Seychelles National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2020

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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 2020, final data for the 2019 calendar year must be provided to the Secretariat by 30 June 2020)	YES 30/06/2020
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 2020, preliminary data for the 2019 calendar year was provided to the IOTC Secretariat by 30 June 2020). **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 2020, final data for the 2019 calendar year must be provided to the Secretariat by 30 December 2020).	No 30/06/2020
If no, please indicate the reason(s) and intended actions: Data capture for Longline fisheries for year 2019 was delayed due to Fungus infestation issues in statistics offices and Covid19 pandemic. Preliminary data will be submitted to IOTC by 30th December 2020.	

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.

Over the past five years, the Seychelles purse seine fleet has remained the same comprising of 13 vessels. The number of supply vessels has decreased from 9 vessel is 2016 to 6 vessels in 2019. In 2019 the nominal effort increased slightly by 136 days (5%) when compared to the previous year to reach a total of 2,922 days fished whilst the catches decreased by 9% from 123,310 MT in 2018 to 112,621 MT in 2019 resulting in a mean catch rate of 38.54 MT/Fishing day. Catches of yellowfin tuna and skipjack tuna decreased by 6% and 10% respectively whilst catches of bigeye tuna increased by 1% when compared to the previous year.

The Seychelles Industrial longline fleet comprised of 58 vessels in 2019 compared to 54 vessels in 2018. The total catch reported by the industrial longline fleet for 2018 was estimated at 17,578 MT of which 5,855 MT consisted of yellowfin tuna. The estimated catch rate has remained more or less similar to the previous year estimated at 0.45 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 1,267 Mt representing a 9% increase compared to the previous year catches.

Similarly, 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. It should be highlighted that major delays were encountered in statistical operations for longline fishery for year 2019 due to technical and administrative related issues in late 2019 and Covid19 pandemic in early 2020. Hence statistics for the year 2019 for longline fisheries will not be presented in this report and will be communicated to the Secretariat later.

CONTENTS

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 2019 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 2015 to 2019. The number of Seychelles registered purse seiners has remained the same for the period 2015 to 2019. The number of supply vessel increased from 7 vessels to 9 vessels, from 2015 to 2016 and then decreased to 6 vessels in 2019. The Seychelles registered longliners increased from 38 vessels to 58 vessels during the period 2014 to 2019. An increasing trend was also observed in the number of registered small scale (semi-industrial) longline vessels from 9 vessels in 2014 to 36 vessels in 2019. It must be noted though that only 24 semi industrial vessel were authorised to fish outside the Seychelles EEZ and were hence registered on the IOTC List of Authorised Vessels.

Table1a. Number of Seychelles registered vessel for the period 2015 to 2019.

Year	Purse seiners	Supply vessels	Longliners	Semi-Industrial
2015	13	7	45	11
2016	13	9	46	29
2017	13	8	54	31
2018	13	7	54	30
2019	13	6	58	36

Table 1b. Seychelles registered vessels by size (GT) as reported to IOTC in 2019.

GT	Purse seiners	Supply vessels	Longliners	Semi-Industrial
<50	-		-	16
51-100	-		-	7
101-500	-	6	37	1
501-1000	-		21	-
>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 2015 to 2019 period. Trend analysis of the purse seine catches in Seychelles over the last 5 years shows that catches has been on an increasing trend from the year 2015 to 2018. In 2019, the catch decreased by 9% from 123,310 MT in 2018 to 112,621 MT in 2019 (Table 2a and Figure 1a)

The fishing effort in term of fishing days, has been on an increasing trend since 2015. Fishing effort increase from 3,264 days fished in 2015 to reach a total of 4,092 days fished in 2016. The fishing effort then decreased to reach 2,786 fishing days in 2018. In 2019, the fishing effort increased slightly by 5% to reach a total of 2,922 days fished.

Historically skipjack tuna dominated the catches of the Seychelles flagged purse seiners in the Western Indian Ocean (WIO). In 2019, skipjack was the dominant caught species, accounting for 65% of the total catch whilst yellowfin tuna made up 29% of the total catch of the Seychelles flagged purse seiners in WIO. Catches of yellowfin tuna decreased by 6% from 35023 MT in 2018 to 33,006 MT in 2019, catches of skipjack tuna decreased by 10% from 81,451 MT in 2018 to 72,917 MT in 2019 and catches of bigeye ,increased slightly by 1% from 6,450 MT to 6,538 MT.

Catch rate has increased from 26.55 Mt/Fishing days in 2016 to 44.25 MT/Fishing days in 2018. In 2019, the catch rate decreased to reach 38.54 Mt/Fishing.

Table 2a. Seychelles flag purse seine annual catch, fishing effort and catch rates reported between 2015 and 2019.

Year	Days Fished	Catch Rate	YFT	SKJ	BET	ALB	NEI	Total
2015	3,264	27.19	39,072	42,426	7,168	60	13	88,740
2016	4,092	26.55	40,121	60,991	7,325	110	65	108,613
2017	3,271	37.36	41,711	69,994	9,761	56	681	122,202
2018	2,786	44.25	35,023	81,451	6,450	13	373	123,310
2019	2,922	38.54	33,006	72,917	6,538	14	146	112,621

