

IDENTIFYING SHARKS FROM THEIR FINS

RIMA W. JABADO

ALEXANDRA Z.A. MORATA



© ElasmO Project 2022

Opinions, findings, conclusions or recommendations expressed in this publication are those of the authors, and do not necessarily reflect the views or policies of the ElasmO Project nor are they an official record. Links to resources outside this document are provided as a convenience and for informational purposes only and should not be construed as an endorsement or approval by the ElasmO Project of information provided through other sites and computer systems.

Citation Jabado RW and Morata AZA. 2022. Identifying sharks from their fins. ElasmO Project. Dubai, United Arab Emirates. pp. 21

Illustrations © Marc Dando, Wild Nature Press
Cover page © Cassandra Scott | Ocean Image Bank
Back cover © Jeff Hester | Ocean Image Bank

TABLE OF CONTENT

What is CITES?	4
Conference of Parties 19	5
Information in this guide	6
Primary fins traded	7
Fin shapes	8
Carcharhinidae – Requiem sharks	9
First dorsal fin	10
Pectoral fins	11
Caudal fin	12
Sphyrnidae – Hammerhead sharks	13
First dorsal fin	14
Pectoral fins	15
Caudal fin	16
Rhinobatidae – Guitarfishes	17
Dorsal fins	18
Caudal fin	19
Summary	21

READING MATERIAL

Abercrombie DL, Jabado RW. 2022. CITES Sharks and Rays - Implementing and Enforcing Listings: Volume III - Dried Product ID. Wildlife Conservation Society, New York, United States. 89 pp.

CITES. 2022. Proposals for amendment of the Appendices. Available at: <https://cites.org/eng/cop/19/amendment-proposals>

Ebert DA, Fowler S, Dando M. 2020. Sharks of the world: a fully illustrated guide. Wild Nature Press

FAO. 2016. SharkFin Guide: identifying sharks from their fins. By Marshall LJ, Barone M. Rome, Italy.

IUCN. 2022. www.iucnredlist.org. The IUCN Red List of Threatened Species. Version 2022.2.

Jabado RW. 2019. Wedgefishes and Giant Guitarfishes: a guide to species identification. Wildlife Conservation Society, New York, United States. 30 pp.

Jabado RW, Abercrombie L. 2022. CITES Sharks and Rays - Implementing and Enforcing Listings: Volume I - Full Carcass ID. Wildlife Conservation Society, New York, United States. 79 pp.

Last P, Naylor G, Seret B, White W, Stehmann M, de Carvalho M. 2016. Rays of the World. CSIRO Publishing

WHAT IS CITES?

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species. Appendices I, II, and III to the Convention are lists of species afforded different levels or types of protection from over-exploitation.

APPENDIX I

... lists species that are the most endangered among CITES-listed animals and plants. They are threatened with extinction and CITES prohibits international trade in specimens of these species except when the purpose of the import is not commercial, for instance for scientific research. In these exceptional cases, trade may take place provided it is authorized by the granting of both an import permit and an export permit (or re-export certificate).

APPENDIX II

... lists species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled. It also includes "look-alike species", i.e. species whose specimens in trade look like those of species listed for conservation reasons. International trade may be authorized by the granting of an export permit or re-export certificate. No import permit is necessary for these species under CITES (although a permit is needed in some countries that have taken stricter measures than CITES requires). Permits or certificates should only be granted if the relevant authorities are satisfied that certain conditions are met, above all that trade will not be detrimental to the survival of the species in the wild.

APPENDIX III

... is a list of species included at the request of a Party that already regulates trade in the species and that needs the cooperation of other countries to prevent unsustainable or illegal exploitation. International trade in specimens of species listed in this Appendix is allowed only on presentation of the appropriate permits or certificates.

CONFERENCE OF PARTIES 19

The Parties to CITES are collectively referred to as the Conference of the Parties (CoP). Every two to three years, the CoP meets to review the implementation of the Convention. This provides the occasion for the Parties to (1) review progress in the conservation of species included in the Appendices; (2) consider (and where appropriate adopt) proposals to amend the lists of species in Appendices I and II; (3) consider discussion documents and reports from the Parties, the permanent committees, the Secretariat and working groups; (4) recommend measures to improve the effectiveness of the Convention; and (5) make provisions (including the adoption of a budget) necessary to allow the Secretariat to function effectively.

The nineteenth meeting of the CoP (CoP19) is scheduled in Panama City, Panama, from 14 – 25 November 2022. Four proposals dealing with Appendix II listings of sharks and rays have been put forward to the CoP. These proposals all include lead species proposed on the basis of Article II paragraph 2(a) of the Convention and satisfying Criterion A and B in Annex 2a of Resolution Conf. 9.24 (Rev. CoP17). These also include “look-alike” species to be listed in Appendix II in accordance with Article II paragraph 2(b) of the Convention and satisfying Criterion A in Annex 2b of Resolution Conf. 9.24 (Rev. CoP17).

CoP19 Proposal 37

The inclusion of all species of the family Carcharhinidae in Appendix II

CoP19 Proposal 38

The inclusion of all species of the family Sphyrnidae in Appendix II

CoP19 Proposal 39

The inclusion of *Potamotrygon wallacei*, *P. leopoldi*, *P. henlei*, *P. albimaculata*, *P. jabuti*, *P. marquesi* and *P. signata* in Appendix II

CoP19 Proposal 40

The inclusion of all species of the family Rhinobatidae in Appendix II

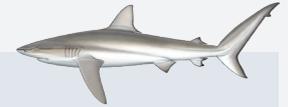
This document provides information on three of these proposals, namely the family Carcharhinidae, Sphyrnidae, and Rhinobatidae. Proposal 39 on species from family Potamotrygonidae (South American freshwater stingrays) is not covered since these species do not enter the fin trade. For those proposals covered, information presented focuses on the primary fins traded (i.e., first dorsal fin, pectoral fins, and caudal fin). Visual identification of these fins has been key in ensuring the implementation of previous shark and ray listings. In fact, capacity building of customs officials through training on visual identification of these fins has enabled the effective enforcement of trade controls. It is therefore important to ensure that any future listings can be effectively implemented by customs officials. Overall, a review of key morphological characteristics used to identify fins to the species level suggests that many fins are indistinguishable between species and that a family level listing is likely more appropriate for ease of implementation.

INFORMATION IN THIS GUIDE

This guide focuses solely on presenting the differences in the primary fins of shark and guitarfish species (first dorsal fin, pectoral fins, and caudal fin). Listings in CITES Appendix II imply that all trade in products derived from these species should be regulated. However, it is currently not possible to differentiate between the second dorsal, pelvic fins, anal fins, and meat of shark and guitarfish species. If these fins or meat are found to enter the trade, genetic techniques will need to be used to determine what species they belong to.

Information collated for this guide is based on an examination of dried fins, fresh carcasses at landing sites, or images of animals in the wild. While there are some variations in colorations between wet (i.e., animals freshly landed) and dried fins (i.e., already at point of trade), most features described in this guide remain distinguishable. Fin descriptions provided apply to adult animals. It is important to note that some fin colorations may change ontogenetically (i.e., depending on whether the animals being traded are juveniles or adults) or regionally (i.e., some colorations may vary depending on ocean basins). Venn diagrams are used to illustrate key features that allow to distinguish between species based on the shape and color of fins. Details are provided in turn for each family and then each species (except for the pectoral fins of the family Rhinobatidae since they do not enter the fin trade).

The International Union for Conservation of Nature Red List of Threatened Species™ status for each species was extracted from www.iucnredlist.org (September 2022). Species are assigned to one of eight categories: EX - Extinct, EW - Extinct in the Wild, Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD). Those assessed as CR, EN, or VU are considered threatened.



