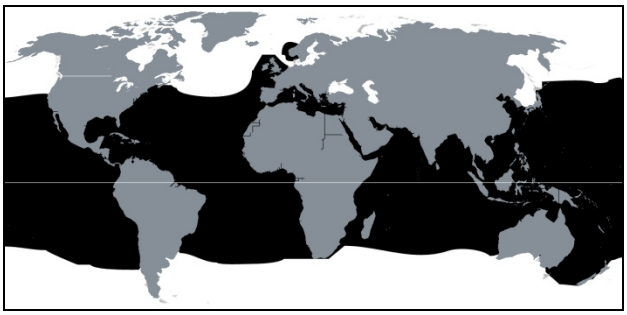
IOTC-2008-SC-R[E]

Executive summary of the status of the blue shark resource

(*as adopted by the IOTC Scientific Committee, December 2008*)

BIOLOGY

The blue shark (*Prionace glauca*) is common in pelagic oceanic waters throughout the tropical and temperate oceans worldwide. It has one of the widest ranges of all the shark species. It may also be found close inshore and in estuaries. Blue shark is most common in relatively cool waters (7 to 16°C) often close to the surface. In the tropical Indian Ocean, the greatest abundance of blue sharks occurs at depths of 80 to 220 m, in temperatures ranging from 12 to 25°C. The distribution and movements of blue shark are strongly influenced by seasonal variations in water temperature, reproductive condition, and availability of prey.



The worldwide distribution of the blue shark

The blue shark is often found in large single sex schools containing individuals of similar size. Adult blue sharks have no known predators; however, subadults and juveniles are eaten by both shortfin makos and white sharks as well as by sea lions. Fishing is likely to be a major contributor to adult mortality.

In the Atlantic Ocean, the oldest blue sharks reported were a 16 year old male and a 13 year old female. Longevity is estimated to be between 20-26 years of age and maximum size is around 3.8 m FL. Size increases when latitude decreases.

Sexual maturity is attained at 5 years of age in both sexes. Blue shark is a viviparous species, with a yolk-sac placenta. Once the eggs have been fertilised there is a gestation period of between 9 and 12 months. Litter size is quite variable, ranging from four to 135 pups and may be dependent on the size of the female. The average litter size observed from the Indian Ocean is 38. New-born pups are around 40 to 51 cm in length. Generation time is about eight years. In Indian Ocean, between latitude 2 ºN and 6 ºS, pregnant females are present for most of the year.

FISHERIES

Blue 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). The blue shark appears to have a similar distribution to swordfish. Typically, the fisheries take blue sharks between 1.8-2.4 m fork length or 30 to 52 kg. Males are slightly smaller than the females. In other Oceans, angling clubs are known for organising sharks fishing competitions where blue sharks and mako sharks are targetted. Sport fisheries for sharks are apparently not so common in the Indian Ocean.

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.

In 2005, seven countries reported catches of blue sharks in the IOTC region. These are not given in this summary because their representativeness is highly uncertain. Apparently, as other shark stocks have declined less blue sharks are being discarded.

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.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is little information on blue shark biology and no information is available on stock structure.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for blue shark are highly uncertain as is their utility in terms of minimum catch estimates.
2. **Nominal CPUE Trends:** Data not available. There are no surveys specifically designed to assess shark catch rates in the Indian Ocean. Trends in localised areas might be possible in the future (for example, from the Kenyan recreational fishery).
3. **Average weight in the catch by fisheries:** data not available.
4. **Number of squares fished:** CE data not available.

STOCK ASSESSMENT

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

MANAGEMENT ADVICE

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 blue shark in the Indian Ocean therefore the stock status is highly uncertain.