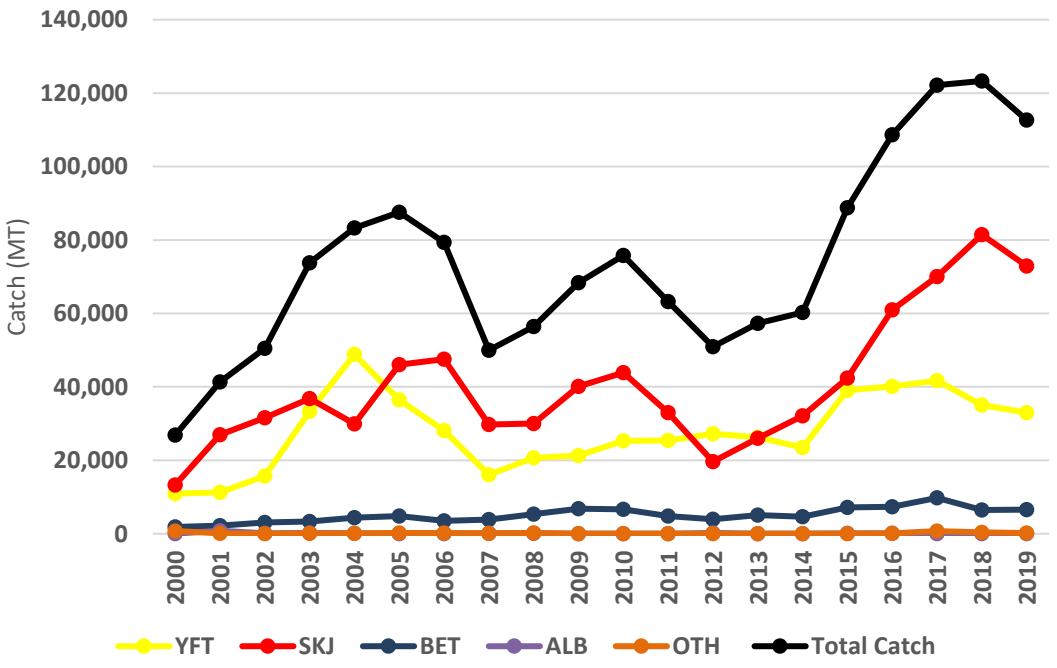
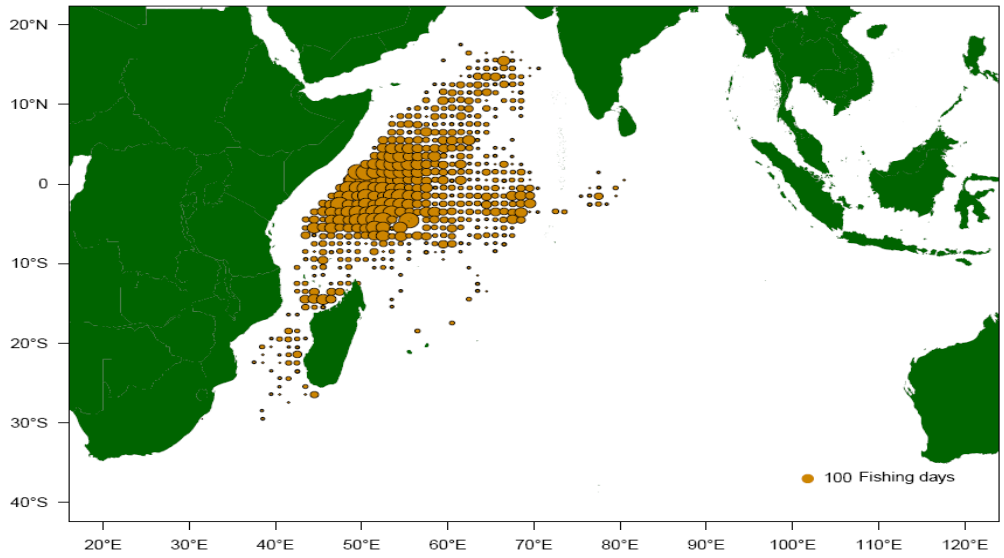


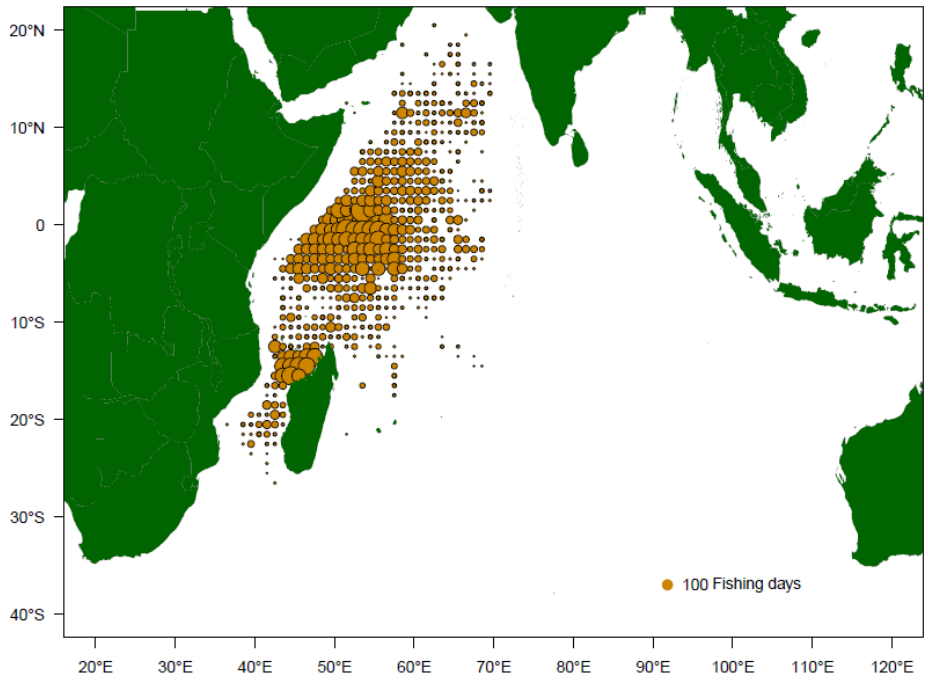
Figure 1a. Trends in annual catches by species for Seychelles' purse seine fleet reported for the period 2000-2019

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 2018, 2019 and for the previous 5 years (2015 – 2019) respectively.

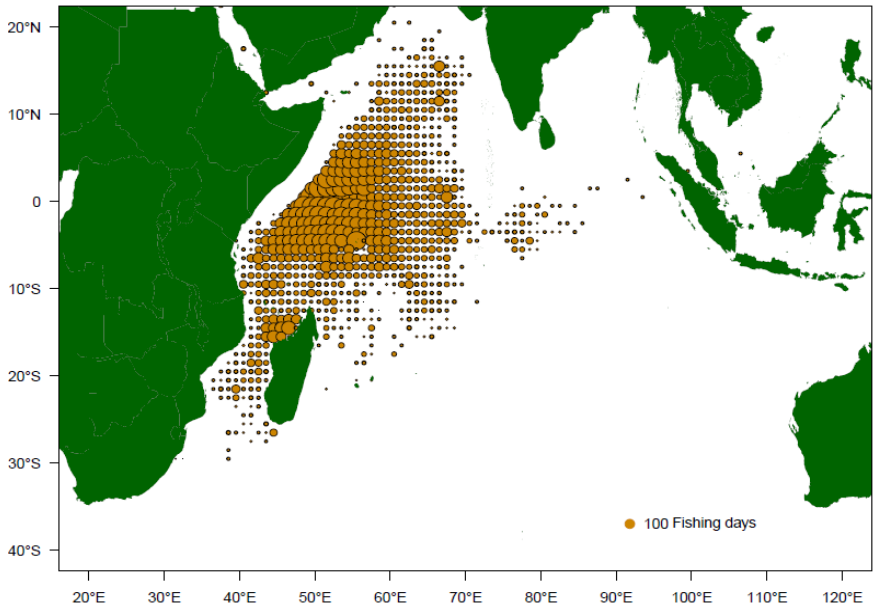
Map 3.1 a(i). Distribution of fishing effort (purse seine fleet) by 1º square, reported in 2018.



Map 3.1 a(ii). Distribution of fishing effort (purse seine fleet) by 1º square, reported in 2019.

