



SHARK NEWS

Newsletter
of the IUCN SSC Shark
Specialist Group
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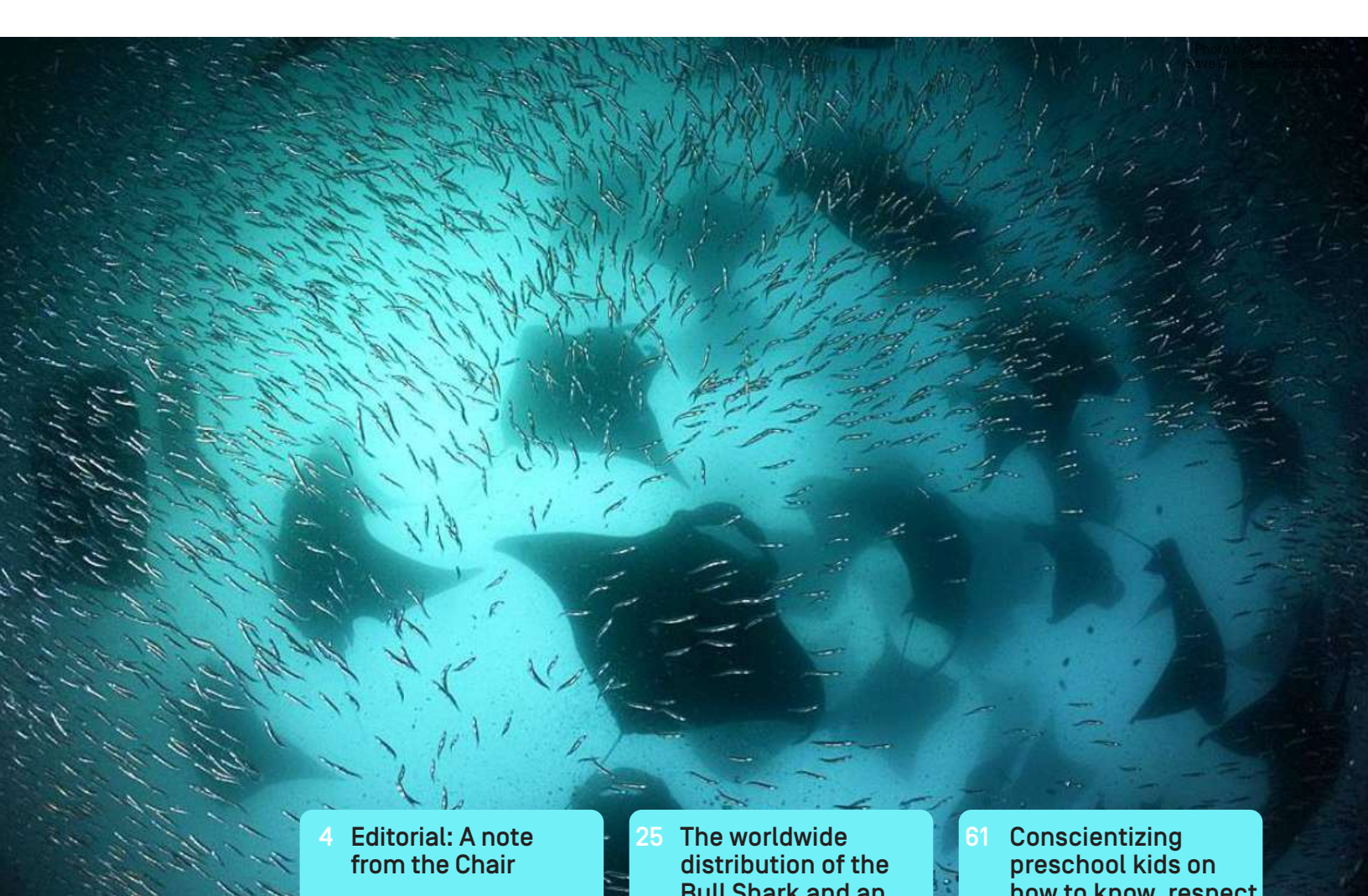


Our Vision

A world where sharks, rays, and chimaeras are valued and managed sustainably.

Our Mission

To secure the conservation, management and, where necessary, the recovery of the world's sharks, rays, and chimaeras by mobilizing technical and scientific expertise to provide the knowledge that enables action.



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Front cover: Caribbean Manta Ray (*Mobula cf. birostris*) and West Atlantic Pygmy Devil Ray (*Mobula hypostoma*) around Isla Mujeres, Quintana Roo, Mexico

Back cover: Reef Manta Ray (*Mobula alfredi*) in Hanifaru Bay, Baa Atoll, Maldives

Content page: Mass Cyclone Feeding Event of Reef Manta Rays (*Mobula alfredi*) in Hanifaru Bay, Baa Atoll, Maldives
Photos by Guy Stevens | Manta Trust



Editorial

A note
from
the Chair
Rima
Jabado

Dear readers,

With the next Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES) Conference of Parties around the corner, it is perhaps not surprising that this issue has several stories related to the trade in shark products and implementation. First, a team from Dalhousie University introduces us to a global project being undertaken to uncover the trade in shark meat, a trade that is increasing and yet for which we have little information on species and quantities. We share the news of the publication of a three-volume guide series on CITES-listed species that Debra Abercrombie and myself worked on over the last few years to support the implementation of trade controls and which will allow the identification of whole sharks, trunks, and dried products (fins, rostra, and gill plates). We have a note to emphasize the detrimental impact of trade on South American Freshwater Stingrays and highlight how CITES can ensure this trade can be regulated. And we have results from a new study showcasing trade data which indicates that European Union Member States provide almost a third of shark-related fin imports into Hong Kong, Singapore, and Taiwan. There have also been announcements for new listing proposals for sharks on CITES, so watch this space as things unfold over the next few months. 🦈 Our feature story is about Important Shark and Ray Areas (ISRA), a project we have recently embarked on that I am convinced will make a difference for shark conservation. Over the last four months, a team from within the SSG, IUCN Ocean Team, and IUCN Marine Mammal Protected Areas Task Force has been busy developing this concept. This first story gives you an idea of what we are working on but stay tuned! There are lots more to come on this very soon as we finalize the ISRA selection criteria and decide on our first region of work. The importance of delineating such critical habitat for sharks and their contribution to species conservation is highlighted in a story on Angel Sharks in the Mediterranean and echoes the feedback we have received about this initiative. We need to identify areas important for the survival of species so that decisions makers can make informed decisions when designing and implementing marine protected areas. Some of these ISRAs might be sites like those discovered for the Giant Guitarfish (*Glaucostegus typus*) in the Andaman and Nicobar Islands in India – areas that Critically Endangered species use as nursery areas and that are critical for the survival of the species. 🦈 Other stories show how consolidating available data can further our knowledge of species distribution of Bull Sharks and how engaging with recreational anglers, although an activity that might seem controversial for many, can be a valuable source of data and contribute to supporting fisheries management decisions. We highlight more work by dedicated and inspiring educators working hard in The Bahamas and Brazil to ensure the next generation cares about the marine environment and can become advocates for sharks. In The Bahamas, they are fortunate to work with children who regularly see sharks in their backyard and have had this wonderful experience so early in their lives. In Brazil, educators have to be very creative in their initiatives working with museum specimens, artists, and increasingly used cards were published online weekly even during the pandemic to make sure they can reach students without in-person activities. 🦈 Our regular contributor Chelsea Stein has yet again done an incredible job with her Q&A piece. She interviewed Dr Michelle Heupel, who pioneered the work on shark movement ecology. She provides us with an insight into how she got started and how her research has had a broader impact across the field of shark and fisheries management. Michelle also spearheaded the first global shark conference – now the only global shark science meeting taking place every four years: Sharks International. The 2022 edition of this conference is fast approaching, and the organizers have provided additional details on the event. With an update on the last meeting of the European Elasmobranch Association, we also learn that this year's meeting will be combined with Sharks International in November in Valencia, Spain. Finally, this issue also contains several announcements for grants and funding opportunities that might be of particular importance to our members and others working on sharks worldwide. 🦈 Again, thank you to all our contributors. It's so great to see members of the SSG and non-members now using Shark News as a platform to share their work. Thank you to Michael and Peter Scholl, who once again produced a beautiful issue we can all be proud of. → [Rima](#)



Michelle Heupel has spearheaded new ways to interpret, integrate, and use data to protect sharks throughout her career.



Making waves in a sea of data

Written by Chelsea Stein





From business to biology, researchers ask questions, discover new things, and inform the world we all share. When it comes to sharks, scientists and conservationists gather copious amounts of data to better understand the lives and behaviors of hundreds of species. The answers they find are ultimately used to inform policy and management decision-making, helping to protect sharks and other ocean life long-term.

"For me, that is what is really exciting about science. When you study an animal that isn't well studied or find something unexpected, that is the real spark," Michelle Heupel said. "Those new things help solve a problem and help create a difference, or even just help us understand better."

Michelle is a research scientist dedicated to making the world better for sharks. She studied marine predator movement around the world for over 25 years. She now serves as the Director of Australia's Integrated Marine Observing System (IMOS), based at the University of Tasmania. Through it all, Michelle has made waves by spearheading new ways to interpret, integrate and use data to understand shark behavior and inform conservation strategies.

Floating a new idea

Doing things differently is not something that intimidates Michelle. At the age of 14, she declared she wanted to be a marine biologist and zoned in on sharks, despite naysayers telling her she would not be able to do it.

Fast forward through a bachelor's in zoology and a PhD in marine sciences; Michelle was studying shark tracking at the Mote Marine Laboratory and Aquarium when an idea came to her that would pioneer how sharks are studied today.

"When I started shark tracking in Florida, 20 something years ago, I took existing technology and used it in a way that no one had before," she said. "And it was totally a gamble."

In the 1990s, new data-logging tracking technology allowed people to put a transmitter in a shark that would send a signal to an acoustic receiver when the animal swam past it. The receivers were designed to be used independently and were not programmed to communicate with one another, so they were typically scattered in different areas, failing to paint a complete picture of where sharks were moving.

Michelle's idea? To use the receivers in a coastal area in an overlapping grid array so that the sharks – specifically, juvenile blacktips (*Carcharhinus limbatus*) – could be tracked continuously by the receivers. When the tracking equipment manufacturers told her the idea

would not work because of the equipment's design, she followed her intuition and tried it anyway. She wound up paving the way for the future of shark tracking.

"We wanted to look at how these sharks use coastal nursery areas," she said. "How long do they stay? How important are those habitats? Where do they roam?"

Today, deploying acoustic tracking equipment in a grid or overlapping array is standard practice worldwide. "The crazy idea I had actually changed how we track where fish go and how they use space."

Movement informs management

From there, Michelle continued to answer a range of research questions, related to shark movement. She said understanding movement can help people and decision-makers see what it might mean for populations if a particular habitat is destroyed or what could happen if management policies change.

"Knowing where sharks spend time and how they use their space is a key element to understanding how environmental changes will impact the population," she said.

Whether she's looking at how Bull Sharks (*Carcharhinus leucas*) use rivers or uncovering where juvenile sharks move during a tropical storm, Michelle continues to embrace new approaches to working with data to protect sharks.

"We used to get detailed tracks of animals only over a day or a few days, and now we are tracking animals for much longer, which lets us see what they do for years of their life and ultimately lets us ask different questions."

Some of her work involved creating 3D home ranges of sharks, incorporating elements like the shape of a reef, the water depth, where a shark is within the water column, and where it is in relation to another species or animal – all based on previously collected data.

"We started by looking at a data set on eels in a fjord in Norway. When you track animals, you often get a bird's eye view, but we know that animals aren't moving in two dimensions," she said. "So, in this case, there were eels that looked like they had overlapping home ranges, and it was assumed that they were sharing space. But when we integrated the depth data, we realized that they were at different levels in the water column and not sharing space after all."

"I think we need more people thinking, 'What else can I get out of this dataset?' because that gives you the chance to understand things in a way that couldn't have otherwise," she continued. "Taking information in isolation is different than when you integrate. It gives you a more holistic view of what they're doing and how they're using the space."

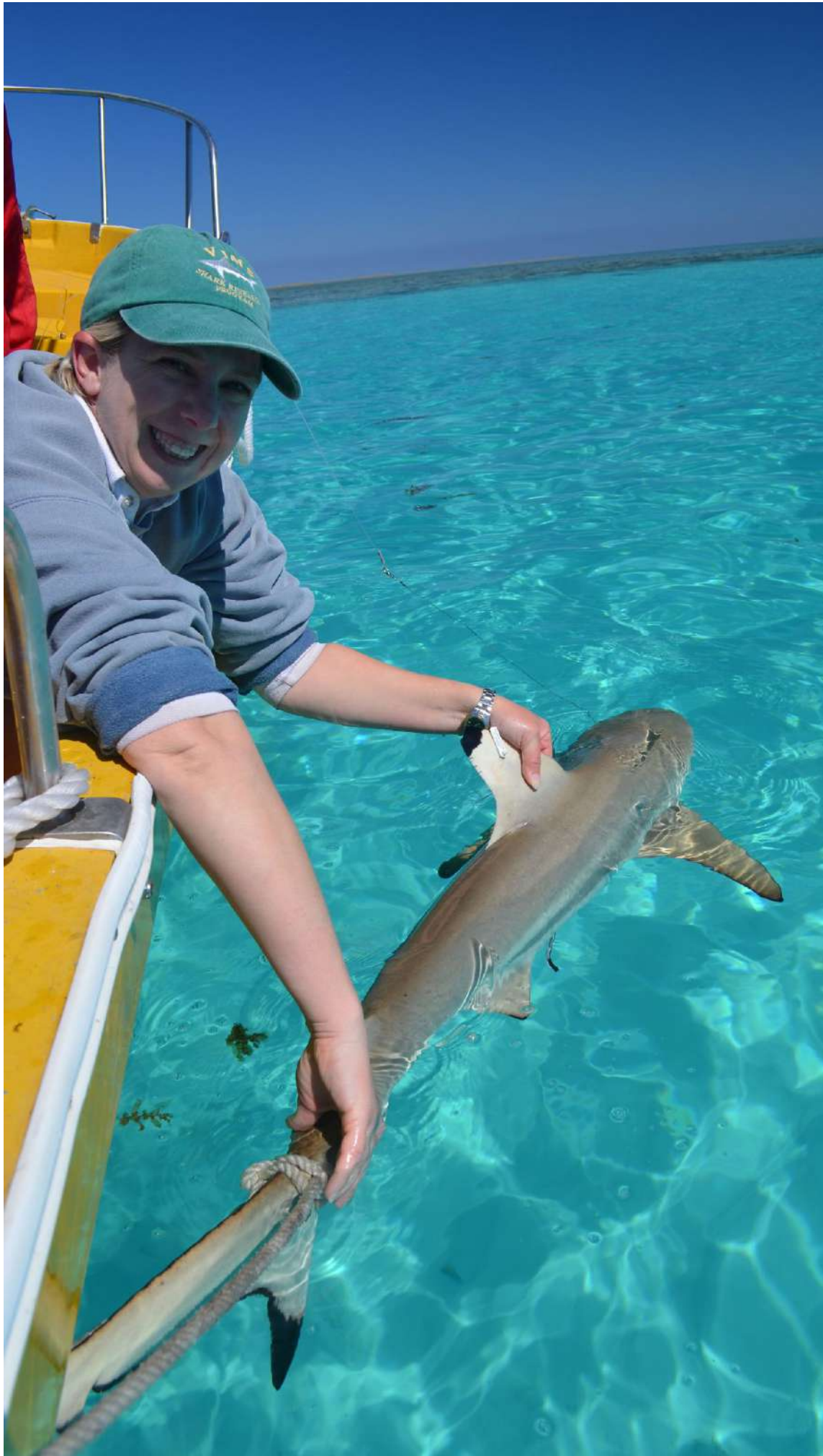
A lasting impact

Beyond her trailblazing track record in shark movement, Michelle is leading a national collaborative research infrastructure program through IMOS, hoping to use data once again to make a broader impact.

"At IMOS, we have over 60 different ocean sub-facilities that we operate around the country. It's a program that has been running for 15 years now, and its objective is to collect sustained observations of the ocean environment," she said. "My interest is taking what we do now and being able to do more."

She aims to bridge the gap between physical oceanographers and biologists because she believes integrating the data streams will help solve more complex questions and better understand the marine environment as a whole.

"Part of the philosophy at IMOS is creating societal benefit," she explained. "So, we look at areas where we think our data can play a role in making a difference... how do we use what we do to be important and useful to more than just scientists? How can it be useful to industries that operate in the marine environment... how can we be useful to the



government... how can we be useful to resource managers? We're grounded in wanting to do something that helps and creates solutions."

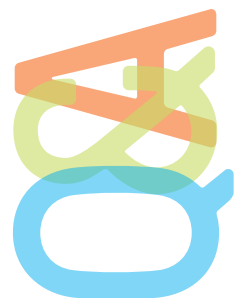
Michelle has also taken strides to support the next generation of shark scientists by launching Sharks International in 2010 – Australia's first global shark conference since 1990. She wanted to ensure scientists and students across Australia and developing countries would have the chance to attend a largescale event to network with others in the field and gain exposure.

"Sharks International was intended to be a one-time thing; I never expected it to spin off into what it is now," she said, noting that the conference was subsequently held in South Africa in 2014 and Brazil in 2018. While the COVID-19 pandemic has complicated largescale events and conferences, Sharks International is in the works to be held in Spain this October, offering both online and in-person components.

"I'm really pleased to see that so many people have gotten on board and think it's useful. We're trying to move the conference around with the focus still being on bringing the shark world to the students, especially students and early career scientists who can't afford to travel overseas to other large conferences."

Whether she's spearheading new ways to study sharks or launching a global event to bring scientists together, there's no doubt that Michelle has created a lasting impact.

"I've tried to make the world better for sharks. That's what I wanted when I started my career," she said. "I personally cherish the moments in my career where I've been able to do something that made a difference."





Map showing Contract Parties
● (dark blue) and Cooperating
Non-Contracting Parties (light blue)
in the Indian Ocean Tuna Commission
(IOTC) (as of February 2022).
Source: www.iotc.org

Sharks* and the Indian Ocean Tuna Commission (IOTC)

*The term 'shark' refers to all species of sharks, rays, and chimaeras



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What is IOTC?

The Indian Ocean Tuna Commission (IOTC) is an intergovernmental organisation responsible for the management of tuna and tuna-like species in the Indian Ocean. Its main objective is 'to promote cooperation among the Contracting Parties (Members) and Cooperating Non-Contracting Parties (CNCs) of the IOTC with a view to ensuring, through appropriate management, the conservation and optimum utilisation of stocks covered by the organisation's establishing Agreement and to encourage sustainable development of fisheries based on such stocks.'

The IOTC was established in 1993 at the 105th Session of the Council of the Food and Agriculture Organization of the United Nations (FAO) and entered into force in 1996. Decisions by IOTC members are legally binding.

IOTC Members can make decisions related to the management of tuna and tuna-like resources and their associated environment that are binding on all Members and Cooperating Non-Contracting Parties. These decisions result in Conservation Management Measures (CMMs) that are adopted by not only Members and CNCs, but also the fisheries that target the species focused in each CMM.

Fish Stocks refer to a community or subpopulation of a certain species of fish, which in fisheries management is considered a single unit.

IOTC Area of Competence

The IOTC area of competence is defined as being FAO statistical fishing areas 51 (Western Indian Ocean) and 57 (Eastern Indian Ocean) and adjacent seas north of the Atlantic Convergence (e.g., sub-area 51.1: Red Sea). [Note: the FAO western boundary lies at 30° E, while the IOTC area of competence lies at 20° E].

Function and responsibilities

The Commission has four essential functions and responsibilities which enable it to achieve its four main objectives. These are:

- to monitor the conditions and trends of stocks and gather, analyse, and disseminate scientific information, catch and effort statistics, and other data relevant to the conservation and management of the stocks and to fisheries based on the stocks;
- to encourage, recommend, and coordinate research and development activities in respect of the stocks and fisheries covered by the IOTC;
- to adopt – on the basis of scientific evidence – Conservation and Management Measures [CMMs] to ensure the conservation of the stocks covered by the Agreement and to promote the objective of their optimum utilisation throughout the Area; and
- to keep under review the economic and social aspects of the fisheries.

Structure of Commission

The IOTC Commission comprises members and states that have an interest in fishing within Indian Ocean waters.

Commission Contracting Parties (Members) are Indian Ocean coastal countries, members of the United Nations or one of its specialised agencies fishing for tuna in the Indian Ocean.

Commission Cooperating Non-Contracting Parties (CNCPs) are recognised States interested in the Indian Ocean fisheries of tuna and tuna-like species.

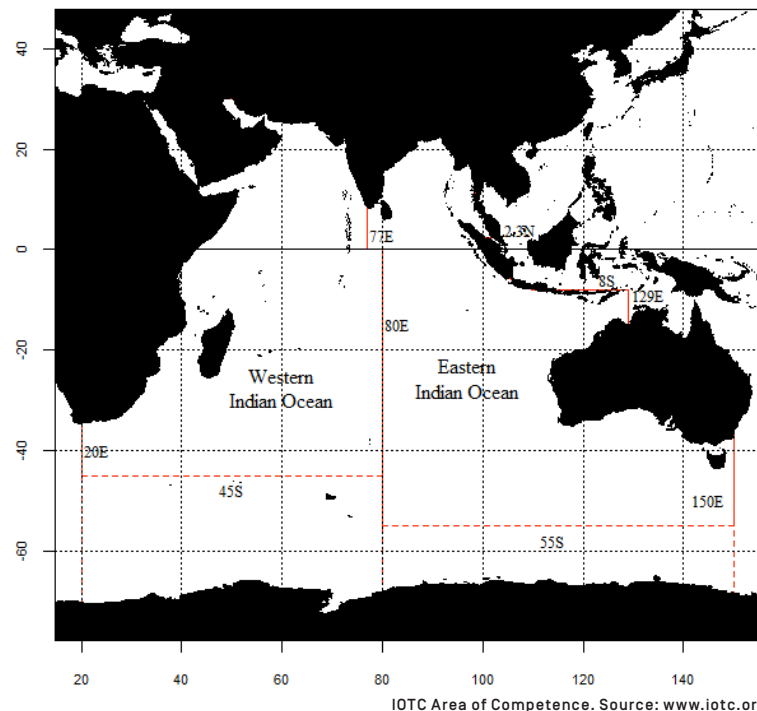
Collectively, Contracting Parties and Cooperating Non-Contracting Parties are called **CPCs** and work within the IOTC Area of Competence. In total, there are 58 CPCs (including 27 EU countries and two French Overseas Territories [OT]), 57 of which are Members, and one is a CNCP.

