Received: 11 November 2015
IOTC-2015-SC18-NR17

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# MALDIVES NATIONAL REPORT
# SUBMITTED TO THE

# INDIAN OCEAN TUNA COMMISSION
# SCIENTIFIC COMMITTEE - 2015

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# Maldives National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2015

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## INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

| | |
|---|---|
| In accordance with IOTC Resolution 10/02, final scientific data for the previous year was provided to the Secretariat by 30 June of the current year, **for all fleets other than longline** [e.g. for a National report submitted to the Secretariat in 2013 final data for the 2012 calendar year must be provided to the Secretariat by 30 June 2013) | YES<br><br>30/06/2015 |
| In accordance with IOTC Resolution 10/02, provisional longline data for the previous year was provided to the Secretariat by 30 June of the current year [e.g. for a National report submitted to the Secretariat in 2013, preliminary data for the 2012 calendar year was provided to the Secretariat by 30 June 2013).<br><br>REMINDER: Final longline data for the previous year is due to the Secretariat by 30 Dec of the current year [e.g. for a National report submitted to the Secretariat in 2013, final data for the 2012 calendar year must be provided to the Secretariat by 30 December 2013). | YES<br><br>28/08/2015 |
| If no, please indicate the reason(s) and intended actions: | |

## 1. Executive Summary

The Maldivian tuna fishery comprises of four main components; pole-and-line, handline, longlining and trolling. The most important is still the traditional liveabait pole-and-line fishery. The fishery was certified by the Marine Stewardship Council (MSC) in November 2012. The main target species is skipjack tuna (*Katsuwonus pelamis*), but small amounts of juvenile yellowfin tuna (*Thunnus albacares*) are also caught in the fishery of which about 5-10% is bigeye tuna (*Thunnus obesus*). Handline fishery is still expanding which targets surface dwelling large yellowfin tuna (> 70 cm FL). A Maldivian longline fishery is being developed following the termination of the licensing scheme for foreign longliners in 2010. Trolling fishery is minor and targets mainly neritic species of kawakawa (*Euthynnus affinis*) and frigate tuna (*Auxis thazard*), but occasionally also catches skipjack and yellowfin tuna.

Catches of skipjack registered a slight drop in 2014 relative to level of 2013. Recent catches have been of the order of 60,000 – 75,000 t, still much less recorded catch in 2006. Caches of yellowfin are increasing, due to the growing handline fishery which targets large yellowfin. No specialized vessel is required for handline fishing hence many pole-and-line vessels now carry both sets of gears and switch target fishery and gear depending on fishing opportunities. Many also practice multi-day fishing switching them opportunistically. Most recent catches of the yellowfin are around 50,000 t and about 60% of the catch is from handline fishery.

The national data collection was based on complete enumeration system, which is now replaced by a modern logbook data collection system. A web-enabled database will become online by the end of this year to allow compilation and processing of catch and effort data. The web-enabled database will also be used to record tuna purchases by the exporters. The database when fully functional will help maintain records of active fishing vessel and fishing licenses.

Maldives is taking lead in skipjack management strategy evaluation (MSE) work that would allow setting of stock reference points and help develop harvest controls rules for skipjack and other tropical species. The work is being done in close collaboration with the Working Party on Methods group supervised by an MSE Advisory Committee set up for the purpose. Its progress is regularly reported to the Secretariat.
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## 2. Background and General Fishery Information

Maldives is a tuna fishing nation with a long tradition dating back hundreds of years. Until the 1980s the tuna fishery was the mainstay of the Maldivian economy, providing employment and a source of protein for its inhabitants. Tuna remains the single most important export commodity from the Maldives earning currently about 160 million US$ a year. Although spectacular growth and expansion of tourism in the country has declined fisheries' economic importance, tuna fishing continues to be the main economic activity in the outer islands. The fishery sector contributes around 2-3% to GDP.

The largest and most important component of the Maldivian tuna fishery is the livebait pole-and-line fishery targeting skipjack (*Katsuwonus pelamis*). Small amounts (~15-17%) of juvenile yellowfin tuna (*Thunnus albacares*) are also caught in the fishery of which about 5-10% is bigeye tuna (*Thunnus obesus*). In the past bigeye tuna is not recorded separately in the domestic catches and so have been estimated from the Thunnus catches. The proportion of bigeye in pole-and-line catches were revised recently (Adam et al., 2014)

A second and still growing component of the tuna fishery is the multi-day handline fishery targeting surface dwelling large (>70 cm FL) yellowfin tuna (Adam and Jauharee, 2009, Adam et al., 2015). Handline fishing does not require specialised modifying of the vessel except for addition of the handline gear and having facilities for fresh-storage of this high-valued catch. Depending on the locale of operation and availability of ice, it is becoming quite common to conduct two types of fishing on the same trip.

The rapid growth and expansion of the handline yellowfin tuna fishery appears to be the reason for the declining effort trend of the pole-and-line component (Figure 1 & Figure 2). Recent years have shown increase in catches of yellowfin to offset reduced catches of skipjack. Recorded catches in yellowfin tuna in 2014 were about 49,000 t which is an increase relative about 5% relative to the 2013 (Figure 2). Skipjack catches were 75,000 t in 2013 up by 40% compared with 2012 levels. In the 2014 catch level dropped slightly.