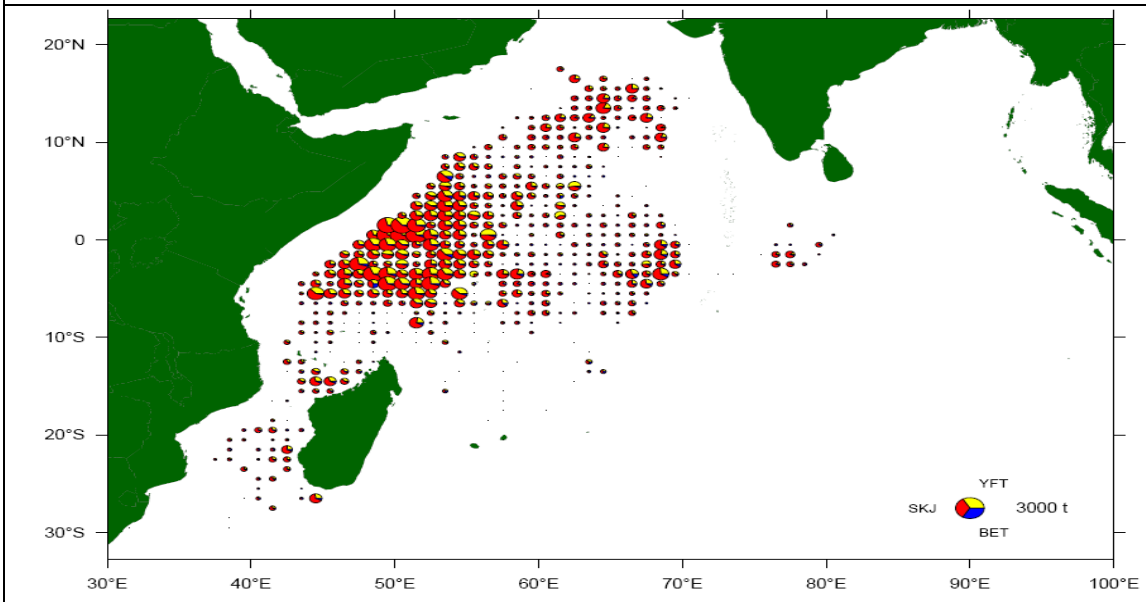


Map 3.1 a(iii). Distribution of fishing effort (purse seine fleet) by 1º square, previous 5 years (2015–2019).

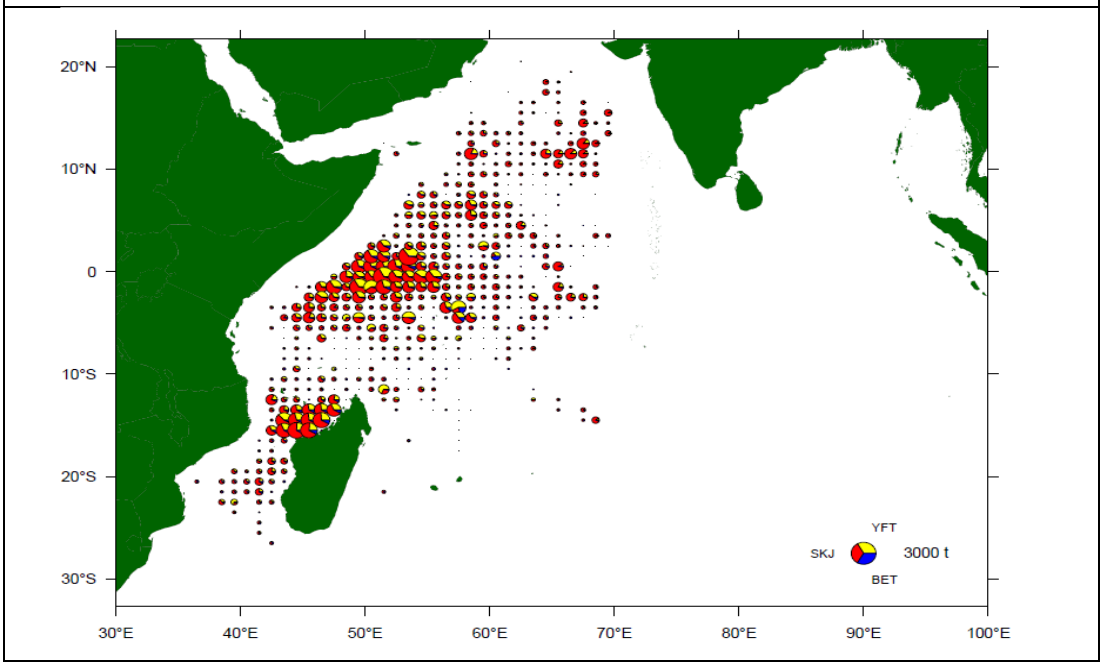


Maps 3.1 *b(i) , b(ii)* and *b(iii)* show the distribution of catches by 1º square reported by Seychelles purse seine fleet for 2018, 2019 and for the previous 5 years (2015 – 2019) respectively.

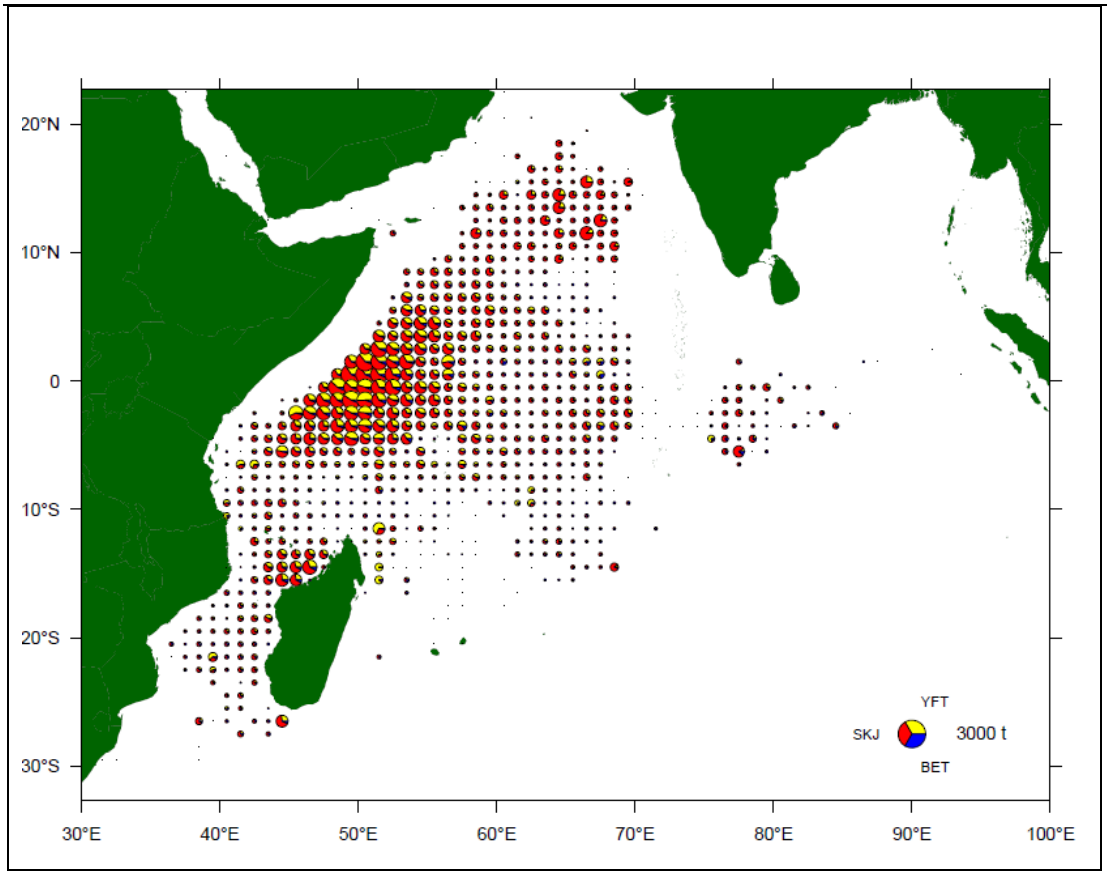
Map 3.1 b(i). Distribution of catch (purse seine fleet) by species by 1º square, reported in 2018.



