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

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Ministry of Blue Economy, Marine Resources, Fisheries and Shipping - Mauritius

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 2019calendar year must be provided to the Secretariat by 30 June 2020)	YES 30/06/2020
In accordance with IOTC Resolution 15/02, provisional **longline data** for the previous year was provided to the IOTC Secretariat by 30 June of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2020, preliminary data for the 2019 calendar year was provided to the IOTC Secretariat by 30 June 2020). **REMINDER:** Final longline data for the previous year is due to the IOTC Secretariat by 30 Dec of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2020, final data for the 2019 calendar year must be provided to the Secretariat by 30 December 2020).	YES 30/06/2020
If no, please indicate the reason(s) and intended actions:	

Executive Summary

In 2019, Mauritius had 3 purse seiners, 1 supply vessel and 15 semi-industrial longliners operating in the tuna fishery. The three purse seiners are large freezer vessels having an overall length of 89.4 M each. The longliners are semi-industrial boats less than 24 Metres in length. Ten out of the 15 semi-industrial longliners operated outside the Mauritius EEZ and the remaining 5 longliners operated exclusively inside the EEZ.

The semi-industrial longline fleet operating exclusively inside the EEZ of Mauritius comprised 5 boats which undertook 21 fishing trips for a total of 167 fishing days and a deployment of 224574 hooks. The majority of the catch consisted of yellowfin (31%), albacore (24%) and swordfish (20%). Their total catch amounted to 58 tonnes. The CPUE was 0.26kg/ hook.

Ten semi-industrial longliners operated outside the EEZ and carried out 154 trips for a total of 1159 fishing days. They landed 746t of fish with a deployment of 1328892 hooks. The CPUE was 0.56kg/hook. Majority of their catch consisted of yellowfin (41%) followed by swordfish (34%). The area of operation was between latitudes13^{o}S and 27^{o}S and longitudes 34^{o}E and 42^{o}E.

The Mauritian purse seiners operated between latitudes 13^{o}N to 13^{o}S and longitudes 44^{o} to 68^{o}E. Total catch of the three purse seiners amounted to 27 082t comprising of 45% yellowfin, 47% skipjack and 7% bigeye tuna for 739 positive sets out of a total of 808 sets. Observers were deployed on the three Mauritian purse seiners for a total of 169 days at sea covering 181 sets.

Sampling exercises were carried out on local semi-industrial longliners. 806 fishes were sampled on the semi-industrial longliners operating inside the EEZ and 11583 fish were sampled from the semi-industrial longliners operating outside the EEZ and. In the artisanal fishery, 278 fishes were sampled for length frequency. Sampling exercises were also carried out on the Mauritian purse seiners when they called at Port Louis and 2621 fish were measured.

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1. BACKGROUND/GENERAL FISHERY INFORMATION [MANDATORY]

Industrial tuna fishing started in Mauritius in the late nineteen seventies. A first Mauritian purse seiner, 'Lady Sushil' was launched in 1979 and eight years later another purse seiner, the 'Lady Sushil II' joined the fleet. A third purse seiner, 'Cirné', started operations in 1991. Until 1997, the three vessels were operating for the local canning factory. However, due to financial problems and change in the administration of the factory, the vessels were sold off and the factory had to rely on import of raw materials to meet its commitments. In 2013, a Mauritius-flagged vessel restarted operating in the purse seine fishery after an absence of 13 years. In 2019, Mauritius had three purse seiners operating in the IOTC area of competence. The three Mauritian purse seiners operated between latitudes 13ºN to 13ºS and longitudes 44º to 68ºE. Total catch of the three purse seiners amounted to 27,082t comprising of 45% yellowfin, 47% skipjack and 7% bigeye tuna for 739 positive sets out of a total of 808 sets. Observers were deployed on the three Mauritian purse seiners for a total of 169 days at sea covering 181 sets.

The Mauritian longline fishery started in 1970 when a longliner was operated by the local tuna canning factory. Due to various problems, the vessel stopped operation soon after.

The Mauritian surface longline fishery targeting mainly swordfish (*Xiphias gladius*) started in the eighties. During experimental longlining for tuna during 1986-88, a few swordfish were caught in the coastal waters of Mauritius (Roullot et al, 1988).

Commercial longline fishing started in 1999 when a small surface longliner started fishing for swordfish in the Mauritian waters. Since then, the number of vessels has gradually increased as promoters were encouraged to exploit the swordfish resource. The Mauritian longline fishing vessels are all semi-industrial vessels less than 24M in length. In 2019, there were 15 semi-industrial longliners which operated both inside and outside the Mauritius EEZ. The semi-industrial longliners landed a total of 804 tonnes of fish. For the longliners operating inside the EEZ, the majority of the catch consisted of yellowfin (31%), followed by albacore (24%) and swordfish (20%). For the longliners operating outside the EEZ, the majority of the catch was yellowfin (41%) followed by swordfish (34%) and bigeye (14%).

An artisanal fishery around Anchored Fish Aggregating Devices (AFADS) exists since 1985. A number of FADs are set at distances ranging from 2 to 12nm from the coast. There are approximately 350 fishermen that are registered to fish around the AFADs. In 2019, catch around the AFADs amounted to 232t.

2. FLEET STRUCTURE [MANDATORY]

In 2019, the Mauritian tuna fleet consisted of three purse seiners, fifteen surface longliners and one supply vessel (Table 1). The purse seiners operated mostly outside the EEZ of Mauritius namely on the high seas and in the EEZ of Seychelles. Each has a length of 89.4 Metres and a GT of 2667t. The surface longliners are boats less than 24 Metres in length. Five of them operated inside and the others outside the EEZ. Their sizes range

from 13.5 to 23.8 metres and their gross Tonnage range from 17.27 to 97t. Mauritius also has one supply vessel that services its two purse seiners. The supply vessel is 30M in length and has a GT of 287t. Table 1 shows the number of vessels of the National fleet which operated in the IOTC area of competence by gear type and size from 2015 to 2019.

