



Government of the Republic of Maldives

Ministry of Fisheries, Marine Resources and Agriculture

Velaanaage, 7th Floor, Ameer Ahmed Magu

Malé - 20096, Republic of Maldives

**MALDIVES NATIONAL REPORT
TO THE SCIENTIFIC COMMITTEE OF THE INDIAN OCEAN
TUNA COMMISSION, 2021**

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

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 15/02, final scientific data for the previous year was provided to the IOTC Secretariat by 30 June of the current year, for all fleets other than longline [e.g. for a National Report submitted to the IOTC Secretariat in 2020, final data for the 2019 calendar year must be provided to the Secretariat by 30 June 2020)	NO 02/09/2020
In accordance with IOTC Resolution 15/02, provisional longline data for the previous year was provided to the IOTC Secretariat by 30 June of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2020, preliminary data for the 2019 calendar year was provided to the IOTC Secretariat by 30 June 2020). REMINDER: Final longline data for the previous year is due to the IOTC Secretariat by 30 Dec of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2020, final data for the 2019 calendar year must be provided to the Secretariat by 30 December 2020).	NO 29/07/2020
If no, please indicate the reason(s) and intended actions:	

Summary

Maldives is a tuna fishing nation with a history dating back hundreds of years. Tuna fishery was the mainstay of the Maldivian economy, providing employment and income, until the establishment of the tourism industry.

The Maldives enacted a new fisheries act in 2019 which superseded the Fisheries Act of 1987. The new Act strengthened fisheries management and governance within the Maldivian waters and Maldives flagged vessels as well as personnel on board these vessels. The Act requires all commercial fisheries, including tuna and non-tuna fisheries, to be managed through respective management plans which have been gazetted.

The tuna fishing fleet has undergone several changes following mechanization that began in 1974. The current fleet is a mixed of wooden and fibre reinforced plastic (FRP) vessels. Majority of the tuna fishing vessels range from 12.5 - 32.5 m in length. Trip lengths for pole and line trip may last between a single day and a week while handline trips are generally 10-15 days long and may depend on the catch and bait availability. The longline fleet that operated in the outer waters of the Maldives EEZ, beyond 100 miles and the high seas, that was suspended in June of 2019 remained as such and therefore did not operate in 2020.

Maldives tuna catches peaked in 2006, reaching about 167,000 t, after which the catches declined by 53% by 2010. Tuna catches have been recovering since with 2020 recording about 146,800 t. In terms of species, skipjack and yellowfin are the two main species in the Maldives tuna fisheries with 70% and 26% contribution respectively.

Skipjack tuna catch from all gears increased by 49% in the last five years (from 69,587t to 103,870t). In contrast, yellowfin tuna catch continues to decline and observed a 19% drop within the last five years (53,264 t to 42,703 t). With the absence of the longline fishery and a decline in reported catches from the pole-and-line fishery, bigeye tuna observed a reduction in catch from 396 t in 2019 to 87 t in 2020. Over the past 5 years, this decline is at 96%. Neritic tunas, frigate and kawakawa remain minor components, contributing about 1% of all tunas.

Pole and line gear landed nearly all of skipjack tuna in 2020 (103,195 t), representing 99% of skipjack tuna landed. Yellowfin tuna contribution from the pole and line gear was at 36% (15,651 t) with the remaining 63% (27,053 t) from the handline fishery. The trolling fleet catch was a negligible amount of 5.6 t of tuna. The longline fishery did not operate in 2020 reporting zero catch.

The two primary gears of the Maldivian tuna fisheries, pole-and-line and handline are highly selective with virtually no bycatch and discards. Observation of over 161 pole-and-line trips by Miller et al, (2017) reported an amount of 0.65% of total tuna catch by weight. Being surface gears, the pole and line and handline gears do not interact or record bycatch of blue sharks, thresher sharks and marine turtles.

Almost all of the important bycatch and other species that interact with commercial tuna fisheries are protected in the Maldives. These include sharks, whalesharks, marine turtles, marine mammals and seabirds inter alia.

Logbooks for the pole and line and handline tuna fisheries were introduced in 2010 and revised in 2012. To improve logbook reporting, modifications to the regulatory framework as well as the fishery licensing conditions were brought about in 2019, which required the submission of the log sheet for the trip prior to unloading the catch. As a results, the logbook coverage has increased substantially.

The web-enabled fishery information system, “*Keyolhu*” serve as the central system to house and report the fishery catch and effort data. The system also facilitates issuing of fishing and fish processing licenses, entry of fish purchase data by the exporters. A mobile-phone based catch reporting application has also been developed for the tuna fisheries which would allow electronic reporting. Full roll-out of the electronic reporting was hampered due to the COVID crisis.

The vessel monitoring system continues to be improved by replacing the old units with newer models with additional features. Installation of VMS systems onboard the required 373 vessels is expected to be complete within the first quarter of 2022.

A program to implement electronic monitoring of fishing activities is ongoing with the system being installed on 14 vessels. The activities of the program has been delayed due to delays in training staff and customization of the software.

National fishery monitoring programs and research activities for the species of importance in the tuna fisheries are implemented. However, as most species, e.g. mobulids, thresher sharks, blue shark, whale sharks and marine turtles, have zero interactions and bycatch, systemic sampling and monitoring programs for such species do not exist. Further, various national legislations protect these species within the Maldivian waters.

Maldives strived to implement the various requirements from IOTC Conservation and Management Measures, including those that came into effect in 2020. Utmost importance of these are the mandatory statistical data recording and reporting. Several measures have been taken to improve the quality and quantity of catch and effort data from the tuna fisheries. Most of the measures relating to sharks, marine turtles, marine mammals and seabirds are not applicable to the Maldives due to the absence in the tuna fisheries and virtually non-existent interactions (noting the longline fishery did not operate in 2020).

1. Background / General Fishery Information

Maldives is a tuna fishing nation with a history dating back hundreds of years. Tuna fishery was the mainstay of the Maldivian economy, providing employment and income, until the establishment of the tourism industry. Tuna fishery is still the most important source of employment and income for a substantial proportion of the population. Tunas are the main source of protein for Maldivians and remain the single most important export commodity from the Maldives earning a substantial proportion of foreign income from fishery exports.

The Maldives enacted a new fisheries act (14/2019) on 15th September 2019. This Act supersedes the Fisheries Act of 1987 (5/87). The Act is structured as a framework law, in that it covers the various multidisciplinary aspects of the sector and serve as the legislative backbone for the sector while leaving the more detailed codification to the regulations and management plans made pursuant to the Act. The Act requires development and implementation of management plans for all commercial fisheries including those on tunas and tuna-like species. All the management plans required by the Act have been gazetted.

The Act applies to all Maldivian fishing vessels and foreign fishing and fishing related vessels entering the maritime zones of the Maldives and vessels flagged to the Maldives operating beyond the maritime zones of the Maldives. It also applies to all fishing and fishing related activities of such vessels and Maldivian and foreign nationals on these vessels.

The tuna fishing fleets of the Maldives operate exclusively within the EEZ of the Maldives. However, operations of the longline fleet were not restricted and did operate on the high seas, until its suspension in 2019.

The most important component of the Maldivian tuna fishery is the livebait pole-and-line fishery. The fishery exploits, in the order of importance, skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), frigate tuna (*Auxis thazard*) and kawakawa (*Euthynnus affinis*). Small amounts of juvenile bigeye tuna are also caught along with yellowfin tuna. While the majority of trips are restricted to coastal areas, within about 100 miles from shore, modern vessels have the capacity to venture even further. To assist the pole-and-line fishers, the Maldives government maintains a network of about 50 Anchored Fish Aggregating Devices (AFADs) located 12-20 miles from the coast. The AFADs are deployed and maintained exclusively by the Government of Maldives. Fishing activities around AFADs are restricted to the pole-and-line fleet. Pole and line fishing trips generally last 1-2 days, however, with the advancement of the vessels and ability to stay at sea longer, fishing trips have mostly become multi-day operations, especially during times of low bait and tuna fishing.

The second most important component of the tuna fishery is the multi-day handline fishery, targeting large yellowfin tuna (>70 cm FL) from the surface (<10m deep) (Adam and Jauharee, 2009, Adam et al., 2015, Ahusan et al., 2016). The export oriented commercial fishery is a relatively recent fishery that began around late 90's or early 2000. Prior to this, seasonal fisheries targeting large sized yellowfin tuna existed in different parts of the country (refer to MRS, 1996) Handline fishing does not require modifying of the pole-and-line vessel except for addition of handline gear and having facilities for fresh-storage of catch. Ease of conducting the fishery off pole-and-line vessels, the ready availability of ice and the high market price have boosted the fishery.

Longline fishery has been a minor component in the Maldives tuna fisheries. Maldives used to have a licensed foreign longline fleet operating in the outer EEZ (75 miles and beyond) since 1985 (Anderson, Hafiz and Adam, 1996). All longline licenses at the time were terminated by the Government of The Maldives in 1994 partly due to non-compliance with the data submission requirement of the license (Anderson et. al, 1996). Licensing was resumed and longline vessels operated under the Maldives flag until mid-2010. The Government of Maldives resumed licensing fully local longline vessels and businesses to fish from 75 miles from shore, within the Maldives EEZ, in 2011. The Longline Fishery Regulation (No. 2014/R-388) allowed vessels to target yellowfin and bigeye tuna from 100 miles and on the high seas and regulated the fishery with a total allowable catch (TAC) based on the fleet development plan submitted to IOTC, a quota system to distribute the TAC, mandatory VMS and logbook reporting of catch and effort. The longline fishery was closed for a third time in 2019 due to low-compliance and irregularities in the data reporting.

The troll fishery is the smallest component of the tuna fisheries and targets neritic species of kawakawa and frigate tuna. Importance of the fleet, which landed substantial proportions of the species in the past, significantly declined due to mechanization of the fishing fleet during 1970s and 80s. Trolling activity peaked during the period of transition during the mechanization of the pole and line fleet (1975-1982) (Anderson et al., 1996). More recently, troll activity seems to have picked up due to the wide availability of small crafts, popularity of recreational fishing and availability of markets for the catch. However, it is thought that these operations mostly target non-tuna species such as sailfish (*Istiophorus platypterus*), wahoo (*Acanthocybium solandri*) and other large species.

2. Fleet structure

The fishing fleet has undergone several changes following the mechanization beginning in 1974. The current fleet is a mix wooden hulled and fibre reinforced plastic (FRP) vessels. Vessels are characterized by having long and open-deck at the stern with a high-rise super structure forward of the vessel. Majority of the Maldivian tuna fishing vessels range from 12.5 - 32.5 m in length (Table 1). Unlike in the past, modern vessels can accommodate up to 30 crew and operate at sea for several days or weeks at a time. However, trip lengths are generally limited by the amount of live-bait, vital for the tuna fishing operations, that can be held onboard the vessels. A typical pole-and-line can last from a single day to a week while handline trips are generally several 10-15 days depending on the catch and bait availability (Adam, Jauharee and Miller, 2015).