Map 3.1 b(ii). Distribution of catch (purse seine fleet) by species by 1º square, reported in 2019.



Map 3.1 b(iii). Distribution of catch (purse seine fleet) by species by 1º square, previous 5 years (2015 – 2019).



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. It must be noted that major delays were encountered in statistical operations for longline fishery data for the year 2019 due to technical and administrative related issues in late 2019 and Covid19 pandemic in early 2020 and will hence not be presented in this report. SFA is doing its utmost to clear the backlog in the shortest possible timeframe and will update the secretariate accordingly.

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 12 % increase was recorded in the number of hooks set from 35.28 million hooks set in 2017 to 39.4 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 17,578 MT, representing an increase of 20% in catches, when compared to 2017 corresponding to the 12% increase 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 33% or 5,855 MT of the total catch, followed by bigeye tuna and the NEI category, representing 27% and 20% respectively. NEI consist of albacore, sailfish,

skipjack, and oil fish. The reported catch of bigeye tuna and NEI category decreased by 6% and 20% respectively whilst catches of yellowfin tuna, swordfish, marlins and shark increased by 71%, 52%,20% and 97% 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 0.42MT/1000 hooks in 2017. It increased slightly in 2018 to reach 0.45MT/1000 hooks.

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	5,834	1,621	1,238	436	1,083	12,518
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	39.42	0.45	5,855	3,680	2,227	1,086	1,198	3,533	17,578

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

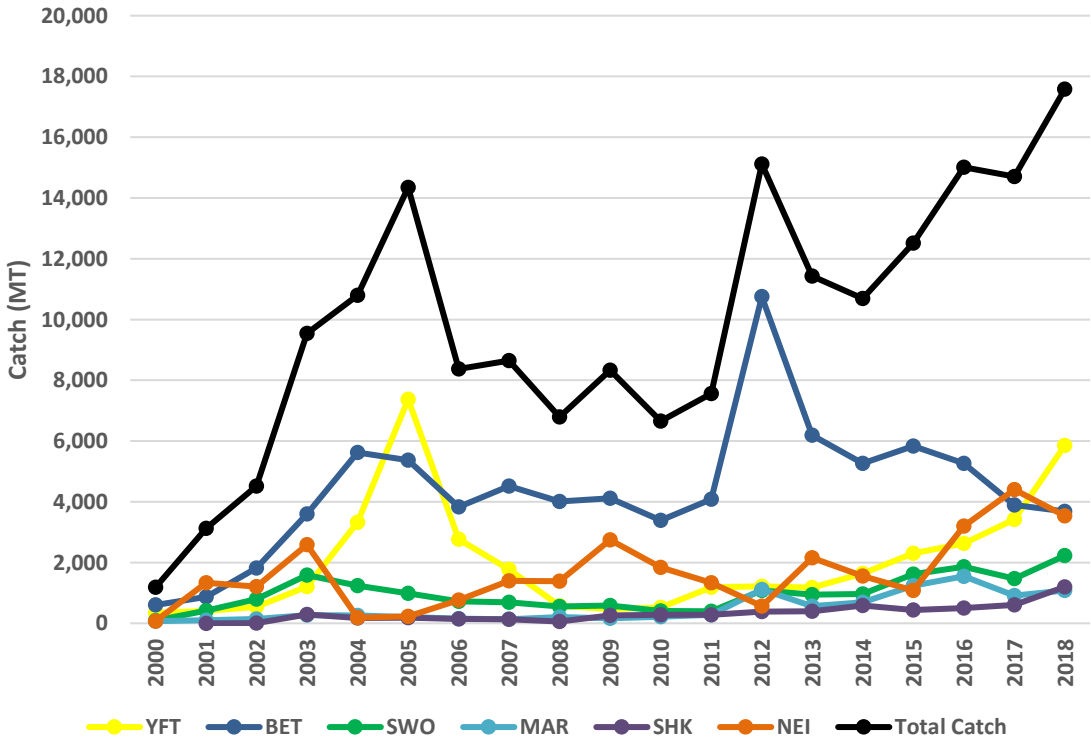
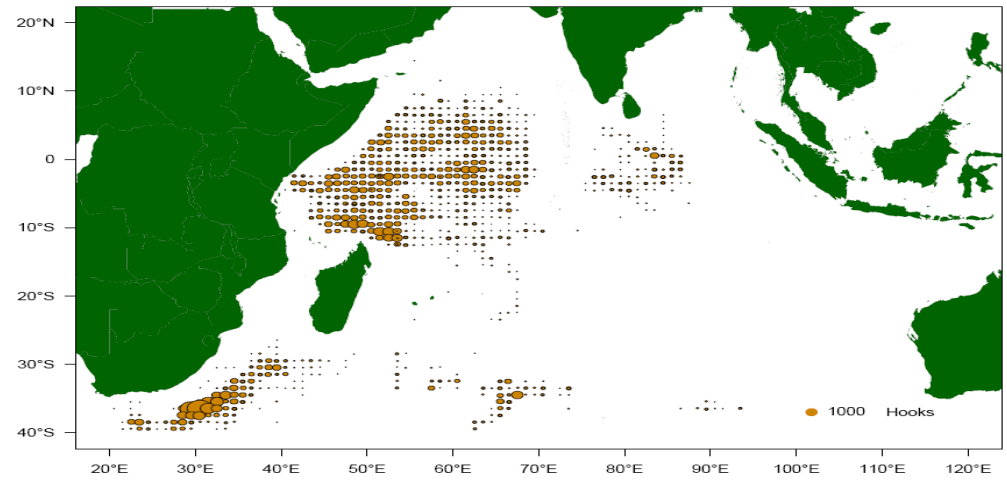


