

Seychelles National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2022

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

<p>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 2022, final data for the 2021 calendar year must be provided to the Secretariat by 30 June 2022)</p>	<p>YES 30/06/2022</p>
<p>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 2022, preliminary data for the 2021 calendar year was provided to the IOTC Secretariat by 30 June 2022).</p> <p>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 2022, final data for the 2021 calendar year must be provided to the Secretariat by 30 December 2022).</p>	<p>YES 30/06/2022</p>
<p>If no, please indicate the reason(s) and intended actions:</p>	

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 2021 in comparison with previous years. It also summarizes research, and data collection related activities as well as actions undertaken in 2021 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 8 vessel in 2017 to 4 vessels in 2021. In 2021 the nominal effort decreased slightly by 195 days (6%) when compared to the previous year to reach a total of 3,027 days fished corresponding to a 9% increase in catches from 112,621 MT in 2020 to 122,885 MT in 2021. This resulted in a higher catch rate of 40.60 MT/ fishing day in the year 2021 compared to 34.84 MT/ fishing day during the previous year. Catches of yellowfin tuna decreased by 4% whilst catches of bigeye tuna and skipjack tuna increased by 91% and 8% respectively when compared to the previous year.

The Seychelles Industrial longline fleet comprised of 64 vessels in 2021 compared to 62 vessels in 2020. The total catch reported by the industrial longline fleet for the year 2021 was estimated at 14,526 MT of which 3,064 MT consisted of yellowfin tuna. The estimated catch rate estimated at 0.36 Mt/1000 hooks for the year 2021 was lower than the previous year (0.55 Mt/1000 hooks).

In 2021, the total catches by the Semi industrial vessels increased by 18% to reached 1,759 MT compared to 1,485 Mt the previous year. This corresponds to an increase of 36% in fishing effort thus giving a mean catch rate of 0.64 MT/ 1000 hooks for the year 2021 compared to 0.73 MT/ 1000 hooks for the previous year.

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 effort were made in the year 2021 to clear the backlog in longline fishery for years 2019 and 2020 resulted from technical and administrative related issues in late 2019 and the Covid19 pandemic in early 2020.

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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 km² 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 transshipments, 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 transshipment, making it difficult to obtain good logbook coverage, transshipment/ landings as well as size frequency data. The Seychelles is however participating in the regional Observer Scheme to monitor transshipment 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 2021 to implement Scientific Committee recommendations and IOTC's Conservation and Management Measures (CMM's).

2. FLEET STRUCTURE

Table 1a. Shows the number of Seychelles registered purse seiners, supply vessels, industrial and semi-industrial longliners for the period 2016 to 2020. The number of Seychelles registered purse seiners has remained constant at 13 vessels for the period 2017 to 2021. The number of supply vessel decreased from 8 vessels to 4 vessels, from 2017 to 2021, and down to 3 vessels by March 2021. The number of Seychelles registered longliners increased from 54 vessels in 2017 to 64 vessels in 2021. An increasing trend was also observed in the number of registered small scale (semi-industrial) longline vessels active from 31 vessels in 2017 to 41 vessels in 2021. It must be noted though that only 15 semi-industrial vessels were authorised to fish outside the Seychelles EEZ in 2021 and were hence registered on the IOTC List of Authorised Vessels.

Table1a. Number of Seychelles registered vessel for the period 2017 to 2021.

Year	Purse seiners	Supply vessels	Longliners	Semi-Industrial
2017	13	8	54	31
2018	13	7	55	30
2019	13	6	57	36
2020	13	5	62	35
2021	13	4	64	42

Table 1b. Seychelles registered vessels by size (GT) as reported to IOTC in 2021.

GT	Purse seiners	Supply vessels	Longliners	Semi-Industrial
<50	-	-	-	35
51-100	-	-	-	7
101-500	-	4	43	-
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 2017 to 2021 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 2017 to 2018 followed by a drop during the period 2019 and 2020. In the year 2021, a total catch of 122,885 MT was reported, compared to the total catch of 112,231 MT reported in 2020 (Table 2a and Figure 1a).

The fishing effort in term of fishing days, shows that following a drop in 2017 from 3,271 fishing days to 2,786 fishing days in 2018, fishing effort has since then been increasing to reach a total of 3,221

days fished in the year 2020. A slight drop was recorded in the fishing effort in 2021 to a total of 3,027 fishing days.

Historically skipjack tuna dominated the catches of the Seychelles flagged purse seiners in the Western Indian Ocean (WIO), a trend which continued in 2021, where skipjack accounted for 66% of the total catch, whilst yellowfin tuna made up 24% of the total catch of the Seychelles flagged purse seiners in WIO. Comparing the period 2020 to 2021, the catches of yellowfin tuna decreased by 4% from 30,502 MT to 29,407 MT, whilst that for skipjack tuna increased by 8% from 75,486 MT to 81,390 MT and that for bigeye tuna increased by 91% from 5,893 MT to 11,230 MT. It must be noted that data for year 2021 was not processed with the T3 Software like for previous years due to technical issues with the software. Hence the data is based on logbook declarations and landing records with no species composition correction as done for previous years.

Catch rate increased from 37.36 Mt/Fishing days in 2017 to 44.25 MT/Fishing days in 2018, followed by a decreasing trend to 34.84 Mt/Fishing days in the year 2020. In 2021 catch rate increased to reach 40.60 Mt/Fishing days.

Table 2a. Seychelles flag purse seine annual catch, fishing effort and catch rates reported between 2017 and 2021.

Year	Days Fished	Catch Rate	YFT	SKJ	BET	ALB	NEI	Total
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
2020	3,221	34.84	30,502	75,486	5,893	8	342	112,231
2021	3,027	40.60	29,407	81,390	11,230	29	829	122,885