Two minor components of the tuna fishery are longline and trolling fisheries. Maldives used to have licensed foreign longline fleet operating in the outer EEZ (100 miles and beyond). During the height of the fishery some 30-40 vessels operated in the Maldivian waters and beyond. Reporting and monitoring of the foreign longline fishery was sub-optimal. Due to pressure from the pole-and-line and handline fishermen, licensing for foreign fishing was finally brought to end in mid-2010. Until November 2011, there was no longline fishing in Maldivian waters. Maldivian vessel started operation during 2012. With an increase in interest from locals to buy vessels and based on Maldives' commitment to conservation and management measures of the IOTC, the government decided to impose a total allowable catch (TAC) for the fishery and a quota system to distribute the TAC among the longline companies. This TAC was based on the fleet development plan submitted by the Maldives to the IOTC and the TAC for 2014 was set 11,800MT and companies purchased 11,360MT of quota. Longline vessels are highly regulated with mandatory VMS and strict licensing and reporting of catches of all bycatch varieties.

The trolling component targets coastal species of Kawakawa (*Euthynnus affinis*) and Frigate tuna (*Auxis thazard*) (Ahusan and Adam, 2011a, Ahusan and Adam, 2011b). Total catches are of the order 7,000 – 8000t per year (Ahusan and Adam, 2012) and showing decreasing trend. Ahusan and Adam (2015) argues that these declines are primarily due to under-reporting of catches due to the low economic value attached to the catch. Trolling vessels are normally ex- pole-and-line vessels relegated to trolling due to their small size.

Pole-and-line fishing is still restricted to coastal areas not extending more than 60-70 miles from the atoll boundary (Figure 1). Fishing effort is highest around the anchored fish aggregating devices (aFADs) located 12-15 miles range from the coast. Longline fishing is restricted to the outer EEZ - from 100 miles and beyond by law.

## 3. Fleet structure

The fishing fleet has undergone several changes following the mechanization beginning in 1973. 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. Two rows of the FRP ice-boxes are commonly placed on the open deck of wooden vessels, a characteristic of handline fishing vessels targeting yellowfin tuna. It is also becoming popular to have inbuilt FRP boxes into the hull for keeping ice or slurry (RSW).

Pole-and-line and handline fishing is conducted from identical vessels and switching from handline to pole-and-line or vice versa is done at no extra cost. Vessels have multiple bait-wells for carrying live scads (Fam: Carangidae) for handline or regular bait for the pole-and-line fishing. The most important visible feature of the handline vessels are the large ice-boxes (0.5 –1.8 t capacity) placed on open fishing platform. Often they are placed in pairs on either side of the engine hatch (2, 4, or 6 numbers are common). Relatively large number of vessels are known to conduct both types of fishing on single trips lasting around 10-14 days (Adam and Jauharee, 2009 and Adam et al., 2015).

Following the cessation EEZ longline foreign licensing in May 2010, the Ministry has undertaken considerable work to establish a Maldivian longline fleet. Nineteen Maldivian-owned longline fishing vessels were licensed in the first year the scheme was established in November 2011. However, these vessels did not start operation until May 2012. Furthermore, there was a growing interest by the locals to either convert large handline yellowfin tuna vessels or to bring in new vessels (purchased from foreign owners) for longline operation. To cater for this demand while promoting a sustainable and transparent approach the Government of the Maldives decided to implement a transparent quota based approach to management of this fishery. As such it was decided to adhere to the fleet development plan submitted by the Maldives to IOTC, and cap the total output of the fishery by introducing a quota system for Maldivian longline vessel.

The quota system increased the revenue from the fishery through licensing fees and also provided a competitive platform for the companies. In 2014, 18 vessels were licensed to operate in the Maldivian waters an in high seas.

**Table 1: Number of vessels operating in the IOTC area of competence, by type for last 4 years (2010-2013).**

| | | Length Range (LoA, meters) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Vessel type | < 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 |
| 2010 | Engine row boat | 12 | -- | -- | -- | -- | -- | -- | -- |
| 2010 | Mechanized Mas dhoani | - | 29 | 88 | 83 | 133 | 58 | 8 | -- |
| 2010 | Mechanized vadhu dhoani | 6 | 4 | -- | -- | -- | -- | -- | -- |
| 2011 | Engine row boat | 11 | -- | -- | -- | -- | -- | -- | -- |
| 2011 | Longline vessel | -- | -- | 2 | -- | 2 | -- | -- | -- |
| 2011 | Mechanized Mas dhoani | -- | 35 | 123 | 125 | 203 | 81 | 10 | -- |
| 2011 | Mechanized vadhu dhoani | 9 | 6 | -- | -- | -- | -- | -- | -- |
| 2012 | Engine row boat | 10 | -- | -- | -- | -- | -- | -- | -- |
| 2012 | Longline vessel | -- | -- | 3 | -- | -- | -- | -- | -- |
| 2012 | Mechanized Mas dhoani | 1 | 50 | 121 | 151 | 223 | 84 | 12 | -- |
| 2012 | Mechanized vadhu dhoani | 3 | 6 | -- | -- | -- | -- | -- | -- |
| 2013 | Engine row boat | 4 | -- | -- | -- | -- | -- | -- | -- |
| 2013 | Longline vessel | -- | 1 | 5 | 2 | -- | -- | -- | 7 |
| 2013 | Mechanized Mas dhoani | -- | 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 Mas dhoani | -- | -- | 132 | 163 | 277 | 94 | 12 | -- |
| 2014 | Mechanized vadhu dhoani | 1 | 2 | 1 | 2 | -- | -- | -- | -- |

## 4. Catch and effort (by species and gear)

Reported national tuna landings in 2014 were around 126,000 t. Of these close to 55% was skipjack tuna and 38% was yellowfin tuna. A plot of location of catch is given in **Error! Reference source not found.**. A small quantity of bigeye tuna is caught along with yellowfin component in the pole-and-line, estimated around 3-4% (Anderson, 1996). Analysis of recent tag release data has shown those estimates may 3 times more (Adam et al., 2014).

