

**DRAFT: EXECUTIVE SUMMARY: PELAGIC THRESHER SHARK**

Indian Ocean Tuna Commission  
Commission des Thons de l'Océan Indien

**Status of the Indian Ocean pelagic thresher shark (PTH: *Alopias pelagicus*)****TABLE 1.** Pelagic thresher shark: Status pelagic thresher shark (*Alopias pelagicus*) in the Indian Ocean

Area <sup>1</sup>	Indicators		2014 stock status determination
Indian Ocean	Reported catch 2013: Not elsewhere included (nei) sharks <sup>2</sup> : Average reported catch 2009–2013: Not elsewhere included (nei) sharks <sup>2</sup> :	0 t 46,728 t 75 t 49,318 t	Uncertain
	MSY (1000 t) (80% CI): F <sub>MSY</sub> (80% CI): SB <sub>MSY</sub> (1000 t) (80% CI): F <sub>2013</sub> /F <sub>MSY</sub> (80% CI): SB <sub>2013</sub> /SB <sub>MSY</sub> (80% CI): SB <sub>2013</sub> /SB <sub>0</sub> (80% CI):	unknown	

<sup>1</sup>Boundaries for the Indian Ocean = IOTC area of competence

<sup>2</sup>Includes all other shark catches reported to the IOTC Secretariat, which may contain this species.

Colour key	Stock overfished (SB <sub>year</sub> /SB <sub>MSY</sub> < 1)	Stock not overfished (SB <sub>year</sub> /SB <sub>MSY</sub> ≥ 1)
Stock subject to overfishing (F <sub>year</sub> /F <sub>MSY</sub> > 1)		
Stock not subject to overfishing (F <sub>year</sub> /F <sub>MSY</sub> ≤ 1)		
Not assessed/Uncertain		

**TABLE 2.** Pelagic thresher shark: IUCN threat status of pelagic thresher shark (*Alopias pelagicus*) in the Indian Ocean

Common name	Scientific name	IUCN threat status <sup>1</sup>		
		Global status	WIO	EIO
Pelagic thresher shark	<i>Alopias pelagicus</i>	Vulnerable	–	–

IUCN = International Union for Conservation of Nature; WIO = Western Indian Ocean; EIO = Eastern Indian Ocean

Sources: IUCN 2007, Reardon et al. 2009

**NOTE:** IOTC Resolution 12/09 *On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence*, prohibits retention onboard, transshipping, landing, storing, selling or offering for sale any part or whole carcass of thresher sharks of all the species of the family Alopiidae<sup>2</sup>.

**INDIAN OCEAN STOCK – MANAGEMENT ADVICE**

**Stock status.** There remains considerable uncertainty in the stock status due to lack of information necessary for assessment or to for the development of other indicators of the stock (Table 1). The ecological risk assessment (ERA) conducted for the Indian Ocean by the WPEB and SC in 2012 (IOTC–2012–SC15–INF10 Rev\_1) consisted of a semi-quantitative risk assessment analysis to evaluate the resilience of shark species to the impact of a given fishery, by combining the biological productivity of the species and its susceptibility to each fishing gear type. Pelagic thresher shark received a high vulnerability ranking (No. 3) in the ERA rank for longline gear because it was characterised as one of the least productive shark species, and with a high susceptibility to longline gear. Despite its low productivity, pelagic thresher shark has a low vulnerability ranking to purse seine gear due to its low susceptibility for this particular gear. The current IUCN threat status of ‘Vulnerable’ applies to pelagic thresher shark globally (Table 2). There is a paucity of information available on this species and this situation is not expected to improve in the short to medium term. Pelagic thresher sharks are commonly taken by a range of fisheries in the Indian Ocean. Because of

<sup>1</sup> The process of the threat assessment from IUCN is independent from the IOTC and is presented for information purpose only

<sup>2</sup> Scientific observers shall be allowed to collect biological samples from thresher sharks that are dead at haulback, provided that the samples are part of the research project approved by the Scientific Committee (or the Working Party on Ecosystems and Bycatch).

their life history characteristics – they are relatively long lived (+ 20 years), mature at 8-9 years, and have few offspring (2 pups every year), the pelagic thresher shark is vulnerable to overfishing. There is no quantitative stock assessment and limited basic fishery indicators currently available for pelagic thresher shark in the Indian Ocean therefore the stock status is **uncertain**.

