

Seychelles National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2023

C. Assan, E. Socrate, J. Jean, J. Lucas, J.A. Lucas, K. Auguste, V. Lucas

Seychelles Fishing Authority, Fishing Port, Victoria, Seychelles

INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

<p>In accordance with IOTC Resolution 15/02 (and other data related CMMs as noted below), final scientific data for the previous year were 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 2023, final data for the 2022 calendar year must be provided to the Secretariat by 30 June 2023)</p>	<p>YES</p> <p>30/06/2023 Resubmitted 19/09/2023</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 2023, preliminary data for the 2022 calendar year were provided to the IOTC Secretariat by 30 June 2023].</p> <p>REMINDER: Final longline data for the previous year are due to the IOTC Secretariat by 30 Dec of the current year [e.g., for a National Report submitted to the IOTC Secretariat in 2023, final data for the 2022 calendar year must be provided to the Secretariat by 30 December 2023].</p>	<p>YES</p> <p>30/06/2023 Resubmitted 19/09/2023</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 2022 in comparison with previous years. It also summarizes research, and data collection related activities as well as actions undertaken in 2022 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 2022. In 2022 the nominal effort decreased further by 93 days (3%) when compared to the previous year to reach a total of 2,934 days fished. The total catch for the purse seine fleet dropped by 1.8 % from 122,885 MT in 2021 to 120,642 MT in 2022. The corresponding catch rate was 41.12 MT/ fishing day, compared to 40.60 MT/ fishing day during the previous year. Catches of yellowfin tuna increased by 5% whilst catches of bigeye tuna and skipjack tuna decreased by 10% and 4% respectively when compared to the previous year.

The Seychelles Industrial longline fleet comprised of 58 vessels in 2022 compared to 64 vessels in 2021. The total catch reported by the industrial longline fleet for the year 2022 was estimated at 9,898 MT of which 2,894 MT consisted of yellowfin tuna. The estimated catch rate was 0.36 Mt/1000 hooks for the year 2022 which is the same as to what was recorded for the previous year. hooks).

In 2022, the total catches by the Semi industrial vessels increased by 18% to reached 2,073 MT compared to 1,758MT the previous year. The fishing effort increased by 80% thus giving a mean catch rate of 0.42 MT/ 1000 hooks for the year 2022 compared to 0.64 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 2022 to clear the backlog in longline fishery logbook and length frequency data for years 2021 and 2022. A new module in the Observe software was also developed and tested to upgrade data management for the longline fishery. Implementation of the new system will start in the year 2024.



Contents

1. BACKGROUND/GENERAL FISHERY INFORMATION.....	5
2. FLEET STRUCTURE.....	6
3. CATCH AND EFFORT.....	6
3.1. Purse Seine Fishery.....	6
3.2. Industrial Longline Fishery.....	11
3.3. Semi Industrial Fishery.....	15
4. RECREATIONAL FISHERY.....	16
5. ECOSYSTEM AND BYCATCH ISSUES.....	17
5.1 Sharks.....	17
5.2 Seabirds.....	21
5.3 Marine Turtles.....	21
5.4 Other ecologically related species (e.g., cetaceans, mobulid rays, whale sharks).....	22
6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS.....	22
6.1. Logsheet data collection and verification.....	22
6.2. Vessel Monitoring System.....	22
6.3. Observer scheme.....	22
6.4. Port sampling programme.....	24
6.5. Unloading/Transhipment of flag vessels.....	24
6.6. Actions taken to monitor catches & manage fisheries for Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish	26
6.7. Gillnet observer coverage and monitoring.....	26
6.8. Sampling plans for mobulid rays [Mandatory].....	26
7. NATIONAL RESEARCH PROGRAMS.....	26
7.1. National research programs on blue shark.....	26



7.2. National research programs on Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish 26

7.3. National research programs on sharks..... 27

7.4. National research programs on oceanic whitetip sharks..... 27

7.5. National research programs on marine turtles 27

7.6. National research programs on thresher sharks 27

8. IMPLEMENTATION OF SCIENTIFIC COMMITTEE RECOMMENDATIONS AND RESOLUTIONS OF THE IOTC RELEVANT TO THE SC. 28

9. LITERATURE CITED 30

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 has 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 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 seine and the locally based small scale fresh tuna longline (semi-industrial) 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. However, with new administrative procedures introduced in 2023, it is mandatory for those vessels to call into Port Victoria at least twice a year, particularly for their yearly compliance inspection. Seychelles is participating in the regional Observer Scheme to monitor transshipment at sea conducted by those industrial longline vessels. Additionally, data are collected through at sea scientific observer programme on the purse seine fleet and through self-sampling programme for size data on the industrial longline fleet. Seychelles is progressively implementing Electronic Monitoring system and Electronic Reporting system on its fleet targeting tuna and tuna-like species in the IOTC area of competence in order to enhance reporting and improve data quality. Seychelles is in the process of developing a licensing framework for the recreational and sport fisheries, which will entail mandatory data reporting with the objective of improving monitoring and overall management of these sub-sectors.

The Seychelles National Report summarizes activities of the Seychelles' industrial purse seine and longline fleet and the small-scale fresh tuna longline fleet operating within the IOTC area of competence, reported over the past 5 years. It also summarizes research, and data collection related activities as well as actions undertaken in 2022 to implement recommendation of the IOTC Scientific Committee recommendations and Conservation and Management Measures (CMM's) adopted by the IOTC Commission.

2. Fleet structure

Table 1a. Shows the number of Seychelles purse seiners, supply vessels, industrial and small scale longliners for the period 2018 to 2022. The number of Seychelles registered purse seiners have remained constant at 13 vessels during the period 2018 to 2022. The number of supply vessel decreased from 7 vessels to 4 vessels, from 2017 to 2022. The number of Seychelles registered longliners increased from 55 vessels in 2017 to 64 vessels in 2021. In 2022, the number of industrial longliners decreased to reach 58 vessels. An increasing trend was observed in the number of registered small scale fresh tuna longline vessels active from 30 vessels in 2018 to 56 vessels in 2022. It must be noted though that only 23 small scale fresh tuna longline vessels were authorised to fish outside the Seychelles EEZ in 2022 and were hence registered on the IOTC Record of Authorised Vessels (RAV).

Table 1a. Number of Seychelles registered vessels for the period 2018 - 2022

Year	Purse Seiners	Supply Vessels	Industrial Longliners	Small scale Longliners
2018	13	7	55	30
2019	13	6	57	36
2020	13	5	62	45
2021	13	4	64	41
2022	13	4	58	56

Table 1b. Seychelles registered vessels by size (GT) as reported to IOTC in 2022

GT	Purse Seiners	Supply Vessels	Industrial Longliners	Small scale Longliners
<50	-	-	-	23
51-100	-	-	-	-
101-500	-	4	42	-
501-1000	-	-	16	-
>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 2018 to 2022 period. Trend analysis of this fleet over the last 5 years shows that catches has been on a decreasing trend from the year 2018 to 2020 followed by an increase in the year 2021. In the year 2022, a total catch of 120,642 MT was reported, compared to 122,885 MT reported in 2021, representing a slight decrease of 2% (Table 2a and Figure 1a).

Contrary to the catches, the fishing effort in term of fishing days, shows an increasing trend during the period 2018 to 2020 followed by a decreasing trend during the last two years. The fishing effort decreased by a slight 3% from 3,027 fishing days in 2021 to 2,934 fishing days in 2022.

Historically skipjack tuna dominated the catches of the Seychelles purse seiners in the Western Indian Ocean (WIO), a trend which continued in 2022, where skipjack accounted for 65% of the total catch, whilst yellowfin and bigeye tuna comprised of 26% and 8% of the total catch of the Seychelles purse seiners in WIO respectively. Compared to the previous year, the catches of yellowfin tuna increased by 5% from 29,407 MT to 30,978 MT in 2022, whilst that for skipjack tuna decreased by 4% from 81,390 MT to 78,250 MT. Bigeye tuna catches decreased by 10% from 11,230 MT to 10,074 MT. It must be noted that data for year 2021 and

2022 were 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 without species composition correction as it was done for previous years. Consequently, the change in species composition could be attributed to the change in data processing methodology, rather than a shift in fishing practices.

Following a decrease in 2019 and 2020, catch rate in terms of Metric Tons per Fishing Days (MT/Fishing days), has been on an increasing trend for 2021 and 2022. Catch rate increased from 34.84 MT/Fishing days in 2020, to reach 41.12 MT/Fishing days in 2022.