Total tuna catches reached an all-time high of over 167,000 t in 2006 but have been declining since except for the most recent year 2013. A reason for this decline in total catches is the sharp and continuing decrease of skipjack catch. Skipjack catches dropped from a record high of 138,000 in 2006 to 53,400 in 2103. By 2012 this is a drop of more than 60% decline (Figure 2).

Yellowfin tuna is the second most important species in the tuna fishery. Catches of yellowfin has increased dramatically over the years, thanks to rapid growth of the handline yellowfin fishery that targets surface dwelling schools of the large yellowfin (> 70 cm FL). Catches of yellowfin tuna were close 50,000 t, a record catch 2014. Close to 80% of the yellowfin catch is expected to be from the handline fishery targeted for export. Both pole and line and handline fishing operates quite close to the atolls and most of the catch is taken in the south of the Maldives (Figure 1).

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 is mainly from pole and vessels (Ahusan and Adam, 2011a and b). Total catches of these two species ranged about 5,000 – 6,000t per annum.

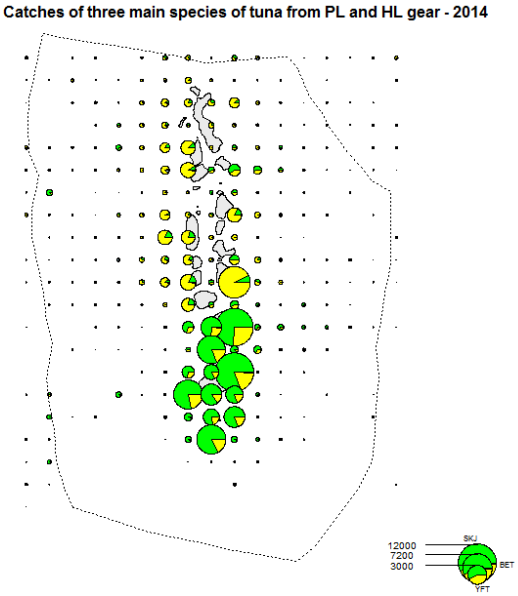


Figure 1: Catches of three main species of tuna from coastal fisheries (pole and line and handline fleet), for 2014

Longline fleet used to be foreign-owned and operated in the EEZ, beyond 100 miles under licensed and joint venture arrangements. Licensing scheme for foreign vessels was scrapped in March 2010. However, in 2011 Maldives has re-started a longline fishery exclusively for Maldivian-owned vessels. In 2014, 18 vessels were given licenses for longline operations. Catch by species by gear and effort trends is shown in Table 1, Figure 2 and Figure 3.

Fishing 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 operational factors) the day of fishing should be standardized to use the CPUE data (Kolody et al., 2011; Sharma et al., 2013, Sharma et al. 2014). Total recorded days of fishing have been declining largely due to increase size of vessels combined with declining overall tuna catches. Reduction in days fishing in most prominent in pole and line component while effort shows slight increase in handline fishery (
Table 2).

**Table 2. Annual catch (MT) and their effort by gear (days fished) in IOTC area of competence for the 2010-2014. Note the fishing effort for 2014 was estimated (may need revision)**

| Year | Gear | SKJ | YFT | KAW | FRG | Effort (days) |
|---|---|---|---|---|---|---|
| 2010 | HL | 1,322 | 9,003 | 12 | 16 | 20,178 |
| 2010 | LL | - | - | - | - | - |
| 2010 | PL | 71,585 | 11,679 | 2,756 | 2,902 | 114,217 |
| 2010 | TR | 814 | 1,153 | 438 | 206 | 30,640 |
| 2011 | HL | 4,870 | 24,518 | 406 | 228 | 44,709 |
| 2011 | LL | - | 1 | 2 | 1 | 47 |
| 2011 | PL | 52,489 | 9,650 | 1,816 | 1,344 | 84,832 |
| 2011 | TR | 313 | 1,046 | 197 | 123 | 19,935 |
| 2012 | HL | 1,981 | 32,969 | 376 | 309 | 51,875 |
| 2012 | LL | - | 113 | - | - | 42 |
| 2012 | PL | 51,134 | 10,896 | 1,012 | 481 | 79,005 |
| 2012 | TR | 276 | 999 | 97 | 31 | 16,334 |
| 2013 | HL | 1,584 | 26,085 | 179 | 70 | 43,196 |
| 2013 | LL | 0 | 239 | - | - | 1,501 |
| 2013 | PL | 72,583 | 18,878 | 760 | 478 | 63,247 |
| 2013 | TR | 255 | 387 | 66 | 18 | 12,300 |
| 2014 | HL | 1,015 | 30,246 | 103 | 50 | 40,000 |
| 2014 | LL | 0 | 183 | - | - | NA |
| 2014 | PL | 67,301 | 18,481 | 741 | 578 | 60,000 |
| 2014 | TR | 181 | 181 | 45 | 22 | 10,000 |

