Recieved: 11 and 17 November 2015
IOTC-2015-SC18-NR19 Rev_1

Indian Ocean Tuna Commission
Commission des Thons de l'Ocean Indien
iotc ctoi

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

Osvaldo Ernesto Chacate
Rui Mutombene

Instituto Nacional de Investigação Pesqueira

Av. Mao Tsé Tung, nº 389, C.P.4603

INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 15/02, 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 2015, final data for the 2014 calendar year must be provided to the Secretariat by 30 June 2015]	YES The data from Industrial Mozambique tuna fleet, semi-industrial linefishery, sport fishery, recreational fishery and artisanal fishery were sent, letter with reference 591/ADNAP/2015 on 29th June. Also, these data are reflected in this report.
In accordance with IOTC Resolution 15/02, 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 2015, preliminary data for the 2013 calendar year was provided to the Secretariat by 30 June 2015]. **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 2015, final data for the 2014 calendar year must be provided to the Secretariat by 30 December 2015).	YES Mozambique has submitted the reports, letter with reference 591/ADNAP/2015 on 29th June. The final longline data are presented in this report.
If no, please indicate the reason(s) and intended actions:	

Executive Summary

This document is produced in order to comply with the obligation of the country as a member of IOTC of providing information whenever requested within the agreed procedures. It provides an overview of the Mozambican fisheries with emphasis to those impacting on tuna and tuna-like species. Likewise, the summary also, provides an update of ongoing actions across the country to ensure maximization of the exploitation of tuna at the country level and long term sustainable exploitation of the tuna stocks.

Similar to previous years the tuna fishery in 2014 was dominated by the distant water fishing nations -DWFN- accessing the resources through fishery Partnership Access Agreement. The total catch reported by these fleets was 3,791 tons.

The national industrial fleet for tuna in 2014 operated with two vessels only in December. The catch of this fleet was 7, 5 tons. The number of vessels increased in 2015 to five licensed and thus increase on catches is expected.

The artisanal, semi-industrial and recreational and sport fisheries show evidences of increasing impacts on tuna and tuna-like species with increasing catches in some regions along the Mozambican coast. However, due to lack of well trained personal and insufficient financing of the monitoring schemes in place contribution and impacts of these fisheries on tuna species is currently poorly known. Detailed catch and effort available information is further presented in specific chapter of the report.

Despite the above mentioned difficulties efforts were made to fund visits to two of the most important fishing provinces (Nampula and Cabo-Delgado) for technical discussions. These discussions have lead to the development of a draft action plan on how to improve the artisanal catch data and how could we increase the compliance with the IOTC requirements on reporting data.

Currently Mozambique is fully implementing the Vessel Monitoring Scheme – VMS to monitor all licensed tuna vessels (both national and foreign).

On Part State Measures, Mozambique is making efforts to follow all the steps required and has updated its inspection report form and advance request to enter into port – AREP which are being used during the pre-inspection of foreign tuna vessels.

The pre-fishing briefing for all licensed vessels is also one of the areas where Mozambique is keen to move to in order to help in combating IUU fishing in the region.

Finally, Mozambique is internally making efforts to improve monitoring and control of the tuna fisheries through internal initiatives involving different stakeholders (management, research and surveillance) and is willing to enhance dialog between them and operators.

Contents

1. BACKGROUND/GENERAL FISHERY INFORMATION

Mozambique is located in the south-eastern part of the African Continent, between latitudes 10°27' S to 26°52' S and longitudes 30°12'E and 40°51'E. The country has the third longest coastline in the Indian Ocean with the total length of more than 2,500 km. Total continental shelf area is about 104,300 km^2 and the EEZ area is 999, 000Km^2. The coastal areas of Mozambique are divided into seven different provinces that can be separated into three macro-areas: (i) northern coast (about 770 km), with a rocky and coral-bearing sea bed and a narrow continental shelf. (ii) Central coast (about 980 km) facing the Sofala bank and including most of the Zambezia province. (iii) The southern coast, that is about 950 km long and it has some coral and rock bottom in some areas and sand in others. The main and more productive fishing area for the national fishing fleets is the Sofala bank area. However, other areas as described above are used by the fishers.

The fishing sectors operating along the coastal area are the *artisanal*, *the* semi-industrial *and industrial* (shallow water shrimp and deep water lobsters trawlers, longliners and line fishing).

The artisanal fishing sector has particular importance for the country´s food security. It operates in the coastal provinces where two thirds of the population live and also in the inland areas where around 20% of the artisanal fisheries catch, comes from. The total catch from artisanal marine sector, is around 150,000 tons/year, and represents around 90% of the country catch; the fishery usually operates from beaches, or near coastal waters (generally within 3 miles), with a wide range of gears, from beach-seines, to hand-lines, gillnets, purse seines and longlines deployed by a mixed fleet of vessels less than 10 m in length. Vessels usually conduct daily fishing trips using one type of gear, but in some cases multiple gears are employed simultaneously. Beach-seines are responsible for most of the catches, around 38% of the total catch; the catches are composed mostly by small pelagic fishes, small demersal species and smaller part of the catch include tuna and tuna like species. The data collection systems in place, implemented by the Fisheries Research Institute doesn´t cover adequately information regarding IOTC species.

The industrial fishing sector, distributed among *shallow water shrimp trawlers* and *the deep water lobsters* with almost no impact on tuna and tuna-like species; and *the industrial line fishing* targeting primarily the bottom fish (large demersal species), with a potential impact on a tuna-like species, specially the narrow-barred Spanish mackerel.

The semi-industrial sector is characterised by vessels between 10 to 20 m in size. It is sub-divided in shrimp trawling and line fishery. The related impacts are as described above to the corresponding Industrial sector.