Historically, Maldives tuna vessels were gear specific. Pole-and-line fishery was conducted off mechanized tuna vessels (*masdhoni*) while troll fishing was conducted from smaller versions of the pole-and-line tuna vessels, locally called a *vadhu dhoni*. With the introduction of the handline yellowfin tuna fishery in the 1990s, mechanized tuna vessels accommodated handline fishery with minor modifications to the vessel and minimal extra costs. In majority of cases, the mechanized tuna vessels are used exclusively for pole-and-line or handline operations. Occasionally, vessels may switch between pole-and-line and handline operations during high abundance of catch. However, this is not common practice as both fisheries require different types and sized bait.

Longline fleet used to be foreign-owned and operated in the outer waters of the Maldives EEZ, beyond 75 miles since 1985 (Anderson, Hafiz and Adam, 1996). Although mandatory catch reporting was provided for in the license agreement, there was poor reporting rates and access to the data proved to be difficult (Adam, 2007). During the height of the fishery some 30-40 vessels operated in the Maldivian waters. In

May 2010, the Government of Maldives ceased foreign licensing to allow for a fully local longline fishery.

The Ministry of Fisheries and Agriculture resumed licensing local longline vessels in 2011 to operate from 75 miles from shore. Nineteen Maldivian-owned longline fishing vessels were licensed in the first year. However, these vessels did not start operation until May 2012. The Longline Fishery Regulation (No. 2014/R-388) was enacted in 2014, to allow locally owned vessels and businesses to fish from 100 miles from the archipelagic baseline, targeting yellowfin and bigeye tuna. A total allowable catch was set for every year broken down into equal number of 20 t quota blocks offered at or above a baseline fee. VMS and logbook reporting of catch and effort data is made mandatory under MCS programme jointly being implemented by Coast Guard and Maldives Customs Services. The fishery was suspended in 2019 due to low-compliance and irregularities in the data reporting.

Table 1: Number of vessels operating in the IOTC area of competence, by gear type and size (2013-2020).

Year	Vessel type	Length Range (LoA, meters)							
		< 07.5	> 07.5 < 12.5	> 12.5 < 17.5	> 17.5 < 22.5	> 22.5 < 27.5	> 27.5 < 32.5	> 32.5 < 37.5	> 37.5
2013	Engine row boat	4	--	--	--	--	--	--	--
2013	Longline vessel	--	1	5	2	--	--	--	7
2013	Mechanized masdhoni	--	23	117	141	224	68	11	--
2013	Mechanized vadhu dhoani	1	6	--	--	--	--	--	--
2014	Engine row boat	2	2	1	1	1	3	--	--
2014	Longline vessel	7	34	10	9	2	--	--	9
2014	Mechanized masdhoni	--	--	132	163	277	94	12	--
2014	Mechanized vadhu dhoani	1	2	1	2	--	--	--	--
2015	Mechanized masdhoni	11	50	161	182	302	108	14	1
2015	Longline vessels	-	-	9	17	2	-	-	-
2016	Mechanized masdhoni	9	43	116	155	273	93	16	-
2016	Longline vessel	-	-	14	21	3	-	-	4
2017	Mechanized masdhoni	-	66	140	170	320	104	17	1
2017	Longline vessel	-	1	13	23	3	-	-	4
2018	Mechanized masdhoni	11	38	94	134	297	95	19	-
2018	Longline vessel	-	-	6	20	1	-	-	-
2019	Mechanised masdhoni	14	47	132	155	320	102	20	
2019	Longline vessel			6	21	1			
2020	Mechanised masdhoni	11	47	134	152	322	107	21	
2020	Longline vessel	-	-	-	-	-	-	-	

3. Catch and effort (by species and gear)

Total tuna landings (skipjack, yellowfin, bigeye, frigate and kawakawa) in 2020 were 146,800 tons by all gears. Tuna catches reached an all-time high of about 167,000 t in 2006 (Figures 1a and 1b). Catches then declined by 53% by 2010 (101,800 t). Total tuna catches have since been recovering with 2020 recording a 146,800 t. In terms of species, skipjack and yellowfin tuna are the two most important species in the Maldives tuna fisheries with 70% and 29% contribution respectively.

Catch of skipjack tuna in the recent five years (2016-2020) increased by 49% (from 69,587 t to 103,870 t). In contrast, yellowfin tuna catch continues to decline and observed a 19% decline in the recent five-year period (53,264 to 42,703). The catch of yellowfin tuna was almost 2,000 t less in 2020 compared to 2019. With the absence of the longline fishery and a decline in reported catches from the pole-and-line fishery, bigeye tuna observed a reduction in catch from 396 t in 2019 to 87 t in 2020. Over the past 5 years, this decline is at 96%. Historically juvenile bigeye tuna caught in pole-and-line fishery was estimated, in part due to the low numbers in the *Thunnus* catches (YFT+BET). Earlier estimates by Anderson, 1996 showed the bigeye component to be between 3-4% while more recent analysis of tag release data has shown that the estimates of bigeye tuna caught in the pole-and-line fishery may be 3 times more, particularly in the south (Adam et al., 2014).

Pole and line tuna gear landed nearly all of skipjack tuna in 2020 (103,195 t), representing 99% of skipjack tuna landed. Yellowfin tuna contribution from the pole and line gear was at 36% (15,651 t) with the remaining 63% (27,053 t) from the handline fishery. Neritic tunas (frigate and kawakawa) used to be a reasonable component in the pole and line catches in the past. However, as neritic tunas are of little value and not landed by the large processors, targeting neritic tunas by the PL fleet is uncommon. However, PL still remains the main gear that catches frigate and kawakawa, with 46 and 76% being landed by PL.

Handline is the most important gear for yellowfin tuna in the Maldives, with 97% of handline catch being yellowfin tuna. Total yellowfin tuna catches in 2020 were 42,703t which was distributed between pole and line and handline gears, at 36 and 63% respectively.

Both pole-and-line and handline fisheries operate quite close to the atolls, although there is a difference in the predominant fishing regions of the two fisheries. Most of the pole-and-line catch is taken from the south of the country while the handline catch is mainly taken from the north and central atolls.

The small-scale trolling fleet targets kawakawa (*Euthynnus affinis*) and frigate tuna (*Auxis thazard*) in the coastal areas and atoll lagoons. The main trolling fleet effectively died in the late 1980s due to improved socio-economic changes. These days catch of kawakawa and frigate come mainly from pole-and-line vessels. Combined catch of both species was 218 t in 2020 by all gears.

Longline fleet used to be foreign-owned and operated in the EEZ, beyond 75 miles under licensed and joint venture arrangements. Licensing scheme for foreign vessels was scrapped in March 2010. However, in 2011 Maldives re-started a longline fishery exclusively for Maldivian-owned vessels, which was suspended again in 2019. As a result, Maldives reported zero catch from longline gear in 2020.

Except or longline fishery, effort is measured in number of fishing days. This was the most natural and easiest since fishing takes place on day-trips leaving early in the morning and returning by evening. In the past, the uniform fleet structure and use of essentially pole-and-line method for most of the tuna catches makes the choice for unit of effort satisfactory. However, with increasing efficiency of vessels (size, engine horse power, fish hold and bait capacity, and other operational factors) fishers are taking longer trips, hence, the day of fishing should be standardized to use the CPUE data (Kolody and Adam., 2011; Sharma et al. 2014, Medley et al. 2018).

Combined effort for pole-and-line, handline and trolling has fluctuated between about 50,000 and 79,600 days in the most recent five-year period. For the two most important gears (pole-and-line and handline), effort seems to have decreased slightly in 2020 from 31,409 to 28,053 days for pole and line and from

27,006 to 23,441 days for handline fishery. This drop in effort is likely attributed to the disruptions caused by national shutdowns due to the COVID pandemic.

Catch and effort by gear and species for the recent five years is presented in Table2. Figures 1a and 1b present the historical catch and catch of main tuna species for the national fleet by gear respectively. Spatial maps of effort by gear are presented for 2020 (Figure 2a) and average for the most recent 5 years (Figure 2b). Catch by gear and for the main species is presented for 2020 in Figures 3a (1-4) and average for the most recent five years in Figure 3b (1-4).

Table 2. Annual catch (t) and effort (days) by gear and primary species in the IOTC area of competence 2014-2020.

Year	Gear	Effort (days)	SKJ (t)	YFT (t)	BET (t)	KAW (t)	FRI (t)
2014	PL	36,269	67,301	18,481	304	741	578
	HL	24,861	1,015	30,246	525	103	50
	LL	na	0	183	1,501	0	0
	TR	4,533	181	181	3	45	22
2015	PL	22,877	68,965	15,796	184	180	96
	HL	24,045	1,057	36,299	1,433	19	8
	LL	na	0.33	112	231	0	0
	TR	1,960	252	231	2	23	14
2016	PL	29,061	68,711	8,550	781	26	124
	HL	31,291	866	44,384	1,066	2	16
	LL	na	2.41	726	624	0	0
	TR	929	9	44	9	2	4
2017	PL	25,042	88,617	17,500	269	142	334
	HL	24,321	198	30,562	113	9	1
	LL	na	1	1,269	691	0	0
	TR	299	9	28	0.3	8	8
2018	PL	45,601	99,886	17,619	221	74	328
	HL	33,797	209	28,960	46	5	4
	LL	Na	3.66	633	163	0	0
	TR	242	0	3	0.27	11	5
2019	PL	31,409	88,174	17,240	224	35	129
	HL	27,006	797	26,932	86	5	1
	LL	Na	1.46	479.21	83.6	0	0
	TR	494	69	49	2	5	2
2020	PL	28,053	103,195	15,651	162	3	86
	HL	23,441	647	27,053	51	1	1
	LL	0	0	0	0	0	0
	TR	146	1	1	0	3	1