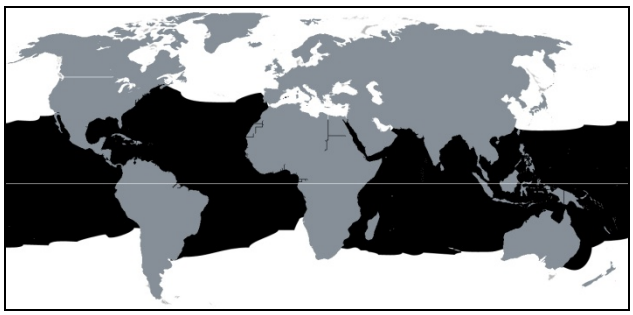
Blue sharks are commonly taken by a range of fisheries in the Indian Ocean and in some areas they are fished in their nursery grounds. Because of their life history characteristics – they are relatively long lived (16-20 years), mature at 4-6 years, and have relativity few offspring (25-50 pups every two years), the blue shark is vulnerable to overfishing.

Executive summary of the status of the silky shark resource

(*as adopted by the IOTC Scientific Committee, December 2008*)

BIOLOGY

The silky shark (*Carcharhinus falciformis*) is one of the most abundant large sharks inhabiting warm tropical and subtropical waters throughout the world.



The worldwide distribution of the silky shark

Although essentially pelagic, the silky shark is not restricted to the open ocean. It also ranges to inshore areas and near the edges of continental shelves and over deepwater reefs. Silky sharks live down to 500 m but has been caught as deep as 4000 m. Typically, smaller individuals are found in coastal waters. Small silky sharks are also commonly associated with schools of tuna.

Silky sharks often form mixed-sex schools containing similar sized individuals. Maximum age is estimated at 20+ years for males and 22+ years for females and maximum size is over 3 m long.

The age of sexual maturity is variable. In the Atlantic Ocean, off Mexico, silky sharks mature at 10-12 years. By contrast in the Pacific Ocean, males mature at around 5-6 years and females mature at around 6-7 year. The silky shark is a viviparous species with a gestation period of around 12 months. Females give birth possibly every two years. The number of pups per litter ranges from 9-14 in the western Indian Ocean, and 2-11 in the central Indian Ocean. Pups measure around 75-80 cm TL at birth and spend first their first few months in near reefs before moving to the open ocean. Generation time is estimated to be 8 years.

FISHERIES

Silky 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). Sri Lanka has had a large fishery for small sized silky shark for over 40 years.

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.

Catches of silky shark in the IOTC region are not given in this summary because their representativeness is highly uncertain.

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.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is little information available on silky shark biology and no information is available on stock structure.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for silky shark are highly uncertain as is their utility in terms of minimum catch estimates.

2. **Nominal CPUE Trends:** data not available.
3. **Average weight in the catch by fisheries:** data not available.
4. **Number of squares fished:** CE data not available.

STOCK ASSESSMENT

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

MANAGEMENT ADVICE

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 silky shark in the Indian Ocean therefore the stock status is highly uncertain. Although the Sri Lankan fishery for small sized silky shark has been sustained for over 40 years, the level of catch over this period is uncertain.

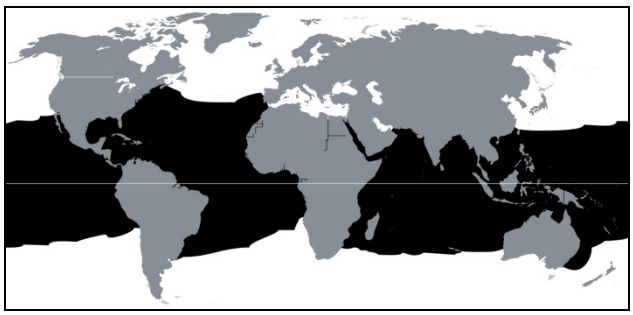
Silky sharks are commonly taken by a range of fisheries in the Indian Ocean and in some areas they are fished in their nursery grounds. Because of their life history characteristics – they are relatively long lived (over 20 years), mature at 6-12 years, and have relativity few offspring (<20 pups every two years), the silky shark is vulnerable to overfishing.