The national fishing sectors that directly target on tuna and tuna-like species are the industrial tuna longliner fleet and Sport and Recreational fishery. The industrial tuna longliner fleet is currently (2014) composed by five vessels. The practice of Recreational and Sport fisheries is more active in the southern coast (21°S to 26°S) comprising the coast of Maputo province, Gaza province and Inhambane province. Despite these fisheries have been practiced in different modalities, ranging from shore (without boat) to offshore boat based, it was found tuna and tuna-like species mainly in the catches from offshore boat based operations (fibreglass ski boat; 3-9m length), using mainly hook and line operated with a fishing rod and manual reel.

2. FLEET STRUCTURE

Foreign Distant Waters Fishing Nations are the main group fishing tuna from Mozambique fishing area. The actual number of fishing vessels is 56 comprised by 34 longliners and 22 purseiners (Table 1). The reduction in number of issued licenses has two different moments: the earlier one related with the issue of piracy which caused insecurity along the northern part of the Mozambican channel and the more recent scenario that have to do with pending concusses between the parties to re-new Partnership Access Agreement.

Table 1. Number of fishing licenses issued to foreign vessels to fish in the Mozambican fishing area, during the last seven years: 2007 to 2014 (Source: ADNAP annual reports).

	N° licenses	
Year	Purse-seiners	Longliners
2007	51	110
2008	47	75
2009	41	70
2010	34	37
2011	34	39
2012	23	35
2013	18	27
2014	22	34

National fleet is composed by nine longliners. Five longliners are operating since January 2015 and the other four are going to start it's operations soon.

The annual number of recreational licenses is presented in the Table 2.

Table 2. Number of recreational licenses (Recreational and Sport fishing) issued for coastal provinces by ADNAP from 2011 to 2014.

Year/Province	C. Delgado	Zambezia	Nampula	Sofala	Inhambane	Gaza	Maputo	Total
2011	189	14	20	55	875	523	1241	2728
2012	161	6	0	62	702	390	1581	2741
2013	306	10	24	46	922	542	1702	3552
2014	201	2	27	110	2008	361	2144	4853

The gears, vessels size and duration of fishing operation by the artisanal fisheries fleet are described bellow in the Table 3.

Table 3: Summary description of the vessel types and gears by fishery sector operating in the IOTC area of competence

Fishery Sector	Vessel	Crew	Main gear types	Comment on catch, operations and duration of the trip
Artisanal Fishermen were around 130,000 in 2012 and the number of fishing boats is 39,550 units. About 88% of the boats of artisanal fishing are canoes (IDPPE 2012).	N/A	N/A	Handline and beach seine	Artisanal fisheries are multi-gear and multispecies and occur along all the coastal provinces, targeting almost everything and are formally licensed. The main species are small pelagic and small demersal fish of the inshore coastal area and estuaries where the fishery occurs. No mean of catch conservation or iced catch (1 day trip maximum).
	Canoe < 3m (paddle) Boat, 3-8m (paddle/sail) Boat 5-10m (outboard)	1-6	Handline/trap, beach seine, gillnet, purse seines and longlines	
	Skiboat, 5-8m	3-6	Rod + line	
Recreational and sport fishing No accurate data is available; around 50 boats operate annually	N/A	N/A	Rod + line	In the domestic recreational fishing there is undocumented number of people fishing as leisure and to supplement domestic food. The sport fishing is more organised. The fishers belong to a club that normally sets standards for fisher ethics and organises tournaments. The recreational spear fishing involves individuals who dive without scuba equipment using spear guns to target selected species. The catch is composed by pelagic species only.
	Skiboat – sport, 5-8m	2-6	Rod + line	
	Skiboat –spear, 5-8m	2-6	Spear	

Semi-industrial An average of 21 operational vessels/month	10-20m	10-15	Rod + line/ handline	The species caught are mainly the large bottom fish. However, it impacts in pelagic such as the Spanish mackerel. Fishing operations takes place more offshore; activity formally licensed; Iced catch (7 to 12 days trip); Port-based activity.
Industrial An average of two operational vessel/month	vessels >20m	15-30	Rod + line /handline and Longlines	The fishing operations takes place more offshore**;** activity formally licensed. The handline fleet is oriented to large bottom fish and the longliners to the tuna and tuna-like species. Frozen catch; up to 30 days trip; Port-based activity.

The annual fishing licenses by gear by fishery sector are described in the Table 4, bellow.

Table 4. Summary of fishing licenses by gear issued for artisanal fishery, semi-industrial, Industrial, recreational and sport fishery in the last years. Source: ADNAP (2012 and 2013, 2014), for all fisheries except artisanal and IDPPE 2012, for artisanal fisheries.

Fishery sector	*Gear*	*N# licenses 2011*	*N# licenses 2012*	*N# licenses 2013*	*N# licenses 2014*	*Comments*
Artisanal fishery						
	Beach seine	-	9.042	*9916*		*Information based on census of artisanal fishing (IDPPE 2012). Data refers to coastal provinces only.* *This is a multispecies fishery with a considerable impact in tuna and tuna-like species*
	Handlines	-	*12.683*	*13853*		
	Gillnets	-	*14.817*	*20396*		
	longlines	-	*678*	*1077*		
	Purse seine	-		*563*		
Semi-industrial						
	Sofala bank Shallow water shrimp	*15*	*14*	*22*	*1*	*For Sofala Bank only. In this fishery significant amount of marine turtles area captured and released.*
	Linefishery	*23*	*41*	*37*	*31*	*In this fishery narrow-barred Spanish mackerel an IOTC mandatory species, is impacted*
Industrial						
	Sofala bank Shallow water shrimp;	*51*	*57*	*44*	*35*	*For Sofala Bank only. In this fishery significant amount of marine turtles area captured and released.*
	Linefishery	*2*	*2*	*3*	*3*	*In this fishery narrow-barred Spanish mackerel an IOTC mandatory species, is impacted*
	Pelagic longline tuna	*1*	*1*	*0*	*2*	*This fleet as tuna and tuna-like species as target.*
Recreational & sport						
	Coastal provinces Recreational and sport fishing	*2.728*	*2.741*	*3.552*	4.853	*Licenses include all modalities shore based, boat based, within and out of fishing tournaments. Tuna and tuna like species are captured in offshore boat based operations (within or out of tournaments)*