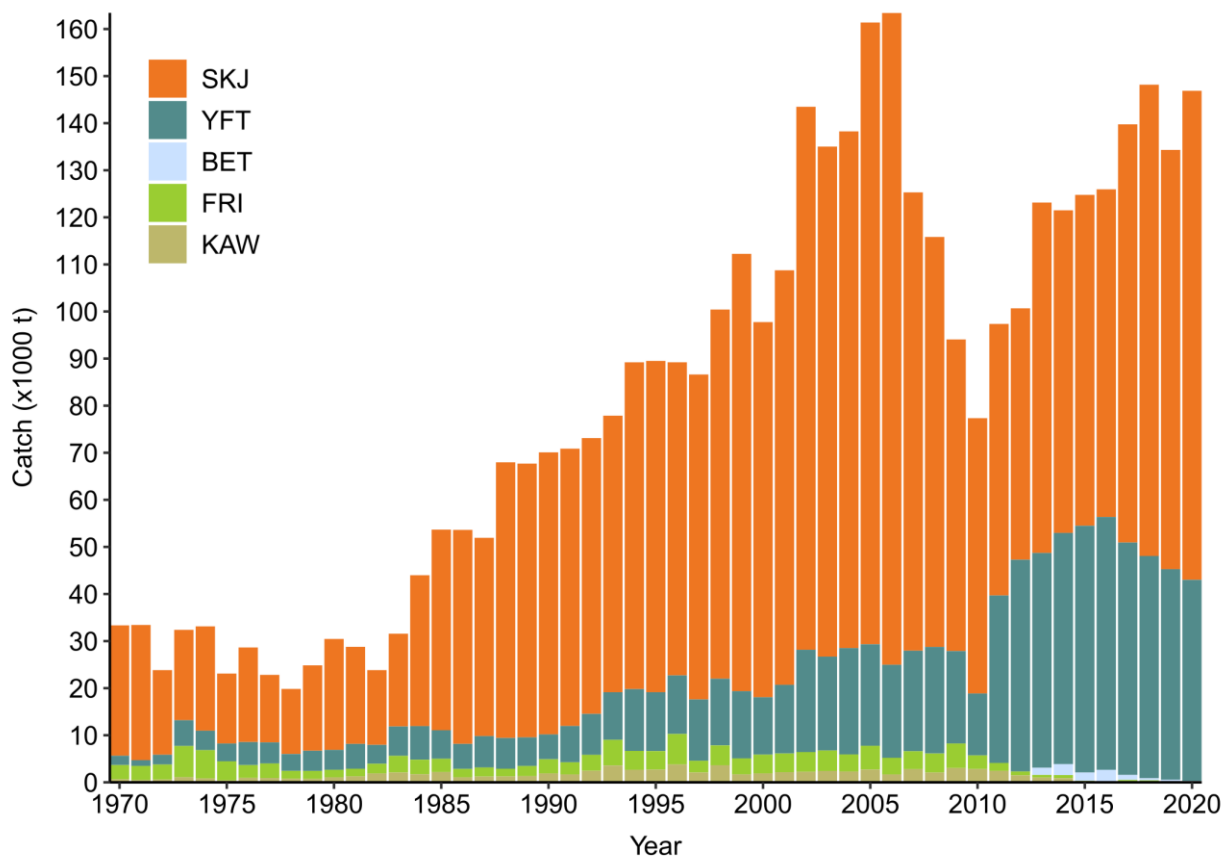


Figure 1a: Historical tuna catch for the national fleet by species (1970-2020). Note that bigeye tuna began to be recorded separately in 2013.

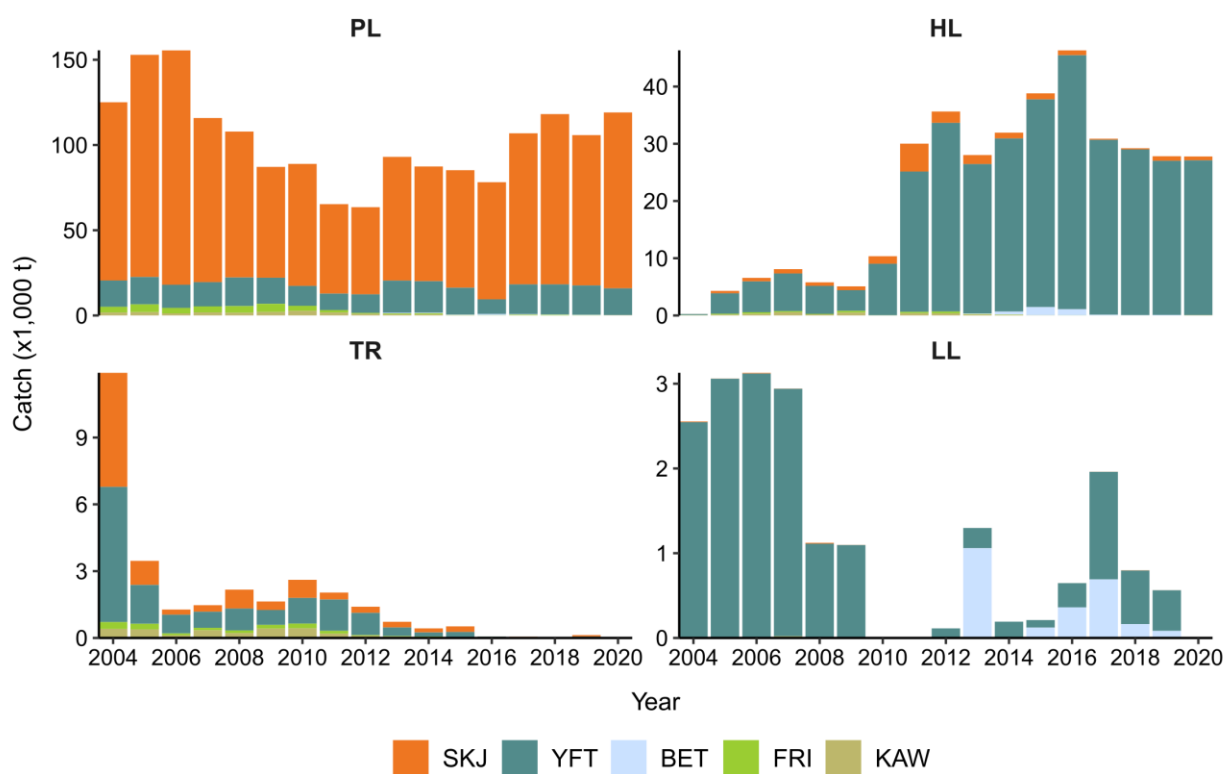


Figure 1b: Catch of main tuna species for the national fleet by gear (2004-2020). Note that bigeye tuna began to be recorded separately in 2013.

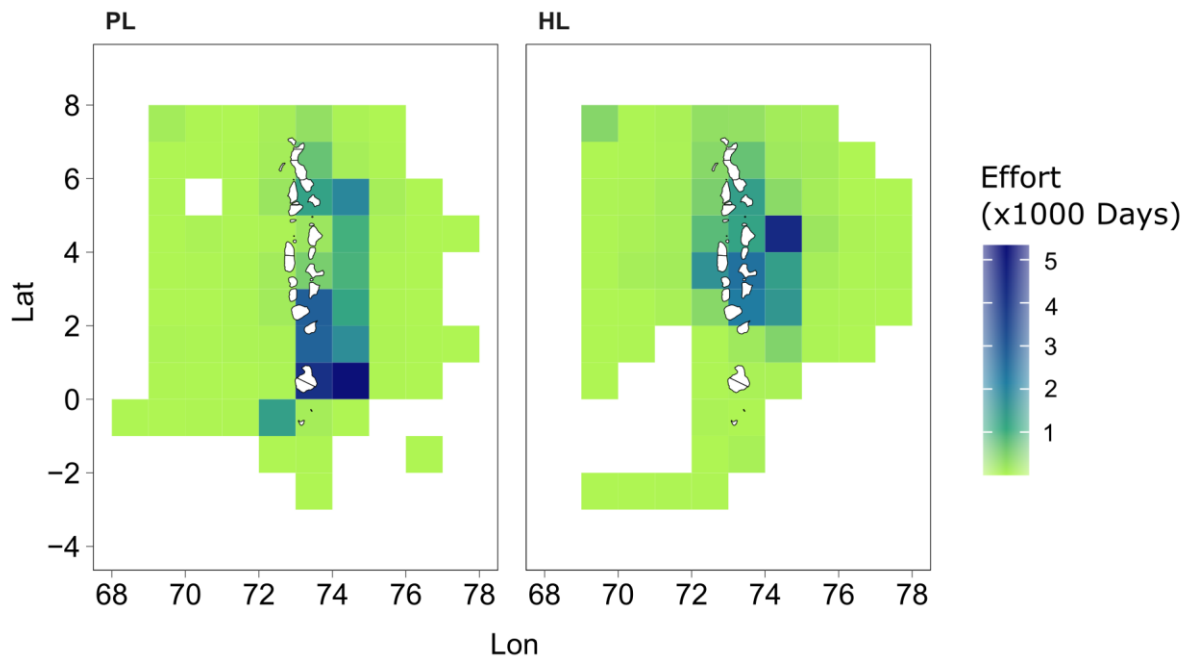
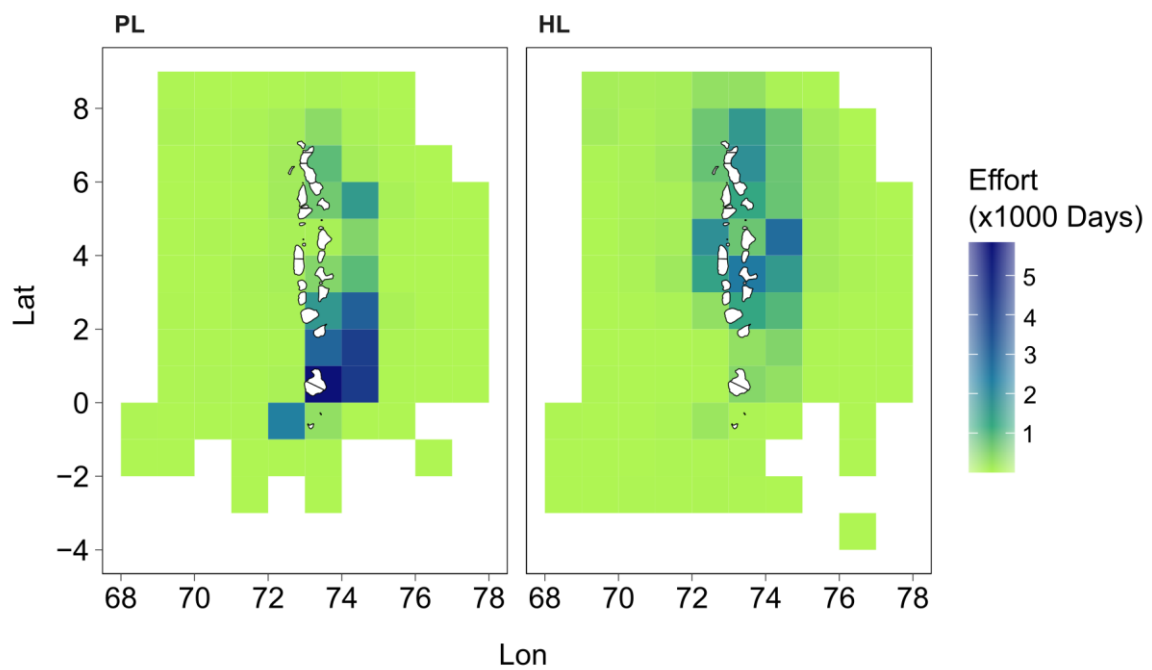


Figure 2a. Map of distribution of fishing effort for pole-and-line and handline gears for 2020.