CARCHARHINIDAE

- Rapid population declines of 70% or more
- 46% of all shark fins in Hong Kong SAR and China
- 66% threatened (14% Critically Endangered, 20% Endangered, 32% Vulnerable)



SPHYRNIDAE

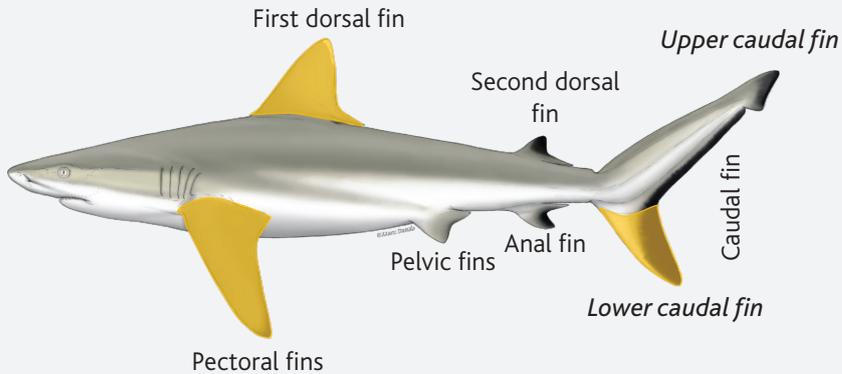
- 89% threatened (56% Critically Endangered, 22% Endangered, 11% Vulnerable)
- Only one species Data Deficient
- Small fins can be confused with fins of juveniles from currently listed species



RHINOBATIDAE

- 58% threatened (11% Critically Endangered, 11% Endangered, 37% Vulnerable)
- 'Small fins' becoming prevalent in trade
- Some species not assessed but likely threatened

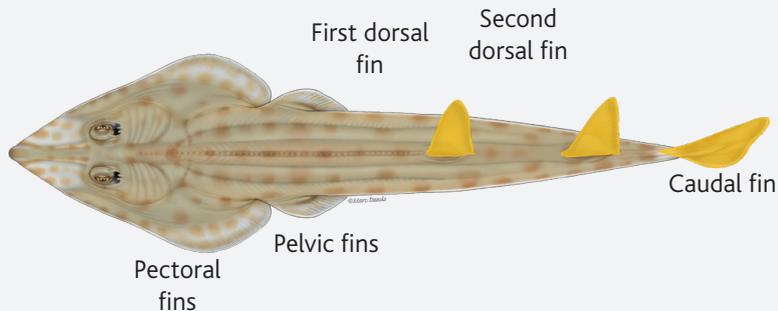
PRIMARY FINS TRADED



FAMILIES CARCHARHINIDAE AND SPHYRNIDAE

REQUIEM AND HAMMERHEAD SHARKS

All fins derived from requiem and hammerhead sharks enter the international trade. However, the primary fins traded, often in sets, are the first dorsal fin, two pectoral fins, and lower caudal fin. The remaining fins (second dorsal fin, pelvic fins, and anal fin) are less valuable and are often mixed together when transported or sold.



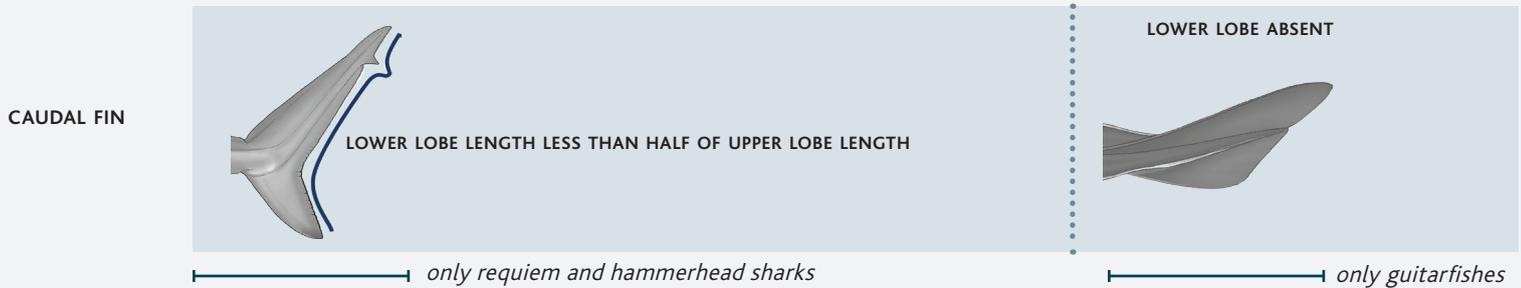
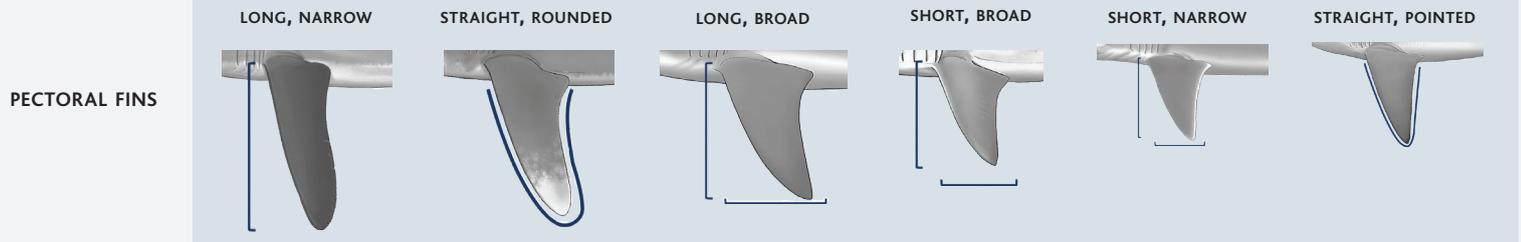
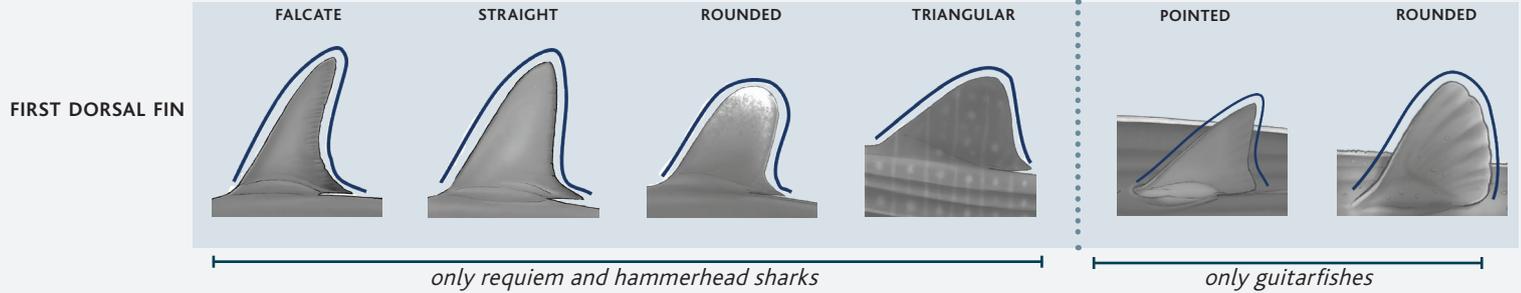
FAMILY RHINOBATIDAE

GUITARFISHES

The first and second dorsal fins are usually traded as a set with the whole caudal fin. The pectoral and pelvic fins are either consumed locally or discarded, and rarely enter the international fin trade. However, they are traded internationally as meat.

