

**PELAGIC THRESHER SHARK****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 15/01 *on the recording of catch and effort data 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 15/02 *Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)* indicated that the provisions, applicable to tuna and tuna-like species, are applicable to shark species.
- 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 all 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 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 15/01, 15/02, 11/04, 05/05 and 12/09*

**RESOLUTION 15/01 ON THE RECORDING OF CATCH AND EFFORT DATA 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. 10 (start). The Flag State shall provide all the data for any given year to the IOTC Secretariat by June 30th of the following year on an aggregated basis.

**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 15/02 MANDATORY STATISTICAL REPORTING REQUIREMENTS FOR IOTC CONTRACTING PARTIES AND COOPERATING NON-CONTRACTING PARTIES (CPCS)**

Para. 2. Estimates of the total catch by species and gear, if possible quarterly, that shall be submitted annually as referred in paragraph 7 (separated, whenever possible, by retained catches in live weight and by discards in live weight or numbers) for all species under the IOTC mandate as well as the most commonly caught elasmobranch species according to records of catches and incidents as established in Resolution 15/01 *on the recording of catch and effort data by fishing vessels in the IOTC area of competence* (or any subsequent superseding Resolution).

**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.

**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

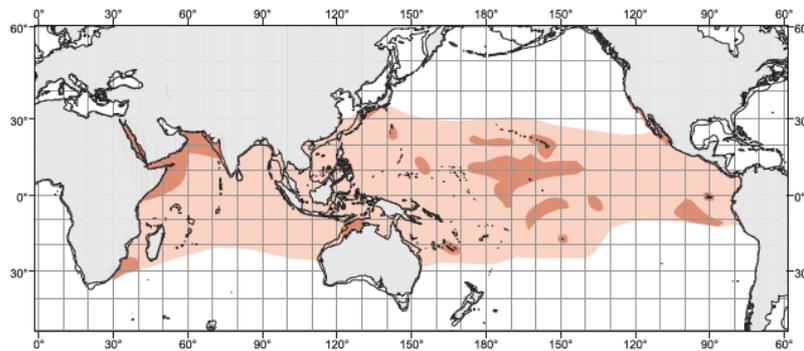
brought along side for taking on board the vessel.

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.

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

Parameter	Description
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 2**). 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, if not retained, they are usually discarded dead and in most cases discarded sharks are not recorded in fisheries logbooks. Hence the current management 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 2.** 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 3**) are uncertain as is their utility in terms of minimum catch estimates. Only two CPCs, Sri Lanka and India, have reported catches of pelagic thresher sharks in their longline and gillnet fisheries.

**TABLE 3.** Pelagic thresher shark: Catch estimates for pelagic thresher shark in the Indian Ocean for 2013 to 2015.

Catch		2013	2014	2015
Most recent catch (reported)	pelagic thresher	0 t	0 t	0 t
	nei-sharks	55,374 t	45,824 t	61,147 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.

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). This estimation was based on nominal catches of target species from the IOTC database under the assumption that target catches are declared correctly. The study highlighted that the catch data on thresher sharks in the IOTC database may be a considerable underestimate (i.e. total estimated catches were approximately 70 times higher than that declared 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.

**LITERATURE CITED**

- Aalbers SA, Bernal D, Sepulveda CA (2010) The functional role of the caudal fin in the feeding ecology of the common thresher shark *Alopias vulpinus*. *J Fish Biol* 76, 1863-1868
- Boggs CH (1992) Depth, capture time and hooked longevity of longline-caught pelagic fish: timing bites of fish with chips. *Fish Bull* 90:642-658
- Clarke S (2008) Use of shark fin trade data to estimate historic total shark removals in the Atlantic Ocean. *Aquat Living Res* 21:373-381
- Clarke SC, McAllister MK, Milner-Gulland EJ, Kirkwood GP, Michielsens CGJ, Agnew DJ, Pikitch EK, Nakano H, Shivji MS (2006) Global estimates of shark catches using trade records from commercial markets. *Ecol Lett* 9:1115-1126
- Compagno LJV (2001) Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Volume 2. Bullhead, mackerel and carpet sharks (Heterodontiformes, Lamniformes and Orectolobiformes). *FAO Species Catalogue for Fishery Purposes*. No 1. Vol. 2. FAO, Rome (Italy). 269 p
- Dulvy NK, Baum JK, Clarke S, Compagno LJV, Cortes E, Domingo A, Fordham S, Fowler S, Francis MP, Gibson C, Martinez J, Musick JA, Soldo A, Stevens JD, Valentih S, 2008. You can swim but you can't hide: the global status and conservation of oceanic pelagic sharks and rays. *Aquatic Conservation: Mar FreshwEcosys* 18, 459-482
- IUCN (2007) IUCN Species Survival Commission's Shark Specialist Group. Review of Chondrichthyan Fishes
- Liu K-M, Chen C-T, Liao T-H, Joung S-J (1999) Age, growth, and reproduction of the pelagic thresher shark, *Alopias pelagicus* in the Northwestern Pacific. *Copeia* 1999, 68-74
- Murua H, Coelho, R., Santos, M.N., Arrizabalaga, H., Yokawa, K., Romanov, E., Zhu, J.F., Kim, Z.G., Back, P., Chavance, P., Delgado de Molina and Ruiz, J. (2012). Preliminary Ecological Risk Assessment (ERA) for shark species caught in fisheries managed by the Indian Ocean Tuna Commission (IOTC). IOTC-2012-SC15-INF10 Rev\_1
- Murua H, Santos MN, Chavance P, Amande J, Seret B, Poisson F, Ariz J, Abascal FJ, Bach P, Coelho R, Korta M (2013) EU project for the provision of scientific advice for the purpose of the implementation of the EUPOA sharks: a brief overview of the results for Indian Ocean. IOTC-2013-WPEB09-19
- Reardon M, Márquez F, Trejo T, Clarke SC (2009) *Alopias pelagicus*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Downloaded on 15 September 2013.
- Romanov EV (2002) Bycatch in the tuna purse-seine fisheries of the western Indian Ocean. *Fish Bull* 100:90-105
- Romanov EV (2008) Bycatch and discards in the Soviet purse seine tuna fisheries on FAD-associated schools in the north equatorial area of the Western Indian Ocean. *Western Indian Ocean J Mar Sci* 7:163-174
- Romanov E, Bach P, Romanova N (2008) Preliminary estimates of bycatches in the western equatorial Indian Ocean in the traditional multifilament longline gears (1961-1989) IOTC Working Party on Ecosystems and Bycatch (WPEB) Bangkok, Thailand. 20-22 October, 2008. 18 p.