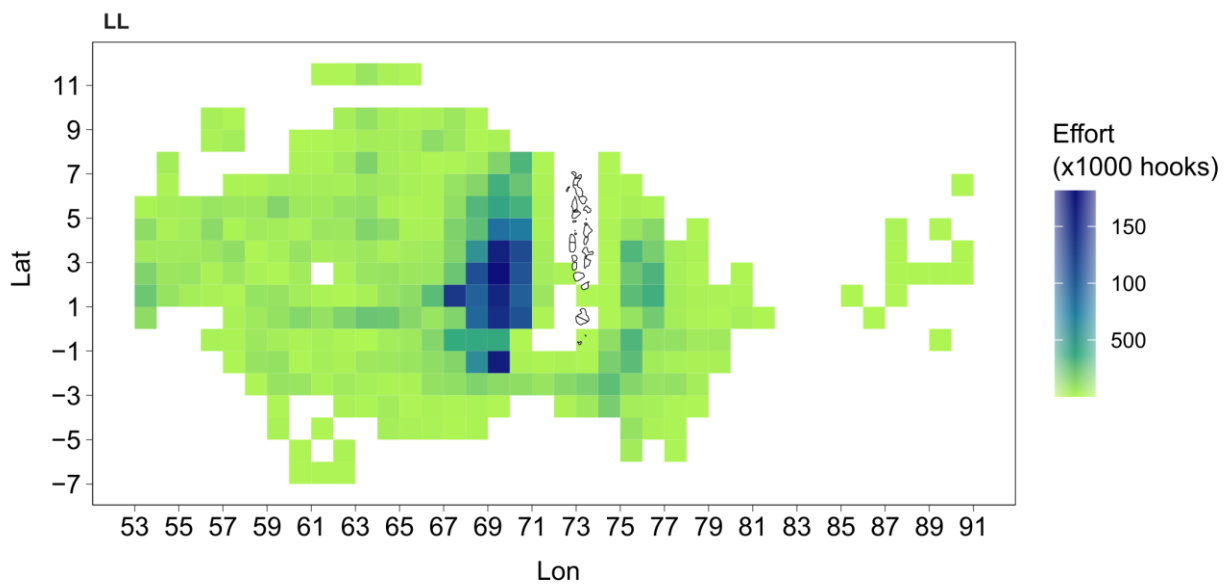


Figure 2b. Map of distribution of fishing effort for pole-and-line and handline gears (average of the period 2016- 2020) and for longline gear (average of the period 2016-2019 as the longline fleet did not operate in 2020).

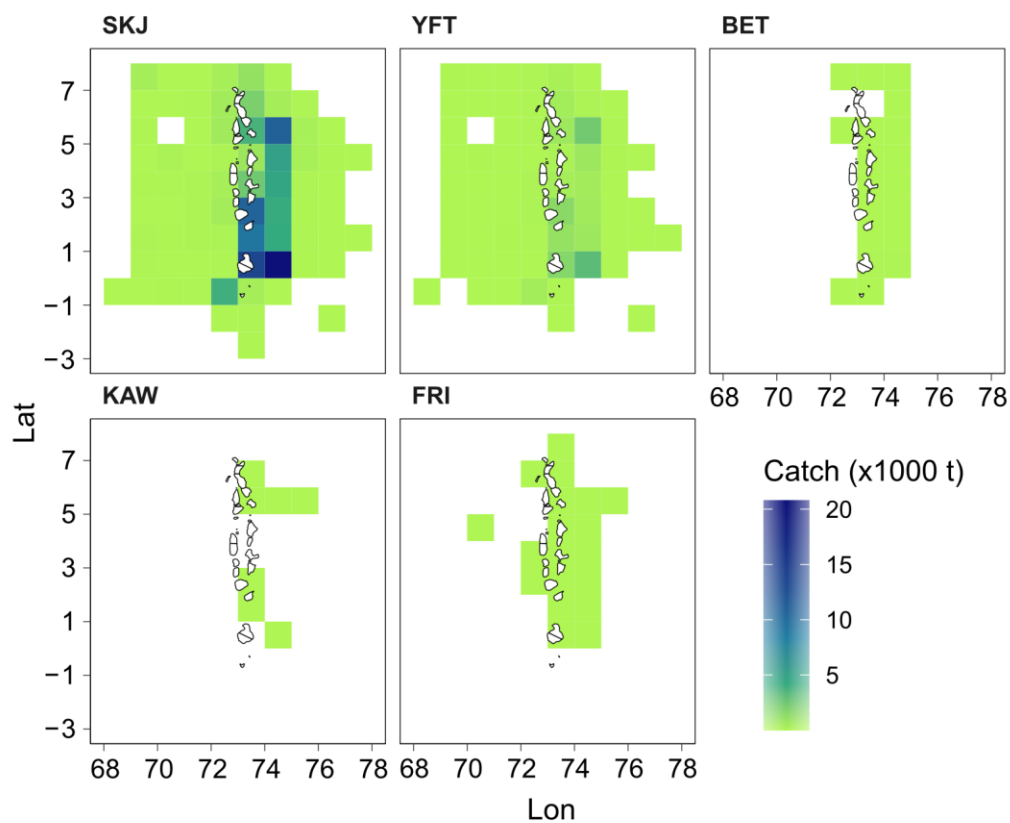


Figure 3a-1. Map of distribution of fishing catch by species for pole-and-line for 2020.

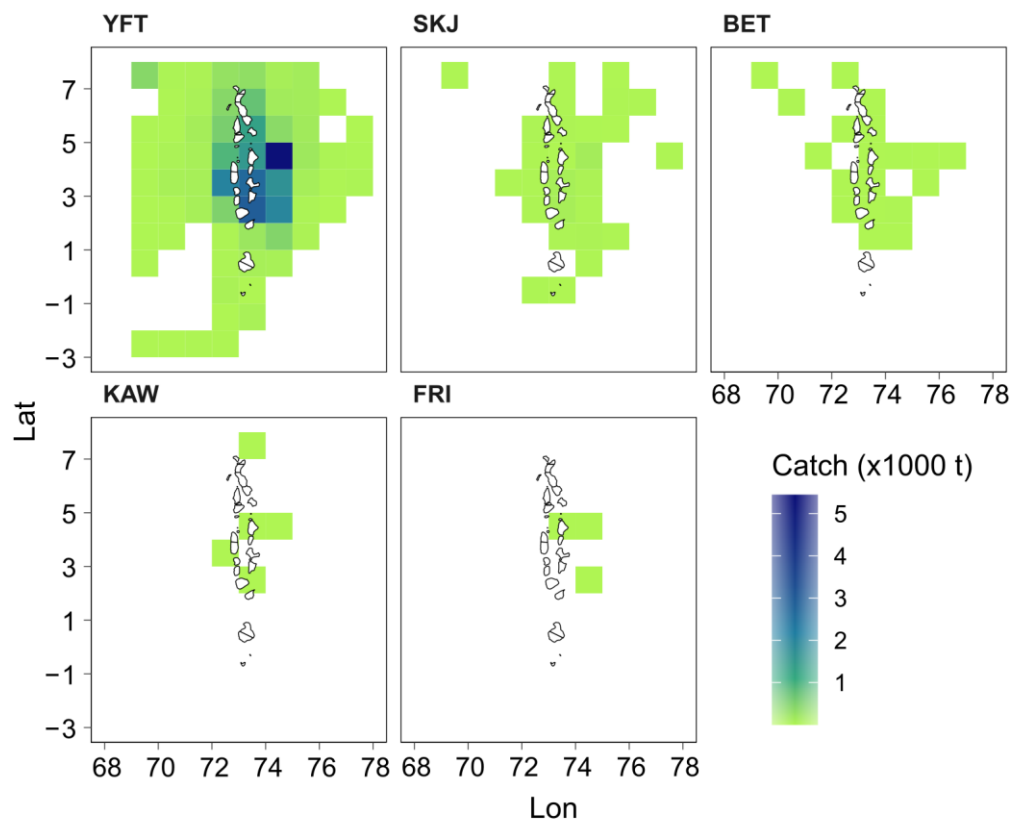


Figure 3a-2. Map of distribution of catch by species for handline for 2020.

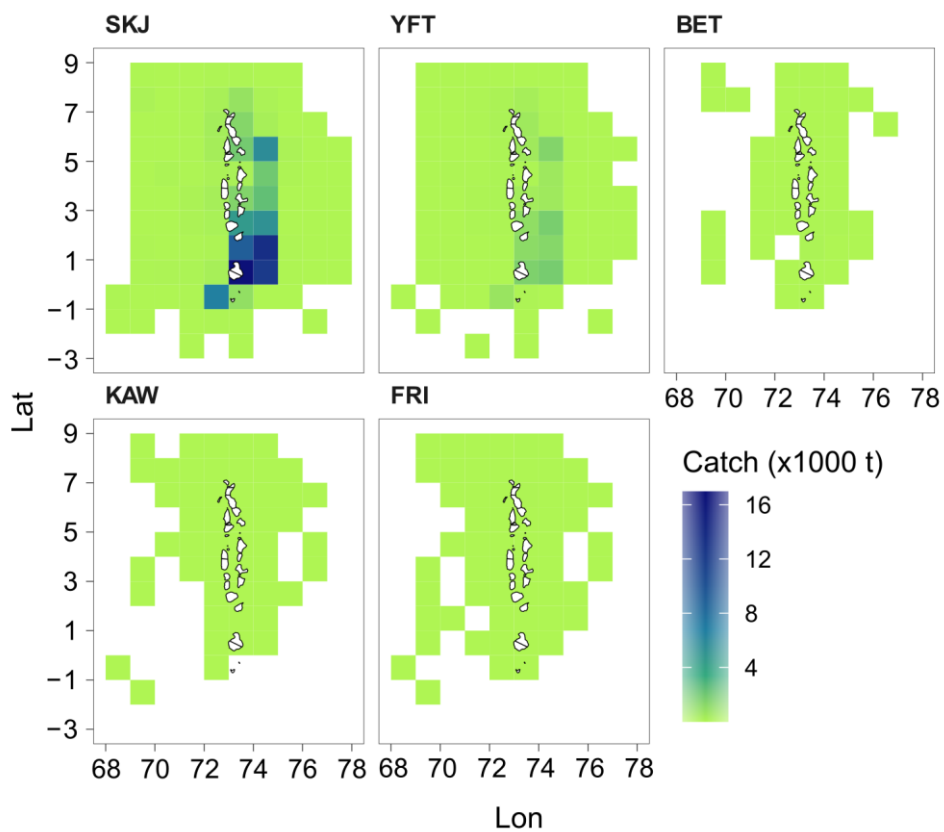


Figure 3b-1. Map of distribution of catch by species for pole-and-line gear (average of the 5 previous years, 2016-2020).

