

## STATUS OF THE INDIAN OCEAN PELAGIC THRESHER SHARK (*ALOPIAS PELAGICUS*) RESOURCE

**TABLE 1.** Status of pelagic thresher shark (*Alopias pelagicus*) in the Indian Ocean – IUCN threat status.

Common name	Scientific name	IUCN threat status		
		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, 2011)

### INDIAN OCEAN STOCK – MANAGEMENT ADVICE

The WPEB **RECOMMENDED** the following management advice for pelagic thresher shark in the Indian Ocean, for the consideration of the Scientific Committee, noting that 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.

**Stock status.** The current IUCN threat status of ‘Vulnerable’ applies to pelagic thresher shark globally (Table 1). There is a paucity of information available on this species and this situation is not expected to improve in the short to medium term. 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 highly uncertain. Pelagic thresher sharks are commonly taken by a range of fisheries in the Indian Ocean. Because of 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.

**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 are apparently ineffective for species conservation. Maintaining or increasing effort will probably result in further declines in biomass, productivity and CPUE. However there are few data to estimated 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 Scientific Committee considered the following:

- The available evidence indicates considerable risk to the status of the IO stock at current effort levels.
- Two important sources of data that inform the assessment, total catches and CPUE are highly uncertain and should be investigated further as a priority.
- Noting that current catches (probably largely underestimated) are estimated at 2 t in 2010, maintaining or increasing effort will probably result in further declines in biomass, productivity and CPUE.
- The SC recommended that mechanisms are developed by the Commission to encourage CPCs to comply with their reporting requirement on sharks.
- The SC agreed three options should be considered for amendment of Resolution 08/04 concerning the recording of the catch by longline fishing vessels in the IOTC area in order to improve data collection and statistics on sharks that would allow the development of stock status indicators.
- The SC recommended that the Resolution 10/12 *on the conservation of thresher sharks (Family Alopiidae) caught in association with fisheries in the IOTC area of competence* is clarified in order for observers to be allowed to collect biological samples (vertebrae, tissues, reproductive tracts, stomachs) from sharks that are dead at haulback, whose retention is prohibited by the current Resolution.

**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 is currently subject to a number of conservation and management measures adopted by the Commission:

- 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 (although for thresher sharks this has been largely superseded by Resolution 10/12).
- Resolution 08/04 *Concerning the recording of catch by longline fishing vessels in the IOTC area* sets out the minimum logbook requirements for longline fishing vessels over 24 metres length and under 24 metres if they fish outside the EEZ of their flag State. As per this resolution, catch of all sharks (retained and discarded) must be recorded.
- Resolution 10/03 *Concerning the recording of catch by fishing vessels in the IOTC area* sets out minimum logbook requirements for all purse-seine vessels 24 metres length overall or greater and those under 24 metres if they fish outside the EEZs of their flag States. As per this resolution, catch and discard of all shark species should be recorded.
- Resolution 10/12 *On the Conservation of Thresher Sharks (Family Alopiidae) caught in Association with Fisheries in the IOTC Area of Competence* prohibiting to Fishing Vessels flying the flag of IOTC Member 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 pelagic thresher 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.

*Extracts from Resolutions 09/06 and 11/04*

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

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.<sup>1</sup>

**RESOLUTION 08/04 CONCERNING THE RECORDING OF CATCH BY LONGLINE FISHING VESSELS IN THE IOTC AREA**

1. Each flag CPC shall ensure that all long line fishing vessels flying its flag and authorized to fish species managed by IOTC be subject to a data recording system. ....