Executive summary of the status of the oceanic whitetip shark resource

(*as adopted by the IOTC Scientific Committee, December 2008*)

BIOLOGY

The oceanic whitetip shark (*Carcharhinus longimanus*) is one of the most common large sharks in warm oceanic waters. It is typically found in shallower waters near oceanic islands.



The worldwide distribution of the oceanic whitetip shark

Oceanic whitetip sharks are relatively large sharks and grow to up to 4 m. Females grow larger than males. The maximum weight reported for this species is 167.4 kg.

Both males and females mature at around 4 to 5 years old or about 1.8-1.9 m TL. Oceanic whitetip sharks are viviparous. Litter sizes range from 1-15 pups, with larger sharks producing more offspring. Each pup is approximately 60-65 cm at birth. In the south western Indian Ocean, whitetips appear to mate and give birth in the early summer, with a gestation period which lasts about one year. The reproductive cycle is believed to be biennial. The locations of the nursery grounds are not well known but they are thought to be in oceanic areas.

The population dynamics and stock structure of the oceanic whitetip shark in the Indian Ocean are not known.

FISHERIES

Oceanic whitetip 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.

Catches of oceanic whitetip sharks in the IOTC region are not given in this summary because their representativeness is highly uncertain.

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.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is little information available on oceanic whitetip shark biology and no information is available on stock structure.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for silky shark are highly uncertain as is their utility in terms of minimum catch estimates.
2. **Nominal CPUE Trends:** data not available.
3. **Average weight in the catch by fisheries:** data not available.

4. **Number of squares fished:** CE data not available.

STOCK ASSESSMENT

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

MANAGEMENT ADVICE

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 oceanic whitetip shark in the Indian Ocean therefore the stock status is highly uncertain.

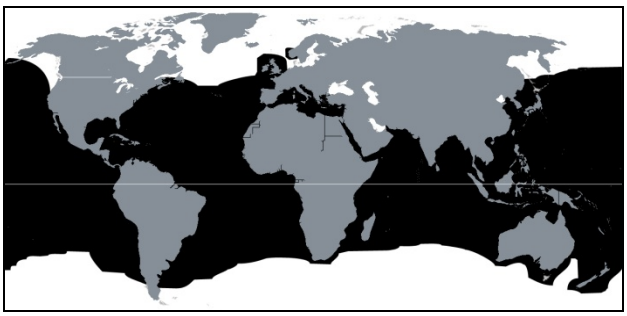
Oceanic whitetip sharks are commonly taken by a range of fisheries in the Indian Ocean. Because of their life history characteristics – they are relatively long lived, mature at 4-5 years, and have relativity few offspring (<20 pups every two years), the oceanic whitetip shark is vulnerable to overfishing.

Executive summary of the status of the shortfin mako shark resource

(*as adopted by the IOTC Scientific Committee, December 2008*)

BIOLOGY

The shortfin mako shark (*Isurus oxyrinchus*) is widely distributed in tropical and temperate waters above 16°C. Makos prefer epipelagic and littoral waters from the surface down to depths of 500 meters. Shortfin mako is not known to school. It has a tendency to follow warm water masses polewards in the summer. Tagging results from the North Atlantic Ocean showed that makos migrated over long distances and this suggests that there is a single well-mixed population in this area. No information is available on stock structure of shortfin mako in Indian Ocean



The worldwide distribution of the shortfin mako shark

The shortfin mako shark is a large and active shark and one of the fastest swimming shark species. It is known to leap out of the water when hooked and is often found in the same waters as swordfish. This species is at the top of the food chain, feeding on other sharks and fast-moving fishes such as swordfish and tunas.

The maximum age of shortfin makos in Northwest Atlantic Ocean is estimated to be over 24 years with the largest individuals reaching 4 m and 570 kg.