Table 2a. Seychelles flag purse seine annual catch, fishing effort and catch rates reported between 2018. and 2022

Year	Days Fished	Catch Rate	YFT	SKJ	BET	ALB	NEI	Total
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
2022	2,934	41.12	30,978	78,250	10,074		1,340	120,642

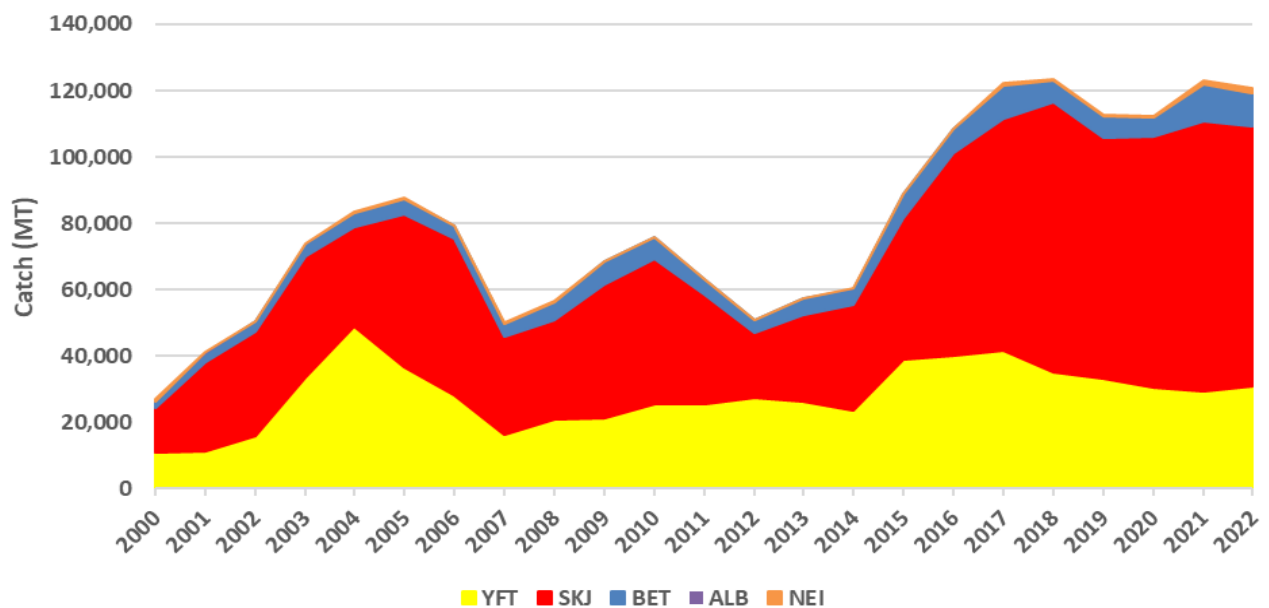
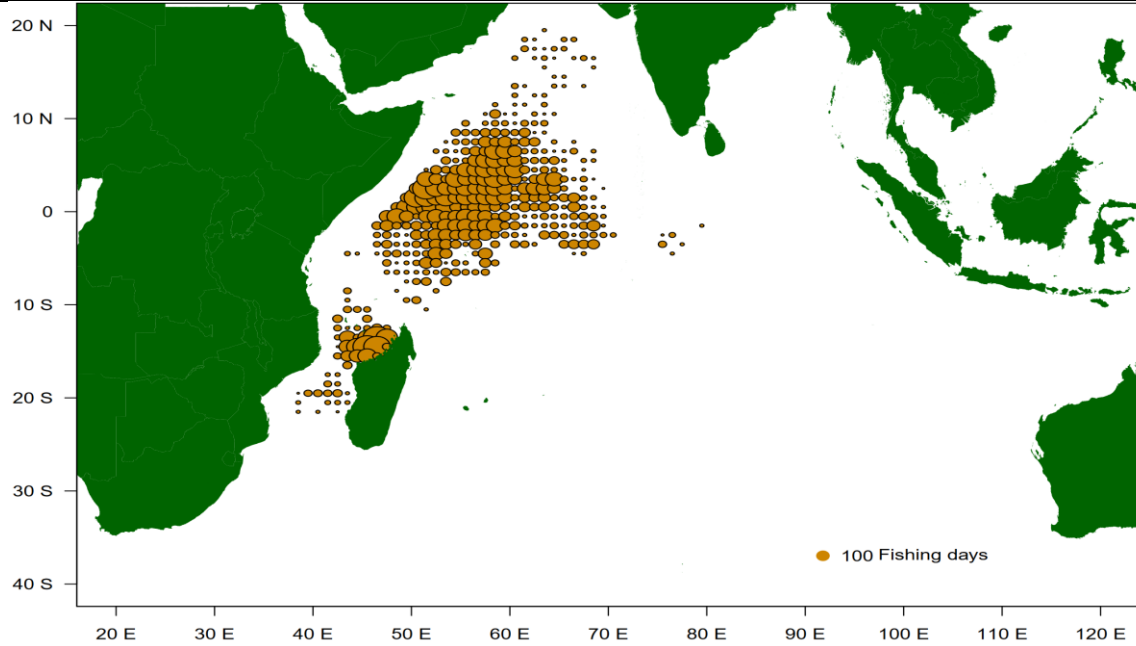


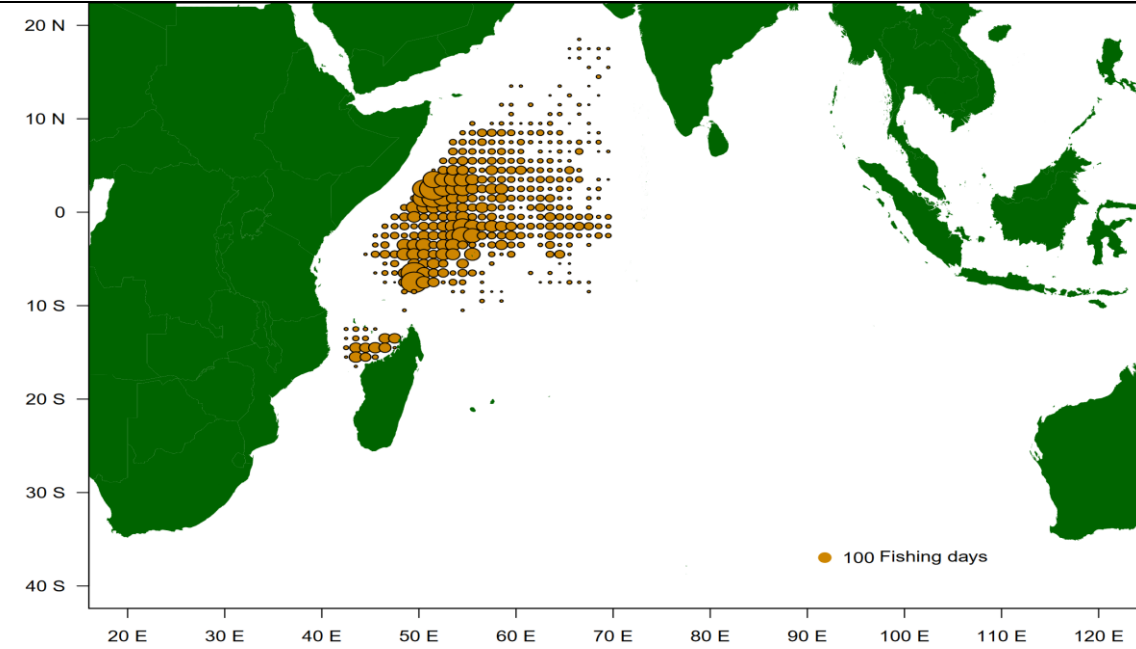
Figure 1a. Trends in annual catches by species for Seychelles’ purse seine fleet reported for the period 2000-2022

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 2021, 2022 and for the previous 5 years (2018 – 2022) respectively.

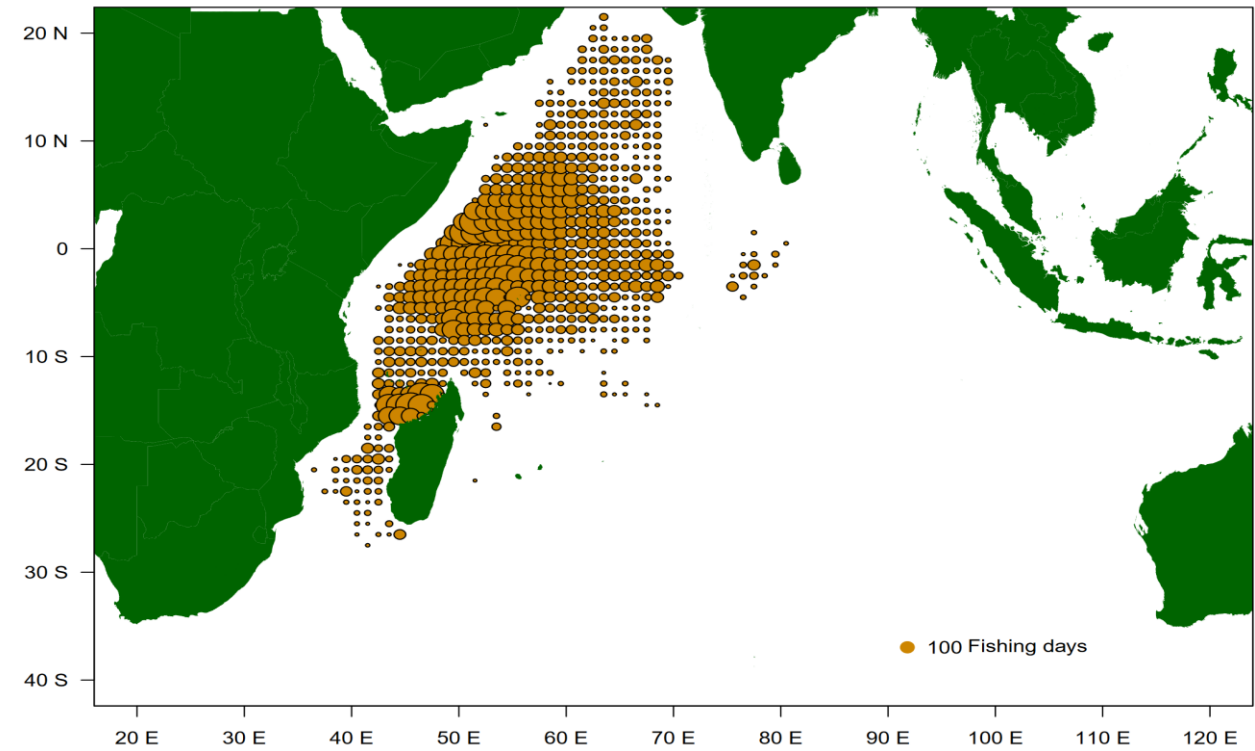
Map 3.1 a(i). Distribution of fishing effort (purse seine fleet) by 1° square, reported in 2021



