IOTC-2021-SC24-NR22_Rev1

Seychelles National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2021

J. Lucas[1], C. Assan[1], V.Lucas[1], E. Socrate[1], E. Barreau[1], J.A. Lucas [1]

[1] Seychelles Fishing Authority, Fishing Port Victoria Seychelles

INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 15/02, final scientific data for the previous year was provided to the IOTC Secretariat by 30 June of the current year, **for all fleets other than longline** [e.g. for a National Report submitted to the IOTC Secretariat in 2020, final data for the 2019 calendar year must be provided to the Secretariat by 30 June 2020)	YES 30/06/2021
In accordance with IOTC Resolution 15/02, provisional **longline data** for the previous year was provided to the IOTC Secretariat by 30 June of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2020, preliminary data for the 2019 calendar year was provided to the IOTC Secretariat by 30 June 2020). **REMINDER:** Final longline data for the previous year is due to the IOTC Secretariat by 30 Dec of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2020, final data for the 2019 calendar year must be provided to the Secretariat by 30 December 2020).	YES 30/06/2021

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 2020 in comparison with previous years. It also summarizes research, and data collection related activities as well as actions undertaken in 2020 to implement Scientific Committee recommendations and IOTC Conservation and Management Measures.

Over the past five years, the Seychelles purse seine fleet has remained the same comprising of 13 vessels. The number of supply vessels has decreased from 9 vessel is 2016 to 4 vessels in 2020. The nominal effort increased slightly by 299 days (10%) in 2020, when compared to the previous year, and reach a total of 3,221 days fished whilst the catches remained constant estimated at 112,231 MT in 2020 (112,621 MT in 2019). The CPUE measured as MT/Fishing day reduced to 34.84, compared to 38.54 MT/ fishing day during the previous year. Catches of yellowfin tuna and bigeye tuna decreased by 8% and 10% respectively whilst catches of skipjack tuna increased by 4% over the period under review.

The Seychelles Industrial longline fleet comprised of 62 fishing vessels in 2020 compared to 57 vessels in 2019. The total catch reported by this fleet for the year 2020 was like the previous year estimated at 22,469 MT of which 7,775 MT consisted of yellowfin tuna. The estimated catch rate has remained constant as per the previous year, estimated at 0.55 Mt/1000 hook.

In 2020, the total catches by the Semi industrial vessels decreased by 26% to reached 1485 MT compared to 2008 MT for the previous year. This corresponds to a drop of 41% in fishing effort thus giving a mean catch rate of 0.73 MT/ 1000 hooks for the year 2020.

Similarly, to previous years, Seychelles, through 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 IOTC area of competence. Due to technical problems, we are unable to provide statistics for observer programme at this point. Update will be provided to the secretariat in due course.

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 impact of the Covid-19 pandemic in early 2020. Seychelles is moving forward with the implementation of EMS and ERS system onboard its fishing fleet targeting tuna and tuna-like species, following successful completion of pilot projects in 2021. The roll-out is expected to be completed by mid 2022.

CONTENTS

1. BACKGROUND/GENERAL FISHERY INFORMATION

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

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

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

Port Victoria is the home base for the WIO purse seiners and the Seychelles small scale longline fleet, hence the activities of those fleet are covered almost 100%. On the other hand, distant water industrial longline vessels seldom use Port Victoria as their port of transhipment, making it difficult to obtain good logbook coverage, transhipment/ landings as well as size frequency data. The Seychelles is however participating in the regional Observer Scheme to monitor transhipment at sea. Furthermore at sea scientific observer programme on the purse seine fleet and self sampling programme on the industrial longline fleet is currently being implemented. Pilot projects for EMS and ERS has been implemented and the Seychelles is planning for a full roll-out of these systems onboard its fleet in 2022.

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 2020 to implement Scientific Committee recommendations and IOTC resolution.

2. FLEET STRUCTURE

Table 1a. Shows the number of Seychelles registered purse seiners, supply vessels, industrial and semi-industrial longliners for the period 2016 to 2020. The number of Seychelles registered purse seiners has remained the same for the period 2016 to 2020. The number of supply vessel decreased from 9 vessels to 5 vessels, from 2016 to 2020. The number of Seychelles registered longliners increased from 46 vessels in 2016 to 62 vessels in 2020. An increasing trend was also observed in the number of registered small scale (semi-industrial) longline vessels from 28 vessels in 2016 to 35 vessels in 2020. It must be noted though that only 10 semi-industrial vessels were authorised to fish outside the Seychelles EEZ in 2020 and were hence registered on the IOTC List of Authorised Vessels.

Table1a. Number of Seychelles registered vessel for the period 2016 to 2020.

Year	Purse seiners	Supply vessels	Longliners	Semi-Industrial
2016	13	9	46	28
2017	13	8	54	31
2018	13	7	55	30
2019	13	6	57	36
2020	13	4	62	35

Table 1b. Seychelles registered vessels by size (GT) as reported to IOTC in 2020.

GT	Purse seiners	Supply vessels	Longliners	Semi-Industrial
<50	-		-	32
51-100	-		-	3
101-500	-	4	41	-
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 2016 to 2020 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 2016 to 2018 followed by a drop in 2019 and has since then remained stable. In the year 2020, a total catch of 112,231 MT was reported similar to the total catch of 112,621 MT reported in 2019 (Table 2a and Figure 1a).

Following a decreasing trend between 2016 and 2018 (4,092 to 2,786 fishing days), fishing effort has since then been increasing to reach a total of 3,221 days fished in 2020.

Traditionally skipjack tuna has been the dominant species caught by the Seychelles purse seine fleet. In 2020, skipjack tuna remained the dominant caught species, accounting for 67% of the total catch whilst yellowfin tuna made up 27% of the total catch. Catches of yellowfin tuna decreased by 8% from 33,006 MT in 2019 to 30,502 MT in 2020, whilst catches of skipjack tuna increased by 4% from 72,917 MT in 2019 to 75,486 MT in 2020 and catches of bigeye tuna decreased by 10% from 6,538 MT in 2019 to 5,893 MT in 2020.

Catch rate has increased from 26.55 Mt/Fishing days in 2016 to 44.25 MT/Fishing days in 2018, followed by a decreasing trend to 38.84 Mt/Fishing days in 2020.

Table 2a. Seychelles flag purse seine annual catch, fishing effort and catch rates reported between 2016 and 2020.

Year	Days Fished	Catch Rate	YFT	SKJ	BET	ALB	NEI	Total
2016	4,092	26.55	40,121	60,991	7,325	110	65	108,613
2017	3,271	37.36	41,711	69,994	9,761	56	681	122,202
2018	2,786	44.25	35,023	81,451	6,450	13	373	123,310
2019	2,922	38.54	33,006	72,917	6,538	14	146	112,621
2020	3,221	34.84	30,502	75,486	5,893	8	342	112,231