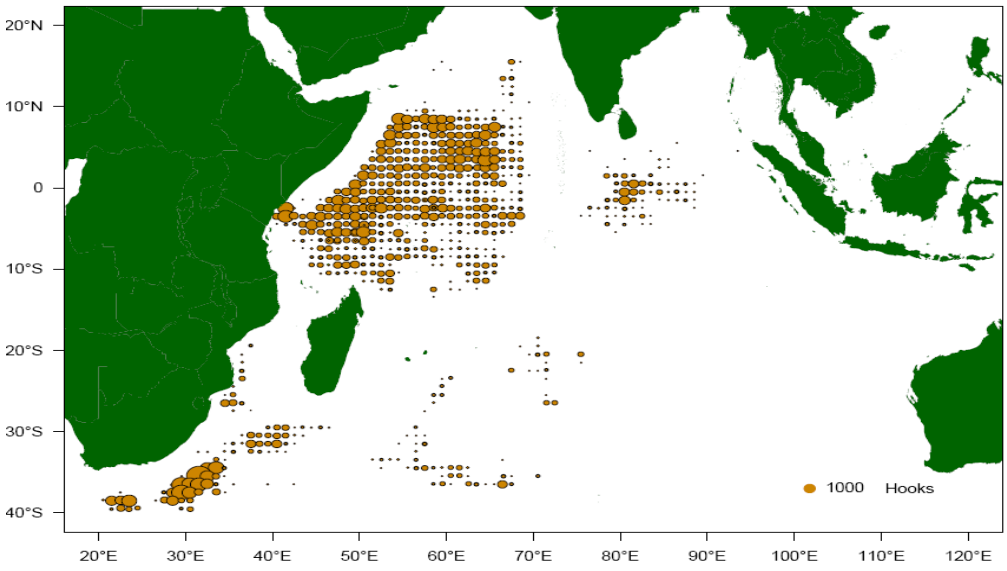
Figure 2a. Trends in annual catch by species reported by the Seychelles industrial longline fleet for period 2000-2018

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.

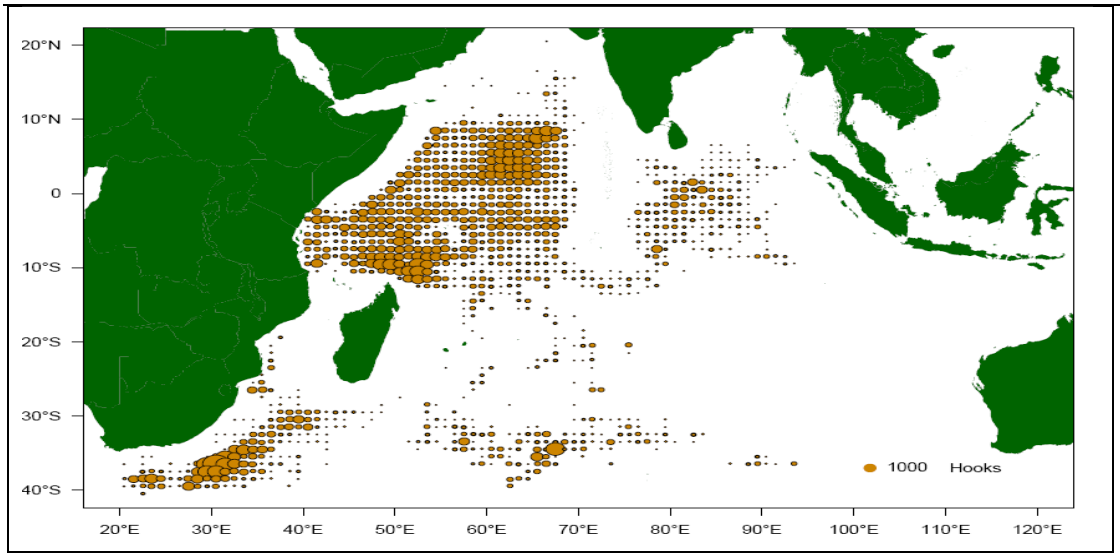
Map 3.2 a(i). Distribution of fishing effort (industrial LL fleet) by 1º square, reported in 2017.



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

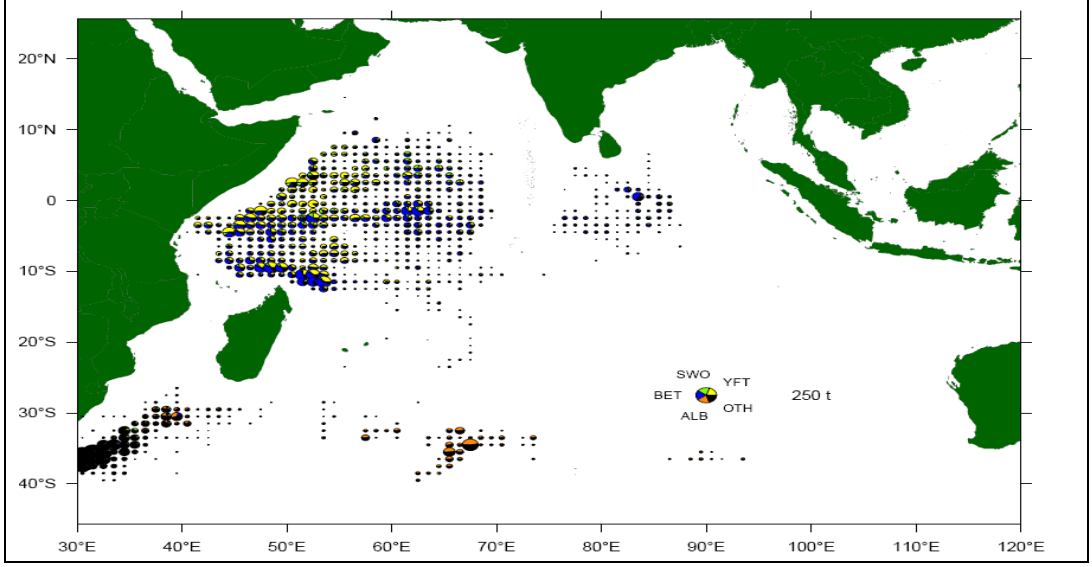


Map 3.2 a(iii). Distribution of fishing effort (industrial LL fleet) by 1º square, previous 5 years (2014 – 2018).