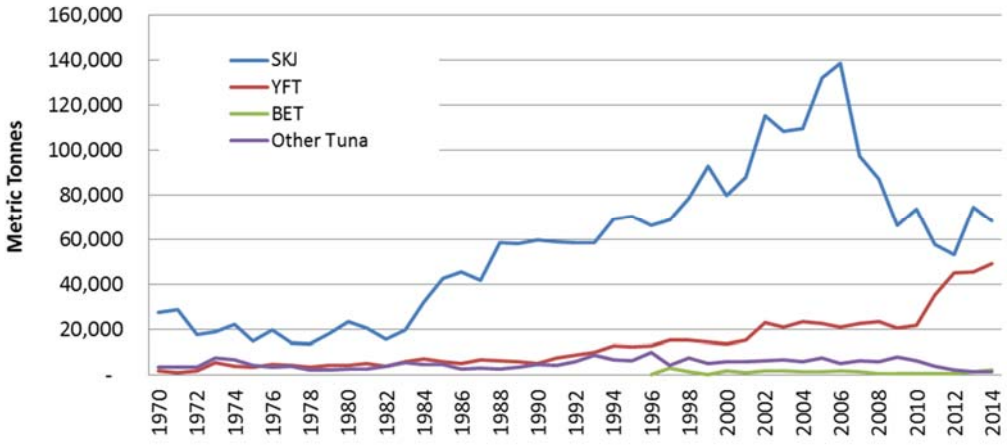


**Figure 2: Historical annual catch for the national fleet by species (1970-2014)**

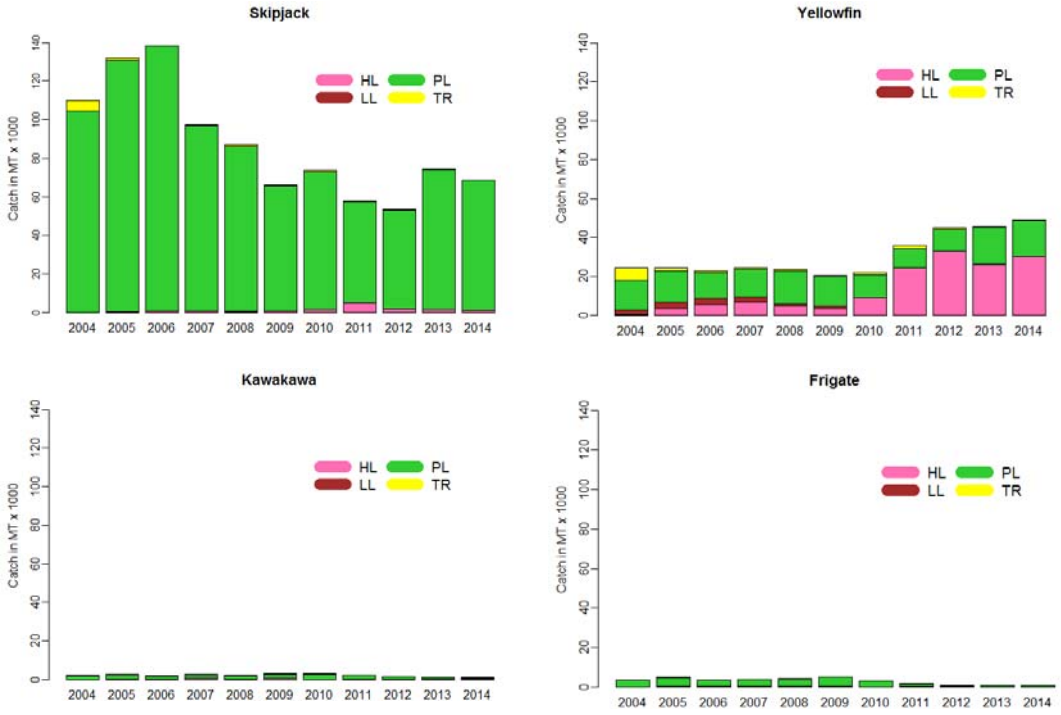


Figure 3: Catch trends by gear for each species for the last 10 years (2004-2013)

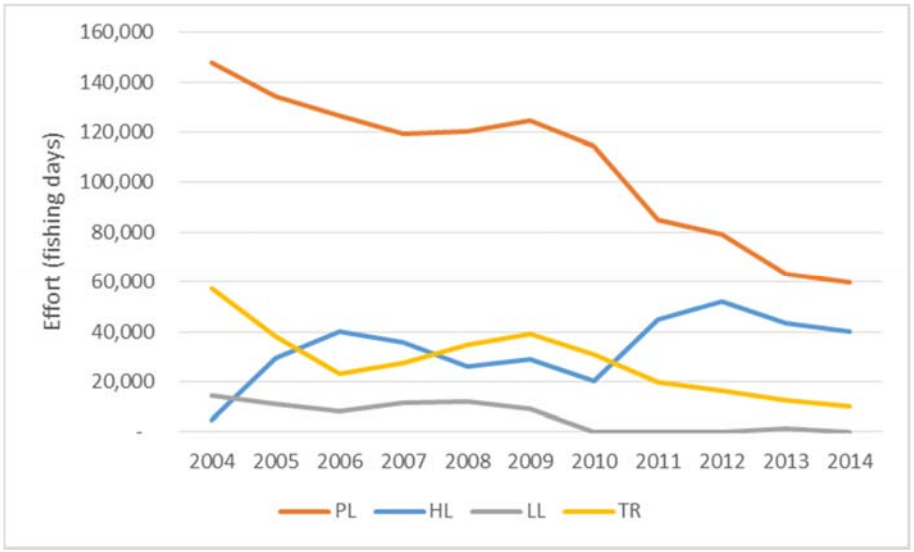


Figure 4: Trends in fishing effort by gear type for the last ten years (2004-2014), Note LL effort days not available for 2014 and fishing effort for other three methods for 2014 were estimated (need revision)