Fins shaded in yellow are considered the primary fins in international trade

FIN SHAPES



CARCHARHINIDAE

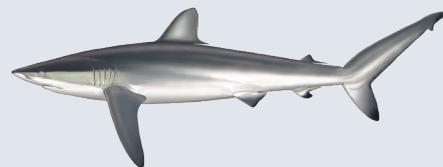
REQUIEM SHARKS

Two species are currently listed in Appendix II: Silky Shark (*Carcharhinus falciformis*) and Oceanic Whitetip Shark (*C. longimanus*).

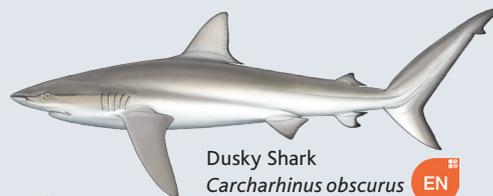
The remaining 54 species in the family are proposed for inclusion: Grey Reef Shark (*Carcharhinus amblyrhynchos*), Dusky Shark (*C. obscurus*), Smalltail Shark (*C. porosus*), Ganges Shark (*Glyphis gangeticus*), Sandbar Shark (*C. plumbeus*), Borneo Shark (*C. borneensis*), Pondicherry Shark (*C. hemiodon*), Smoothtooth Blacktip Shark (*C. leiodon*), Sharptooth Lemon Shark (*Negaprion acutidens*), Caribbean Reef Shark (*C. perezi*), Daggernose Shark (*Isogomphodon oxyrhynchus*), Night Shark (*C. signatus*), Whitenose Shark (*Nasolamia velox*), Blacknose Shark (*C. acronotus*), Whitecheek Shark (*C. dussumieri*), Lost Shark (*C. obsoletus*), Pacific Smalltail Shark (*C. cerdale*), Borneo Broadfin Shark (*Lamiopsis tephrodes*) and Broadfin Shark (*Lamiopsis temminckii*) along with all other species in the family: Genus *Carcharhinus*, Genus *Isogomphodon*, Genus *Loxodon*, Genus *Nasolamia*, Genus *Lamiopsis*, Genus *Negaprion*, Genus *Prionace*, Genus *Rhizoprionodon*, Genus *Scoliodon*, Genus *Triaenodon*.



Oceanic Whitetip Shark
Carcharhinus longimanus



Silky Shark
Carcharhinus falciformis



Dusky Shark
Carcharhinus obscurus



Pondicherry Shark
Carcharhinus hemiodon



Grey Reef Shark
Carcharhinus amblyrhynchos



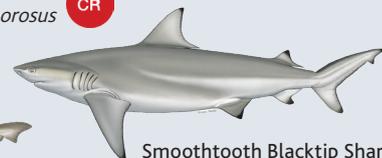
Caribbean Reef Shark
Carcharhinus perezi



Sicklefin Lemon Shark
Negaprion acutidens



Smalltail Shark
Carcharhinus porosus



Smoothtooth Blacktip Shark
Carcharhinus leiodon



Daggernose Shark
Isogomphodon oxyrhynchus

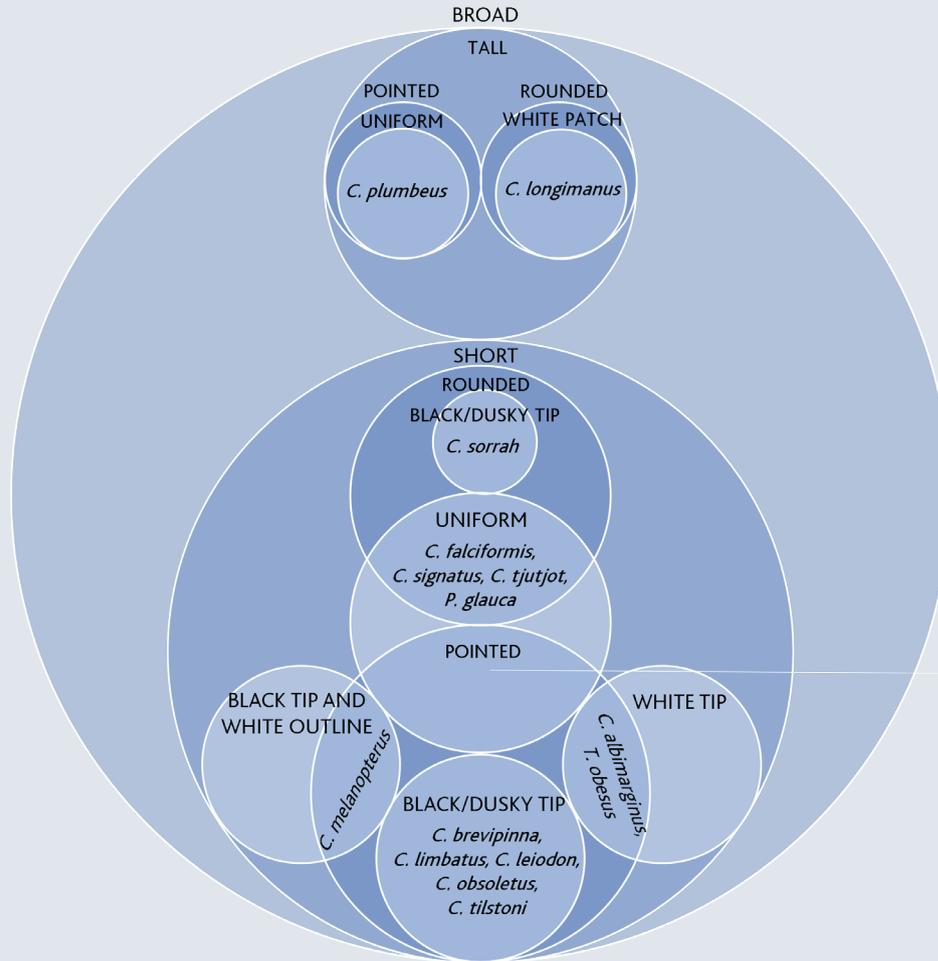


CARCHARHINIDAE

REQUIEM SHARKS

DORSAL FINS

It is not possible to distinguish between first dorsal fins derived from most requiem sharks. The large majority of dorsal fins originating from requiem sharks are uniform in color, short, and broad. Some exceptions to this include the Oceanic Whitetip Shark (*C. longimanus*), which is already listed in Appendix II and easily identifiable by its white blotched markings on the apex of the fin, or the Blacktip Reef Shark (*C. melanopterus*), with a large distinct black blotch at apex of the fin. Many of the other requiem shark species often have a black or dusky tip on their dorsal fins and fins may vary in height. While fins may be categorized into species groupings by coloration (e.g., the blacktip complex), it still is generally not visually possible to determine the species the fins might originate from. Genetic techniques are required if species level identification is required.