Map 3.1 a(ii). Distribution of fishing effort (purse seine fleet) by 1° square, reported in 2022.

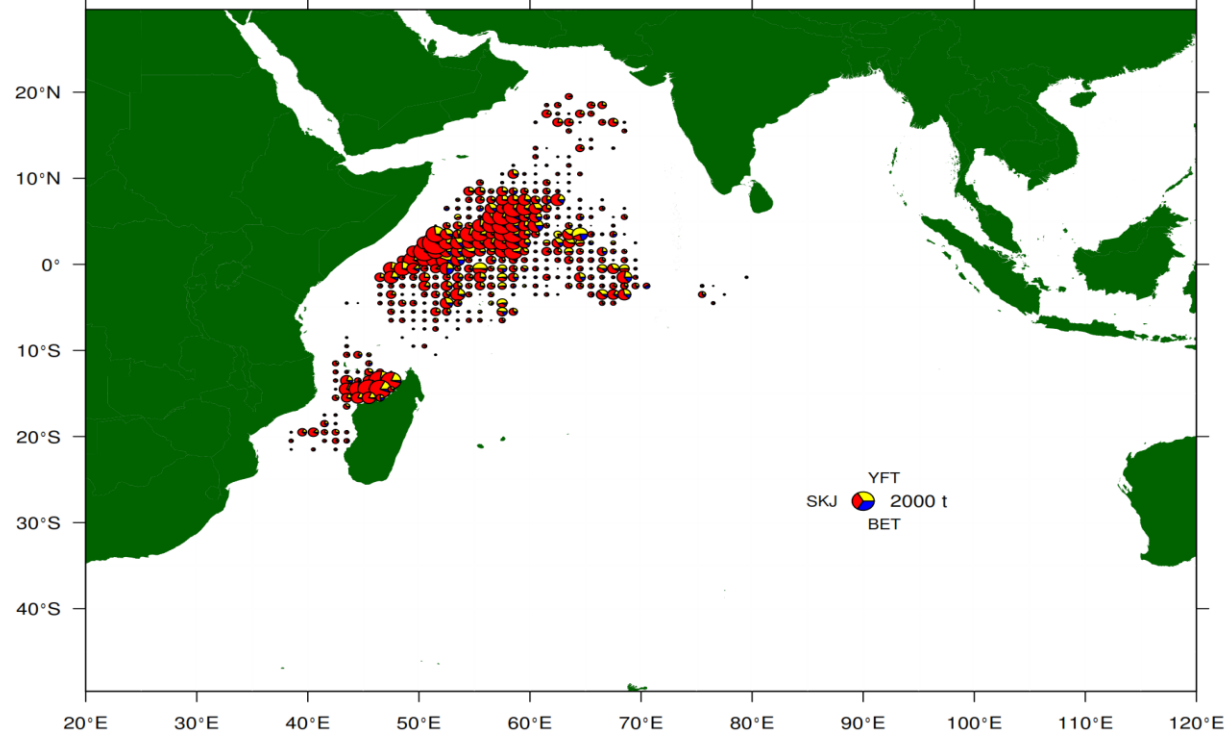


Map 3.1 a(iii). Distribution of fishing effort (purse seine fleet) by 1° square, previous 5 years (2018–2022).

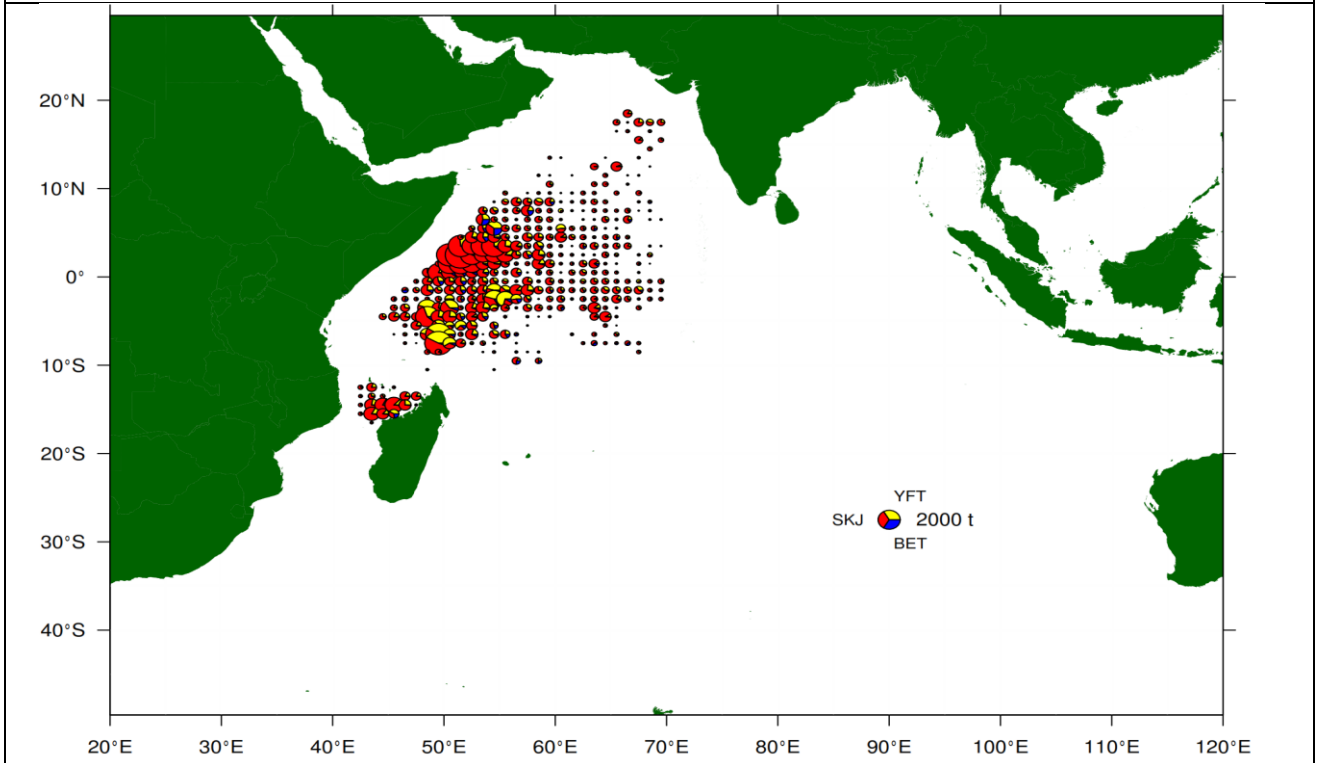


Maps 3.1 b(i), b(ii) and b(iii) show the distribution of catches by 1° square reported by Seychelles purse seine fleet for the years 2021, 2022 and for the previous 5 years (2018 – 2022) respectively.