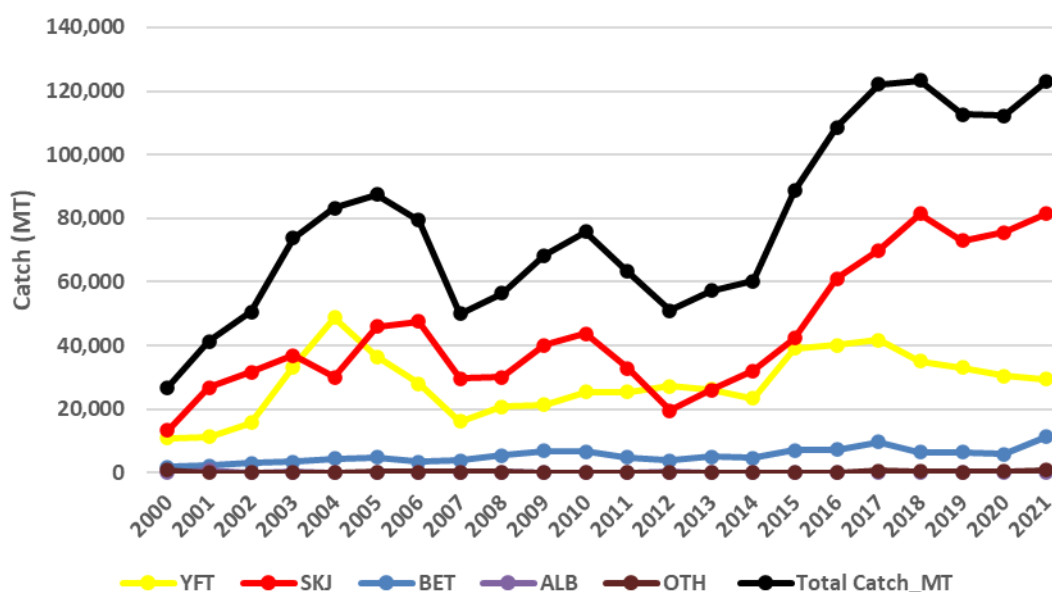
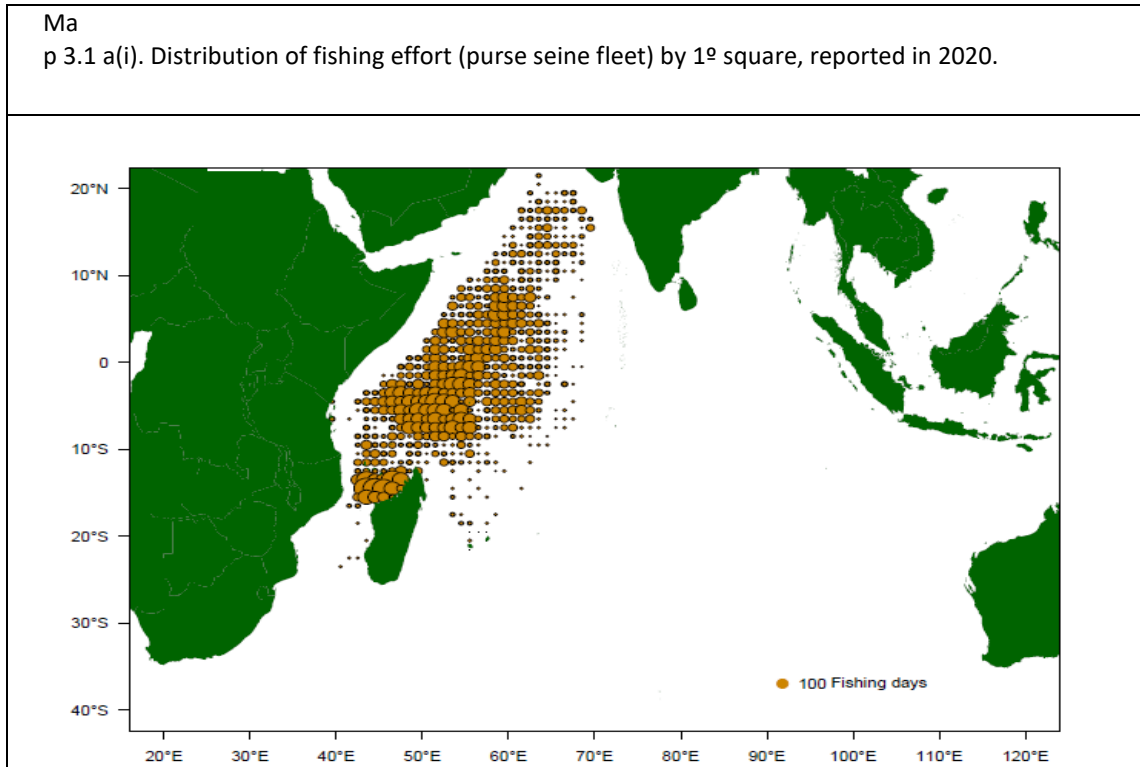
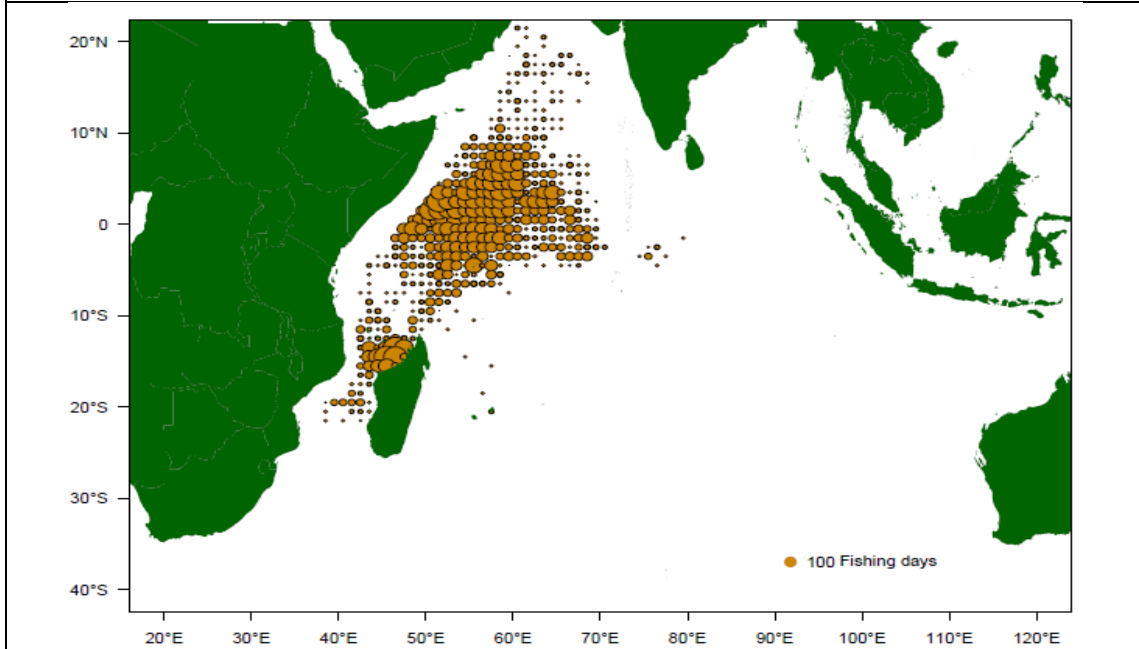


Figure 1a. Trends in annual catches by species for Seychelles' purse seine fleet reported for the period 2000-2021

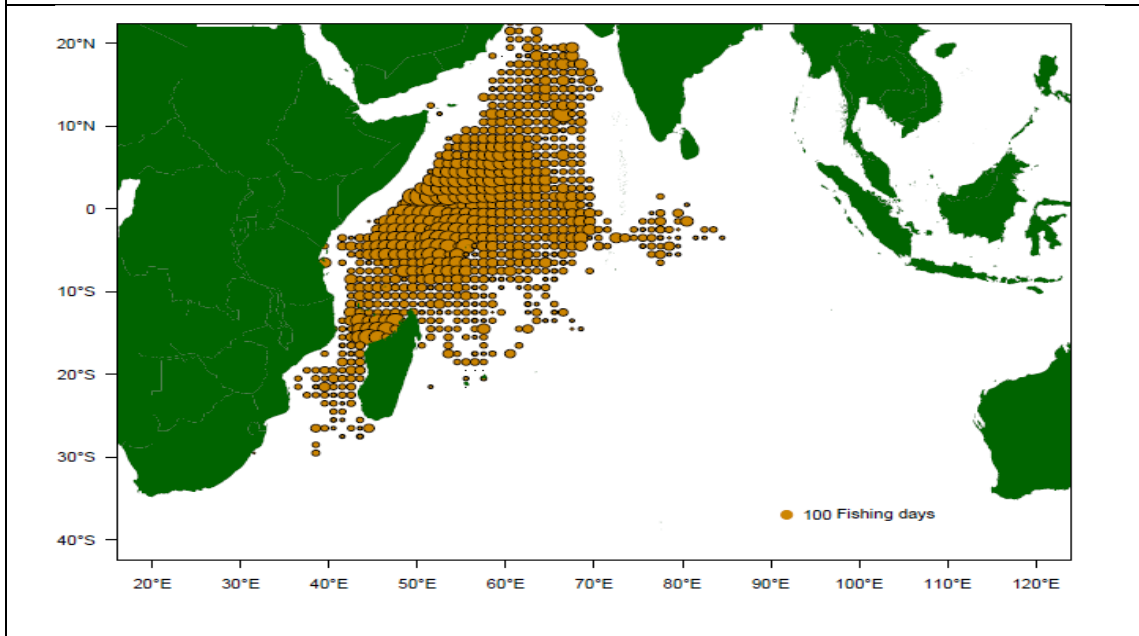
Maps 3.1 *a(i)*, *a(ii)* and *a(iii)* show the distribution of fishing effort by 1° square reported by Seychelles purse seine fleet for 2020, 2021 and for the previous 5 years (2017 – 2021) respectively.