Table 1: Number of vessels of the Mauritius fleet operating in the IOTC area of competence, by gear type and size (2015 – 2019)

Year	Gear	Number of vessels	Number of fishing days	GT	LOA (m)	Preservation Methods
2015	Surface longline	5	191	32- 97.4	13.50-22.80	Chilled
	Purse seine	7	357	678-2667	49.56-90	Frozen
2016	Surface longline	11	649	32-97.4	14.3-23.8	Chilled/Frozen
	Purse seine	2	475	2667	89.4	Frozen
2017	Purse seine	2	511	2667	89.4	Frozen
	Supply vessel	1	191 days at sea	287	30	
2018	Surface longline	13	1112	21.2 – 97	16.1 – 23.8	Chilled/Frozen
	Purse seine	2	511	2667	89.4	Frozen
	Supply vessel	1	183 days at sea	287	30	
2019	Surface longline	15	1326	17.27-97.40	13.50-23.80	Chilled/Frozen
	Purse seine	3	681	2667	89.4	Frozen
	Supply vessel	1	198 days at sea	287	30	

3. CATCH AND EFFORT (BY SPECIES AND GEAR)

The semi industrial longliners licensed to operate both within and outside the EEZ undertook 175 fishing trips for a total of 1326 fishing days with a deployment of 1553466 hooks. The total catch of the semi-industrial longline fleet was 804t. These boats have been targeting swordfish which are usually landed gilled and gutted with both the head and tail off.

For the semi-industrial longliners fishing inside the EEZ in 2019, a total catch of 57t of fish was recorded with a deployment of 224574 hooks (Table 2b). The CPUE was 0.26 kg/hook. Yellowfin tuna made up 30.7% of the catch followed by albacore (24.1%) and swordfish (20.3%) of the catch. The percentage of the other species were: bigeye tuna (9.2%) and marlins (7.1 %). The remainder of the catch consisted of wahoo, skipjack, oil fish dolphin fish and other miscellaneous species.

The semi-industrial longliners that operated outside the EEZ of Mauritius carried out 118 fishing trips and landed a total of 1159t of fish. 1328892 hooks were deployed (Table 2a). The CPUE was 0.6kg/hook. The majority of the catch composed of yellowfin tuna (41.1%) followed by swordfish (34.3%) and bigeye tuna (14.4%). Marlins made

up 3.4% of the catch and sharks 1.0%. Other species included skipjack, sailfish, oilfish, dolphin fish and miscellaneous species.

A total of 681 fishing days was recorded for the three super freezer purse seiners and 808 sets were deployed out of which, 739 were positive (Table 2c). The total catch amounted to 27,082 tonnes with a catch composition of 45.4% of yellowfin tuna, 47% skipjack tuna, 7% bigeye tuna and 0.1% albacore tuna. Miscellaneous fishes constituted 0.6% of the total catch. The purse seiners operated between latitudes 13ºN and 13ºS and longitudes 44ºE to 68ºE (Figure 2b). 57% of the catch (15,416t) was made on log-associated schools whilst 43% (11,66t) was from free school. The majority of the log-associated catch originated from artificial logs (92%) and only 8% of the log-associated catch was made on natural logs. On the free schools, 72% of the catch comprised yellowfin whilst 23% of the catch were skipjack. On natural logs, skipjack made up 64% of the catch, yellowfin 28% and bigeye 7%. On artificial logs skipjack made up 65% of the catch, yellowfin 24% and bigeye 9%. Three observers were deployed on the Mauritius-flagged purse seiners. They spent 169 days at sea and covered 181 sets.

All the fishing operations of the semi-industrial and industrial tuna fishing vessels under Mauritius flag are monitored regularly by the Vessel Monitoring System (VMS). Moreover, the catch is verified through the fishing logbooks submitted by the vessels' masters. It is mandatory for the vessels to submit logbooks and if a vessel fails to submit its logbook, it is subjected to penalties. The catch of the vessels landing at Port Louis is also monitored during landing at port and this is done by the officers based at the Port State Control Unit.

The tables below 2a, 2b and 2c show the annual catch and effort of the Mauritius flagged longliners fishing outside the EEZ (Table 2a) and inside the EEZ (Table 2b) and of the Mauritius flagged purse seiners (Table 2c) in the IOTC are of competence.

Table 2a. Annual catch and effort of Mauritius flagged longliners (fishing outside the EEZ) in the IOTC area of competence (2016 – 2019)

Species	Catch (kg)			
	2016	**2017**	**2018**	**2019**
Yellowfin	40235	140068	213025	307124
Bigeye	49763	109313	79209	107723
Albacore	4772	2113	8970	4996
Swordfish	88698	203174	307974	255925
Marlins	23546	24004	22436	25610
Other billfishes	2107	6787	8027	7822
Sharks	825	1195	4029	7448
NEI	4822	26017	47624	29802
Effort (No. of hooks)	322532	701637	1148857	1328892

Table 2b. Annual catch and effort of Mauritius flagged longliners (fishing inside the EEZ) in the IOTC area of competence (2011 -2019)

Species	Catch (Kg)								
	2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Yellowfin	16476	5715	11265	11265	28270	52702	124797	46095	17748
Bigeye	10826	2960	17185	7955	13284	20481	49243	7642	5320
Albacore	8415	5555	6215	6451	12075	28789	34346	36869	13917
Swordfish	43999	17065	28320	14015	42175	64076	115005	20782	11720
Other billfishes	3531	1810	2053	1055	3885	14709	23248	5672	3620
Sharks	740	455	680	90	485	3339	5607	6602	690
NEI	5407	2561	2255	1789	2695	7956	26174	6101	4813
Effort (No. of hooks)	252480	182300	150560	105120	195850	439046	953344	296620	224574

Table 2c. Annual catch and effort of the Mauritius flagged purse seiners operating in the IOTC area of competence (2013 - 2019)

Species	Catch (tonnes)						
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Yellowfin	352	4844	5448	7404	768	11322	12287
Bigeye	27	532	1430	530	1354	1784	1895
Skipjack	476	3132	2849	3788	8503	9283	12742
Albacore	-	49	78	55	134	16	16
Total	855	8557	9805	11777	17672	22405	26940
Effort (No. of sets)	53	482	490	463	719	650	808

The figures 1a and 1b below show the historical annual catch for the Mauritius longline and purse seine fleet respectively. Regarding the longline fleet, there has been an increase in the catch made by all the longliners since 2014. This is mainly due to the development of the fleet from 5 to 15 vessels in 2019 except for the period 2009 to 2014 where there was a decrease in the number of active vessels in this fishery. It is to be noted that in 2016, 3 longliners started to operate in Mozambique. In 2019, 10 longliners were active in the Mozambican waters.