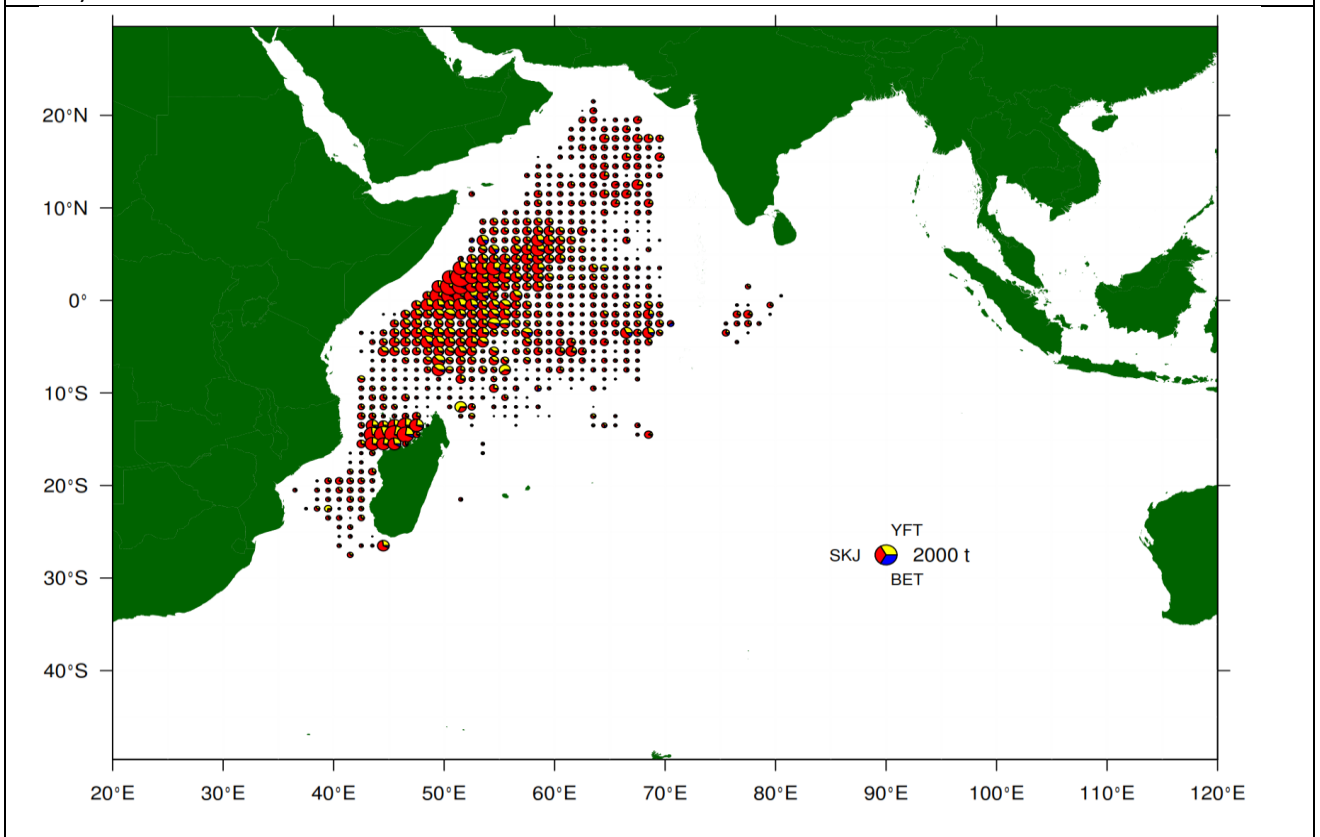
Map 3.1 b(i). Distribution of catch (purse seine fleet) by 1° square, reported in 2021



Map 3.1 b(ii). Distribution of catch (purse seine fleet) by 1° square, reported in 2022.



Map 3.1 b(iii). Distribution of catch (purse seine fleet) by 1° square, previous 5 years (2018–2022).



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 2018 to 2022. The reported fishing effort in terms of the number of hooks set remained more or less constant during the period 2018 to 2021 averaging to 39.73 million hooks per year. A decrease of 30% was reported in the number of hooks set in the year 2022, estimated at 27.75 million hooks set, compared to 39.86 million hooks set in 2021.

The total catch increased from 17,558 MT in 2018 to 22,469 MT in 2020. This was followed by a decrease of 35% to reach 14,526 MT in 2021. For the year 2022, the Seychelles registered industrial longliners reported an estimated catch of 9,898 MT, representing a decrease of 32%, when compared to 2021.

Historically bigeye tuna dominated the catches of the Seychelles industrial longline fleet operating in the IOTC area of competence. However, during the period 2018 to 2020, yellowfin became the dominant species caught. e. In 2022 bigeye tuna dominated the Seychelles industrial longline fleet catches with an estimated catch of 3,882 MT, accounting for 39% of the total catch, followed by yellowfin tuna and the NEI category and, representing 29% and 16% respectively. NEI consist of mostly of oilfish (*Ruvettus pretiosus*), albacore and sailfish. For 2022, reduction in catches were report across all species when compared with the previous year. For the 2022, decreased in catches were reported for all species when compared to the previous year.

Since 2019, the catch rate reported by the Seychelles longline fleet has been on a decreasing trend, from 0.58MT/1000 hooks in 2019 reaching 0.36MT/1000 hooks in 2021. The catch rate reported for 2022 remained at 0.36 MT/1000 hooks.

Table 2b. Annual catch, fishing effort and catch rates reported by Seychelles industrial longline fleet. from the years 2018 – 2022

Year	Fishing Effort (million hooks)	Catch Rate (MT/1000 hooks)	Catch Rate						
			YFT	BET	SWO	MAR	SHK	NEI	TOTAL
2018	39.37	0.45	5,845	3,675	2,223	1,085	1,197	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
2022	27.75	0.36	2,894	3,882	780	338	416	1,589	9,898

