

STATUS OF THE INDIAN OCEAN SCALLOPED HAMMERHEAD SHARK (*SPHYRNA LEWINI*) RESOURCE

TABLE 1. Status of scalloped hammerhead shark (*Sphyrna lewini*) in the Indian Ocean – IUCN threat status.

Common name	Scientific name	IUCN threat status		
		Global status	WIO	EIO
Scalloped hammerhead	<i>Sphyrna lewini</i>	Endangered	Endangered	Least concern

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

SOURCES: IUCN (2007, 2011)

The WPEB **RECOMMENDED** the following management advice for scalloped hammerhead sharks in the Indian Ocean, for the consideration of the Scientific Committee:

INDIAN OCEAN STOCK – MANAGEMENT ADVICE

The WPEB **RECOMMENDED** the following management advice for scalloped hammerhead shark in the Indian Ocean, for the consideration of the Scientific Committee.

Stock status. The current IUCN threat status of ‘Endangered’ applies to blue sharks globally and specifically for the western Indian Ocean (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 or basic fishery indicators currently available for scalloped hammerhead shark in the Indian Ocean therefore the stock status is highly uncertain. Scalloped hammerhead sharks are commonly taken by a range of fisheries in the Indian Ocean. They are extremely vulnerable to gillnet fisheries. Furthermore, pups occupy shallow coastal nursery grounds, often heavily exploited by inshore fisheries. Because of their life history characteristics – they are relatively long lived (over 30 years), and have relatively few offspring (<31 pups each year), the scalloped hammerhead shark is vulnerable to overfishing.

Outlook. Maintaining or increasing effort will probably result in further declines in biomass and productivity. 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 certain areas in the southern and eastern Indian Ocean. It is therefore unlikely that catch and effort on scalloped hammerhead shark will decline in these areas in the near future, and may result in localised depletion.

The Scientific Committee considered the following:

- The available evidence indicates considerable risk to the stock status at current effort levels.
- The primary source of data that drive the assessment (total catches) is highly uncertain and should be investigated further as a priority.
- Noting that current reported catches (probably largely underestimated) are estimated at an average ~16 t over the last five years, ~22 t in 2010, maintaining or increasing effort will probably result in further declines in biomass and productivity.
- The SC recommended that mechanisms are developed by the Commission to encourage CPCs to comply with their reporting requirement on sharks.
- The SC agreed that 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.

SUPPORTING INFORMATION

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

CONSERVATION AND MANAGEMENT MEASURES

Scalloped hammerhead shark in the Indian Ocean are 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.
- 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 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 11/04 *on a Regional Observer Scheme* requires data on blue shark interactions to be recorded by observers and reported to the IOTC within 150 days. The Regional Observer Scheme (ROS) started on 1st 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.

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 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

Scalloped hammerhead shark (*Sphyrna lewini*) is widely distributed and common in warm temperate and tropical waters (Fig. 1). It is also found in estuarine and inshore waters. In some areas, the scalloped hammerhead shark forms large resident populations. In other areas, large schools of small-sized sharks are known to make seasonal migrations polewards. Scalloped hammerhead sharks feeds on pelagic fishes, rays and occasionally other sharks, squids, lobsters, shrimps and crabs. Table 2 outlines some of the key life history traits of scalloped hammerhead shark in the Indian Ocean.

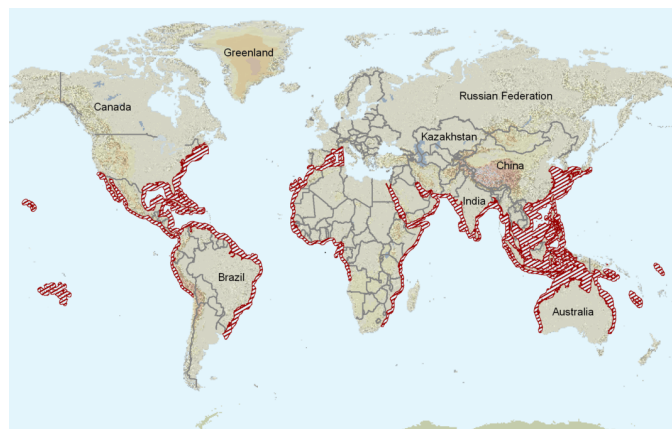


Fig. 1. The worldwide distribution of the scalloped hammerhead shark (source: www.iucnredlist.org)

TABLE 2. Biology of Indian Ocean scalloped hammerhead shark (*Sphyrna lewini*).