Map 3.1 a(ii). Distribution of fishing effort (purse seine fleet) by 1° square, reported in 2021.

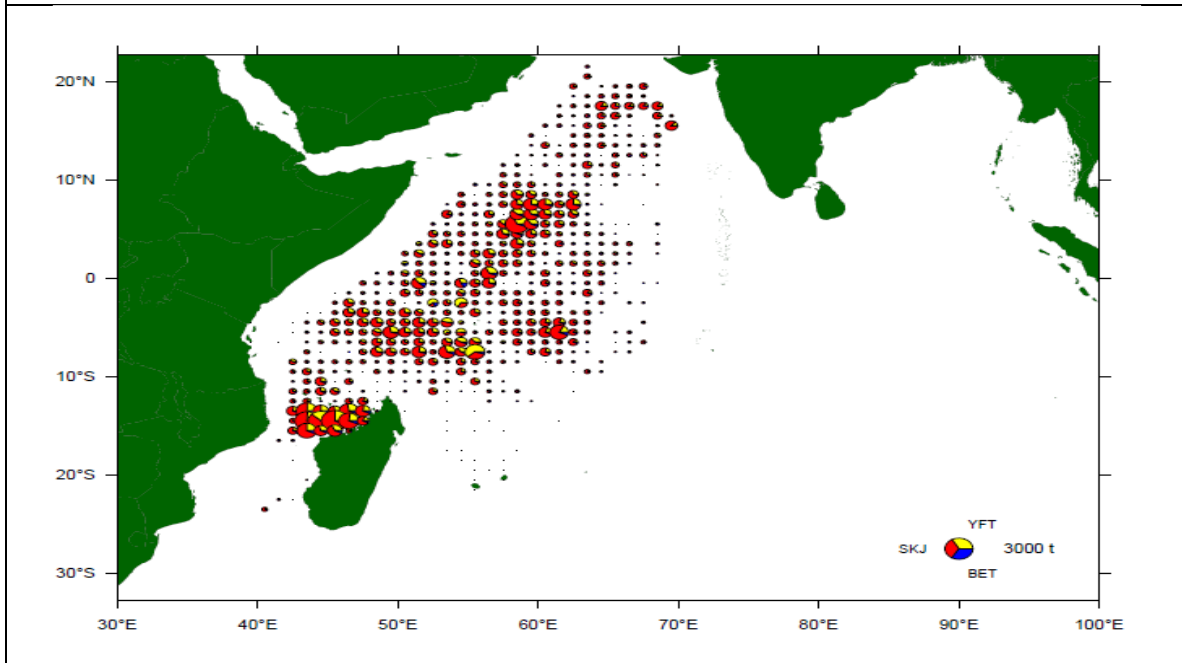


Map 3.1 a(iii). Distribution of fishing effort (purse seine fleet) by 1° square, previous 5 years (2017–2021).

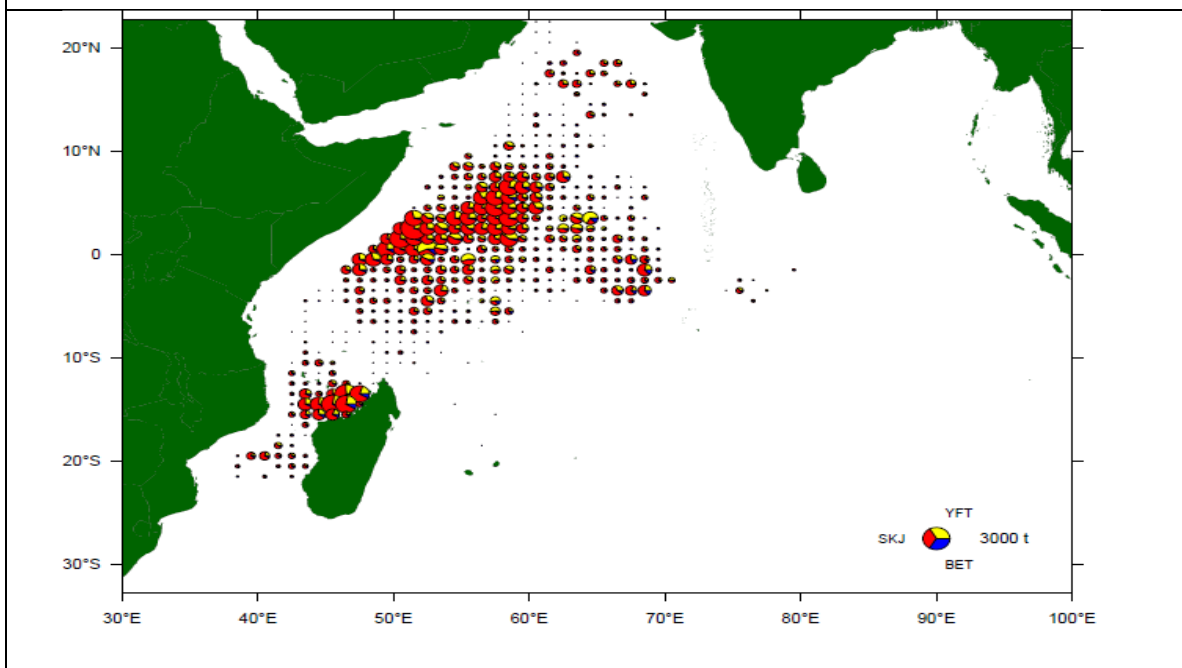


Maps 3.1 *b(i)*, *b(ii)* and *b(iii)* show the distribution of catches by 1° square reported by Seychelles purse seine fleet for the years 2020, 2021 and for the previous 5 years (2017 – 2021) respectively.

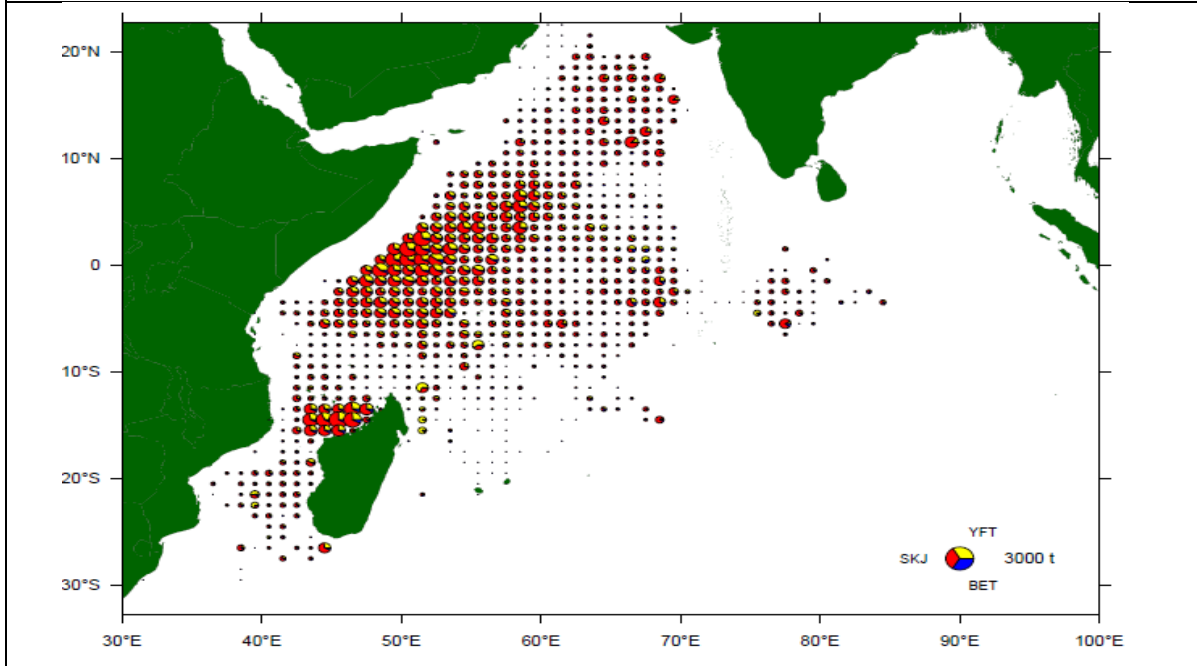
Map 3.1 *b(i)*. Distribution of catch (purse seine fleet) by species by 1° square, reported in 2020.