Subsidiary Bodies

There are several subsidiary bodies within the Commission which include:

- Compliance Committee (CoC): Monitors the compliance of the CPCs with adopted CMMs.
- Standing Committee on Administration and Finance: Advises the Commission on administrative and financial matters.
- Scientific Committee (SC): Composed of scientists amongst Members and experts outside the SC. They collect, process, disseminate and analyse fishery data; provide advice to the Commission on the status of stocks and the management actions necessary to ensure the sustainability of the fishery; and develop and coordinate cooperative research programs in support of fisheries management.

There are also seven science Working Parties (WP) with the primary function to support the Scientific Committee so that it can fulfil its mandate to provide the Commission with the information it needs to manage fish stocks under the IOTC mandate and the ecosystems in which the fisheries operate. The most common objective is to provide the Scientific Committee with analyses of the current status of the stocks and an evaluation of possible management actions. Some Working Parties are established to analyse and produce recommendations on a specific technical problem.



IOTC Area of Competence. Source: www.iotc.org

Commission Contracting Parties (Members)	Acceptance
Australia	13/11/1996
Bangladesh, People's Republic of	24/04/2018
China	14/10/1998
Comoros	14/08/2001
Eritrea	09/08/1994
European Union	27/10/1995
France [OT]	03/12/1996
India	13/03/1995
Indonesia	20/06/2007
Iran, the Islamic Republic of	28/01/2002
Japan	26/06/1996
Kenya	29/09/2004
Korea, Republic of	27/03/1996
Madagascar	10/01/1996
Malaysia	22/05/1998
Maldives	13/07/2011
Mauritius	27/12/1994
Mozambique	13/02/2012
Oman, Sultanate of	05/04/2000
Pakistan	27/04/1995
Philippines	09/01/2004
Seychelles	26/07/1995
Somalia	22/05/2014
Sri Lanka	13/06/1994
South Africa	16/02/2016
Sudan	03/12/1996
Tanzania	18/04/2007
Thailand	17/03/1997
United Kingdom of Great Britain & Northern Ireland	22/12/2020
Yemen	20/07/2012

Commission Cooperating Non-Contracting Parties (CNCP)	
Senegal	2006

1. WP on Billfish (WPB)
2. WP on Data Collection and Statistics (WPDCS)
3. WP on Methods (WPM)
4. WP on Neritic Tunas (WPNT)
5. WP on Temperate Tunas (WPTmT)
6. WP on Tropical Tunas (WPTT)
7. WP on Ecosystems and Bycatch (WPB)

Which shark species are covered by IOTC?

Even though sharks are not part of the 16 tuna and tuna-like species directly under the IOTC mandate, they are frequently caught in association with fisheries targeting IOTC species. Some fleets are known to actively target sharks and IOTC species simultaneously.

CPCs are required to report information at the same level of detail as for the 16 species directly under the IOTC mandate.

The following table includes the main species reportedly caught in IOTC fisheries; however, this list is not exhaustive, and many other shark species are likely to interact with these fisheries.

Order	Family	Scientific Name	Common Name
Carcharhiniformes	Carcharhinidae	<i>Carcharhinus falciformis</i>	Silky Shark
Carcharhiniformes	Carcharhinidae	<i>Carcharhinus longimanus</i>	Oceanic Whitetip Shark
Carcharhiniformes	Carcharhinidae	<i>Galeocerdo cuvier</i>	Tiger Shark
Carcharhiniformes	Carcharhinidae	<i>Prionace glauca</i>	Blue Shark
Carcharhiniformes	Sphyrnidae	<i>Sphyrna lewini</i>	Scalloped Hammerhead Shark
Carcharhiniformes	Sphyrnidae	<i>Sphyrna spp.</i>	Hammerhead Sharks
Lamniformes	Alopiidae	<i>Alopias superciliosus</i>	Bigeye Thresher
Lamniformes	Alopiidae	<i>Alopias pelagicus</i>	Pelagic Thresher
Lamniformes	Alopiidae	<i>Alopias vulpinus</i>	Common Thresher
Lamniformes	Lamnidae	<i>Carcharodon carcharias</i>	Great White Shark
Lamniformes	Lamnidae	<i>Isurus oxyrinchus</i>	Shortfin Mako
Lamniformes	Lamnidae	<i>Isurus paucus</i>	Longfin Mako
Lamniformes	Lamnidae	<i>Lamna nasus</i>	Porbeagle Shark
Lamniformes	Pseudocarchariidae	<i>Pseudocarcharias kamoharai</i>	Crocodile Shark
Myliobatiformes	Dasyatidae	<i>Pteroplatytrygon violacea</i>	Pelagic Stingray
Myliobatiformes	Mobulidae	<i>Mobula spp.</i>	Mobulid Rays
Orectolobiformes	Rhincodontidae	<i>Rhincodon typus</i>	Whale Shark

The Working Party on Ecosystems and Bycatch is responsible for 'reviewing and analysing matters relevant to bycatch, byproduct and non-target species which are affected by IOTC fisheries for tuna and tuna-like species (i.e., sharks, marine turtles, seabirds, marine mammals and other fishes), as well as the ecosystems in which they operate; and to develop mechanisms which can be used to better integrate ecosystem considerations into the scientific advice provided by the Scientific Committee to the Commission.'

Conservation and Management Measures (CMMs)

The CPCs meet annually during the "Session of the Commission" to propose CMMs concerning the management of tuna and tuna-like species under the IOTC mandate and the fisheries that target them. These decisions are passed in the form of either Resolutions or Recommendations.

Resolutions are binding on Commission Members unless there is a specific objection on the part of a Member and require a two-thirds majority of Members present and voting to adopt them. Recommendations are not binding on Commission Members and rely on voluntary implementation. The Commission may, by a simple majority of its Members present and voting, adopt Recommendations concerning conservation and management measures of the stocks for furthering the objectives of the IOTC Agreement. *Resolutions and Recommendations are structured as: xx/yy, where "xx" refers to the year it was implemented, and "yy" the order it was listed that year.*

The first resolution directly related to sharks was 05/05 Concerning the conservation of sharks caught in association with fisheries managed by IOTC, which is currently superseded by Resolution 17/05 [Resolution 05/05]. The oldest active resolution directly related to sharks was adopted in 2012 and targeted the conservation of Thresher Sharks [*Alopias* spp.] [Resolution 12/09]. Since then, several additional resolutions have been implemented by the IOTC that apply to shark conservation in the IOTC area of competence. On the other hand, as recommendations are not legally binding on the CPCs, few are active and none apply to sharks.

Resolutions that apply to all sharks are highlighted in the table on the next page. Additional details are not provided but can be found online through the links provided. For example, Resolution 15/01 on the recording of catch and effort data by fishing vessels in the IOTC area of competence sets out the minimum logbook requirements for purse seine, longline, gillnet, pole and line, handline and trolling fishing vessels over 24 metres in length overall and those under 24 metres if they fish outside the Exclusive Economic Zones (EEZ) of their flag States within the IOTC area of competence. As per this Resolution, the catch of all sharks must be recorded (retained and discarded). Similarly, Resolution 15/02 on mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs) indicated that the provisions applicable to tuna and tuna-like species apply to shark species.

On the other hand, a summary of the information in resolutions on a shark species or species group is provided. There are currently 16 active resolutions covering 17 shark species/groups and no recommendations.



Double-hooked Blue Shark,
Rhode Island

Photo by Ron Watkins | Ocean Image Bank



Silky Sharks, Cuba

Photo by Sean Chinn | Ocean Image Bank

Resolution number	Resolution Title	Status	Source
21/02	On establishing a programme for transshipment by large-scale fishing vessels	Active and supersedes resolution 19/06	
19/02	On procedures on a Fish Aggregating Devices (FADs) management plan	Active and supersedes resolution 18/08	
19/03	On the conservation of Mobulid Rays caught in association with fisheries in the Area	Active	
19/05	On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna, and non-targeted species caught by purse seine vessels in the IOTC Area of Competence	Active and supersedes resolution 17/04	
18/02	On management measures for the conservation of Blue Shark caught in association with IOTC fisheries	Active	
18/04	On BIOFAD experimental project	Active	
18/07	On measures applicable in case of non-fulfilment of reporting obligations in the IOTC	Active and supersedes resolution 16/06	
17/05	On the conservation of sharks caught in association with fisheries managed by IOTC	Active and supersedes resolution 05/05	
17/04	On a ban on discards of Bigeye Tuna, Skipjack Tuna, Yellowfin Tuna, and non-targeted species caught by purse seine vessels in the IOTC Area of Competence	Superseded by resolution 19/05	
16/07	On the use of artificial lights to attract fish to drifting fish aggregating devices	Active and supersedes resolution 15/07	
15/01	On the recording of catch and effort data by fishing vessels in the IOTC Area of Competence	Active and supersedes resolution 13/03	
15/02	Mandatory statistical requirements for IOTC Members and Cooperating Non-Contracting Parties (CPCs)	Active and supersedes resolution 10/02	
15/06	On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna, and a recommendation for non-targeted species caught by purse seine vessels in the IOTC area of competence	Superseded by resolution 17/04	
15/09	On a Fish Aggregating Devices (FADs) working group	Active	
13/05	On the conservation of Whale Sharks (<i>Rhincodon typus</i>)	Active	
13/06	On a scientific and management framework on the Conservation of Sharks species caught in association with IOTC managed fisheries.	Active	
13/11	On a ban on discards of bigeye tuna, skipjack tuna, yellowfin tuna and non-targeted species caught by purse seine vessels in the IOTC area of competence	Superseded by resolution 15/06	
12/09	On the conservation of Thresher Sharks (family Alopiidae) caught in association with fisheries in the IOTC Area of Competence	Active and supersedes resolution 10/12	
11/04	On a regional observer scheme	Active & supersedes resolution 10/04	
10/12	On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence	Superseded by resolution 12/09	
05/05	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	Superseded by resolution 17/05	



Reef Manta Rays (*Mobula alfredi*) in Dhonfaru Faru, Baa Atoll, Maldives

Sharks in the Indian Ocean are currently subject to several Conservation and Management Measures adopted by the Commission. The below provides an overview and extracts from these CMMs.

Resolution 19/03

Prohibits all vessels [including artisanal] from intentionally fishing, retaining on board, transshipping, landing, storing any part or whole carcass of Mobulid Rays caught in the Area. Mobulid Rays are to be released unharmed. CPCs shall ensure that fishers are aware of and use proper mitigation, identification, handling and releasing techniques and keep onboard all necessary equipment for the release of Mobulid Rays. The only exception is for subsistence fisheries. CPCs shall develop sampling plans to monitor the Mobulid Rays catches by the subsistence and artisanal fisheries and are encouraged to investigate at-vessel and post-release mortality in mobulids.

The following species are affected by the IOTC Resolution 19/03:

Mobulid Rays (*Mobula* spp.)

A **subsistence fishery** is a fishery where the fish caught are consumed directly by the families of the fishers rather than being bought by middle-(wo)men and sold at the next larger market, per the FAO Guidelines for the routine collection of capture fishery data. FAO Fisheries Technical Paper. No. 382. Rome, FAO. 1999. 113p.

Artisanal fishing refers to fisheries other than longline or surface fisheries [i.e., purse seines, pole and line, gillnet fisheries, hand-line and trolling vessels], registered in the IOTC Record of Authorized Vessels [Definition in footnote 1 of Res. 15/02].

Resolution 18/02

Imposes obligations on CPCs whose vessels catch Blue Shark in the Area to ensure that effective management measures are in place to support the sustainable fishing of Blue Sharks, in line with IOTC's Convention objective. Each CPC shall ensure that its vessels catching Blue Shark associated with IOTC fisheries in the Agreement area record their catch.

The following species are affected by the IOTC Resolution 18/02:

Blue Shark (*Prionace glauca*)

Resolution 17/05

Introduces measures to educate fishers on full utilisation of their shark catches, except for species prohibited by the IOTC. It prohibits the removal of shark fins on board vessels for sharks landed fresh and provides a ratio [not more than 5% fins of the weight of sharks on board] for sharks landed frozen. The purchase of shark fins that have been removed, retained on-board, transhipped or landed in contravention to this Resolution are also prohibited. CPCs have specific reporting requirements regarding fisheries involving sharks.

Resolution 13/06

[*Objection from India: Not binding on India*]

Concerned with establishing a scientific framework for the conservation and management of shark species in the Area, it requires the Commission to determine the shark species subjected to IOTC CMMs. Prohibits all fishing vessels [except artisanal fishing vessels] from retaining on board, tranship, land or store any part or whole carcass of Oceanic Whitetip Sharks and, if caught, to be released unharmed. CPCs shall encourage fishers to take other shark protection measures.

The following species are affected by IOTC Resolution 13/06:

Oceanic Whitetip Shark [*Carcharhinus longimanus*]

Article IX [paragraphs 5, 6 and 7] of the IOTC Agreement refers to the '*Objections*' procedure for CMMs adopted by the Commission. Specifically:

'Para. 5. Any Member of the Commission may, within 120 days from the date specified or within such other period as may be specified by the Commission under paragraph 4, object to a [CMM] adopted under paragraph 1. A Member of the Commission which has objected to a measure shall not be bound thereby. Any other Member of the Commission may similarly object within a further period of 60 days from the expiry of the 120-day period. A Member of the Commission may also withdraw its objection at any time and become bound by the measure immediately if the measure is already in effect or at such time as it may come into effect under this article.

Para. 6. If objections to a measure adopted under paragraph 1 are made by more than one-third of the Members of the Commission, the other Members shall not be bound by that measure; but this shall not preclude any or all of them from giving effect thereto.

Para. 7. The Secretary shall notify each Member of the Commission immediately upon receipt of each objection or withdrawal of objection.'

Resolution 13/05

Requires CPCs to ban their vessels from intentionally setting a purse seine net around a Whale shark in the Area if it is sighted before the commencement of the set. They must also require that, in the event that a Whale Shark is unintentionally encircled in the purse seine net, the shark shall be released unharmed while considering the crew's safety; and report the incident to the relevant authority. CPCs shall adopt Fish Aggregating Device designs that reduce the incidence of entanglement.

The following species are affected by IOTC Resolution 13/05:

Whale Shark (*Rhincodon typus*)

Resolution 12/09

Prohibits IOTC member or CPC fishing vessels from retaining on board, tranship, land, store, sell or offer for sale any part or whole carcass of Thresher Sharks (*Alopias* spp.). Any Thresher Sharks caught shall be released unharmed, and the incident reported, as required by IOTC data reporting procedures. The Resolution also supports research on Thresher Sharks conducted with approval from the IOTC.

The following species are affected by IOTC Resolution 12/09:

Bigeye Thresher (*Alopias superciliosus*)

Pelagic Thresher (*Alopias pelagicus*)

Common Thresher (*Alopias vulpinus*)

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- * Indian Ocean Tuna Commission. Accessed on 07 February 2022. Status summary for species of tuna and tuna-like species under the IOTC mandate, as well as other species impacted by IOTC fisheries. iotc.org/science/status-summary-species-tuna-and-tuna-species-under-iotc-mandate-well-other-species-impacted-iotc
- * Indian Ocean Tuna Commission. (2021). Compendium of active conservation and management measures for the Indian Ocean Tuna Commission. Publication. December 17. iotc.org/cmm
- * Objection from India to IOTC Resolutions 13/02, 13/03, 13/06 AND 13/07. Accessed on 09 February 2022. iotc.org/documents/objection-india-iotc-resolutions-1302-1303-1306-and-1307

The following includes the main species reportedly caught in IOTC fisheries; however, this list is not exhaustive, and many other shark species are likely to interact with these fisheries.



Reef Manta Ray
Mobula alfredi



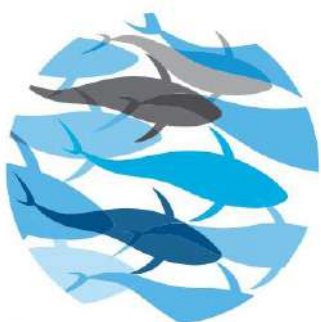
Oceanic Manta Ray
Mobula birostris



West Atlantic Devil Ray
Mobula hypostoma



Longhorned Pygmy Devil Ray
Mobula eregoodoo



iotc ctoi



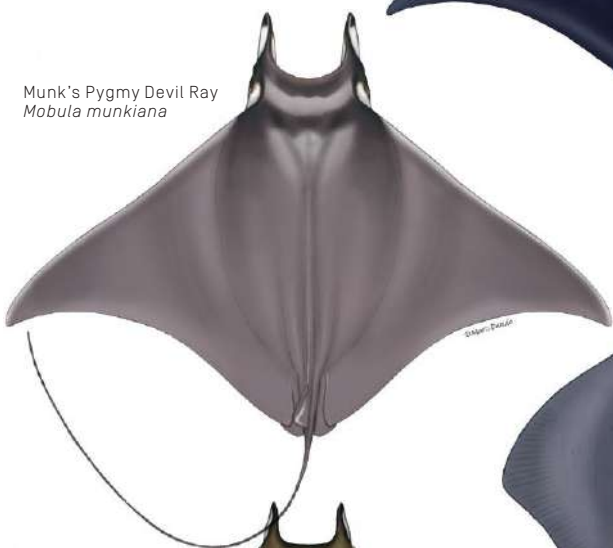
Shortfin Pygmy Devil Ray
Mobula kuhlii



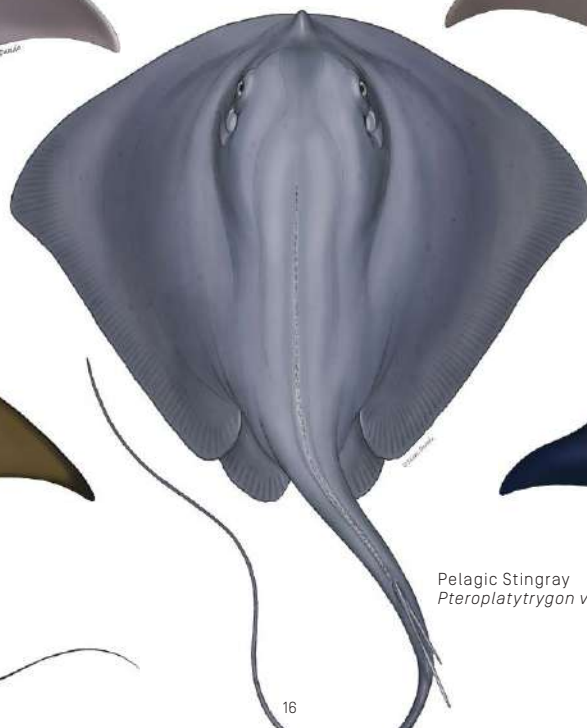
Spinetail Devil Ray
Mobula mobular



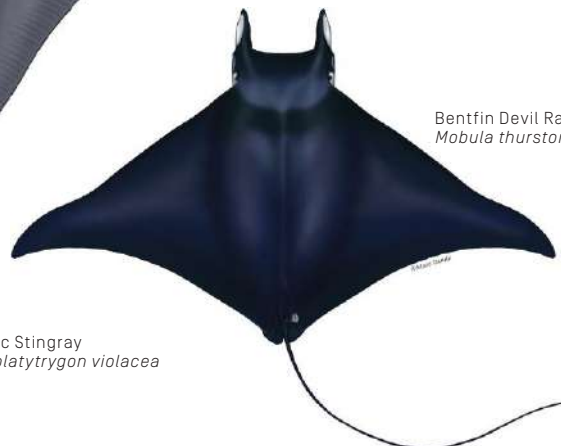
East Atlantic Pygmy Devil Ray
Mobula rochebrunei