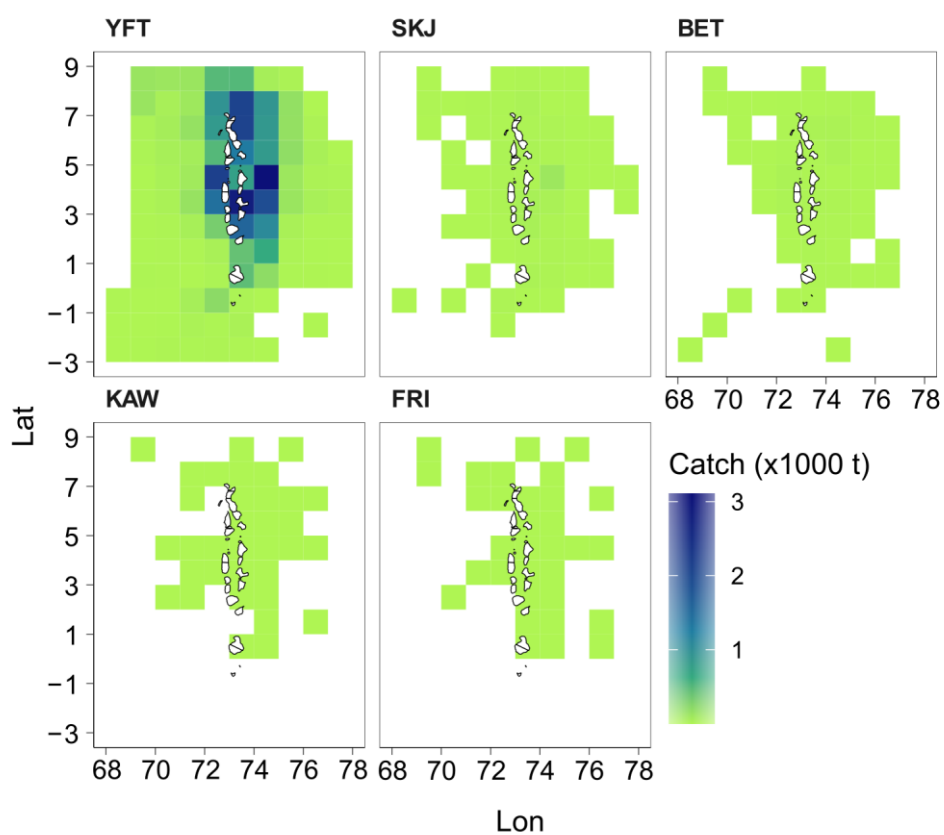


Figure 3b-2. Map of distribution of catch by species for handline gear (average of the 5 previous years, 2016-2020).

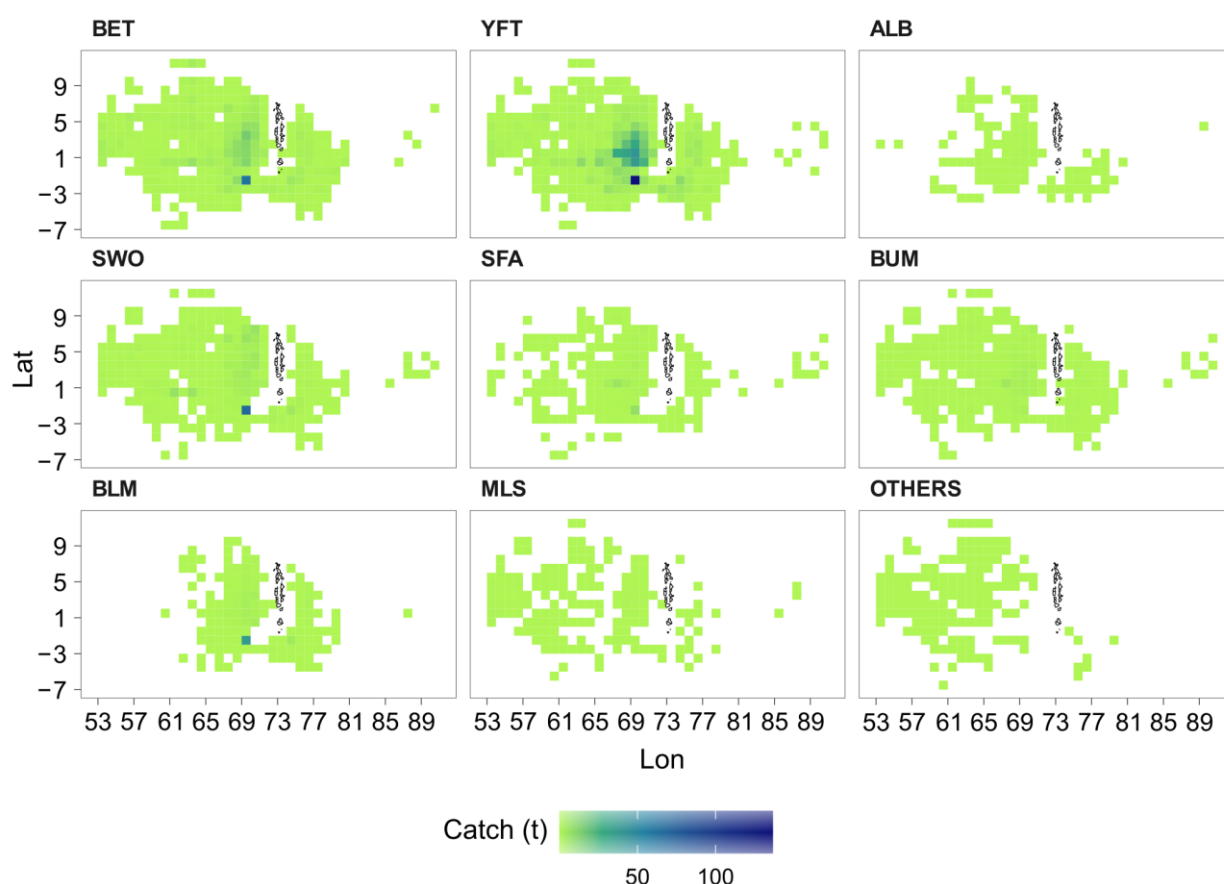


Figure 3b-3. Map of distribution of catch by species for longline gear (average of the period 2016-2019). Note that the longline fishery did not operate in 2020.

4. Recreational fishery

Big game fishing is popular among tourists and locals and it is now common practice to have an outfit in almost every resort. Common target species are sail fish (*Makaira* spp.), marlins and wahoo (*Acanthocybium solandri*) but also large yellowfin to some extent. Dogtooth tuna (*Gymosarda unicolor*) are often caught on the troll lines operated off the outer atoll reef. Casting using poppers, rod and reel is also popular game fishing activity targeting mainly large jacks, snappers and other similar fish off the reef and seamounts. The fishery is mostly a catch and release fishery.

Maldives Marine Research Institute (former Marine Research Centre) is currently working towards understanding the recreational fishery and devising a data collection mechanism.

Reef fishing logbooks have been introduced and are being enforced slowly. Although not reef associated species, the logbook has provisions to report billfish catch and effort. In addition, MoFMRA has developed management plans to improve the fishery statistics of billfish and implement the necessary changes to incorporate species of interest. These activities are expected to improve the data on billfish landings in the Maldives and follows the Scientific Committee's request (Paragraph 79 - 81, IOTC-2012-SC15-R[E], 2012).

5. Ecosystem and bycatch issues

Maldives has a highly selective form of fishing with virtually no by-catch and no discards. Miller et al, 2017, observed 161 pole-and-line fishing events and reported a figure of 0.65% of total tuna catch by weight. The pole-and-line method alone contributed close to 81% of the total tunas in 2020. Similarly, handline and troll fishing methods are also highly selective with almost no bycatch and discards. The longline fishery did not operate in 2020 resulting in zero bycatch and ecosystem issues from the fishery. This has resulted in minimal impacts from the Maldives tuna fisheries on non-targeted, associated and dependent species and the ecosystem.

Livebait is critical for the tuna pole-and-line and handline fishery and is considered as retained species. The species exploited by tuna fleet are characterized by short generation times and high intrinsic rates of population growth. These are species that are not easily overexploited. Maldives has recently intensified monitoring and conducted a review of the livebait fishery. It has also produced a management plan for the livebait fishery, expected to be revised soon.

5.1. Sharks

Shark fishing is banned in Maldives waters, since March of 2010. Further, all sharks were protected in 2020 by the General Fisheries Regulation (R-75/2020). With the absence of a longline fishery, bycatch of sharks in the tuna fisheries is virtually non-existent.

Provisions are in place in the “Longline Fishery Regulation (2014/R-388)” to minimise bycatch of sharks and other ecologically important species, in adherence to relevant IOTC Conservation and Management Measures. The Regulation prohibits use of sharks caught in the fishery and ensures that all live sharks caught are released and reported. The Regulation has further provisions to retain the dead shark by-catch for subsequent confiscation at the port. However, as Maldives is yet to make the required arrangements, all sharks caught in the longline fishery are released or discarded at sea. This information is reported through the mandatory logbooks and are regularly presented to the IOTC Working Party on Ecosystem and Bycatch (WPEB). It should be noted that the longline fishery was suspended in 2019.

5.1.1. NPOA-Sharks

Maldives’ National Plan of Action on the Conservation and Management of Sharks (NPOA-Sharks) was formulated and presented to the stakeholders in April 2014. It was subsequently endorsed by the Ministry of Fisheries and Agriculture on April 2015. With the aim to ensure the implementation and observation of the shark fishery ban, the NPOA-Sharks addresses six key areas: mitigating the impacts of shark fishery ban; improving data collection and handling of shark by-catch; improving scientific research on shark populations; raising awareness on life-history characteristics of sharks; improving coordination, consultation and monitoring of shark ban; and cooperating on international agreements pertaining to sharks and with relevant RFMOs on research and management of shark species.

5.1.2. Shark finning Regulation

All shark species are protected under the R-75/2020 General Fisheries Regulation which was enacted in 2020. Harvesting, retaining on-board, storing on-board, transshipping, transporting to a landing facility or landing any of the species protected under the General Fisheries Regulation is prohibited. Further, the longline fishery has been suspended since 2019, which had bycatch of sharks. The pole and line, handline and troll fisheries have minor interactions with sharks. The Maldives Tuna Fishery Management Plan

published on 27th January 2021 include provisions to reduce bycatch and mortality of sharks in the longline fishery.

5.1.3. Blue shark

The pole-and-line, handline and trolling fisheries for tuna and tuna-like species do not catch blue sharks. The longline fishery that had shark bycatch was suspended in June 2019. Since none of the current gears catch blue sharks, the paragraph 4 of Resolution 18/02 that requires CPCs to monitor the blue shark catches does not apply to Maldives.

Table 3: Total number and weight of sharks, by species, retained by the national fleet in the IOTC area of competence.

Not Applicable: Maldives imposes a fishery ban on sharks and therefore does not retain sharks caught in any of the fisheries.

Table 4: Total number of sharks, by species/group, released/discarded by the national fleet in the IOTC area of competence. HH: Heamerhead sharks (Sphyrnidae), THR: Threasher sharks (Alopiidae), MAK: Mako sharks (Lamnidae), OCS: Oceanic whitetip shark (Carchahinidae), OTH: Other sharks).