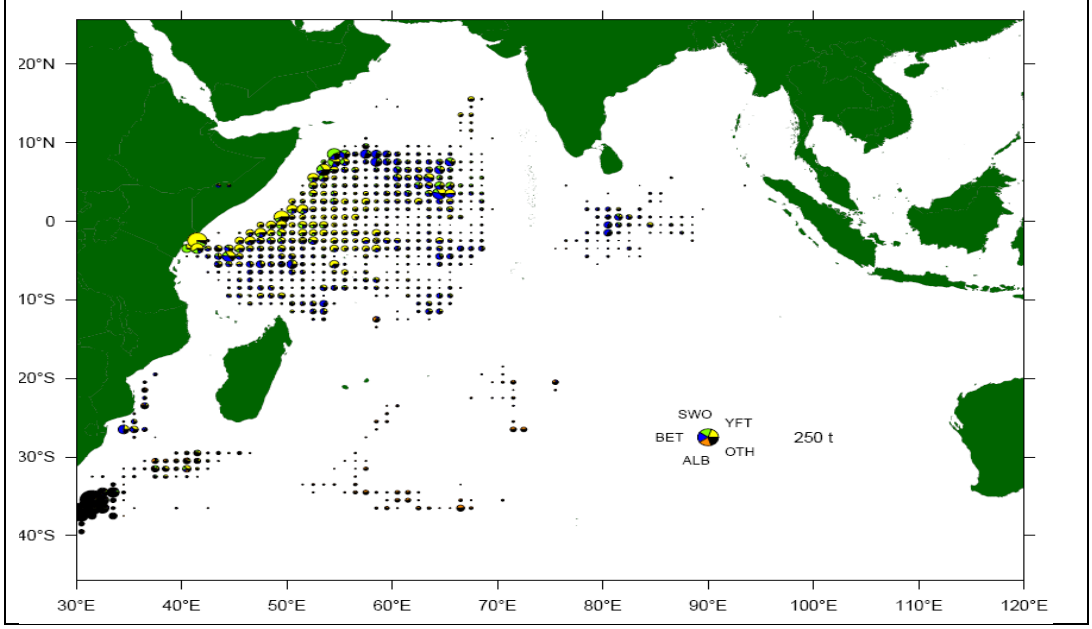


Map 3.2 b(i), b(ii) and b(iii) show the distribution of catches by species by 1° square reported by Seychelles' industrial longline fleet for 2017, 2018 and the previous 5 years (2014 – 2018) respectively.

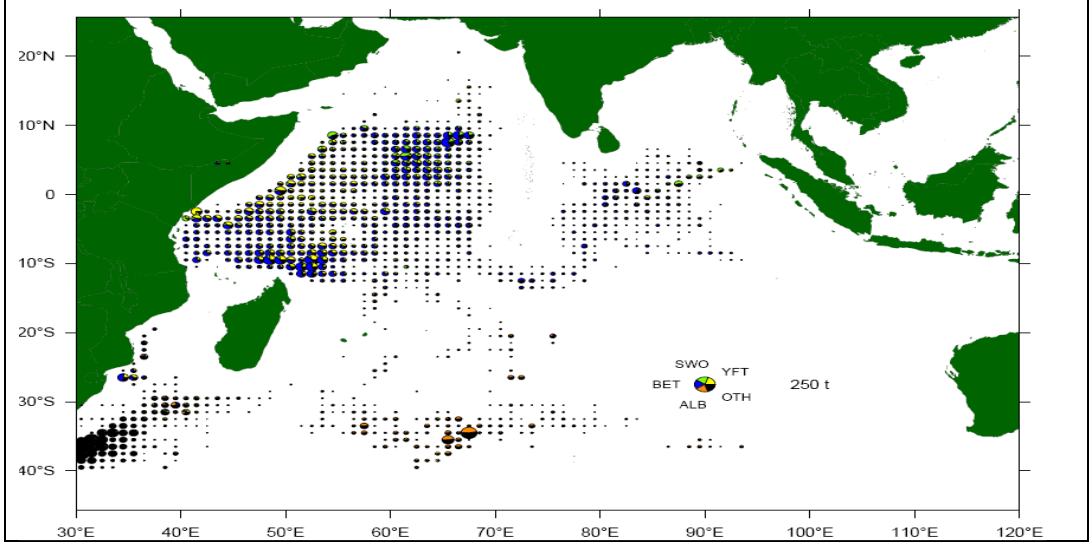
Map 3.2 b(i). Distribution of catch (industrial LL fleet) by species by 1º square, reported in 2017.



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. Similar to the Industrial longline fishery major delays were

encountered in statistical operations for this fishery with data for the year 2019 as a result of technical and administrative related issues in late 2019 and Covid19 pandemic in early 2020. Consequently data for the semi industrial for 2019 will not be presented in this report. SFA is doing its utmost to clear the backlog in the shortest possible timeframe and will update the secretariate accordingly.

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 398 % to reach a total of 970 Mt. 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 1,267 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	0	82
2015	205,505	0.95	98	33	47	5	11	1	0	195
2016	1,234,642	0.79	576	130	185	20	53	2	2	969
2017	2,052,804	0.57	740	117	215	24	60	2	6	1162
2018	2,153,119	0.59	831	112	229	20	69	1	5	1267

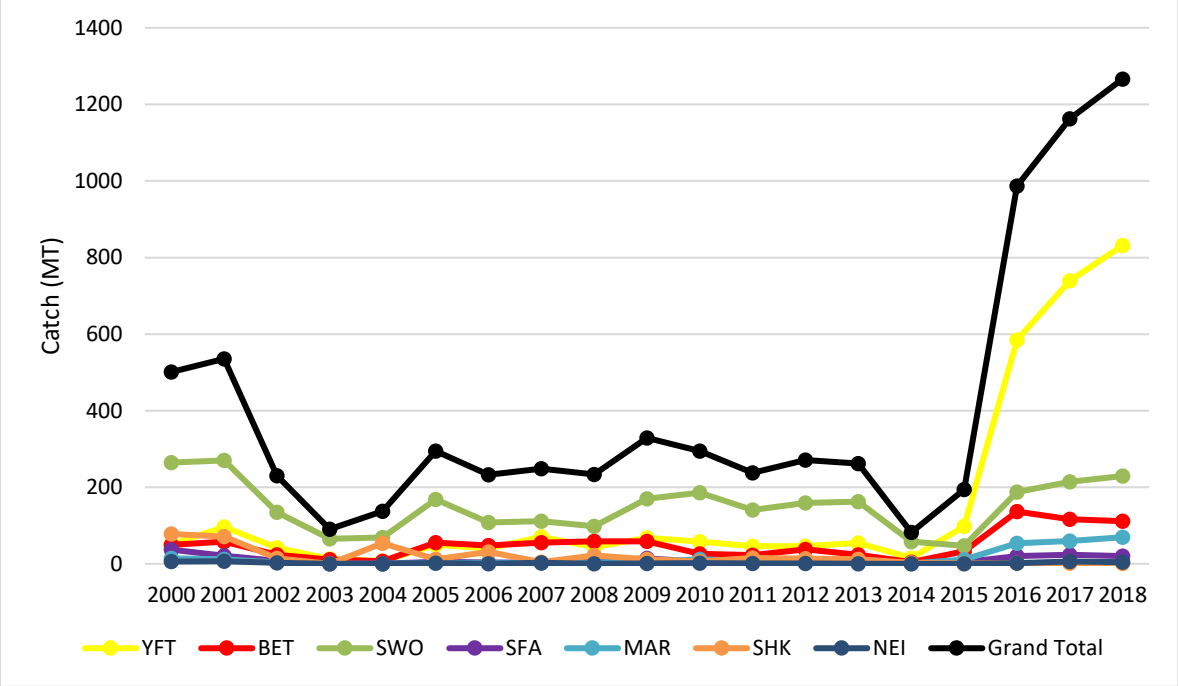


Figure 1c. Trends in annual catch by species reported by the Semi Industrial longline fleet between the period 2000 and 2018.