Munk's Pygmy Devil Ray
Mobula munkiana



Pelagic Stingray
Pteroplatytrygon violacea

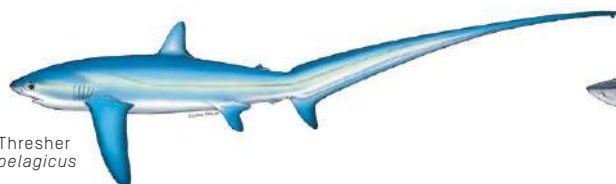


Bentfin Devil Ray
Mobula thurstoni



Sicklefin Devil Ray
Mobula tarapacana

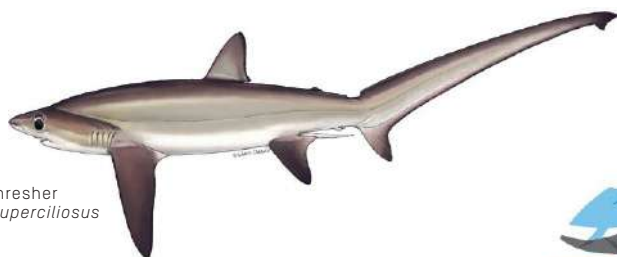
Pelagic Thresher
Alopias pelagicus



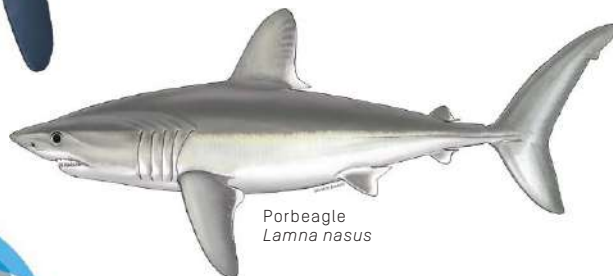
Longfin Mako
Isurus paucus



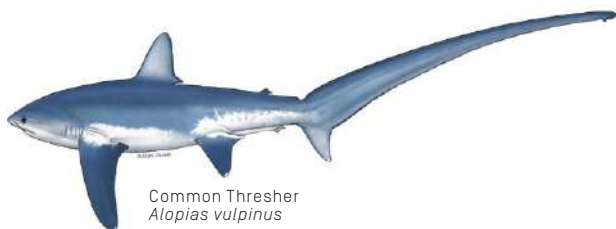
Bigeye Thresher
Alopias superciliosus



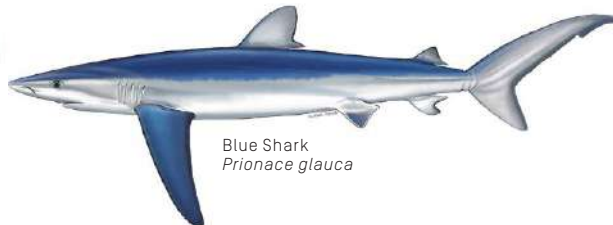
Porbeagle
Lamna nasus



Common Thresher
Alopias vulpinus



Blue Shark
Prionace glauca



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Silky Shark
Carcharhinus falciformis



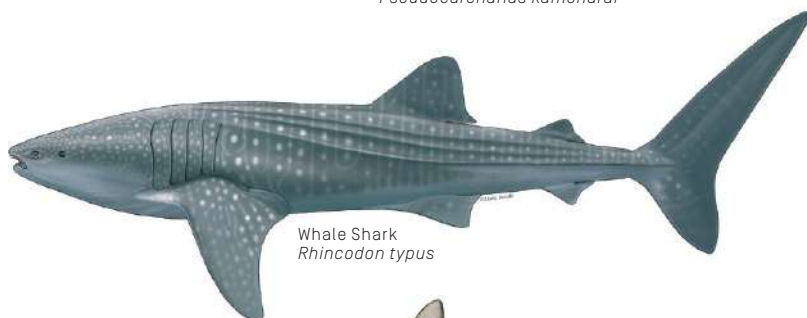
Crocodile Shark
Pseudocarcharias kamoharai



Oceanic White Tip
Carcharhinus longimanus



Whale Shark
Rhincodon typus



White Shark
Carcharodon carcharias



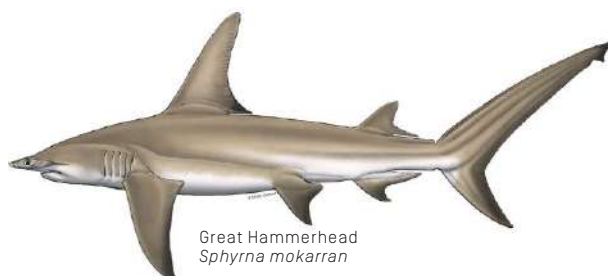
Scalloped Hammerhead
Sphyrna lewini



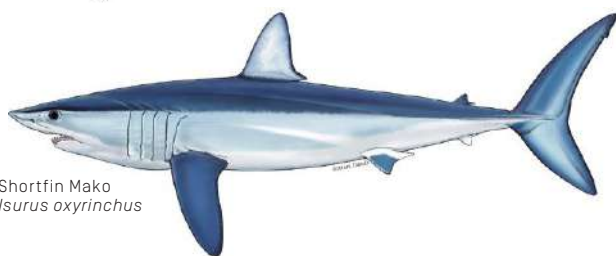
Tiger Shark
Galeocerdo cuvier



Great Hammerhead
Sphyrna mokarran



Shortfin Mako
Isurus oxyrinchus



Smooth Hammerhead
Sphyrna zygaena



Shark
Spotlight



Mumburarr Whipray

[*Urogymnus
acanthobothrium*]



Photo by Peter Kyne

Alexandra Morata

IUCN SSC Shark Specialist Group | Programme Officer

Taxonomy

The order Myliobatiformes includes 214 species from 37 genera and 12 families: Aetobatidae [Pelagic Eagle Rays], Dasyatidae [Sting-rays], Gymnuridae [Butterfly Rays], Hexatrygonidae [Sixgill Sting-rays], Mobulidae [Devil Rays], Myliobatidae [Eagle Rays], Plesiobatidae [Giant Stingarees], Potamotrygonidae [Neotropical Stingrays], Rhinopteridae [Cownose Rays], Urolophidae [Stingarees], Urotrygonidae [Round Rays], and Zanobatidae [Panrays].

Urogymnus acanthobothrium, commonly known as Mumburarr Whipray, belongs to the Dasyatidae family and is one of the six species from the *Urogymnus* genus. The species name was coined by the presence of parasites of the genus *Acanthobothrium* found on the Mumburarr Whipray. The vernacular name 'Mumburarr Whipray' originates from the local Limilngan language of the Minitja people from the West Alligator River region, Northern Territory, Australia.

Morphology

Being a whipray, *U. acanthobothrium* has a long, thin, whip-like tail that is uniformly white above and more yellowish/darker ventrally. The Mumburarr Whipray is distinguished from the closely related, congener Mangrove Whipray [*Urogymnus granulatus*] by its more angular snout, absence of white flecks on the dorsal surface, a uniformly white ventral surface with no broad black margin, and a longer tail. It reaches a maximum size of 161 cm disc width [DW], making it one of the largest whiprays, has pronounced denticle bands, and no thorns/thornlets on its body (juveniles may have weak shoulder thorns). Its dorsal surface is yellowish-brown in colour with irregular grey speckles, while the ventral surface is primarily white with dark grey patches.

Distribution and Habitat

The Mumburarr Whipray occurs in northern Australia and southern Papua New Guinea, with a patchily known distribution. It is a euryhaline species that occurs in brackish reaches of tidal rivers, estuarine waters, and coastal marine habitats, at depths of 2–60 m.

However, as the species was only described in 2016, is known to occur in remote areas, and available data are based on only ten specimens, it could be more widespread.

Conservation measures and IUCN Red List status

The Mumburarr Whipray has been assessed as Data Deficient (DD) on the IUCN Red List of Threatened Species. Its occurrence in remotely and poorly-surveyed areas mean it is only known from a few specimens, although it may also be naturally rare. The limited available data makes it difficult to assess the species beyond Data Deficient, but generally, euryhaline elasmobranchs are of conservation concern. Additionally, given their large size, the species possibly shares similar life history characteristics with other large elasmobranchs: late age-at-maturity, low fecundity, long lifespan, and low natural mortality; thus having low productivity and greater difficulty to recover population numbers.

In the Northern Territory, Australia, the West Alligator River where *U. acanthobothrium* is found is completely closed with no boat access permitted. In the Kakadu National Park which includes the West Alligator River, commercial fishing is prohibited. Additionally, elasmobranchs incidentally caught in commercial fisheries are discarded, which provides protection to Mumburarr Whiprays in northern Australia. While both Australian and Papua New Guinean Mumburarr Whiprays are caught as bycatch in prawn trawl fisheries, Australia has higher levels of regulation; thus, *U. acanthobothrium* could be more threatened in Papua New Guinea. Further information on catch levels is needed to accurately assess its Red List status.

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All photos provided
by Irene Kingma

Update from the 24th EEA Conference in Leiden, The Netherlands

Written by Irene Kingma

Nederlandse Elasmobranchen Vereniging (NEV) | Dutch Elasmobranch Society (NEV)

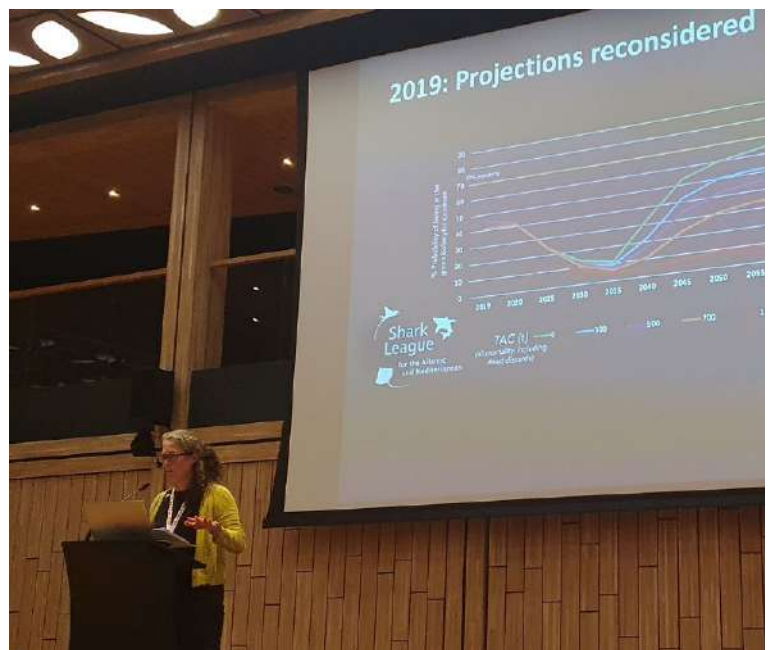
The 24th European Elasmobranch Association Annual Scientific Conference [EEA2021] was held in Leiden, the Netherlands, from November 2nd to 5th, 2021. The conference was hosted by the Dutch Elasmobranch Society, who initially planned to organise the meeting in 2020 but delayed it due to the Covid-19 pandemic. The theme of EEA2021 was “Are we there yet? – What developments in the science and policy landscape have delivered for shark and ray conservation?”. To ensure everyone who wanted to was allowed to present, the conference was conducted online on November 2nd and in-person from the 3rd to the 5th. The in-person part had over 100 participants with 80 oral presentations (including one delivered in the form of a song accompanied on ukulele).

The EEA conference aims to bridge advances in scientific understanding of elasmobranch biology and ecology with the latest developments in conservation and management. This was reflected in four keynote speeches, two of which focused on science whilst the other two explored developments in conservation and management of sharks. Dr Sophy McCully from Cefas and Dr Alec Moore from Bangor University gave keynotes from their scientific background; McCully presented on progress to stock assessments and population estimates for sharks in Northern European waters, and Moore described how unconventional research techniques and sources are essential to study elasmobranchs.

On the policy and conservation side, Ali Hood, Director of Conservation at Shark Trust, gave an overview on accomplishments in shark conservation over the past decade and the challenges still ahead of us. She ended her presentation with a call to action on the protection of Mako Sharks (*Isurus* spp.) through the International Commission for the Conservation of Atlantic Tunas (ICCAT). This campaign was successful in reaching its objective later that month. The presentation by Angelo Villagomez of The Pew Charitable Trusts was not focused on sharks but equity in conservation, highlighting the benefits of indigenous peoples’ perspectives and the necessity to include these in efforts to protect nature.

Another essential element of the EEA conference is that for many students, it is a space to present their work. Hence, the organisers lower the participation cost for students and add elements to the program that allowed them to actively engage. All poster presenters were given the opportunity to have a one-minute pitch during the main sessions to introduce their research. On the 3rd day of the conference, there were five breakout sessions for topical workshops where participants discuss and brainstorm about current hot topics in shark research and conservation.

Next year’s EEA conference will be combined with the Sharks International 2022 conference, held in Valencia, Spain, from October 20th to 22nd.



Sharks International 2022

A Mediterranean shark fiesta you do not want to miss!

Abstract submissions, keynotes, and registration.

Since the January edition of Shark News, a lot has happened at Sharks International 2022 (SI2022). The last few weeks has seen the opening of abstract submissions, announcements of keynote speakers, and teasers of Valencian culinary and cultural events coming this October. If you are considering attending Europe's first Sharks International – now is the time to get involved!

If you need a quick recap before we jump into these exciting developments, here is a summary: In 2018, it was announced that SI2022 was coming to Europe. Due to the COVID pandemic, a hybrid event was proposed, featuring five digital days (October 10–14) leading up to an in-person conference (October 20–22) in Valencia, Spain. Since then, the shark community have been signing up to the SI2022 portal (si2022.org), where over 700 members now have the opportunity to discuss what they want to see at the conference this October. As early signups, most of these secured the 2021 discount and will enjoy a 10% discount when tickets become available.

Back to the latest news!

Abstract submissions! Earlier this month, we hosted an online explainer session that talked through the presentation types available to delegates. This session is available to view on the si2022.org platform, where users can also find briefing documents that detail submission requirements. The submission period has begun, so do not wait any longer to start thinking about your idea! To help with this, we are hosting a number of recorded online skills sessions that offer practical guidance on presentation formats.

New presentation formats! As a hybrid event, SI2022 offers both physical and digital presentation formats. The online event will provide a platform for live and pre-recorded presentations and discussion sessions. Short videos will replace posters, and longer 'workshop' videos will profile key techniques and skills. The 'poster' videos are an exciting new addition to the Sharks International line-up and offer delegates the opportunity to present in the language of choice. We are working on subtitling for broader audience engagement. While at the in-person days, you will find a blend of

traditional presentations and posters alongside digital content to enable broad engagement. All content will be available through the online platform to registered delegates. Online guidance material will help you choose the correct format for your work.

Keynotes! March and April provided the SI2022.org community with an exciting preview of the conference in October with the announcement of keynote speakers! These speakers are experts in their field, and their experience covers the three pillars of SI2022: shark research, communication, and advocacy for conservation. Check out the online portal at [SI2022.org](https://si2022.org) if you have not already seen the announcements to find out more.

Social events! Valencia will take up the challenge of delivering a warm Mediterranean welcome to delegates from around the world. To this end, events have been planned that will embrace the best of Spanish Mediterranean culture, showcasing what European hospitality can deliver. As Sharks International's first European destination, Valencia is sure to impress!



SHARKS
INTERNATIONAL

VALENCIA 2022



Prioritising conservation efforts for the Critically Endangered Angel Sharks in the North-eastern Mediterranean Sea

Photo by Panagiotis Karavetis

A juvenile *Squatina squatina*, caught and released in Lemnos Island in 2021



Juvenile Angel Shark [*Squatina squatina*] covered with sand and swimming

Photo by Poursanidis, D.

Dr Ioannis Giovos

IUCN SSC Shark Specialist Group | Mediterranean Regional Group | Member iSea, Environmental Organisation for the Preservation of the Aquatic Ecosystems, Greece | University of Patras, Department of Animal Production, Fisheries & Aquaculture, Greece | University of Padova, Department of Biology, Italy



An individual *Squatina aculeata* caught in the 1980's in the Cyclades islands

Photo by Dimitris Skiadas

Roxani Naasan Aga Spyridopoulou

iSea, Environmental Organisation for the Preservation of the Aquatic Ecosystems, Greece | University of the Aegean, Department of Marine Sciences, Greece

Angel Sharks are among the most threatened species of sharks globally. Three species are present in the Mediterranean Sea: Sawback Angelshark [*Squatina aculeata*], Smoothback Angelshark [*Squatina oculata*], and Angelshark [*Squatina squatina*], all listed as Critically Endangered according to the International Union for Conservation of Nature (IUCN) Red List of Threatened Species due to steep population declines as a result of fisheries overexploitation.

To actively contribute to the conservation of Angel Sharks in the Eastern Mediterranean, iSea, with collaboration from experts at 15 institutions and with the support of the Shark Conservation Fund and the Save Our Seas Foundation, conducted a study to define critical areas for these three species in the Aegean Sea. Using all the available observations of the species and using models, locations around Cyclades islands, between Chios Island and the coast of Turkey, areas in Dodecanese islands and the coast of Turkey and the Northern coasts of Crete were identified as the most important areas for Angel Sharks within the Aegean Sea.

As a next step, the current network of Marine Protected Areas and Fisheries Restricted Areas in Greece and Turkey was examined to determine overlaps with identified critical areas and prioritise future conservation efforts in critical areas where management measures have already been developed. Five protected areas from Turkey were found to overlap with critical Angel Shark areas, while

no overlap was observed with protected areas in Greece.

The dire conservation status of the three Angel Shark species and the lack of overlap between their current distribution and the protected areas network in the Aegean Sea highlights the urgent need for conservation measures, mainly because almost all recent observations of the species were individuals captured in fisheries.

Protected areas targeting elasmobranchs are currently completely absent within the Mediterranean Sea, while the current protected areas network does not support the protection of such species. Therefore, a new tool spatial planning tool must be developed [e.g., Important Shark and Ray Areas] or old underutilised approaches could be used [e.g., Specially Protected Areas of Mediterranean Importance] to support efforts to conserve Angel Sharks in this basin.

Finally, the study provides policy recommendations for Greece and Turkey to secure improved protection of Angel Sharks in the Aegean Sea.

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The worldwide distribution of the Bull Shark *Carcharhinus leucas* [Valenciennes, 1839] and an account of its occurrence in low salinity habitats

Written by Dr Peter Gausmann

Ruhr University Bochum | Bochum, Nordrhein-Westfalen, Germany

Introduction

The Bull Shark (*Carcharhinus leucas*), a cosmopolitan euryhaline elasmobranch species, is famous for its ability to leave marine environments and penetrate far into freshwater bodies around the globe. Most Bull Sharks found in freshwater are immature. Due to the circumstance that many other marine predators (including other sharks) are stenohaline, the time period spent in rivers and lakes by juvenile *C. leucas* is valued as an effective strategy to reduce mortality and guarantee a higher percentage of surviving immature individuals. Investigations found that immature Bull Sharks can spend up to four/five years in a purely freshwater environment. Although many scientific publications deal with a particular ecological aspect of this species, no previous study has attempted to account for all the records from fresh and brackish water to quantify these occurrences. The author made a critical review of scientific literature, databases, newspapers, and online media sources that spans more than four years of investigation. Moreover, the information out of these references was used to build an updated and reliable distribution map of *C. leucas*.

Records in rivers, lakes, and estuaries

The result of 415 global fresh and brackish water localities with evidence of *C. leucas* highlights the importance of these habitats for the reproduction of this species. The North American and Australian continents were identified as the regions with the most significant numbers of Bull Shark records, underlining that shark

research is conducted most intensively in the developed world. From the developing world, such as the west coast of the African continent, only a small number of *C. leucas* records were derived, highlighting the need for more in-depth research on elasmobranchs in data-poor regions. The record of the farthest freshwater penetration by *C. leucas* was made in the Amazon River, the largest river of the South American continent, with a recorded distance of 5,080 km from the sea. Despite this, for many large streams inside the known range of *C. leucas*, such as the Kongo, the Indus, and the Mekong River, until today no records of the Bull Shark were made, which means that, currently, research on freshwater elasmobranchs in rivers of the developing world is not conducted deeply. Furthermore, many Bull Shark records from rivers and lakes are quite old, deriving from the beginning to the middle of the 20th century (e.g., Jamoer Lake, West Papua, Indonesia). It is unclear if and how Bull Sharks still utilize these habitats.

Dependency of low salinity habitats

The results of the author's study indicate a strong dependency of *C. leucas* on low salinity habitats for its reproductive behaviour. Estuaries, rivers and river mouths, lakes, and shallow bays of the tropics and subtropics can be considered crucial habitats for the Bull Shark. Therefore, the protection of pristine river systems and associated estuaries and lakes is essential for this species' life history. However, Bull Sharks were reported even from artificial habitats like urban canals and waterways in metropolitan regions of the USA and Australia (e.g., Miami Canals, Gold Coast Canals). The investigation also shows that *C. leucas* is habitat-limited due to its dependency on low salinity environments and does not occur in regions that lack rivers and river mouths connected to the sea (e.g., the Red Sea).



Photo by Philippe Lecomte | plongee-passion-photo.com



Distribution map of *Carcharhinus leucas* showing major rivers and areas of uncertain presence ["?"] (Gausmann 2021)

Worldwide distribution

Carcharhinus leucas is a cosmopolitan species with a geographical range that includes the coastlines of all major ocean basins (Atlantic Ocean, Indian Ocean, Pacific Ocean) in tropical, subtropical, and warm-temperate regions. By investigating literature, fishery reports, databases, and reliable semi-scientific literature, former gaps in the known distribution of this species were closed. For example, in the Indian Ocean, the Bull Shark shows a continuous distribution from South Africa to Western Australia. Nevertheless, there remain some areas where records of *C. leucas* could not be confirmed (e.g., California, USA).

Conservation aspects

The investigation by the author also revealed that many of the large rivers where *C. leucas* has been reported from are showing habitat degradation as a result of intensive river regulation measures. For example, dam buildings, water power plants, and impoundments prevent the movement of Bull Sharks into the upper reaches of several large rivers, such as the Mississippi, the Zambezi, and the Tigris Rivers. Together with the intense fishing pressure that affects nearly all of the world's currently known shark species, the devaluation of freshwater ecosystems of the tropics and subtropics can be assessed as a further threat for *C. leucas*, a migratory shark species that is known to rely on low salinity environments.