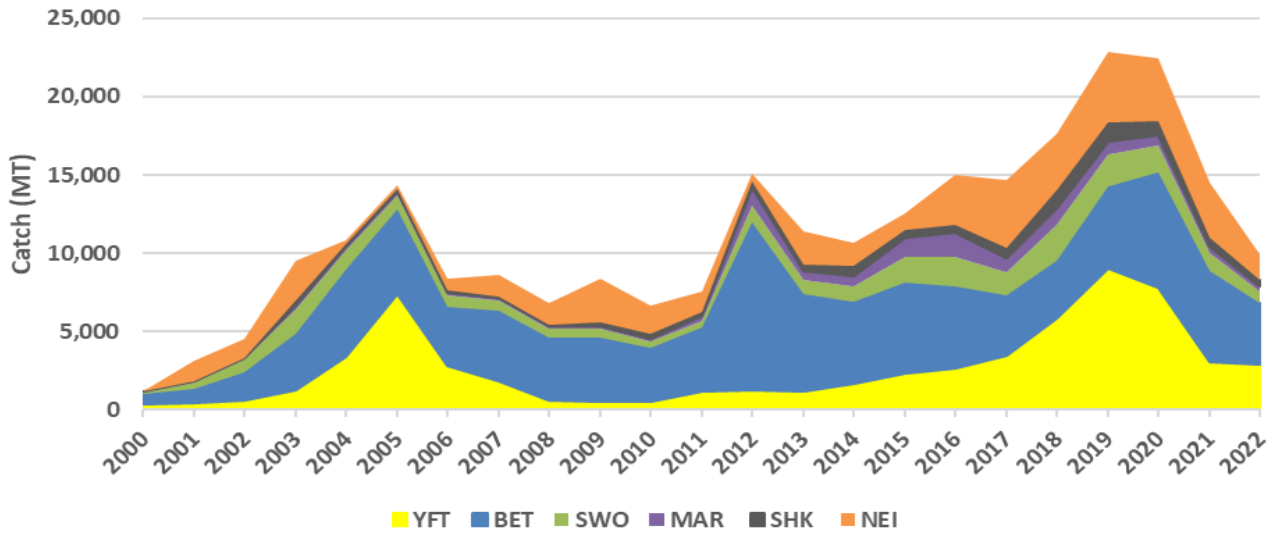
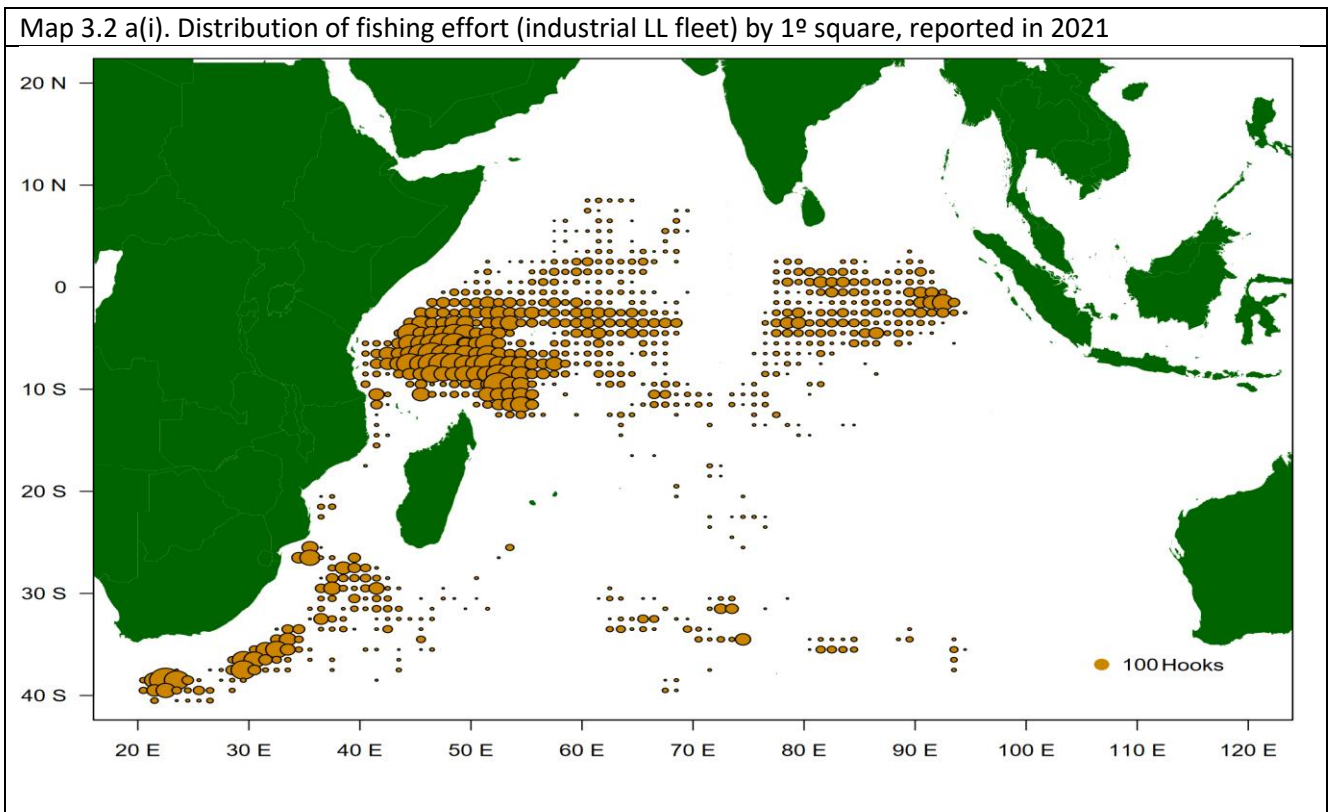
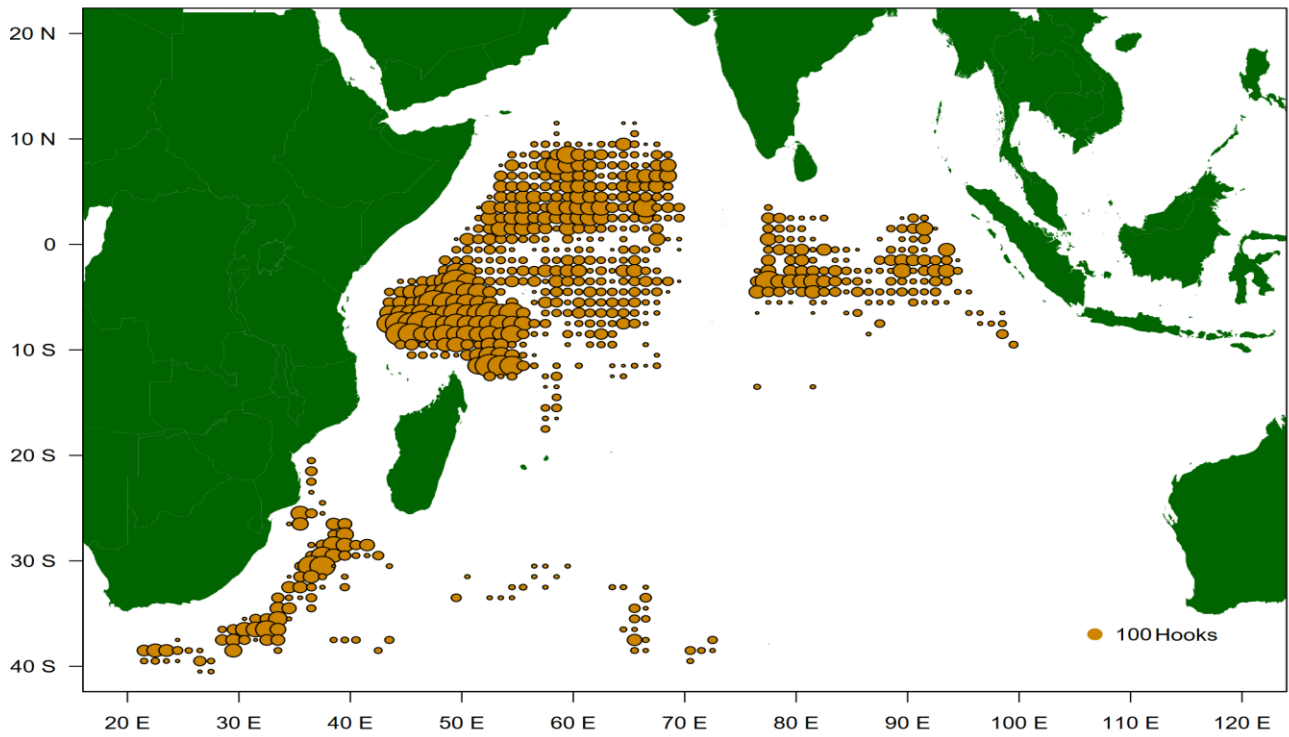


Figure 2a. Trends in annual catch by species reported by the Seychelles industrial longline fleet for period 2000-2022

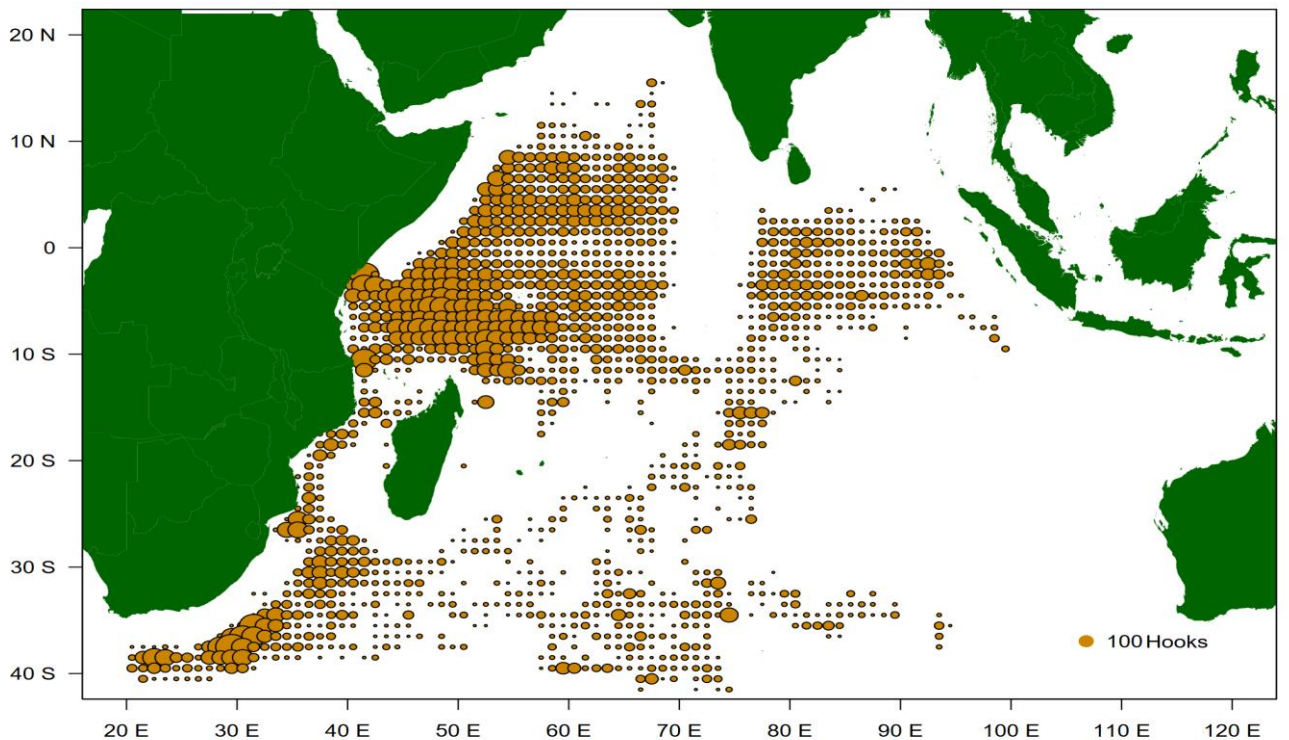
Maps 3.2 a(i), a(ii) and a(iii) show the distribution of fishing effort by 1° square reported by Seychelles' industrial longline fleet for the years 2021, 2022 and the previous 5 years (2018 – 2022) respectively.