**Outlook.** Current longline fishing effort is directed to other species, however pelagic thresher sharks is a common bycatch these fisheries. Hooking mortality is apparently very high, therefore IOTC regulation 10/12 prohibiting retaining of any part of thresher sharks onboard and promoting life release of thresher shark may be largely ineffective for species conservation. Maintaining or increasing effort can result in declines in biomass, productivity and CPUE. However there are few data to estimate CPUE trends, in view of IOTC regulation 10/12 and reluctance of fishing fleet to report information on discards/non-retained catch. The impact of piracy in the western Indian Ocean has resulted in the displacement and subsequent concentration of a substantial portion of longline fishing effort into other areas in the southern and eastern Indian Ocean. It is therefore unlikely that catch and effort on pelagic thresher shark will decline in these areas in the near future, which may result in localised depletion. The following should be noted:

- Two important sources of data that inform the assessment, total catches and CPUE are uncertain or unavailable, and should be investigated further as a priority.
- Noting that current catches (probably largely underestimated) are estimated at an average ~75 t over the last five years ~0 t in 2013, maintaining or increasing effort can result in declines in biomass, productivity and CPUE.
- Mechanisms need to be developed by the Commission to encourage CPCs to comply with their reporting requirement on sharks.

### SUPPORTING INFORMATION

*(Information collated from reports of the Working Party on Ecosystems and Bycatch and other sources as cited)*

### CONSERVATION AND MANAGEMENT MEASURES

Pelagic thresher shark in the Indian Ocean are currently subject to a number of Conservation and Management Measures adopted by the Commission:

- Resolution 13/03 *on the recording of catch and effort by fishing vessels in the IOTC area of competence* sets out the minimum logbook requirements for purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres length overall and those under 24 metres if they fish outside the EEZs of their flag States within the IOTC area of competence. As per this Resolution, catch of all sharks must be recorded (retained and discarded).
- Resolution 13/06 *on a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries* prohibits, as an interim pilot measure, the retention onboard, transshipment, landing or storing any part or whole carcass of oceanic whitetip sharks (*Carcharhinus longimanus*) (and requests for all other species) by all vessels on the IOTC record of authorised vessels or authorised to fish for tuna or tuna-like species, with the exception of observers who are permitted to collect biological samples (vertebrae, tissues, reproductive tracts, stomachs) from oceanic whitetip sharks that are dead at haulback and artisanal fisheries for the purpose of local consumption, and will conduct a review and an evaluation of the interim measure in 2016.
- Resolution 12/09 *On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence* prohibits fishing vessels flying the flag of IOTC Members and Cooperating non-Contracting Parties (CPCs) from retaining on board, transshipping, landing, storing, selling or offering for sale any part or whole carcass of thresher sharks of all the species of the family Alopiidae.
- Resolution 11/04 *on a Regional Observer Scheme* requires data on shark interactions to be recorded by observers and reported to the IOTC within 150 days. The Regional Observer Scheme (ROS) started on 1<sup>st</sup> July 2010.
- Resolution 10/02 *Mandatory statistical requirements for IOTC Members and Cooperating Non-Contracting Parties (CPC's)* indicated that the provisions, applicable to tuna and tuna-like species, are applicable to shark species.
- Resolution 05/05 *Concerning the conservation of sharks caught in association with fisheries managed by IOTC* includes minimum reporting requirements for sharks, calls for full utilisation of sharks and includes a ratio of fin-to-body weight for shark fins retained onboard a vessel.