**RESOLUTION 10/12 ON THE CONSERVATION OF THRESHER SHARKS (FAMILY ALOPIIDAE) CAUGHT IN ASSOCIATION WITH FISHERIES IN THE IOTC AREA OF COMPETENCE**

1. Fishing Vessels flying the flag of an IOTC Member and Cooperating non-Contracting Parties (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.
2. 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.
3. CPCs shall encourage their fishermen to record 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**

10. Observers shall:

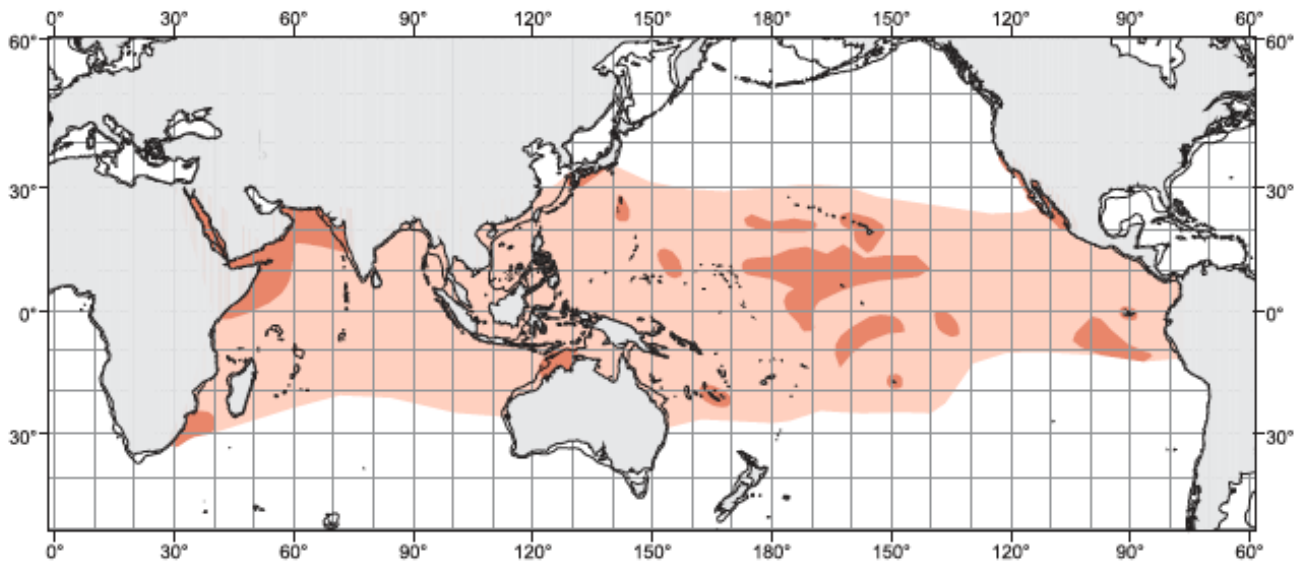
- b) Observe and estimate catches as far as possible with a view to identifying catch composition and monitoring discards, by-catches and size frequency

**FISHERIES INDICATORS***General*

Pelagic thresher shark (*Alopias pelagicus*) is a common shark in pelagic coastal and oceanic waters throughout the tropical Indo-Pacific (Fig. 1). This species is commonly confused with common thresher shark (*Alopias vulpinus*), which is mostly temperate species and often recorded under wrong name. Apparently most of tropical records of common thresher sharks in the Indo-Pacific are misidentified pelagic threshers. Due to identification confusions actual distribution and biology of pelagic and common thresher sharks are poorly known. It is probably highly migratory and is epipelagic from the surface to at least 300 m

<sup>1</sup> This is not applicable to Alopiidae in view of Resolution 10/12 *On the conservation of thresher sharks (Family Alopiidae) caught in association with fisheries in the IOTC area of competence.*

depth (Compagno 2001, Romanov, 2011 pers. comm.). It aggregates around seamounts and continental slopes (Compagno 2001). No predation on pelagic thresher sharks has been reported to date; however being smaller species among thresher sharks it may 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 used its long tail to attack prey (Compagno, 2001; Aalbers et al., 2010). Table 2 outlines some of the key life history traits of pelagic thresher shark in the Indian Ocean.



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

**TABLE 2.** 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) and females at 145-150 cm TL.
Reproduction	Pelagic thresher shark is an ovoviparous species, without a placental attachment. <ul style="list-style-type: none"> <li>• Fecundity: very low (2)</li> <li>• Generation time: 8-10 years</li> <li>• Gestation period: &lt;12 months</li> <li>• Reproductive cycle: unknown</li> </ul> <p>Its potential annual rate of population increase under sustainable fishing is thought to be very low and has been estimated at or 0.033 (Dulvy <i>et al.</i> 2008)</p>
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: Compagno (2001); Lui et al. (1998); Reardon et al. (2004); Romanov (2011) pers. comm.