Sexual maturity is attained at 7 to 8 years or at around 2.7-3.0 m TL for females and 2.0-2.2 m TL for males. The length at maturity of female shortfin makos differs between the Northern and Southern hemispheres. The nursery areas are apparently in deep tropical waters. Female shortfin makos are ovoviviparous. Developing embryos feed on unfertilized eggs in the uterus during the gestation period which lasts 15-18 months. Litter size ranges from 4 to 25 pups, with larger sharks producing more offspring. Growth of the pups is very fast to reach 70 cm (TL) at birth. The length of the reproductive cycle is around three years. Generation time is estimated to be 14 years.

FISHERIES

Shortfin mako 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). In other Oceans, due to its energetic displays and edibility, the shortfin mako is considered one of the great gamefish of the world.

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.

Catches of shortfin mako sharks in the IOTC region are not given in this summary because their representativeness is highly uncertain.

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.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is little information available on shortfin mako shark biology and no information is available on stock structure.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for shortfin mako are highly uncertain as is their utility in terms of minimum catch estimates.
2. **Nominal CPUE Trends:** data not available.
3. **Average weight in the catch by fisheries:** data not available.
4. **Number of squares fished:** CE data not available.

STOCK ASSESSMENT

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

MANAGEMENT ADVICE

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 shortfin mako shark in the Indian Ocean therefore the stock status is highly uncertain.

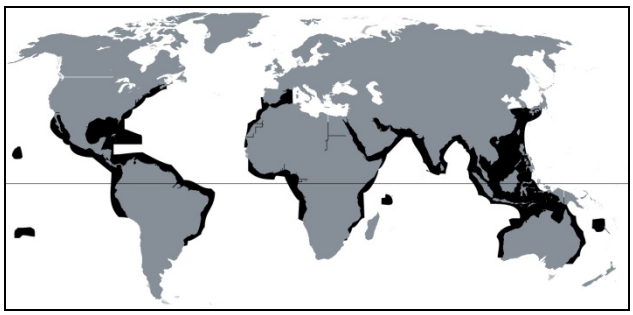
Shortfin mako sharks are commonly taken by a range of fisheries in the Indian Ocean. Because of their life history characteristics – they are relatively long lived (over 24 years), mature at 7-8 years, and have relativity few offspring (<30 pups every three years), the shortfin mako sharks is vulnerable to overfishing.

Executive summary of the status of the scalloped hammerhead shark resource

(*as adopted by the IOTC Scientific Committee, December 2008*)

BIOLOGY

The scalloped hammerhead shark (*Sphyrna lewini*) is widely distributed and common in warm temperate and tropical waters down to 275 m. It is also found in estuarine and inshore waters.



The worldwide distribution of the scalloped hammerhead shark

In some areas, the scalloped hammerhead shark forms large resident populations. In other areas, large schools of small-sized sharks are known to migrate pole wards seasonally.

Scalloped hammerhead sharks feeds on pelagic fishes, other sharks and rays, squids, lobsters, shrimps and crabs.

The maximum age for Atlantic Ocean scalloped hammerheads is estimated to be over 30 years with the largest individuals reaching over 2.4 m.

Males in the Indian Ocean mature at around 1.4-1.65 m TL. Females mature at about 2.0 m TL. The scalloped hammerhead shark is viviparous with a yolk sac-placenta. The young are around 38-45 cm TL at birth, and litters consist of 15-31 pups. The reproductive cycle is annual and the gestation period is 9-10 months. The nursery areas are in shallow coastal waters.

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.

Catches of scalloped hammerhead sharks in the IOTC region are not given in this summary because their representativeness is highly uncertain.

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.

AVAILABILITY OF INFORMATION FOR STOCK ASSESSMENT

There is little information available on scalloped hammerhead shark biology and no information is available on stock structure.

Possible fishery indicators:

1. **Trends in catches**: The catch estimates for scalloped hammerhead are highly uncertain as is their utility in terms of minimum catch estimates.
2. **Nominal CPUE Trends:** data not available.

