A Handbook on Sharks Caught in SBT Fishing Grounds

Ecologically Related Species Working Group

Commission for the Conservation of Southern Bluefin Tuna

みなみまぐろ保存委員会

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Introduction

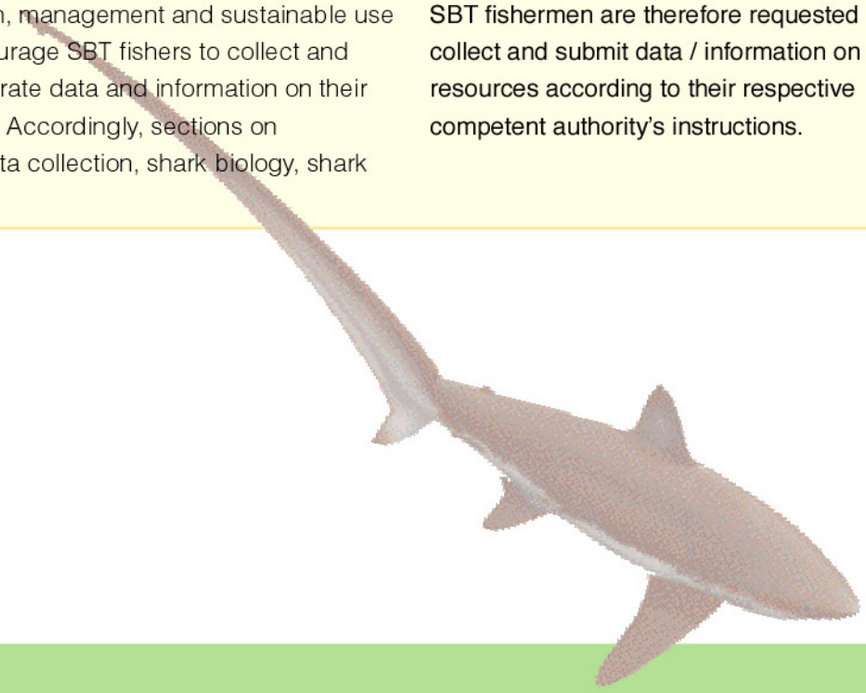
The Ecologically Related Species Working Group (ERS WG) has been established under the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) to investigate the nature and extent of the interaction of species that are ecologically linked to southern bluefin tuna (SBT) in the fishery. The ERS WG also provides information and advice on issues relating to species associated with southern bluefin tuna (SBT). This work will assist the CCSBT to achieve its objectives of the conservation and optimum utilization of SBT.

The ERS WG is carefully monitoring the trends in shark resources caught as by-catch, or secondary products in SBT fisheries. There is concern over the increase of shark catches and the consequences that this has for the populations of some shark species in several areas of the world's oceans.

The purpose of this pamphlet is to raise awareness of the issues associated with shark conservation, management and sustainable use and to encourage SBT fishers to collect and submit accurate data and information on their shark catch. Accordingly, sections on reporting/data collection, shark biology, shark resources, and shark identification have been included.

In 1998, the Food and Agriculture Organization developed an "International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks)". The objective of the IPOA-Sharks is to ensure the conservation and management of sharks and their long-term sustainable use. All members of CCSBT, who contribute to fishing mortality of shark resources, should participate in the management of shark resources consistent with the IPOA-Sharks. For the plan's objectives to be realized, the collection of relevant and consistent data, including commercial data and data leading to improved species identification and ultimately, the establishment of abundance indices is necessary. This information can then be used as the basis for the conservation, management and sustainable use of shark resources.

SBT fishermen are therefore requested to collect and submit data / information on shark resources according to their respective competent authority's instructions.



Sharks and Fisheries

Shark Resources

Historically, humans have used sharks as a food resource and, over time, entire industries have evolved from this enterprise.

Shark meat is widely used and distributed in both dried and fresh forms in many parts of the world. Other shark parts are also utilised for medicinal, decorative and cultural purposes. For example, gelatin found between vertebral joints is used as a food source, teeth are used for jewelry and skin has been used as sandpaper to work timber. Shark liver oil is known for its pharmaceutical benefits. Recently, chondroitin sulfuric acid extracted from shark cartilage has been utilised for treating ailments such as arthritis. Sharks have also become important to some diving and sport fishing operations and some species, such as the spiny dogfish are used extensively for medical dissection and scientific experiments.