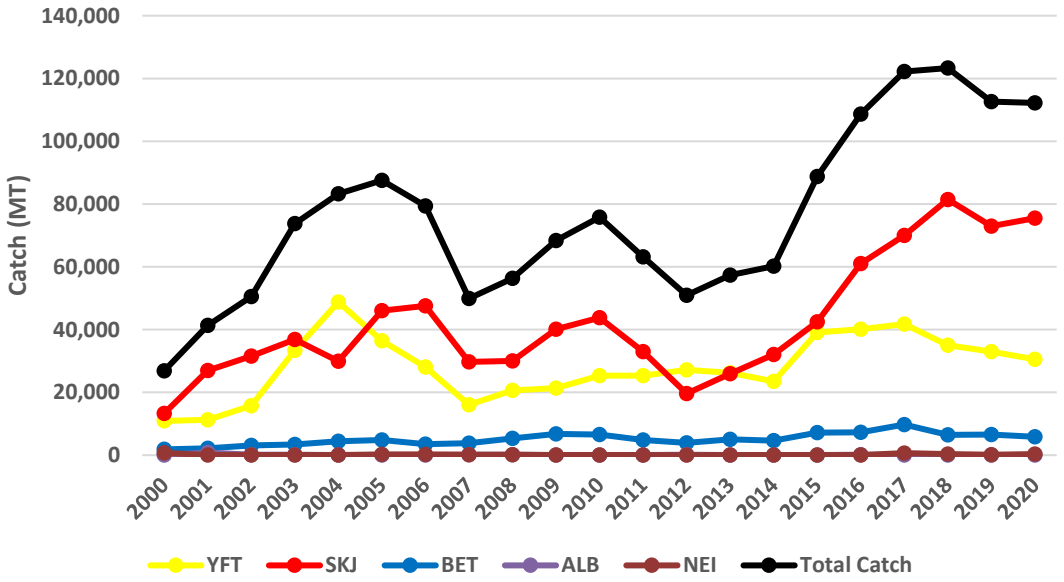
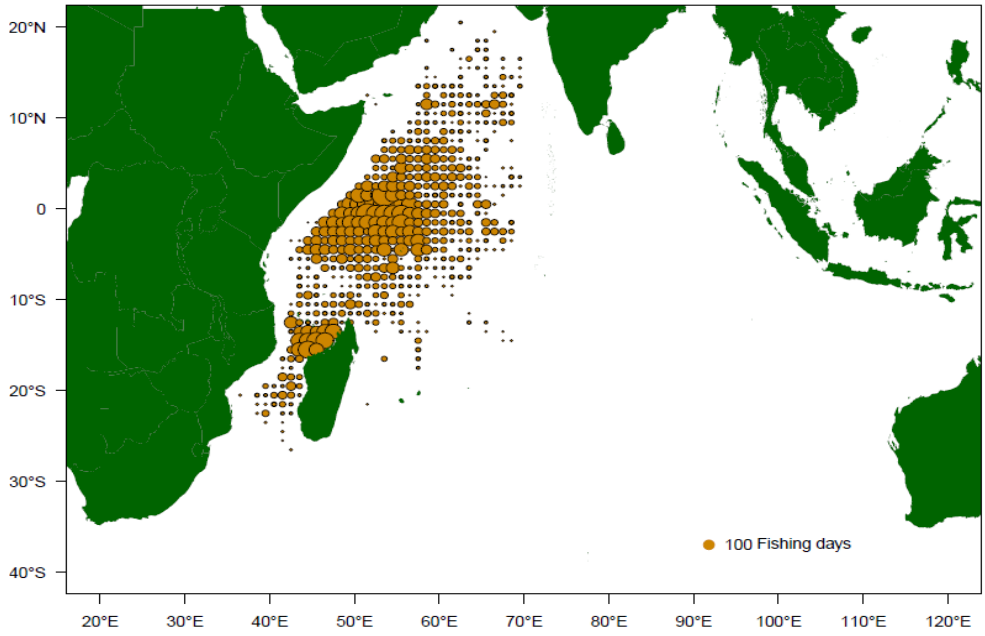


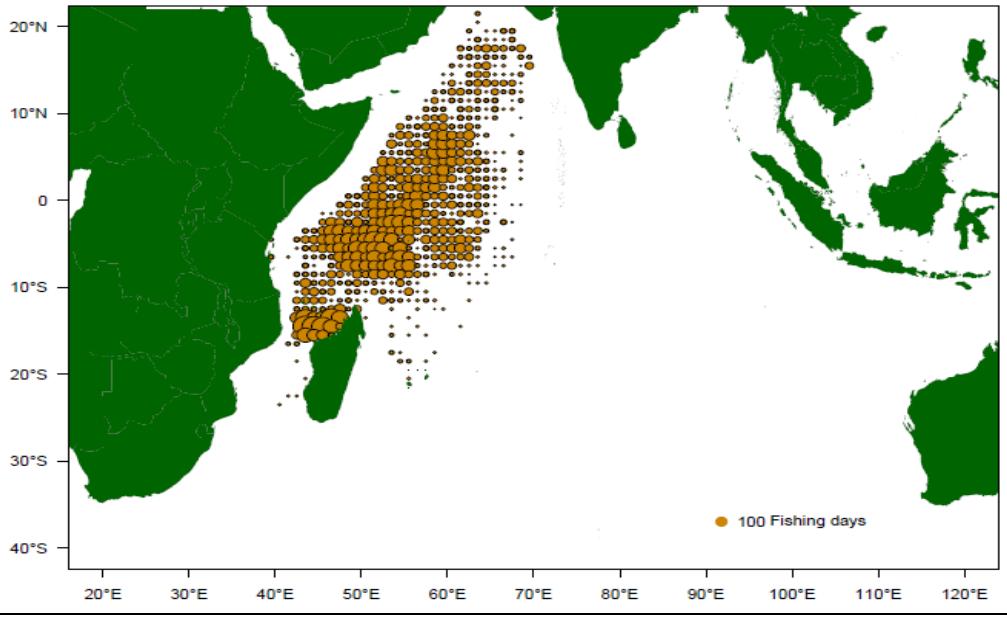
Figure 1a. Trends in annual catches by species for Seychelles' purse seine fleet reported for the period 2000-2020

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 2019, 2020 and for the previous 5 years (2016 – 2020) respectively.

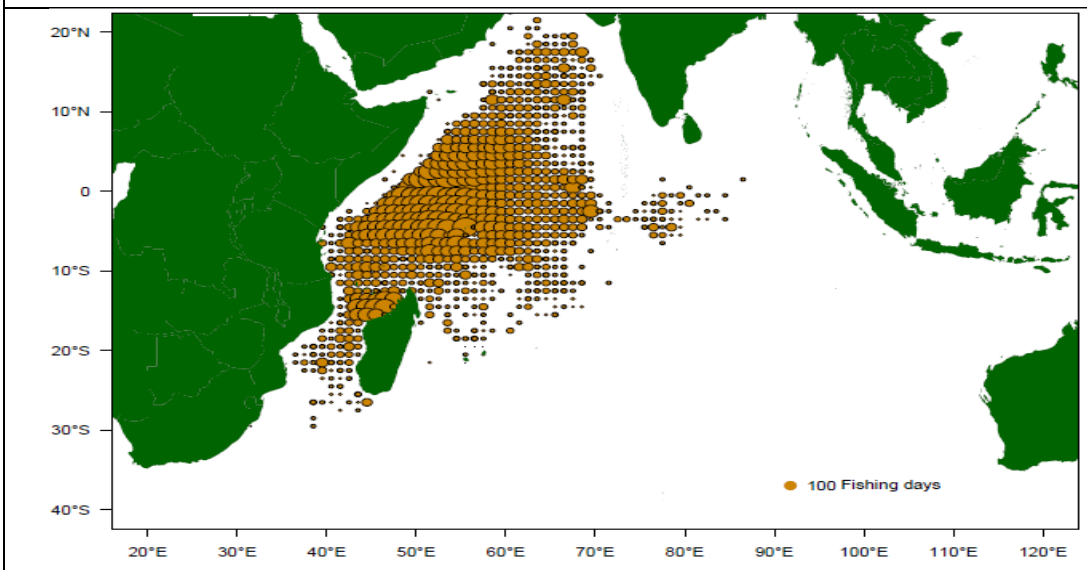
Map 3.1 a(i). Distribution of fishing effort (purse seine fleet) by 1º square, reported in 2019.