3. CATCH AND EFFORT (BY SPECIES AND GEAR)

The estimated total catches of tuna and tuna-like species from DWTFN and national fleets in 2014, account to 15,116.13 tons. This total catch represents an increase by 62% of the catch reported in the year 2013 (5,706 tons). This increase can be explained by operation of five Industrial longliner vessels associated to all effort in visiting the main tuna landing provinces and gathering more statistics data. Thus, difficulties of monitoring the artisanal, recreation and sport fishing are still challenging.

- **BY THE DWTFN**

The Mozambique fishing zone is assessed by the foreign vessels primarily in a seasonal base, when the tuna resource is abundant in the Mozambique Channel. The annual catch of the main tuna species reported by the foreign vessels is presented below, Table 5.

Table 5. Annual catch in tons of the tuna primary species and the fishing effort for the Mozambican fishing area (ADNAP annual reports).

Species	2007	2008	2009	2010	2011	2012	2013	2014
Skipjack	641	2550	1942	2345	1162	249	21	12
Albacore tuna	541	341	106	248	663	114	229	212
Bigeye tuna	350	322	173	274	387	154	257	361
Yellowfin tuna	3402	2647	824	1613	2280	890	2096	2275
Swordfish	218	209	721	837	463	920	590	205
Tuna	428	471	538	603	465	99	448	-
Total catch (tons)	5581	6549	5221	6640	5925	2426	4149	3065
Effort (fishing days)			1353	2727	2412	1551	1734	2215

- **BY THE INDUSTRIAL NATIONAL FLEET**

Table 6. Annual catch in tons and the fishing effort (ADNAP annual report-2014).

Species	Skipjack	Albacore tuna	Bigeye tuna	Yellowfin tuna	Swordfish	Tuna	Total catch (tons)	Effort (fishing days)
2013								
2014	0	0	780	1389	3365	1947	7521	06

The map of fishing effort distribution presented bellow is related to the industrial longliners fishing vessels. The red dots refer to the positions where the fishing activity occurred on December 2014.