3. **Average weight in the catch by fisheries:** data not available.
4. **Number of squares fished:** CE data not available.

STOCK ASSESSMENT

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

MANAGEMENT ADVICE

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 relativity few offspring (<31 pups each year), the scalloped hammerhead shark is vulnerable to overfishing.

Executive summary of the status of sea turtles in the Indian Ocean

(*as adopted by the IOTC Scientific Committee, December 2008*)

OVERVIEW OF THE SEA TURTLE SPECIES

Six species of sea turtles[1] inhabit the Indian Ocean and likely interact with the fisheries for tuna and tuna-like species.

Green turtle

The green turtle (*Chelonia mydas*) is the largest of all the hard-shelled sea turtles, growing up to one meter long and weighing 130-160 kg. Adult green turtles are unique among sea turtles in that they are herbivorous, feeding on seagrasses and algae. Green turtles reach sexual maturity between 20 and 50 years. Females return to their natal beaches (i.e. the same beaches where they were born) every 2 to 4 years to nest, laying several clutches of about 125 eggs at roughly 14-day intervals several times in a season. However, very few hatchlings survive to reach maturity – perhaps fewer than one in 1,000.

The green turtle is globally distributed and generally found in tropical and subtropical waters along continental coasts and islands between 30°N and 30°S. Green turtles primarily use three types of habitat: oceanic beaches (for nesting), convergence zones in the open ocean, and benthic feeding grounds in coastal areas. Adult migrate from foraging areas to mainland or island nesting beaches and may travel hundreds or thousands of kilometers each way. After emerging from the nest, hatchlings swim to offshore areas, where they are believed to live for several years, feeding close to the surface on a variety of pelagic plants and animals. Once the juveniles reach a certain age/size range, they leave the pelagic habitat and travel to nearshore foraging grounds.

The Indian Ocean hosts some of the largest nesting populations of green turtles in the world, particularly on oceanic islands in the southwest and on islands in SE Asia. Many of these populations are now recovering after intense exploitation in the last century greatly reduced the populations; some populations are still declining. The green turtle is one of the most widely distributed and commonest of the marine turtle species in the Indian Ocean.

Hawksbill turtle

The hawksbill (*Eretmochelys imbricata*) turtle is small to medium-sized compared to other sea turtle species. In the Indian Ocean, adults weigh 45 to 70 kg, but can grow to as large as 90 kg. Female hawksbills return to their natal beaches every 2-3 years to nest. A female hawksbill may lay 3-5, or more, nests in a season, which contain an average of 130 eggs.

Hawksbill turtles use different habitats at different stages of their life cycle, but are most commonly associated with coral reefs. Post-hatchlings (oceanic stage juveniles) are believed to occupy the pelagic environment. After a few years in the pelagic zone, small juveniles recruit to coastal foraging grounds. This shift in habitat also involves a shift in feeding strategies, from feeding primarily at the surface to feeding below the surface primarily on animals associated with coral reef environments.

Hawksbill turtles are circumtropical, typically occurring from 30°N to 30°S latitude. Adult hawksbill turtles are capable of migrating long distances between nesting beaches and foraging areas, which are comparable to migrations of green and loggerhead turtles.

In modern times hawksbills are solitary nesters (although some scientists postulate that before their populations were devastated they may have nested on some beaches in concentrations) and thus, determining population trends

1 The following biological information on marine turtle species found around the Indian Ocean is derived largely from the NOAA Fisheries, Office of Protected Resources, website: (http://www.nmfs.noaa.gov/pr/species/turtles/), supplemented by other sources (such as a website of the Australian Government, Department of Environment, Water, Heritage and the Arts for information on the Flatback turtle)

or estimates on nesting beaches is difficult. Decades long protection programs in some places, particularly in the Indian Ocean, have resulted in population recovery. Hawksbills – although generally not found in large concentrations, are widely distributed in the Indian Ocean. The largest populations of hawksbills in or around the Indian Ocean (which are among the largest in the world) occur in the Seychelles, Indonesia and Australia.