Parameter	Description
Range and stock structure	The scalloped hammerhead shark is widely distributed and common in warm temperate and tropical waters down to 900 m. It is also found in estuarine and inshore waters. In some areas, the scalloped hammerhead shark forms large resident populations. In other areas, large schools of small-sized sharks are known to migrate seasonally polewards. Area of overlap with IOTC management area = high. There is no information available on stock structure.
Longevity	The maximum age for Atlantic Ocean scalloped hammerheads is estimated to be over 30 years with the largest individuals reaching over 310 cm TL. In the Eastern Indian Ocean, females are reported to reach 350 m TL.
Maturity (50%)	Males in the eastern Indian Ocean mature at around 140-165 cm TL. Females mature at about 200 cm TL. In the northern Gulf of Mexico females are believed to mature at about 15 years and males at 9-10 years.
Reproduction	The scalloped hammerhead shark is viviparous with a yolk sac-placenta. Litters consist of 13-23 pups (mean=16.5). The reproductive cycle is annual and the gestation period is 9-10 months. The nursery areas are in shallow coastal waters. <ul style="list-style-type: none"> • Fecundity: medium (<31 pups) • Generation time: 17-21 years • Gestation Period: 9-10 months • Reproductive cycle is annual
Size (length and weight)	The maximum size for Atlantic Ocean scalloped hammerheads is estimated to be over 310 cm TL. In the Eastern Indian Ocean, females are reported to reach 350 m TL. New-born pups are around 45-50 cm TL at birth in the eastern Indian Ocean.

SOURCES: Stevens and Lyle (1989); Jorgensen et al (2009)

Fisheries

Scalloped hammerhead sharks are often targeted by some semi-industrial, artisanal and recreational fisheries and are a bycatch of industrial fisheries (pelagic longline tuna and swordfish fisheries and purse seine fishery). There is little information on the fisheries prior to the early 1970's, and some countries continue not to collect shark data while others do collect it but do not report it to IOTC. It appears that significant catches of sharks have gone unrecorded in several countries. Furthermore, many 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 the statistics are limited by the lack of species-specific data and data from the major fleets.

The practice of shark finning is considered to be regularly occurring and on the increase for this species (Clarke 2008; Clarke et al. 2006, Holmes et al. 2009) and the bycatch/release injury rate is unknown but probably high.

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	rare	common		absent	common	unknown
Fishing Mortality	unknown	unknown	unknown	unknown	unknown	unknown
Post release mortality	unknown	unknown	unknown	unknown	unknown	unknown

SOURCES: Romanov (2002, 2008); Dudley & Simpfendorfer (2006); Romanov et al. (2008)

Catch trends

The catch estimates for scalloped hammerhead 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 scalloped hammerhead shark* in the Indian Ocean for 2009 and 2010.

Catch		2009	2010
Most recent catch	Scalloped hammerhead shark	21 t	22 t
	nei-sharks	62,229 t	61,966 t
Mean catch over the last 5 years (2006–2010)	Scalloped hammerhead shark		16 t
	nei-sharks		64,838 t

* catches likely to be misidentified with the smooth hammerhead shark (*S. zygaena*) which is an oceanic species.

Note that the catches recorded for sharks are thought 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, seven countries reported catches of scalloped hammerhead sharks in the IOTC region.

Nominal and standardised CPUE Trends

Data not available at the IOTC Secretariat. However, Indian longline research surveys, in which scalloped hammerhead sharks contributed up to 6% of regional catch, demonstrate declining catch rates over the period 1984–2006 (John and Varghese 2009). CPUE in South African protective net shows steady decline from 1978.

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 blue shark has been undertaken by the IOTC Working Party on Ecosystems and Bycatch.

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