The catch of the Mauritius purse seine fleet has known a gradual increase from 2013 to 2019 (Figure 1b). In 2013 only one small purse seiner with a G.T of 678t was operational from October to December followed by the coming in operation of 5 additional small purse seiners of the same size and 1 super freezer purse seiner with a GT of 2667t in 2014. The 5 small purse seiners stopped operating in 2016. A third purse seiner joined the fishery in 2019. Based on the historical catches, majority of the catch consisted of yellowfin (42%-63%) followed by Skipjack (29%-48%). A gradual increase was noted in the percentage catch of skipjack from 29 % in 2015 to 48% in 2017. This was reversed in 2018 with 44% of skipjack caught. The highest percentage of yellowfin in the total catch was observed in 2016 with 63%. It was followed by a decrease in 2017 and a slight increase in 2018. In 2019, the percentage of yellowfin in the catch decreased again to reach 46%.

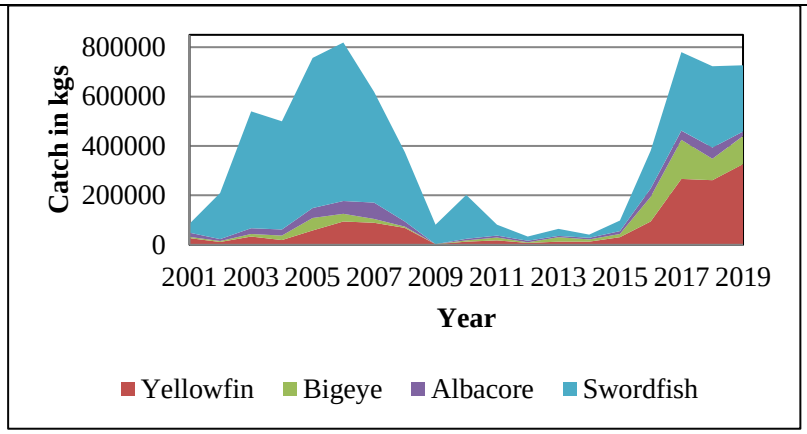

Figure 1a. Historical annual catch of the primary species for the Mauritius longline fleet in the IOTC area of competence (2001 – 2019)

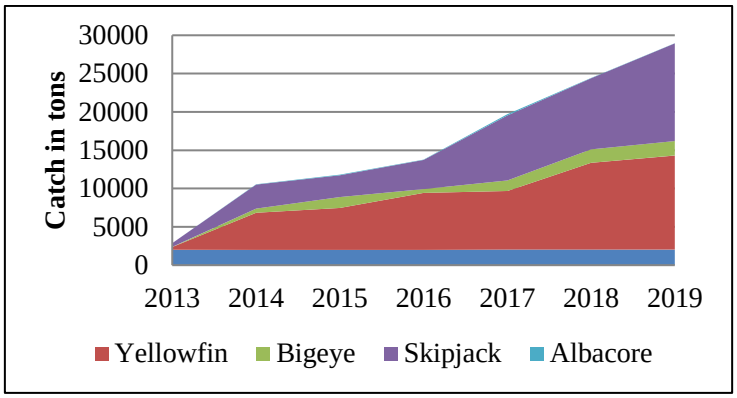

Figure 1b: Historical annual catch for the Mauritius purse seine fleet in the IOTC area of competence (2013-2019)

Figure 2a. Figures 2a (i), (ii) and (iii) show the fishing effort of the Mauritius longline fleet both inside and outside the Mauritian EEZ and that of the Mauritius purse seine fleet in 2019. In 2019, a total of 224574 hooks were used by the Mauritius flagged longliners fishing in the EEZ and the geographical distribution of the fishing effort was concentrated in grid 15° to 20 °S and 55 ° to 60 °E. For the national longline fleet operating outside the EEZ, the vessels operated in the EEZ of Mozambique. Regarding the Mauritius flagged purse seiners, fishing effort were deployed mostly in the EEZ of Seychelles and on the high seas in 2019 (Figure 2a iii).

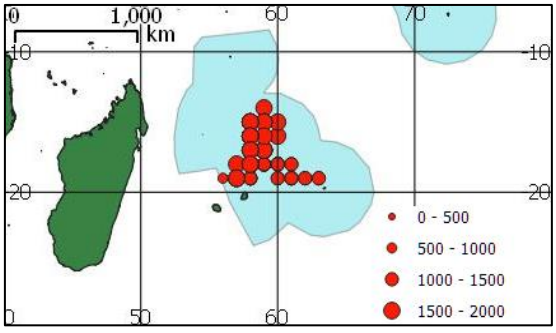

Figure 2a (i): Fishing effort (no. of hooks) -Mauritius-flagged longliners fishing in the EEZ (2019)

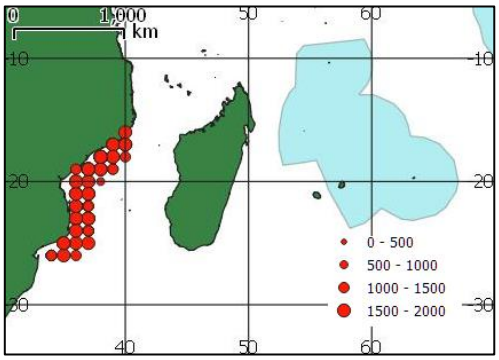

Figure 2a (ii): Fishing effort (no. of hooks) - Mauritius-flagged longliners fishing outside the EEZ (2019)

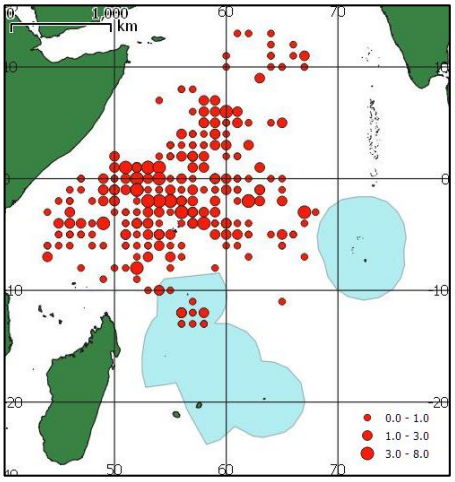

Figure 2a (iii): Fishing effort (no. of sets) - Mauritius-flagged purse seiners (2019)

Figures below 2b (i) to (iii) show the fishing effort of the Mauritius longline fleet both inside and outside the Mauritian EEZ and that of the Mauritius purse seine fleet in from 2015 to 2019. The fishing effort of the national longline fleet operating in the EEZ was concentrated between latitudes 15ºS to 20ºS and 56ºE to 62 ºE. For the longliners which operated outside the EEZ, the spatial distribution of fishing effort extended from 12°S to 27°S and longitudes 34°E to 42°E mainly in the EEZ of Mozambique. During the last five years, the fishing effort of the Mauritius purse seine fleet covered an extended area over the high seas and in the EEZ of Seychelles from 14°N to 15°S and 40°E to 85°E.