## 5. Recreational fishery

Big game fishing is popular among the tourists and it is now common practice to have an outfit in almost every resort. Common target species are sail fish (Makaira spp.) and dolphin fish (*Coryphaena hippurus*), but also large yellowfin and skipjack tuna. 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 big game fishing activity targeting mainly large jacks off the reef and seamounts. Tourist resorts have separate fishery landings forms and it is expected that their catch are recorded in the national fishery statistics. Some resorts are reporting their monthly landings from the recreational fishery to MRC.

There are no institutionalized mechanisms for recording catch. Unlike in other countries, Maldives does not have fishing clubs where recreational fisheries are data recorded

Reef fishing logbooks have been recently introduced and being enforced slowly. This arrangement is expected to improve the landings of billfishes in the Maldives (Para 79 and 80, IOTC–2012–SC15–R[E], 2012)

## 6. Ecosystem and bycatch issues

Maldives has a highly selective form of fishing with almost zero by-catch and no discards. The pole-and-line method alone contributes more than 70% of the total tuna landings. Similarly handline and trolling fishing methods are also highly selective with no bycatch and discards. Currently less than 1% of tuna is caught from longline which contributes catches of non-target, associated and dependent species (such as sharks etc.).

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 ban on egg-harvesting from 14 turtle nesting islands. Maldives is also a signatory for the IOSEA MoU signed on April 2010.

Livebait is critical for the tuna pole-and-line fishery and 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 of this fishery and are in the process of developing a livebait fishery management plan.

### 6.1. Sharks

Shark fishing is banned in Maldives waters including the EEZ. The ban is effective from March of 2010. However, with the introduction of longline fishing from 100nm and beyond into high seas, there is a possibility of shark by-catch in the fishery. Provisions are in placed in "Regulation on Fishing and Export of Large Yellowfin Tuna" to minimise the by-catch of sharks in adherence to IOTC Resolution 05/05 and the more recent one 12/09. The Regulation requires shark bycatch to be reported, released if alive, and landed intact to be destroyed if it is dead. . In 2014, 18 vessels were given licenses under the quota system for longline operations.

**NPOA-Sharks:** Maldives' National Plan of Action on the Conservation and Management of Sharks (NPOA-Sharks) has been formulated and presented to the stakeholders on April 2014. NPOA-Sharks has been endorsed by the Ministry of Fisheries and Agriculture on April 2015. With the aim to ensure the implementation and observation of the total shark fishery ban, the NPOA-Sharks addresses six key areas; mitigation of impact of shark fishery ban, improvement of data collection and handling of shark by-catch, improve research on shark stocks, raise awareness on life-history characteristics of sharks, improve coordination, consultation and monitoring of shark ban and cooperate on international agreements pertaining to sharks and with relevant tRFMOs on research and management of shark species.

**Shark bycatch in tuna longline fishery:** The shark fishery ban prohibits usage of any shark species caught from the EEZ of the Maldives. The "Regulation on Fishing and Export of Large Yellowfin Tuna"

has provisions to retain the dead shark by-catch for subsequent confiscation. However, as the Maldives do not yet have any observer coverage, the dead shark by-catch from the longline fleet operating in the Maldives' EEZ is discarded to the sea. Logbooks for tuna longline fishery currently record the shark-bycatch as species-complexes; mako sharks, thresher sharks, hammerhead sharks, oceanic white tip shark and other sharks. An analysis of shark by-catch by species-complexes caught in the longline fishery in 2013-14 was presented at the IOTC WPEB of 2015 (Figure 5).

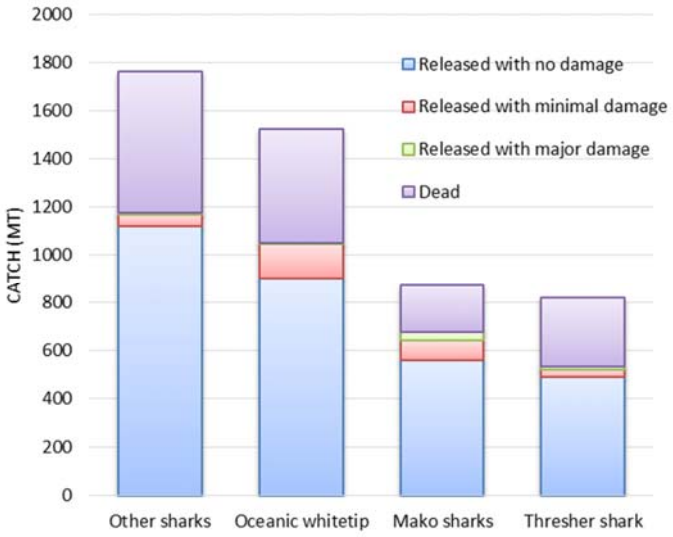


Figure 5: Catches of sharks in the Maldives longline fishery - 2014

## 6.2. Seabirds

The interaction with seabirds is minimal in handline, pole-and-line, trolling fisheries and longline fisheries. New logbook data collection system allows the fisherman to report such interaction and currently there is none reported. "Regulation on Fishing and Export of Large Yellowfin Tuna" mandates longline fishing vessels to implement at least one seabird mitigation measure to reduce by-catch of seabirds. These measures are in adherence to IOTC Resolution nos: 10/06 and the new 12/06.