Map 3.1 *b(ii)*. Distribution of catch (purse seine fleet) by species by 1° square, reported in 2021.



Map 3.1 b(iii). Distribution of catch (purse seine fleet) by species by 1° square, previous 5 years (2017 – 2021).



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 2017 to 2021. The reported fishing effort in terms of the number of hooks set has been on an increasing trend for the period 2017 to 2020. However, a 2 % decrease was recorded in the number of hooks set in the year 2021, estimated at 39.86 million hooks set, compared to 40.55 million hooks set in 2020.

The total catch increased from 14,709 MT in 2017 to 22,469 MT in 2020. For the year 2021, the Seychelles registered industrial longliners reported an estimated catch of 14,526 MT, representing a decrease of 35% in catches, when compared to the previous year.

Since 2018 yellowfin tuna dominated the catches of the Seychelles flagged industrial longline fleet operating in the Western Indian Ocean (WIO). However, in 2021 bigeye tuna was the dominant species caught by this fleet with an estimated catch of 5,826 MT caught accounting for 40% of the total catch, followed by NEI category and yellowfin tuna, representing 24% and 21% respectively. NEI consist of mostly oil fish, albacore and sailfish. During 2021, decreased in catches were reported for all species when compared to the previous year.

The catch rate been on an increasing trend from 0.42MT/1000 hooks in 2017 to reach 0.58MT/1000 hooks in 2019 and has since then been on a decreasing trend, reaching 0.36MT/1000 hooks in 2021.

Table 2b. Annual catch, fishing effort and catch rates reported by Seychelles industrial longline fleet from the years 2017 – 2021

Year	Fishing Effort (million hooks)	Catch rate (MT/1000 hooks)	YFT	BET	SWO	MAR	SHK	NEI	Total
2017	35.28	0.42	3,423	3,897	1,468	908	607	4,400	14,704
2018	39.37	0.45	5,845	3,675	2,223	1085	1197	3,531	17,558
2019	39.15	0.58	8,978	5,265	2,090	753	1,293	4,486	22,866
2020	40.55	0.55	7,775	7,391	1,721	654	904	4,025	22,469
2021	39.86	0.36	3,064	5,826	1,100	408	578	3,550	14,526

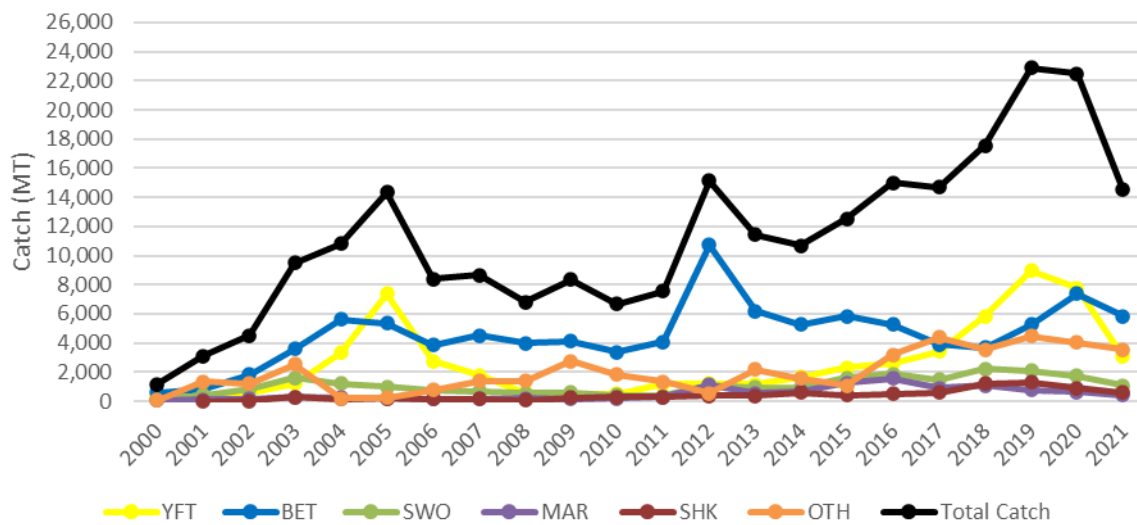
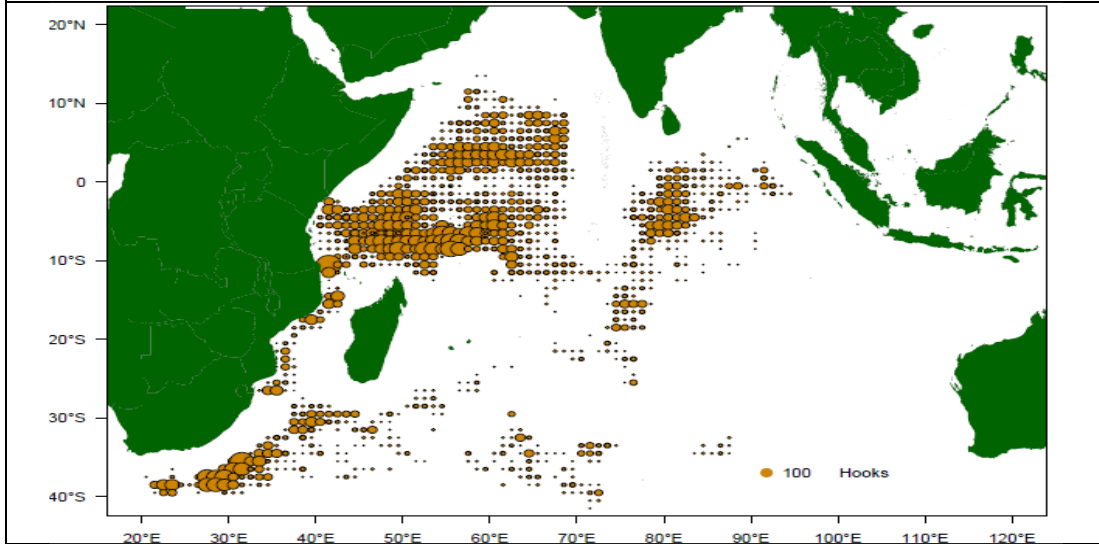