Map 3.1 a(ii). Distribution of fishing effort (purse seine fleet) by 1º square, reported in 2020.

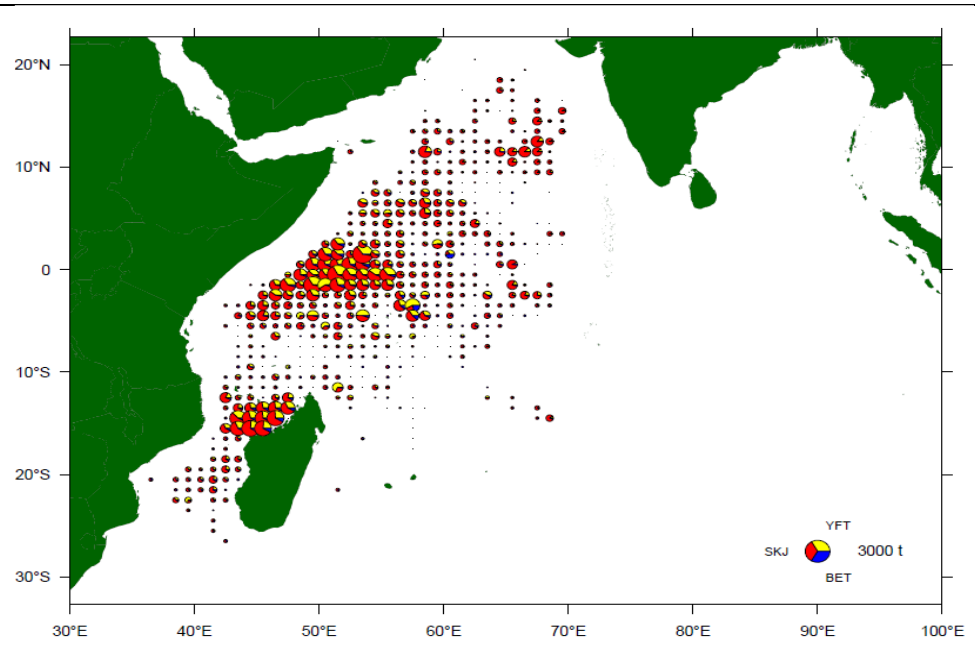


Map 3.1 a(iii). Distribution of fishing effort (purse seine fleet) by 1º square, previous 5 years (2016–2020).

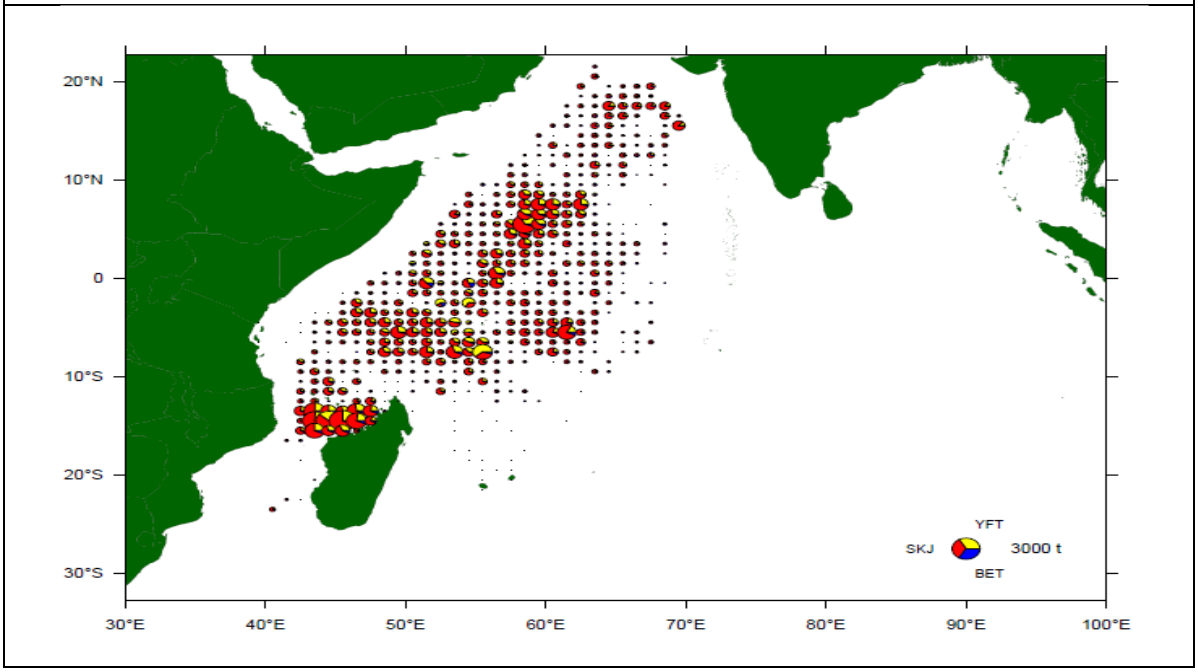


Maps 3.1 *b(i) , b(ii)* and *b(iii)* show the distribution of catches by 1° square reported by Seychelles purse seine fleet for the years 2019, 2020 and for the previous 5 years (2016 – 2020) respectively.

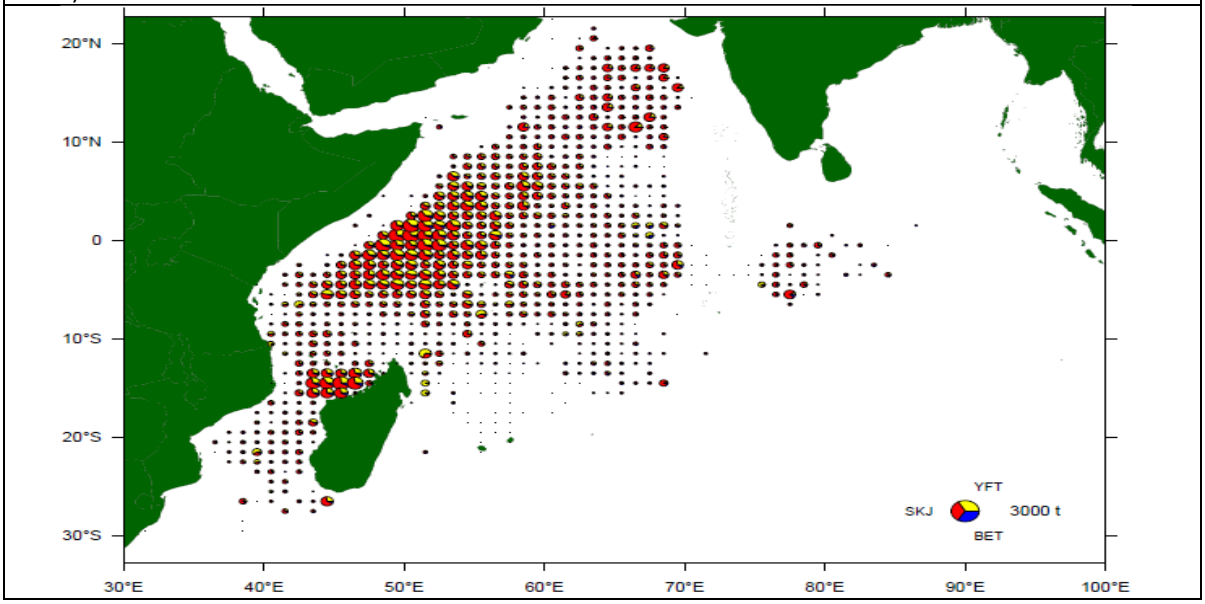
Map 3.1 b(i). Distribution of catch (purse seine fleet) by species by 1º square, reported in 2019.