Carcharhinus leucas, subadult male specimen (~1.5 m TL) captured along the Amazon River at Pinduri (Santarém, Pará, Brazil) (Gausmann 2021)

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Uncovering the global shark meat trade



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Dr Chris Mull,
Zoya Tyabji

Integrated Fisheries Lab |
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Dr Aaron MacNeil

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IUCN SSC Shark Specialist Group |
North America Regional Group | Member

Dusky Shark (*Carcharhinus obscurus*) caught by artisanal fishers in southeastern Brazil

High demand for shark, ray, and chimaera (herein 'shark') products has led to overexploitation of shark populations worldwide. Despite the recognition that current demand is unsustainable, actions to properly manage stocks and limit shark mortality in most jurisdictions have been limited, in part, due to the low availability of data on the global trade of shark products. The current understanding of the shark trade has been mostly based on the global commercialization of shark fins. Despite gains over the past decade in improving labelling accuracy, genetic analysis of species composition in the shark fin trade, and shifting consumer behaviour to reduce shark fin demand through public campaigns; markets for shark meat remain poorly understood — with low resolution for traded volumes and species composition. Information regarding the socio-economic, geographic, and cultural aspects that influence the shark meat trade are also scarce.

Unlike the shark fin trade, which follows consolidated and centralized networks into a few dominant markets in Asia, shark meat markets appear to follow new, distinct, and decentralized supply routes to meet traditional, expanding, and emerging demands, especially in Latin America, Europe, and Asia. In addition to the complexity of multi-scale and widespread markets, a comprehensive understanding of the global shark meat trade is hindered by under-reporting, mislabelling, and the recording of traded shark products using taxonomically and commodity aggregated categories, making it challenging to disaggregate the meat trade by species. Moreover, shark meat markets are more widespread than shark fin markets due to the higher demand for shark meat as a protein source. There has been a noticeable expansion of the meat trade in recent years despite documented declines in shark fisheries production.

Our global shark meat project, initiated in 2019 and supported by the Shark Conservation Fund, aims to quantify species-specific

trade in shark meat among key shark fishing countries, separating meat consumed domestically and traded internationally. In doing so, we seek to identify major sources and sinks for shark meat, including those that threaten potentially threatened species. We target 56 countries based on their known or suspected role as major producers, exporters, importers, or consumers of shark meat. Data on shark catches and trade for each selected country are being obtained through collaborative data acquisition and field surveys. Using a multi-faceted modelling and fieldwork approach, in collaboration with a global network of experts, we will estimate species level fisheries exploitation, domestic consumption, and international trade in shark meat. We believe that developing a global model of species-specific exploitation and trade will be critical for creating national, regional, and global conservation and management strategies for sharks.

An essential outcome of this project will be to identify species of relevance to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) that constitute a significant fraction of the global shark meat trade. Key to the success of this project will be the translation of our results into policy-relevant information and actions that can be disseminated globally, delivering detailed information to show governments their role in the global shark meat trade and support effective management of threatened shark species, as well as encourage sustainable exploitation. We are a highly collaborative project and encourage anyone interested in the project to reach out to Ana Martins (a.martins@dal.ca) or Chris Mull (chris.mull@dal.ca) to discuss ideas.

Project Principal Investigators: Dr Elizabeth Babcock (University of Miami), Dr Luke Warwick (WCS), Dr Demian Chapman (Mote Marine Laboratory), and Dr Aaron MacNeil (Dalhousie University).



Tissue samples collected from landed carcasses in Tutóia, Northeast Brazil



Photo by Ana Barbosa Martins

Landed carcasses with
fins attached in Tutóia,
Northeast Brazil



Photo by Paulo Santos

→ Fresh Tiger Shark
[*Galeocerdo cuvier*] commercialized in the municipality of Tutóia, Northeast Brazil

↓ Shark meat commercialized in different forms [e.g. trunks, fillets, etc.] in Bragança, North Brazil



Photo by João Bráulio L. Sales



Photo by Ana Barbosa Martins

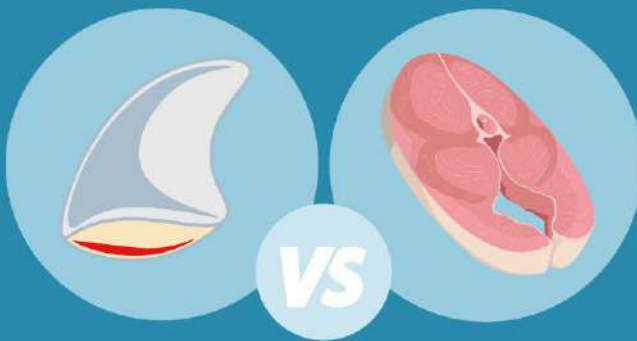
↓ *Narcine* sp. landed in Bragança, North Brazil



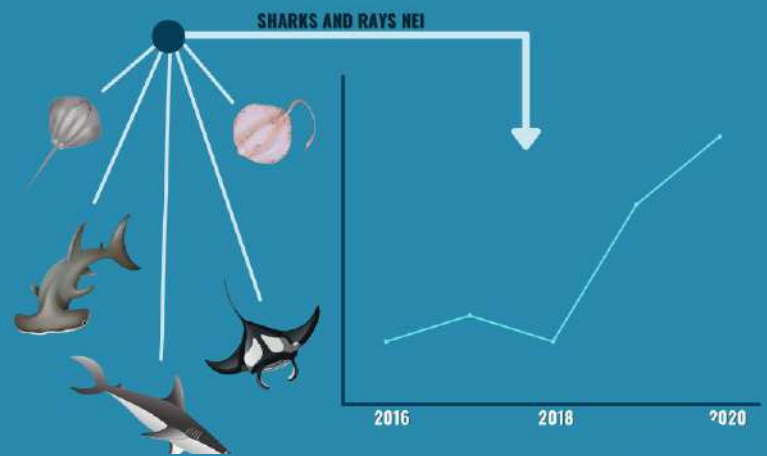
Photo by João Bráulio L. Sales



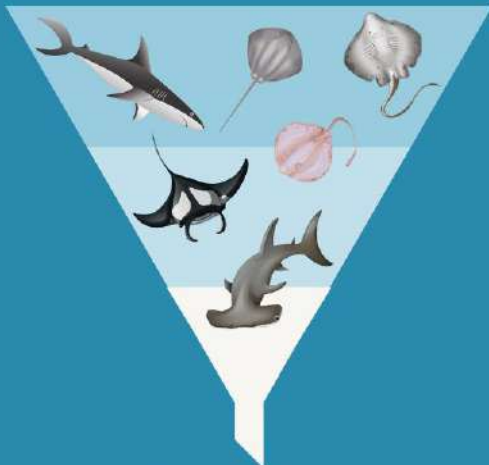
WHAT IS MORE VALUABLE, SHARK FINS OR MEAT?



POOR RESOLUTION IN LANDINGS DATA



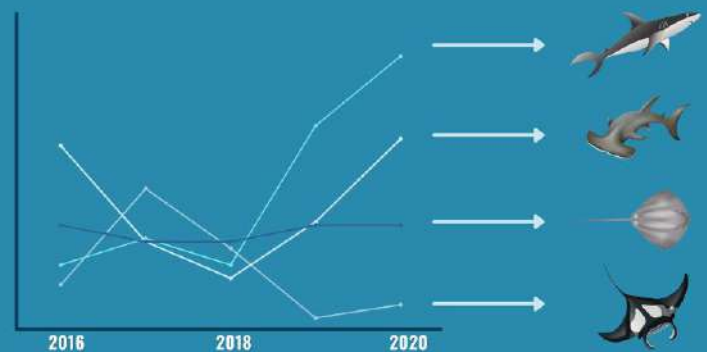
HOW MANY SPECIES FIT INTO COMMODITY CODES?



030265

DOGFISH AND OTHER SHARKS, FRESH OR CHILLED, WHOLE

IDENTIFYING SPECIES IN CATCHES AND IN TRADE





Creating the Next Generation of Shark Advocates

Students from Bimini exploring the ocean during a Shark4Kids field trip with Bimini Scuba Center

Written by Jillian Morris

Founder & President | Sharks4Kids

When you are taught to fear something, it is nearly impossible to care about it. During many of the shark lessons we have taught, in person and virtually, I have had five-year-olds from landlocked areas tell me they are afraid of sharks. How does this happen? Why does this happen? Education is how we can change the conversation, and it is how we empower and inspire students to take action for sharks and the oceans. Kids are usually overlooked when conservation action plans are created and implemented, but they might just be crucial for the longevity and sustainability of these efforts. Sharks4Kids was born from a belief that kids can make a difference. They are powerful and can influence their peers, families, and community.

The goal of Sharks4Kids is to create the next generation of shark advocates through education, outreach and adventure. Since we launched our website in November 2013, we have taught nearly 200,000 students about sharks, shark science and shark conservation. We have done over 1500 virtual lessons with students in 74 countries and 49 US States. We have done in-person visits in 15 countries and 16 US States. In 2021, despite the challenges COVID presented, we were still able to teach nearly 40,000 students.

Resources

Our team of scientists, educators, videographers, artists and photographers have created a dynamic range of materials and resources for students, teachers and parents. These include lesson plans, crafts, coloring pages, videos, curriculum and more. By using Next Generation Science, Standards, Ocean Literacy Principles, and UN Sustainable Development Goals, we have created relevant and accessible resources for educators to incorporate into their required topics. These are free to access and have guides on how to best use them.

Classroom Visits

Learning comes to life when students can engage with a person working directly in the field or with the animals they are learning about. Our virtual learning experience has been available for over eight years. It allows us to travel the world and reach even more students, and it eliminates financial barriers that otherwise might restrict schools from experiencing this kind of learning. We launched our webinar series in 2020, which allowed us to connect students with over 100 different scientists, artists, authors, photographers, and videographers worldwide.

Field Trips

The Bahamas is arguably the 'Shark Diving Capital of the World,' with shark ecotourism generating nearly 114 million USD annually. The Bahamas established its shark sanctuary in 2011, banning the landing of sharks and the possession or sale of sharks and shark parts. During in-person school visits on seven of the islands, Sharks4Kids has taught students from age 4-18 about sharks found in their region, the conservation status of these sharks, the importance of the sanctuary, career opportunities and why they should be proud to be from a country at the forefront of shark research and conservation. When we ask if students have ever seen a shark, most hands have raised no matter which island we have been on. I love the reaction when I tell students they are "lucky" to have seen a shark. It is not something they have really thought about. They are even more surprised when I mention that most kids their age have never seen a shark or even the ocean. These visits have increased awareness, but the greatest impact has come from getting kids in the ocean. Experiencing something first-hand not only creates a connection but can also change one's perspective.

Despite living on the small islands of Bimini, most of the students Sharks4Kids has taken out have never been on a boat. Partnering with Neal Watson's Bimini Scuba Center, we have been able to take hundreds of middle and high school students to see six species of shark and two species of ray. Students' first immersion is standing in shallow water off a beach, and eventually, they can snorkel with Southern Stingrays [*Hypanus americanus*] and Atlantic Nurse Sharks [*Ginglymostoma cirratum*]. We then move to a site in slightly deeper water with Caribbean Reef Sharks [*Carcharhinus perezi*] or sometimes Great Hammerheads [*Sphyrna mokarran*]. On every single trip, we see fear turning to fascination right before our eyes. Kids go from not wanting to get in the water to not wanting to get out. It's remarkable how fast such a drastic and significant change happens. These moments are not only amazing, but we are seeing them shape the lives of students as they get older. Sharks4Kids has been taking students from the island of Bimini, The Bahamas, on field trips for a decade, and we see the ripple effect of education and outreach. Parents stop me in the street to share their kids' excitement and usually how they won't stop talking about sharks. We have also seen more and more of the local teachers asking to join us on field trips. They are eager to have their own experience and learn. We even had one of the science teachers learn to scuba dive because of his trips with us. In turn, he has encouraged his students to pursue more ocean-related careers and opportunities.

The crew from the dive shop also share their stories with students. Many were afraid of sharks but are now diving guides and even shark feeders on the provisioning sites. Two of the students who have gone through our program are currently working for the



dive shop. It's been amazing to see their journey. They have overcome their initial fear and have become incredible ambassadors for sharks. Ranelle first joined us in 2012, visiting the mangroves to see juvenile Lemon Sharks (*Negaprion brevirostris*). I still remember the trip and how nervous she was. Flash forward 2021, and she is now a feeder on the Great Hammerhead dive safaris. There are very few Bahamian women who are dive guides or instructors, so she is a true inspiration to girls and young women in the community. She is breaking barriers and helping them see what is possible.

The Future

Sharks4kids is constantly creating new content and updating our resources to match new data and species. We are also teaching kids about weird and wonderful species, the ones they won't necessarily see on the cover of a book or television.

Sharks4kids is partnering with scientists and organizations in different regions of the world to create more localized programs. We believe that having a local ambassador connect and teach local area students is essential and more effective. Students are more likely to connect with someone from their community, and this connection can shape what they imagine possible and opportunities they might pursue. We've seen this in The Bahamas and are excited to expand our reach.

Jillian with juvenile
Lemon Sharks in Bimini





Jillian snorkeling with a student from Bimini - all smiles when she experience the underwater world for the first time!

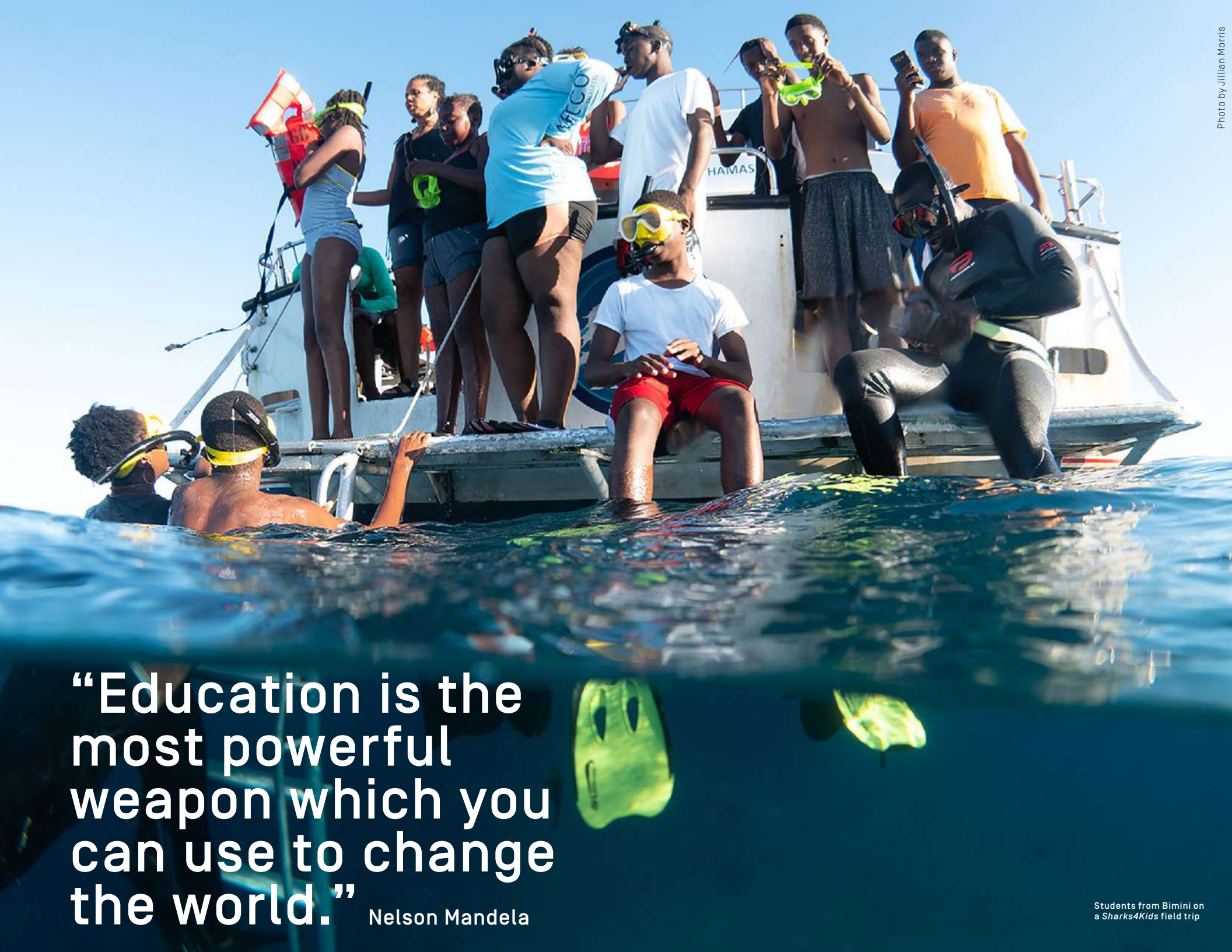
“When we fear or mis-
understand something,
our concern or capacity
to care is absent. And as
I have learned over my
career, for conservation
to be successful, people
need to care.”

Rick McPherson





Students going on a virtual shark dive to learn more about these amazing animals



“Education is the most powerful weapon which you can use to change the world.”

Nelson Mandela



Photo by Dr Enle Hensel



Photo by Duncan Brake



Safe Space for Sharks: Important Shark and Ray Areas

Written by
Dr Lauren De Vos

Sharks and rays have never been in more trouble than now. With recent International Union for the Conservation of Nature (IUCN) Red List of Threatened Species updates positing that over a third of all species have a high risk of extinction, the need to explore new tools for their protection is urgent. The IUCN Species Survival Commission (SSC) Shark Specialist Group's Important Shark and Ray Areas (ISRAs) initiative aims to identify key areas that play a critical role in the survival of sharks, rays, and chimaeras. Using the best available science and drawing on the existing experience from other Important Area processes, scientists hope to provide information on sharks, rays, and chimaeras and highlight these special areas to decision-makers.

It's summer in the southern hemisphere and female Sand Tiger Sharks (*Carcharias taurus*) are congregating at Quarter-Mile reef off the South African coast. Most of the female sharks amassing here are pregnant and come to Sodwana Bay, a popular dive destination in the iSimangaliso Wetland Park, to gestate in these warm waters. The pregnant females who call Quarter-Mile and Raggie Reef in iSimangaliso their maternity ward are the lucky ones: no angling of any sharks or rays is permitted here. iSimangaliso – the park's name means "Miracle and Wonder" in the Zulu language – is a UNESCO World Heritage Site and South Africa's largest coastal marine protected area (MPA).

The fact that an MPA can protect individual sharks during a key life event, and one where they are all grouped together at one time is important. Many sharks are wide-ranging nomads that move huge distances across the oceans; however, many more shark and ray species have specific habitat needs and use what scientists term "essential habitats" for mating and pupping, as nurseries, and for feeding. Even those species that travel extraordinary distances, like Sereia the Tiger Shark (*Galeocerdo cuvier*) that was recorded by Dr Ryan Daly from the Oceanographic Research Institute (ORI) as having swum 6,500 kilometres from southern Mozambique to Indonesia, need safe spaces to protect them at various stages of their lives and in special places across our oceans.

How do we identify, manage, and motivate for the conservation of other areas that may require the same kind of protection that iSimangaliso provides to sharks? Over the course of 400 million years, chondrichthyans (sharks, rays, and chimaeras) have filled every inch of our oceans. Weird, wild, and wonderful forms make this group one of the most diverse on our planet. And it is their very diversity that makes chondrichthyans important: such variety means that they may very well perform a host of different functions. These functions provide services for our own survival.

Over time, chondrichthyans have populated coral reefs and seagrass meadows, mangroves and kelp forests, open oceans and murky depths: in each marine habitat, we find a special suite of species that are adapted to their home. As fascinating and important as these animals are to us, we are only just uncovering basic

information about their life histories. In many cases, we don't know where most shark species mate or pup. Consolidating information about how sharks and rays use different habitats and where they are most susceptible to human activities may be the key to protecting chondrichthyans during important life stages. Finding out which regions harbour extraordinary diversity or high levels of endemism (where species are found that occur nowhere else on earth) might also help us focus on managing those places where many forms – and therefore, functions – can be most effectively conserved.

What is an ISRA?

Important Shark and Ray Areas (ISRAs) are specific ocean areas or identified marine habitats that are considered key to the survival of shark, ray and chimaera species (hereafter referred to as 'sharks'). These areas can (and should) be managed separately for the purpose of conservation. Currently, these areas exist in theory only. In fact, they live as a developing idea. This process is spearheaded by the IUCN SSC Shark Specialist Group and will draw on expertise globally and rely on the input of many stakeholders.

The ISRAs are not a new concept. Their predecessors, the Important Bird and Biodiversity Areas (IBAs) and the Important Marine Mammal Areas (IMMAs), are examples that guide how the same approach might work for sharks too. According to Birdlife International, the IBAs are sites that are considered of global importance for bird conservation: they are deemed the most critical areas to protect. Worldwide, a network of over 13,500 IBAs was determined using standardized criteria and a scientific selection process. An IBA or an IMMA can be identified on a map in physical space. California's Salton Sea, for instance, is an IBA: a space for breeding Laughing Gulls (*Larus atricilla*), an aggregation site for American White Pelicans (*Pelecanus erythrorhynchos*), and the wintering site for the world's largest concentration of Black-necked Grebes (*Podiceps nigricollis*). On the IMMA website, hovering your cursor over the digitised map highlights, for example, the Eastern Indian Ocean Blue Whale (*Balaenoptera musculus*) migratory route that stretches the length of the Western Australian coastline. This IMMA spans the route migrated by a Blue Whale subspecies – the Pygmy Blue Whale (*Balaenoptera musculus brevicauda*) – from its summer feeding grounds in the Perth Canyon to its breeding grounds in Banda, Indonesia.