Leatherback turtle

The leatherback (*Dermochelys coriacea*) is the largest turtle and the largest living reptile in the world. Mature males and females can grow to 2 m and weigh almost 900 kg. Females lay clutches of approximately 100 eggs on sandy, tropical beaches. They nest several times during a nesting season.

The leatherback is the only sea turtle that lacks a hard, bony shell and adults are capable of tolerating a wide range of water temperatures. The leatherback is the most wide ranging marine turtle species, and regularly migrates enormous distances, e.g. between the Indian and south Atlantic Oceans. They are commonly found in pelagic areas, but they also forage in coastal waters. The distribution and developmental habitats of juvenile leatherbacks are poorly understood. While the leatherback is not as common in the Indian Ocean as other species, important nesting populations are found in and around the Indian Ocean, including in Indonesia, South Africa, Sri Lanka and India's Andaman and Nicobar Islands

Loggerhead turtle

The loggerhead turtle (*Caretta caretta*) may grow to one meter long and weigh around 110 kg. It reaches sexual maturity at around 35 years of age. Loggerheads are circumglobal, occurring throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans.

Loggerheads nest in relatively few countries in the Indian Ocean and the number of nesting females is generally small, except on Masirah Island (Sultanate of Oman) which supports one of only two loggerhead nesting beaches in the world that have greater than 10,000 females nesting per year. The hatchlings and juveniles are pelagic, living in the open ocean, while the adults forage in coastal areas. Studies in the Atlantic and Pacific Oceans show that loggerheads can spend decades living on the high seas, crossing from one side of an ocean basin to another.

Olive ridley

The olive ridley (*Lepidochelys olivacea*) turtle is considered the most abundant sea turtle in the world, with an estimated 800,000 nesting females annually. Adults are relatively small, weighing on average around 45 kg. Their size and morphology varies from region to region..

The olive ridley is globally distributed in the tropical regions of the South Atlantic, Pacific, and Indian Oceans. It is mainly a pelagic species, but it has been known to inhabit coastal areas, including bays and estuaries. Olive ridleys often migrate great distances between feeding and breeding grounds. They mostly breed annually and have an annual migration from pelagic foraging, to coastal breeding and nesting grounds, back to pelagic foraging. They can dive to depths of about 150 m to forage. Olive ridleys reach sexual maturity in around 15 years, a young age compared to some other sea turtle species. Females nest every year, once or twice a season, laying clutches of approximately 100 eggs.

The olive ridley has one of the most extraordinary nesting habits in the natural world. Large groups of turtles gather off shore of nesting beaches. Then, all at once, vast numbers of turtles come ashore and nest in what is known as an "arribada". During these arribadas, hundreds to thousands of females come ashore to lay their eggs. In the northern Indian Ocean, arribadas occur on three different beaches along the coast of India. Gahirmatha (Orissa, India) used to be one of the largest arribada nesting sites in the world. However, arribada nesting events have been less frequent there in recent years and the average size of nesting females has been smaller, indicative of a declining population. Declines in solitary nesting of olive ridleys have been recorded in Bangladesh, Myanmar, Malaysia, and Pakistan. In particular, the number of nests in Terengganu, Malaysia has declined from thousands of nests to just a few dozen per year. Solitary nesting also occurs extensively throughout this species' range. Despite the enormous numbers of olive ridleys that nest in Orissa, this species is not generally common throughout much of the Indian Ocean.

Flatback turtle

The flatback turtle (*Natator depressus*) nests exclusively along the northern coast of Australia. It gets its name from its relatively flat, smooth shell, unlike other marine turtles which have a high domed shell. The flatback is a medium-sized marine turtle, growing to up to one meter long and weighing up to 90 kg. It is carnivorous, feeding mostly on soft-bodied prey such as sea cucumbers, soft corals, jellyfish, molluscs and prawns.