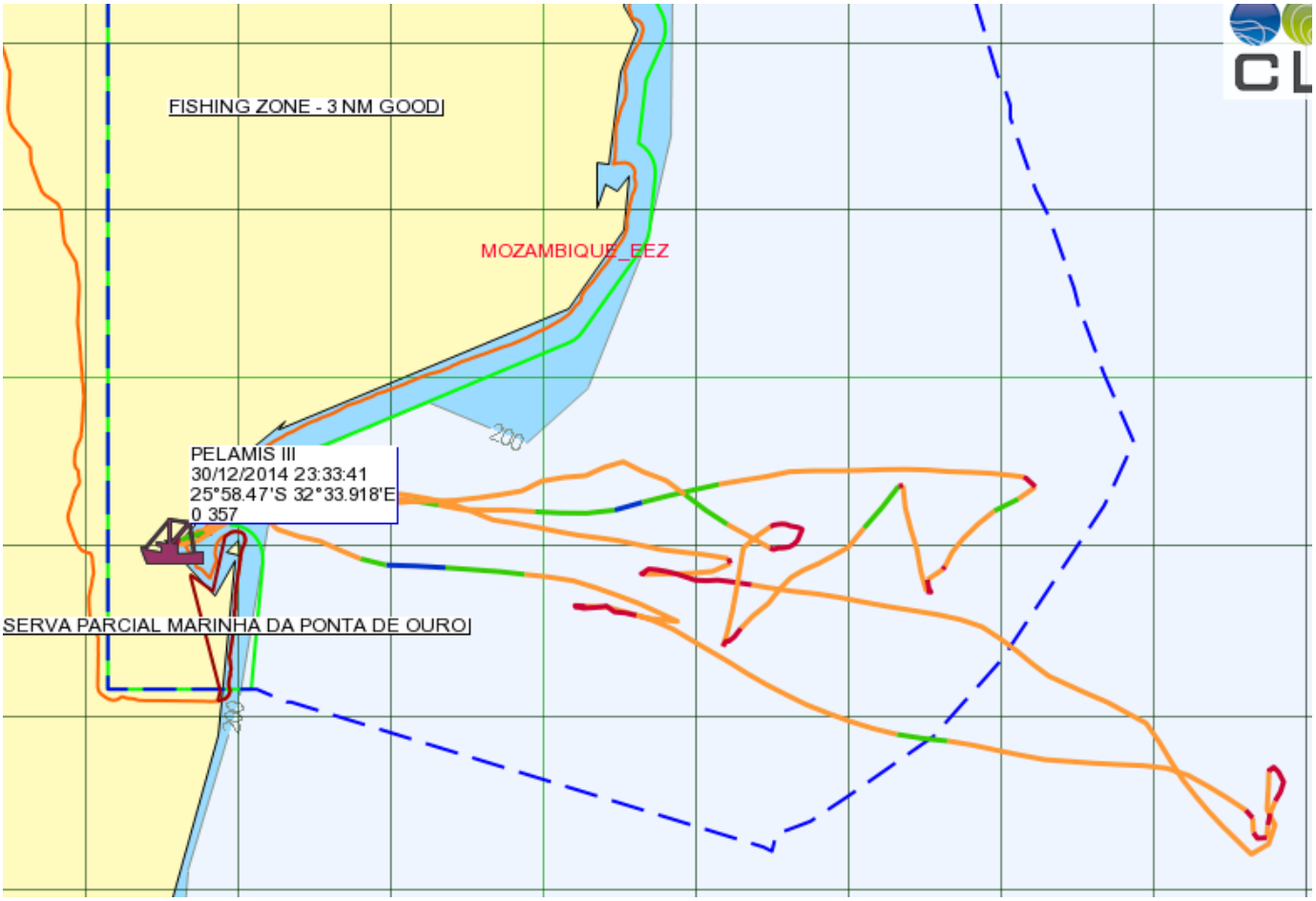


Figure 1a. Map of the distribution of fishing effort in 2014, for the longliners fishing in the IOTC area of competence. Update of the previous map provided in 2012 for one single longliner in placeby that time.

Figure 1b. Map of the distribution of fishing effort, by gear type for the national fleet in the IOTC area of competence (average of the 5 previous years e.g. 2009–2014). **Not available.** We are reporting for a fishery that begun in 2011 and by that time, a problem was noticed with the VMS that came to effective function in 2012.

Figure 2a. Map of distribution of fishing catch, by species for the national fleet, in the IOTC area of competence (most recent year e.g. 2012). **Not available**

Figure 2b. Map of distribution of fishing catch, by species for the national fleet, in the IOTC area of competence (average of the 5 previous years e.g. 2008–2012). **Not available**

- **BY THE ARTISANAL COASTAL FISHERIES**

The estimated total catch by the artisanal coastal fisheries in 2014 was 4443 tons. The catch information for the coastal artisanal fisheries comes from six of the seven coastal provinces. The provinces with high contribution with tuna and tuna-like artisanal fisheries catch are Nampula (78%), Cabo Delgado (8%) and Inhambane (7%).

In general, the species that contributed more to the total catch are namely, Narrow barred Spanish mackerel (55%) and Frigate tuna (34%).

Table 7. Aggregated Annual Catch by primary species in the IOTC area of competence for artisanal coastal fisheries, 2008-2014.

	Artisanal fisheries						
Species	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Yellowfin tuna	25	1	1	0	3	0	4
Skipjack	936	36	43	0	0	0	15
Bigeye tuna	684	325	321	26	2125	0	36
Albacore tuna	125	4	6	0	16	0	75
Black Marlin	827	6	0	0	0	10	66
Indo-Pacific Sailfish	67	0	0	0	0	0	16
Swordfish	223	25	0	0	0	0	
Narrow barred Spanish mackerel	1550	1640	1676	690	2224	579	2623
Striped marlin	0	0	11	0	0	0	
Indo-Pacific Blue Marlin	0	4	28	0	0	0	
Frigate tuna	595	332	2551	66	444	170	1598
Kawakawa	322	429	125	3	567	121	10
Longtail tuna	0	0	125	0	0	0	0
Total fishing effort	Annual fishing effort not available						
Total catch in tons	5353	2802	4886	786	5378	880	4443

From 2008 to 2012: The aggregated catch information in the table above is from five coastal provinces, namely Maputo, Inhambane, Sofala, Nampula and Cabo Delgado;

In 2013: The data are only for three provinces, Inhambane, Zambezia and Nampula;

In 2014: The data covers six provinces out of the seven coastal provinces.

- **BY THE SEMI-INDUSTRIAL LINEFISHERY**

Table 8. Aggregated Annual Catch and Effort by gear and primary species in the IOTC area of competence for semi-industrial linefishery (Only Narrow barred Spanish Mackerel), in 2013 and 2014.

	2013	**2014**
Narrow barred Spanish Mackerel	150	80
Total fishing effort	4,100 days	2,219 days