### Fisheries

Pelagic thresher shark are often targeted by some recreational, semi-industrial and artisanal fisheries and are a bycatch of industrial fisheries (pelagic longline tuna and swordfish fisheries). Typically, the fisheries take pelagic thresher sharks between 120-190 cm FL or 20 to 90 kg (Romanov, 2011 pers. comm.). In Australia thresher sharks used to be a target of 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 1970's. 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 the 2010 IOTC regulation. The practice of shark finning is considered to be regularly occurring and on the increase for this species (Clarke 2008; Clarke et al. 2006). The bycatch/release mortality rate is unknown but probably high. In longline fisheries pelagic thresher sharks are often hooked by the tail (Compagno, 2001; Romanov, 2011 pers. comm.) and die soon afterward. Therefore they are discarded dead if not retained. In most cases discarded sharks are not recorded in fisheries logbooks. Therefore the current IOTC regulation measures (notably Resolution 10/12) 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. Extremely common misidentification of this species with common thresher shark aggravate situation with data collection.

**TABLE 3.** 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); Romanov (2011) pers. comm.

### Catch trends

The catch estimates for pelagic thresher shark are highly uncertain as is their utility in terms of minimum catch estimates. Four CPCs have reported detailed data on sharks (i.e. Australia, EU (Spain, Portugal and United Kingdom), South Africa, and Sri-Lanka) while nine CPCs have reported partial data or data aggregated for all species (i.e. Belize, China, Japan, Korea, Malaysia, Oman, Seychelles, Mauritius, UK-territories).

**TABLE 4.** Catch estimates for pelagic thresher shark in the Indian Ocean for 2009 and 2010.

Catch		2009	2010
Most recent catch	pelagic thresher	2 t	2 t
	nei-sharks	62,229 t	61,966
Mean catch over the last 5 years (2006–2010)	pelagic thresher	<i>No data reported prior to 2009</i>	
	nei-sharks		64,838 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 2010, none of CPCs reported catches of pelagic thresher sharks in the IOTC region.

### 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. Trends in the Indian Ocean research CPUE data series suggest that the longline vulnerable biomass has declined (Romanov, E. pers comm). Historical research data shows overall decline both in CPUE and mean weight of thresher sharks (Romanov, 2011, pers. comm.).

### Average weight in the catch by fisheries

Data not available.

### 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, S.A., Bernal, D. & Sepulveda, C.A. (2010) The functional role of the caudal fin in the feeding ecology of the common thresher shark *Alopias vulpinus*. *Journal of Fish Biology*, 76, 1863-1868.
- Boggs CH, 1992. Depth, capture time and hooked longevity of longline-caught pelagic fish: timing bites of fish with chips. *Fishery Bulletin* 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, and Shivji MS, 2006. Global estimates of shark catches using trade records from commercial markets. *Ecology Letters* 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, N.K., Baum, J.K., Clarke, S., Compagno, L.J.V., Cortes, E., Domingo, A., Fordham, S., Fowler, S., Francis, M.P., Gibson, C., Martinez, J., Musick, J.A., Soldo, A., Stevens, J.D. & Valentih, S. (2008) You can swim but you can't hide: the global status and conservation of oceanic pelagic sharks and rays. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 18, 459-482.
- IUCN, 2007. IUCN Species Survival Commission's Shark Specialist Group. Review of Chondrichthyan Fishes.
- IUCN, 2011. IUCN Red List of Threatened Species. Version 2011.1. [www.iucnredlist.org](http://www.iucnredlist.org)
- 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.
- Reardon, M., Márquez, F., Trejo, T. & Clarke, S.C. 2004. *Alopias pelagicus*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.1. <[www.iucnredlist.org](http://www.iucnredlist.org)>.
- Romanov EV, 2002. Bycatch in the tuna purse-seine fisheries of the western Indian Ocean. *Fishery Bulletin* 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 Journal of Marine Science* 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.