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



Map 3.1 b(iii). Distribution of catch (purse seine fleet) by species by 1º square, previous 5 years (2016 – 2020).



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 2016 to 2020. The reported fishing effort in terms of the number of hooks set has been on an increasing trend since 2016. A 4 % increase was recorded in the number of hooks set in the year 2020 estimated at 40.55 million hooks set compared to 39.15 million hooks set in the year 2019.

The total catch increased from 15,009 MT in 2016 to 22,866 MT in 2019. For the year 2020, the Seychelles industrial longline fleet reported an estimated catch of 22,469 MT, representing a slight decrease of 2%, when compared to the previous year.

In term of species composition, yellowfin tuna remained the dominant species caught by this fleet with an estimated catch of 7,775 MT caught in 2020 accounting for 35% of the total catch, followed by bigeye tuna and the NEI category, representing 33% and 18% respectively. NEI is dominated by albacore, sailfish, and oil fish. The reported catch of bigeye tuna increased by 40% whilst catches of yellowfin tuna, swordfish, marlins, shark and NEI category decreased by 13%, 18%,13%, 30% and 10% respectively when compared to the previous year.

Following a slight decrease in catch rate from 0.43 MT/1000 hooks in 2016 to 0.42 MT/1000 hooks in 2017, the catch rate has since then been increasing gradually to reach 0.58MT/1000 hooks in 2019. It decreased slightly in 2020 to reach 0.55MT/1000 hooks.

Year	Fishing Effort (million hooks)	Catch rate (Mt/1000 hooks)	YFT	BET	SWO	MAR	SHK	NEI	Total
2016	34.62	0.43	2,634	5,267	1,863	1,548	496	3,200	15,009
2017	35.28	0.42	3,423	3,897	1,468	908	607	4,400	14,704
2018	39.37	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

Table 2b. Annual catch, fishing effort and catch rates reported by Seychelles industrial longline fleet from the years 2016 - 2020

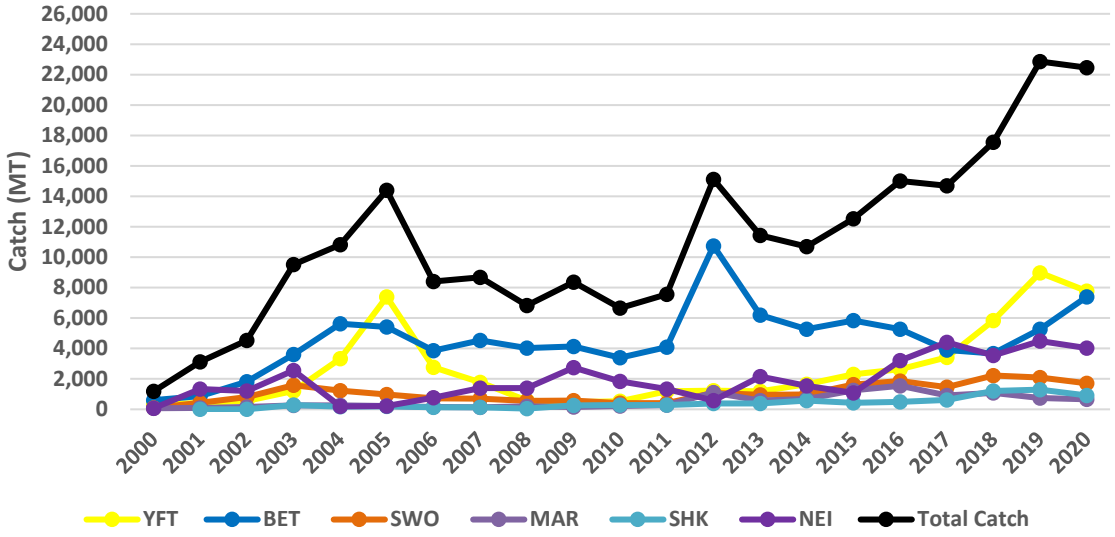
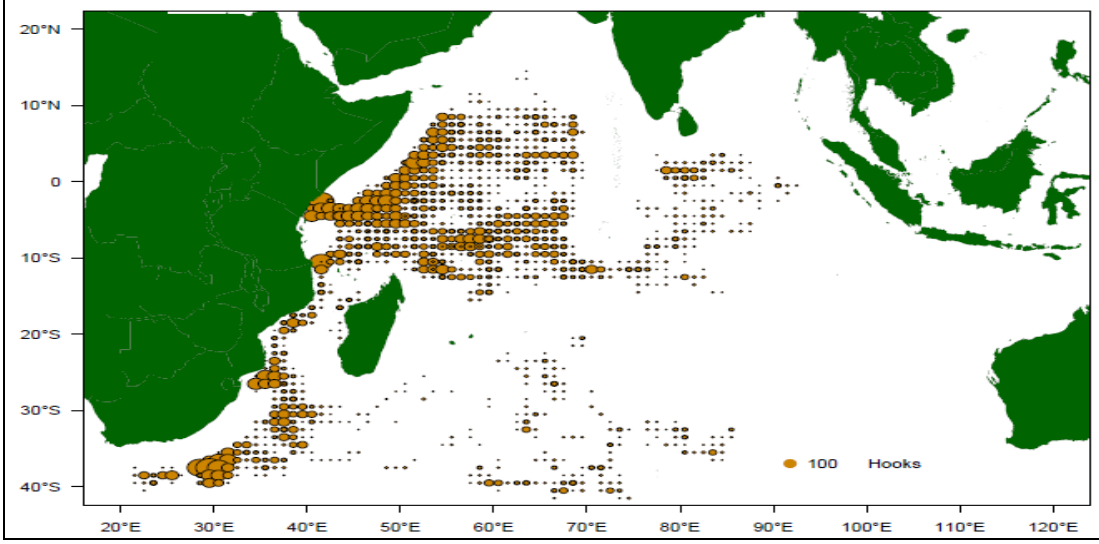


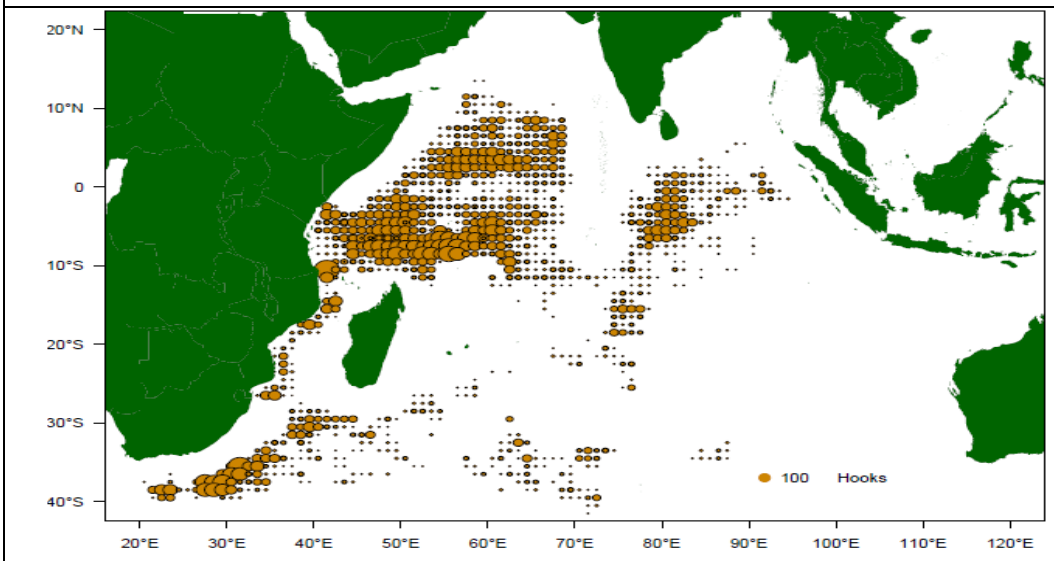
Figure 2a. Trends in annual catch by species reported by the Seychelles industrial longline fleet for period 2000-2020

Maps 3.2 a(i), a(ii) and a(iii) show the distribution of fishing effort by 1º square reported by Seychelles' industrial longline fleet for the years 2019, 2020 and the previous 5 years (2016 – 2020) respectively.