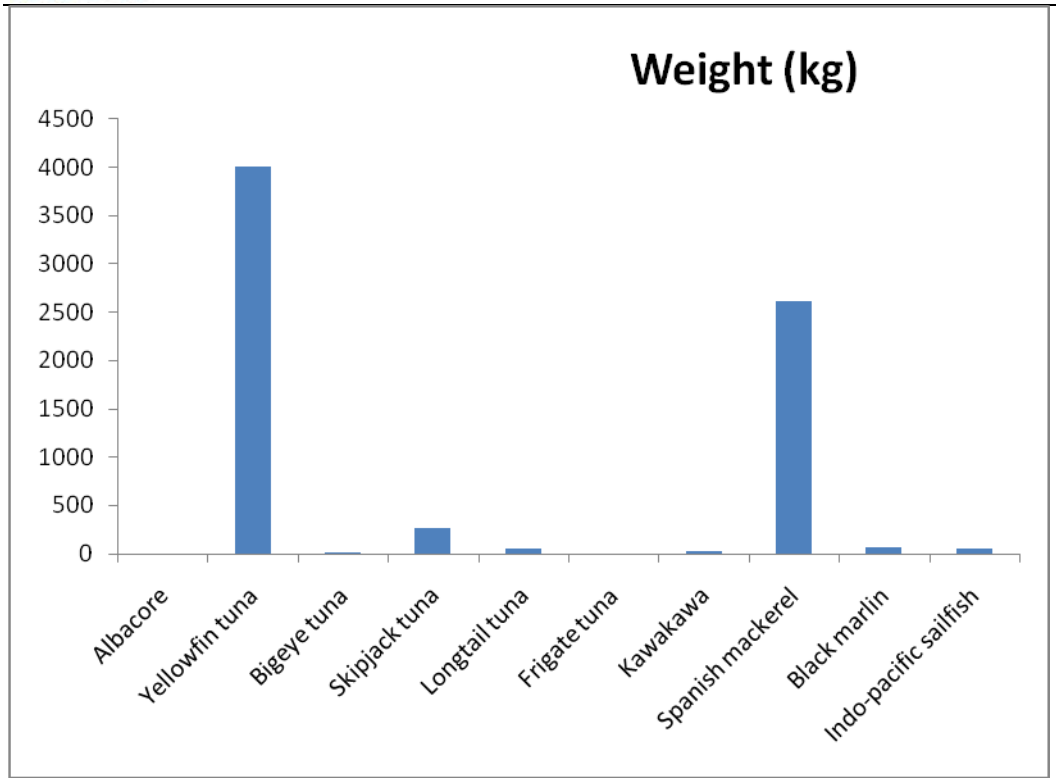
4. RECREATIONAL FISHERY

The practice of recreational and sport fisheries is more active in the southern coast (21°S to 26°S) comprising the coast of Maputo province, Gaza province and Inhambane province. In the Northern site of the country the activity are pronounced in Cabo Delgado province.

Despite the fact that these fisheries are practiced in different modalities, ranging from shore (without boat) to offshore boat based, it was found that tuna and tuna-like species mainly in the catches from offshore boat based operations (fibreglass ski boat; 3-9m length). The main gear used to target tuna and tuna-like species is hook and line operated with a fishing rod and manual reel.

In 2014, the monitoring program covered only fishing competitions that took place in Maputo province. The catches were dominated by yellowfin tuna and Spanish mackerel (fig 3 and Table 9). The total observed catch was 7.13 tons.

Figure 3. Catch in weight and table 9. Catch in number of tuna and tuna-like species on recreational and sport fishing of Maputo province in 2014.



Species	Nº ind
Albacore	
Yellowfin tuna	874
Bigeye tuna	4
Skipjack tuna	100
Longtail tuna	19
Frigate tuna	
Kawakawa	10
Spanish mackerel	409
Black marlin	1
Indo-pacific sailfish	2
TOTAL	1446

For the recreational fishing, voluntary submission of catch cards by recreational anglers (mainly on boats) occurred from 1996-1999 at Ponta d'Ouro and Ponta Malongane in the south coast, and commenced again in 2008 (with inclusion of Maputo and Inhambane provinces). The cards are inconsistently completed by anglers, who use various common names of fish, and zero catches are not reported. Thus, the information for this fishery can just be considered available for Ponta d'Ouro and Malongane with consistent reporting in the last three years. In these specific places that are within a conservation area, the Marine Park officers were trained by IIP (Fisheries Research Institute) and a partnership was established to help in the collection of these cards. For the other areas the information of this fishery is unavailable.

5. ECOSYSTEM AND BY CATCH ISSUES

No specific action plan was set and implemented yet. In future issues to take into consideration at the national level in this regard are going to be identified and prioritised. The new Law on Fisheries is already in force (Law No 22/2013 of November 01) in Mozambique and with a view of bringing the aspects that are in the Law there is an ongoing process of revising the fishing regulation. Thus, a paragraph that will define the obligation of vessels to comply with all IOTC resolution in regard to sharks, seabirds and sea turtles is going to be included in the revised regulation.

Moreover, Mozambique has developed in 2014, the Terms and Conditions of Licensing for tuna fishing and are attached to fishing license. These contain all the measures for the conservation and management of tuna fisheries and include the aspects related to conservation of sharks, seabirds and sea turtles.

5.1 Sharks

The lack of specific national strategies is still a challenge. However, in regard to the NPOA Shark specifically, drafting is expected to commence in 2016 as delayed due to financial limitation in 2015 under SWIOFish project within the framework of the implementation of the Linefish Management Plan.

Moreover, the country is supporting the listing of new species as protected following the adequate assessment thought the CITES Commission at the national level.
The estimated annual catch of sharks is presented bellow on table 10. The information is relative to beach seines, surface and demersal gill nets and handline from Nampula and Zambézia provinces where the catch of sharks is high.

Table 10. Estimated catch (in tons) of sharks in artisanal fisheries of Zambézia and Nampula provinces in 2013 and 2014.

Shark species name	**2013**	**2014**
Sphyrna lewini	95.9	95
Sphyrna zygaena	211.7	4.6
Carcharhinus falciformis	1.8	
Carcharhinus leucas	201.6	135.2
Carcharhinus sealei	69.0	
Carcharhinus sorrah	24.9	
Carcharhinus limbatus	3.8	
Loxodon macrorhinus	26.3	0.6
Rhizoprionodon acutus	54.1	0.7
Hemipristis elongatus	14.5	2.634
Carcharhinus albimarginatus		5.2
Shark		10.2
Total	**703.7**	**253.9**

Recreational and sport fishery as well the semi-industrial linefishery has practically null impacts on shark species.

5.2 Seabirds

No NPOA is available yet in this regard. However, to help in monitoring, Mozambique is regularly briefing the master of their fishing vessel on the mandatory requirement to report any seabird interaction with longliner fleet; has developed and introduced a new longline logbook which requires the skipper to fill in the information on interactions whenever it occur and the observers when on-board, are required to report these interactions. Recently, it was agreed at the national level to introduce in the national legislation all the requirements regarding sea birds conservation measures in the terms and conditions for licensing.

5.3 Marine Turtles

No specific strategy for marine turtles is available. However, Mozambique has developed and introduced since 2012 a new longline logbook for tuna longliner to improve data collection, including information on interactions with sea turtles.

