by 1º square, reported in 2018.



Map 3.2 b(iii). Distribution of catch (industrial LL fleet) by species by 1º square, previous 5 years (2014 – 2018).



3.3 Semi Industrial Fishery

Table 2c summarizes the fishing activities of the locally based small scale (semi-industrial) longline fleet from 2014 to 2018. The fishing effort in terms of hooks set, has been on an increasing since 2014. In 2018, an increase of 5% was reported in the number of hooks set from 2.05 million hooks in 2017 to 2.15 million hooks in 2018.

Total catch increased by 73% from 82 MT in 2014 to 195 MT in 2015. In 2016 , the semi-industrial catch increased by 407 % to reach a total of 970 Mt. In 2016. The increase was mainly due to the significant increase in the number of vessel joining this fishery in 2016.The semi-industrial fishery catch continues to increase and in 2018 the semi industrial fishery recorded the highest catch since the onset of this fishery in 1996, with a reported catch of 1,266 MT, representing a 9% increase compared to the previous year catches.

The catch rate increased from 0.69 Mt/1000hooks in 2014 to 0.95 Mt/1000hooks in 2015, followed by a decreasing trend to reach 0.59Mt/1000hooks in 2018.

Swordfish dominated the catch composition accounting for an average of 71% of the total reported catch in 2014. However during the last four years, yellowfin tuna replaced swordfish as the dominant species caught in the semi-industrial longline fishery, where it accounted for 66% of the total catch followed by swordfish and bigeye tuna accounting for 18% and 9% of the total catch in 2018 respectively.

Table 2c.Catch, fishing effort and catch rates reported by the Semi Industrial longline fleet between 2014 and 2018.

Year	Effort (Hooks)	Catch rate (MT/1000 hooks)	YFT	BET	SWO	SFA	MAR	SHK	NEI	Total
2014	118,973	0.69	15	5	58	1	1	2	-	82

2015	205,505	0.95	98	33	47	5	11	1	-	195
2016	1,234,642	0.79	585	136	188	21	53	2	2	987
2017	2,052,804	0.57	740	117	215	24	60	2	6	1,162
2018	2,153,119	0.59	831	112	229	20	69	1	4	1,266

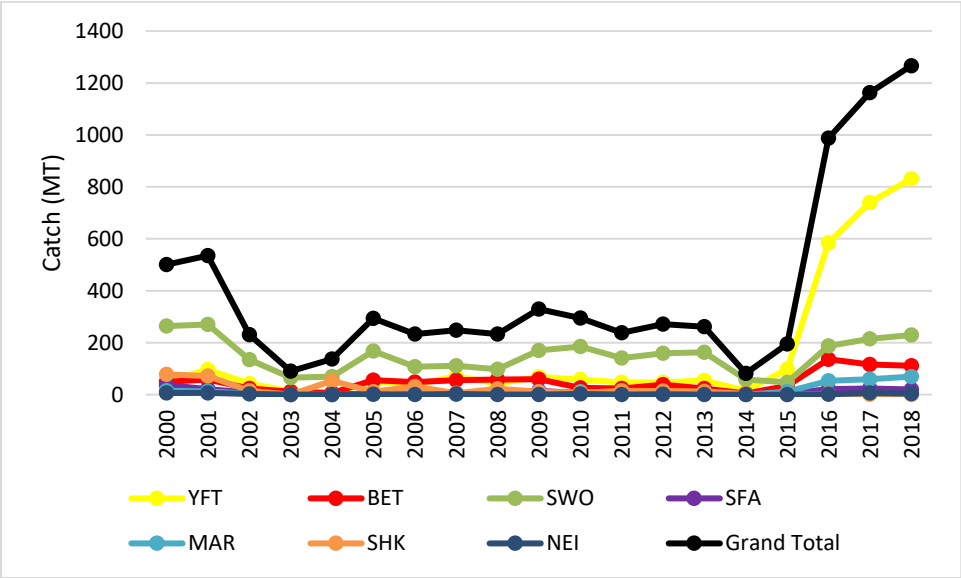


Figure 1c. Trends in annual catch by species reported by the Semi Industrial longline fleet between the period 2000 and 2018.