- C. acronotus, C. altimus,*
- C. amblyrhynchoides,*
- C. amblyrhynchos,*
- C. amboinensis, C. borneensis,*
- C. brachyurus, C. cautus,*
- C. cerdale, C. coatesi,*
- C. dussumieri, C. fitzroyensis,*
- C. galapagensis, C. humani,*
- C. hemiodon, C. isodon,*
- C. leucas, C. macloti,*
- C. obscurus, C. perezi,*
- C. porosus, C. sealei*
- G. gangeticus, G. garricki,*
- G. glyphis, I. oxyrhynchus,*
- L. macrorhinus, L. temmincki,*
- L. tephrodes, N. velox,*
- N. acutidens, N. brevirostris,*
- R. acutus, R. lalandii,*
- R. longurio, R. oligolinx,*
- R. porosus, R. taylora,*
- R. terraenovae, S. laticaudus,*
- S. macrorhynchos*

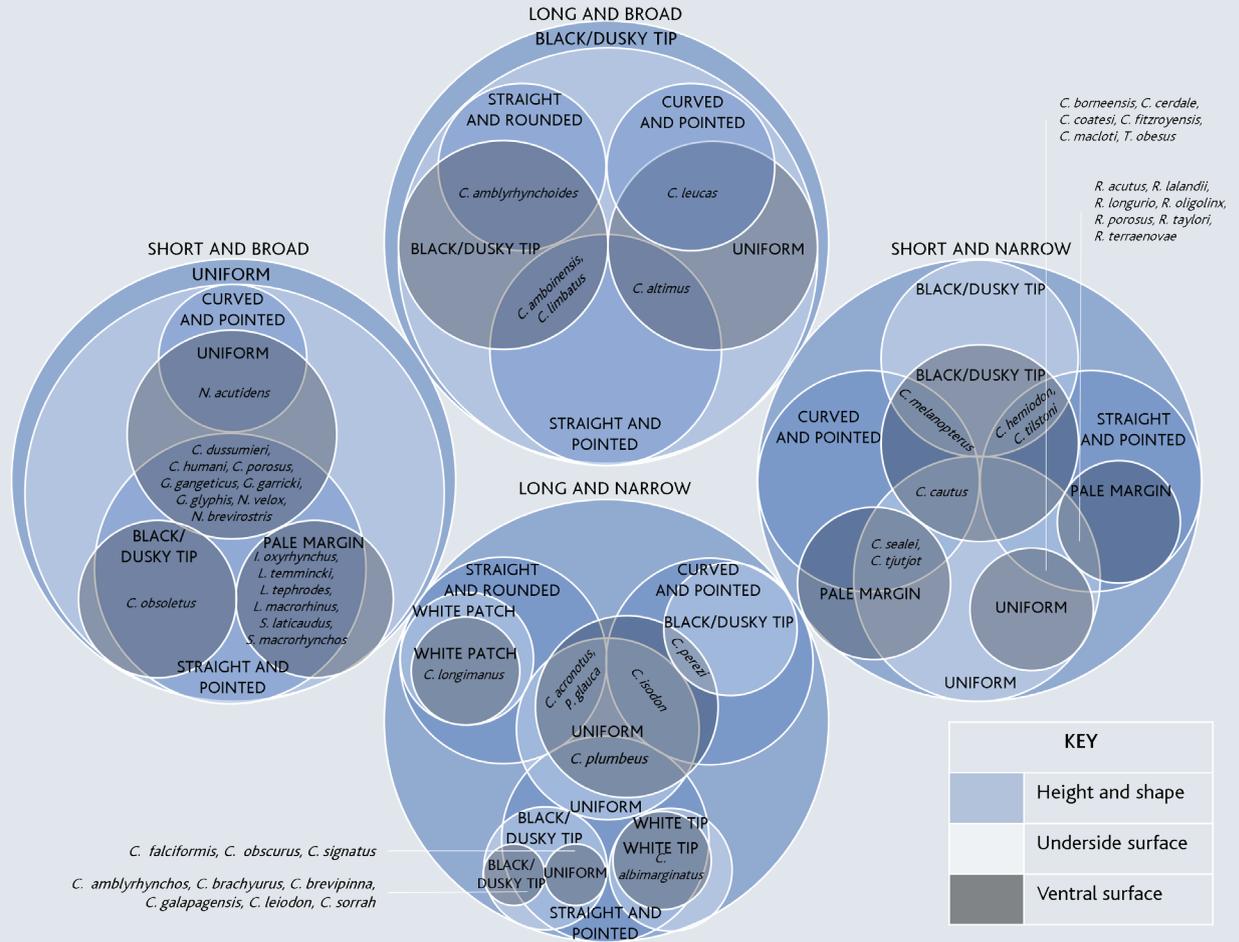
KEY	
	Height and shape
	Pattern

CARCHARHINIDAE

REQUIEM SHARKS

PECTORAL FINS

It is not possible to distinguish between pectoral fins derived from most requiem sharks. The large majority of pectoral fins can be categorized into larger groupings (short and broad or long and narrow), however, it is important to also look at the shape of the anterior margins and the coloration on the dorsal and ventral (underside) sides. These can vary depending on the size of the animals the fins originate from (i.e., adult or juveniles). Some exceptions to this include the Oceanic Whitetip Shark (*C. longimanus*), which is already listed in Appendix II. While fins may be categorized into species groupings by coloration (e.g., the blacktip complex), it still is generally not visually possible to determine the species the fins might originate from. Genetic techniques are required.



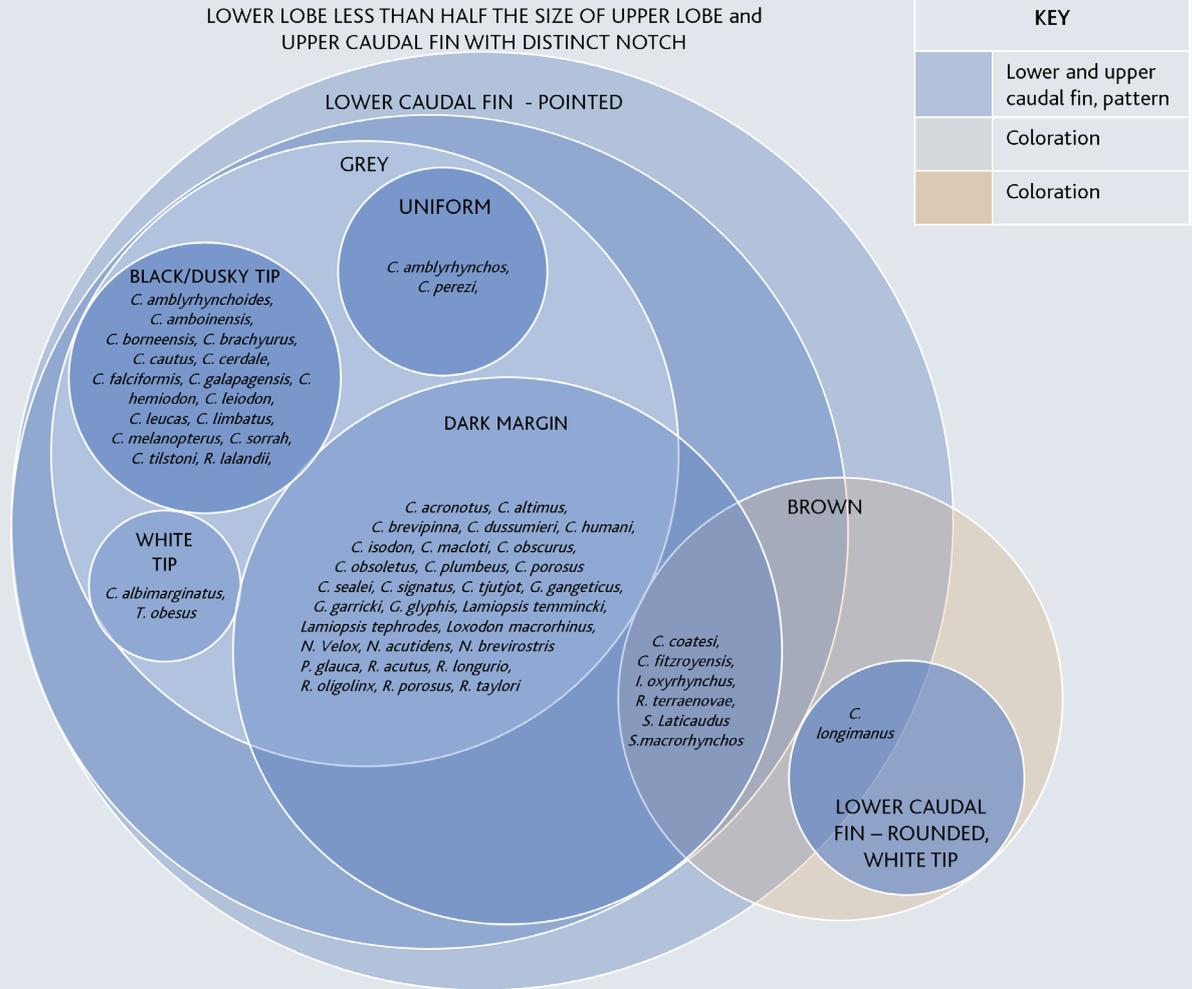
CARCHARHINIDAE

REQUIEM SHARKS

CAUDAL FIN

It is not possible to distinguish between whole caudal fins or lower caudal lobes derived from requiem sharks. One exception is the Oceanic Whitetip Shark (*C. longimanus*), which is already listed in Appendix II.