Sea turtles interaction with fisheries in Mozambique have been reported in the Sofala Bank trawlers since the onset of the fishery and the first attempt to quantify the level of incidental catch and mortality in this fishery was done by Gove et al., (2001). An interviews to "ice vessel" skippers based study concluded that sea turtle capture and mortality by the shrimp industry is a problem since every fishing season between 1,932 and 5,436 sea turtles were caught by this fleet and recommended that TEDs should be mandatory in the fishery. The re-design of the current maritime fisheries regulation, which was enacted in 2003 (Decree 43/2003) used those findings and the perception of at least part of the wider Sofala Bank operators and conservation organizations to make the use of TEDs mandatory by 2004.

A second interview based assessment was conducted by Brito (2012) Reporting that at least 1,735±1,235 sea turtles are caught each fishing season. Over 54.8% of the incidents occur within a few miles of the small islands forming the Primeiras and Segundas archipelago in the northern one fifth section of the Sofala Bank shrimp fishery.

Although there are known interaction between the artisanal fisheries and sea turtles, no actual studies are available to cite on the magnitude of these interaction along the coastal area.

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

No relevant information available now.

Table 10. Observed annual catches of special species (seabirds, marine turtles and marine mammals) by gear in the national fleet, in the IOTC area of competence (for the most recent five years at a minimum, e.g. 2009–2014 or to the extent available).

No data available

6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS

In Mozambique the collection of fisheries data and statistics is under mandate of Ministry of Sea, Inland waters and Fisheries (MIMAIP). The fisheries data collected includes catch and effort, environmental data and socio-economic data. Each category of data is collected under the responsibility of one or more of the four institutions of the MIMAIP; the National Fisheries Administration (ADNAP), the National Fisheries Research Institute (IIP), the National Institute for the Development of Small Scale Fisheries (IDPPE) and the National Directorate of Fisheries Economy and Policy (DNEPP) (Table 11).

Table 11. Fisheries data collection in Mozambique: Institutions involved and categories of data collected.

Category of data	Artisanal fleet	S-industrial fleet	Industrial fleet
Annual catches	IIP	ADNAP/ IIP	ADNAP/IIP`
Fishing craft statistics	IDPPE	ADNAP	ADNAP
Catch-and-effort data	IIP, IDPPE	ADNAP	ADNAP
Length frequency data	IIP	IIP	IIP
Observer trip report	IIP	IIP	IIP
Socio-economic data	IDPPE, DNEPP	DNEPP	DNEPP

Despite a functional data collection system existing on National scale, it proved to be not very efficient to fulfil with the IOTC standards for data collection and reporting. To increase the level of compliance regarding the fisheries data and statistics, Mozambique started an internal reflection in regard to its institutional arrangement under the MIMAIP to guaranty effective collection of fisheries data. This reflection will lead to assess the level of gaps (limitations) and needs for improvement on the national fisheries data collection system, according with IOTC standards for data collection and reporting. The document which contains such analysis will next year, 2016 be the basis for this section of the National Scientific Report, since the analysis was not completed in 2015.

All the fisheries except the subsistence fisheries (invertebrate collectors), are subjected to scientific monitoring program implemented by the Fishery Research Institute (IIP). The on-board observer program is conducted in semi-industrial and industrial commercial fisheries while the catch and effort from the artisanal fisheries are monitored by a National Stratified Random Sampling System locally known as SNAPA (Sistema Nacional de Amostragem da Pesca Artesanal), and recreational and sport fisheries are covered by on landing site sampling during the disembarkation on the local of the fishing completion. Logbooks and other monitoring tools are also used as part of monitoring system (see table 12 below). Logbooks are monitored by ADNAP which also issue the fishing licences. However, the information from the logbooks is shared with IIP when required. The IIP also conduct specific studies as a tool to fill the gaps of both monitored and not monitored fisheries.

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

New longline Logbook data collection has been developed in 2011/2 to improve quality of data collection. The new logbook was developed according to the IOTC requirements for longliner fleet and was introduced in 2014 for all national fisheries including tuna. The data verification process is carried out by Fisheries Administration of Mozambique (ADNAP), since 2001. The logbooks filled by EU vessels has been received through the EU commission in Mozambique, however this has not always been the case for some vessels. The EU fleet is also reporting catches through ERS system under FPA. The other foreign fleets outside of the FPAs send catch reports directly to ADNAP through entry exit reports. For the Mozambican flagged vessel the information is also collected by logbooks and it is expected that this system will gradually improve with the current investments in monitoring control and surveillance and Mozambique's integration with the regional RFMO's and bilateral cooperation. The new logbooks are provided to the captain of the vessel prior to the fishing activity. The new logbooks in use since 2014, allow collecting a wide range of information such as fishing positions (coordinates), catch per set, by species and interaction with protected species. The logbooks are returned back to ADNAP by the end of each fishing trip and after the verification of the information ADNAP send a copy to IIP.
Associated to this, there is a national observer scheme that allows the collection of the scientific data as required.

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

The Ministry of Fisheries of Mozambique, recognizing the Vessel Monitoring System - VMS as important tool for MCS contracted a VMS provider in 2001. Nevertheless, the system was not working properly due the lack of assistance to the installed equipment. Thus, the Ministry decided to look for a new provider. So in 2010 was developed the current system which became fully operational in 2011 covering national fisheries and also foreign tuna fleets through the communication protocol established. The system was running in META software and it is installed in Maputo at National Fisheries Administration – ADNAP. In 2012, the VMS

was upgraded from META software to THEMIS software with the aim of having a multifunctional system.

The THEMIS software was proved to be better because it allows the vessels monitoring and produce reports containing the required information on vessel location (position), velocity, date, time and direction. It also allows exchange of information with other FMCs, and will allow integrating ERS in VMS, and receive information from Orbcomm and AIS Satellite providers.