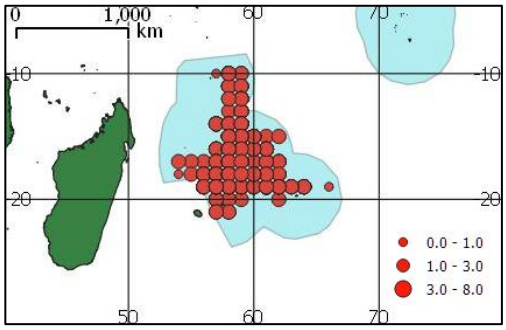

Figure 2b (i): Fishing effort (no. of hooks) -Mauritius-flagged longliners fishing in the EEZ (2015 -2019)

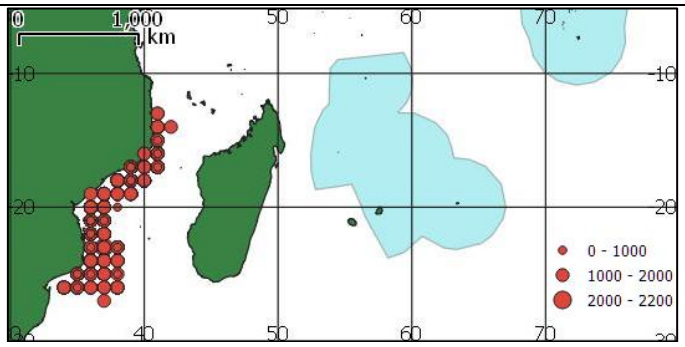

Figure 2b (ii): Fishing effort (no. of hooks) - Mauritius-flagged longliners fishing outside the EEZ (2016-2019)

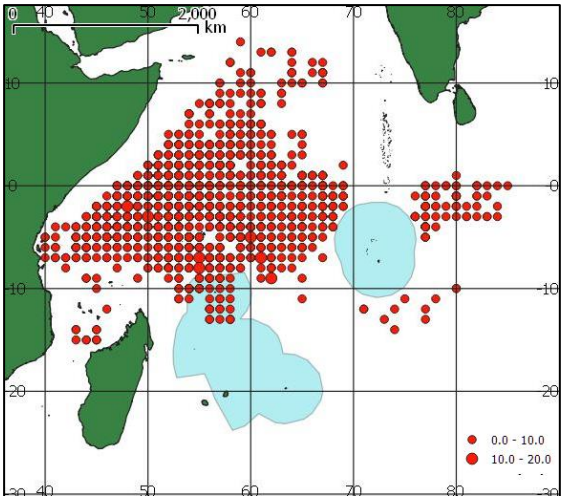

Figure 2b (iii): Fishing effort (no. of sets) - Mauritius-flagged purse seiners (2015 - 2019)

Figures 3a (i) to (vii) show the map of distribution of catch for the longline and purse seine national fleets in 2019. Both swordfish and tuna catches are concentrated between 15º to 20 ºS and 55 º to 62 ºE for those vessels fishing in the EEZ while for those fishing outside the EEZ, catches were mostly concentrated between 18º to 25 ºS and 36 º to 37 ºE. For the national purse seine fleet, catches of the tropical tuna were concentrated between 5°N to 5°S and 50°E to 60°E.

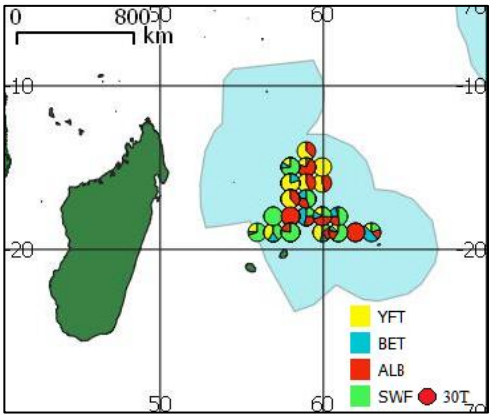

Figure 3ai. Distribution of catch by species for the Mauritian flagged longliners in the EEZ (2019)

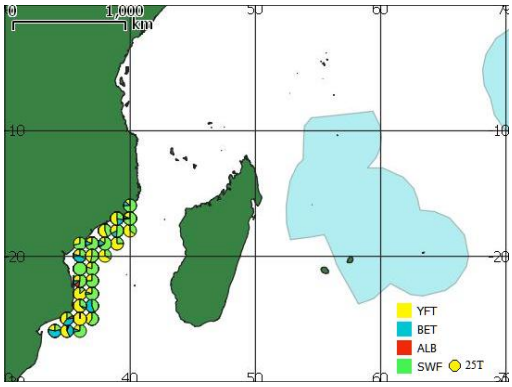

Figure 3aii. Distribution of catch by species for the Mauritian flagged longliners outside the EEZ (2019)

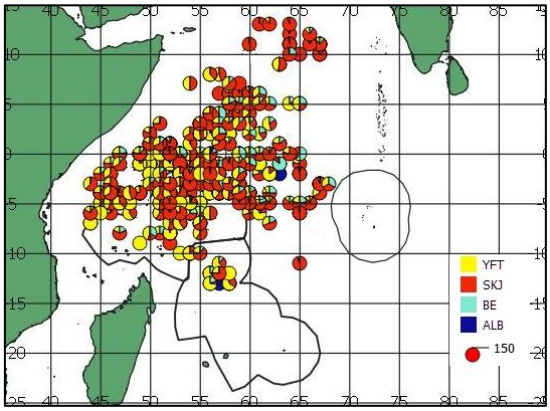

Figure 3aiii. Distribution of catch, by species for the Mauritian flagged purse seiner in the IOTC area of competence (2019)

In figures 3b (i) to 3b (vii), the catches for the national longline and purse seine fleet have been aggregated for the last five years 2015 to 2019. The same spatial concentration of catches (15º to 20 ºS and 55 º to 62 ºE) can be observed for the national longline fleet operating inside the EEZ in the last five years as in 2019. For those who are active outside the EEZ, the spatial distribution of catches was concentrated between 18º to 25 ºS and 35 º to 37 ºE. Regarding the national purse seine fleet, the spatial distribution from 2015 to 2019 were more extended than in 2019. Catches were concentrated in areas extending from 5°N to 8°S and 50°E to 65°E.