Flatback turtles are found in northern coastal areas, from Western Australia's Kimberley region to the Torres Strait extending as far south as the Tropic of Capricorn. Feeding grounds also extend to the Indonesian Archipelago and the Papua New Guinea Coast. Although flatback turtles do occur in open seas, they are common in inshore waters and bays where they feed on the soft-bottomed seabed.

Flatbacks have the smallest migratory range of any sea turtle species, though they do make long reproductive migrations of up to 1300 km. This restricted range means that the flatback is vulnerable to habitat loss, especially breeding sites

AVAILABILITY OF INFORMATION ON THE INTERACTIONS BETWEEN SEA TURTLES AND FISHERIES FOR TUNA AND TUNA-LIKE SPECIES

IOTC and the Indian Ocean -- South-East Asian Marine Turtle Memorandum of Understanding, an agreement under the Convention on Migratory Species (IOSEA) are actively collecting a range of information on fisheries and sea turtle interactions. The IOSEA database covers information from a wider range of fisheries and gears than IOTC does.

The IOSEA Online Reporting Facility[2] compiles information through IOSEA National Reports on potential sea turtle fisheries interactions, as well as various mitigation measures put in place by its Signatory States and collaborating organisations. For example, members provide information on fishing effort and perceived impacts of fisheries that may interact with sea turtles, including longlines, purse seines, FADs, and gillnets.

While the information is incomplete for some countries and is generally descriptive rather than quantitative, it has begun to provide a general overview of potential fisheries interactions as well as their extent. No information is available for China, China,Taiwan, Japan, Republic of Korea (among others) which are not yet signatories to IOSEA Information is also provided on such mitigation measures as appropriate handling techniques, gear modifications, spatial/temporal closures etc.

IOSEA is collecting all of the above information with a view to providing a regional assessment of member States' compliance with the FAO Guidelines on reducing fisheries interactions with marine turtles.

The IOTC has implemented data collection measures to better understand the nature and extent of the interactions between fisheries for tuna and tuna-like species in the Indian Ocean and sea turtles.

IOTC members have implemented a number of national observer programmes that are providing information on the levels of sea turtle bycatch. While there have been the recent improvements in the observer data from purse seine operations, coverage of longline and artisanal fleets remains low.

Purse seine

EC observers (covering on average 5 % of the operations annually) reported 74 sea turtles were caught by French and Spanish purse seiners over the period 2003 to 2007[3]. The most common bycatch species reported are olive ridley, green and hawksbill and these were mostly caught on log sets and returned to the sea alive.

Long line

While information on most of the major longline fleets is currently not available, in the South African longline fisheries the sea turtle bycatch mainly comprises leatherback turtles, with lesser amounts of loggerheads, hawksbills and greens[4]. Estimated average catch rates of sea turtles ranged from 0.005 to 0.3 turtles per 1000 hooks and varied by location, season and year. The highest catch rate reported in one trip was 1.7 turtles per 1000 hooks in oceanic waters.

The Soviet Indian Ocean Tuna Longline Research Programme undertaken in the western Indian Ocean from 1964 to 1988 reported catching 2 sea turtles from a total of 1346 sets (around 660,00 hooks)[5].

[2] (www.ioseaturtles.org/report.php) and Dr Jack Fraizer (Smithsonian Institution)
[3] IOTC-2008-WPEB-08
[4] IOTC-2006-WPBy-15

[5] IOTC-2008-WPEB-10

Over the period 1997 to 2000, the Programme Palangre Réunionnais[6] examined sea turtle bycatch on 5,885 longline sets in the vicinity of Reunion Island (19-25° S, 48-54° E). The fishery caught 47 leatherbacks, 30 hawksbills, 16 green turtles and 25 unidentified sea turtles. This equated to a catch rate of less than 0.02 sea turtles per 1000 hooks over the 4 years.