Linked to the above action, training of personnel in the use of the tools of the THEMIS software was carried out.
The implementation of the VMS has been providing positive results such as detention of illegal fishing vessels, location of the vessels for conflicts resolution propose, control of the entrance and exit of authorized foreign fishing vessels in the Mozambican EEZ.

The current challenges to the implementation of the VMS are related to increasing the capacity building in VMS and also to expand it to small scale national fleet to allow an effective operational VMS Centre. The other challenge is to incorporate catch report and ERS in VMS to allow cross check and better analysis.

6.3. **Observer programme and Port sampling programme** (including date commenced and status; number of observer, include percentage coverage by gear type).

Scientific Observer programme has been carried out in the national fleet targeting shallow water shrimps, deep-water shrimps and on those for demersal fish (linefishery), since the 1980s. It has been also implemented on the national flagged tuna longliners since 2012 (Table 12). The recreational fishing is the less monitored fishery. IIP distribute fishing catch cards to many lodges and hotels were recreational fishing is a current activity but the level of fill and return of these card is very low. The cards were supposed to be filled per outing but the operators normally says that tourist fishers do not accept or they forget to fill the cards.
Mozambique's commitment with IOTC initiatives in this field and will improve the ability of the country to carry out scientific monitoring of tuna. The Fishery Research Institute has eight scientific observers who have been trained under the SWIOFP and have the respective registration and certification. Most of these observers are above 45 years of age what poses a challenge to IIP in training new people who will answer to future challenges. A course for training new scientific observer for tuna fisheries has been planned for 2016 in Mozambique.

Table 12. The coverage of Mozambican fisheries with potential impacts on IOTC mandatory species by the scientific observer program under the Ministry of Fisheries (IIIP/ADNAP).

Fishery Sector and fisheries	**On-board Sampling (%)**	**Port Sampling (%)**	**On landing site Sampling (%)**	**Logbooks (%)**
1. Artisanal	No	No	Yes	No
1.1. Beach seine	0%	0%	>50%	0%
1.2. Handlines	0%	0%	>50%	0%
1.3. Gillnets	0%	0%	>50%	0%
1.4. purse seines	0%	0%	>50%	0%
1.5. longlines	0%	0%	>50%	0%
1.6. other gears	0%	0%	<50%	0%
2. Semi-industrial	Yes	Yes	NA	Yes
2.1 Linefishery	3%	10%	NA	80%
3. Industrial	Yes	No	NA	Yes
3.2. Linefishery	3%	0%	NA	100%
3.3. Pelagic longline	60%	0%	NA	100%
4. Recreational & sport	No	NA	Yes	Yes
4.1. Recreational fishing	0%	NA	2%	2%
4.2. Sport fishing	0%	NA	0%	30%

6.4. Length data

Table 13 shows the length data collected in the fisheries which potentially impact on IOTC species.

Table 13. Number of individuals measured by species and by fishery in 2014.

Fisheries	Species	Number sampled	Observation
Artisanal coastal fisheries	No IOTC mandatory species measured	0	The sampling system of artisanal fisheries was designed to collect data of the main species (coastal) that support the fishery (mainly small pelagic and demersal species). Although catch data are recorded for all species including IOTC mandatory species, size measurements for IOTC species is not taken by artisanal sampling system. Recognizing that this is a sector with a potential impact on many of the IOTC species, IIP is currently studying alternative approaches to collect such type of data. No action that resulted in availability of data was taken yet in this regard.
Semi-	Narrow-barred	301	Only the Narrow-barred Spanish

industrial Linefishery	Spanish mackerel		mackerel is captured in this fishery. This species has a great contribution on total production of linefishery and biological data such lengths are collect by mean of observer on board. Other IOTC species (tunas, billfish, pelagic sharks, marine turtles, birds and mammal) are not impacted by the fishery.
Sport fishery (Linefishery)	Black Marlin	1	Data refer to on landing site sampling in or out of some fishing tournaments in the southern part of Mozambique (Maputo province in 2014). Collection of recreational fishing data is very difficult as the cards distributed by IIP to the many lodges along the coast are not filled by the amateur fishers. IIP is currently studying alternative approaches to collect such type of data. This action did not produce results yet.
	Yellowfin tuna	874	
	Skipjack	100	
	Albacore	2	
	Bigeye tuna	4	
	Frigate tuna	2	
	kawakawa	11	
	Indo-pacific Sailfish	2	
	Spanish mackerel	409	
	Longtail tuna	44	
All fleets	Sharks	0	Sharks size is not measured. Training for observers and fishing masters on shark issues is planned for 2016. Logbooks and other sheets used to collect data were modified to accommodate among others, sharks size data issue.

6.5. Unloading/Transhipment [including date commenced and status of implementation]
No transhipment

7. NATIONAL RESEARCH PROGRAMS

The Fisheries Research Institute (IIP), under the Ministry of Fisheries, has the responsibility of undertaking research in fisheries related issues as well as the aquatic environment and aquaculture. The IIP does not possess a research vessel what is a challenge to carry out its mission. However, several research on demersal fish, small and large coastal pelagic fish, squids and octopus, bivalves, shallow water shrimp and oceanographic research are ongoing with collaboration of fishing industry and countries such as Norway, and others which provide the necessary support in vessels or funding. Recently, the tuna fishery development plan was completed and approved by the cabinet.

Table 14. Summary table of national research programs, including dates.