Sustainable Management of Sharks in Fisheries

According to statistics released by the United Nations Food and Agriculture Organization (FAO), about one million tons of cartilaginous fishes (the group of fishes to which sharks belong) are used as fishery resources throughout the world. Sharks are often caught by longline fishers targeting species such as tuna, but they are often reported as unidentified shark catch (Walker 2000).

The FAO IPOA on Sharks notes concern over the increase of shark catches and the consequence which this has for the populations of some shark species in several areas of the world's oceans. This is because sharks often have low levels of productivity, long recovery times in response to over-fishing and complex spatial structures. Consequently, the intensive harvesting of sharks has the potential to cause the depletion of stocks and to result in a slow stock recovery.

Careful and accurate monitoring of shark catch data is vital to ensure the conservation and management of sharks and their long-term sustainable use. This monitoring cannot be achieved without the assistance of the SBT fishing industry.

The guide attached to this pamphlet contains a list of shark species commonly caught in SBT fisheries to assist fishers to identify and accurately record shark catch.

Shark Tagging and Recording

A number of tagging programmes are being carried out on shark species to increase our knowledge including aspects of movements, age structure, reproduction and longevity. It is vitally important to ensure that information is recorded about the catch of any tagged sharks. In particular, please record the species and length of any tagged sharks that you catch. Also record the tag number and when and where the shark was caught. Recording additional information, such as weight, is certainly appreciated. Please provide this information to the address on the tag or to your national fisheries organization.

Biology of Sharks

Taxonomy, distribution and migration

Sharks, rays, skates and chimaeras belong to the cartilaginous fishes (Chondrichthyes) rather than the bony fishes. There are approximately 400 species of sharks and about 500 species of rays. Of these, approximately 20 species of shark and one ray are caught in tuna longline fisheries, with blue shark, shortfin mako shark, porbeagle and thresher sharks caught most frequently.

Sharks have evolved and adapted to live in a diverse range of environments including the deep sea, open oceans and coastal zones. Sharks may also occupy various depths of the water column between surface and deep water. Some species are known to migrate between coastal and oceanic environments at night and may move between the surface and depths of several hundred metres during the day. Sharks usually segregate by sex and age and some studies have shown that pelagic species, such as blue and shortfin mako sharks undertake large-scale migrations throughout their life history.

Growth and reproduction

It is difficult to generalize about how fast shark species grow, as there are wide differences between species. Although many sharks are not fast growing (unlike most bony fishes) some species of pelagic sharks exhibit fast annual rates much like tuna and billfish. Blue sharks mature at 4-6 years for males and 5-7 years for females and are thought to live for about 20 years. Shortfin mako sharks are mature at five years for males and 7-8 years for females and may live to at least 12 years.