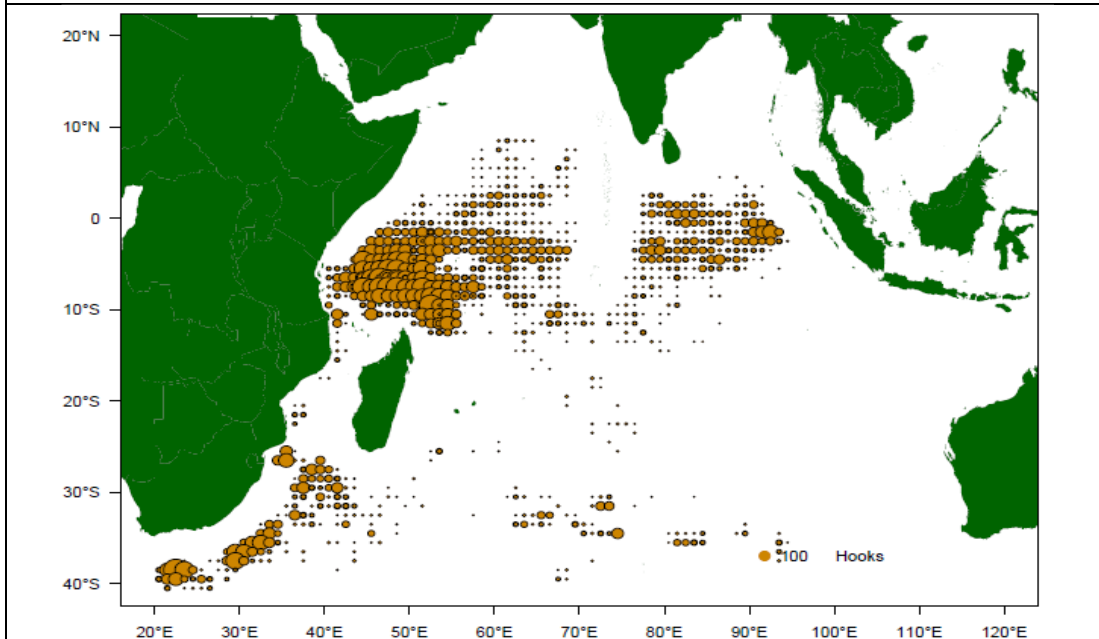
Figure 2a. Trends in annual catch by species reported by the Seychelles industrial longline fleet for period 2000-2021

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 the years 2020, 2021 and the previous 5 years (2017 – 2021) respectively.

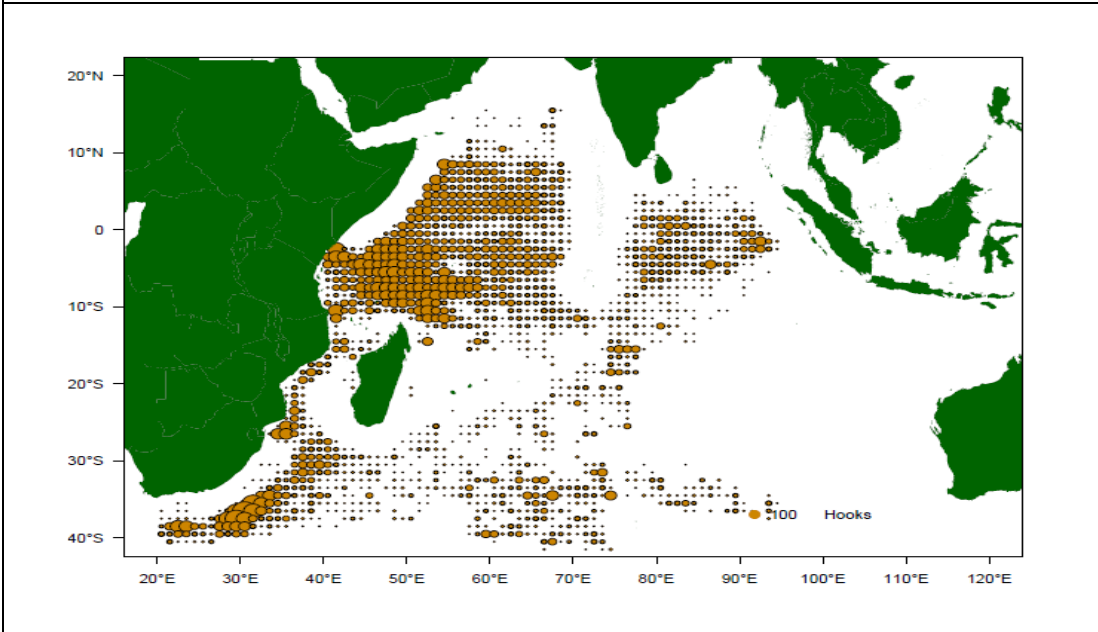
Map 3.2 a(i). Distribution of fishing effort (industrial LL fleet) by 1° square, reported in 2020.



Map 3.2 a(ii). Distribution of fishing effort (industrial LL fleet) by 1° square, reported in 2021.

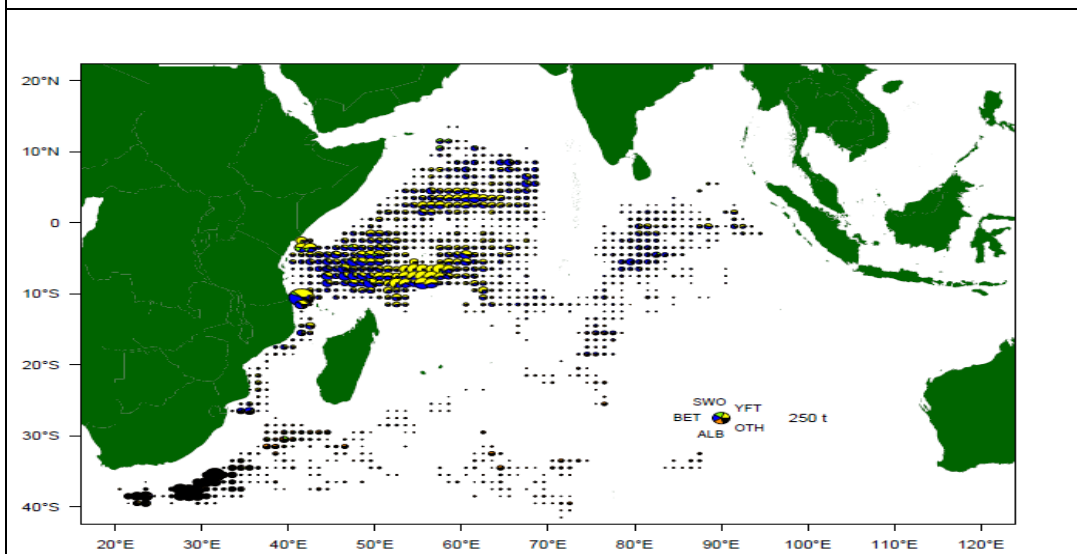


Map 3.2 a(iii). Distribution of fishing effort (industrial LL fleet) by 1° square, previous 5 years (2017 – 2021).