## 6.3. Marine Turtles

Maldives is signatory to the Indian Ocean – Southeast Asian (IOSEA) Marine Turtle Memorandum of Understanding. A second 10-year Turtle Moratorium is in force from 2006-2016 that includes banning of hunting, taking, or harming turtles, including harvesting of eggs from 14 islands known for turtle nesting. Regulation on Fishing and Export of Large Yellowfin Tuna describes turtle mitigation measures during longline fishing operations, including release of live turtles and having de-hookers and line cutters on vessels. Maldives is now collaborating with the Bay of Bengal Large Marine Ecosystem Project (BoBLME) to raise awareness on the issue of derelict fishing gear on marine turtles in the central Indian Ocean. A paper studying the impacts of derelict fishing gear on turtles particularly oliveridley turtles (*Lepidochelys olivacea*) has been presented by the Maldives at the IOTC WPEB of 2014. In 2015, an analysis of bycatch level and composition including marine turtle bycatch was presented at IOTC WPEB 2015.

## 6.4. Other ecologically related species

Whale sharks and dolphins are protected under fisheries regulation. Even though handline fishermen target yellowfin tuna from dolphin associated schools, the interaction is minimal and there has been no reported dolphin catches or interactions.

Table 2: 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.

| | Seabirds | Marine Turtles | Marine Mammals |
|---|---|---|---|
| 2010 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 |
| 2013 | NA | 0 | 0 |
| 2014 | 0 | 0 | 0 |

# 7. National data collection and processing systems

Data collection and reporting system of Maldives was based on total enumeration of the catch requiring conversion factors for estimating weight of the catch. Vessels report catch by species and effort data (number of days fished) to it respective island council offices where the vessels are registered. There the data are aggregated by vessel by month providing catch by species in number along with the number of day fished.

Complication on separating catch by gear occurred due to the prominence attached to vessel type rather than gear (Adam et al. 2012). For historical reasons it is assumed the 'pole-and-line vessels' would always use pole-and-line gear and so the vessel type is assigned to presumed gear type in the monthly aggregated forms.

## 7.1. Logbook data collection and verification

The enumerated system of data reporting through island councils still exist. . The system is slowly being replaced by a logbook system staring from 2010. Logbooks went through a second revision in 2012 and the new logbooks were introduced in January 2013. Following successful establishment of logbooks it is now anticipated that the enumerated system of data reporting will be stopped from 1 January 2016. The logbook data has allowed Maldives to report data by the required 1 x 1 degree resolution helping to comply with data reporting requirements..

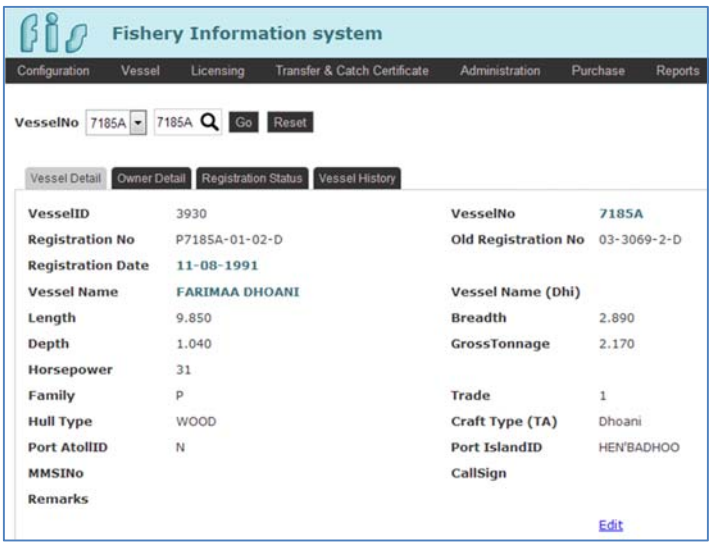


Figure 6: Screen capture of new Fishery Information System (FIS) showing Vessel Module

A web-enabled fishery information system is being developed to further improve the current database (Figure 6). Several modules of the system is now online and the system will allow integrating vessel registry, fishing licenses, fish purchase (by the commercial companies) and logbook data to provide a comprehensive system of compilation and reporting.

Logbook data verification may only be done through an observer system. One full time observer has been employed during September of this year.

MRC has undertaken several scientific observer trips to record information on fishing events. As such MRC has carried out over 80 observer trips in 2014 and this information has been used to cross-check the information provided by the log- books.