4. RECREATIONAL FISHERY

There is an important recreational fisheries subsector active mostly at weekends and in the evenings. These recreational fishers utilize mostly handline fishing techniques, targeting demersal species such as groupers, snappers and lethrinids, and semi-demersal species such as carangids and sphyraenids. Tuna and tuna-like species are not targeted by the recreational fishery sector, however a limited quantity of such species are taken as bycatch.

SFA undertook a comprehensive boat frame survey of the Seychelles domestic fleet, between August and November 2017. The survey was part of a larger project to develop a fishery–specific fishing fleet management and licensing system. The survey counted and recorded a total of 1,115 boats of which 742 were commercial fishing boats, 168 hire craft (sports fishing) and 116 recreational boats.

There are currently no regulations related to this part of the fleet. However the implementation of the licensing framework, at the beginning of 2020 will allow the management of this subsector. It will include management measures such as minimum size and bag limit for particular species. Furthermore mandatory reporting of statistics will be a condition of the new licensing system.

5. ECOSYSTEM AND BYCATCH ISSUES

In close collaboration with the industry, the Seychelles have developed, implemented and collaborated to many programmes aimed at enhancing the collection of scientific data required by the IOTC for the sound management of tuna and tuna-like stocks of the Indian Ocean. The following items describe some of the major progress accomplished in recent years and ongoing projects aimed at addressing ecosystem and bycatch issues in the Seychelles tuna fisheries:

- Since April 2017, the Seychelles purse seine fishery has started a Fisheries Improvement Project (FIP) SIOTI[1] in association with 30 purse seiners flying the flags of the EU and Mauritius and affiliated to the fishing associations OPAGAC, ANABAC and ORTHONGEL as well as with the processing companies Thai Union and Princes Tuna. The ultimate aim is to meet the highest standards of sustainable fishing, such as the Marine Stewardship Council standard. The component of the FIP dealing with the current and future actions concerning the use of FADs and satellite buoys is presented in the IOTC document IOTC-2019-WPEB15-37;
- Seychelles has implemented a large observer programme on Seychelles purse seiners and support vessels since 2014, co-funded by the industry through the Code of Good Practices and OCUP programmes. The program follows the same methodology (i.e. protocol and data capture and management software) than the EU observer programme. The observer coverage has significantly increased over the recent years and reached 70% in 2018. The IOTC documents IOTC-2018-WPEB14-15 and IOTC-2019-WPDCS15-20 provide information derived from the collection of data on bycatch and discard;
- The Code of Good Practices has been developed by OPAGAC and ANABAC and implemented in most vessels of the Seychelles purse seine fishery since 2013 with the support of AZTI. The overarching

[1] https://fisheryprogress.org/fip-profile/indian-ocean-tuna-purse-seine-sioti

objective is to reduce the adverse impacts of purse seine fishing on the marine ecosystems. This voluntary programme is mainly funded by the fishing companies and conducted through the boarding of national observers who collect scientific data and systematically monitor the design of the Fish-Aggregating Devices (FADs) used in the fishery and the release of incidentally caught or FAD-associated fauna. The programme is described in the IOTC documents IOTC–2017–WPDCS13–29_Rev1 and IOTC-2019-WPEB15-33;

- The OCUP programme developed by ORTHONGEL funds the systematic boarding of observers on two of the Seychelles purse seiners for monitoring fishing activities with a focus on the composition of the bycatch and discards. The OCUP program is presented in document IOTC-2017-WPDCS13-22;
- A programme of monitoring and recovery of FADs and buoys stranded in some islands of the Seychelles has been developed by OPAGAC and implemented by the local NGO Island Conservation Society (ICS) in collaboration with the Seychelles Fishing Authority. In 2019, the program FAD WATCH has been extended from the 15 purse seiners affiliated to OPAGAC to the 42 purse seiners of SIOTI. The programme is presented in the IOTC document IOTC-2018-WPEB14-12;
- The Seychelles purse seiners have also participated to the EU-funded project BIOFAD aimed at assessing the use of eco-friendly, biodegradable FADs so as to result their impact on the environment. The objectives and results of the BIOFAD project are described in the IOTC document IOTC-2018-SC21-13;
- In 2019, the Seychelles developed an Electronic Monitoring pilot project on high seas longliners to address the lack of observations at sea for this component of the Seychelles fishery. Three vessels will be equipped with sensors and cameras to record setting and hauling activities, estimate the size and species composition of the catch retained and discarded and monitor transhipments at sea.