Just like the IBAs, the IMMAs, and the soon-to-be Important Marine Turtle Areas (IMTAs), an ISRA will hold no legal sway and have no management stipulations. Whichever area has been identified, reviewed, and defined as an ISRA will exist not only in name on a map but also as a suite of scientific information consolidated by regional experts that is available to decision-makers. "The information that is amalgamated through collective expertise by a group of regional experts is subject to peer review. This ensures that the required criteria are met and that the Important Area is actionable". Dr Giuseppe Notarbartolo di Sciara completed his PhD working on Devil Rays (family Mobulidae) at the Scripps Institution of Oceanography, University of California San Diego, and is a member of the IUCN SSC Shark Specialist Group. However, his life's work has also largely encompassed research focused on marine mammals, and he has formed part of the IMMA team. His insights are contributing to the unfolding ISRA journey. While an IMMA (or ISRA) delineation may not lead to an area-based protection, the information it provides could help guide exactly that – and its identification itself may be a persuasion to act to conserve the biodiversity found there. Giuseppe relates an experience from the IMMA process: "The IMMAs were first placed on a map in 2017. This



Mangroves and coral,
Kimbe Bay, Papua New Guinea

Photo by Matt Curnock | Ocean Image Bank



Seagrass meadow in Greece
Mediterranean Sea

Photo by Dimitris Poursanidis | Ocean Image Bank



St Joseph Atoll, Seychelles



North Bimini, The Bahamas

is a very short timescale for policy to be enacted, but despite this, we have still witnessed enormous interest,” he notes. “We are still in the interest phase rather than in the implementation phase. But,” he offers by way of example: “When the South African oil company Sasol had been granted a permit to explore Mozambique’s Bazaruto National Park (and the IMMA to its north) for gas, information about the only viable population of Dugongs (*Dugong dugon*) left in Africa was available [a factor that had informed IMMA delineation here]. Sasol pulled out of the venture, and I cannot say that they did this because of the IMMA identification. But I can assume that it played a role”. Giuseppe’s take-home message is that the IMMAs are starting to show that once you’ve consolidated the information and presented it in a useful way, the uptake of scientific evidence by policymakers, governments, NGOs, citizens or any other actors might be swifter, and more effective for translation into policy.

Why are ISRAs important?

Sharks are a contemporary conservation crisis. “The premise for this whole process is rooted in the fact that chondrichthyans are highly threatened: the paper published last year in *Current Biology* showed that an estimated 37% of species are threatened according to the IUCN Red List.” Dr Rima Jabado is the current Chair of the IUCN SSC Shark Specialist Group, and her concern for the status of sharks species has spurred her push to ensure the ISRAs become a reality as a tool. “However,” she continues: “Fewer than 5% of species are listed on any international agreement. We seem to be doing so much, and yet so little”.

The ISRA process is also overdue if we are to understand anything more about critical shark habitats. Rima flags the paucity of our natural history knowledge for many sharks: “Two excellent examples are White Sharks (*Carcharodon carcharias*) and Whale Sharks (*Rhincodon typus*). We know that there are aggregations, but where are the pregnant females? Where are the baby sharks?” What is known for the pregnant Sand Tiger Sharks of iSimangaliso is information that still needs consolidation for other species and regions. “We lack basic life history information on some of the ocean’s most charismatic animals. I believe that this ISRA process will catalyse increased focus on what information we’re missing”. Rima’s work in the Middle East and West Africa has revolved around shark fisheries; despite this, she asserts: “For too long, we have been focused on the impact of fisheries on sharks and how these species are interacting with fisheries. The pool of research done on critical habitats, by comparison, seems small”.

Despite her strong research background in shark fisheries, Rima is increasingly convinced that we need to shift some focus to new tools that can be used in conjunction with the fisheries treaties and trade management that have been the hallmark of traditional shark conservation. “What are the regions of hope for certain species? Spatial solutions can be effective when well-designed and efficiently implemented”. She cautions: “Most MPAs have not been effective for sharks, largely because these networks were not established with this taxon in mind or for different reasons. With ISRAs, when MPAs are being designed and established, there will be information available to policymakers to consider sharks”. Rima continues with an observation that her years in fisheries make clear: “From a management perspective, typically sharks have been seen as a fisheries issue by the environmental sector, and as a biodiversity issue by the fisheries departments. The idea is to find a balance where both ministries are responsible for, and considering, sharks.”

So, there is a rationale for the need to conserve sharks and the need for a new spatial tool. But what essential goals could ISRAs

achieve? Giuseppe’s experience with the IMMAs guides an insight: “You can do several different things with an Important Area [IMMA, IBA or future ISRA]. You can decide that an ISRA or part of an ISRA can become an MPA – or you could decide that a shipping lane should be moved outside of that ISRA if maritime traffic poses a threat. You could modify the fishing activities in a particular season. Our goal is to bring the best information science can provide to government and policymakers”.

How did ISRAs come about?

“We have taken the example of the Important Marine Mammal Areas (IMMAs) to construct the ideas of the ISRAs, which in turn were taken from the example of the Important Bird and Biodiversity Areas (IBAs)”, explains Giuseppe. And how will the ISRAs take shape? Rima chuckles: “That’s exactly the question we are currently grappling with. What are the data sources? What are the criteria by which we will guide ISRA selection? We need a scientifically robust process: these nominated areas will be scrutinised. We need to ensure the information we are gathering is strong enough to support the decisions that follow.”

How are ISRAs different from MPAs?

“The difference between ISRAs and MPAs is like night and day”, asserts Giuseppe, whose experience with the IMMAs guides his insights into what the ISRAs will become. “But it’s still a key question to clarify”. Giuseppe’s need for a precise distinction comes from experience: the concept was not made explicit during the initial IMMA process, and authorities did not initially understand this difference. The consequence was that they were very hesitant to offer support in the early phase. “The MPAs are a legal tool made by human beings for human beings”, he pauses. “What I mean by that is that managers of a particular ocean area designate rules that regulate, for conservation purposes, human behaviour in that area. That’s an MPA”. He continues: “IMMAs or ISRAs are based on our scientific knowledge of the ecology and habitat requirements of a particular species, or a particular group of species, but ...” and here he cautions: “An Important Area (be it an IBA, IMMA, IMTA or a future ISRA) does not dictate at all what must be done with this information. And it’s important to ensure that this difference is well understood. For example, those of us scientists involved in the ISRA process have no authority to decide whether an area should be protected or not; all we can do is recommend based on our scientific knowledge that something is important for protection”.

“Of course, the idea is that the designation of an ISRA will hopefully stimulate management action and inform policy where it is most needed”.

How is an ISRA identified?

Giuseppe outlines the process followed by the IMMAs: “We work region-by-region. We solicit the submission of provisional areas of interest from anyone, and the submission has requirements that are outlined in a template. A regional workshop is held to examine the area’s merit for submission, and we invite regional experts (usually between 20 and 30 experts). Not all submissions become Important Areas. At the end of the workshop, we have a list of candidate IMMAs. These go through a further review panel, and a good number of them don’t make it to IMMA status if the science they are based on is not robust enough”. Rima adds that the ISRA approach will likely use the nine regions used by the IUCN SSC Shark Specialist Group as their starting point and that each region should take about a year to review.

There is also the question of which areas have a head start on



St Joseph Atoll is the most important nursery area on the Amirantes Bank in Seychelles, and a critical breeding ground for sharks, rays and turtles

available research and therefore are nominated as candidate ISRAs. Giuseppe explains: “We don’t always have all the information we need to identify an IA. In fact, we have many regions without much information [for instance, the high seas and areas beyond national jurisdiction]. We tend to have more IAs within Exclusive Economic Zones (EEZs) not because the high seas are less interesting for the animals but because we simply don’t know enough to designate IAs there. A good portion of the ocean doesn’t have an IBA or IMMA and won’t have an ISRA, not because they are irrelevant but because we don’t know about it. The process, however, is repeated each decade. So, hopefully, we will improve our understanding from one decade to another”.

“There is a lot of scattered information. The exercise here is collating this information and having it published as a map to show people what is available”, explains Rima. “We are always going to feel there are insufficient data. But there are enough data to at least say what can be prioritised right now”.

Where is the ISRA process heading?

“This process is funding-dependent”, reminds Rima. “Dedicated people need to be hired to complete this work. Therefore, I’ve really wanted the first year of the ISRAs process to be about laying solid

foundations that will form the basis for expansion in the future. We need to have rigorous criteria established that have found consensus.” With a framework in place that can guide ISRA designation in other regions, and the human capital to complete the workload, the project becomes both repeatable and scalable. Rima concludes: “Once this process is in place, and more funding is available, you can hire more people [and the project scales up relatively quickly]. It’s a question of resources and time”.

The year 2022 is therefore about selecting, reviewing and finalising the criteria that will guide the designation of an ISRA. The document to guide the ISRA process will be launched at the 5th International Marine Protected Areas Congress (IMPAC5). You can follow the process at the new ISRA website: Important Shark and Ray Areas [sharkrayareas.org] and through their social media channels on Facebook, Twitter and IUCN SSG newsletter’ Shark News [iucnssg.org/shark-news.html].

*Support for this work has been received from the Save Our Seas Foundation, the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety, and Consumer Protection. The identification of the ISRA selection and review criteria is being coordinated by the IUCN SSC Shark Specialist Group with support from the IUCN Ocean Team and the IUCN Marine Mammal Protected Areas Taskforce.

Jardines de la Reina, Cuba



ISRA
IMPORTANT SHARK
AND RAY AREAS



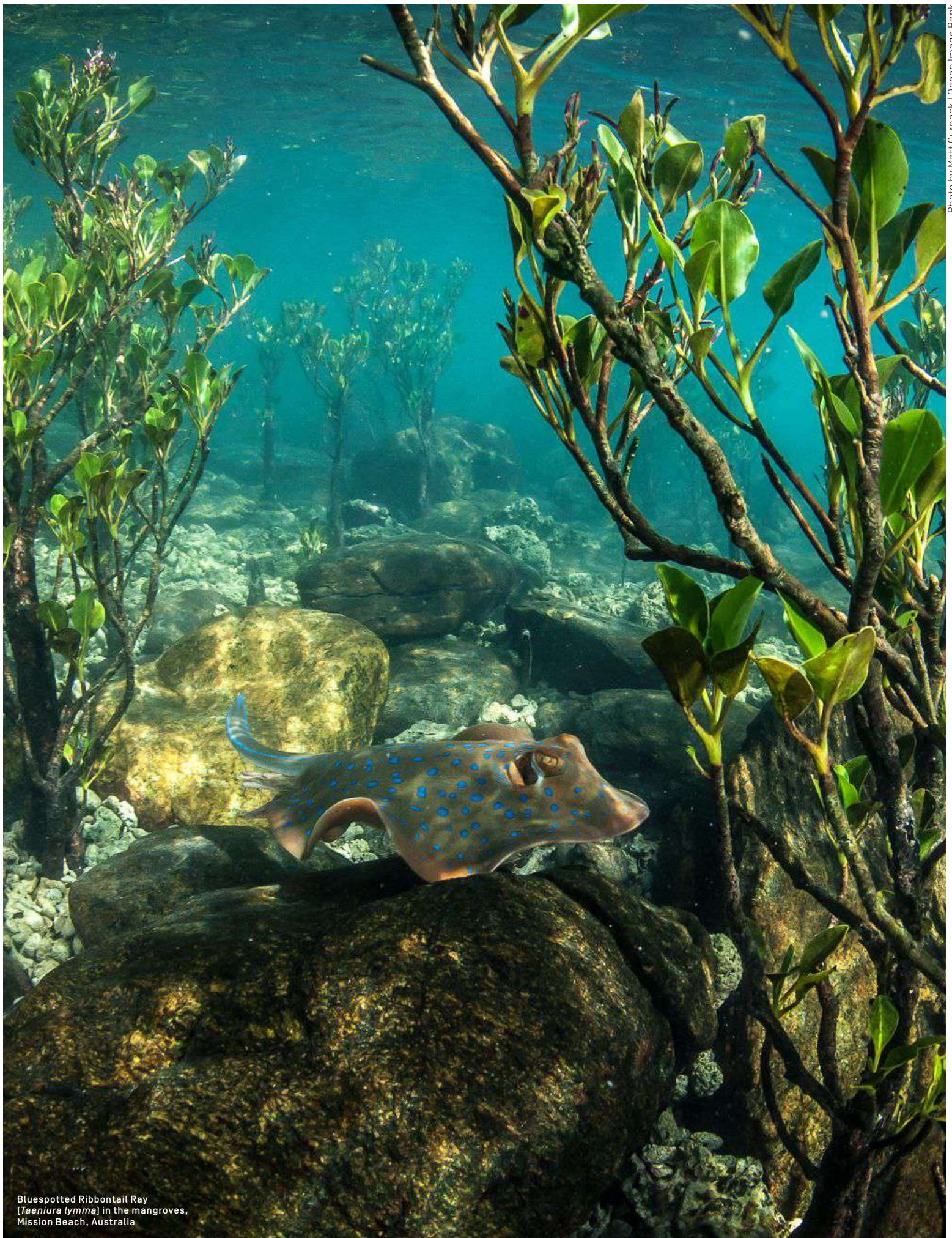
Juvenile Lemon Sharks (*Negaprion brevirostris*) living their first few years among the protection of the shallow waters within the Mangroves of Bimini Island

↑ Photo by Michael Scholl | Save Our Seas Foundation

↓ Photo by Sirachai (Shin) Arunrugstichai | shinsphoto.com



Giant Freshwater Whipray (*Urogyomus polylepis*) with researchers



Bluespotted Ribbontail Ray
(*Taeniura lymna*) in the mangroves,
Mission Beach, Australia



Aerial view Mayotte Island



Many of the islands shallow coastal waters where Giant Guitarfish (*Glaucostegus typus*) pups were observed are in close proximity to human settlements. As a result, their habitats are threatened by anthropogenic activities such as waste disposal, boating and fishing activities.



Region
Update:
Indian
Ocean

A refuge amidst peril

Giant Guitarfish in the Andaman Islands, India

Written by Evan Nazareth
Nature Conservation Foundation, Mysore

India supports one of the world's major shark and ray fisheries, the effects of which were largely undocumented until recently. While a growing field of shark and ray fisheries research expanded our knowledge on the sheer species diversity in our waters, it also uncovered their drastic population declines. Close relatives of the more familiar stingrays, giant guitarfishes (family *Glaucostegidae*), are one such example. Five of the seven species of Giant Guitarfishes are found in the heavily fished waters surrounding the Indian peninsula. As a result, their populations have declined significantly, making them one of the most threatened marine species.

After years of conducting fisheries surveys and seeing Giant Guitarfishes at fish markets and auction sites across India, it was not until a walk along the shore of the Andaman Islands that I saw my first live Giant Guitarfish, which was soon followed by a second, and then a third. New-born pups, merely 30 cm long, these odd little creatures seemed to be aggregating in ankle-deep water along the coast of India's remote archipelago. This led me to wonder if they were using these habitats as nursery grounds, which, if true, could have major conservation implications for these Critically Endangered and poorly known species.

So began The Giant Guitarfish Project. With funding from the Rufford Foundation, we started by understanding the extent to which Giant Guitarfish were distributed across the Andaman Islands and identifying locations where the juveniles were aggregating. We did this by utilising Local Ecological Knowledge (LEK), which has proved to be a rich source of baseline information on elusive and data-poor species. Between September 2019 and June 2020, we conducted 175 interviews with members of local communities who lived and worked along the

island's vast coastline.

The extensive interview survey helped identify 70 locations across the islands where Giant Guitarfishes were observed, with a majority of these observations being of juvenile animals in shallow nearshore waters. However, our data also suggest that their populations have declined significantly over the last two decades. While at present we have only confirmed the occurrence of the Giant Guitarfish (*Glaucostegus typus*) in the islands, this may not have always been the case, but rather, a result of other Giant Guitarfish species succumbing to severe population declines.

Nevertheless, this survey has helped identify several potential nursery areas across the islands. This in itself is a significant finding, showing that a species on the verge of extinction across most of its range is still relatively abundant in these islands. As research focusing on these elusive species progresses in India, it is essential to see the data generated through these projects also translate to conserving the species in our waters. Moving forward, The Giant Guitarfish Project aims to understand better the role that shallow coastal habitats play in the species' life, highlighting the importance of these habitats to this globally significant population and using these findings to designate areas that require focused conservation initiatives.

Further reading:

Nazareth, E., D'Souza, E., Arthur, R., Jabado, R.W., 2022. Distribution of the Critically Endangered Giant Guitarfish (*Glaucostegus typus*) based on Local Ecological Knowledge in the Andaman Islands, India. *Ocean Coast. Manag.* 220. doi.org/10.1016/j.ocecoaman.2022.106075

A Shovelnose Guitarfish (*Glaucostegus granulatus*) at a fish landing site in south Maharashtra, India. Giant Guitarfishes are a frequent sight at fish markets and landing sites that obtain their fish from nearshore fisheries.





Respondents were shown pictures of Giant Guitarfish and Wedgefish to evaluate their ability to distinguish between these two morphologically similar species groups.



Angling for Shark Science Anglers and Scientists, Together as Equals



Photo by Harry Stone | @harrystone_photo



Region
Update:
Northern
Europe

Hannah Rudd

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Recreational shark angling can be controversial. Images that circulate the internet every year can showcase poor practice to the detriment of the animals featured and are emotionally evocative. These images and associated social media posts often spur anti-angling rhetoric that generates unhelpful stereotypes and overlooks the practice's potential benefits to science and conservation. As a result, it further drives a wedge between the two communities rather than building on common ground through outreach and education to overcome these problems.

Historically there has been a disconnect between recreational angling and science, with the two communities being siloed from one another. This has been especially prevalent in the UK, where angler-led scientific initiatives have attracted the greatest participation and scientist or Government-led data recording schemes are often shunned. When attempts have been made to work together, a lack of transparency and trust in scientists and Government is often cited as the breakdown of these connections. A recent survey of UK recreational shark anglers [manuscript in prep] revealed that 98% of respondents believe that scientific research on UK sharks is valuable, and 68% would like to contribute more to scientific and conservation research.

Recreational angling can provide high-quality data on shark abundance, distribution and demographics, and plug much-needed information gaps required for conservation management, particularly as charter skippers and anglers are at sea more frequently and for more extended periods than scientific survey budgets allow. It can also facilitate the collection of valuable scientific samples, for example, genetic and dietary studies. Skippers' and anglers' ability to monitor life in the ocean alongside the value of their often decades-long experience has often been overlooked. However, it can deliver missing pieces of the scientific puzzle.

Shark Hub UK is a new collaborative group that brings recreational shark anglers and scientists together as equals for sharks. The collaboration comprises representatives from Bournemouth University, the University of York, Plymouth Marine Laboratory, the Angling Trust, the Shark Angling Club of Great Britain, the Pat Smith Database and the Sportfishing Club of the British Isles. Teaming up the practical knowledge and insight into shark activity that recreational shark anglers in the UK hold, with the skills and analytical tools available to scientists, Shark Hub UK is an exciting venture for anglers and shark

scientists alike. The coalition is working towards shared objectives for a healthier future for shark species in the North Atlantic. The group seeks to achieve this by advocating the importance of knowledge and data gathered by the recreational angling community and by providing shark anglers with the best resources for best-practice handling, including information and practical guidance involving shark biology, ecology, and conservation.

As a collective, Shark Hub UK has already achieved significant success, even before its more formalised partnership in June 2021. Through a series of shark-focussed Angling Trust Virtual Sea Angling Forums, they have connected hundreds of sea anglers with the expertise of researchers Dr Georgia Jones, Dr Simon Thomas, and Dr Bryce Stewart to engage sea anglers in shark research and share with them detailed information on the how and why of shark angling best-practice.

Importantly, Shark Hub UK has also demonstrated the significant value of angler data and participation in the scientific understanding of our shark species. The Shark Angling Club of Great Britain and Pat Smith Databases contain thousands of recreational shark capture records collected over the last 60 years, together representing one of the most extensive datasets of Blue Sharks (*Prionace glauca*) globally, in addition to high quality, catch per unit effort adjusted data available for several other species. The data on Porbeagles (*Lamna nasus*), which are listed as Critically Endangered in Europe and severely lacking in data from the Northeast Atlantic, were presented at the 2021 International Commission on the Conservation of Atlantic Tunas (ICCAT) Standing Committee Research and Statistics, providing valuable data on catch trends following the zero Total Allowable Catch introduced for commercial fisheries in 2010.

Building resilient relationships between stakeholder groups that can make a meaningful contribution to conservation take time, but this investment is fundamental to the long-term goals of shark conservation. There is a considerable way to go and many hurdles to overcome to make recreational shark angling as sustainable as possible. Still, by working closely with the angling community, Shark Hub UK aims to establish that reality sooner than if the disconnect continues.

For more information, please visit
anglingtrust.net/sea/shark-hub-uk/
twitter.com/sharkhubuk
instagram.com/sharkhubuk/
facebook.com/sharkhubuk



Photo by Harry Stone | @harrystone_photo

Unmanaged Trade Jeopardizes Freshwater Stingrays Management and Conservation



Region
Update:
South
America



Xingu Freshwater Stingray (*Potamotrygon leopoldi*), one of the most valuable traded species, in its natural environment in the Xingu River

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Neotropical freshwater stingrays (Potamotrygoninae) are restricted to the main South American river basins [Carvalho 2016]. They are an important biodiversity component in aquatic ecosystems and are highly valued by aquarists due to their attractive color patterns and are regionally feared for inflicting sting wounds [Rosa et al. 2010, Junior et al. 2013, Ramos 2017]. Many species are endemic to specific rivers or basins [Fontenelle et al. 2021], so identifying their capture range from the wild is possible. In 2004, Brazilian scientists [Araújo et al. 2004] submitted an Information Document to the Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES] Animals' Committee [AC], highlighting the need for efficient potamotrygonin trade control and management. After years of discussions, a CITES Appendix III listing [i.e., voluntary reporting of species and quantities traded] was recommended [CITES 2017]. In the past, some South American parties proposed CITES Appendix II listings [i.e., matching export and import quantities of species and trade at sustainable levels]. However, none reached the votes required for adoption by the Convention. Despite being successfully farmed in captivity with value-added hybridizations to obtain valuable color patterns [Raghavan et al. 2013], the demand and trade of wild-caught specimens persist due to farming inbreeding issues. Besides the ornamental trade, commercial fishing to supply fish markets has impacted potamotrygonins. Some species taken for food are considered Critically Endangered in the Brazilian National Red List [Araújo et al. 2018], such as Discus Ray (*Paratrygon aiereba*). The market has been expanding from regional to international. Currently, under Appendix III, wild-caught, endemic species continue to have exports reported from countries where they do not even occur [CITES 2021].