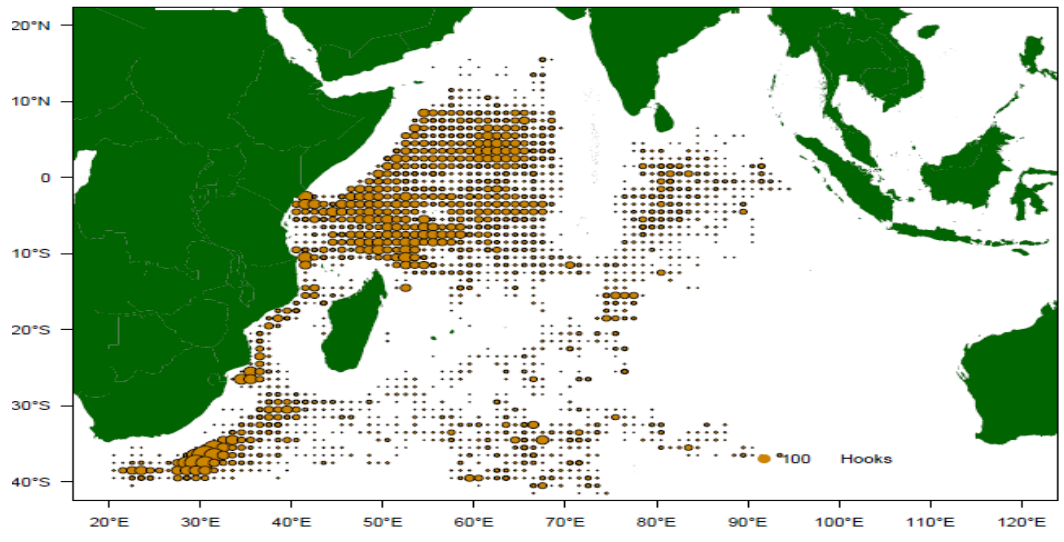
Map 3.2 a(i). Distribution of fishing effort (industrial LL fleet) by 1º square, reported in 2019.



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

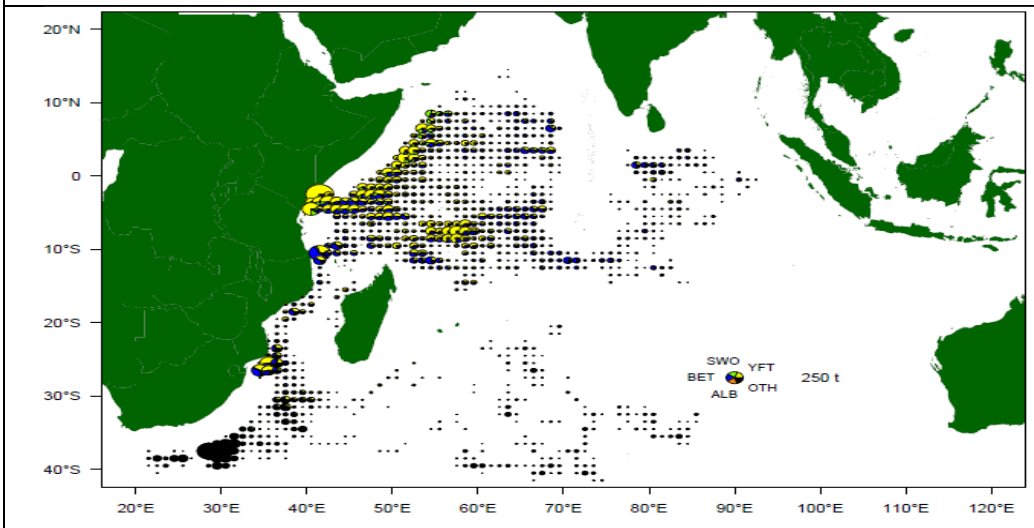


Map 3.2 a(iii). Distribution of fishing effort (industrial LL fleet) by 1º square, previous 5 years (2016 – 2020).

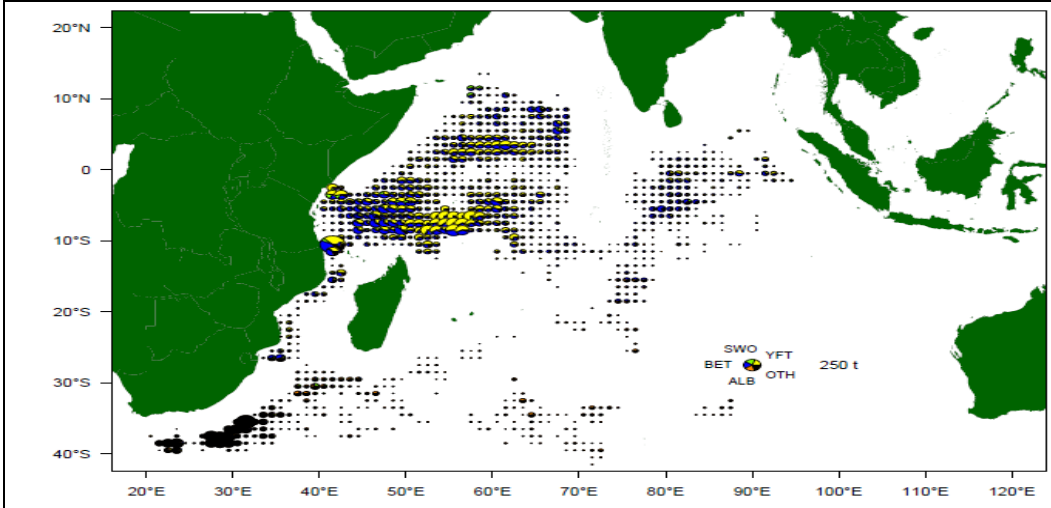


Map 3.2 b(i), b(ii) and b(iii) show the distribution of catches by species by 1° square reported by Seychelles' industrial longline fleet for 2019, 2020 and the previous 5 years (2016 – 2020) respectively.