Year	Fleet	HH	THR	MAK	OCS	OTH
2014	LL	18	822	875	1525	1763
2015	LL	14	44	72	221	264
2016	LL	78	374	534	464	1964
2017	LL	34	86	141	86	457
2018	LL	0	6	5	3	5
2019	LL	0	23	14	1	38
2020	-	-	-	-	-	-

Note: Maldives suspended the longline fleet operations in 2019

5.2. Seabirds

The interaction with seabirds is minimal in handline, pole-and-line, troll fisheries and longline fisheries. New logbook data collection system allows the fishermen to report such interactions. “Longline Fishery Regulation” mandates longline fishing vessels to implement at sea, bird mitigation measures in adherence to IOTC Resolution nos: 10/06 and the new 12/06.

All seabirds of the Maldives are protected by the Regulation 2020/R-25. Regulation 2014/R-169 protects all migratory and seasonal birds, including seabirds. An action plan to protect and manage seabird nesting sites have been developed.

5.3. Marine Turtles

Maldives imposed a 10 year moratorium on catching or harming of turtles in 1995. The moratorium was renewed in 2005 extending further 10 years with a ban on egg-harvesting from 14 turtle nesting islands (Ali & Shimal, 2016). With the termination of the second ten-year moratorium in 2016, a new legislation on marine turtles under the Environment Protection and Preservation Act (4/93) came into effect in April 2016, declaring all species of marine turtles as protected and prohibits harvest of turtle eggs throughout

the Maldivian archipelago. Maldives is also a signatory to the IOSEA Marine Turtles MoU, signed on April 2010.

Longline fishery was the only fishery that interacted with marine turtles in the Maldives. At the time of the fishery, which closed in June 2019, the fishery was governed by the Longline Fishery Regulation. The Regulation describes turtle mitigation measures during longline fishing operations, including release of live turtles and having de-hookers and line cutters on vessels. The *FAO Guidelines to Reduce Sea Turtle Mortality in Fisheries Operations* is carefully. Use of circle hooks and fish bait is encouraged in the longline fishery. The Regulation on longline fishing also stipulates that the hooks be set below a depth of 60m to minimize the interaction of sharks and turtle bycatch. Best practices for handling and release of sea turtles are also prescribed in the Regulation. With the suspension of the longline fishery in June 2019, Maldives tuna fisheries do not interact with marine turtles.

Fishery: PL SKJ fishery				Data source: Observer report				
Year	Lat*	Lon	Total effort (days)	Total effort observed	Species	Captures (number)	Mortalities (number)	Live releases (number)
2107	0	73	1	1	Marine turtles	0	0	0
2018	0	72	2	2	Marine turtles	0	0	0
2019	0	71	2	2	Marine turtles	0	0	0
2019	0	72	5	5	Marine turtles	0	0	0
2019	0	73	13	13	Marine turtles	0	0	0
2019	0	74	1	1	Marine turtles	0	0	0
2019	1	73	4	4	Marine turtles	0	0	0
2019	1	74	3	3	Marine turtles	0	0	0
2019	2	73	9	9	Marine turtles	0	0	0
2019	4	73	1	1	Marine turtles	0	0	0

2019	5	72	6	6	Marine turtles	0	0	0
2019	5	73	2	2	Marine turtles	0	0	0

5.4. Other ecologically important species

Whale sharks and dolphins are protected by the fisheries law in the Maldives. Even though handline fishermen target yellowfin tuna from dolphin associated schools, the interactions are minimal and fishermen avoid hooking dolphins as there is no value in it.

Table 5. Reported annual bycatch of special interest species (seabirds, marine turtles and marine mammals) as reported for the longline fishery. Note that the longline fishery was suspended in June 2019 and did not operate in 2020.

Year	Fishery	Seabirds	Marine Turtles	Marine Mammals
2014	LL	NA	22	0
2015	LL	0	53	0
2016	LL	15	424	0
2017	LL	1	56	0
2018	LL	0	4	0
2019	LL	0	5	0

6. National data collection and processing systems

Data collection from the tuna fishery began in 1959, with species level data being collected since 1970 and vessel specific catch and effort data being available from 1995 onwards. The system was based on total enumeration of catches, requiring conversion factors for estimating weight. Vessels reported catch by species and effort data (number of days fished) to their respective island offices where the vessels are registered. The data were then aggregated by vessel and month providing catch by species/species groups and effort in number of days fished. This system of reporting continued until end of 2017.

6.1. Logbook data collection and verification

Logbooks were introduced to the tuna fisheries in 2010 and refined twice, with the most recent revision in 2012 and the revised logbooks being introduced in January 2013. Following successful establishment of the logbooks, the enumerated system of data reporting was ceased in 31st December 2017, which was gradually being phased out since 2010. The logbook data allowed Maldives to report data by the required spatial resolution improving compliance with the data reporting requirements.

To address the issue of inadequate returns, changes have been brought to the regulatory framework and fishing license conditions, making it mandatory for the completed logbooks to be returned to the processing or purchase facilities prior to the unloading operations. This change was put into effect on 1st March 2019 and the return rates have improved considerably since.

A web-enabled fishery information system, “*Keyolhu*” is now fully functional and all catch data are recorded and analysed through the system. This is a major improvement to the old database for data recording. The system facilitates vessel registration, issuing fishing licenses & fish processing licenses, data entry of fish purchase (by the commercial companies) and logbook data to provide a comprehensive system of compilation and reporting. The system is also designed to computerize the process of issuance of catch certificates required for the exports of all frozen, fresh or canned tuna from the Maldives.

Logbook data could be verified through different mechanisms. The observer data collected by the Maldives Marine Research Institute (former Marine Research Centre), with donor funding, allow verification of all aspects of logbook reported data. Further, landings data, obtained through the tuna exporting companies is used to verify and used in situations of non-reporting. Additionally, the Fisheries Information System, *Keyolhu*, allows near real-time tracking of landings and purchases as well as licensing.

6.2. Electronic catch reporting

A mobile catch reporting application for tuna fishery has also been developed to allow electronic catch reporting and rolled out in December 2019. This would allow for near real time reporting of catches electronically and it is anticipated that this change will improve the quality and timeliness of the data reported by the fishers. Full-fledge implementation of this program has been delayed due to COVID.

6.3. Vessel Monitoring System

The World Bank funded Sustainable Fisheries Resources Development Project’s activities to revamp the existing VMS system is already underway. Consequently, a major overhaul of the VMS System is under way as old units are replaced by new technology that would allow reporting at sea with additional benefits such a crew social welfare messaging etc. Currently, replacement work for 80% mandatory vessel category (from 373 vessels fall under 24m or vessels operating beyond EEZ) is completed and is anticipated to achieve 100% within 1st quarter of 2022.

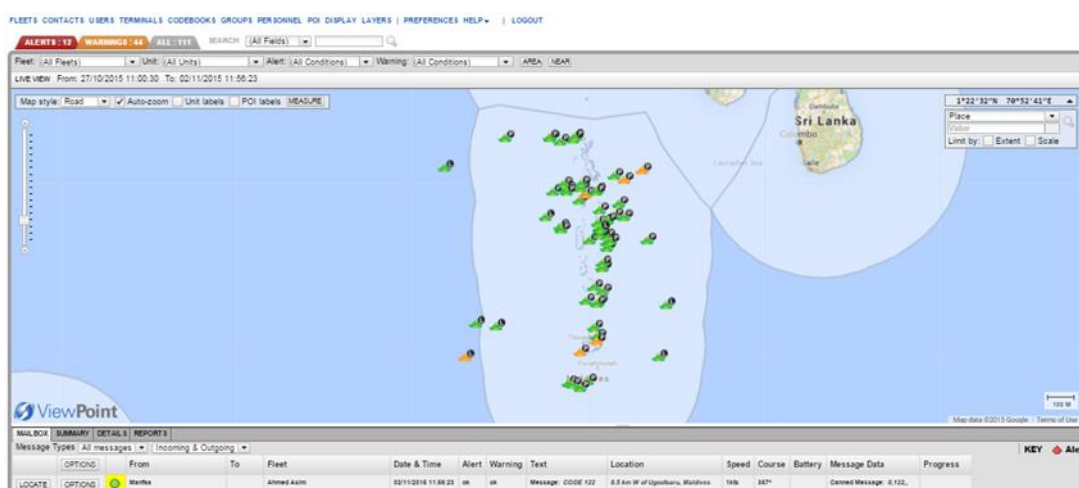


Figure 6. Screen capture of the Maldives VMS System. Currently 121 vessels have VLDs, continuously monitored by the Fishery Management Division, of the Ministry of Fisheries and Agriculture

6.4. Observer Scheme

The National Observer program was established in 2015, but had to be suspended for various reasons. The program has proven to be costly and due to high staff turn-over and the size of the vessels, it has been problematic to train and deploy observers on board fishing vessels. To overcome these difficulties, the

focus is now to shift to an electronic observer system to comply with the requirements of the relevant resolutions of the IOTC.

The bycatch sampling and observer trips by MMRI and IPNLF that began in 2014 continues and observer reports are submitted to IOTC. The objective of the programme is to take part on fishing trips to observe and collect data, including biological and operational data. A sampling protocol is established for the observer on sampling and recording on database of both the catch and bycatch, including the livebait fishery. These observations are consistent with the IOTC observer requirements and 54 observer reports was submitted in 2019. The observer trips had to be suspended due to the COVID pandemic related closures, but has resumed in 2021. No observer trips were conducted in 2020.

Table 6. Number of trips observed for the years 2017-2020 for the pole-and-line fleet.

Year	Fishery	Number of trips observed
2017	Pole-and-line	1
2018	Pole-and-line	2
2019	Pole-and-line	54
2020	Pole-and-line	0

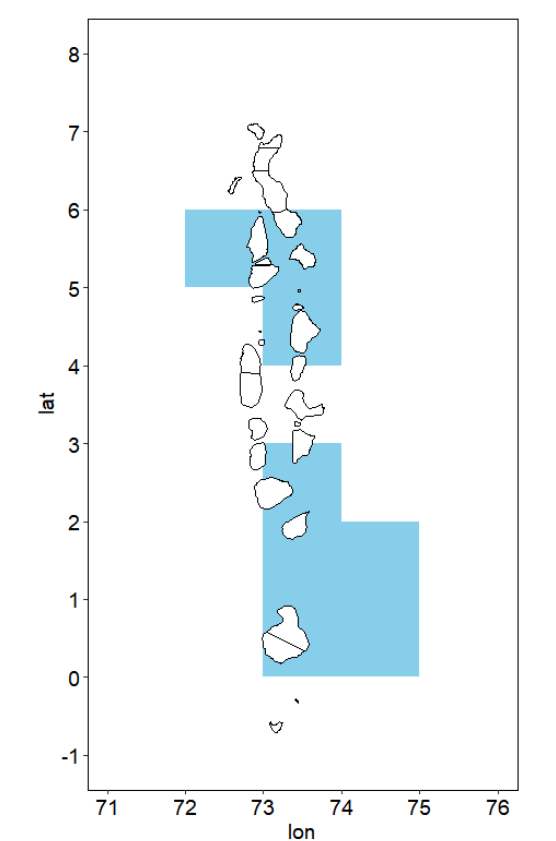


Figure 4. Spatial distribution of observer coverage for 2019. There were no observer trips in 2020 due to COVID pandemic.