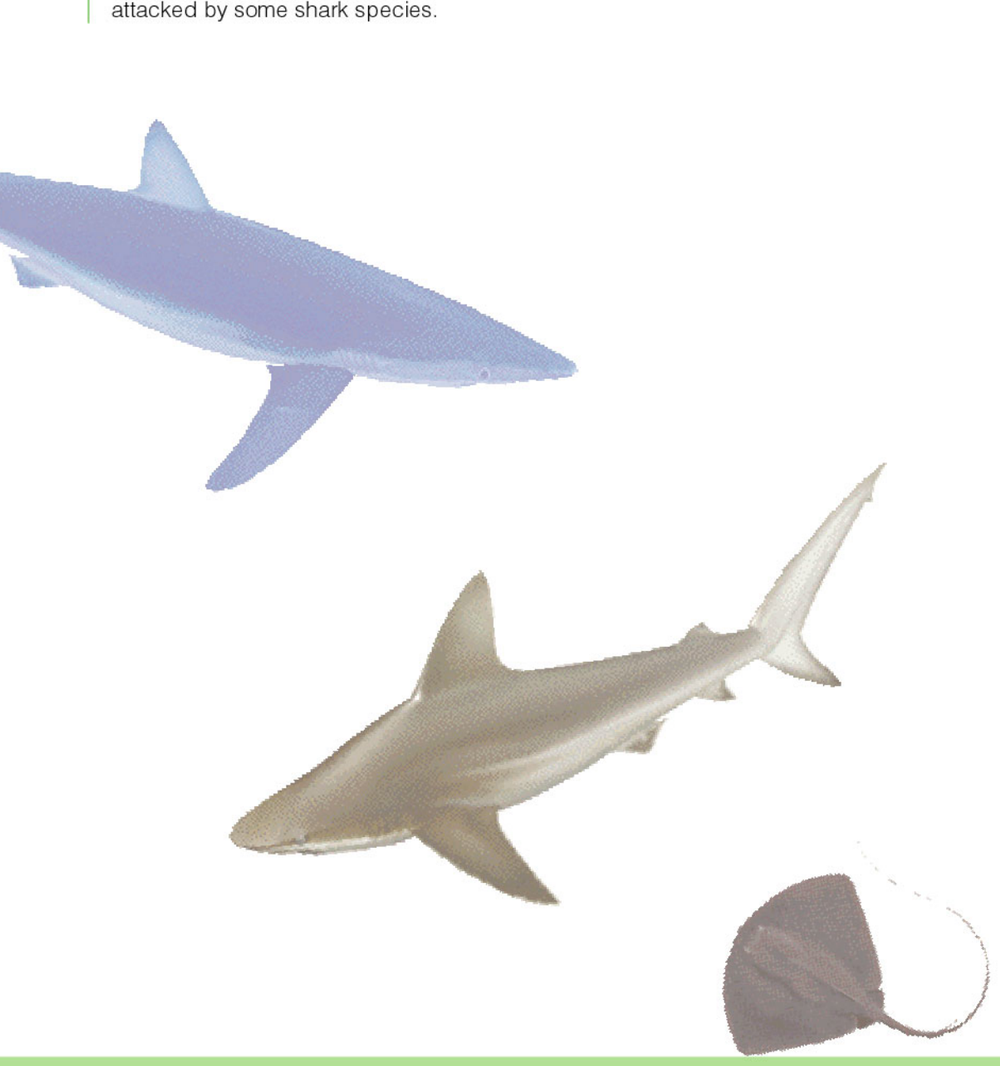
Unlike the reproduction strategy of bony fishes, many shark species give birth to a few large-sized offspring. The number of viable embryos per shark differs widely. For example, blue sharks may produce 30 embryos whereas shortfin mako, grey nurse and thresher sharks produce between 2-4 embryos. For many species, the gestation period is about one year and the reproductive cycles last 1-3 years.

In summary, shark species are often characterized as long-lived, slow growing, and produce few offspring. These features make them particularly vulnerable to the effects of overfishing as their recovery from fishing pressure will also be slow. Therefore, careful monitoring, such as the collection of catch data, is needed for the management and conservation of shark resources.

Behavior

Sharks are predatory animals and are an integral part of the marine ecosystem. For example, Salmon sharks hunt salmon and Spiny dogfish hunt herring. Sharks can also be drawn to certain fisheries and preferred prey species. For example tunas caught on hooks can be attacked by some shark species.

Sharks are known to occasionally damage human-made installations such as underwater cables, oceanographic observation equipment and fishing gear. This damage often occurs when equipment emits electromagnetic fields that attract or aggravate sharks.



A Comparative Table in Five Languages on Names of Sharks Caught in SBT Fishing Grounds