## 7.2. Vessel Monitoring System

Maldives now has successfully established a VMS system. At the time of this writing there are 120 vessels equipped with VLDs (Figure 5). Under the current regulations all fishing vessels applying for a new license or a renewal should have a VLD installed on board as of 1 June 2014. However, for the ease of process licenses are renewed or issued based on the request to install VLDs as there is a delay in installing VLDs due to logistics issues in travelling to islands but Ministry expects to increase VMS coverage progressively to incorporate all licensed fishing vessels..

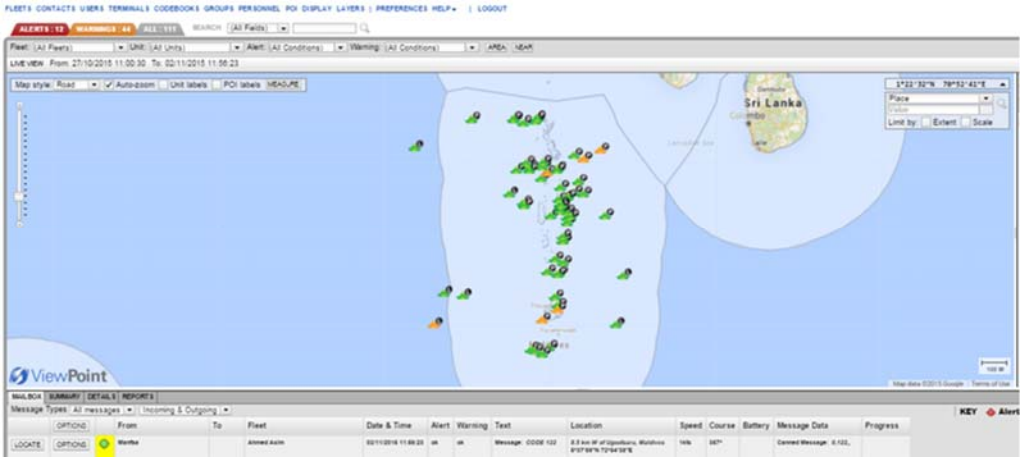


Figure 7: Screen capture of the Maldives VMS System. Currently 18 longline vessels have VLDs, monitored round the clock by the Fishery Management Division, of the Ministry of Fisheries and Agriculture

## 7.3. Observer Programme

After years of planning Maldives has now established an observer scheme. An observer has been trained and is now undertaking observation trips to collect the information as specified by the relevant IOTC regulation. The Observer started work in October 2015 and has now completed 4 fishing trips over the past few weeks.

Furthermore, Marine Research Centre has established an observer scheme to collect scientific information regarding fishing events which is fully consistent with the requirements of the IOTC observer requirements. The scientific observers has carried out over 80 fishing trips in 2015 and the information that has been collected has proven to be very useful to cross verify the information provided by the fishermen and the other information regarding fishing events.

It is expected that the observer scheme will be expanded over the next 2 years to attain the necessary level of coverage.

## 7.4. Port sampling programme

A port-sampling programme is not in place yet. It should be noted that under the implementation of EU – IUU fresh fish collectors (fish buyers) are required to record the details of catch and report to the Ministry which is being used as part of the issuing of catch certificate and to corroborate with the fishermen reported logbooks. A review of the fishermen-field officer size sampling programme was undertaken

recently and recruits are being made in the main fish collection areas for size sampling at the ports, in addition to fishermen samplers. Table 3 provides a summary of size measurements taken for the year 2013.

**Table 3: Number of individuals measured, by species by gear for 2013**

| Gear | SKJ | YFT | BET | KAW | FRI | Total |
|---|---|---|---|---|---|---|
| PL | 16,089 | 9233 | 874 | 812 | 531 | 27,539 |
| HL | 0 | 3344 | 0 | 30 | 0 | 3,374 |
| LL | 0 | 163 | 911 | 0 | 0 | 1,074 |
| **Total** | **16,089** | **12,740** | **1,785** | **842** | **531** | **3,1987** |

## 7.5. Unloading/Transhipment

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

# 8. National research programs

Table 4 provides a summary of the major research program currently being done. They are primarily geared towards improving national reporting and compliance to IOTC. A continuing work still has been the development of a Fishery Information System (FIS) – an integrated web-enabled database system that allows maintaining records and tracking of fishing vessel registries, their fishing licenses and help to compile the various logbooks (HL, PL and LL). The system would also allow produce summaries that would facilitate reporting data to IOTC.

A new programme started in September 2014 is the bycatch sampling programme. The objective of the programme is take part on regular fishing trips to observe and measure the total catch, including species composition of tuna catch. A sampling protocol has been established for observations, sampling, and recording on database of both the catch and bycatch including the livebait fishery, valid to meet IOTC observer criteria. Efforts will be concentrated in the south, including L. Maandhoo, Ga. Thinadhoo and GDh Kooddoo (Villingilli). Options will also be explored to conduct fishing trips from the Malé as well as from Lh. Felivaru.