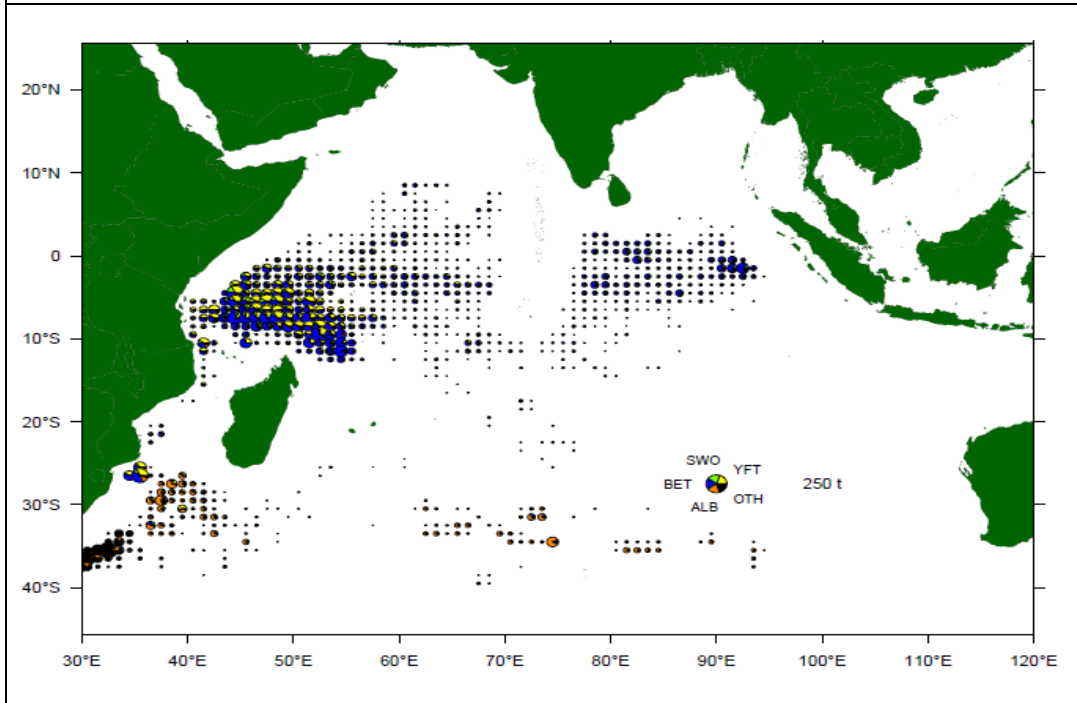


Map 3.2 b(i), b(ii) and b(iii) show the distribution of catches by species by 1° square reported by Seychelles’ industrial longline fleet for the years 2020, 2021 and the previous 5 years (2017 – 2021) respectively.

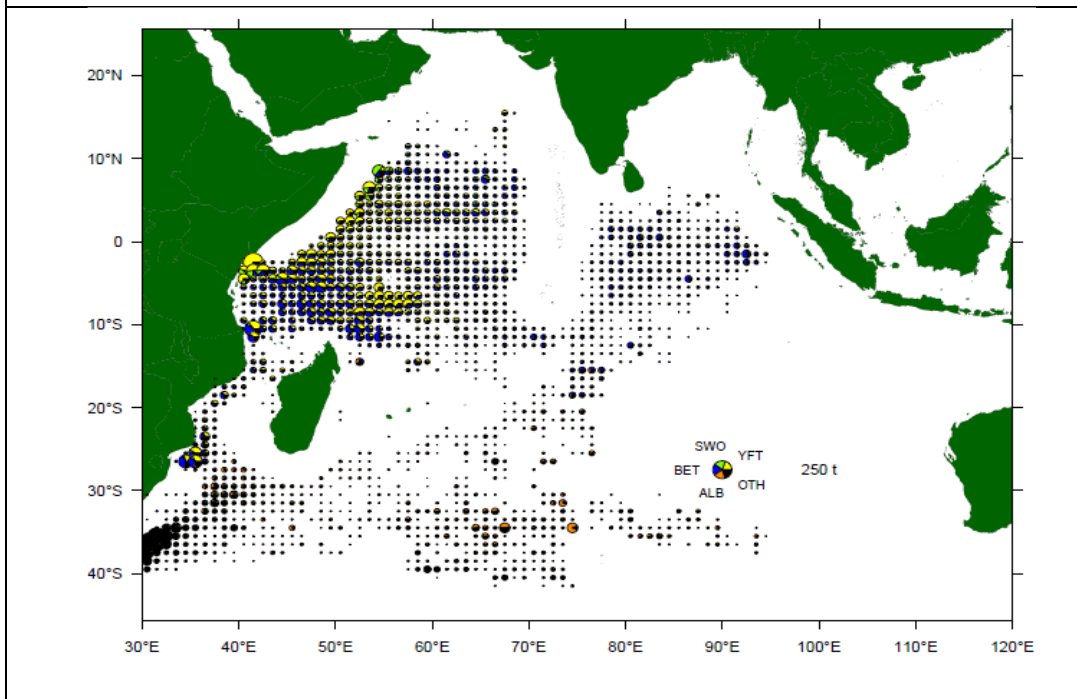
Map 3.2 b(i). Distribution of catch (industrial LL fleet) by species by 1° square, reported in 2020.



Map 3.2 b(ii). Distribution of catch (industrial LL fleet) by species by 1° square, reported in 2021.



Map 3.2 b(iii). Distribution of catch (industrial LL fleet) by species by 1° square, previous 5 years (2017 – 2021).



3.3 Semi Industrial Fishery

Table 2c summarizes the fishing activities of the locally based small scale (semi-industrial) longline fleet from 2017 to 2021. The fishing effort in terms of hooks set, has been on an increasing trend since 2017 to reach of 2.55 million hooks set in the year 2019, followed by a drop to reach 2.03 million hooks in 2020. In 2021, an increase of 36% was reported in the number of hooks set estimated at 2.76 million hooks when compared to the previous year.

The total catches increased from 1,108 MT in 2017 to a record catch of 2008 MT in the year 2019, followed by a 26% decrease in 2020, to reach 1,485 MT. During the year 2021, the semi industrial fishery reported a total catch of 1,759 MT representing an increase of 18% in catches compared to 2020.

Between 2017 and 2019, the catch rate estimated for the semi industrial fleet, increased from 0.54 MT/1000hooks in 2017 to 0.79 MT/1000hooks followed by a decreasing trend to reach 0.64MT/1000hooks in 2021.

Historically swordfish has been the main target species of the semi-industrial longline fishery. However, since 2015, yellowfin tuna replaced swordfish as the dominant species caught by this fleet. In the year 2021 yellowfin tuna accounted for 89% of the total catch followed by swordfish and bigeye tuna accounting for 6% and 3% respectively.

Table 2c. Catch, fishing effort and catch rates reported by the semi industrial longline fleet between 2017 and 2021.

Year	Effort (Million Hooks)	Catch rate (MT/1000 hooks)	YFT	BET	SWO	SFA	MAR	SHK	NEI	Total
2017	2.06	0.54	711	116	191	24	58	2	6	1108
2018	2.07	0.61	833	113	226	20	70	1	4	1,267
2019	2.55	0.79	1507	119	313	13	55	-	2	2,008
2020	2.03	0.73	1,277	55	135	3	7	-	7	1,485
2021	2.76	0.64	1,572	50	99	17	14	1	7	1,759

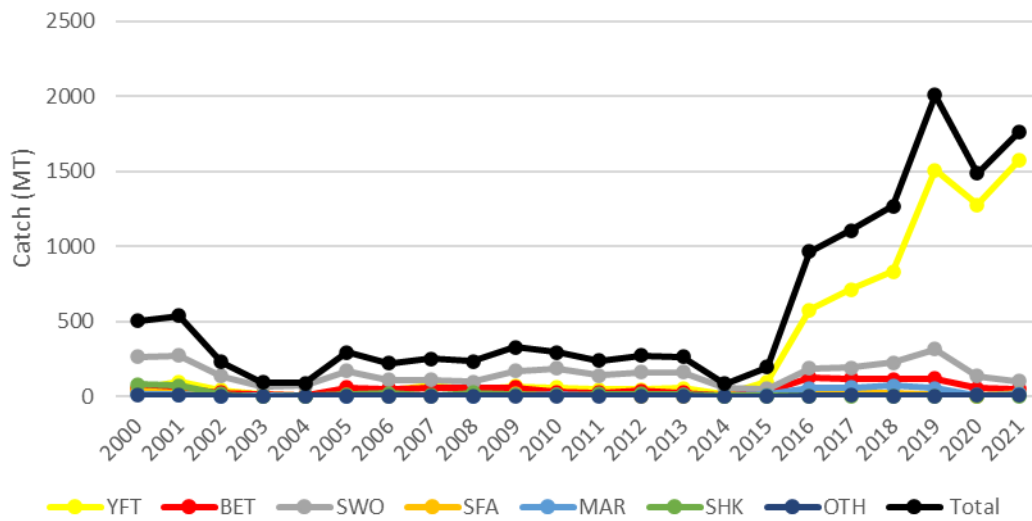


Figure 3c. Trends in annual catch by species reported by the semi industrial longline fleet between the period 2000 and 2021.