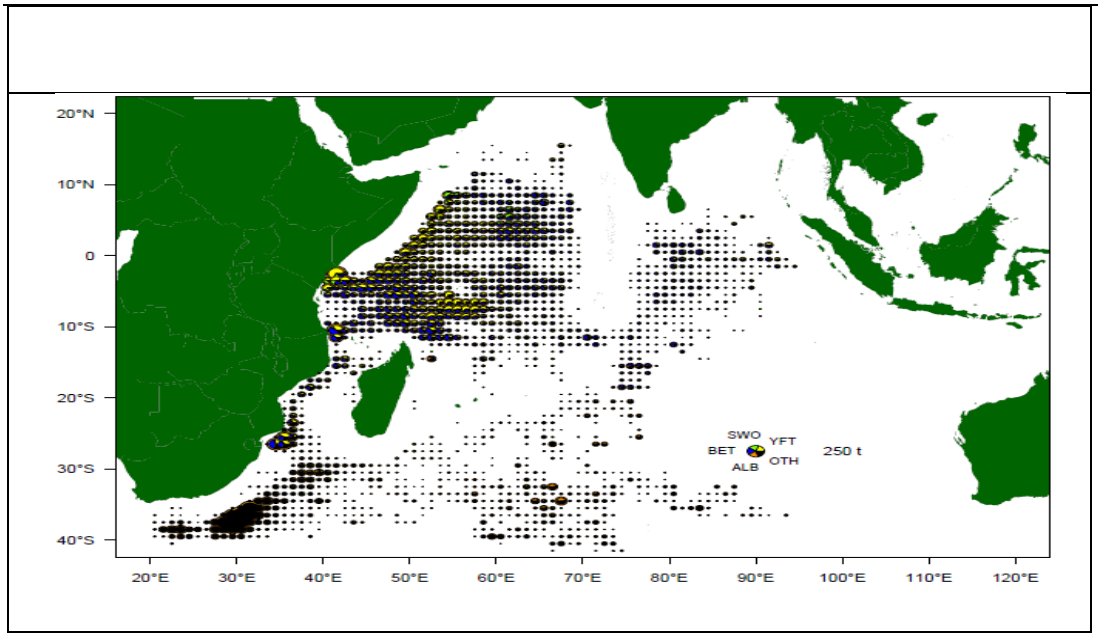
Map 3.2 b(i). Distribution of catch (industrial LL fleet) by species by 1º square, reported in 2019.



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



Map 3.2 b(iii). Distribution of catch (industrial LL fleet) by species by 1º square, previous 5 years (2016 – 2020).



3.3 Small scale fresh tuna fishery

Table 2c summarizes the fishing activities of the domestic small scale fresh tuna longline fleet from 2016 to 2020. The fishing effort in terms of hooks set, has been on an increasing trend since 2016 to reach a record high of 2.55 million hooks set in the year 2019. In 2020, a decrease of 20% was reported in the number of hooks set estimated at 2.03 million hooks when compared to the previous year. This is a result of the Covid 19 pandemic, impacting outbound air freight, which temporally stop this fishery.

The total catches increased from 969 MT in 2016 to a record catch of 2008 Mt in the year 2019. During the year 2020, the domestic small scale fresh tuna longline fishery reported a total catch of 1,485 MT representing a decrease of 26% in catches compared to the previous year.

The catch rate decreased from 0.78 Mt/1000hooks in 2016 to 0.54 Mt/1000hooks in 2017, followed by an increasing trend to reach 0.79Mt/1000hooks in 2019. The catch rate estimated for the year 2020 stands at 0.73 MT/ 1000 hooks.

Historically the fishery main target species was swordfish, however, since 2015, yellowfin tuna replaced swordfish as the dominant species. In 2020 yellowfin tuna accounted for 86% of the total catch, followed by swordfish and bigeye tuna accounting for 9% and 4% of the total catch respectively.

Table 2c. Catch, fishing effort and catch rates reported by the Semi Industrial longline fleet between 2016 and 2020.

Year	Effort (Million Hooks)	Catch rate (MT/1000 hooks)	YFT	BET	SWO	SFA	MAR	SHK	NEI	Total
2016	1.24	0.78	574	128	184	21	53	2	2	966
2017	2.06	0.54	711	116	191	24	58	2	6	1,108
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	-	2	2,008
2020	2.03	0.73	1,277	55	135	3	7	-	7	1,485

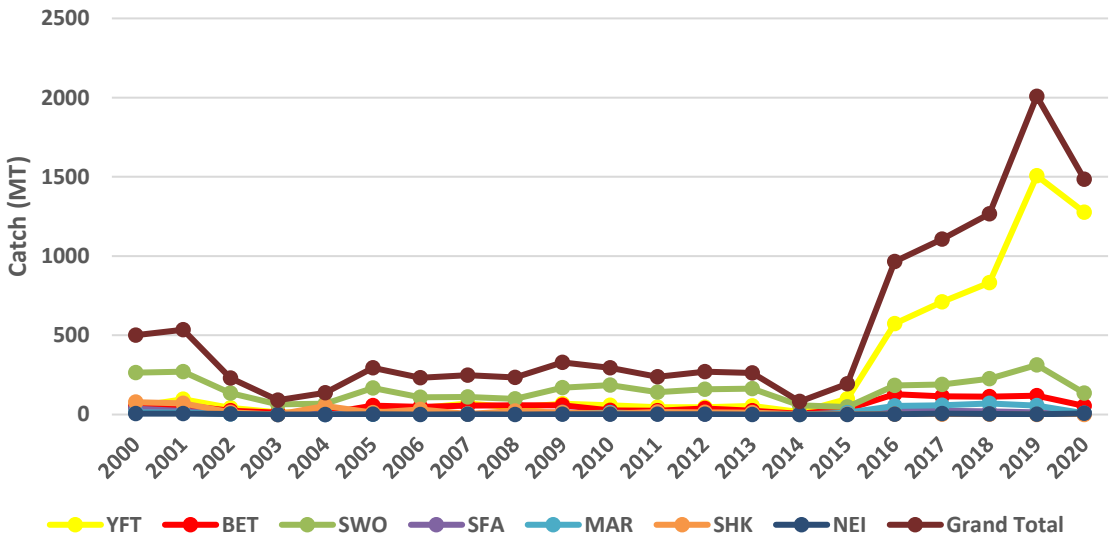


Figure 3c. Trends in annual catch by species reported by the Semi Industrial longline fleet between the period 2000 and 2020.

4. RECREATIONAL FISHERY

There is an important recreational fisheries subsector active mostly at weekends and in the evenings. These recreational fishers utilize mostly handline fishing techniques, targeting demersal species such as groupers, snappers and lethrinids, and semi-pelagics species such as carangids and sphyraenids. Tuna and tuna-like species are not targeted by the recreational fishery sector, however a limited quantity of these 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 to improve the management of the domestic fishery, which was scheduled for early 2020, has been delayed due to the Covid-19 pandemic. Work is in progress and it is expected that implementation will begin in 2022. Its implementation will improve the management of this sub-sector and will include mandatory data reporting as condition of licencing.

5. ECOSYSTEM AND BYCATCH ISSUES

In close collaboration with the industry, the Seychelles have developed, implemented and collaborated on various programmes aimed at enhancing the collection of scientific data required by the IOTC for the sound management of tuna and tuna-like 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) SIOTI[1] in association with 30 purse seiners flying the flags of the EU and Mauritius and affiliated to the fishing associations ANABAC and ORTHONGEL as well as with the processing companies Thai Union and Princes Tuna. The ultimate aim is to meet the highest standards of sustainable fishing, such as the Marine Stewardship Council standard.

- Seychelles observer programme on Seychelles purse seiners and support vessels which was initiated in 2014, continued during 2020. The programme is co-funded by the industry through the Code of Good Practices. Mandatory coverage and data reporting requirement have been met for this fishery (see section 6.3 for further details).

- 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

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

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. this component of the Seychelles fishery.

5.1 Sharks

Due to limited institutional capacity and other fisheries requirement urgent attention, the National Plan of Action for the Conservation and management of Sharks (NPOA) 2016-2020, has not been implemented to a satisfactory level. Consequently, following discussions with relevant stakeholders, the plan will be extended for a further 3 years. The secretariat will be notified of this decision.