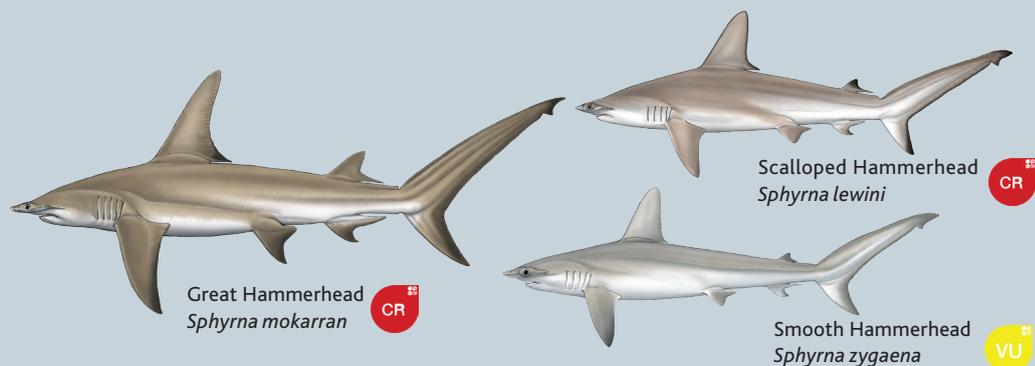
Although all requiem sharks have the length of their lower lobe less than half the length of their upper lobe and an upper lobe with a distinct notch, species may have uniform colored caudal fins, or have various markings on the lower lobe or the anterior margins of the caudal fin. While it may be possible to group species by the coloration of their caudal fins, overall, it is not possible to determine the exact species these fins might originate from. Genetic techniques are required.



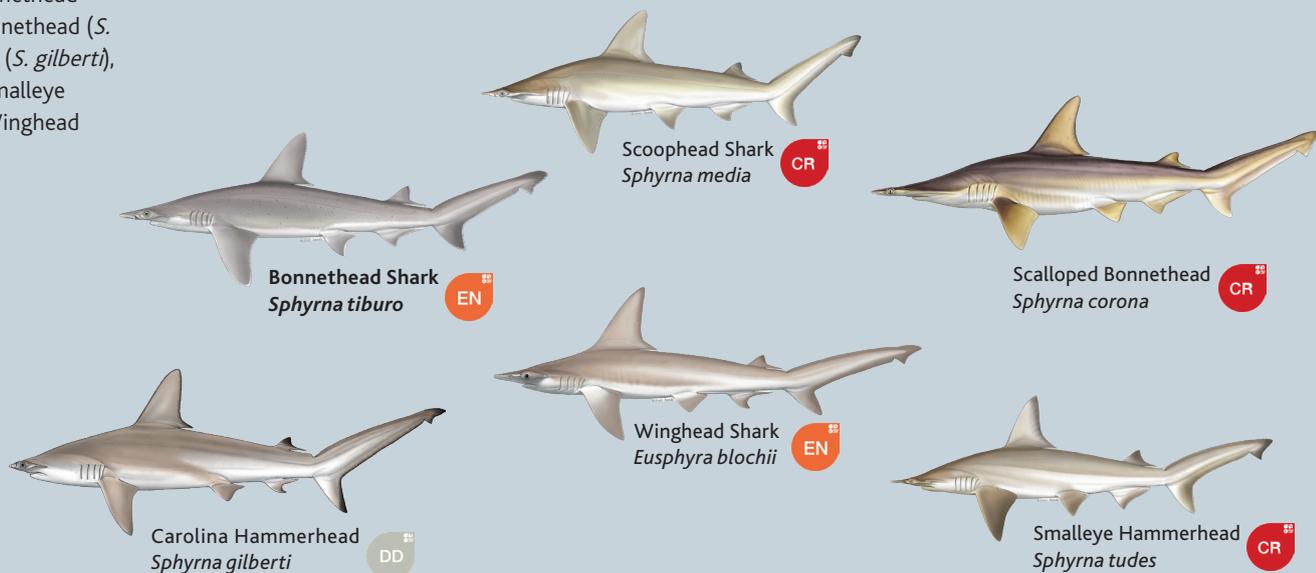
SPHYRNIDAE

HAMMERHEAD SHARKS

Three species are currently listed in Appendix II: Great Hammerhead (*Sphyrna mokarran*), Scalloped Hammerhead (*S. lewini*), and Smooth Hammerhead (*S. zygaena*).



The remaining six species in the family are proposed for inclusion: Bonnethead Shark (*S. tiburo*), Scalloped Bonnethead (*S. corona*), Carolina hammerhead (*S. gilberti*), Scoophead Shark (*S. media*), Smalleye Hammerhead (*S. tudes*), and Winghead Shark (*Eusphyra blochii*).