5.1 Sharks

The Seychelles Fishing Authority reviewed its National Plan of Action for the Conservation and management of Sharks (NPOA) 2007-2011 and developed a new 5 years plan for the period 2016-2019.

The recruitment of a Project Coordinator to coordinate the efforts of key stakeholders, through the Shark – NPOA Steering Committee responsible to oversee the implementation of the Sharks NPOA 2016-2020, was completed in July 2019. The Authority is in the process of setting up the Steering committee which will be composed of key stakeholders.

5.1.2. Sharks finning regulation , 2006

These Regulations place restrictions on the removal of fins of all species of shark on board of foreign-owned or local fishing vessels of a total length of 24 metres and above, fishing within or outside the Seychelles Waters. In accordance IOTC resolution 17/05 a ratio of not more that 5% in weight of shark fins to weight of shark carcasses without fins must be respected at all times onboard all Seychelles industrial longline fishing vessels greater than 24 meters in length, up to first point of landing. Implemented is through condition of Certificate of Authorisation.

Table 3a: Total number and weight of sharks, by species, retained by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2013–2018).

	Blue shark		Mako sharks		Porbeagle		Hammerhead sharks		Thresher sharks		Oceanic whitetip shark		Various sharks NEI		Total N0	Total MT
Year	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT		
2014	9,658	433	1,387	51	5	0			2	0			2,221	99	13,273	583
2015	6,826	319	1,136	56									1,239	60	9,202	436
2016	9,592	402	1,629	66	1	0	19	1	9	0	1	0	794	28	12,045	496
2017	12,380	482	1,948	80	9	0					20	1	1,837	44	16,193	607
2018	12,360	550	1,986	89						0			1,283	49	15,629	687

Table 3b: Total number and weight of sharks, by species, retained by the Seychelles semi- Industrial Longline fleet in the IOTC area of competence (for the period 2013–2018).

	Blue shark		Mako sharks		Oceanic whitetip shark		Hammerhead sharks		Tiger sharks		Various sharks NEI		Total N0	Total MT
Year	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT		
2014	41	2.0	4	0.3	2	0.1	0	0.0	1	0.0	2	0.1	51	2.5
2015	16	0.7	1	0.1	2	0.1	0	0.0	0	0.0	165	0.0	184	0.8
2016	16	0.5	12	0.4	3	0.2	12	0.2	1	0.0	79	1.0	123	2.3
2017	1	0.0	3	0.1	1	0.0	10	0.2	7	0.1	98	1.6	121	2.0
2018	0	0.0	1	0.0	1	0.1	2	0.0	0.0	0.0	50	0.6	54	0.8

Table 4: Total number of sharks, by species, released/discarded by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2017–2018).

			Discarded Status			
Year	**Spcs_Acode**	**Scientific_name**	**Alive**	**Dead**	**Unknown**	**Grand Total**
2017	BSH	Prionace glauca		15		15
2017 Total				**15**		**15**
2018	BSH	Prionace glauca	52	52	19	123
	CCL	Carcharhinus limbatus		43		43
	MAK	Isurus spp	6	4		10
	PSK	Pseudocarcharias kamoharai		1		1
	THR	Alopias spp	13	43		56
2018 Total			**71**	**143**	**19**	**233**

5.2 Seabirds

In late 2018, Seychelles revised the logbook for the industrial longline fleet, to allow for the capture of information related to interaction with seabirds for vessels operating South of 20 degrees south. Compares to 21 vessels in 2017, 16 vessels operated in this area with a reduction of fishing effort (number of hooks set) of 49.2% (Table 5) . Data reported in 2018 is being compiled and will be submitted to the IOTC secretariat.

In 2019, Seychelles developed an Electronic Monitoring pilot project on high seas longliners to address the lack of observations at sea for this component of the Seychelles fishery. Three vessels will be equipped with sensors and cameras to record setting and hauling activities, estimate the size and species composition of the catch retained, record byatch and discarded and monitor transhipments at sea.

Table 5: Number of longline fishing vessel operating south of 20 degrees south and their corresponding fishing effort (2014 – 2018).