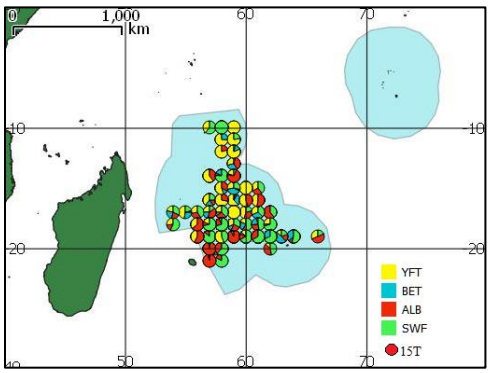

Figure 3bi. Distribution of catch by species for the Mauritian flagged longliners in the EEZ (2015–2019)

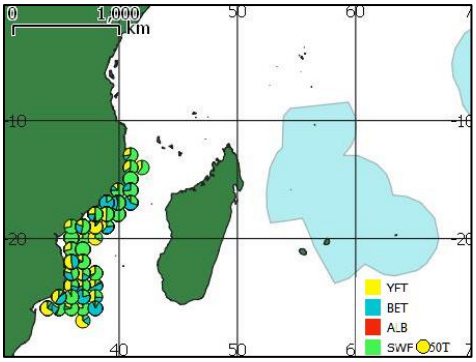

Figure 3bii. Distribution of catch by species for the Mauritian flagged longliners outside the EEZ (2016–2019)

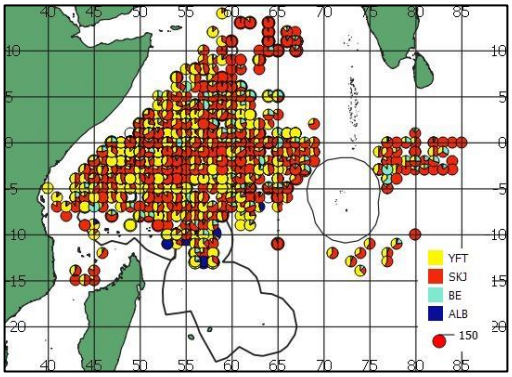

Figure 3biii. Distribution of catch (tons), by species for the Mauritian flagged purse seiners in the IOTC area of competence (2015–2019)

4. RECREATIONAL FISHERY

The sports/recreational fishing is an important activity for the tourism industry and local recreational fishermen. International big game fishing competitions are held annually. Around 60 sports/recreational fishing boats are involved in this fishery. The main fishing gear is trolling and the fishery supplies the local market with an estimated amount of about 350 tonnes. The main species comprises marlins, sailfish, tuna, common dolphinfish and wahoo. The estimated catch in the sports/recreational fishery for pelagic species is estimated at around 350 tonnes of fish.

5. ECOSYSTEM AND BYCATCH ISSUES

5.1 Sharks

Skippers, masters and agents of vessels have been sensitised on the conservations and management measures related to sharks; namely Resolutions 12/09, 13/05 and 13/06 17/05 and 18/02. Those resolutions have been included in the licence conditions as mandatory. The skippers/masters have also been informed of their obligation to comply with Resolution 19/03 concerning mobulid rays. Furthermore, identification guides on pelagic sharks have been distributed to the masters of the national-flagged vessels. Mauritius has already implemented its NPOA-sharks and has conducted a shark identification workshop in 2014. Sharks catches have been reported in the fishing logbooks of the longliners. The shortfin mako (*Isurus oxyrhinchus*) and the blue sharks *(Prionace glauca*) are among the species caught.

5.1.1. NPOA sharks

Mauritius has a National Plan of Action for the Conservation and Management of Sharks (NPOA- Sharks, Mauritius) since the year 2015. A copy of the NPOA-Sharks, Mauritius was forwarded to the IOTC. In the NPOA, a series of actions have been described to ensure the conservation and management of sharks. These include:

(i) Decrease fishing effort in any fishery where shark catch is unsustainable;
(ii) Improve data collection and monitoring of shark fisheries;
(iii) Train all concerned in identification of shark species;
(iv) Facilitate and encourage research on sharks;
(v) Improve the utilization of sharks caught; and
(vi) Ascertain control over access of fishing vessels exploiting shark stocks

5.1.2. Sharks finning regulation

Sharks finning is banned in Mauritius. All vessels licensed to fish for tuna and tuna -like species are bound by the licence conditions to comply with the different IOTC resolutions, more specifically to Resolution 17/05. The licence conditions are made under Section 37 of the Fisheries and Marine Resources Act 2008 and are thus legally binding.

5.1.3. Blue shark

Skippers/Masters are bound to report any catch of blue sharks. The skippers/masters have to abide by Resolution 18/02 as licence conditions are binding as per the Marine Fisheries and resources Act 2007. All blue sharks reported in the logbooks have been transmitted to the IOTC. Monitoring of Blue sharks caught is through logbook information and observer reports. Table 3 shows the total number and weight of sharks, by

species, retained by the national fleet in the IOTC area of competence from 2013 to 2019 while the total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence (2014–2019) are shown in table 4.

Table 3: Total number and weight of sharks, by species, retained by the national fleet in the IOTC area of competence (2013-2019)

Year	No. of sharks	Species	Weight (Kg)
2013	**17**	*Isurus oxyrhinchus*	**680**
2014	**3**	*Isurus oxyrhinchus*	**90**
2015	**12**	*Isurus oxyrhinchus*	**485**
2016	**95**	*Isurus oxyrhinchus*	**3519**
	33	*Prionace glauca*	**575**
	2	*Sphyrnidae*	**70**
2017	**217**	*Isurus oxyrhinchus*	**6552**
	13	*Prionace glauca*	**250**
2018	**138**	*Prionace glauca*	**3074**
	432	*Isurus oxyrhinchus*	**6006**
	104	*Isurus paucus*	**1351**
	1	*Carcharinus limbatus*	**50**
	10	*Carcharinus falciformi*	**200**
	18	*Sphyrna sp*	**600**
2019	**65**	*Prionace glauca*	**1455**
	394	*Isurus oxyrhinchus*	**5478**
	62	*Isurus paucus*	**810**
	1	*Carcharinus falciformi*	**202**
	9	*Sphyrna sp*	**573**

Table 4: Total number of sharks, by species, released/discarded by the national fleet in the IOTC area of competence (2014–2019)

Year	No. of sharks released	Species
2014	3	*Isurus oxyrhrincus*
2015	12	*Isurus oxyrhrincus*
2016	9	*Prionace glauca*
2017	Nil	Not applicable
2018	1(released alive)	*Rhincodon typhus*
2019	Nil	Not applicable

5.2 Seabirds

As reported in the Implementation Report for Mauritius for the year 2019, there was no incidental bycatch of seabirds by the Mauritian longliners. Nil encounters with seabirds have been reported in all the fishing logbooks received from the foreign-flagged and Mauritius-flagged licensed vessels for 2019. Furthermore, Mauritius-

flagged longliners are semi-industrial vessels less than 24 meters that operate mostly in the EEZ and not beyond the zone of 25 degrees in the South Latitude explaining the nil encounters with seabirds.