*Extracts from Resolutions 13/03, 13/06, 12/09, 11/04 and 05/05*

#### **RESOLUTION 13/03 ON THE RECORDING OF CATCH AND EFFORT BY FISHING VESSELS IN THE IOTC AREA OF COMPETENCE**

Para. 1. Each flag CPC shall ensure that all purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels flying its flag and authorized to fish species managed by IOTC be subject to a data recording system.

Para. 8 (start). The flag State and the States which receive this information shall provide all the data for any given year to the IOTC Secretariat by June 30<sup>th</sup> of the following year on an aggregated basis.

**RESOLUTION 13/06 ON A SCIENTIFIC AND MANAGEMENT FRAMEWORK ON THE CONSERVATION OF SHARK SPECIES CAUGHT IN ASSOCIATION WITH IOTC MANAGED FISHERIES**

Para. 8. CPCs, especially those targeting sharks, shall submit data for sharks, as required by IOTC data reporting procedures.

**RESOLUTION 12/09 ON THE CONSERVATION OF THRESHER SHARKS (FAMILY ALOPIIDAE) CAUGHT IN ASSOCIATION WITH FISHERIES IN THE IOTC AREA OF COMPETENCE**

Para. 2 Fishing Vessels flying the flag of an IOTC Member or Cooperating non-Contracting Party (CPCs) are prohibited from retaining on board, transshipping, landing, storing, selling or offering for sale any part or whole carcass of thresher sharks of all the species of the family Alopiidae, with the exception of paragraph 7.

Para. 3 CPCs shall require vessels flying their flag to promptly release unharmed, to the extent practicable, thresher sharks when brought along side for taking on board the vessel.

Para. 4 CPCs shall encourage their fishers to record and report incidental catches as well as live releases. These data will be then kept at the IOTC Secretariat.

**RESOLUTION 11/04 ON A REGIONAL OBSERVER SCHEME**

Para. 10. Observers shall:

b) Observe and estimate catches as far as possible with a view to identifying catch composition and monitoring discards, by-catches and size frequency

**Resolution 10/02 MANDATORY STATISTICAL REQUIREMENTS FOR IOTC MEMBERS AND COOPERATING NON-CONTRACTING PARTIES (CPC'S)**

Para. 3. The provisions, applicable to tuna and tuna-like species, shall also be applicable to the most commonly caught shark species and, where possible, to the less common shark species.

**RESOLUTION 05/05 CONCERNING THE CONSERVATION OF SHARKS CAUGHT IN ASSOCIATION WITH FISHERIES MANAGED BY IOTC**

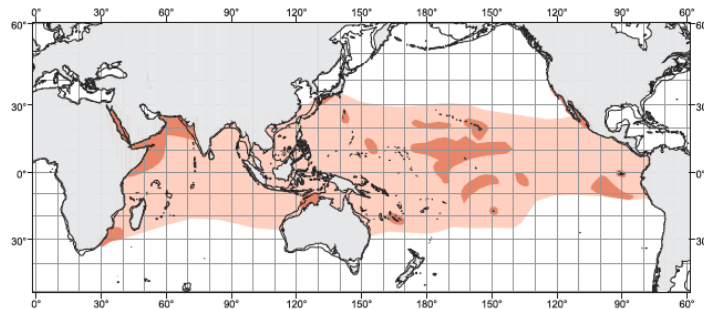
Para. 1. CPCs shall annually report data for catches of sharks, in accordance with IOTC data reporting procedures, including available historical data.

Para. 3. CPCs shall take the necessary measures to require that their fishermen fully utilise their entire catches of sharks. Full utilisation is defined as retention by the fishing vessel of all parts of the shark excepting head, guts and skins, to the point of first landing.