Project title	Period	Countries involved	Budget total	Funding source	Objectives	Short description
Implementation of the recently approved linefish management plan	2014-2018			Mozambique Government	Guarantee the sustainability of fishery by using an ecosystem approach	A plan to develop a NPOA sharks is under this management plan
Demersal fishery potential	2012-2015			IFAD	Assess the fishing potential accessible to small scale fishers	
Small and large coastal pelagic fish fishery potential	2012-2015			IFAD	Assess the fishing potential accessible to small scale fishers	
Octopus fishery potential	2012-2015			IFAD	Assess the fishing potential accessible to small scale fishers	
Implementation of FADs for the small scale coastal fishers	2012-2015			IFAD	Improve the use of FADs as an option to increase the income of the smaller fishers	

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

Table 15. Respond with progress made to recommendations of the SC and specific Resolutions relevant to the work of the Scientific Committee [to be updated annually to include most recent Conservation and Management Measures adopted by the Commission].

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	Mozambique is addressing the issue using a longline logbook that captures all required information stated in this resolution. Mozambique has also developed Terms and conditions for tuna licensing for all vessels operating in its EEZ.
15/02	Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)	Paragraphs 1–7	Mozambique submitted the mandatory statistics for the national fleet as stated in the resolution requirements within deadlines.
15/05	On conservation measures for striped marlin, black marlin and blue marlin	Paragraph 4	Mozambique has no gillnet fisheries impacting on marlin species. However, effort is in place to record and report data on marlin species as required by this resolution.
13/04	On the conservation of cetaceans	Paragraphs 7– 9	Mozambique is addressing the issue using a longline logbook that captures all required information stated in this resolution. Mozambique has also developed Terms and conditions for tuna licensing for all vessels operating in its EEZ.
13/05	On the conservation of whale sharks (*Rhincodon typus*)	Paragraphs 7– 9	Mozambique is addressing the issue using a longline logbook that captures all required information stated in this resolution. Mozambique has also developed Terms and conditions for tuna licensing for all vessels operating in its EEZ.
13/06	On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries	Paragraph 5–6	Mozambique is addressing the issue using a longline logbook that captures all required information stated in this resolution. Mozambique has also developed Terms and conditions for tuna licensing for all vessels operating in its EEZ. No research on oceanic whitetip shark has been conducted yet by

Res. No.	Resolution	Scientific requirement	CPC progress
			Mozambique.
12/09	On the conservation of thresher sharks (family alopiidae) caught in association with fisheries in the IOTC area of competence	Paragraphs 4–8	Mozambique is addressing the issue using a longline logbook that captures all required information stated in this resolution. Mozambique has also developed Terms and conditions for tuna licensing for all vessels operating in its EEZ.
12/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3–7	Mozambique reported to IOTC that there have been no interactions with sea birds reported by the national tuna fishing vessels, in 2014. Mozambique is regularly briefing the master of the vessels on the mandatory requirement to report all interactions and the new longline logbook requires the registration of an interaction with seabirds. Mozambique has also developed Terms and conditions for tuna licensing for all vessels operating in its EEZ which contains this requirements.
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	Mozambique reported that there have been no interactions with marine turtles reported in 2014. The new longline logbook for tuna requires reporting on interactions with sea turtles. Also, the implementation of the observer scheme provide additional informational in this regard. Although, the information is not reported yet, the interaction with artisanal beach seine and gill net is known in specific areas area and mitigation measures are implemented such as sensibilization to the fishers.
11/04	On a regional observer scheme	Paragraph 9	Mozambique did not succeed to deploy observer in 2014. The national industrial fleet started its activity by the end of the year and no observer was available to embark.
05/05	Concerning the conservation of sharks caught in association with fisheries	Paragraphs 1–12	The Mozambican longliners fishing for tuna in the Indian Ocean reported nil catch of sharks in 2014 and this

Res. No.	Resolution	Scientific requirement	CPC progress
	managed by IOTC		information was reported to the IOTC. Mozambique does not license vessels to target pelagic sharks. The implementation of the observer scheme is going to address other issues related to this resolution compliance.

9. LITERATURE CITED

- ADNAP (Administração Nacional das Pescas). 2013. Relatório Anual. 51 Pp.
- ADNAP (Administração Nacional das Pescas). 2012. Relatório Anual. 52 Pp.
- ADNAP (Administração Nacional das Pescas). 2013. Plano Estratégico e Desenvolvimento da Pescaria de Atum em Moçambique – PEDPA. 48 PP.
- ADNAP (Administração Nacional das Pescas). 2014. PLANO DE GESTÃO PARA A PESCARIA DE LINHA DAS ÀGUAS MARÍTIMAS DE MOÇAMBIQUE 2014-2018. 56pp.
- Action plan – COMPLIANCE SUPPORT MISSION TO MOZAMBIQUE. JULY, 2013.
- Brito. A. 2012. An interview-based assessment of the incidental capture and mortality of sea turtles in Mozambique´s Sofala Bank commercial shrimp fishery. Revista Moçambicana de Investigação Pesqueira. 30: 31-56 - Ministério das Pescas 2009.
- DNEPP (DIRECÇÃO NACIONAL DA ECONOMIA E POLITICAS PESQUEIRAS). 2013. RELATÓRIO ANUAL. 22 Pp.
- IDPPE (Instituto Nacional para o Desenvolvimento da Pesca de Pequena Escala). 2013. Censo da pesca artesanal 2012 – Principais Resultados. 122pp.
- IIP, 2013. Relatório Anual 2012. Instituto Nacional de Investigação Pesqueira. Maputo. 79pp.
- IIP, 2014. Relatório Anual 2013. Instituto Nacional de Investigação Pesqueira. Maputo. 81pp.
- IIP, 2015. Relatório Anual 2014. Instituto Nacional de Investigação Pesqueira. Maputo. 81. In Press.
- MINISTÉRIO DAS PESCAS. 2009. Plano director das Pescas 2010-2019. Maputo. 55pp.