4. RECREATIONAL FISHERY

There is an important recreational fisheries subsector active mostly on 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 their management, which was scheduled for early 2020, delayed due to the Covid-19 pandemic. The process has now been initiated, to address the recommendations of the Mahe Plateau Trap and line Fishery Co-management plan.

The implementation of a licensing framework will will improve the management of this sub-sector and will include mandatory data reporting requirement as one of the license condition.

5. ECOSYSTEM AND BYCATCH ISSUES

- Seychelles purse seiners continued their involvement in the Fisheries Improvement Project (FIP) SIOTI¹ 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 to support the Code of Good Practices project. 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 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 transshipments at sea. Implementation of the program was initiated in 2021, with currently 100% coverage for the purse seine vessels, using two main systems as negotiated with the fleet companies. There are ongoing negotiations with the longline vessel companies for the implementation of the EMS systems as well as the use of electronic logbooks.
- 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 was presented in the IOTC document IOTC-2018-WPEB14-12;
- A fisher survey was conducted during 2021 with the collaboration of SFA and the FAO -Area Beyond National Jurisdiction, (ABNJ) project on the Abandoned, Lost or Otherwise Discarded Fishing Gear (ALDFG) program to estimate rates, levels and causes of the ALDFG. The report is expected to be ready in 2022. The survey covered the Seychelles industrial purse seine and semi-industrial longline fleet.

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

5.1 Sharks

5.1.1. NPOA sharks

The Seychelles Fishing Authority reviewed its National Plan of Action for the Conservation and management of Sharks (NPOA) 2007-2011 of which a new five (5) year plan for the period 2016-2020 was developed. The plan was to be reviewed in 2021, however given the lack of capacity at the SFA, it was not implemented. The work programs are still relevant to the current situation, and thus the timeline has been extended for another five (5) years.

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, transshipment 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 than 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. Implementation is done through the conditions of the Certificate of Authorisation.

5.1.3. Blue shark

Seychelles has revised the logbook for its fleet targeting tuna and tuna-like species in the IOTC area of competence to cater for recording catches of blue sharks as well as any interaction of the species with the fishing gear.

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 2017–2021).

Year	Blue shark		Mako sharks		Porbeagle		Hammerhead sharks		Thresher sharks		Oceanic whitetip shark		Silky Shark		Various sharks NEI		Total NO	Total MT	
	NO	MT	NO	MT	NO	MT	NO	MT	NO	MT	NO	MT	NO	MT	NO	MT			
2017	12380	482	1948	80	9	0	0	0	0	0	0	20	1	0	0	1837	44	16193	607
2018	22154	1006	2915	135	3	0	2	0	0	0	0	0	0	79	2	1503	55	26657	1197
2019	24034	1014	3370	153	0	0	0	0	0	0	0	0	0	4147	112	416	14	31966	1293
2020	16482	707	2539	108	0	0	8	0	0	0	0	0	0	2931	89	1	0	21961	904
2021	10634	462	1379	64	0	0	0	0	0	0	0	0	0	1852	53	0	0	13866	578

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 2017–2021).

Year	Blue shark		Mako sharks		Oceanic whitetip shark		Hammerhead sharks		Tiger sharks		Various sharks NEI		Porbeagle		Total NO	Total MT
	NO	MT	NO	MT	NO	MT	NO	MT	NO	MT	NO	MT	NO	MT		
2017	1	0.5	3	0.1	1	0	10	0.2	7	0.1	99	1.6	0	0	121	2
2018	0	0	1	0	1	0.1	2	0	0	0	50	0.6	0	0	54	0.8
2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	3	0.1	5	0.1	4	0.02	0	0	3	0.1	5	0.2	3	0.1	23	0.6

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 2020–2021).

Year	Species Code	Scientific Name	Discarded Status			Grand Total
			Alive	Dead	Unknown	
2020	BSH	<i>Prionace glauca</i>	468	273	1	742
	MAK	<i>Isurus spp</i>	10	125		135
	THR	<i>Alopias spp</i>	24	6		30
	FAL	<i>Carcharhinus falciformis</i>	45	133		178
	POR	<i>Lamna nasus</i>		1		1
2020 Total			547	538	1	1086
2021	BSH	<i>Prionace glauca</i>	981	735		1716
	MAK	<i>Isurus spp</i>	69	34		103
	THR	<i>Alopias spp</i>	28	15		43
	FAL	<i>Carcharhinus falciformis</i>	16	27		43
	POR	<i>Lamna nasus</i>	1	3		4
	PSK	<i>Crocodile shark</i>	1			1
2021 Total			1096	814		1910

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 in the WIO. Reporting started in 2019 and the relevant data are submitted to the IOTC secretariat.

To complement data received from logbook, Seychelles has started the implementation of the EMS on vessels, with 100% coverage for the purse seine fleets. Ongoing negotiations are underway with the longline fleet companies for the implementation of the EMS as well as the use of electronic logbooks.

Table 5. Total number of seabird, released/discarded by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2020–2021).

Year	Species	ALIVE	DEAD	Unknown	Grand Total
2020	Seabird NEI	23	16	1	40
2021	Seabird NEI	55	79		134

Table 5b: Number of longline fishing vessel operating south of 20 degrees south in the WIO and their corresponding fishing effort (2017 – 2021).

Year	Number of Vessels	Fishing Effort (number of hooks)
2017	21	10,574,114
2018	16	5,365,690
2019	23	10,181,135
2020	19	8,083,483
2021	24	7,796,075

5.3 Marine Turtles

Data for the year 2020- 2021 remains unavailable given SFA is still facing technical issues to retrieve and upload the data within the central database, thus the latest complete datasets is in the year 2019. The authority will ensure that the data is submitted to the IOTC Secretariat once successfully retrieved and processed.

A total of seven interactions were reported in 2019 by observers deployed on-board the Seychelles purse seine fleet Those are reported below in table 6.

The Seychelles Industrial longline fleet reported 68 interactions in 2021, compared to 37 in 2020.

Table 5c: Total number of marine turtle, released/discarded by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2020–2021).

Year	Species	ALIVE	DEAD	Unknown	Grand Total
2020	Marine Turtle	17	19	1	37
2021	Marine Turtle	57	11		68

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 2021, compared to a single reported interaction in 2020.

Table 5c: Total number of marine mammal, released/discarded by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2020–2021).

Year	Species	ALIVE	DEAD	Unknown	Grand Total
2020	Marine Mammal	0	1	0	1
2021	Marine Mammal	0	0	0	0

6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS

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, transshipment, 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

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 with the deployment of small vessel tracking units.