Year	Number of Vessels	Fishing Effort
2014	6	2,333,972
2015	4	1,610,334
2016	10	6,063,322
2017	21	10,574,114
2018	16	5,365,690

5.3 Marine Turtles

A total of 25 interactions were reported in 2018 by observers deployed on-board the Seychelles purse seine fleet.

Scientific Name	Reported interaction
Caretta caretta	6
Chelonia mydas	4
Eretmochelys imbricata	2
Lepidochelys olivacea	9
Testitudines	4
Grand Total	25

Table 6. Interaction with marine turtles reported through observer programme on Seychelles Purse seine vessels.

5.4 Other ecologically related species (e.g. marine mammals, whale sharks) [Desirable]

A total of 2 interactions were recorded for whale shark in 2018

6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS [Mandatory]

6.1. Logsheet data collection and verification (including date commenced and status of implementation)

A mandatory logbook system collecting catch and effort and other relevant data (such as bycatch, environmental data) exist for the following fisheries targeting tuna and tuna-like species.

I. **Industrial longline:** From early 80's to date 2 (averaging <70% annual coverage with 90% for more recent years)
II. **Industrial purse seine:** 1984 to date (95 – 100% annual coverage)
III. **Small scale longline:** 1995 to date (95 – 100% coverage)

Logbooks are reviewed as and when required to cater for new obligations when they arise. Logbook data are validate with landing, tanshipoment and VMS data when available. Scientific port sampling for size distribution and species composition exist for the Purse eine and small scale longline fleet. The industrial longline fleet is covered via self reporting (size distribution).

6.2. Vessel Monitoring System (including date commenced and status of implementation)

Since 2003, one of the prerequisite for any Seychelles registered vessel to be authorized to target tuna and tuna-like species in the WIO is to have an operational Vessel Monitoring System. VMS reports are being automatically transmitted to the Fisheries Monitoring Centre (FMC) at SFA on an hourly basis. VMS

information collected are use to validate logbook data. A programme to increase VMS coverage on vessels of less than 24 meters is currently being given consideration.

6.3. Observer rogramme

The National Scientific Observer Programme was initiated in July 2013 to address the objectives of the IOTC Regional Observer Scheme (ROS; Res. 11/04) of collecting verified catch data and other scientific data related to the purse seine component of the Seychelles tuna fishing fleet. The programme is carried out by the Seychelles Fishing Authority (SFA). During 2013, it comprised mainly of preliminary trials and it really kicked off in 2014 to this date.

A total of 328 fishing trips were observed on Seychelles purse seiners during 2014-2018. This represents about 8,223 days of observation at sea with more than 7,672 fishing sets observed, with a total catch of 240,145 MT of tuna and tuna-like species. Over the years, observer coverage has generally improved both in terms of quality and quantity. In 2018, 68% of all Seychelles purse seine fishing sets were observed, representing ~2,000 fishing operations. This is proof that the learning process has been quite effective. Observer data have been presented at the IOTC Working Party on Ecosystems and Bycatch (IOTC-2018-WPEB14-15) and at the IOTC Working Party on Data Collection and Statistics (IOTC-2019-WPDCS15-20).

Table 6. Annual observer coverage for the Seychelles purse seine fleet (2014–2018)

Year	Trips	Days at sea	Sets	Catch (mt)
Purse seiners				
2014	7	173	132	3,153
2015	65	1,928	1,577	41,319
2016	68	2,026	1,917	44,162
2017	96	2,103	2,048	67,034
2018	92	1,993	1,998	84,477