Map 3.2 a(ii). Distribution of fishing effort (industrial LL fleet) by 1° square, reported in 2022

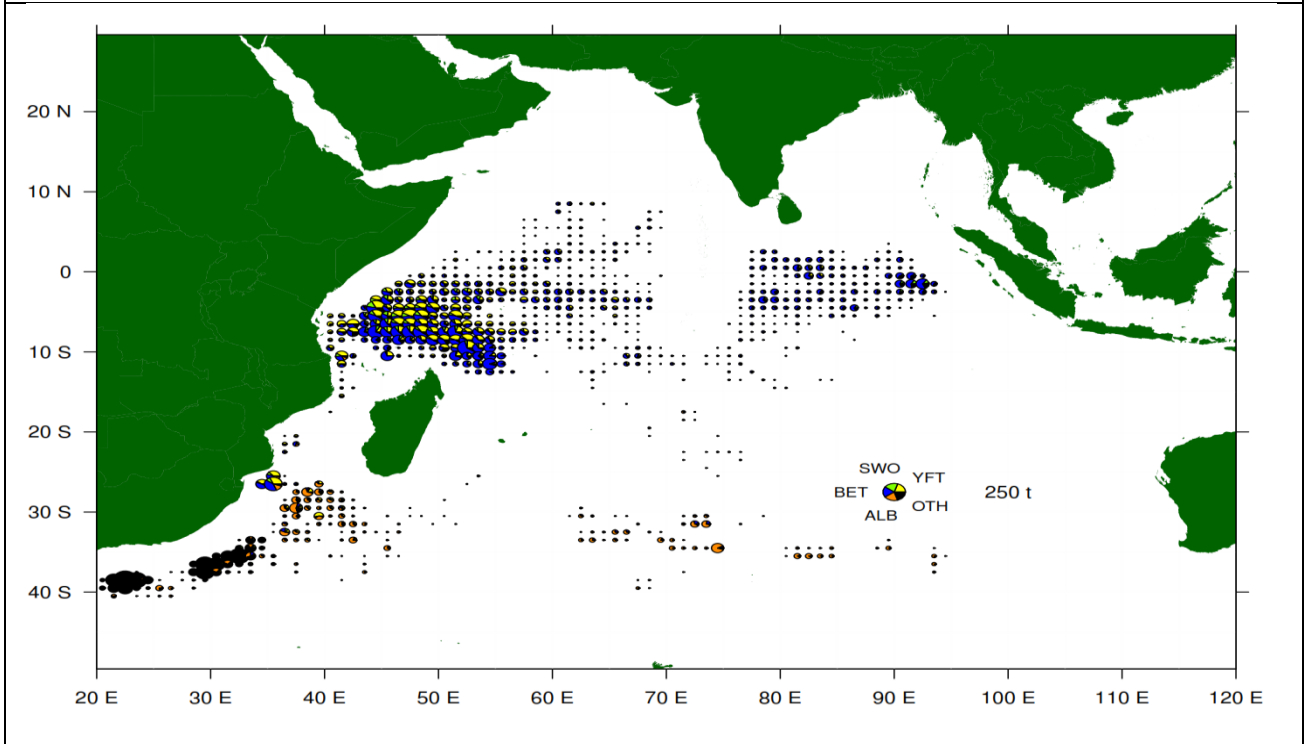


Map 3.2 a(iii). Distribution of fishing effort (industrial LL fleet) by 1° square, previous 5 years (2018 – 2022)

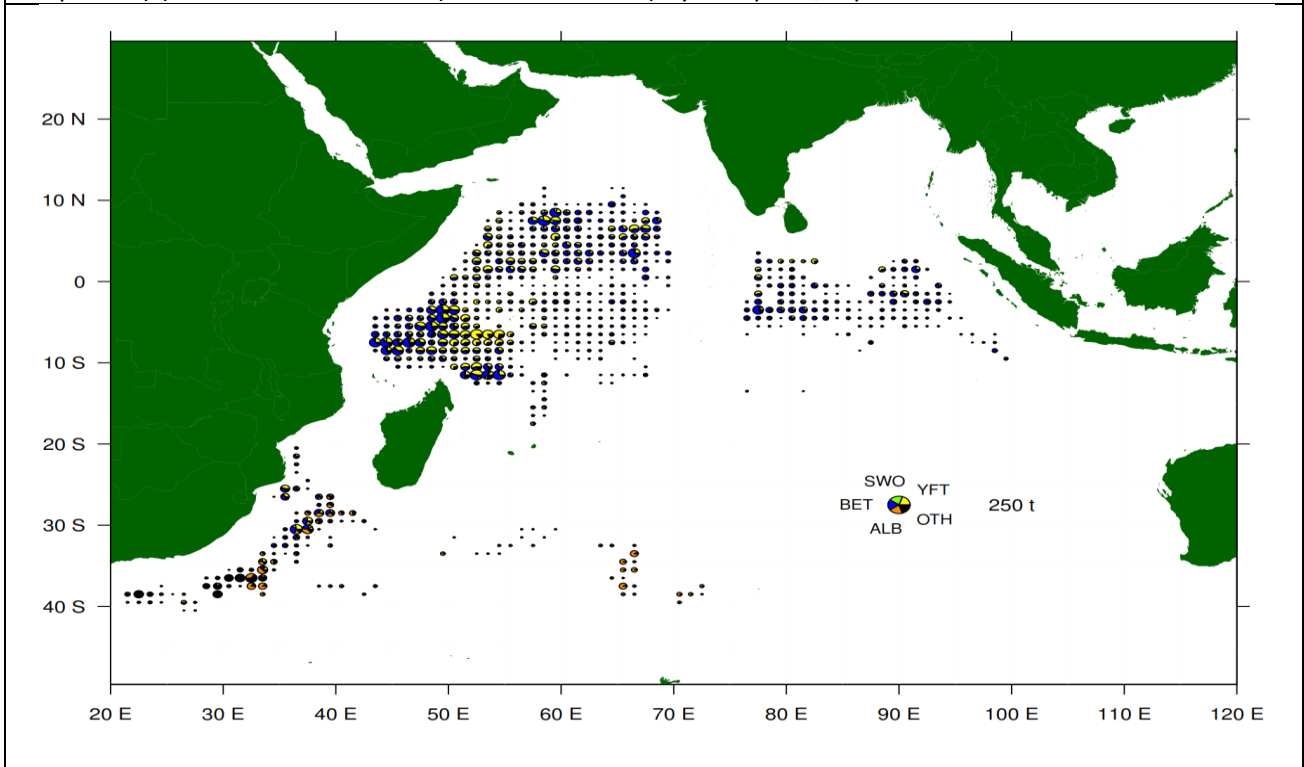


Maps 3.2 b(i), b(ii) and b(iii) show the distribution of catches by 1° square reported by Seychelles' industrial longline fleet for the years 2021, 2022 and the previous 5 years (2018 – 2022) respectively.

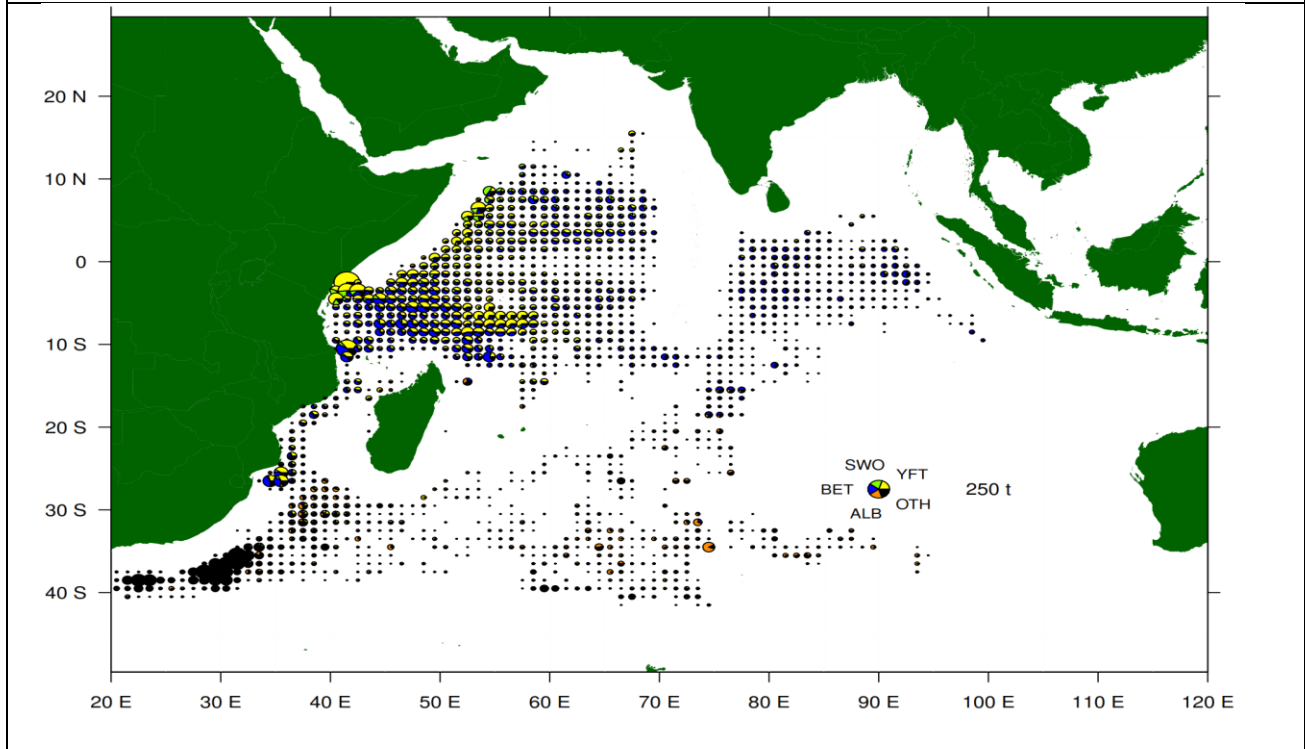
Map 3.2 b(i). Distribution of catch (industrial LL fleet) by 1° square, reported in 2021



Map 3.2 b(ii). Distribution of catch (industrial LL fleet) by 1° square, reported in 2022



Map 3.2 b(iii). Distribution of catch (industrial LL fleet) by 1° square, previous 5 years (2018 – 2022)



3.3. Semi Industrial Fishery

Table 2c summarizes the fishing activities of the Seychelles small scale (semi-industrial) longline fleet from 2018 to 2022. The fishing effort in terms of number of hooks set, fluctuated between 2.03 million hooks and 2.76 million hooks during the period 2018 to 2021. In 2022, a significant increase of 144% was reported in the number of hooks set estimated at 4.96 million hooks when compared to the previous year. This remarkable increase in fishing effort is attributed to the increase in number of vessels licensed, which increased from 41 vessels in 2021 to 53 vessels in 2022.