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.

The November 2017 boat frame survey of the Seychelles domestic fleet recorded a total of 1,115 boats of which 742 were commercial fishing boats, 168 hire-crafts (sports fishing) and 116 recreational boats.

The implementation of a licensing framework for the domestic fishery to improve the management of the domestic fishery, which was scheduled for early 2020, has been delayed due to the Covid-19 pandemic. Work is in progress and it is expected that implementation will begin in semester one of 2021. Its implementation will improve the management of this sub-sector and will include mandatory data reporting as condition of licencing.

5. ECOSYSTEM AND BYCATCH ISSUES

In close collaboration with the industry, the Seychelles have developed, implemented and collaborated on various 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:

- Seychelles purse seiners continued their involvement in the 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 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.

- Seychelles observer programme on Seychelles purse seiners and support vessels which was initiated in 2014, continued during 2019. The programme is co-funded by the industry through the Code of Good Practices. Mandatory coverage and data reporting requirement have been met for this fishery.

- 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

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

Seychelles fishery. Three vessels were 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. Data analysis and audit of the programme is expected to be undertaken in 2021.

- 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 was extended from the 15 purse seiners affiliated to OPAGAC to the 42 purse seiners under the SIOTI. The programme is presented in the IOTC document IOTC-2018-WPEB14-12;

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 2016-2020. The plan will be reviewed in 2021.

5.1.1. Sharks finning regulation , 2006

The (Shark Finning) Regulation, 2006 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; Seychelles prohibits the removal of shark fins from fresh shark on board its vessels as well as the landing, retention on-board, transhipment and carrying of shark fins which are not naturally attached to the fresh shark carcass until the first point of landing.

For Frozen shark, for safety purpose fins can be removed, however 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 on-board 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.

5.1.2 Blue shark

Seychelles has revised logbook for its fleet targeting tuna and tuna-like species in the IOTC area of competence to cater for the capture of catches of blue sharks as well as to record any interaction of blue shark with the fishing gear. Data for the year 2019 are still being processed and will be reported to the secretariat before December 31st 2020.

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 2014–2018).

	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	0	0	2	0	0	0	2,221	99	13,273	583
2015	6,826	319	1,136	56	0	0	0	0	0	0	0	0	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	0	0	0	0	20	1	1,837	44	16,193	607
2018	22,173	1,006	2,916	135	3	0	2	0	0	0	0	0	1,582	57	26,676	1,198

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 2014–2018).

	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	53	54		107
2018 Total			**111**	**154**	**19**	**284**

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. Reporting started in 2019 and the data are currently being processed and will be reported to the secretariat before the 31st December 2020.

To complement data received from logbook, Seychelles is assessing the feasibility of EMS on those vessels and an EMS pilot project was initiated in late 2019 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 bycatch and discarded and monitor transhipments at sea.

(Table 5). Data reported in 2019 is being compiled and will be submitted to the IOTC secretariat.

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** (number of hooks)
2014	6	2,333,972
2015	4	1,610,334
2016	10	6,063,322
2017	21	10,574,114
2018	19	7,659,397

5.3 Marine Turtles

A total of seven interactions were reported in 2019 by observers deployed on-board the Seychelles purse seine fleet

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

date	time	longitude	latitude	scientific_name	fate_label
1/20/2019	7:20:34	55.23	7.03	Eretmochelys imbricata	Discarded alive
4/7/2019	2:35:54	46.93	-13.6	Eretmochelys imbricata	Discarded alive
4/8/2019	6:15:54	46.93	-14.12	Eretmochelys imbricata	Discarded alive
4/25/2019	7:50:51	45.92	-3.62	Caretta caretta	Discarded alive
5/22/2019	3:30:50	42.8	-15.75	Chelonia mydas	Discarded alive
11/5/2019	5:50:28	58.07	7.15	Lepidochelys olivacea	Discarded alive

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

There were no reported interaction with whale shark in 2019, compared to 2 interactions recorded 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 validated with landing, transhipment, and VMS data when available. Scientific port sampling for size distribution and species composition exist for the Purse seine 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 IOTC area of competence 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 implemented.

6.3. Observer programme

A total of 398 fishing trips were observed on Seychelles purse seiners during 2014-2019. This represents about 10,000 days of observation at sea with more than 9,500 fishing sets observed, with a total catch of 301,856 MT of tuna and tuna-like species. Over the years, observer coverage has generally improved both in terms of quality and quantity. In 2019, 69% of all Seychelles purse seine fishing sets were observed, representing ~1,700 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. Figures based on datasets in central database.

Year	Trips	Days at sea	Sets	Catch (mt)
Purse Seiner				
2014	7	173	1,32	3,153
2015	66	1,988	1,641	42,667
2016	68	2,026	1,917	44,162
2017	97	2,146	2,079	67,890
2018	93	1,996	1,998	84,477
2019	67	1,767	1,826	59,507

Percentage Coverage (Observe database/Logbook data)

year	trips	days	sets	catch
2014	8.54	8.07	7.20	5.23
2015	54.55	60.04	55.78	48.09
2016	43.31	49.16	45.87	40.68
2017	65.54	64.23	57.16	55.88
2018	69.40	69.38	67.59	68.72
2019	48.55	87.56	54.06	52.80

In regards to the trip coverage, there has been gradual improvement ever since the launch of the program in 2014. However, for 2019, since there is an issue with the uploading of datasets in the central database, this contributes to the decrease in coverage. Most datasets were retrieved after the 2019 trips, it is just a question of uploading them.

Figures based on actual deployments (Seychelles Flag)

Year	No. of Vessels	Trips	Days at sea	Average no. of days at sea per trip	No. of observers	Trip per observer
Purse seiners						
2014	4	4	151	37.8	4	1
2015	13	71	2,809	39.5	46	1.5
2016	13	100	3,495	35	44	2.3
2017	13	92	2,536	27.6	27	3.4
2018	13	101	2,627	26	35	2.8
2019	13	94	2,733	29.1	31	3

Based on the actual deployment figures, there has been significant change since the launch of the program in 2014. The first two years of the program can be allocated to the learning process. The number of trips was relatively low for the number of observers. For example, in 2015, 71 trips were done by 46 observers for an average of 1.5 trip. The following year, 2016, 100 trips were done by 44 observers. The observer pool was quite big and it did not necessarily equate good data quality retrieved. In 2017 to 2019, the observer pool stabilised around 30 individuals were they each did 3 trips on average annually. A smaller group of observers lead to better control over the data quality.