**FISHERIES INDICATORS**

***Pelagic thresher shark: General***

The Pelagic thresher shark (*Alopias pelagicus*) is commonly found in pelagic coastal and oceanic waters throughout the tropical Indo-Pacific (Fig. 1). This species is often confused with common thresher shark (*Alopias vulpinus*), which is a predominantly temperate species and often misidentified. In fact most tropical records of common thresher sharks in the Indo-Pacific are considered to be misidentified pelagic threshers. Due to identification issues, the actual distribution and biology of pelagic and common thresher sharks are poorly known. The pelagic thresher is thought to be highly migratory and epipelagic, found in surface waters to depths of 300 m (Compagno 2001). It aggregates around seamounts and continental slopes (Compagno 2001). There is little information on the predation of pelagic thresher sharks, however being the smallest species among thresher sharks it may well be preyed upon by bigger species such as tiger shark, makos, white sharks, and killer whales. Fishing is a major contributor to adult mortality. This species uses its long tail to attack prey (Compagno 2001, Aalbers et al. 2010). Table 3 outlines some of the key life history traits of pelagic thresher shark in the Indian Ocean.



**Fig. 1.** Pelagic thresher shark: The worldwide distribution of the pelagic thresher shark (source: FAO).

**TABLE 3.** Pelagic thresher shark: Biology of Indian Ocean pelagic thresher shark (*Alopias pelagicus*).

Parameter	Description
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Range and stock structure	In the tropical Indian Ocean, the greatest abundance of pelagic thresher shark occurs at depths of 50 to 300 m, in temperatures ranging from 8 to 25°C. It is considered as highly migratory species however no published information on horizontal movements of pelagic thresher shark is known for the Indian Ocean. Apparently pelagic thresher shark is a solitary fish however it is often aggregated around seamounts or over continental slopes. Area of overlap with IOTC management area = high. No information is available on stock structure.
Longevity	No ageing studies is known for the Indian Ocean, In the Pacific Ocean (China, Taiwan Province) the oldest pelagic thresher sharks reported were a 20 year old male (170 cm SL) and a 28 year old female for fish ~ 188 cm SL.
Maturity (50%)	Age: Sexual maturity is attained at 8-9 years (females), 7-8 years (males). Size: Males mature at 140-145 cm standard length (SL) 240-275 (TL) and females at 280-290 cm TL.
Reproduction	Pelagic thresher shark is an ovoviviparous species, without a placental attachment. <ul style="list-style-type: none"> <li>• Fecundity: very low (2)</li> <li>• Size at birth: 130-140 cm TL</li> <li>• Generation time: 8-10 years</li> <li>• Gestation period: &lt;12 months</li> <li>• Reproductive cycle: unknown</li> </ul> Its potential annual rate of population increase under sustainable fishing is thought to be very low and has been estimated at or 0.033
Size (length and weight)	Maximum size is around 365 cm TL. New-born pups are around 158-190 cm TL. Length-weight relationship for both sexes combined in the Indian Ocean is $TW=0.001*10^{-4}*FL^{2.15243}$

Sources: Lui et al. 1998, Compagno 2001, Reardon et al. 2004, White 2007, Dulvy et al. 2008

### ***Pelagic thresher shark: Fisheries***

Pelagic thresher shark are often targeted by some recreational, semi-industrial and artisanal fisheries and are also taken as bycatch of industrial fisheries (pelagic longline tuna and swordfish fisheries) (Table 4). The typical size of pelagic thresher caught ranges from 120-190 cm FL or 20-90 kg (Romanov pers comm). In Australia thresher sharks used to be targeted by sport fishermen. Sport fisheries for oceanic sharks are apparently not so common in other Indian Ocean countries.