6.5. Electronic Monitoring System

A World Bank (WB) funded project to implement Electronic Monitoring (EM) is on-going. Electronic Observer Systems have been installed on 14 fishing vessels to achieve the required level of 5% coverage for the fishing fleet. Full-fledged implementation of Electronic Monitoring has been hampered due to delays in training of the video analysis staff, customization of the video analysis software and COVID related restrictions.

6.6. Port sampling programme

A systematic port-sampling programme to monitor artisanal landings is not in place yet. However, size sampling of catch landed at the ports are conducted regularly through samplers at the two key PL tuna landing ports, by fishermen samplers on their vessels, and scientific observer and MMRI staff.

All fish processing and purchasing facilities are required to obtain a processing license to process fish for the export market as stipulated by the Licensing Regulation. Changes have been made to the license conditions and data reporting requirements to make it mandatory for all licensed fish processing facilities to record and report size frequency data. This will ensure that Maldives complies with length frequency data reporting requirements to the IOTC in the future. Table 8 provides a summary of the size data for the year 2020.

Table 7. Number of vessel trips or vessels active monitored, by species and gear

Table 8: Number of individuals measured, by species and gear for 2020.

Gear	SKJ	YFT	BET	KAW	FRI	Total
PL	33,203	26,034	167	170	862	71,156
HL		2,660				2,660

6.7. Unloading/Transshipment

This section is not applicable to Maldives as at-sea transshipments are banned in Maldivian waters and Maldivian-flagged vessels do not tranship at sea in the IOTC Convention Area.

Table 9. Quantities by species and gear landed in ports located in the IOTC area of competence [Mandatory]

Table 10. Quantities by species and gear transhipped in ports located in the IOTC area of competence [Mandatory]

6.8. Actions taken to monitor catches and manage fisheries for Striped Marlin, Black Marlin, Blue Marlin and Indo-Pacific Sailfish - completed

The Maldives Billfish Fishery Management Plan published in 2020 include provisions to manage billfish fishery including measures related to data collection and monitoring all billfish species.

6.9. Sampling plans for mobulid rays

The Maldives tuna fisheries have minimal bycatch and interactions with non-targeted, endangered and threatened species. As such, the pole and line, handline and trolling fisheries do not catch mobulid rays. Miller et. Al, (2017), after monitoring 106 pole and line fishing trips, reported 7 species of finfish caught as bycatch and did not record mobulid rays. The longline fishery has been suspended and did not operate in 2020. Due to the non-interaction of Maldives tuna fisheries with mobulid rays, a sampling plan as stipulated in Paragraph 11 of Resolution 19/03 is not required in Maldives.

7. National research programs

The Maldives Marine Research Institute (MMRI) is national agency mandated to conduct research on the marine resources, including fishery resources and the marine environment. Various programs exist that are of relevance to IOTC. These include fishery monitoring and research, as well as ecosystem monitoring and research activities. In addition to national activities, MMRI collaborates with regional and international agencies that would contribute to better understanding of the stocks of tuna and tuna-like species.

7.1. National research programs on blue shark

The pole and line, handline and trolling fisheries that target tunas and tuna like species do not have blue shark by-catch. Further, the longline fishery, that had shark bycatch has been suspended since June 2019 and therefore does not have bycatch data to analyse/report. The data were reported to the WPEB when the fishery operated.

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

The Maldives Billfish Fishery Management Plan published in 2020 include provisions to manage billfish fishery including measures related to data collection data reporting of all species of billfishes.

Billfish catch monitoring is part of the fisheries monitoring programs at the Maldives Marine Research Institute. The Sustainable Fisheries Resources Development Project is funding for expansion of the billfish catch monitoring activities.

Since the longline fishery was the only Maldivian fishery that landed billfish bycatch, suspension of the longline fishery has reduced the incidental catch of billfishes.

7.3. National research programs on sharks

Baited Remote Underwater Vehicle studies to understand the population of sharks are part of the ecosystem research activities at MMRI. The study has been ongoing since 2018. Results of the study are expected to be published soon.

As sharks are fully protected within the Maldives waters, and the tuna fisheries have minimal interaction with sharks, studies on the aspects of post-release survival, safe release and fishing practices do not apply.

MMRI implements data collection to understand the interaction and shark depredation rates in the handline yellowfin tuna, grouper and reef fisheries.

7.4. National research programs on oceanic whitetip sharks

The pole and line, handline and trolling fisheries that target tunas and tuna like species do not have oceanic whitetip shark by-catch. Further, the longline fishery, that had bycatch of whitetip sharks has been suspended since June 2019 and therefore does not have bycatch data to analyse/report. The data were reported to the WPEB when the fishery operated.

7.5. National research programs on marine turtles

Resolution 12.04, paragraph 10, encourage CPCs to undertake research trials of circle hooks, use of whole finfish for bait, alternative FAD designs, alternative handline techniques, gillnet designs and fishing practices and other mitigation methods which may improve the mitigation of adverse effects on marine turtles.

The pole and line, handline and trolling fisheries that target tunas and tuna like species do not have turtle by-catch. Further, since the longline fishery, that interacts with marine turtles has been suspended since June 2019, the requirement for circle hooks and handling techniques and other and other requirements specified in the resolution does not apply to Maldives. Further, the Anchored FADs used in the Maldives are of non-entangling designs. It is noted that under the Environment Protection and Preservation Act (4/93), marine turtles are fully protected in the Maldives.

7.6. National research programs on thresher sharks

Maldives does not currently implement a research program on thresher sharks that would contribute to the requirements of Resolution 12.09 paragraph 6 (CPCs shall, where possible, implement research on sharks of the species *Alopias* spp in the IOTC area of competence, in order to identify potential nursery areas). The surface fisheries (pole and line, handline and trolling) do not interact with thresher sharks. The longline fishery has been suspended since June 2019 and therefore does not have fishery by-catch data to investigate.

Table 8 provides a summary of the major research program being implemented. They are primarily geared towards improving national reporting and compliance to IOTC Conservation and Management Measures.

Table 8: Summary table for national research programs currently underway.

Project title	Period	Countries involved	Budget total	Funding source	Objectives	Short description
Maldives yellowfin and SKJ CPUE standardization	Ongoing Starting from September 2016	Maldives	US\$ 15,500	IPNLF & World Wise Foods	To improve and extend analyses of SKJ CPUE and develop PL/HL YFT CPUE for IOTC Working parties	The project aims to make use of available data and information on operational aspects of the fishery to develop a standardized CPUE series for possible use in stock assessment of tropical tunas, particularly yellowfin and skipjack. Maldives submitted revised standardize series for PL skipjack and yellowfin tuna at the WPTT stock assessment

						meeting in 2021.
Behavior and fishery dynamics of tuna around anchored FADs of the Maldives	36 moths, (starting date: October 2017)	Maldives, France (French IRD) UK	US\$ 300,000	IPNLF, Marks & Spencer (UK), MARBEC (IRD, France). MRC/MoFA	To characterize behaviour and residence time of skipjack and yellowfin in the Maldives aFAD array and also compare behaviour around dFADs / aFADs	Research is linked to a PhD (staff of MMRI). One key objective is to explore possibilities of using presence/absence data of tunas around anchored FADs as a means to estimated abundance proxies independent of the fisheries.
Bycatch sampling Programme	2014-2020	Maldives	US\$ 100,000	IPNLF	To observe and sample bycatch in pole-and-line fishery	Observers take part on regular fishing trips to observe and sample the catch/bycatch. A sampling protocol consistent with IOTC;s relevant CMMs has been established for observations, sampling, and recording on database of both the catch and bycatch including the livebait fishery. Data collection encompasses the PL and HL fisheries.
Sustainable Fisheries Resources Development Project – Tuna Sampling Programme	2017-2022	Maldives	US\$ 70,000	World Bank	To increase the size sampling effort in the Maldives	Port-samplers are based in 3 major landing sites in the Maldives, where size sampling takes 5 days a week. Samplers are based in major tuna landing ports. Additionally, fishermen samplers recruited from the artisanal fleet report fishery and size data regularly.

8. Implementation of Scientific Committee Recommendations and Resolutions of the IOTC relevant to the SC

Table 9 below summarises the progress on recommendations of the Scientific Committee and Specific Resolutions relevant to the work of the Scientific Committee.

Table 9: Scientific requirements contained in Resolutions of the Commission, adopted between 2005 and 2018.

Res. No.	Resolution	Scientific requirement	CPC progress
13/04	On the conservation of cetaceans	Paragraphs 7– 9	Maldives is part of the International Whaling Commission’s Indian Ocean Sanctuary established in 1979. Furthermore, all whales and dolphins are protected by law in the Maldives and their interactions with the fisheries are minimal. The observer & bycatch sampling programme records all interactions with cetaceans during fishing trips. Reports from the observer program will present all, if any, interactions with cetaceans. Maldives recently completed the progress report on List of

Res. No.	Resolution	Scientific requirement	CPC progress
			Foreign Fisheries and Marine Mammals to comply with US Marine Mammal Protection Act's Import Provisions. MMPA requires exporting countries to maintain risks of mortality to cetaceans in par with US regulation by 2023.
13/05	On the conservation of whale sharks (<i>Rhincodon typus</i>)	Paragraphs 7– 9	Whale sharks are protected in the Maldives. None of fisheries of the Maldives are known to harm the whale sharks. Maldivian flagged vessels fishing on high seas are longline vessels and are unlikely to encounter any interaction with whale sharks. The logbooks which are mandatory, do have provisions to report interactions with non-targeted and bycatch species.
13/06	On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries	Paragraphs 5-6	All species of sharks are protected in the Maldives. Observer data suggests that interactions with sharks in the pole-and-line, handline and troll fisheries are minimal. The Regulation on longline fishing in Maldives stipulates that all live sharks must be released immediately should they be caught in the longlines and any dead sharks must be landed at an inspection site for verification. Shark interactions are recorded in detail in the log books of all fisheries targeting tunas (PL, HL and LL) and information on shark interactions has been reported to the IOTC as required.
12/09	On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence	Paragraphs 4-8	All species of sharks are protected in the Maldives. Incidental catch of sharks is reported from all tuna fisheries through the logbooks. All data relating to shark interactions and catch is reported to IOTC. Shark fishing is prohibited in Maldivian waters. See section on Resolution 13/06 for details. An observer scheme is established and the information on shark interactions will be verified through these observer schemes.
12/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 4-8	Longline is the only gear with potential for incidental bycatch of seabirds. Appendix 2 of “Longline Fishery Regulation” stipulates adoption of one of the 6 mechanisms to mitigate incidental bycatch of seabirds as per the relevant IOTC resolutions. Interactions with seabirds should also be reported as per the IOTC requirements through the logbooks.
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	With the termination of the second ten-year turtle moratorium in 2016, a new legislation on marine turtles under the Environment Protection and Preservation Act (4/93) came into effect in April 2016 which fully protects marine turtles in the Maldives. The Strategic Action Plan of the Maldives (2019-2023) pledges to protect from each atoll, representative sites of reefs, wetlands, islands and sandbanks. These sites include areas important for marine turtles among other things.