Scientific Name	ID Nos.	Japanese	English	Korean	Mandarin	Indonesian
Sphyrna lewini	1	アカシュモクザメ	Scalloped hammerhead	홍살귀상어	紅肉Y髻鮫、路氏雙髻鯊	Cucut martil, cucut capingan
Sphyrna zygaena	2	シロシュモクザメ	Smooth hammerhead	귀상어	Y髻鮫、槌頭雙髻鯊	Cucut martil
Alopias vulpinus	3	マオナガ	Thresher shark	진환도상어	狐鮫、狐形長尾鯊	Cucut tikus
Carcharhinus galapagensis	4	ガラパゴスザメ	Galapagos shark	갈라파고스상어	直翅真鯊	-
Galeocerdo cuvier	5	イタチザメ	Tiger shark	뱀상어	鼬鮫、居氏鼬鯊	Cucut omas, cucut macan
Carcharodon carcharias	6	ホホジロザメ	Great white shark	백상아리	食人鮫、噬人鯊	Cucut koboi
Carcharhinus plumbeus	7	ヤジブカ	Sandbar shark	흉상어	高鰭白眼鮫	Cucut buas karang
Carcharhinus obscurus	8	ドタブカ	Dusky shark	회색흉상어	灰色白眼鮫	Cucut lanyam
Galeorhinus galeus	9	イコクエイラクブカ	School shark	행락상어	翅鯊	-
Prionace glauca	10	ヨシキリザメ	Blue shark	청새리상어	鋸峰齒鮫、大青鯊	Cucut lalaek, cucut selendang, cucut karet
Carcharhinus longimanus	11	ヨゴレ	Oceanic whitetip shark	장완흉상어	污斑白眼鮫	Cucut koboi
Carcharhinus falciformis	12	クロトガリザメ	Silky shark	미흑점상어	平滑白眼鮫	Cucut lancam, cucut kejem
Lamna nasus	13	ニシネズミザメ	Porbeagle	비악상어	鼠鯊（大陸）	Mako
Pseudocarcharias kamoharai	14	ミズワニ	Crocodile shark	강남상어	蒲原氏擬錐齒鯊	Cucut buaya
Dasyatis violacea	15	カラスエイ	Pelagic stingray	노랑가오리류	紫魟（大陸）	Pari kembang, pari macan
Alopias superciliosus	16	ハチワレ	Bigeye thresher	큰눈환도상어	深海狐鮫、深海長尾鯊	Cucut lutung, cucut paitan
Alopias pelagicus	17	ニタリ	Pelagic thresher	환도상어	淺海狐鮫、淺海長尾鯊	Cucut monyet, cucut tikus
Isurus oxyrinchus	18	アオザメ	Shortfin mako	청상아리	灰鯖鮫、尖吻鯖鯊	Cucut anjing, cucut cakilan
Isurus paucus	19	バケアオザメ	Longfin mako	단순청상아리	長臂灰鯖鮫、波卡鯖鯊	Cucut baster, cucut monas
Scymnodalatias albicauda	20	オジロザメ	Whitetail dogfish	흰꼬리돔발상어	白尾擬鎧鯊（大陸）	Cucut karil
Zameus squamulosus	21	ビロウドザメ	Velvet dogfish	우단상어	鱗鎧鯊（大陸）	Cucut botol

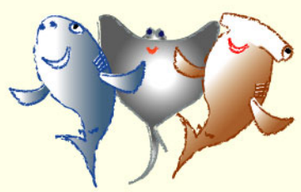
Reporting Data Collection

Please collect and submit data on sharks and other bycatch in accordance with your AFMA logbook.

Contact List (Australia)

Contacts for Sharks and Seabirds

Logbook Section
Australian Fisheries Management Authority
PO Box 7051,
Canberra Business Centre
ACT 2610 Australia

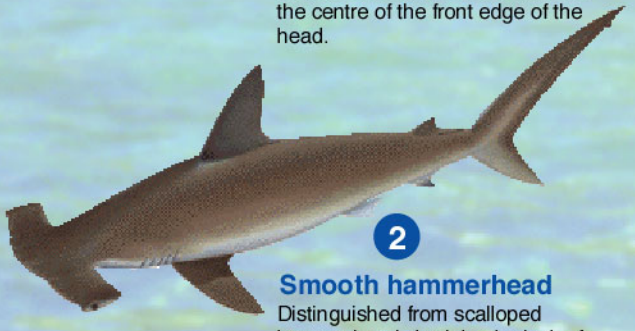


IDENTIFICATION SHEET OF SHARK SPECIES CAUGHT IN SBT FISHING GROUNDS

Coastal Sharks

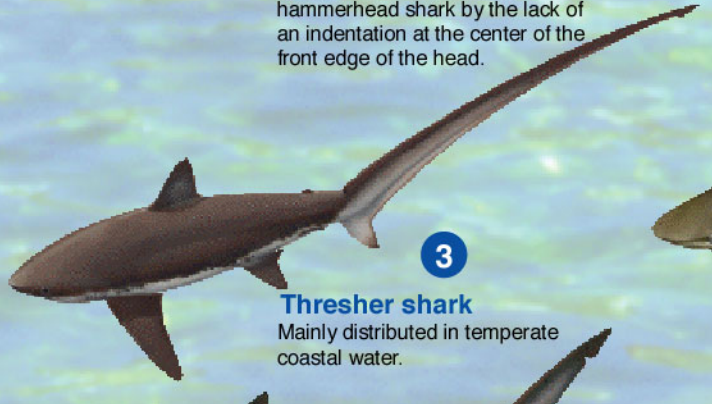
1

Scalloped hammerhead
Characterised by an indentation at the centre of the front edge of the head.



2

Smooth hammerhead
Distinguished from scalloped hammerhead shark by the lack of an indentation at the center of the front edge of the head.