There is little information on the fisheries prior to the early 1970s. Some countries still fail to collect shark data while others do collect it but fail to report to IOTC. It appears that significant catches of sharks have gone unrecorded in several countries. Furthermore, many existing catch records probably under-represent the actual catches of sharks because they do not account for discards (i.e. do not record catches of sharks for which only the fins are kept or of sharks usually discarded because of their size or condition) or they reflect dressed weights instead of live weights. FAO also compiles landings data on elasmobranchs, but their statistics are limited by the lack of species-specific data and data from the major fleets. Thresher sharks were marketed both locally and in European markets until at least up until early 2011 despite IOTC Resolution 12/09. The practice of shark finning is considered to be regularly occurring and on the increase for this species (Clarke et al. 2006, Clarke 2008). The bycatch/release mortality rate is unknown but probably high. In longline fisheries pelagic thresher sharks are often hooked by the tail (Compagno 2001) and die soon afterward. Therefore they are usually discarded dead if not retained. In most cases discarded sharks are not recorded in fisheries logbooks. Therefore the current IOTC measures (notably Resolution 12/09) appear to have limited conservation effect while contributing to further loss of fisheries data. Other types of conservation efforts such as protected areas should be considered for this species group by the WPEB, taking into account a detailed analysis of catch distribution and 'hotspots' of abundance derived from research data. The common confusion between the common and pelagic thresher sharks creates difficulties for data enumerators and means there is a high degree of uncertainty associated with the species-specific data reported.

**TABLE 4.** Pelagic thresher shark: Estimated frequency of occurrence and bycatch mortality in the Indian Ocean pelagic fisheries.

Gears	PS	LL		BB/TROL/HAND	GILL	UNCL
		SWO	TUNA			
Frequency	absent	Common		rare	unknown	unknown
Fishing Mortality	no	high	high	unknown	unknown	unknown
Post release mortality	N/A	unknown	unknown	unknown	unknown	unknown

Sources: Boggs 1992, Romanov 2002, 2008

### ***Pelagic thresher shark: Catch trends***

The catch estimates for pelagic thresher shark (Table 5) are uncertain as is their utility in terms of minimum catch estimates. Five our CPCs have reported detailed data on sharks (i.e. Australia, EU (Spain, Portugal and United Kingdom), I.R. Iran. South Africa, and Sri Lanka) while thirteen CPCs have reported partial data or data aggregated

for all species (i.e. Belize, China, Indonesia, Japan, Rep. of Korea, Malaysia, Mozambique, Oman, Philippines, Seychelles, Mauritius, UK-territories, Vanuatu).

**TABLE 5.** Pelagic thresher shark: Catch estimates for pelagic thresher shark in the Indian Ocean for 2011 to 2013.

Catch		2011	2012	2013
Most recent catch (reported)	pelagic thresher	17 t	328 t	0 t
	nei-sharks	53,658 t	42,793 t	46,728 t
Mean catch (reported) over the last 5 years (2009–2013)	pelagic thresher		76 t	75 t
	nei-sharks		48,708 t	49,318 t

Note that reported shark catches are incomplete. The catches of sharks are usually not reported and when they are they might not represent the total catches of this species but simply those retained on board. It is also likely that the amounts recorded refer to weights of processed specimens, not to live weights. In 2012, one country reported catches of pelagic thresher sharks in the IOTC region.

A recent project estimated possible thresher shark catches for fleets/countries based on the ratio of shark catch over target species by metier (Murua et al 2013). The estimation was done using target species nominal catch from the IOTC database and assuming that target catches have been accurately declared. The estimated catch from this study highlighted that the possible underestimation of thresher shark in the IOTC database is considerable (i.e. the estimated catch is around 70 times higher than the declared/report and contained in the IOTC database).

#### ***Pelagic thresher shark: Nominal and standardised CPUE Trends***

Data not available at the IOTC Secretariat. There are no surveys specifically designed to assess shark catch rates in the Indian Ocean. Historical research data shows overall decline both in nominal CPUE and mean weight of thresher sharks (Romanov pers com).

#### ***Pelagic thresher shark: Average weight in the catch by fisheries***

Data not available.

#### ***Pelagic thresher shark: Number of squares fished***

Catch and effort data not available.

#### **STOCK ASSESSMENT**

No quantitative stock assessment for pelagic thresher shark has been undertaken by the IOTC Working Party on Ecosystems and Bycatch.

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