All masters and agents of the licensed vessels have been provided with "Seabirds Identification cards for fishing vessels operating in the Indian Ocean" whereby identification techniques and mitigation measures are described.

5.3 Marine Turtles

The protection of marine turtles and eggs of marine turtles is ensured under Sections 16 (1) (c) and 17 (1) (c) of the Fisheries and Marine Resources Act 2007.

Furthermore, vessels' agents and masters have been provided with the 'Marine Turtle Identification Cards – for Indian Ocean Fisheries' depicting different species of turtles, techniques of releasing hooked turtles as well as some literature related to the ecology of marine turtles, threats to marine turtles; amongst others.

Also, the license conditions of Mauritius make provision for compliance to Resolution 12/04.

Other measures taken by Mauritius related to the conservation of marine turtles have been included in 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' already submitted to the Secretariat on the 1 April 2020. Interaction of the Mauritian purse seiners for Marine turtles has been reported for Resolution 12/04 in April 2020. In 2019, there were 15 interactions with marine turtles and 13 turtles were released alive. The following interactions have been noted by the Mauritian purse seiners.

Species of turtle encountered and discarded	**Released Alive**	**Dead**	**Month (2019)**
LKV-Olive ridley turtle	6	2	November
TTH Hawksbill turtle	1	0	January
TTH Hawksbill turtle	1	0	February
TUG Green Turtle	1	0	March
TUG Green Turtle	1	0	August
TUG Green Turtle	1	0	October
TTL Loggerhead Turtle	1	0	March
TTL Loggerhead Turtle	1	0	April

	Fishery – **Purse Seine**			Observed ** **Observer data**				
Year	Lat	Lon	Total effort	Total effort observed	Species	Captures (number)	Live releases (number)	Mortalities (*Released dead*) (number)
2019	04	060E	1	1	LKV-Olive ridley turtle	0	3	2
2019	10	064E	1	1	LKV-Olive ridley turtle	0	1	0
2019	11	067E	1	1	LKV-Olive ridley turtle	0	2	0
2019	02S	067E	1	1	TTH-Hawksbill turtle	0	1	0
2019	08S	055E	1	1	TTH-Hawksbill turtle	0	1	0

2019	07S	043E	1	1	TTL-Loggerhead turtle	0	1	0
2019	01	050E	1	1	TTL-Loggerhead turtle	0	1	0
2019	07S	044E	1	1	TUG-Green Turtle	0	1	0
2019	00S	064E	1	1	TUG-Green Turtle	0	1	0
2019	11	060E	1	1	TUG-Green Turtle	0	1	0
2018	02	052E	3	3	LKV-Olive ridley turtle	0	1	1
2018	07S	061E	5	5	TTH-Hawksbill turtle	0	1	0
2018	03	061E	4	4	TTX- Marine turtles nei	0	1	0
2018	05	054E	2	2	TUG-Green Turtle	0	1	0
2018	03S	077E	1	1	TUG-Green Turtle	0	1	0
2017	02		4	4	LKV-Olive ridley turtle	0	0	1
2017	07S	049E	2	2	TTL-Loggerhead turtle	0	0	1
2017	03S	076E	1	1	TUG-Green turtle	0	0	1
2017	07S	055E	3	3	TUG-Green turtle	0	0	1
2017	04S	060E	4	4	TTH-Hawksbill turtle	0	0	1
2017	00	048E	6	6	TTH-Hawksbill turtle	0	0	1
2017	02S	080E	4	4	TTX-Marine turtles nei	0	0	1
2016	-	-	-	-	-	0	0	0
2015	-	-	-	-	-	0	0	0
2014	-	-	-	-	-	0	0	0

NB: Effort units = Number of sets

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

The Fisheries and Marine Resources Act 2007 makes provision for the protection of marine mammals under Section 17 (1) (d) as stipulated: "*no person shall land or cause any person to land, sell or have in his possession in Mauritius or in the maritime zones any marine mammal"*.

No catch of seabirds, marine turtles and marine mammals have been recorded for the national fleet in the IOTC area of competence for the most recent five years.

Table 5. Observed annual catches of species of special interest by species (seabirds, marine turtles and marine mammals) by gear for the national fleet, in the IOTC area of competence 2015–2019

YEAR	Turtles	Seabirds	Marine mammals
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0

NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS

6.1. Logsheet data collection and verification

Catch data is being collected from the fishing logbooks since 2001. The fishing licence conditions make it mandatory for all the fishing vessels to submit duly filled in logbooks to the Ministry upon arrival at port. All the fishing positions are verified for accuracy against the Vessel Monitoring System (VMS) and landing data from the Port State Control Unit (PSCU), Mauritius Ports Authority and fishing agents. 196 logbooks from longliners and 37 logbooks from purse seiners were processed. Observers are also deployed on three purse seiners.

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

The Vessel Monitoring System operates under the Fisheries and Marine Resources (VMS) Regulations Government Notice No. 87 of 2005, which came into operation on 01 June 2005 and is housed at the Fisheries Monitoring Centre (FMC) based at the Albion Fisheries Research Centre (AFRC). The VMS monitors the positions, speed and direction of fishing vessels by means of Inmarsat and Argos satellite-based tracking systems. At a regular interval (two hours for vessel with Inmarsat and one hour for those fitted with Argos transponders), the vessel sends the data reports to the Land Earth Station (LES) via a satellite network which transmit the data to a database of the Server of the FMC.

A Mauritian Fishing Licence is only issued to fishing vessels (local and foreign) equipped with valid and operational satellite-based reporting devices on-board. The VMS assists in the management of licensed vessels in the Exclusive Economic Zone (EEZ) of Mauritius. The reporting and movement of these vessels are monitored at the FMC on a regular basis. Any fishing vessel suspected of illegal fishing activities may be prosecuted and fined accordingly. Any discrepancies in the reporting and any anomalies in the logbook entries checked against the VMS database may result in the forfeit of the logbook deposit fee as well as revocation the Fishing Licence. 385 vessels have been monitored during 2019.