Res. No.	Resolution	Scientific requirement	CPC progress
			Logbooks for all the tuna fisheries have provisions to report interactions with non-targeted protected species, including marine turtles. The data is reported regularly to IOTC. As longline fishery has the potential for interaction with marine turtles, Appendix 2 of Regulation on Longline Fishing in the Maldives describes turtle mitigation measures during fishing operations, including release of live turtles, having de-hookers and line cutters on vessels as per the relevant IOTC resolutions.
11/04	On a regional observer scheme	Paragraphs 9	The Observer program that was established in 2015 proved to be costly and due to high staff turn-over, it was problematic to train and deploy observers on board fishing vessels. To overcome these difficulties the focus has been to shift to an electronic observer system to comply with the requirements of the relevant resolutions of the IOTC. The World Bank funded SFRDP Electronic Observer Systems have been installed on 14 tuna fishing vessels. The full-fledged implementation of Electronic Monitoring has been delayed due to delays in training of the video analysis staff and also due to delays in customization of the video analysis software. The EM units will be rotated randomly to cover the diversity of the vessel sizes and types. It is expected that the number of units being installed will be sufficient to achieve the required 5% observer coverage. In the meantime, MMRI and IPNLF continues scientific observer trips that began in 2014. The information collected by the observers are consistent with the IOTC requirements and are submitted to IOTC regularly.
17/05	On the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 6, 9, 11	Shark fishing is prohibited in Maldives waters (the entire EEZ). The ban is effective from May 2010. The new fishery regulation (2020/R-75) prohibits intentional catch, harming and removal of sharks, among others from Maldives waters and by Maldivian flagged vessels operating on the high seas. The regulation further prohibits the sale, display and import and export of sharks and shark products. Hence, any incidental catch of shark by other gears has to be released immediately. Further, the longline gear, which had shark bycatch has been suspended since June 2019 and therefore none of the Maldivian tuna fisheries have a considerable shark bycatch. The tuna fishery logbook has provisions to report any incidental catch of sharks. The data are reported to IOTC regularly. As there is virtually zero catch of sharks in Maldivian tuna fisheries, the provisions on reducing shark bycatch, safe release, post release survival, improve gear selectivity and handling practices do not apply to Maldives.

Res. No.	Resolution	Scientific requirement	CPC progress
			MMRI undertakes shark research as part of the Ecosystem research activities.
18/02	On management measures for the conservation of blue shark caught in association with IOTC fisheries	Paragraphs 2-5	Shark fishing is prohibited in Maldives waters (the entire EEZ). The ban is effective from May 2010. The new fishery regulation (2020/R-75) prohibits intentional catch, harming and removal of sharks, among others from Maldives waters and by Maldivian flagged vessels operating on the high seas. The longline fishery which had bycatch of blue sharks has been suspended since June 2019. As none of the tuna fisheries in the Maldives (by)catch blue sharks, the paragraphs 2-5 do not apply to Maldives.
18/05	On management measures for the conservation of the Billfishes: Striped marlin, black marlin, blue marlin and Indo-Pacific sailfish	Paragraphs 7 – 11	The Maldives Billfish Fishery Management Plan published in 2020 include provisions to manage billfish fishery including measures related to data collection data reporting of all species of billfishes. Further, with funding from the Sustainable Fisheries Resources, the Maldives Marine Research Centre is to begin scientific data collection of billfish landings. It is expected that this effort will produce a better understanding of the fishery in the Maldives.
18/07	On measures applicable in case of non-fulfilment of reporting obligations in the IOTC	Paragraphs 1, 4	Maldives has taken measures to strengthen implementation of logbook scheme in tuna fishing fleet by strengthening enforcement at the landing centres. Landing centres are now required to confirm the submission of logbook prior to the offloading of the catch. All data related to tuna fisheries including fishing license, logbook, landing data are electronically logged into Fisheries Information System. Electronic logbook has been introduced for tuna fishery (Maldives pole and line and handline fishery) and full rollout of this application will enable automatic data verification across data patches. Maldives reports its actions taken to implement the reporting obligations as well as report the zero-catch matrix in accordance with Paragraphs 1 and 4, Maldives.
19/01	On an Interim Plan for Rebuilding the Indian Ocean Yellowfin Tuna Stock in the IOTC Area of Competence	Paragraph 22	Maldives does not use gillnets in the tuna fisheries, nor does it allow gillnet vessels to operate within the waters. Therefore, the paragraph 22 (CPCs are encouraged to increase their observer coverage or field sampling in gillnet fishing vessels by 10% using alternative data collection methodologies (electronic or human) verified by the IOTC Scientific Committee by 2023) does not apply.
19/03	On the Conservation of Mobulid Rays Caught in Association with Fisheries in the IOTC Area of Competence	Paragraph 11	The Maldives tuna fisheries have minimal bycatch and interactions with non-targeted, endangered and threatened species. As such, the pole and line, handline and trolling fisheries do not catch mobulid rays. The longline fishery has been suspended and did not operate in 2020. Therefore,

Res. No.	Resolution	Scientific requirement	CPC progress
			Paragraph 11 of the Resolution 19/03 does not apply to Maldives.

9. References

- Adam, M.S., A.R. Jauharee and K. Miller (2015). Review of Yellowfin Tuna Fisheries in the Maldives, Paper submitted to IOTC Working Party on Tropical Tunas (IOTC-2015-WPTT-17-17), October 23-29, 2015, Montpellier, France, 15pp.
- Adam, M.S (2007). The Maldivian Tuna Fishery – An update. Paper submitted to IOTC Working Party on Tropical Tunas (IOTC-2007-WPTT-23), July 16-20, 2007, Victoria, Seychelles, 23pp.
- Adam, M.S. A.R. Jauharee, and M. Ahusan (2014). Notes on Yellowfin/Bigeye Tuna Ratio and Size Distribution in the Maldivian Tuna Fishery. Paper submitted to WPPT16, IOTC–2014–WPTT16–26. 11 pp.
- Adam, M. S., H. Sinan, S. Rasheed, R. Abdulla (2012). Notes of the presence of ‘Other Marine Fish’ in the Maldives Pole-and-line catch. Paper submitted to 14th Session of the Working Party on Tropical Tuna, Mauritius, 24-29 October 2012, IOTC-2012-WPTT14-INF04. 13 pp.
- Adam, M. S and A.R Jauharee (2009). Handline yellowfin tuna fishery of the Maldives. Paper submitted to WPTT 2009, Mombasa, Kenya. 14 pp.
- Ahusan, M. (2016). Review of Neritic Tuna Fisheries in the Maldives. Paper submitted to IOTC-WPN06. IOTC-2016-WPNT06-11 Rev_1, June 21-24, Seychelles. 10 pp.
- Ahusan, M., I. Nadheeh, and M Shiham Adam (2016). Length Distribution of Yellowfin Tuna from the Maldives Pole-and-line and Handline Tuna, Paper submitted to IOTC-WPTT18, October 4-10, Seychelles. 6 pp.
- Anderson, R.C., Hafiz, A. & Adam, M.S. (1996). Review of the Maldivian Tuna Fishery. Maldives Marine Research Bulletin 2:176pp.
- Ahusan, M & M. S. Adam (2011a). Kawakawa (*Euthynnus affinis*) fishery in Maldives. Paper presented at the 1st Working Party on Neritic Tunas Meeting. IOTC-2011-WPNT-01. November, 14th – 16th, 2011. Chennai, India. 10 pp.
- Ahusan, M & M. S. Adam. (2011b). Frigate tuna (*Auxis thazard*) fishery in Maldives. Paper presented at the 1st Working Party on Neritic Tunas Meeting. IOTC-2011-WPNT-01. November, 14th – 16th, 2011. Chennai. 10 pp.
- Ali, K (2016). Status of the Shark Fishery Ban in the Maldives and the Implementation of the National Plan of Action on Sharks - An Update with Notes on Turtles and Seabirds. Paper submitted to ITOC-WPEB12-2016, September 12-16, Seychelles. 15 pp.

- Ali, K and Shimal, M. (2016). Review of the Status of Marine Turtles in the Maldives. Marine Research Centre. Ministry of Fisheries and Agriculture, Male', Rep. of Maldives. 27 pp.
- Ali, K (2015). Status of the Shark Fishery Ban in the Maldives and the Implementation of the National Plan of Action on Sharks - An Update with Notes on Turtles and Seabirds, Paper submitted to IOTC Working Party on Ecosystem and Bycatch (OTC-2015-WPEB11-12 Rev_1), September 07-11, 2015, Olhao, Portugal. 12 pp.
- Anderson R.C., Hafiz A. and Adam M.S. 1996. Review of the Maldivian Tuna Fishery. Maldives Marine Research Bulletin 2:176pp.
- Kolody, D & Adam, M.S. (2011). Maldives Skipjack Pole-and-Line Fishery Catch Rate Standardization 2004 – 2010. Thirteenth Session of the Indian Ocean Tuna Commission Working Party on Tropical Tunas.
- Medley, P., Ahusan, M. & Adam, M. S (2018). Bayesian Skipjack and Yellowfin Tuna CPUE Standardisation Model for Maldives Pole and Line 1970-2016. Paper presented at the IOTC Working Party on Tropical Tunas, WPTT20. October 29th – November 3rd, 2018. Mahe', Seychelles.
- Miller KI, Nadheeh I, Jauharee AR, Anderson RC, Adam MS (2017). Bycatch in the Maldivian pole-and-line tuna fishery. PLOS ONE 12(5): e0177391. <https://doi.org/10.1371/journal.pone.0177391>
- Miller, K, R. Jauharee, I. Nadheeh, and M. Shiham Adam (2016). Interactions with Endangered, Threatened and Protected (ETP) species in the Maldivian pole-and-line tuna fishery, IPNLF Technical Report #7. IPNLF, London. 28 pp.
- MRS (1996) The Maldivian Tuna Fishery: A Collection of Tuna Resource Research Papers. Maldives Marine Research Bulletin 2: 176
- Sharma, R, Geehan, and M. S. Adam (2014). Maldives skipjack pole and line fishery catch rate standardization 2004–2012: Reconstructing historic CPUE until 1985. Working Paper submitted to WOPTT16, Bali, Indonesia, IOTC-2014-WPTT16-42. 33 pp.

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