| Lead species proposed in **bold** |

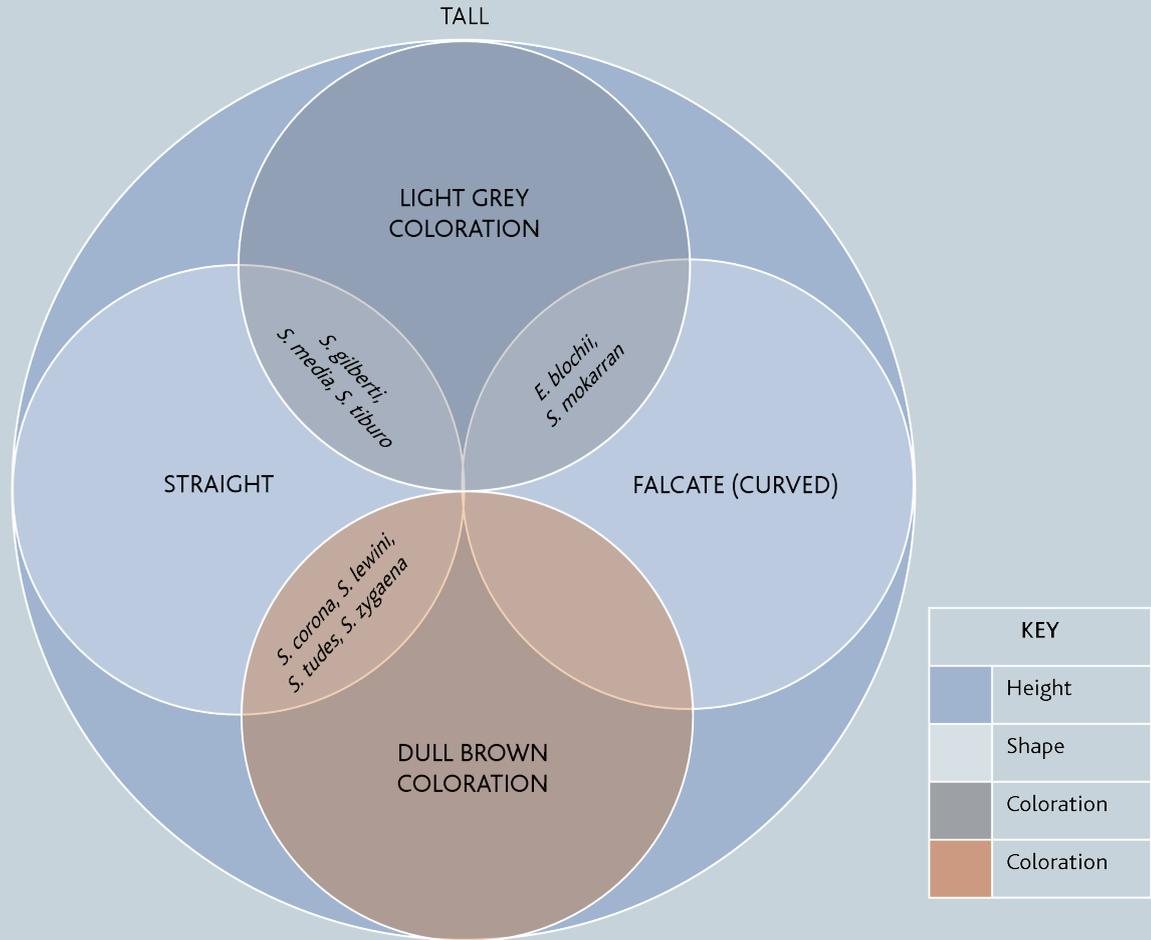
SPHYRNIDAE

HAMMERHEAD SHARKS

DORSAL FINS

All hammerhead dorsal fins are considered tall fins. Two species have tall and falcate dorsal fins, namely, the Great Hammerhead (*S. mokarran*) and the Winghead Shark (*E. blochii*). The Great Hammerhead is already listed in Appendix II. It is not possible to distinguish between the dorsal fins of these two species.

The remaining hammerhead species have tall dorsal fins with a straight anterior margin. In wet form, there might be a slight distinction in the coloration of the dorsal fins (light grey or dull brown). However, dry fins are likely to all look the same. Overall, it is not possible to distinguish between dorsal fins derived from juveniles of all these species (noting exception above). Large dorsal fins might be attributed to the Scalloped Hammerhead (*S. lewini*) or Smooth Hammerhead (*S. zygaena*) which are already listed on Appendix II. Overall, it is not possible to determine the species the fins might originate from. Genetic techniques are required.



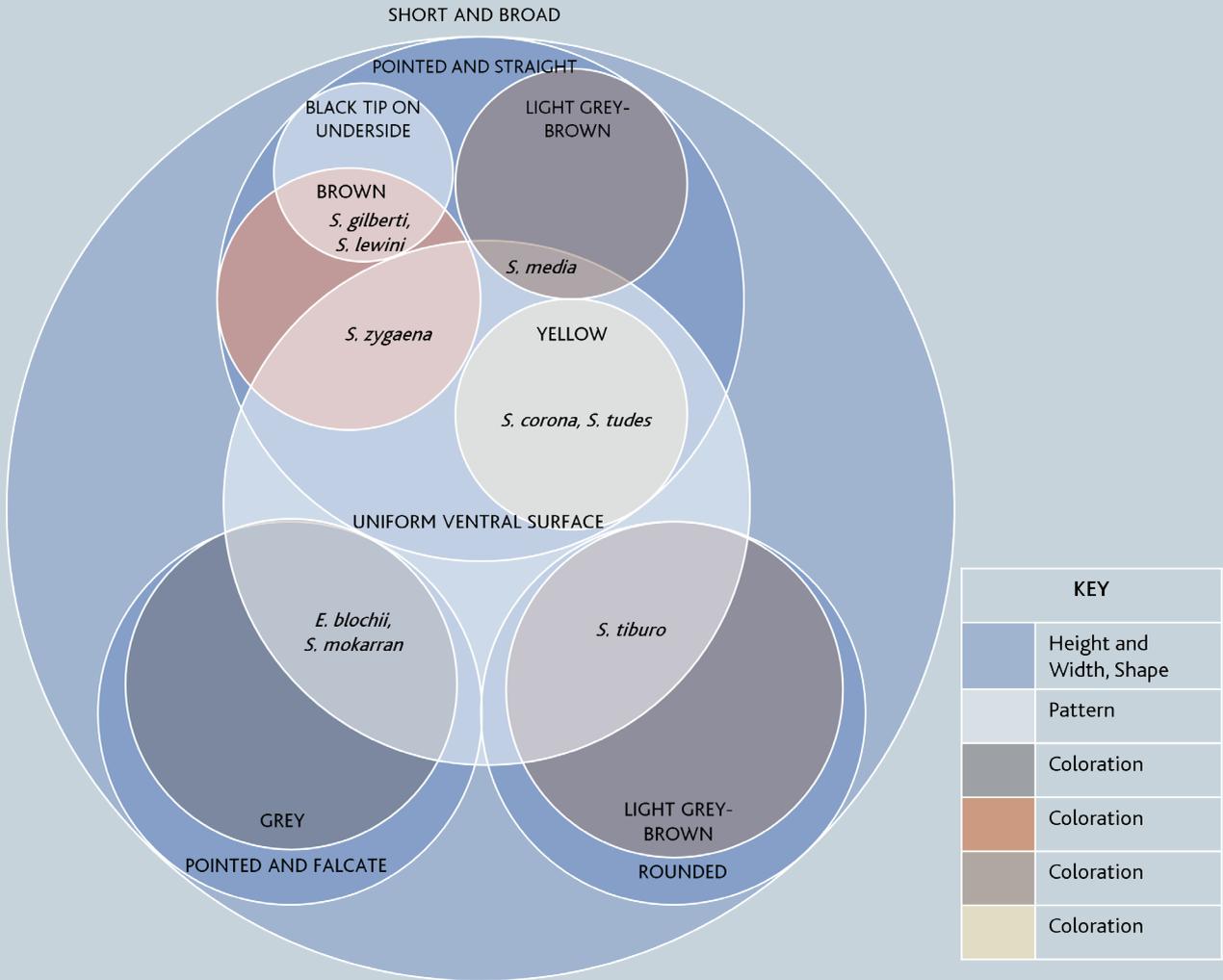
SPHYRNIDAE

HAMMERHEAD SHARKS

PECTORAL FINS

It is difficult to distinguish between most pectoral fins deriving from hammerhead sharks. In wet form, there might be a slight distinction in the coloration for some species (i.e., yellow coloration). Features related to the shape and color on the underside of the fins (i.e., black or dusky at apex) are common to several species. It is therefore not possible to determine the species the fins might originate from. Genetic techniques are required.

Note – Great Hammerhead pectoral fin size might appear large rather than short and broad due to the maximum total length this species can reach and the proportion of the fins compared to the body.