5.1.1. Sharks finning regulation , 2006

The (Shark Finning) Regulation, 2006 place restrictions on the removal of fins of all species of shark on board of foreign-owned or local fishing vessels of a total length of 24 metres and above, fishing within or outside the Seychelles Waters.

In accordance IOTC resolution 17/05; Seychelles prohibits the removal of shark fins from fresh shark on board its vessels as well as the landing, retention on-board, transhipment and carrying of shark fins which are not naturally attached to the fresh shark carcass until the first point of landing.

For Frozen shark, for safety purpose fins can be removed, however a ratio of not more that 5% in weight of shark fins to weight of shark carcasses without fins must be respected at all times on-board all Seychelles industrial longline fishing vessels greater than 24 meters in length, up to first point of landing. Implemented is through condition of the Authorisation to fish.

5.1.2 Blue shark

Seychelles has revised logbook for its fleet targeting tuna and tuna-like species in the IOTC area of competence to cater for the capture of data related to catches of blue sharks as well as to record any interaction of this species with the fishing gear. Data for the year 2020 are still being processed and will be reported to the secretariat before December 31st, 2021.

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 2016–2020).

	Blue shark		Mako sharks		Porbeagle		Hammerhead sharks		Thresher sharks		Oceanic whitetip shark		Silky Shark		Various sharks NEI		Total N0	Total MT
Year	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT		
2016	9592	402	1629	66	1	0	19	1	9	0	1	0	0	0	794	28	12045	496
2017	12380	482	1948	80	9	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	79	2	1503	55	26657	1197
2019	24034	1014	3370	153	0	0	0	0	0	0	0	0	4147	112	416	14	31966	1293
2020	16,574	712	2,551	109		0	8	0		0			1	0	2,928	89	22,061	909

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 2016–2020).

	Blue shark		Mako sharks		Oceanic whitetip shark		Hammerhead sharks		Tiger sharks		Various sharks NEI		Total N0	Total MT
Year	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT	N0	MT		
2016	16	0.7	12	0.4	3	0.2	12	0.2	1	0.0	52	1.0	96	2.3
2017	1	0.5	3	0.1	1	0.0	10	0.2	7	0.1	99	1.6	121	2.0
2018	0	0	1	0	1	0.1	2	0	0	0	50	1	54	0.8
2019	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

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 2019–2020).

			Discarded Status			
Year	**Spcs_Acode**	**Scientific_name**	**Alive**	**Dead**	**Unknown**	**Grand Total**
2019	**BSH**	**Prionace glauca**	**560**	**593**		**1153**
	MAK	**Isurus spp**	**9**	**3**		**12**
	THR	**Alopias spp**	**125**	**36**		**161**
	SPN	**Sphyrna spp**	**2**			**2**
	FAL	**Carcharhinus falciformis**	**79**	**202**		**281**
	OCS	**Carcharhinus longimanus**	**3**			**3**
	POR	**Lamna nasus**		**1**		**1**
2019 Total			**778**	**835**		**1613**
2020	**BSH**	**Prionace glauca**	468	273	1	742
	MAK	**Isurus spp**	10	125		135
	THR	**Alopias spp**	24	6		30
	FAL	**Carcharhinus falciformis**	45	133		178
	POR	**Lamna nasus**		1		1
2020 Total			**547**	**538**	**1**	**1086**

5.2 Seabirds

In late 2018, Seychelles revised the logbook for the industrial longline fleet, to allow for the capture of information related to interaction with seabirds for vessels operating South of 20 degrees south. Reporting started in 2019 and the data are presented in table 5 below.

To complement data received from logbook, Seychelles is in the process of introducing EMS on all of its industrial fishing vessels. All of the vessel will be equipped with sensors and cameras to record setting and hauling activities, estimate the size and species composition of the catch retained, record bycatch and discards, as well as to monitor transhipments at sea, undertaken by industrial longline fishing vessels.

Table 5. Total number of seabird, released/discarded by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2019–2020).

Year	Species	ALIVE	DEAD	Unknown	Grand Total
2019	**Seabird NEI**	110	124		234
2020	**Seabird NEI**	23	16	1	40

Table 5b: Number of longline fishing vessel operating south of 20 degrees south and their corresponding fishing effort (2016 – 2020).

Year	Number of Vessels	Fishing Effort (number of hooks)
2016	10	6,063,322
2017	21	10,574,114
2018	16	5,365,690
2019	23	10,181,135
2020	19	8,083,483

5.3 Marine Turtles

The reported interaction of the industrial longline fleet with Marine Turtles reduced significantly in 2020 compared to 2019 (Table 5c.). Data for our purse seine fleet are only presented for 2019. This is due to a technical problem with the data server which is currently being addressed. On available the data will be submitted to the secretariat.

Table 5c: Total number of marine turtle, released/discarded by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2019–2020).

Year	Species	ALIVE	DEAD	Unknown	Grand Total
2019	**Marine Turtle**	90	10	1	101
2020	**Marine Turtle**	17	19	1	37

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) [D

Only one interaction with marine mammals was reported in 2020, compared to 2 interactions recorded in 2019.

Table 5c: Total number of marine mammal, released/discarded by the Seychelles Industrial Longline fleet in the IOTC area of competence (for the period 2019–2020).

Year	Species	ALIVE	DEAD	Unknown	Grand Total
2019	**Marine Mammal**	0	2	0	2
2020	**Marine Mammal**	0	1	0	1

6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS [Mandatory]

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

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

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

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

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

Since 2003, one of the 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 use to validate logbook data. A programme to increase VMS coverage on vessels of less than 24 meters is currently being implemented.

6.3. Observer programme

A total of 447 fishing trips were observed on Seychelles purse seiners during 2014-2020. 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	-	-	-	-

Percentage Coverage (Observe database/Logbook data)

year	trips	days	sets	catch
2014	8.54	8.07	7.20	5.23
2015	54.55	60.04	55.78	48.09
2016	43.31	49.16	45.87	40.68
2017	65.54	64.23	57.16	55.88
2018	69.40	69.38	67.59	68.72
2019	75	87.56	54.06	52.80
2020	-	-	-	-

Figures based on actual deployments (Seychelles Flag)

Year	No. of Vessels	Trips	Days at sea	Average no. of days at sea per trip	No. of observers	Trip per observer
Purse seiners						
2014	4	4	151	37.8	4	1
2015	13	71	2,809	39.5	46	1.5
2016	13	100	3,495	35	44	2.3

2017	13	92	2,536	27.6	27	3.4
2018	13	101	2,627	26	35	2.8
2019	13	94	2,733	29.1	31	3
2020	13	49	1,381	20	18	2.7

Based on the actual deployment figures, there has been significant change since the launch of the program in 2014. The first two years of the program can be allocated to the learning process. The number of trips was relatively low for the number of observers. For example, in 2015, 71 trips were done by 46 observers for an average of 1.5 trip. The following year, 2016, 100 trips were done by 44 observers. The observer pool was quite big and it did not necessarily equate 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 2020 there was a drop in the number of observers. 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 general observer coverage for 2020 was 40%. There was a total of 49 trips of Seychelles flagged purse seine vessels which had an observer onboard and this figure accounts for 1,381 days at sea. Observers covered an additional 7 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. At the peak of the pandemic between April and July, only 13 deployments were made in contrast to 2019 which accounted for 40 deployments over the same period. Not a single deployment was recorded for October and November 2020.