Moreover, in countries with national regulations [i.e., export quotas], illegal trade only increases post-capture mortality [Beltrão et al. 2021]. With stricter export and import control, an Appendix II listing would not ban wild-caught potamotrygonins from the international aquarium market. Still, it would help avoid illegal trade and require sustainable fisheries. If CITES can contribute to the regulation of international animal trade of endemic and restricted-range species, then who benefits from an ongoing illegal trade? Hope is for changes at the 2022 upcoming CITES Conference of Parties Meeting.

Acknowledgements: The authors acknowledge the help of ornamental fishers and fieldwork assistants.

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Skinned pectoral fins of Discus Ray (*Paratrygon aiereba*) for sale as food in the open market of Manaus, in the northern region of Brazil

Photo: Ruben Dario Morales-Gamb



Wallace's Freshwater Stingray (*Potamotrygon wallacei*), a key species from the Negro River basin found in the ornamental trade

Photo by Maria Lúcia Góes de Araújo

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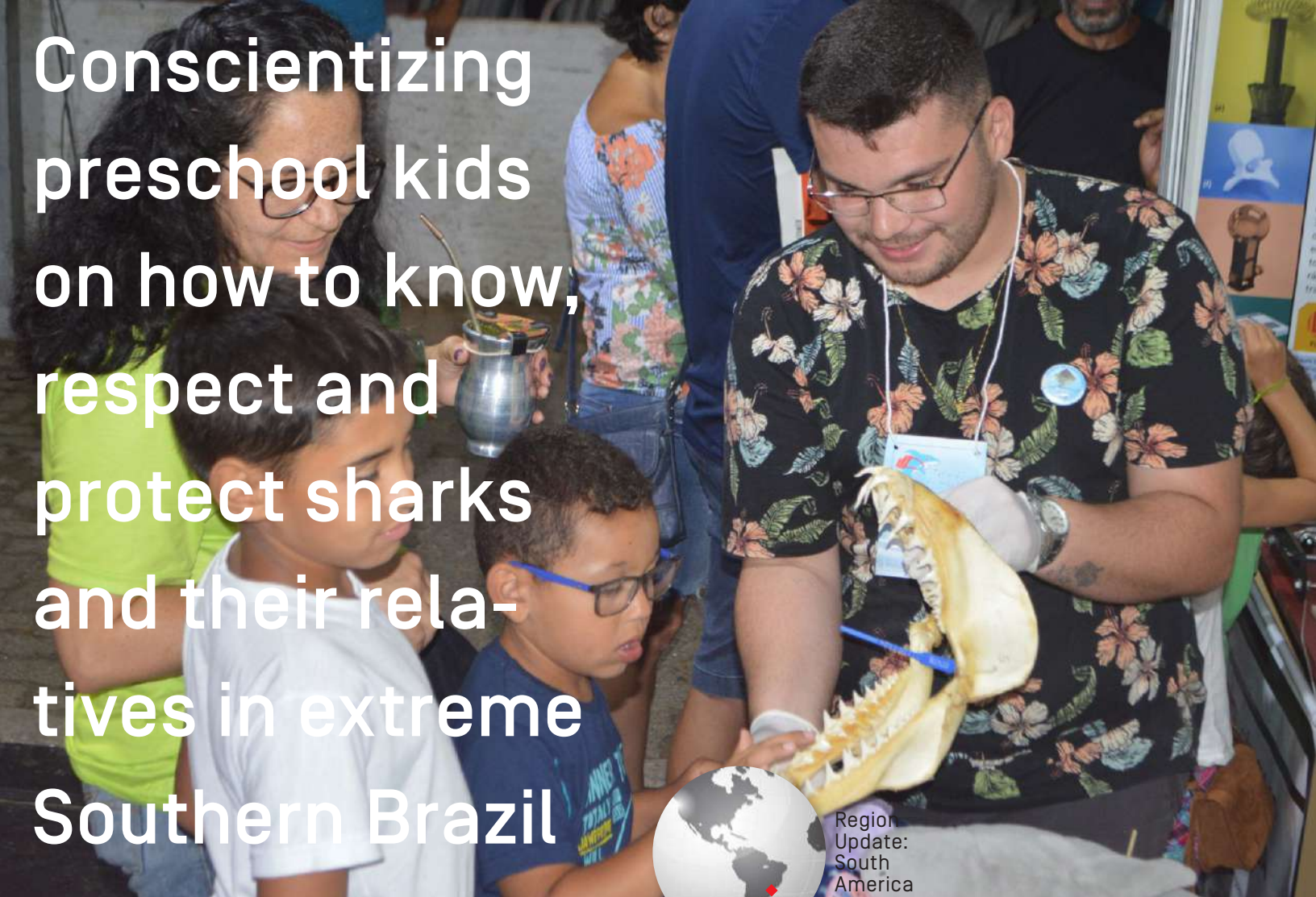
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Conscientizing preschool kids on how to know, respect and protect sharks and their relatives in extreme Southern Brazil



Region
Update:
South
America

All photos provided by M. Oddone

Dr Maria Cristina Oddone

IUCN SSC Shark Specialist Group | South America Regional Group | Member Project “Backpack Sharks” (Projeto Tubarões de Mochila) | Founder and coordinator

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The Backpack Sharks Project (Projeto Tubarões de Mochila) is a university initiative from the Instituto de Ciências Biológicas, Federal University of Rio Grande (FURG), devoted to society. The target public is preschool children, and it was formally initiated in 2018. The initiative was raised in the Laboratory of Chondrichthyes of ICB-FURG [formally registered under codes EXT-820 e EXT-1006].

This project aims to bring to schoolchildren (especially those in the initial years) knowledge of sharks and their relatives (rays, skates and chimaeras) that inhabit the coast of Southern Brazil, especially those threatened with extinction. University laboratory technicians, graduate and postgraduate students are actively involved in the project. Activities carried out by the project’s executors are available on the education site of the project, and the posts are public.

Before the COVID-19 pandemic, we used to visit the schools and show children, in playful ways, which were the primary and more charismatic components of the Southern Brazil chondrichthyan fauna. During the activities, the demystification of sharks as sea villains was constantly brought up, especially through the puppet theatre, where a Shortfin Mako (*Isurus oxyrinchus*) (Tutu) and a little

girl (Clarinha) became best friends and spent time on the beach listening to Tutu’s funny tales on his adventures in the sea. The species inhabiting the coast of the city of Rio Grande, in extreme southern Brazil, are completely unharmed, but people rarely know this. The fascinating characteristics of the life history of chondrichthyans were also shown to the children, e.g., the diversity of egg capsules of oviparous species, which are an abundant regional component on beaches, the different ways of embryo-maternal nutrient transfer, and also the different body morphotypes of sharks and their relatives, which simply fascinated the kids and brought endless questions. A collection of fixed biological materials, like jaws, embryos, egg capsules, and adult specimens of several species, were also brought and shown. Children’s fascination when looking and touching a real shark for the first time in their lives was simply unbelievable.

Another key objective was to conscientize the importance of conserving chondrichthyan species as critical elements of the regional biodiversity. Eighty-three marine chondrichthyans species occur on the Continental Shelf of Rio Grande do Sul State. Of these, two are chimaeras, 48 are sharks, and 33 are rays [Vooren and Oddone 2019]. The conservation of the evolutive and biological diversity of the Southern Brazilian chondrichthyan is related to the preservation of the ecosystem that supports their populations. Actions for the conservation of threatened species may be oriented by comprehending how anthropogenic impacts must be controlled so that the remaining populations are maintained at safe levels for stability or recovery. In this context, the industrial fisheries represent the





Photo by Natalia Gualarte

largest threat for the chondrichthyan biodiversity in Southern Brazil [Vooren and Klippel 2005].

Nevertheless, there are numerous reasons we should explain to children the importance of conserving natural resources early in their lives, apart from fisheries and their adverse effects! First of all, it is our ethical commitment as human beings to ensure the conservation of our local fauna. Secondly, sharks and their relatives are extremely charismatic animals, most of them mistakenly considered as killers; given that shark attacks are limited to a small number of species and in specific areas, but children seldom know that. Examples are the growing interest in including sharks and their relatives in touch tanks in aquaria directed to children in several parts of the world and their constant presence in oceanariums. Shark behaviour and life-history traits are in some cases so fascinating and enchanting, but children are not aware about most of these traits.

The fourth reason is why our efforts should be directed to conserving sharks and their relatives. This is due to their fragility as organisms because some of their life history characteristics. Coupled with that issue, Southern Brazil has one of the largest bottom trawl fleet concentration in the region [Vooren and Oddone 2019]. Such combination has demonstrated to be irreversibly harmful over the decades, leading several species to the most critical conservation status.

During the pandemic, another project was developed, facing the impossibility of visiting schools. With the aid of our magnificent scientific draft person, Alissa Coelho Lehn, biology student, the “Condروفichas” were created. Each week an informative and colourful card was published on the project website, each one corresponding to a shark, ray, or chimaera species of the Southern Brazilian chondrofauna. The accompanying texts are brief and funny and include information on the species’ biology, adapted for children. In this way, even during the pandemic, children were able to learn about sharks and their relatives in the safety of their homes. Our motto is that we need to know to protect, and who loves, protects.

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Photos by Jocarlos Goulart Alberton





Assess Working Group Update Upcoming IUCN Red List assessments

Dr Cassie Rigby

IUCN SSC Shark Specialist Group | Red List Authority Coordinator |
Assess Working Group Chair

The SSG is undertaking assessments of a further four new recently described shark and ray species, in addition to the 23 species outlined in the previous Shark News [Issue 4 January 2022 | bit.ly/3nj4uU6]. Unless new information becomes available that might impact the conservation status of a species, we will not be reassessing other species at this time.

Common Name	Scientific Name	Authority	Type of assessment	Contact
Family Pentanchidae				
Manocheian's Catshark	<i>Apristurus manocheiani</i>	Cordova & Ebert 2021	New	Cassie Rigby
Family Squatinidae				
Small-crested Angelshark	<i>Squatina mapama</i>	Long, Ebert, Tavera, Acero & Robertson 2021	New	Cassie Rigby
Family Scyliorhinidae				
Cinder Cloudy Catshark	<i>Scyliorhinus hachijoensis</i>	Ito, Fujii, Nohara & Tanaka 2022	New	Cassie Rigby
Family Myliobatidae				
Wafic's Eagle Ray	<i>Aetomylaeus wafickii</i>	Jabado, Ebert & Al Dhaheri 2022	New	Rima Jabado

We would like to check if you have any information pertaining to the taxonomy, biology, distribution, degree of exposure to threatening processes, and levels of fishing effort. We understand species-specific data are lacking for these new species, so we aim to infer or suspect population changes from the best available information on levels of fishing pressure.

We would also appreciate any details on fisheries that may interact with the species in the above list: general catch and effort trends and data on how individual species ranges overlap with fisheries (this includes both quantitative and qualitative data).

If you have any information that can contribute to these assessments and are interested in being involved, we would like to hear from you. Please contact the lead person as mentioned in the table.

- **Dr Rima Jabado** | rimajabado@iucnssg.com
- **Dr Cassie Rigby** | cassandrarigby@iucnssg.com

Please submit any information as soon as possible. We aim to complete these assessments for review by the end of April 2022. Your level of involvement can range from contributing information to being closely involved as an assessor. To be considered an Assessor, we will ask you to complete the online Red List Training course Modules 1–4 at Online IUCN Red List Training. If you are interested in being involved in IUCN Red List assessments or would like more information on the assessment process or online training courses, please contact Dr Cassie Rigby.



Guide author Rima Jabado at a shark and ray identification workshop in Hong Kong

New Tools to Curtail the Illegal Shark Trade

Photo by Luke Warwick | Wildlife Conservation Society

Written by Luke Warwick

Wildlife Conservation Society

A new one-stop visual identification tool has been developed to get customs officials the information they need to seize any shark products illegally traded.

The commercial trade in shark and ray parts is valued at a billion dollars annually, but until recently, it has been poorly regulated, driving these slow-growing predators towards oblivion. With 37 percent of almost 1,250 species of sharks, rays, and chimaeras recently evaluated as threatened with extinction by the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (assessed as Critically Endangered, Endangered, or Vulnerable), regulation and oversight of this trade is essential if it is not to push shark and ray species closer to the edge.

Over the last decade, the United Nations Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) has listed an increasing number of shark and ray species in its appendices to combat the threat of this trade. But these measures need to be implemented and well-enforced if they are to be effective. A particular challenge for customs officials, fisheries, and trade inspectors is identifying individual shark species and their products with which they are not familiar. Fortunately, a group of Governments, NGOs and scientists have collaborated to produce guides with the most up-to-date available information on each CITES-listed species to assist fisheries and customs inspectors in implementing the CITES regulations.

Since 2014, approximately 60 regional and domestic shark and ray workshops have taken place globally to assist with the imple-

mentation of CITES listings, and the feedback from those trainings has informed the development of these new guides, ensuring they cover the products most commonly traded in a way that allows for quick training of customs and border staff. The new one-stop visual identification tool has been developed to help streamline these trainings and get customs officials the information they need to seize any shark products that are being traded illegally. This new resource was made freely available to all CITES Parties as they gathered at the Convention's Standing Committee in Lyon, France, in early April 2022.

The three identification guides cover whole animals; shark trunks (bodies with head and fins removed) that are exported to be consumed as meat; and dried products such as shark fins, sawfish (Pristidae family) rostra, and Manta and Devil Ray (Mobula genus) gill plates. The guides combine decades of previous work, simplifying the training process for customs officials by covering all CITES-listed species and the major products in trade in one tool.

These guides will be crucial in helping customs departments in countries where sharks and rays are caught and traded to identify products from protected and regulated CITES-listed species that are often hidden in shipments of unlisted species. This aids the implementation of the Convention in its crucial aim of preventing unsustainable trade, driving sharks and rays to extinction in the face of a continued decline in these ancient predators' populations.

Trainings using these guides have already been conducted in Mozambique and Colombia, with additional work planned for a range of countries, including Bangladesh and Madagascar, in the coming months. The three-part identification tool is available in English for download at no cost, with additional languages to be added in the coming months.

CITES SHARKS AND RAYS

Implementing and enforcing listings -- VOLUME I



FULL CARCASS ID

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ing listings -- VOLUME II



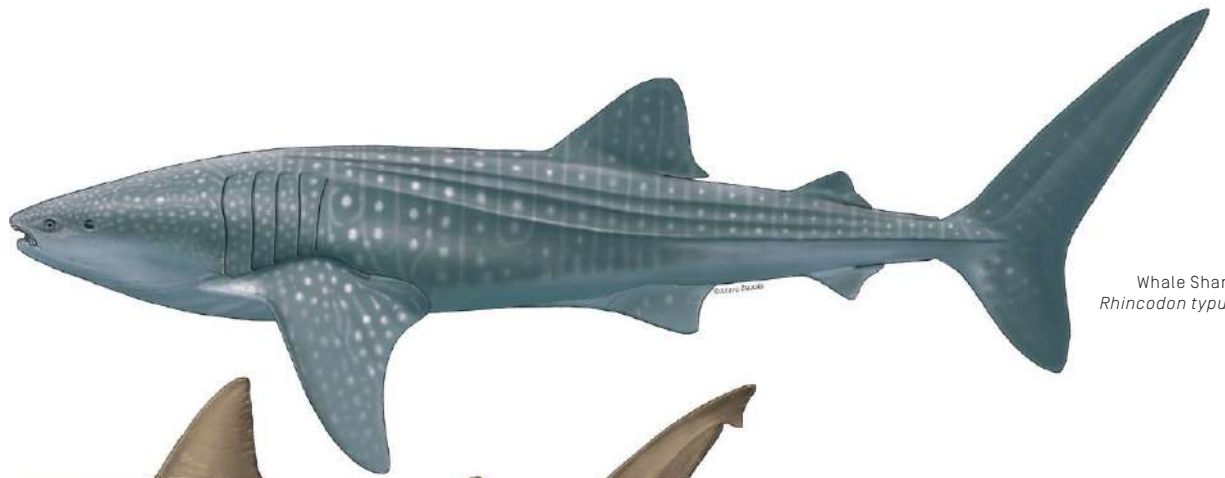
CITES SHARK

Implementing and enforcing

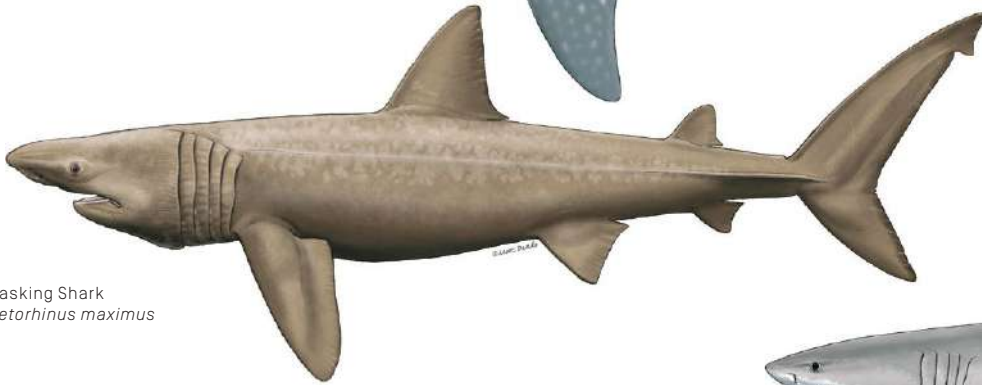
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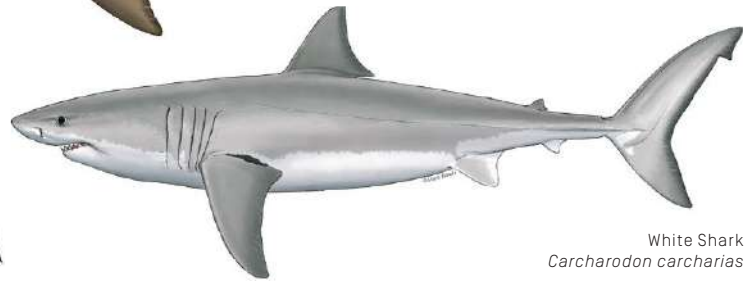
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Whale Shark
Rhincodon typus