6.3. Observer scheme

A total of 447 fishing trips were observed on Seychelles purse seiners during 2014-2021. This represents more than 11,000 days of observation at sea with more than 9,500 fishing sets observed, with a total catch of more 325,000 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
2020	-	-	-	-
2021	-	-	-	-

Annual observer deployment figures (coverage against logbook data) for the Seychelles purse seine fleet

Year	Trips	Days at sea	Average no. of days at sea per trip	No. of observers	Sets	Catch
2016	68 (43%)	2026 (49%)	35	44	1917 (45%)	44,162 (40%)
2017	96 (65%)	2103 (64%)	27.6	27	2048 (57%)	67,034 (55%)
2018	92 (68%)	1993 (69%)	26	35	1998 (67%)	84,477 (68%)
2019	94	2733 (93%)	29.1	31		
2020	44	1268 (39%)	20	18		
2021	44 (28%)	1299 (43%)	29.5	15		

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/observer. The following year, 2016, 100 trips were done by 44 observers. The observer pool was quite big and it did not necessarily equate to quality data being 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. However, in 2021 there was a drop in the number of observers, 15. This is because the restrictions related to the COVID-19 pandemic brought uncertainty in the livelihoods of some observers, therefore, some of them took decisions to find alternatives ways to earn their livelihoods. The smaller observer pool also meant that they had to be deployed more frequently when deployment picked up by the end of 2021.

The general observer coverage for 2021 was 43%. There was a total of 44 trips of Seychelles flagged purse seine vessels which had an observer onboard and this figure accounts for 1,299 days at sea. Observers covered an additional 6 trips onboard Seychelles-flagged supply vessels.

The coverage rate can be considered as a low one compared to the previous years, however it can be explained by the various restrictions imposed by the COVID-19 pandemic. Vessel companies and operators were still in the process of adapting to the effects of the pandemic for example quarantine period during crew change, as well as trying to identify a clear procedure (PCR tests etc) to facilitate the boarding of observers. Furthermore, there was a period whereby the Seychelles Public Health Authority prohibited the boarding of Seychellois observers with the goal of minimising the risk of exposure of residents. On certain occasions, vessels had to leave for fishing trips without an observer and hence contributing to a lower coverage rate.

In terms of the data records under the program, the lag between the database figures and the actual deployment figures for 2019-2021 is still visible. The SFA is still facing technical issues regarding the upload of data files into the central database. Given the specificity of the software used for the program, it is rather complicated to have an alternative to have all datasets concatenated and available for analysis. Consequently, detailed catch data (number of sets, tonnage) is not available for 2021 as well. Efforts have been made to seek help externally and whilst travel restrictions did not work in our favour, there has been some progress since, and the database is expected to be tackled in 2022. The authority will ensure that the data is submitted to the IOTC Secretariat once successfully retrieved and processed.

In conclusion, similarly to the year 2020, 2021 has not been the best year in regards to observer deployments for reasons that can be classified as force majeure. Nevertheless, towards the very end of 2020, there were signs of optimism as vessel companies and operators were able to put in place systems to enable the boarding of observers. In the same spirit we are hoping to overcome the technical shortcomings related to the management of the database by building capacity so that in future submissions such issues are lessened. It is expected that during 2022, the implementation of EMS on purse seine vessels will complement data gathered via human observer programme. The programme will be expanded to cover the industrial longline fleet, which is currently not being covered by human observers.

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.



It must be noted that the Covid-19 pandemic in the year 2020 severely affected the port sampling program whereby no sampling activities were conducted between mid-March to November 2020.

During the year 2021, the Covid-19 restrictions was lifted during the month of March. However, some vessels were still restricting access to the SFA technicians, unless they had been vaccinated. Given that not all technicians were vaccinated, this impacted on the level of sampling carried out during the first semester of the year.



Table 7a. Number of vessel trips monitored, by species (Number) for the Seychelles Purse seine fleet for the period 2017 to 2021

Year	Number of Trips	Number of fish Counted							Grand Total
		ALB	BET	FRI	KAW	LTA	SKJ	YFT	
2017	53		6,580	1803	71		55,794	26,138	90,386
2018	81	1	8,474	4,173	692	4	127,571	41,706	182,621
2019	73		9,222	3,026	10		136,642	45,332	194,232
2020	22		3,058	434			42,924	11,213	57,629
2021	55		5,550	2196			111,644	29,999	149,389

Table 7b. Number of individuals fish measured for Seychelles registered purse seiners for the period 2017 to 2021.

Year	ALB	BET	BLM	FRI	KAW	LTA	SKJ	YFT
2016	100	6384		773	89		20550	39775
2017		6580		1803	71		15500	26138
2018	1	8474		4173	692	4	34200	41706
2019		9214	4	3026	10		34642	45174
2020		3051		434			10950	11207
2021		5550		2196			27400	29974

Table 7c. Number of individuals measured for Seychelles small scale longliners for the period 2017 to 2021

Year	ALB	BET	SWO	YFT	Total
2017		40	67	277	384
2018		26	78	172	276
2019		30	103	290	423
2020		212	235	841	1288
2021		17	28	407	452

6.5. Unloading/Transhipment of flag vessels

Collection of transhipment 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. Negotiations are ongoing for the implementation of EMS systems and the use of electronic logbook systems (ERS) with longline vessels companies.



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

Year	PORT	Species					Grand Total
		YFT	SKJ	BET	ALB	MIX	
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
2020	PORT VICTORIA	6,535	7,646	397	1	7	14,585
2020 Total		6,535	7,646	397	1	7	14,585
2021	PORT VICTORIA	4,413	10,051	622.099			15,085
2021 Total		4,413	10,051	622.099			15,085

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

Year	PORT	Species						Grand Total
		YFT	SKJ	BET	ALB	FRI	MIX	
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
2020	DIEGO SUAREZ	1,686	4,420	623				6,729
	PORT VICTORIA	21,647	59,192	8,687		1	115	89,642
	PORT LOUIS	1,036	891	257	0			2,184
2020 Total		24,369	64,503	9,567	0	1	115	98,556
2021	DIEGO SUAREZ	1,581	4,691	516				6,788
	PORT VICTORIA	22,875	65,703	8,473	19			97,070
	PORT LOUIS	333	650	23				1,006
2021 Total		24,789	71,044	9,013	19			104,865

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.

6.7. 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

Seychelles has not initiated the drafting of its sampling plans for the monitoring of mobulid rays catches in its artisanal and subsistence fisheries. A survey will be undertaken in 2022 to assess the occurrence of both shark and rays in those fisheries and subsequently a sampling programme will be drafted and implemented.

7. 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

An ongoing tagging programme is being implemented by Sport Fishing Club on Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish.

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 under relevant authorities and NGOs. Essentially the same monitoring protocols have been employed at all sites, which makes the data collected comparable for scientific analysis. This is reported annually as per the Reporting of progress of implementation of the FAO Guideline to Reduce Sea Turtle Mortality in Fishing Operation and on the implementation of resolution 12/04 on marine turtles.

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.

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

8. 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 2012 and 2021.

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 are submitted to the IOTC secretariat. Seychelles is also investigating the possibility of implementing EMS onboard its industrial longline fleet. In port observations are undertaken on the small scale (semi-industrial) 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. Implemented as Terms and condition of Certificate of Authorization as the domestication process of IOTC CMM's progress.
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 domestication 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 (<i>Rhincodon typus</i>)	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.

Res. No.	Resolution	Scientific requirement	CPC progress
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
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 than 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.
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 programmes
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.
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 transshipment 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	A survey to assess the occurrence of Mobulids rays in artisanal and subsistence fisheries is schedule for 2022 and subsequently a sampling plan will be drafted and implemented.

9. LITERATURE CITED [Mandatory]

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