6.3. Observer scheme

Deployment of observers on board national purse seiners has been initiated as from February 2015. Observers were deployed on purse seiners in 2016, 2017, 2018 and 2019. For purse seiners, Mauritius has been able to maintain an observer coverage of at least 15% throughout the years; for the 2019 Observer's Program 25.6% coverage was achieved. On the Mauritius-flagged purse seiners, 181 sets and 169 days at sea were covered by three observers in 2019. Table 6 shows the annual observer coverage on the Mauritius flagged longliners and purse seiners from 2015 to 2019.

Table 6. Annual observer coverage (2015-2019)

Year	Gear	Period	Number of Days
2015	Purse seine	26/02/15 – 03/05/15	69
		06/04/15 – 17/06/15	71
		06/05/15 – 15/07/15	70
2016		23/03/16 – 01/06/16	78
		01/06/16 – 10/08/16	71
		08/09/16 – 17/11/16	71
2017		04/10/17 – 13/12/17	71
2018	Purse seine	02/05/18 – 11/07/18	71
		30/05/18 – 05/08/18	68
	Longline	03/11/18 – 14/11/18	16
		17/11/18 – 28/11/18	12
		03/11/18 – 14/11/18	16
		17/11/18 – 29/11/18	13
2019	Purse Seiner	17/05/19 -07/06/19	20
		11/06/19 -22/06/19	11
		23/06/19 -01/07/19	8
		11/07/19 -21/07/19	11
		01/07/19 -18/07/19	16
		24/07/19 -25/08/19	31
		25/08/19 -02/09/19	6
		29/08/19 -02/10/19	35
		10/10/19 -01/11/19	23

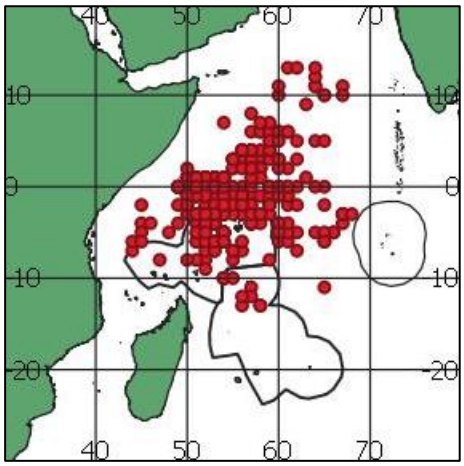

Figure 4b. Map showing the spatial distribution of observer coverage for the Mauritius-flagged purse seiners (2019)

6.4. Port sampling programme

Port sampling program started since the coming into operation of the first Mauritian purse seiners in the 1980's. The sampling programme consists of sampling exercises that are carried out on the catch of tuna unloaded by licensed longliners and purse seiners. Data collection sheets have been designed accordingly to enable the recording of length, weight and species composition data during unloading of catch from both foreign vessels and local boats. The vessel's name and date of unloading is also recorded during sampling. Fork length measurements and weight data are recorded for tunas while operculum to keel measurements and weight are recorded for swordfish that are unloaded by local longliners. Table 7 shows the number of active vessels which were monitored.

Table 7: Number of vessels active monitored, by species and gear

Species	No. of vessels		
	Purse seine	Longline (inside the EEZ)	Longline (outside the EEZ)
Yellowfin	3	5	10
Skipjack	3	NIL	NIL
Bigeye	3	2	10
Albacore	NIL	4	NIL
Black marlin	NIL	3	NIL
Blue Shark	NIL	3	NIL
Blue Marlin	NIL	2	NIL
Mako shark	NIL	3	NIL
Striped marlin	NIL	3	NIL
Sailfish	NIL	2	NIL
Swordfish	NIL	5	10

Table 8: No. of individuals measured by species and gear

Species	No. of individuals measured		
	Purse seine	Longline (inside the EEZ)	Longline (outside the EEZ)
Yellowfin	966	190	5085
Skipjack	1368	NIL	NIL
Bigeye	287	38	1524
Albacore	NIL	101	NIL
Black marlin	NIL	9	NIL
Blue Shark	NIL	5	NIL
Blue Marlin	NIL	5	NIL
Mako shark	NIL	6	NIL
Striped marlin	NIL	8	NIL
Sailfish	NIL	7	NIL
Swordfish	NIL	437	4974

6.5. Unloading/Transhipment of flag vessels

Mauritius acquired its purse seine fleet in 2013 and transshipment activities were initially recorded in Victoria, Seychelles in October 2013. In 2019, the one Mauritius-flagged purse seiners transhipped a total of 921.8 tonnes of tuna in Seychelles out of which a certain quantity was destined for Mauritius and the remaining to various destinations like France, Indonesia, Italy, Seychelles, Spain and Thailand1. Tables 9a and 9b shows the quantities of fish landed per species by the Mauritian flagged longliners in ports within the IOTC area of competence. Table 9c shows the quantities of fish transhipped by Mauritius flagged purse seiners in other ports in 2019.

Table 9a: Quantities landed by Mauritius-flagged longliners by species and gear in ports located in the IOTC area of competence

Species	Qty landed by gear in kg	
	Longline (inside the EEZ)	Longline (outside the EEZ)
Yellowfin	17748	307124
Bigeye	5320	107723
Swordfish	11720	255925
Albacore	13917	4996
Striped marlin	885	1105
Black marlin	1275	14695
Blue marlin	1250	9480
Longfin mako	90	810
Shortfin mako	370	5478
Blue shark	230	1085
Sailfish	210	6476
Dolphin fish	129	21703
Skipjack	175	2690
Wahoo	3193	0
Oilfish	190	689
Spearfish	0	1346
Hammerhead Sharks	0	75
Marlins	0	330
Misc	1126	4720

Table 9b: Quantities landed by Mauritius-flagged purse seiners by species landed in ports located in the IOTC area of competence

Species	Qty landed in tons
Yellowfin	12287.30
Skipjack	12742.15
Bigeye	1895.51
Albacore	15.79

Table 10: Quantities (tons) transhipped by Mauritius-flagged purse seiners in 2019

Gear	Species		
	YFT	SKJ	BET
Purse seine	291.7	583.5	46.6

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

Catches Striped Marlin, Black Marlin and sailfish are reported to the Secretariat as per Resolutions 15/02. Masters and Skippers have been sensitised to the need to report these species. Masters and skippers are bound to comply with Resolution 18/05. Mauritian vessels do not target these species and the catch limits referred in Resolution 18/05 do not apply. The Masters/ skippers are aware that they have to report their catch in accordance with the requirements of resolution 15/01. Monitoring of the catches is done through logbook data. Observers are also placed on the Mauritian vessels.