3

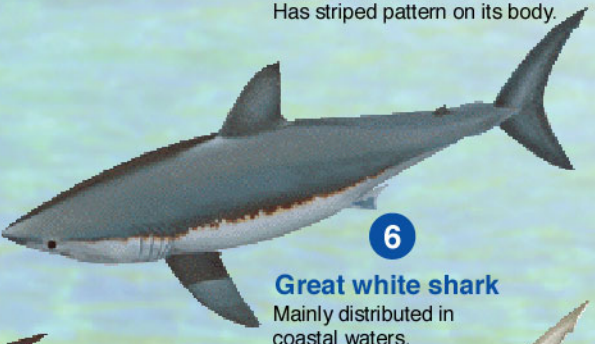
Thresher shark
Mainly distributed in temperate coastal water.

4

Galapagos shark
Mainly distributed on the coast and in the ocean around Hawaii.

5

Tiger shark
Mainly distributed on the coast. Has striped pattern on its body.



6

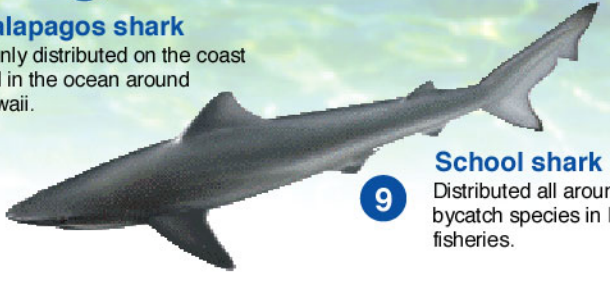
Great white shark
Mainly distributed in coastal waters.

7

Sandbar shark
Distributed in tropical SBT waters, especially the SBT spawning grounds in south-east of Java, Indonesia.

8

Dusky shark
Distributed all around Australia and often confused with Carcharhinus brachyurus (bronze whaler).



9

School shark
Distributed all around New Zealand Common bycatch species in New Zealand tuna longline fisheries.

Oceanic Sharks

10 Blue shark
Broadly distributed in the ocean and abundantly caught by longline fishery.

11 Oceanic whitetip shark
Distinguished by clear white markings at the tips of the fan shaped pectoral and dorsal fins.

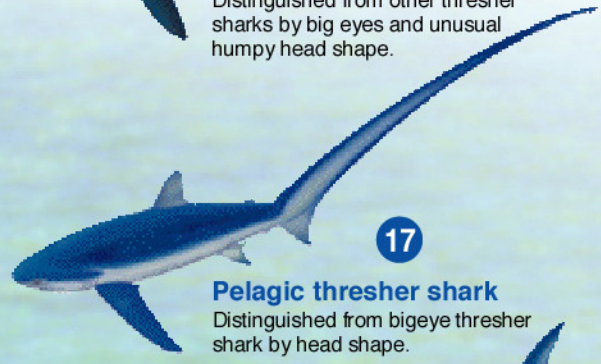
12 Silky shark
Mainly distributed in tropical waters.

13 Porbeagle
Distributed in the southern hemisphere and the North Atlantic Ocean.

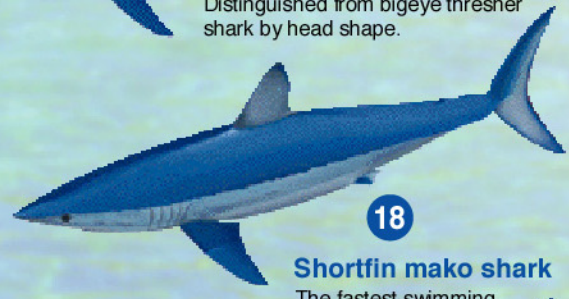
14 Crocodile shark
Distinguished by big eyes and very sharp teeth. Small-sized shark of 1m maximum body length.

15 Pelagic stingray
Has a sharp spine on the base of its tail. The only pelagic species of stingray.

16 Bigeye thresher shark
Distinguished from other thresher sharks by big eyes and unusual humpy head shape.



17 Pelagic thresher shark
Distinguished from bigeye thresher shark by head shape.



18 Shortfin mako shark
The fastest swimming shark. Its meat is consumed for food.

19 Longfin mako shark
Distinguished from shortfin mako shark by its long pectoral fins.

20 Whitetail dogfish
Distributed on the bottom of the sea in the southern hemisphere. Small-sized shark of 1m maximum body length.

21 Velvet dogfish
Distinguished from the crocodile shark by the absence of an anal fin. Small-sized shark of 80cm maximum body length.