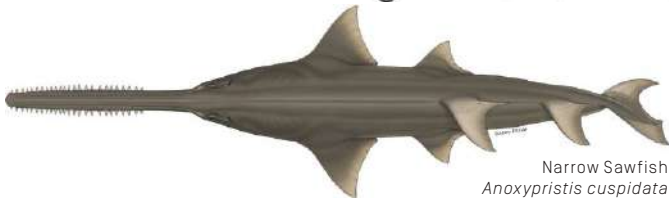
Basking Shark
Cetorhinus maximus



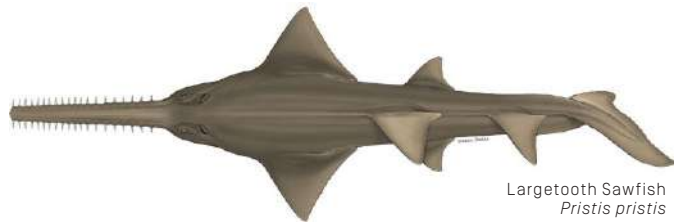
White Shark
Carcharodon carcharias



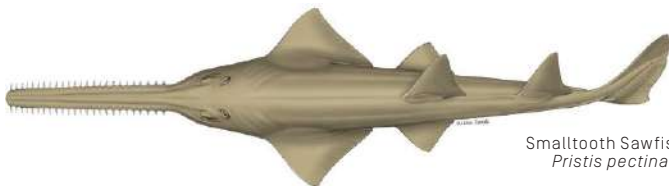
Dwarf Sawfish
Pristis clavata



Narrow Sawfish
Anoxypristis cuspidata



Largetooth Sawfish
Pristis pristis



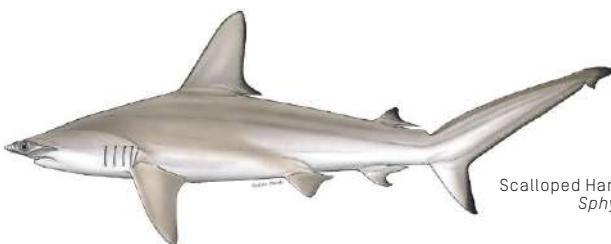
Smalltooth Sawfish
Pristis pectinata



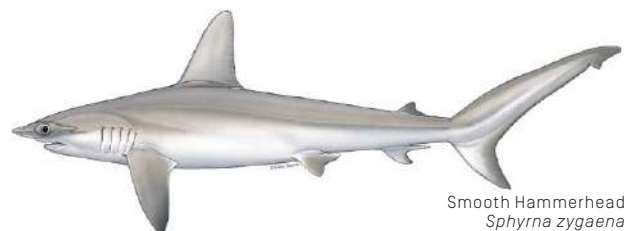
Green Sawfish
Pristis zijsron



Great Hammerhead
Sphyrna mokarran



Scalloped Hammerhead
Sphyrna lewini



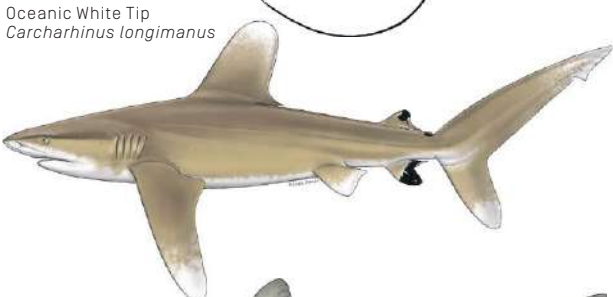
Smooth Hammerhead
Sphyrna zygaena



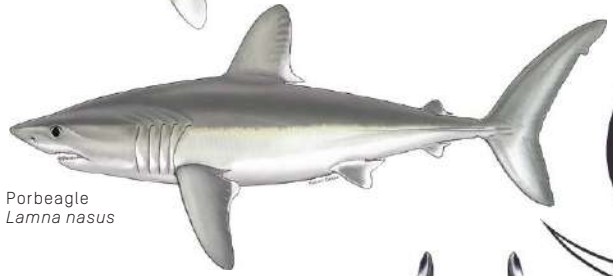
Reef Manta Ray
Mobula alfredi



Giant Manta Ray
Mobula birostris



Oceanic White Tip
Carcharhinus longimanus



Porbeagle
Lamna nasus



Longhorned Pygmy Devil Ray
Mobula eregoodoo



West Atlantic Pygmy Devil Ray
Mobula hypostoma



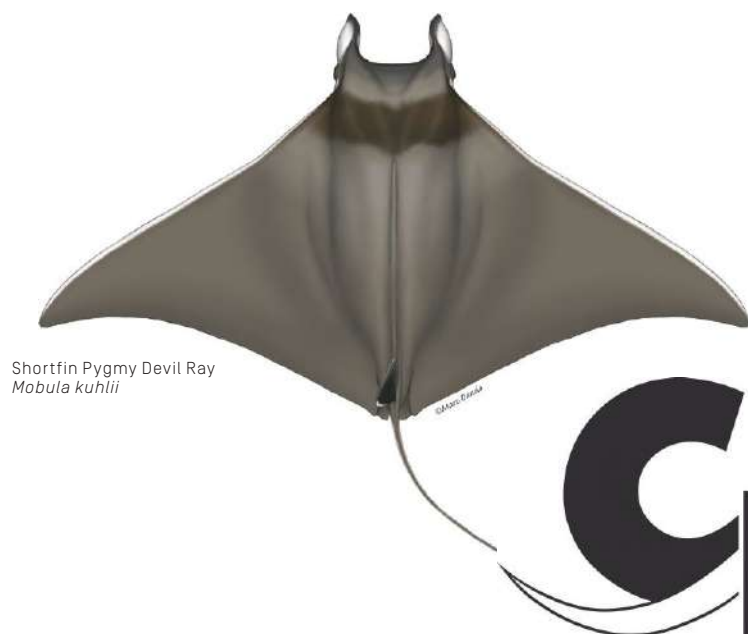
Munk's Pygmy Devil Ray
Mobula munkiana



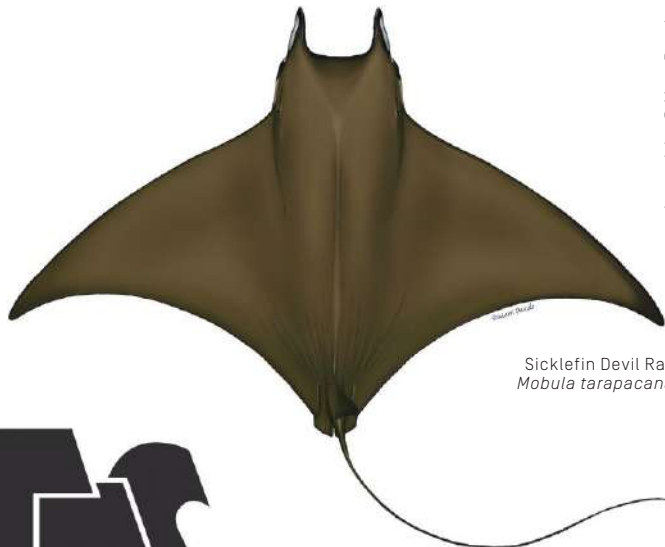
Spinetail Devil Ray
Mobula mobular



Bentfin Devil Ray
Mobula thurstoni

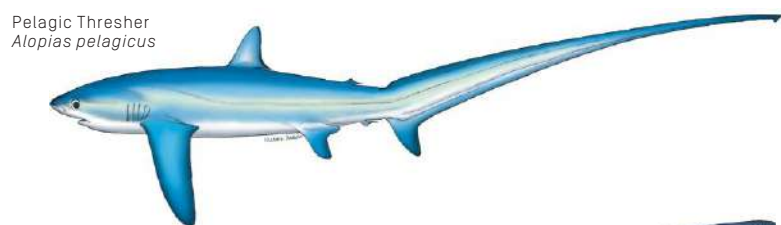


Shortfin Pygmy Devil Ray
Mobula kuhlii

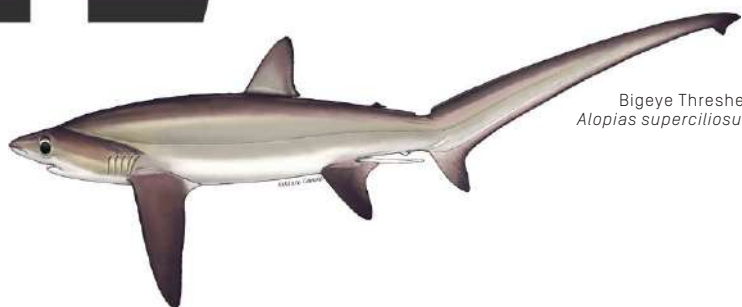


Sicklefin Devil Ray
Mobula tarapacana

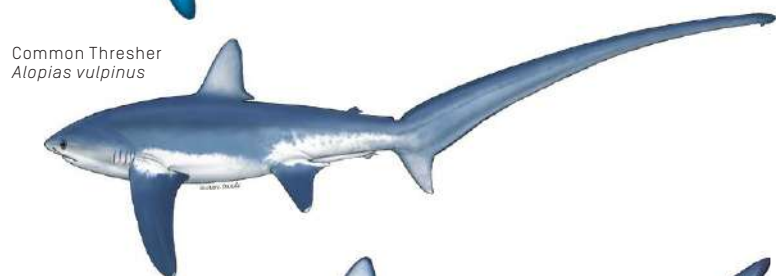
CITES



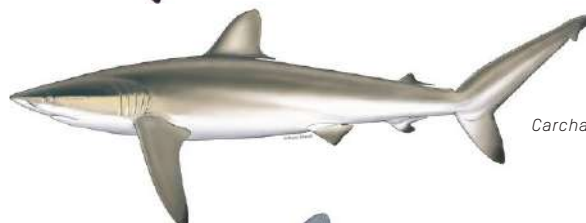
Pelagic Thresher
Alopias pelagicus



Bigeye Thresher
Alopias superciliosus



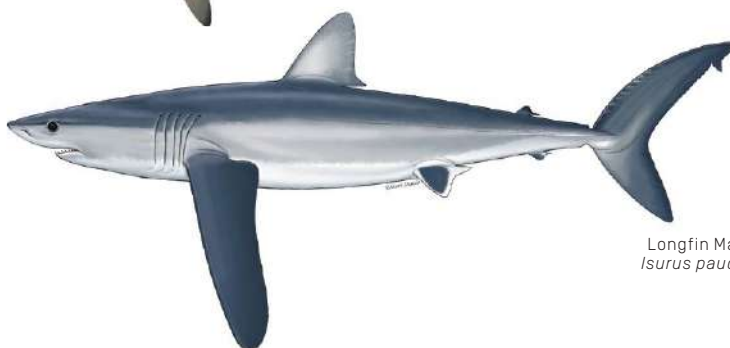
Common Thresher
Alopias vulpinus



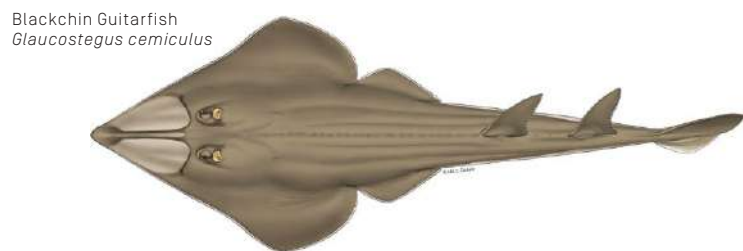
Silky Shark
Carcharhinus falciformis



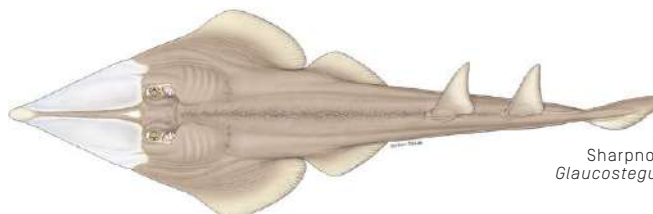
Shortfin Mako
Isurus oxyrinchus



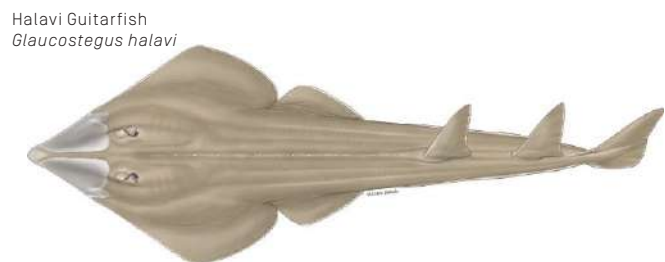
Longfin Mako
Isurus paucus



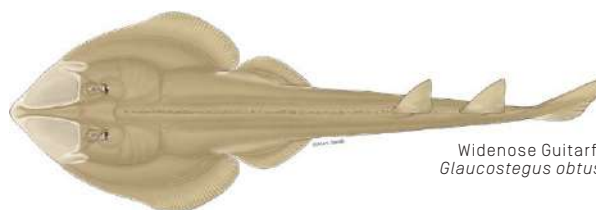
Blackchin Guitarfish
Glaucostegus cemiculus



Sharpnose Guitarfish
Glaucostegus granulatus

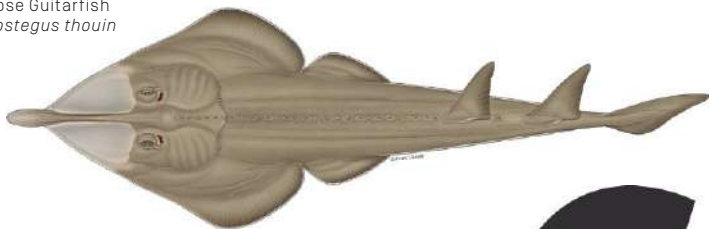


Halavi Guitarfish
Glaucostegus halavi

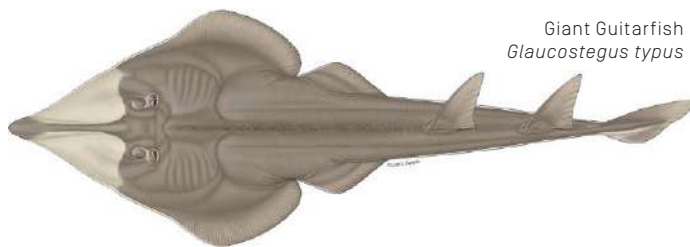


Widenose Guitarfish
Glaucostegus obtusus

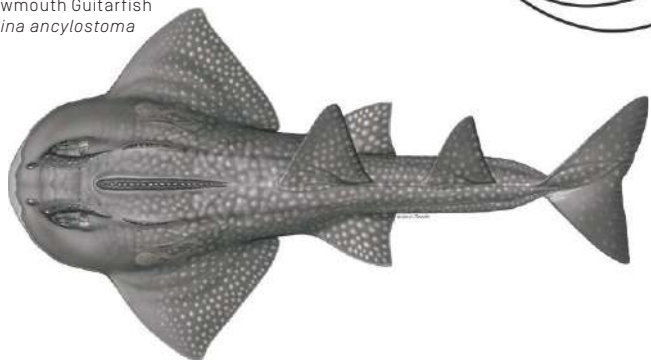
Clubnose Guitarfish
Glaucostegus thouin



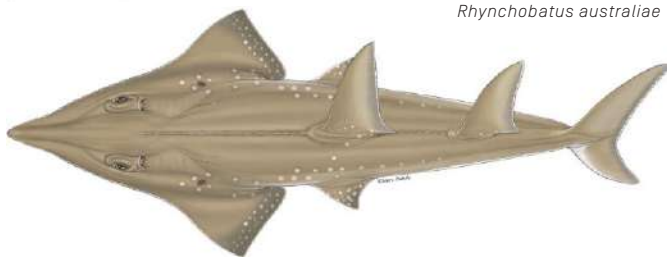
Giant Guitarfish
Glaucostegus typus



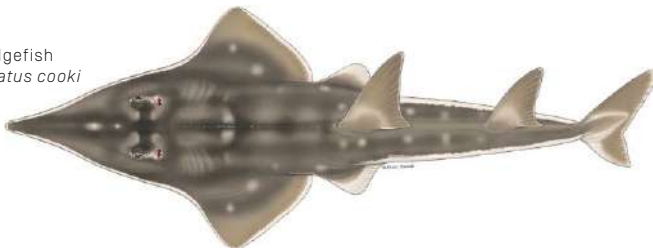
Bowmouth Guitarfish
Rhina ancylostoma



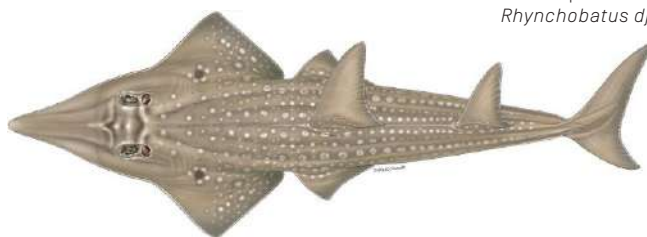
Bottlenose Wedgefish
Rhynchobatus australiae



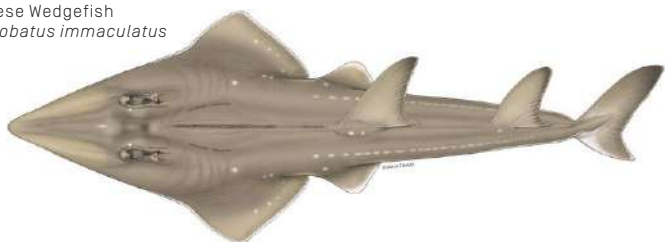
Clown Wedgefish
Rhynchobatus cooki



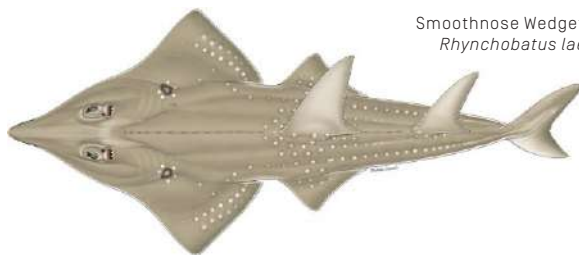
Whitespotted Wedgefish
Rhynchobatus djiddensis



Taiwanese Wedgefish
Rhynchobatus immaculatus



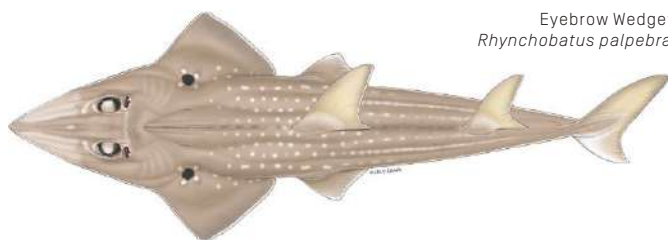
Smoothnose Wedgefish
Rhynchobatus laevis



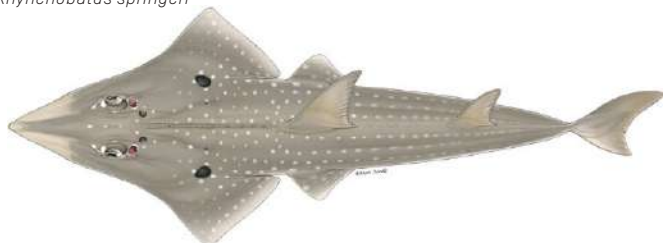
African Wedgefish
Rhynchobatus luebberti



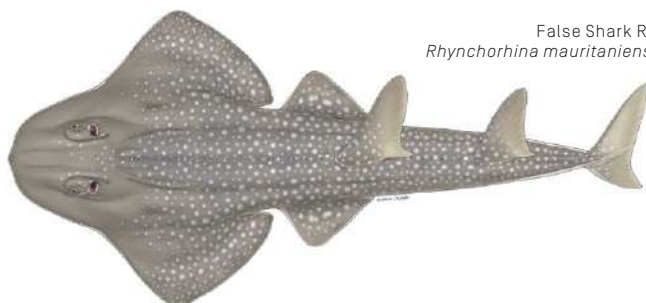
Eye-brow Wedgefish
Rhynchobatus palpebratus



Broadnose Wedgefish
Rhynchobatus springeri



False Shark Ray
Rhynchorhina mauritaniensis





ifaw

Supply and demand: the EU's role in the global shark trade

Executive summary

Since the early 2010s, global shark conservation work has come a long way. At that time, sharks were considered a side item in conservation conversations; even an afterthought and almost no management existed. Today, shark management issues are a core component of many conservation conversations, especially relating to their catch, trade and contributions to global marine biodiversity health. In the span of just 10 years, the beginning of a global framework to monitor and manage shark populations has started to emerge.

However, while the world has made significant progress in its management of sharks and rays in recent years, the actions taken have not been enough. Shark populations continue to decline rapidly worldwide. **More than 50% of shark species are threatened or near threatened with extinction, and pelagic sharks [species of sharks found on the high seas] have declined more than 70% in only a 50-year period.** Adding to the concern, a recent study found that shark populations were functionally extinct on 20% of reefs surveyed globally.

Small or large, coastal or high seas—sharks are disappearing, with the piecemeal management efforts to date failing to stop their decline.

Global shark declines are driven by international demand for shark fins and meat, coupled with widespread lack of management for both the catch and trade of shark species. **While many place the burden of change on the consumptive countries, primarily in Asia, equally responsible for these declines are countries with internationally operating fishing fleets and trade in shark products.**

International Fund for Animal Welfare (IFAW) developed this study to examine the role of the European Union (EU) in the global shark trade and steps needed to ensure that the EU becomes a positive player ceasing its contribution to the decline of shark species, as well as providing recommendations for the way forward. Previous studies have examined the EU's role as a leading shark catcher [Okes & Sant 2019], as well as a major supplier for the global shark meat trade based on graph theory [Niedermüller et al. 2021].

This current study provides the first comprehensive picture of the

EU's role as reflected in official raw customs data from Hong Kong Special Administrative Region (referred to as Hong Kong SAR hereafter), Singapore and Taiwan province, China (referred to as Taiwan province hereafter), covering both fin and meat import, re-export and export data compiled over an extensive period (2003–2020).

This has allowed us to examine up-to-date trade routes between the EU and major shark fin hubs, identify discrepancies in reporting and suggest improvements from both a traceability and management perspective.

This study found that despite known population declines, the EU continues to be a significant player in the global export of shark fins, with **EU Member States supplying on average 28% of the shark fin-related imports into Hong Kong SAR, Singapore and Taiwan province and even up to 45% in 2020.**

Every country participating in the global shark trade must take actions, both at a national and international level. Historically, the EU has championed shark and ray trade management measures at conventions such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) or the Convention on the Conservation of Migratory Species of Wild Animals (CMS), but with only 25% of the global trade currently subject to sustainable trade limits and populations in rapid decline, clearly additional steps must be taken. Other similarly resourced governments, such as Canada and the United Kingdom, have taken strong precautionary action in recent years to ban their trade in [detached] shark fins due to well-reasoned sustainability concerns. If the EU is to adhere to its biodiversity and sustainability ambitions while remaining one of the largest traders of shark products, it must once again step into a leadership role and set the global tone for trade management and reform needed to improve the tracking of shark products traded internationally; and to prevent the widespread extinction of sharks. Given its significant role, action by the EU to better monitor and track the trade of shark products, as well as to advocate for sustainable trade limits via CITES Appendix II listings, would shift global markets towards a better, sustainable future for sharks.