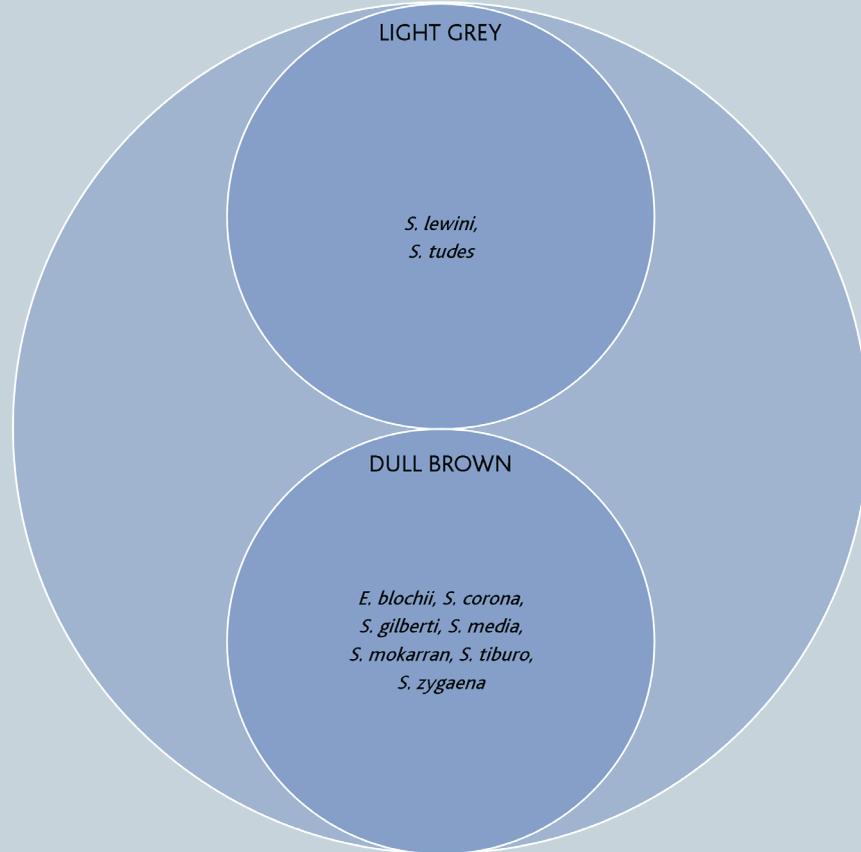
SPHYRNIDAE

HAMMERHEAD SHARKS

CAUDAL FIN

It is not possible to distinguish between whole caudal fins or lower caudal lobes derived from hammerhead sharks. In wet form, there might be a slight distinction in the coloration of the lower caudal lobe (light grey or dull brown). However, it still is not possible to determine the species the fins might originate from. Genetic techniques are required.

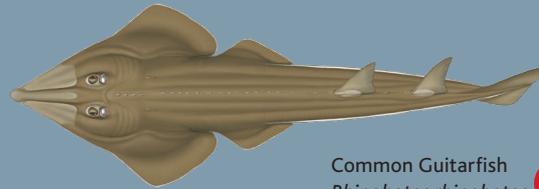
UPPER CAUDAL FIN - DISTINCT NOTCH,
LOWER CAUDAL FIN - STRAIGHT, LOWER LOBE
LESS THAN HALF THE SIZE OF UPPER LOBE



RHINOBATIDAE

GUITARFISHES

There are currently no guitarfish species of the Family Rhinobatidae listed on CITES appendices.

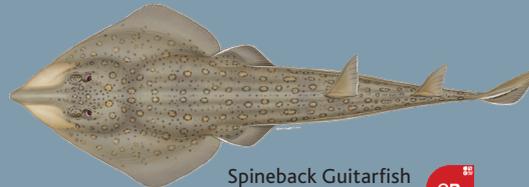


Common Guitarfish
Rhinobatos rhinobatos CR



Whitespotted Guitarfish
Rhinobatos albomaculatus CR

All 37 species in the family are proposed for inclusion: Stripenose Guitarfish (*Acroteriobatus variegatus*), Brazilian Guitarfish (*Pseudobatos horkelii*), Whitespotted Guitarfish (*Rhinobatos albomaculatus*), Spineback Guitarfish (*R. irvinei*), Common Guitarfish (*R. rhinobatos*), and Brown Guitarfish (*R. schlegelii*) along with all other species in the family.



Spineback Guitarfish
Rhinobatos irvinei CR

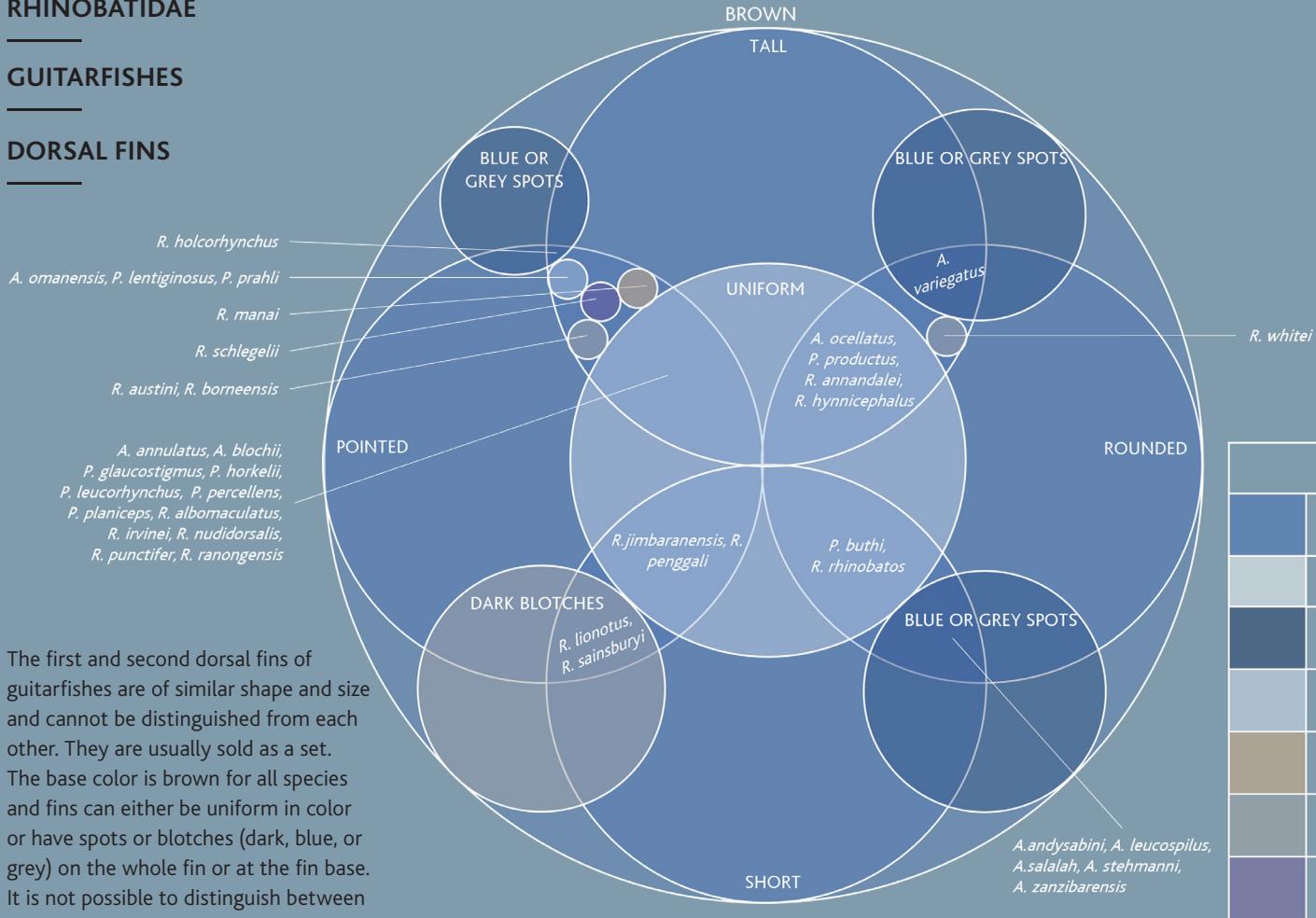


Stripnose Guitarfish
Acroteriobatus variegatus CR

RHINOBATIDAE

GUITARFISHES

DORSAL FINS



KEY	
[Dark Blue]	Coloration, height, shape
[Light Blue]	Pattern Uniform
[Medium Blue]	Pattern Blue or grey spots
[Lightest Blue]	Pattern White spots
[Brown]	Pattern Brown spots
[Grey]	Pattern Dark Blotches
[Purple]	Pattern Dark and white blotches