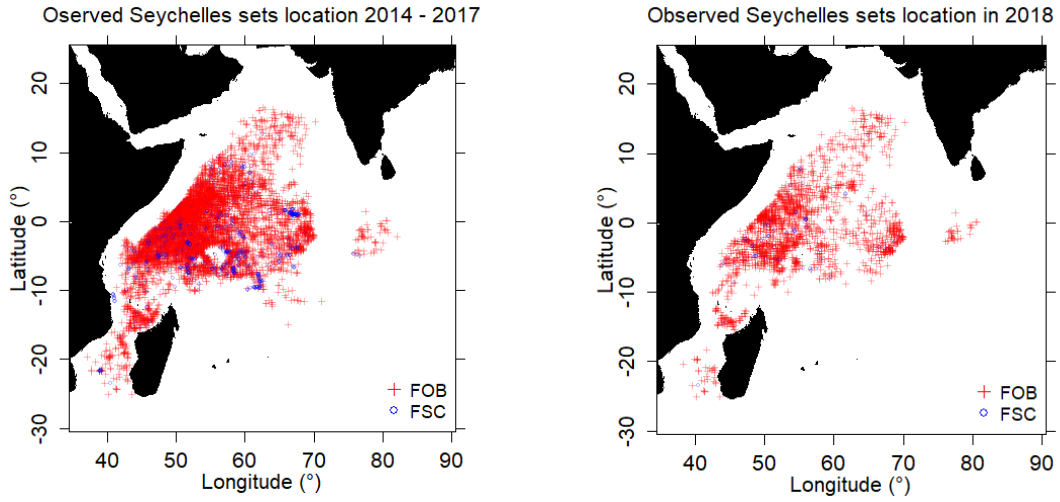


Fig. 4. Map showing spatial distribution of the fishing sets observed onboard Seychelles purse seiners during (left 2014-2017) and right 2018. FOB = School associated with drifting floating object; FSC = Free Swimming School.

In 2016, a pilot project on Electronic Monitoring (EM) System, supported by the FAO-ABNJ tuna programme, the Seychelles Government, OPAGAC and SATLINK was implemented on two Seychelles purse seiners. In 2019, Seychelles developed an EM pilot project on two purse seiners with the fishing company SAPMER and on three industrial longliners with the Deep Sea Tuna Longline Association (Seychelles). Data will become available in 2020 and enable to augment the quality of observations at sea with a focus on composition of the retained catch on Seychelles purse seiners and provide some valuable information on bycatch and discards for the Seychelles high seas longline fishery.

6.4 Port sampling programme

Port sampling is a routine and ongoing activity for the purse seine and small scale longline fleet. On the other hand the distant water industrial longline fleet does not land in Port Victoria; hence there are currently no port sampling programmes for those vessels. However a self-sampling programme is being implemented, whereby size frequency data are being recorded by the crew and transmitted to the Seychelles Fishing Authority. Size frequency data for all the fleet are submitted to the secretariat on annual basis.

Table 7a. Number of vessel trips monitored, by species (Number) for the Seychelles Purse seine fleet

	Number of fish Counted								
Year	Number Trips	ALB	BET	FRI	KAW	LTA	SKJ	YFT	Total
2014	56	106	8,777	228			73,572	42,722	125,405
2015	73	335	9,035	197	5		63,776	54,454	127,802
2016	79	100	6,384	773	89		72,989	39,775	120,110
2017	53		6,580	1,803	71		55,794	26,138	90,386
2018	81	1	8,474	4,173	692	4	127,571	41,706	182,621

Table 7b. Number of individuals measured for Seychelles registered purse seiners in 2018

Number of fish measured									
Year	ALB	BET	BLM	FRI	KAW	LTA	SKJ	YFT	Total
2014	106	8777		228			21294	42566	72,865
2015	335	9035		197	5		19700	54454	83,391
2016	100	6384		773	89		20550	39775	67,571
2017		6580		1803	71		15500	26138	50,092
2018	1	8474		4173	692	4	34200	41706	89,249

Table 7c. Number of individuals measured for Seychelles small scale longliners

	Species				
Year	ALB	BET	SWO	YFT	Total
2014		2	77	15	94
2016	1	45	187	508	741
2017		40	67	277	384
2018		26	78	172	276

6.5 Unloading/Transhipment

Collection of transshipment and landing forms from fish processing companies for the purse seine fishery and the semi-industrial longline fishery is an ongoing activity with a 95 -100% coverage for each fleet. On the other hand, the distant water industrial longliners rarely land in port Victoria, making monitoring of transhipments/ landing difficult. However, we do receive information on landing in foreign ports. Seychelles is also participating in the IOTC regional observer scheme to monitor transhipment at sea on carrier vessels. Data for the industrial longline fleet is currently being compile to be submitted to the IOTC secretariat.

Table 9a. Quantities (MT) by species landed in ports located in the IOTC area of competence by Seychelles Purse seine fleet.