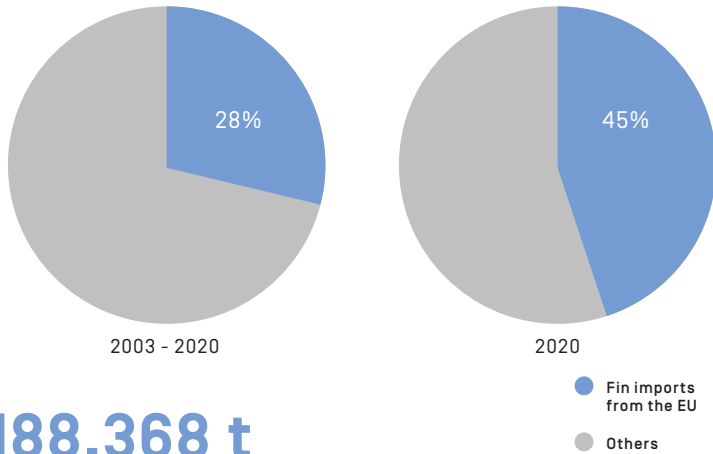
View of the caudal fins of a stack of Blue Sharks (*Prionace glauca*). Covered with ice and sold at the Port of Vigo, Galicia, Spain

Recommendations

1. Improve recording of data and trade records via a review of the Harmonized System (HS) commodity codes for shark products and standardise code use with key trading partners
2. Ensure that any shark species found in the international shark product trade is listed in CITES Appendix II
3. Build domestic capacity for long-term trade monitoring through trade data analysis
4. Prioritise the use of trade data to combat illegal wildlife trade in sharks and shark products

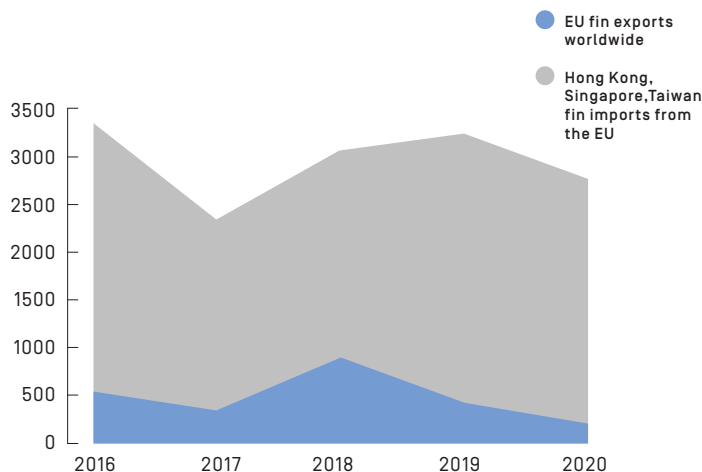
Visual data overview of the EU's role in shark fin and meat trade

study period 2003-2020



188,368 t

[metric tons] of shark fin products were imported into Hong Kong SAR, Singapore and Taiwan province combined, with the EU responsible for almost a third of this import (on average 28.35%, 53,407.49 metric tons). From 2017 onwards the EU's role increases and accounts for almost half of the shark fin imports in 2020 (45.42% in 2020). Whereas global shark fin-related exports to these trade hubs have been declining, the proportion of export by EU has increased.



Data discrepancies

between import data from Hong Kong SAR, Taiwan province and Singapore compared to the EU export data: the aggregated import data consistently displayed a considerably higher import figure than the corresponding total export data from the EU [to all countries]. The discrepancy between the two datasets ranges from 1,650.08 metric tons to 2,318.18 metric tons, suggesting a concerning case of potential misreporting in the shark fin-related trade.



Top five EU member state sources for shark fin imports

into Hong Kong SAR, Singapore and Taiwan province

	Reported sources	Total reported trade [metric tons]
1st	Spain	51795
2nd	Portugal	642
3rd	Netherlands	621
4th	France	295
5th	Italy	25

Top five EU member state sources for shark fin imports

out of Hong Kong SAR, Singapore and Taiwan province

	Reported destinations	Total reported trade [metric tons]
1st	Italy	4245
2nd	Spain	680
3rd	Greece	674
4th	Bulgaria	560
5th	Cyprus	91

The shark meat-related exports and re-exports from these hubs to the EU were comparably low. Shark meat is most often consumed domestically within the EU or in South America and South Korea, which has not been analysed with this study.



Photo by Robert Marc Lehmann | robertmarclehmann.com



Photo by Steve De Neef | stevedeneef.com

About IFAW

For over a decade, IFAW has been working with governments around the world to support better management for sharks and rays. From the development of shark identification materials for fisheries, customs and enforcement officers, to raising awareness on the conservation needs of shark species, and building the capacity of governments to meet their obligations under international conventions such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS). IFAW also provides technical support for governments looking to enact progressive and precautionary management for shark catch limits, or prohibitions when warranted, at a national level.

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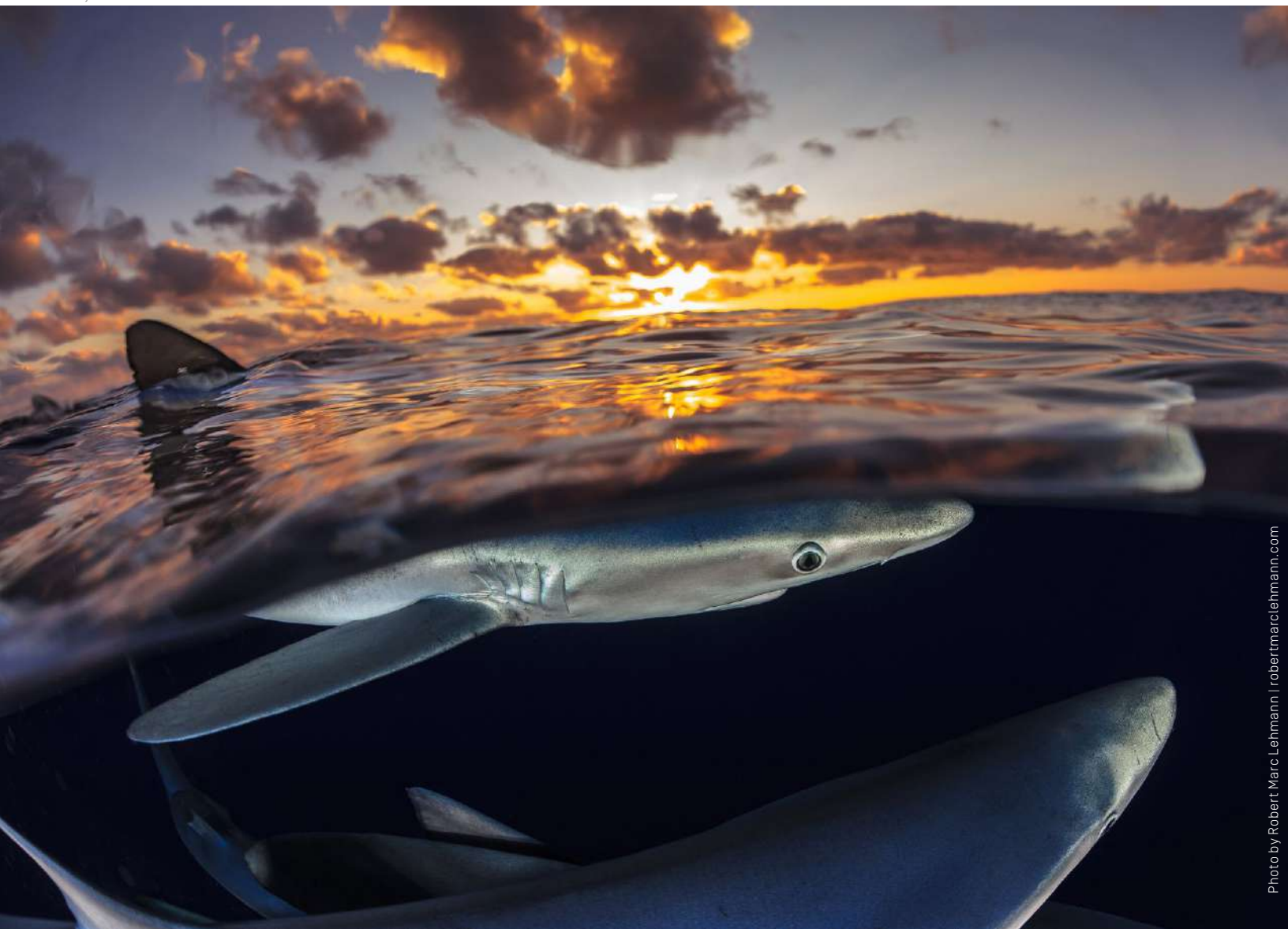
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Photo by Robert Marc Lehmann



Upcoming Meetings 2022

All meetings are subject to change due to the impacts of the coronavirus [SARS-CoV-2 | COVID-19] situation that varies in location and time. Please visit the respective websites and communication from the organising host organisation for more information.



Northeast Pacific Shark Symposium (NEPSS) V

April 21 - 22, 2022

12:00 - 4:30pm

Pacific Daylight Time (PDT)

Virtual meeting

seattleaquarium.org/2022-northeast-pacific-shark-symposium-v

This biennial shark meeting began in 2004, was initially called the Cowshark Conservation Workshop and focused on the biology and ecology of Sixgill and Sevengill Sharks, known as "Cowsharks" and distinguished by their extra gill slits. Many sharks have five gill slits but sixgills have six and sevengills have seven—hence their names. Cowsharks remained the focus of the meeting for 10 years until, in 2014, it was changed to be the called the Northeast Pacific Shark Symposium (NEPSS).

The change was driven in part because of increased interest by biologists that studied sharks outside of the Cowshark family as well as the fact that at the first NEPSS we also convened an International Union for the Conservation of Nature (IUCN)

Northeast Pacific Shark specialist group meeting where IUCN members worked on regional re-assessments of Northeast Pacific shark conservation status updates. Since then, the meeting has been known as the NEPSS, although the sixgill image remains the logo for the conference.

This symposium is the largest gathering of shark biologists in the west of North and Central America along the Northeast Pacific.

As we start the planning for our 2022 symposium, we have concluded that with so many unknowns around COVID-19, it would not be prudent to meet in person. However, we don't want to miss the chance to connect this year, so the symposium is going virtual via Zoom. The Shark and Ray Action Plan developed by SPREP.

Please submit your abstracts by January 21, 2022 to ocs-newsletters@gmail.com. Each presentation will be 10 minutes with 5 minutes for questions.



37th Annual Scientific Meeting American Elasmobranch Society (AES)

July 27 - 31, 2022

[Dates subject to change]

Spokane, WA, USA

elasmobranch.org

asih.org/meetings

The American Elasmobranch Society is a non-profit organization that seeks to advance the scientific study of living and fossil sharks, skates, rays, and chimaeras, and the promotion of education, conservation, and wise utilization of natural resources. The Society holds

annual meetings and presents research reports of interest to professionals and students of elasmobranch biology. Those meetings are held in conjunction with annual meetings of the American Society of Ichthyologists and Herpetologists each year at rotating North American venues.



Sharks International Conference 2022 (SI2022)

October 10 - 14, 2022

[online virtual conference]

October 20 - 22, 2022

[in-person conference]

Valencia, Spain

si2022.org

Sharks International 2022 (SI2022) is a hybrid event to be held in October 2022 that will bring together a diverse community of people from across the world interested in sharks, rays, and chimaeras and addressing the challenge of elasmobranch conservation in this Decade of Ocean Science. Hosted by the Shark Trust, Submon, and Lamna, in association with the European Elasmobranch Association (EEA), the event will include five online days (October 10-14) featuring enhanced digital content on key themes in shark research and conservation, leading up to a three-day in-person conference in Valencia (October 20-22). The conference is funded by the Save our Seas Foundation, supported by L'Océanogràfic, the largest aquarium in Europe, and streamed live across the world. If you are interested in sharks, rays and chimaeras, and want to be a part of the 700+ member community currently shaping SI2022, sign up to the portal at si2022.org.



IMPAC 5

5th International Marine Protected Areas Congress (IMPAC5)

September 1 - 8, 2022

Vancouver, Canada

impac5.ca

International Marine Protected Areas Congresses (IMPAC) are an opportunity for the global community of marine conservation managers and practitioners to exchange knowledge, experience and best practices to strengthen the conservation of marine biodiversity and to protect the natural and cultural heritage of the ocean.

IMPAC5 will be jointly hosted by the Host First Nations — Musqueam Indian Band, Squamish Nation, and Tsleil-waututh Nation — together with the Province of British Columbia, the Government of Canada, the Canadian Parks and Wilderness Society (CPAWS) and the International Union for the Conservation of Nature (IUCN).

IMPAC5 is an opportunity to bring together Indigenous peoples and cultures from around the world to embrace a collaborative approach and learn from Indigenous leadership in ocean conservation.

Join thousands of marine protected area professionals from around the world to chart a course towards protecting 30% of the ocean by 2030. Learn about traditional marine protection practices and innovative sustainability initiatives from local and international indigenous experts.

Funding Opportunities 2022

PAUL M. ANGELL FAMILY FOUNDATION

The Paul M. Angell Family Foundation

pmangellfamfound.org

The Paul M. Angell Family Foundation makes grants in three priority areas: Conservation, Performing Arts and Social-Causes.

The Foundation's Conservation grant making focuses primarily upon issues of ocean conservation. Priorities within Conservation are:

- Supporting the creation of Marine Protected Areas
- Encouraging sustainable fisheries management
- Eliminating illegal, unreported, and unregulated fishing
- Conserving the world's shark and ray species
- Limiting plastics pollution and other ocean debris
- Preserving coral species and ecosystems

Types of support:

1. General Operating: This is the most flexible type of grant. Funds may be applied in any manner in which the organization sees fit, subject to its mission.
2. Program and Project Grants: These grants are targeted to a specific program or goal. Applicants must submit a program budget and narrative to support their applications.
3. Education: Education grants support programs which disseminate information crucial to the organization's mission. They may include, but are not necessarily limited to: lectures, demonstrations, workshops, guided tours, exhibitions, and distribution of printed or online materials.

The Foundation is pleased to announce the deadlines for the Fall 2022 cycle. Please note, all LOIs are due on the deadline date on or before 11:59 PM, Central Daylight Time (CDT), unless otherwise noted.

- We will begin accepting LOIs (Letters of Inquiry) for the Fall 2022 cycle on Monday, May 2, 2022
- LOIs are due Monday, June 6, 2022
- Full applications (if LOI is approved) are due Friday, August 5, 2022
- Awards will be announced by the early-November, 2022

As always, please do not hesitate to contact (pmangellfamfound.org/contact/) the foundation office at any time with questions.



Save Our Seas Foundation (SOSF)

The Save Our Seas Foundation (SOSF) is committed to protecting our oceans by funding and supporting research, conservation and education projects worldwide, focusing primarily on threatened marine wildlife and their habitats. Only projects concerned with marine chondrichthyan species (sharks, rays, skates, sawfishes and chimaeras) will be considered. The Keystone and Small Grant application processes both consist of a two-stage online application. Only one application will be accepted from any one applicant. If a project leader has an ongoing SOSF Grant, he/she cannot apply for a new grant. All applications will be reviewed by the SOSF scientific committee and require final approval from the Foundation's Board of Directors.

2023 Keystone Grants

saveourseas.com/grants/funding-applications/keystone-grants/
The funding cycle is biennial, with the grant application window opening in even years (e.g. 2022), and the grant covering

the period from March 2023 to June 2024. Funds are allocated on an annual basis, with the option to apply for continued funding every year. The usual project duration is limited to three years. Grants average 25,000 USD per annum.

The Keystone Grant application process consists of a two-stage online application. It is the policy of the SOSF to provide, where practicable, a degree of continuing support to the projects it is funding; the leaders of such projects may be invited by the SOSF to complete an application for a continuation grant in the coming year.

Stage I applications for the 2023 Keystone Grants are open until May 16, 2022 at 18:00 CET.

2023 Small Grants

saveourseas.com/grants/funding-applications/small-grants/
The Small Grant is designed for short (12- to 18-month) and small (grants average US\$5,000) projects dedicated to early career scientists (within five years of a degree being awarded). Aimed at original and innovative start-up projects, the grant presents early career scientists, conservationists or educators with an opportunity to prove themselves. It targets local projects conducted by local project leaders. Whether or not the project is part of a larger endeavour, SOSF Small Grants are for specific and finite projects.

The SOSF will consider small grant applications that, inter alia, aim to undertake the preliminary investigations necessary before a larger, longer-term project can be developed. Successful applicants for small project grants, including scoping projects, are not eligible to submit a Small Grant application the following year, but are not excluded from submitting a new Keystone Grant application. Stage I applications for the 2023 Small Grants are opening on April 18, 2022.



The Zoological Society of London (ZSL)

The EDGE Fellowship Programme

edgeofexistence.org/apply-now/

The EDGE of Existence programme highlights and protects some of the most unique species on the planet, which are on the verge of extinction. These weird and wonderful species are Evolutionarily Distinct and Globally Endangered. Representing a unique and irreplaceable part of our world's biodiversity, many EDGE species have been overlooked by conservationists – until now.

We are only reviewing applications from African countries in 2022!

One of the most effective ways ZSL's EDGE of Existence programme is working to secure the future of EDGE species is by awarding two-year Fellowships to future conservation leaders ("EDGE Fellows") working on poorly-known EDGE species.

What do EDGE Fellows receive?

EDGE Fellows follow a comprehensive two-year training programme comprising of:

- A grant of up to £10,000 to undertake a 2-year project on a priority EDGE species;
- A 4-week Conservation Tools training course held in the tropics;
- Ongoing technical support and mentoring from ZSL biologists;
- A 2-week Conservation Leadership training course in London.

Am I eligible? You may be eligible for an EDGE Fellowship if you:

- Focus your work on an EDGE species included on

Funding Opportunities 2022

the 2022 curated list (edgeofexistence.org/wp-content/uploads/2022/04/EDGE_2022_curated_list_Africa.xlsx);

- Are an early-career conservation biologist or wildlife manager (less than 10 years' experience);
- Are a resident of the country in which the proposed focal species occurs.

The EDGE Fellowship application deadline is July 17, 2022 at 23:59 (BST). All applications will be reviewed by a panel of internal and external experts.

Marine Conservation Action Fund at



Marine Conservation Action Fund (MCAF) Fellowship and Grant Program

andersoncabotcenterfor-oceanlife.org/our-work/programs/mcaf/
mcaf.formstack.com/forms/apply_copy_1

MCAF is part of the New England Aquarium's Anderson Cabot Center for Ocean Life and is a micro-granting and fellowship program that addresses critical needs in the marine conservation field, including rapid turnaround funding for urgent, time sensitive projects and support for early-stage, entrepreneurial projects led by local conservation leaders in low and middle-income countries. We are excited to induct new conservation leaders into the supportive community of 12 visionary and accomplished MCAF Fellows who have helped make the program what it is today.

Who can apply?

MCAF Fellows are visionary and collaborative leaders who are pursuing a community-based, multi-disciplinary approach to achieve lasting conservation outcomes, and who have demonstrated a commitment to training and mentoring the next generation of ocean leaders. Eligible applicants are nationals of low and middle income countries. For a full list of eligibility criteria, please read Fellowship Program Overview and Application Guidelines.

Fellowship Benefits

MCAF provides financial, technical and professional resources, mentoring and community-building to support the success of Fellows' conservation initiatives; their professional growth and resilience; the sustainability of their organizations; and their efforts to develop the next generation of ocean leaders.

Applications are due May 10, 2022

We encourage you to reach out with any questions about the MCAF Fellowship Program and application process:

- MCAF Director Elizabeth Stephenson: estephenson@neaq.org
- MCAF Program Officer Emily Duwan: eduwan@neaq.org



Shark Conservation Fund

Shark Conservation Fund (SCF) 2023 Small Grant

sharkconservationfund.org/small-grant-rfp/

The Shark Conservation Fund (SCF) is a collaboration of philanthropists dedicated to solving the global shark and ray crisis. Our goal is to halt the overexploitation of the world's sharks and rays, prevent extinctions and restore imperiled species through strategic and catalytic grantmaking.

Our objectives are to:

1. Ensure effective regulation of global trade in shark and ray products through listing the top species of sharks and rays in global trade on CITES Appendices and implementing those listings;
2. Prevent the extinction of the most imperiled sharks and rays by enhancing legal protections in priority countries and at international forums; and
3. Combat unsustainable shark and ray fishing globally through the adoption and implementation of conservation and management measures through international forums and in priority countries.

The Small Grant Fund supports these objectives by providing grants that do not exceed \$25,000 and are one-year in duration. Annually, we have \$250,000 available for Small Grants, which typically allows us to make up to 10 grants per year. There is no guarantee that the submission of a Small Grant proposal will lead to funding. Types of projects eligible for Small Grants include:

- Emerging conservation opportunities;
- Small scientific studies, re-

ports, or evaluations that are directly linked to advance shark and ray conservation policy in the near term;

- Scoping larger shark and ray conservation and management projects; and
- Capacity building for small NGOs, especially in developing countries.

Priority will be given to:

- Applicants that have not previously received funding from the SCF;
- Projects that help implement the SCF's investment strategy, especially projects that implement listings of sharks and rays on CITES;
- Projects that are directly linked to efforts to improve shark and ray conservation policy; and
- Small NGOs in developing countries.

To apply, please complete the Letter of Interest form by 5:00 pm ET Monday, March 28, 2022. If a proposal is requested, applicants will be notified by Tuesday, April 19, 2022. Applicants will be asked to submit an online application form by Friday, May 13, 2022, by 5:00 pm ET.

IUCN SSG Sponsors & Supporters



The IUCN SSC Shark Specialist Group is fiscally sponsored by Re:wild, a 501(c)(3) non-profit organization with headquarters in Austin, TX, USA (tax ID: 26-2887967).

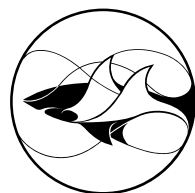


Sharks and rays need you.
Please donate and help us make a difference.

Sharks and rays are some of the most threatened species in the world, more so than land animals. Populations are declining at alarming rates and 37% of species are already threatened with extinction. With your support we can find solutions and take actions to conserve these incredible animals before it is too late.

The IUCN SSC Shark Specialist Group achievements over the last 30 years have been possible due to the generous support of funders, members, and other volunteers from countless organizations. Our members volunteer their time, effort and expertise to advance our mission and vision.

We would like to express our most sincere gratitude for the generous grants, collaborations, and support to our group, our teams, our projects, and our efforts. We appreciate the support that has been provided over the years and look forward to continuing our journey and endeavors together into the future.



**Shark
Conservation
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