Following a record total catch of 2008 MT in the year 2019, a significant decrease of 26% was recorded 2020, to reach 1,485 MT. Ever since an increasing trend has since been observed reaching a reported total catch of 2,073 MT in 2023, representing an increase of 40% in catches compared to 2021.

From the year 2018 to the year 2019, the catch rate estimated for the small-scale longline fleet, increased from 0.61 MT/1000hooks to 0.79 MT/1000 hooks followed by a decreasing trend to reach 0.42MT/1000 hooks in 2022 (table 2c).

Since 2015, yellowfin tuna has been the dominant species caught by this fleet. This trend continued during 2022, whereby yellowfin tuna accounted for 93% of the total catch, followed by swordfish at 3%.

Table 2c. Catch, fishing effort and catch rates reported by the small-scale longline fleet between 2018 and 20212

Year	Fishing Effort (million hooks)	Catch Rate (MT/1000 hooks)	YFT	BET	SWO	SFA	MAR	SHK	NEI	TOTAL
2018	2.07	0.61	833	113	226	20	70	1	4	1,267
2019	2.55	0.79	1,507	119	313	13	55	0	2	2,008
2020	2.03	0.73	1,277	55	135	3	7	0	7	1,485
2021	2.76	0.64	1,572	50	99	17	14	1	7	1,758
2022	4.96	0.42	1,920	20	72	14	28	10	9	2,073

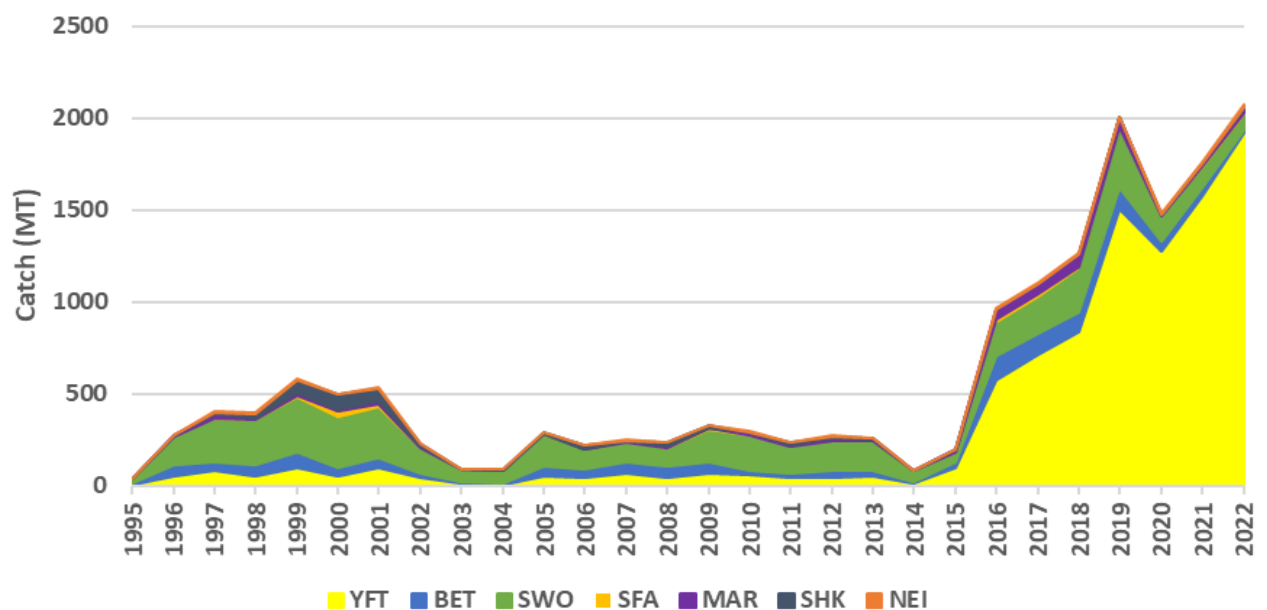


Figure 3c. Trends in annual catch by species reported by the small-scale longline fleet between the period 1995 and 2022

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 is taken as bycatch. Currently there are no data collection programmes for the recreational/ sport fishing sub-sectors. However, with the implementation of a licensing framework, which is currently under development, license conditions will include the mandatory reporting of relevant data to the and will enhance the monitoring and management of those fisheries.

During the last boat frame survey of the Seychelles' domestic fleet, conducted in November 2017, a total of 1,115 boats were recorded, of which 742 were commercial fishing boats, 168 hire-crafts (sports fishing) and 116 recreational boats. Seychelles Fishing Authority is conducting a boat frame survey for the domestic fleet which will establish the number of vessels that are currently involve in sport and recreational fisheries.

5. Ecosystem and bycatch issues

In close collaboration with the industry, the Seychelles has 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 species stocks in 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) 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. The actions include, among others;

- i. Forming a collaboration between governments, industry, and fleets to bring about improvements in the fishery;
- ii. Addressing the shortfalls in stock health, ecosystem health, and management of the fishery by taking action toward meeting the objectives described by the Improvement Performance Goals (IPGs);
- iii. Improving the fishery to a point at which it can undergo (and pass) full assessment by the MSC by the end of March 2022;
- iv. Working with regional management to implement plans to rebuild the overfished yellowfin stock as the lack of a universally agreed harvest strategy and harvest control rules hold back recovery of the stock.

After successfully completing an Electronic Monitoring pilot project on high seas longliners and purse seiners in 2019, the Seychelles Fishing Authority is at the moment implementing a full-scale EMS programme on all of its industrial vessels (purse seine and longline). The project will address the lack of observations at sea for the longline fleet and to complement the scientific observer programme on the purse seine fleet.

The Seychelles Fishing Authority in collaboration with the industry is implementing a FAD-Watch project to prevent and mitigate at the maximum level possible the stranding and entanglement of drifting Fish Aggregating Devices (dFADs) in coral reefs, shallow water habitats and coastal zones of Seychelles. Two cruises are planned per year to retrieve stranded dFADs.

5.1 Sharks

5.1.1. NPOA sharks

¹ [Indian Ocean Tuna – SIOTI - WWF Seafood Sustainability](#)



The Seychelles Fishing Authority reviewed its National Plan of Action for the Conservation and management of Sharks (NPOA) 2016-2020 of which a new five (5) year plan for the period 2021-2026 was developed. The work programs are still relevant to the current situation, hence the timeline has been extended for another five (5) years.

5.1.2. Sharks finning regulation

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 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. Implementation is done through the conditions of the Certificate of Authorisation.

5.1.3. Blue shark

Seychelles has revised the logbook for its industrial longline fleet targeting tuna and tuna-like species in the IOTC area of competence to cater for recording catches and interactions with blue sharks. The relevant data are submitted to the IOTC secretariat as per the relevant timeline.

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 2018-2022).

Year	Blue shark		Mako sharks		Porbeagle		Hammerhead sharks		Thresher sharks		Various NEI	Sharks		Silky shark		Total NO	Total MT
	NO	MT	NO	MT	NO	MT	NO	MT	NO	MT		NO	MT	NO	MT		
2018	22,154	1,006	2,915	135	3	0	2	0	0	0	1,503	55	79	2	26,657	1,197	
2019	24,034	1,014	3,370	153	0	0	0	0	0	0	416	14	4,147	112	31,966	1,293	
2020	16,482	707	2,539	108	0	0	8	0	0	0	1	0	2,931	89	21,961	904	
2021	10,634	462	1,379	64	0	0	0	0	0	0	0	0	1,852	53	13,866	578	
2022	7,601	343	798	39	1	0	0	0	0	0	0	0	1,404	33	9,804	416	

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 2018–2022).

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		
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	0	0	3	0.1	5	0.2	3	0.1	23	0.6
2022	92	4.2	30	0.7	0	0	2	0	0	0	128	4.7	0	0	252	9.6

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 2021–2022).