		Species						
YEAR	**PORT**	**YFT**	**SKJ**	**BET**	**ALB**	**FRI**	**MIX**	**Grand Total**
2014	DIEGO SUAREZ	450	164	31				644
	PORT VICTORIA						15,488	15,488
2014 Total		**450**	**164**	**31**			**15,488**	**16,133**
2015	DIEGO SUAREZ	623	200	84				907
	PORT VICTORIA	382	138	66			26,269	26,854
	PORT LOUIS	866	943	140	1	2	0	1,951
2015 Total		**1,871**	**1,280**	**289**	**1**	**2**	**26,269**	**29,711**
2016	DIEGO SUAREZ	507	731	83				1,322
	PORT VICTORIA	1,874	1,508	132	1		12,997	16,513
2016 Total		**2,382**	**2,239**	**216**	**1**		**12,997**	**17,834**
2017	DIEGO SUAREZ						1,492	1,492
	PORT VICTORIA	737	292	67			12,768	13,863
	PORT LOUIS						389	389
2017 Total		**737**	**292**	**67**			**14,649**	**15,744**
2018	PORT VICTORIA	5,777	6,799	723				13,299
2018 Total		**5,777**	**6,799**	**723**				**13,299**

Table 10a. Quantities (MT) by species and gear transhipped in ports located in the IOTC area of competence by Seychelles Purse seine fleet

		Species						
Year	**PORT**	**YFT**	**SKJ**	**BET**	**ALB**	**FRI**	**MIX**	**Grand Total**
2014	MOMBASA	1,145	417	187		0		1,748
	PORT VICTORIA						40,315	40,315
2014 Total		**1,145**	**417**	**187**		**0**	**40,315**	**42,063**
2015	DIEGO SUAREZ	124	146	98	0		1,491	1,860
	PORT VICTORIA	648	228	55	2		50,637	51,570
2015 Total		**772**	**375**	**153**	**2**		**52,128**	**53,430**
2016	PORT VICTORIA	3,248	1,468	360	15		80,404	85,495
2016 Total		**3,248**	**1,468**	**360**	**15**		**80,404**	**85,495**
2017	DIEGO SUAREZ						5,946	5,946
	PORT VICTORIA	3,709	6,225	1,457	0		96,329	107,720
	PORT LOUIS						130	130
2017 Total		**3,709**	**6,225**	**1,457**	**0**		**102,406**	**113,796**
2018	DIEGO SUAREZ	311	815	357				1,483
	PORT VICTORIA	23,000	72,547	12,014				107,561
	PORT LOUIS	330	299	41				670
2018 Total		**23,640**	**73,662**	**12,413**				**109,715**

6.6. Actions taken to monitor catches & manage fisheries for Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish

Implementation is done through the terms and condition of the Certificate of Authorisation. Steps are on the way for the domestication of IOTC Conservation and Management Measures.

7.0 NATIONAL RESEARCH PROGRAMS

Currently there are no national research programmes being implemented which are relevant to tuna and tuna-like species.

7.1. National research programs on blue shark

Currently there are no such research project.

7.2. National research programs on Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish

The SFA is collaborating with the Seychelles Sport Fishing Club to undertake a tagging programme on Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish. As and when data become available, the information shall transmitted to the IOTC secretariat.

7.3. National research programs on sharks

Currently there are no such research project.

7.4. National research programs on oceanic whitetip sharks

Currently there are no such research project.

7.5. National research programs on marine turtles

Seychelles fishing Authority has participated in the EU led BIOFAD project on the purse seine fleet and is promoting the use of Non entangling and biodegradable FADs for the national fleet. More research are necessary in this area. **The** Authority is also collaboration on the FADWATCH project, aim at mitigating beaching and damage to coral reefs. See section 3 on Ecosystem and bycatch issues for more details**.**

7.6. National research programs on thresher sharks

Currently there are no such research project.

Table 8. Summary table of national research programs, including dates. [currently underway]
Example only

Project title	Period	Countries involved	Budget total	Funding source	Objectives	Short description

7. IMPLEMENTATION OF SCIENTIFIC COMMITTEE RECOMMENDATIONS AND RESOLUTIONS OF THE IOTC RELEVANT TO THE SC. [Mandatory]

Table 9. Scientific requirements contained in Resolutions of the Commission, adopted between 2011 and 2018.