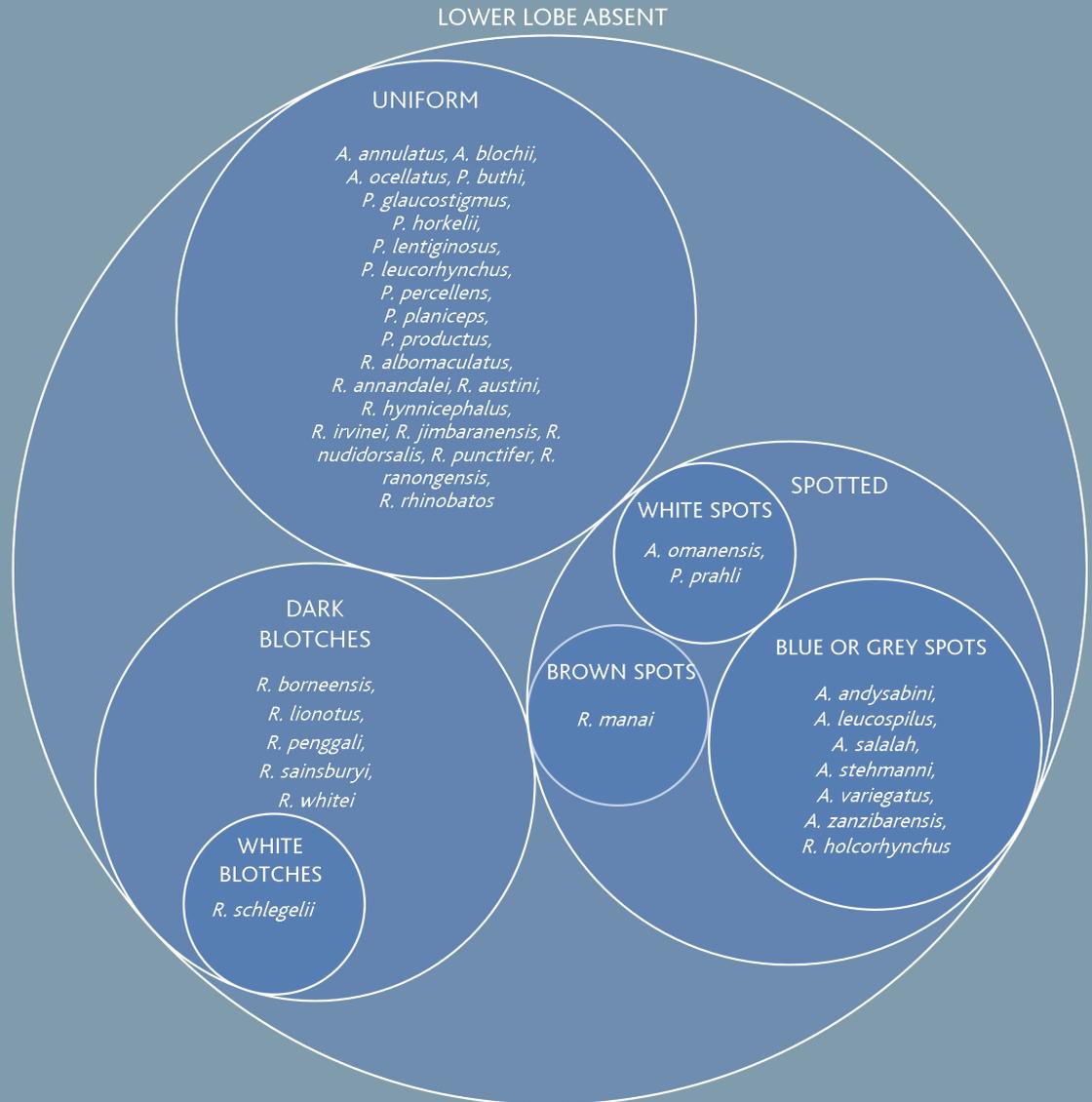
The first and second dorsal fins of guitarfishes are of similar shape and size and cannot be distinguished from each other. They are usually sold as a set. The base color is brown for all species and fins can either be uniform in color or have spots or blotches (dark, blue, or grey) on the whole fin or at the fin base. It is not possible to distinguish between whole caudal fins or lower caudal lobes derived from hammerhead sharks. It is generally not possible to determine the species the fins might originate from. Genetic techniques are required.

RHINOBATIDAE

GUITARFISHES

CAUDAL FIN

It is often difficult to distinguish between whole caudal fins derived from guitarfish species. All species lack a lower lobe, but some may have uniform colored caudal fins, or have various markings or patterns at the cross-section of the fin or on the whole fin. These markings may or may not be visible depending on how the caudal fin has been cut. If markings or patterns are visible on the caudal fin, these may be in form of dark or white blotches or variously colored spots (i.e., white, brown, or bluish grey). Overall, it is not possible to determine the exact species the fins might originate from. Genetic techniques are required.



SUMMARY

An estimated 37% of sharks, rays, and chimaeras are considered threatened with extinction. Over the last decades, the fin trade has been a major driver of shark fisheries globally and this has led to drastic population declines for many species. CITES listings have attempted to regulate the trade of some of these species because they meet CITES Appendix II criteria. The current status of many shark and ray species requires additional and immediate action. With an increasing number of species edging towards extinction, it is important to consider how trade regulations can support existing conservation measures for these species. Visual identification approaches that have been developed to support the current CITES shark and ray listings have been effective and allow to distinguish between most listed and unlisted species. With almost 100 species being considered at CoP19, it is important to evaluate how implementation of proposed listings can be effectively undertaken.

At the point of landing, all species included in Proposals 37, 38, and 40 are identifiable to the species level. Identification guides to support implementation of the proposed listings are often available at the national and regional levels and in multiple languages. This allows for species-specific management and monitoring, and the issuance of CITES permits before products enter the international trade (if supported with appropriate documentation such as non-detriment and legal acquisition findings). This in turn is likely to increase traceability and reporting at the species-level.

At the point of trade, the ability to visually identify first dorsal fins and pectoral fins (for some species) has been key to ensure effective implementation of species listings. With multiple species of requiem, hammerhead, and guitarfish species being proposed, visual identification to the species-level will become increasingly difficult and customs officials will need to rely on genetic approaches to determine the species entering the trade. As highlighted in this document, look-alike issues for the majority of these species will occur within each of the families proposed.

Finally, the trade in meat for sharks and rays has significantly increased over the last decade. Most species proposed for listing are likely to enter the international meat trade. The identification of meat (or often processed carcasses with no distinguishing features) products is needed to implement listings. However, visual identification to the species level is not possible and genetic techniques are required. This trade is an important challenge that needs to be addressed.

The information provided in this guide demonstrates the difficulty in identifying fins to the species level for all three proposals. Combined with the current status of species, family level listings of sharks and rays are likely going to be more effective from both a conservation and implementation/enforcement perspective. This family level approach has also been adopted for other species such as seahorses and orchids and has encouraged the development of traceability mechanisms. Since the majority of fins of the newly proposed species cannot be distinguished from each other without genetic tools, a family listing would allow customs officials to implement new listings and support with regulating international trade.



ELASMOPROJECT