Year	Species Code	Scientific Name	Discarded Status		Grand Total
			Alive	Dead	
2021	BSH	Prionace glauca	981	735	1,716
	MAK	Isurus spp	69	34	103
	PSK	Pseudocarcharias kamoharai	1		1
	THR	Alopias spp	28	15	43
	FAL	Carcharhinus falciformis	16	27	43
	POR	Lamna nasus	1	3	4
2021 Total			1,096	814	1,910
2022	BSH	Prionace glauca	1,259	1,177	2,436
	MAK	Isurus spp	73	69	142
	THR	Alopias spp	12	7	19
	SPN	Sphyrna spp	2	2	4
	FAL	Carcharhinus falciformis	36	46	82
2022 Total			1,382	1,301	2,683

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 all vessels operating in the IOTC area of competence and targeting tuna and tuna-like species. The relevant data are submitted to the IOTC secretariat.

To complement data received from logbook, Seychelles is progressively implementing an EMS programme on all its tuna fishing vessels operating in the IOTC area of competence.

Longline fleets which operate South of 25°S employ current seabird mitigation measures such as tori lines, weighted branch lines, and bird scaring devices. This is a crucial component during compliance inspections to ensure adherence to seabird conservation measure. The development of an NPOA for seabirds is ongoing.

Table 5. Total number of seabird, released/discarded by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2020–2022).

Year	Species	Alive	Dead	Grand Total
2021	Seabird NEI	55	79	134
2022	Seabird NEI	83	26	109

Table 5b: Number of longline fishing vessel operating south of 20 degrees south in the WIO and their corresponding fishing effort (2021 – 2022).

Year	Number of Vessels	Fishing Effort (Number of Hooks)
2018	16	5,365,690
2019	23	10,181,135
2020	19	8,083,483
2021	24	7,796,082
2022	9	3,857,617

5.3 Marine Turtles

- Master/Skipper are required to record and report interactions with marine turtles in the mandatory logbook. Whilst there is no human observer programme for industrial LL, discussions are ongoing on the establishment of the EMS programme on this fleet. The Seychelles' Authority ensures that vessel owners/operators and masters are aware of the mitigation techniques to be applied by the crew for the release of marine turtles in accordance with handling guidelines provided by the IOTC in the marine turtle identification cards. Mitigation measures and other impacts on marine turtles and ecosystem are reported annually in the National Report to the Scientific Committee and in the Report of Implementation.

Table 5c: Total number of marine turtle, released/discarded by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2021–2022)

Year	Species	Alive	Dead	Grand Total
2021	Marine Turtle	57	11	68
2022	Marine Turtle	95	8	103

5.4 Other ecologically related species (e.g., cetaceans, mobulid rays, whale sharks)

There was no reported interaction with whale shark in 2022.

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 100% 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

The fisheries Act 2014, Sub-Part 5 – Requirements and conditions relating to fishing vessels and gears, 29. (1). Since 2003, one of the prerequisites 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 used 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

(including date commenced and status; number of observers, include percentage of coverage by fishery. Also, a description of the protocols supporting the observer programs and sampling schemes mentioned in paragraphs 3, 5, 7 and 8 of Res [22-04])

The year 2022 had a much better outlook than the two previous years that was plagued by the pandemic. The observer pool was boosted to about 34 individuals as compared to 15 in 2021. The general observer coverage for 2022 was 87%. There was a total of 99 trips of Seychelles flagged purse seine vessels which had an observer onboard and this figure accounts for 2551 days at sea. Observers covered an additional 6 trips onboard Seychelles-flagged supply vessels. In terms of the data records under the program, the lag between the database figures and the actual deployment figures for 2019-2022 is still visible. The SFA is still facing technical difficulties regarding compilation and dissemination of observer data.

Efforts have been made to seek help externally, and having re-established access to the central database, the SFA is now in the process of data extraction. The authority is hopeful that this will be resolved in early 2024 and will ensure that the data is submitted to the IOTC Secretariat once successfully retrieved and processed.

Table 6. Figures based on datasets in central database.

Year	Trips	Days at sea	Average no. of days at sea	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		
2022	99	2551 (87%)	25.8	34		

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 2018 to 2022

Year	Number Trips	ALB	BET	FRI	KAW	LTA	SKJ	YFT
2018	81	1	8,474	4,173	692	4	127,571	41,706
2019	73		9,222	3,026	10		136,642	45,332
2020	22		3,058	434			42,924	11,213
2021	55		5,550	2,196			111,644	29,999
2022	84		6,403	2,905			122,845	40,156

Table 7b. Number of individuals fish measured for Seychelles registered purse seiners for the period 2018 to 2022

Year	ALB	BET	BLM	FRI	KAW	LTA	SKJ	YFT
2018	1	8,474		4,173	692	4	34,200	41,706
2019		9,214	4	3,026	10		34,642	45,174
2020		3,051		434			10,950	11,207
2021		5,550		2,196			27,400	29,974
2022		6,403		2,905			28,995	40,131

Table 7c. Number of individuals measured for Seychelles small scale longliners for the period 2018 to 2022

Year	ALB	BET	SWO	YFT	Total
2018		26	78	172	276
2019		30	103	290	423
2020		212	235	841	1,288
2021		17	28	407	452
2022		85	242	3,166	3,493

Table 7d. Number of individuals measured for Seychelles industrial longliners for the period 2018 to 2022

Year	ALB	BET	BLM	BSH	BUM	MLS	SWO	YFT
2018	2200	18973	129	4935	44	1710	10790	36217
2019	25544	52424	184	8094	251	797	16068	75493
2020	14107	45336	150	3850	260	688	8621	42,727
2021	16401	45662	44	4420	144	428	7629	29001
2022	9801	43270	92	4183	49	324	8,227	23,383

6.5. Unloading/Transhipment of flag vessels

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 transshipments/ landing difficult. However, we do receive information on landing in foreign ports. Seychelles is also participating in the IOTC regional observer scheme to monitor transshipment 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	YFT	SKJ	BET	ALB	FRI	MIX	Bycatch	Grand Total
2018	PORT VICTORIA	5,777	6,810	723		142	599	290	14,340
2018 Total		5,777	6,810	723		142	599	290	14,340
2019	PORT VICTORIA	6,172	8,888	2,956			24	28	18,068
	PORT LOUIS	161	32	5			2	0	200
2019 Total		6,333	8,920	2,961			25	28	18,267
2020	DIEGO SUAREZ						1	0	1
	PORT VICTORIA	6,535	7,646	397	1	76	132	54	14,839
2020 Total		6,535	7,646	397	1	76	133	54	14,840
2021	PORT VICTORIA	4,422	10,096	622		456	313	92	16,001
2021 Total		4,422	10,096	622		456	313	92	16,001
2022	PORT VICTORIA	6,296	6,892	404	1	984	790	149	15,516
	PORT LOUIS					75		6	81
2022 Total		6,296	6,892	404	1	1,059	790	155	15,597

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	YFT	SKJ	BET	ALB	FRI	MIX	Grand Total
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						1,057	1,057
2021 Total		24,456	70,394	8,989	19		1,057	104,915
2022	DIEGO SUAREZ	286	1,141	83				1,510
	PORT VICTORIA	23,298	65,809	9,043	1	10	418	98,580
	PORT LOUIS	1,240	4,610	431				6,282
2022 Total		24,825	71,560	9,558	1	10	418	106,372

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. Catches and interactions are recorded through logbook and observer programme. 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 [Mandatory]

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 is currently being undertaken to assess the occurrence of both shark and rays in those fisheries and subsequently a sampling programme will be drafted and implemented. The survey will be completed in December 2023 and the result will be presented at the relevant IOTC forum.

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 programs 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, however a survey is being conducted to assess the occurrence of sharks in the artisanal and subsistence fisheries.

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 2022.

Res. No.	Resolution	Scientific requirement	CPC progress
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 and hawksbill turtles. 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 longline fleet.
12/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3–7	Data on interactions with seabirds are being captured in the new logbook and are reported to the IOTC secretariat. Steps are on the way for the development of an NPOA for seabirds.
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	Implemented through the Certificate of Authorisation. 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, vessels owners 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.

Res. No.	Resolution	Scientific requirement	CPC progress
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
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 does 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 does 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 (<i>If not provided under Res 21/01 below</i>)	Paragraph 22	
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 ongoing and expected to be completed by 31 st

Res. No.	Resolution	Scientific requirement	CPC progress
			December 2023. Subsequently a sampling plan will be drafted and implemented.
21/01	On an Interim Plan for Rebuilding the Indian Ocean Yellowfin Tuna Stock in the IOTC Area of Competence (<i>If not provided under Res 19/01 above</i>)	Paragraph 23	The IOTC Secretariat was notified of the individually allocated quota system, to manage the yellowfin tuna quota.
22/04	On a regional observer scheme	Paragraph 12	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

9. Literature cited

SEYCHELLES FISHING AUTHORITY (2016) Seychelles National Plan of Action for the conservation and management of sharks, 119 pp.

The Seychelles purse seine fishery observer program: Overview, challenges, and perspectives. **IOTC-2017-WPDCS13-29**, Juliette Lucas, Vincent Lucas, Iñigo Krug, Alexander Tirant, Cindy Assan, Maria Mein, Danielle Jupiter, Emmanuel Chassot. IOTC-2021-SC24-NRXX Page 13 of 32

FAD Watch: a collaborative initiative to minimize the impact of FADs in coastal ecosystems, 07/09/2018. IOTC-2018-WPEB14-12