In conclusion, there is a notable gap between the number of deployment figures and the database figures. There are two main explanations for this. One is due to the simple fact that some datasets are not complete. This is usually the case with newly trained observers who are not fully used to the software and are still grasping the complexity involved in collecting the data when the fishing set is underway. Two, datasets for the recent years have been retrieved but have not yet been uploaded to the central database and hence are not accounted for in the figures. This is because we have been encountering major issues in having an updated server, database and everything that a database management system entails. The smooth running of the database requires that the whole system is up to date so that it can properly upload the datasets and do the necessary checks. The latter has greatly affected the 2019 figures. We hope to work on these shortcomings by building capacity so that in future submissions such issues are lessened.

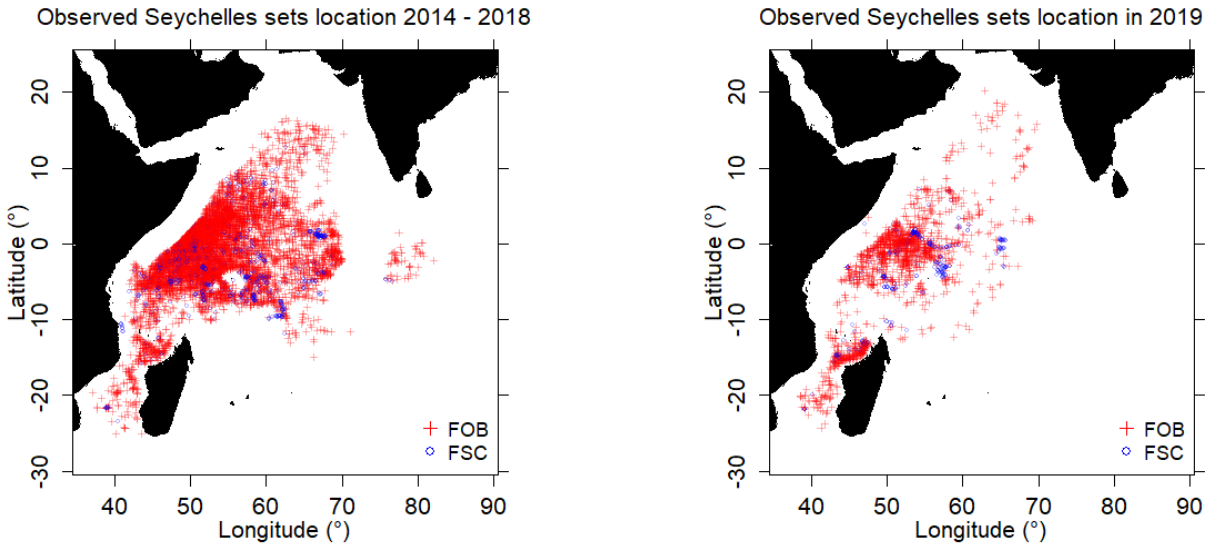


Fig. 4. Map showing spatial distribution of the fishing sets observed onboard Seychelles purse seiners during (left 2014-2018) and right 2019. FOB = School associated with drifting floating object; FSC = Free Swimming School.

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 for the period 2015 to 2019

		Number of fish Counted							
Year	Number of Trips	ALB	BET	FRI	KAW	LTA	SKJ	YFT	Grand Total
2015	68	335	9,035	197	5		63,776	54,454	127,802
2016	72	100	6,384	773	89		72,989	39,775	120,110
2017	50		6,580	1,803	71		55,794	26,138	90,386
2018	69	1	8,474	4,173	692	4	127,571	41,706	182,621
2019	57		8,219	2,840	9		119,431	39,871	170,370

Table 7b. Number of individuals fish measured for Seychelles registered purse seiners for the period 2015 to 2019.

Number of fish measured								
Year	ALB	BET	FRI	KAW	LTA	SKJ	YFT	Grand Total
2015	335	9,035	197	5		19,700	54,454	83,726
2016	100	6,384	773	89		20,550	39,775	67,671
2017		6,580	1,803	71		15,500	26,138	50,092
2018	1	8,474	4,173	692	4	34,200	41,706	89,250
2019		8,211	2,840	9		30,142	39,713	80,915

Table 7c. Number of individuals measured for Seychelles small scale longliners for the period 2014 to 2018

	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.

Total		Species						
Year	PORT	YFT	SKJ	BET	ALB	FRI	MIX	Grand Total
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**
2019	PORT VICTORIA	6,172	8,888	2,956			24	18,040
	PORT LOUIS	161	32	5			2	200
2019 Total		**6,333**	**8,920**	**2,961**			**25**	**18,240**

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

Total		Species						
Year	PORT	YFT	SKJ	BET	ALB	FRI	MIX	Grand Total
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**
2019	DIEGO SUAREZ	302	1,067	206				1,574
	PORT VICTORIA	24,534	50,213	11,139	3	51	316	86,256
	PORT LOUIS	209	430	27				667
	MADAGASCAR	893	3,084	393				4,370
2019 Total		**25,939**	**54,793**	**11,764**	**3**	**51**	**316**	**92,867**

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.

Gillnet observer coverage and monitoring

The gillnet fishery is restricted to coastal waters and target small pelagic such as sardinella and mackerels. Coverage is done through enumerators on landing sites.

6.8 Sampling plans for mobulid rays [Mandatory]

Seychelles has not initiated the drafting of it sampling plans for the monitoring of the mobulid rays catches in its artisanal and subsistence fisheries. This is expected to be completed in early 2021.

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 national research program on blue shark.

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 national research program on shark other than the usual data collection programs .

7.4. National research programs on oceanic whitetip sharks

Currently there are no research project on oceanic whitetip sharks.

7.5. National research programs on marine turtles

Turtle monitoring programs were implemented, starting in the early 1970s, throughout the country and proved to be a highly effective conservation tool.Today there are almost 20 such programmes operating in the Seychelles. Essentially the same monitoring protocols have been employed at all sites, which makes the data collected comparable for scientific analysis. The Seychelles Fishing Authority is currently collaborating with the Department of Environment to compile a report on ongoing research on marine turtles. The report will be submitted to the IOTC secretariat during 2021.

7.6. National research programs on thresher sharks

Currently there are no research project on thresher sharks.

Table 8. Summary table of national research programs, including dates.

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.

Table 9. Scientific requirements contained in Resolutions of the Commission, adopted between 2011 and 2019.

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 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. 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	
19/01	On an Interim Plan for Rebuilding the Indian Ocean Yellowfin Tuna Stock in the IOTC Area of Competence	Paragraph 22	The IOTC Secretariat was notified on 04.05.2020 of the individually allocated quota system, introduce new e-logbook and transhipment forms, increase scientific and port inspection, revised licence condition provide penalties for non-compliance
19/03	On the Conservation of Mobulid Rays Caught in Association with Fisheries in the IOTC Area of Competence	Paragraph 11	The drafting of a plan to monitor catches of Mobulids Rays in artisanal and subsistence fisheries will be initiated in 2021.

8. LITERATURE CITED

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