6.7. Gillnet observer coverage and monitoring

No gillnet vessel is registered under the Mauritius flag.

6.8 Sampling plans for mobulid rays

Up to now, no mobulid rays have been reported in the national fleet and since 2019, Resolution 19/03 for the conservation of Mobulid rays is mandatory as per the fishing licence conditions.

7.0 NATIONAL RESEARCH PROGRAMS

7.1. National research programs on blue shark

No research programme is being undertaken on blue shark.

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

No research programme is being undertaken on marlins and sailfish.

7.3. National research programs on sharks

No research programme is being undertaken on sharks.

7.4. National research programs on oceanic whitetip sharks

No research programme is being undertaken on oceanic whitetip sharks.

7.5. National research programs on marine turtles

No research programme is being undertaken on marine turtles.

7.6. National research programs on thresher sharks

No research programme is being undertaken on thresher sharks.

Table 8. Summary table of national research programs, including dates. (Not applicable)

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

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

Table 9. Scientific requirements contained in Resolutions of the Commission, adopted between 2012 and 2019.

Res. No.	Resolution	Scientific requirement	CPC progress
11/04	On a regional observer scheme	Paragraph 9	2 observers were deployed on board national-flagged purse seiner and the observer coverage was 25.6% for purse seiners for 2019. 181 sets were observed.
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	Licensed fishing vessels have been notified about the mitigation measures proposed under this resolution. Furthermore, marine turtles and their eggs are protected by the Mauritian law as specified in Sections 16 and 17 of the Fisheries and Marine Resources Act 2007, Act no. 27 of 2007. Also, information for Resolution 12/04 has already been submitted to the IOTC as per the FAO Guidelines on 01/04/20.
12/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3–7	No encounter with seabirds has been reported in the fishing logbooks. All vessels have been advised on the application of the seabird mitigation measures. Furthermore, 'Seabird Identification Cards' provided by the IOTC, have been distributed to the agents of the Mauritius-flagged vessels.
12/09	On the conservation of thresher sharks (family alopiidae) caught in association with fisheries in the IOTC area of competence	Paragraphs 4–8	Skippers of national flagged vessels have been trained in the identification of thresher sharks and have been informed to release live specimens of thresher sharks caught. They have also been provided with identification guides. No vessel has reported any encounter with thresher sharks.
13/04	On the conservation of cetaceans	Paragraphs 7– 9	As per the logbooks of the fishing vessels, there has been no encirclement of cetaceans by the Mauritius-flagged purse seiners. Skippers have to report any interaction with cetaceans. Also, the Fisheries and Marine Resources Act 2007, Act No. 27 of 2007 has prohibited the fishing of marine mammals, under Section 17. Compliance with Resolution 13/04 for the conservation of cetaceans is mandatory as per the fishing licence conditions.
13/05	On the conservation of whale sharks (*Rhincodon typus*)	Paragraphs 7– 9	The masters and agents of the Mauritius-flagged vessels have already been sensitised on the importance to comply with Res 13/05.
13/06	On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries	Paragraph 5–6	Mauritius is not a shark-fishing nation and does not issue licenses to foreign vessels targeting sharks. However, guides related to the shark identification have been distributed among the agents of the Mauritius-flagged vessels to avoid the retention of endangered shark species under the IOTC mandate on board. Moreover, the NPOA-sharks of Mauritius highlights the conservation of sharks caught as bycatch. Data on sharks was submitted to the IOTC on 30/06/20

Res. No.	Resolution	Scientific requirement	CPC progress
15/01	On the recording of catch and effort by fishing vessels in the IOTC area of competence	Paragraphs 1–10	As per the license conditions, it is mandatory for the vessels to keep on board a copy of the logbook which has provision for daily recording the catch and effort. Logbooks are collected and data after each trip of each vessels. The data is then input and analysed. Logbook data is also verified against VMS record and declarations at landing ports.
15/02	Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)	Paragraphs 1–7	Data on mandatory statistical reporting is regularly submitted to the IOTC in June of every year. All the data pertaining to Resolution 15/02 for the year 2019 was submitted to the IOTC Secretariat on the 30/06/20 in accordance with the reporting requirements.
17/05	On the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 6, 9, 11	Mauritius is not a shark-fishing nation and does not issue licenses to foreign vessels targeting sharks. However, guides related to the shark identification have been distributed among the agents of the Mauritius-flagged vessels to avoid the retention of endangered shark species under the IOTC mandate on board. Moreover, the NPOA-sharks of Mauritius highlights the conservation of sharks caught as bycatch. Data on sharks was submitted to the IOTC on 30/06/20.
18/02	On management measures for the conservation of blue shark caught in association with IOTC fisheries	Paragraphs 2-5	Mauritian vessels catching blue shark are required to record their catch in the logbooks. This data is reported as per Resolution 15/02. As per the fishing licence conditions it is mandatory for the skippers to record catch data on blue sharks.
18/05	On management measures for the conservation of the Billfishes: Striped marlin, black marlin, blue marlin and Indo-Pacific sailfish	Paragraphs 7 – 11	All fishing vessels have to report in their logbooks Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish catches and whether released alive and/or discarded. Data about marlins are submitted to the IOTC in accordance with the Resolution 15/02. Compliance with Resolution 18/05 for the conservation of bill fishes is mandatory as per the fishing licence conditions.
18/07	On measures applicable in case of non-fulfilment of reporting obligations in the IOTC	Paragraphs 1, 4	The Implementation Report was submitted to the Secretariat on 01/04/20 and includes all measures taken for the reporting obligations regarding the mentioned resolutions in the different sections of the report. All columns in the form 1RC are filled and zero catches are recorded where applicable.
19/01	On an Interim Plan for Rebuilding the Indian Ocean Yellowfin Tuna Stock in the IOTC Area of Competence	Paragraph 22	The terms and conditions of the fishing licence and authorisation (ATF) were amended to include resolutions 19/01 which entered into force in December 2019. Commitment has been taken to pay back the excess catch this year and the next year.
19/03	On the Conservation of Mobulid Rays Caught in Association with Fisheries in the IOTC Area of Competence	Paragraph 11	Compliance with Resolution 19/03 for the conservation of Mobulid rays is mandatory as per the fishing licence conditions since 2019.

7. LITERATURE CITED

1. Fisheries and Marine Resources Act 2007
2. Implementation Report 2019 for Mauritius (IOTC-2019-CoC16-IR17-MUS)
3. Compendium of active Conservation and Management measures for the Indian Ocean
4. The first three years' experience in the use of Fish Aggregating Devices in Mauritius (Roullot *et al* 1998)