Res. No.	Resolution	Scientific requirement	CPC progress
11/04	On a regional observer scheme	Paragraph 9	Seychelles exceed minimum requirement for coverage of the purse seine fleet. Data collected for this fleet is being analysed to be submitted to the secretariat. Seychelles is also investigating the possibility of expanding this programme onboard its industrial longline fleet. In port observations are undertaken on the small scale longline fleet.
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	Under the current fisheries legislation, it is illegal to fish, catch or kill green turtle and hawksbill turtle. Several marine turtle monitoring programmes are coordinated by a number of different non-governmental organisations to monitor turtle population in Seychelles. Data collected from observer programme on tuna purse seiners are currently being analysed. A new logbook catering for the reporting of interaction has been introduced for the industrial longline fleet.
12/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3–7	A new logbook which caters for the reporting of interactions by industrial longliners was introduced in July 2017. Furthermore, SFA's enforcement officers have been trained how to identify mitigation devices.
12/09	On the conservation of thresher sharks (family alopiidae) caught in association with fisheries in the IOTC area of competence	Paragraphs 4–8	Relevant fleet operators have been notified of the requirements of this resolution and thresher shark are not permitted to be retained. Implemented as Terms and condition of Certificate of Authorization as the dpmestication process of IOTC CMM's progress.
13/04	On the conservation of cetaceans	Paragraphs 7– 9	The Authority has informed vessels owners and operators of this resolution and prohibits intentionally setting a purse seine net around any cetacean in the IOTC area of competence. Moreover they have been instructed on the best practice guidelines for the safe release and handling of cetaceans, developed by the IOTC Scientific Committee, in case of incidental encirclement. It is also incorporated as term and condition on the Certificate of Authorization.
13/05	On the conservation of whale sharks (*Rhincodon typus*)	Paragraphs 7– 9	The Authority has informed vessels owners and operators of this resolution and prohibits intentionally setting a purse seine net around whale shark in the IOTC area of competence. Moreover they have been instructed on the best practice guidelines for the safe release and handling of whale shark, developed by the IOTC Scientific Committee. . It is also incorporated as term and condition on the Certificate of Authorization.
13/06	On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries	Paragraph 5–6	The relevant fleet (s) has been notified of the requirement of IOTC resolution 13/06 and the need to comply and report interactions. Logbooks have been modified to report interactions including releases.
15/01	On the recording of catch and effort by fishing vessels in the IOTC area of competence	Paragraphs 1–10	Seychelles has been annually providing the IOTC catch and effort data collected through mandatory logbook system on its purse seine, industrial longline and small scale longline fleets. Catch data for artisanal fishery are also provided to the secretariat in the required formats

Res. No.	Resolution	Scientific requirement	CPC progress
15/02	Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)	Paragraphs 1–7	Seychelles has been annually providing Nominal catch data as well as size frequency data to the IOTC for its purse seine, industrial longline and small scale longline fleets.
17/05	On the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 6, 9, 11	National rregulations place restrictions on the removal of fins of all species of shark on board of foreign-owned or local fishing vessels of a total length of 24 metres and above, fishing within or outside the Seychelles Waters. Where authorisation is granted, a ratio of not more that 5% in weight of shark fins to weight of shark carcasses without fins must be respected at all times onboard all Seychelles industrial longline fishing vessels greater that 24 meters in length, up to first point of landing.
18/02	On management measures for the conservation of blue shark caught in association with IOTC fisheries	Paragraphs 2-5	Revised logbook do cater for the reporting of capture. See table 4 for reported catches. Relevant data are also reported to the IOTC secretariat annually. Currently there are no ongoing research programme
18/05	On management measures for the conservation of the Billfishes: Striped marlin, black marlin, blue marlin and Indo-Pacific sailfish	Paragraphs 7 - 11	Revised logbook do cater for the reporting of capture. See table 4 for reported catches. Relevant data are also reported to the IOTC secretariat annually. Electronic tagging programme is being implemented with the help of NGO. Data to be made available to the Secretariat.
18/07	On measures applicable in case of non-fulfilment of reporting obligations in the IOTC	Paragraphs 1, 4	

8. LITERATURE CITED

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