**Table 4: Summary table for national research programs.**

| Project title | Period | Countries involved | Budget total | Funding source | Objectives | Short description |
|---|---|---|---|---|---|---|
| Development of Fishery Information System (FIS) web-enabled database | 2012-2018 | Local | US$ 81,000 | International NGOs | To develop an integrated database to enter and compile fishery information | This brand new database is developed to accommodate logbook data collection currently in place. It also allows to monitor vessel registry and issue fishing license. |
| Development of SKJ Harvest Control Rules | 2013-2015 | Local | US$ 75,000 | IPNLF / MSPEA / ABNJ / IOTC | Evaulation of management procedures with a view to develop harvest control rules for SKJ | A consultant is hired to develop SKJ MSE work in collaboration with the IOTC Secretariat and WPM Group (see Adam et al. 2013, Nokome and Adam, 2014 and Nokome and dam 2015) |
| Bycatch sampling Programme | 2014-2016 | Maldives | US$ 100,000 | IPNLF | To observe and sample bycatch in pole-and-line | Observers take part on regular fishing trips to observe and measure the total catch, |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | fishery | including species composition of tuna catch. A sampling protocol has been established for observations, sampling, and recording on database of both the catch and bycatch including the livebait fishery, valid to meet IOTC observer criteria. |
| Port Sampling Progrmme | 2015-2016 | Maldives | US$ 30,000 | WWF | To increase the size sampling effort in the Maldives | Porta-samplers are based in major landing site in the Maldives, where size sampling takes 5 days a week. |

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

The table below summarises the progress Maldives has made to recommendations of the Scientific Committee and Specific Resolutions relevant to the work of the Scientific Committee.

**Table 5: Summary response on the progress made to recommendation of the SC and specific Resolutions relevant to the work of the Scientific Committee.**

| 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 | Logbook data collection system has been established in 2010; logbooks revised in 2013 based on the new requirements of Res 13/03. Each fishing vessel should have a logbook on board to record catch and effort and reporting of catch and effort data is mandatory. For the first time, in 2013 Maldives reported the catch and effort data by IOTC requirements of 1x1 geographic gird. A new web-enabled database to compile the data in new format is complete and will be operational by June 2015 |
| 15/02 | Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties | Paragraphs 1- 7 | Maldives has been regularly providing total catch/effort and size data for the stock assessment work of the working party meetings. Maldives have submitted the 2014 catch and effort data on June 30, 2015. Longline data was submitted to IOTC 28/8/2015 |
| 15/05 | On the conservation for striped marlin, black marlin and blue marlin | Paragraph 4 | Catches of black marlin in the Maldives are from handline, caught in coastal areas outside of the atolls. Black marline may also be caught in LL bycatch which are reported. Maldives is making efforts to collect catch/effort and size data from its landings. |
| 13/04 | On the conservation of cetaceans | Paragraphs 7– 9 | The logbooks have fields to record cetaceans. Furthermore, the observer & bycatch sampling programme is keeping track of interactions. There are plans to produce a report after the first year of completion the observer programme that should provide summary of such interactions |
| 13/05 | On the conservation of whale sharks (*Rhincodon typus* | 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 only recently started fishing on high seas. These vessels are only longline vessels and are unlikely to encounter any interaction that is worthy of reporting for fishery purpose. The logbooks do have a field for recording such unusual encounters if any. An |

| Res. No. | Resolution | Scientific requirement | CPC progress |
|---|---|---|---|
| | | | observer scheme is now in place to verify any such interactions |
| 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 and actively targeting sharks inside Maldivian waters is prohibited.<br>The main types of fishery in Maldives are the pole and line and the handline tuna fishery. Observations suggest that interaction with sharks is minimal in these fisheries and any shark that is caught is released live.<br>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. However at present there are no inspection sites and all dead sharks are discarded at sea.<br>Shark interactions are recorded in detail in the log books and quality information on shark interactions has been reported to the IOTC as required.<br>Under the recently formulated shark NPOA, review and analysis of longline bycatch is given a priority. LL shark bycatch data form 2014 have been provided to IOTC |
| 12/09 | On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence | Paragraphs 4-8 | Shark fishing is prohibited in Maldivian waters. See section on Resolution 13/06 for details. . An observer scheme is now 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 | The Appendix 2 of "Regulation longline fishing in Maldives" gives 6 ways to mitigate the bycatch of seabirds as per the relevant IOTC resolutions. Implementation of one of these mitigation measures is mandatory. 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 | Maldives is signatory to the Indian Ocean – Southeast Asian (IOSEA) Marine Turtle Memorandum of Understanding. A second 10-year Turtle Moratorium is in force from 2008-2018 that includes banning of hunting, taking, or harming turtles, including harvesting of eggs. Appendix 2 of Regulation on Longline Fishing in the Maldives describes turtle mitigation measures during longline 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 | An Observer scheme has been established in the Maldives and one observer has now been trained and mobilized. The observer started work on October 2015 and has now undertaken 4 observer trips.<br>In addition to this, MRC has deployed observers on over 80 fishing trips. The information collected by the observers are consistent with the IOTC requirements and has proven to be very useful to validate the information provided in the fisheries log books.<br>The government of Maldives will expand the observer program over the next 2 years to progressively attain the necessary level of coverage as required by the IOTC resolutions.<br>One observer has been recruited and his work has started in September of this year. |
| 05/05 | Concerning the conservation of sharks caught in association with fisheries managed by IOTC | Paragraphs 1–12 | Shark fishing is prohibited in Maldives waters (the entire EEZ). The ban is effective from May 2010. The only fishery likely to catch shark would be longline fishery. Currently |

| Res. No. | Resolution | Scientific requirement | CPC progress |
|---|---|---|---|
| | | | there are 12 active longline vessels (targeting BET/YFT) operating between 100nm to 200nm of Maldives EEZ. The Regulation Longline Fishing in Maldivian waters requires shark by-catch to be released alive if possible and landed otherwise to an inspection port |

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