Gillnets

Overall, the incidental captures of sea turtles by longlines and purse seine fishing is considered to be relatively minor compared to that of gillnets. While the IOTC currently has virtually no information on sea turtle-gillnet interactions, the IOSEA database indicates that the gillnet fisheries occur in about 90% of IOSEA members in the Indian Ocean, and the fishery is considered to have moderate to relatively high impact on sea turtles in about half of these IOSEA member States.

IOTC'S APPROACH TO ENHANCE THE CONSERVATION OF SEA TURTLES

The IOTC collaborates with IOSEA. With 28 Signatory States bordering the Indian Ocean and contiguous waters, the IOSEA MoU is the world's largest intergovernmental agreement focusing on the conservation of marine turtles and their habitats.

In accordance with the FAO Technical Guidelines to Reduce Sea Turtle Mortality in Fishing Operations IOTC encourages its members to implement the following range of measures to mitigate the impact of fishing operations on sea turtles:

A. In general

i) Requirements for appropriate handling, including resuscitation or prompt release of all bycaught or incidentally caught (hooked or entangled) sea turtles.

ii) Retention and use of necessary equipment for appropriate release of bycaught or incidentally caught sea turtles.

B. For purse seine fisheries

i) Avoid encirclement of sea turtles to the extent practical.

ii) Develop and implement appropriate gear specifications to minimize bycatch of sea turtles.

iii) If encircled or entangled, take all possible measures to safely release sea turtles.

iv) For fish aggregating devices (FADs) that may entangle sea turtles, take necessary measures to monitor FADs and release entangled sea turtles, and recover these FADs when not in use.

C. For longline fisheries

i) Development and implementation of appropriate combinations of hook design, type of bait, depth, gear specifications and fishing practices in order to minimize bycatch or incidental catch and mortality of sea turtles.

ii) Retention and use of necessary equipment for appropriate release of bycaught and incidentally caught sea turtles, including de-hooking, line cutting tools and scoop nets.

The Commission also encourages members to collect and voluntarily provide the Scientific Committee with all available information on interactions with sea turtles in fisheries targeting the species covered by the IOTC Agreement, including successful mitigation measures, incidental catches and other impacts on sea turtles in the IOTC Area, such as the deterioration of nesting sites and swallowing of marine debris.

In an effort to better understand the situation the IOTC has implemented data collection measures to improve the collection of scientific data regarding all sources of mortality for sea turtle populations, including but not limited to, data from fisheries within the IOTC Area to enhance the proper conservation of sea turtles

1. IOSEA has also been collecting information on progress made towards the completion of national plans of action for sea turtles. According to information available as at November 2008, six Indian Ocean IOSEA

[6] Poisson F. and Taquet M. (2001) L'espadon: de la recherche à l'exploitation durable. Programme palangre réunionnais, rapport final, 248 p. available in the website www.ifremer.fr/drvreunion

Signatory States (Australia, Comoros, Myanmar, Saudi Arabia, Seychelles, United Kingdom) already have national action plans in place while another ten (Bangladesh, Eritrea, Indonesia, Kenya, Madagascar, Pakistan, South Africa, Sri Lanka, Thailand, United Republic of Tanzania) are working towards this end.

MANAGEMENT CONCERNS

The IOTC notes that the World Conservation Union (IUCN) has classified the olive ridley turtle as vulnerable, the green turtle and loggerhead turtle as endangered and the hawksbill turtle and leatherback turtle as critically endangered.

While the status of sea turtles is affected by a range of factors such as degradation of nesting beaches and targeted harvesting of eggs and turtles, the level of mortality of sea turtles due to capture by gillnets and to a lesser extent purse seine fishing and longline is not known. Notwithstanding this, it is acknowledged that the impact on sea turtle populations from fishing for tuna and tuna-like species may increase if fishing pressure increases, or if the status of the sea turtle populations worsens due to other factors such as an increase in fishing pressure from other fisheries or anthropological or climatic impacts.