Concerning the data recorded under the program, the lag between the database figures and the actual deployment figures for the 2019 – 2020 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 2020. Efforts have been made to seek help externally, however travel restrictions did not work in our favour. However, data sets for the 2020 observer trips have been retrieved and it is in our records. We hope to get the database running smoothly as soon as possible and to be able to provide the necessary figures in future reports.

In conclusion, 2020 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. We hope that we can pursue this momentum for 2021. 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.

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 covid19 pandemic in the year 2020 severely affected the port sampling program whereby no sampling activities were conducted between mid-March to November 2020.

Table 7a. Number of vessel trips monitored, by species (Number) for the Seychelles Purse seine fleet for the period 2016 to 2020

		Number of fish Counted							
Year	Number of Trips	ALB	BET	FRI	KAW	LTA	SKJ	YFT	Grand Total
2016	79	100	6,384	773	89		72,989	39,775	120,110
2017	53		6,580	1,803	71		55,794	26,138	90,386
2018	81	1	8,474	4,173	692	4	127,571	41,706	182,621
2019	73		9,222	3,026	10		136,642	45,332	194,232
2020	22		3,058	434			42,924	11,213	57,629

Table 7b. Number of individuals fish measured for Seychelles registered purse seiners for the period 2016 to 2020.

Number of fish measured								
Year	ALB	BET	FRI	KAW	LTA	SKJ	YFT	Grand Total
2016	100	6384	773	89		72989	39775	120110
2017		6580	1803	71		55794	26138	90386
2018	1	8474	4173	692	4	127571	41706	182621
2019		9222	3026	10		136642	45332	194232
2020		3058	434			42924	11213	57629

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

	Species				
Year	ALB	BET	SWO	YFT	Total
2014		2	77	15	94
2016	1	45	187	508	741
2017		40	67	277	384
2018		26	78	172	276
2019		30	103	290	423
2020		212	235	841	1288

6.5 Unloading/Transhipment

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. Data for the industrial longline fleet is currently being compile to be submitted to the IOTC secretariat.

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

Total		Species					
Year	PORT	YFT	SKJ	BET	ALB	MIX	Grand Total
2016	DIEGO SUAREZ	507	731	83			1,322
	PORT VICTORIA	1,874	1,508	132	1	12,997	16,513
2016 Total		**2,382**	**2,239**	**216**	**1**	**12,997**	**17,834**
2017	DIEGO SUAREZ					1,492	1,492
	PORT VICTORIA	737	292	67		12,768	13,863
	PORT LOUIS					389	389
2017 Total		**737**	**292**	**67**		**14,649**	**15,744**
2018	PORT VICTORIA	5,777	6,799	723			13,299
2018 Total		**5,777**	**6,799**	**723**			**13,299**
2019	PORT VICTORIA	6,172	8,888	2,956		24	18,040
	PORT LOUIS	161	32	5		2	200
2019 Total		**6,333**	**8,920**	**2,961**		**25**	**18,240**
2020	PORT VICTORIA	6,535	7,646	397	1	7	14,585
2020 Total		**6,535**	**7,646**	**397**	**1**	**7**	**14,585**

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

Total		Species						
Year	PORT	YFT	SKJ	BET	ALB	FRI	MIX	Grand Total
2016	PORT VICTORIA	3,248	1,468	360	15		80,404	85,495
2016 Total		**3,248**	**1,468**	**360**	**15**		**80,404**	**85,495**
2017	DIEGO SUAREZ						5,946	5,946
	PORT VICTORIA	3,709	6,225	1,457	0		96,329	107,720
	PORT LOUIS						130	130
2017 Total		**3,709**	**6,225**	**1,457**	**0**		**102,406**	**113,796**
2018	DIEGO SUAREZ	311	815	357				1,483
	PORT VICTORIA	23,000	72,547	12,014				107,561
	PORT LOUIS	330	299	41				670
2018 Total		**23,640**	**73,662**	**12,413**				**109,715**
2019	DIEGO SUAREZ	302	1,067	206				1,574
	PORT VICTORIA	24,534	50,213	11,139	3	51	316	86,256
	PORT LOUIS	209	430	27				667
	MADAGASCAR	893	3,084	393				4,370
2019 Total		**25,939**	**54,793**	**11,764**	**3**	**51**	**316**	**92,867**
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**

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

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

Gillnet observer coverage and monitoring

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

6.8 Sampling plans for mobulid rays [Mandatory]

Seychelles has initiated a pilot project in 2021 to monitor the occurrence of mobulid rays catches in its artisanal and subsistence fisheries. Detail of the sampling protocole will be provided to the secretariat in due course.

7.0 NATIONAL RESEARCH PROGRAMS

Currently there are no national research programmes being implemented which are relevant to the species under the IOTC perview.

7.1. National research programs on blue shark

Currently there are no national research program on blue shark.

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

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

7.3. National research programs on sharks

Currently there are no national research program on shark other than the usual data collection programs .

7.4. National research programs on oceanic whitetip sharks

Currently there are no research project on oceanic whitetip sharks.

7.5. National research programs on marine turtles

Turtle monitoring programs were implemented, starting in the early 1970s, throughout the country and proved to be a highly effective conservation tool. Todate there are almost 20 such programmes operating in the Seychelles. Essentially the same monitoring protocols have been employed at all sites, which makes the data collected comparable for scientific analysis. The Seychelles Fishing Authority in collaboration with Ministry of Agriculture, Climate Change and Energy is currently compiling the report for 2020 which will be submitted to the secretariat in due course.

7.6. National research programs on thresher sharks
Currently there are no research project on thresher sharks.

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

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

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

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

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

Res. No.	Resolution	Scientific requirement	CPC progress
15/02	Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)	Paragraphs 1–7	Seychelles has been annually providing Nominal catch data as well as size frequency data to the IOTC for its purse seine, industrial longline and small-scale longline fleets.
17/05	On the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 6, 9, 11	National regulations place restrictions on the removal of fins of all species of shark on board of foreign-owned or local fishing vessels of a total length of 24 metres and above, fishing within or outside the Seychelles Waters. Where authorisation is granted, a ratio of not more that 5% in weight of shark fins to weight of shark carcasses without fins must be respected at all times onboard all Seychelles industrial longline fishing vessels greater that 24 meters in length, up to first point of landing.
18/02	On management measures for the conservation of blue shark caught in association with IOTC fisheries	Paragraphs 2-5	Revised logbook do cater for the reporting of capture. See table 4 for reported catches. Relevant data are also reported to the IOTC secretariat annually. Currently there are no ongoing research programme
18/05	On management measures for the conservation of the Billfishes: Striped marlin, black marlin, blue marlin and Indo-Pacific sailfish	Paragraphs 7 - 11	Revised logbook do cater for the reporting of capture. See table 4 for reported catches. Relevant data are also reported to the IOTC secretariat annually. Electronic tagging programme is being implemented with the help of NGO. Data to be made available to the Secretariat.
18/07	On measures applicable in case of non-fulfilment of reporting obligations in the IOTC	Paragraphs 1, 4	
19/01	On an Interim Plan for Rebuilding the Indian Ocean Yellowfin Tuna Stock in the IOTC Area of Competence	Paragraph 22	The IOTC Secretariat was notified on 19.08.2020 of the individually allocated quota system, introduce new e-logbook and transhipment forms, increase scientific and port inspection, revised licence condition provide penalties for non-compliance
19/03	On the Conservation of Mobulid Rays Caught in Association with Fisheries in the IOTC Area of Competence	Paragraph 11	A pilot project was completed in 2021. More details on the sampling protocole will be transmitted to the secretariat in the near future.

8. 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.

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