

# SHARK NEWS

Newsletter  
of the IUCN SSC Shark  
Specialist Group  
#6 | July 2022





## 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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**4 Editorial: A note from the Chair**

**6 Q&A with Early Career Scientists within the SSG**

**16 Sharks and the SPAW Protocol in the Wider Caribbean Region**

**28 Shark Spotlight: Paddlenose Spookfish**

**30 Interactive Shark Alley Exhibit opens at the Two Oceans Aquarium**

**36 Face-to-face with the world’s most Dangerous Predator**

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**40 Sharks International 2022 – Only three months to go!**

**42 The IUCN Green Status of Species Webinar**

**46 Global Genetic Reference Database of eDNA Barcodes**

**48 Experts Consider Shark Week a ‘Missed Opportunity’**

**54 Preventing Shark and Ray Extinctions is Not Enough**

**60 Future Oceans: Priority Areas for Biodiversity Conservation**

**80 The First Record of a Saw Shark from Namibia**

**82 Tracking threatened sharks and rays in West Africa**

**86 Conservation, Fisheries, Trade and Management Status of CITES-Listed Sharks**

**92 The Ecological Significance of Sharks**

**94 All About Sawfishes**

**100 Diagnostic Book on Sawfishes in Costa Rica**

**110 Funding Opportunities**

**112 Upcoming Meetings**

**113 Our Sponsors and Supporters**

Cover photos: Spotted Ratfish (*Hydrolagus collieri*) usually live between 50 and 400 meter depths, but at night when hunting for crustaceans and mollusks it reaches shallow depths. The photo was taken during a night dive on the house reef of the God’s Pocket Resort (Vancouver Island, British Columbia, Canada) at a depth of 15 meters. Photos by Claudio Zori





# Editorial

A note  
from  
the Chair  
Rima  
Jabado

Dear readers,

Over the last decade, I have spent considerable time working across the African continent. I have often felt that there is so little information and so few projects focused on sharks in so many countries where we simply know nothing about the status of species and their interactions with fisheries. So, I was thrilled to see contributions from the African region for this issue. We feature work being done in South Africa through the Two Oceans Aquarium, which has set up a Shark Alley exhibit. This encourages visitors to shift their perceptions of sharks from 'man-eaters' to 'predators in danger'. In parallel, also in South Africa, a team from WILDOCEANS has been working with beachgoers to promote awareness of the need to conserve species and the importance of sharks in maintaining healthy ecosystems. This work is essential in a country where White Sharks [*Carcharodon carcharias*] are often encountered and where sharks are often feared. We have exciting news from Guinea Bissau, where a team has tagged Critically Endangered species in a natural wonderland – the Bijagos Archipelago. This collaborative effort between local communities, government, and national and international partners is already providing some much-needed data on how this huge expanse of mangroves and intertidal flats can support a large diversity of sharks. We also have a report of the first record of a Saw Shark from Namibia – the first record of this species group from anywhere along the coast of western Africa! There are undoubtedly many other stories out there, and I look forward to reading more from these emerging projects. 🦈 In a timely fashion, as Shark Week has taken over the screens around the world, scientists provide their opinion on this longstanding TV show. There are always mixed feelings about this – but many feel that this program does not benefit sharks, science, or conservation. Read more from our regular Q&A contributor Chelsea Stein about some of the analyses done in relation to hosts, guests, species featured, and overall messaging of the program since it was launched in 1988. She also introduces us to three early career SSG members working in the field in Brazil, Ghana, and Indonesia. Their work, although set in different landscapes, tell the same story of dedication to research and conservation of sharks. It's so great to see this new generation of shark scientists working tirelessly to make a difference, and I can't wait to read about the work of others from the remaining SSG regions. Many members and non-members have also been publishing books and reports on sharks to raise the profile of the species and ensure accurate information is available. Authors have provided insight into their work to highlight the ecological significance of sharks, shared beautifully illustrated children's books on sawfishes, and introduced us to an interactive online book on sawfishes in Costa Rica. 🦈 We feature a report on how to improve synergies between Regional Fisheries Bodies and the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). This information is particularly relevant as new proposals to list sharks on CITES are currently being evaluated. However, several new initiatives have been launched, shifting from the traditional fisheries or trade management focus of conservation. Andy Cornish from WWF introduces us to SARRI – the Shark and Ray Recovery Initiative – where sites have been chosen around the world to work with coastal communities, local partners, and experts to secure shark recovery zones. Our feature story is once again related to Important Shark and Ray Areas (ISRA) as we move closer to making this a reality. With core funding from the Shark Conservation Fund, it is exciting to share how this approach can complement other similar area-based biodiversity and seascape approaches. Both projects are progressing at a fast pace, so we hope to keep providing updates about them. 🦈 By the time the next issue of Shark News is released, many of us will have met at Sharks International in Valencia, Spain. Decisions on abstracts have just been made, and the global shark community will meet online and/or in-person to share their work. The organizers have provided additional information on how to keep updated on events and contribute. With the support of the IUCN Green Status of Species Working Group, the SSG also held an online webinar on this first international standard for measuring conservation actions' effectiveness using a science-based species recovery metric. All our webinars are available to watch on our YouTube and Vimeo channels, and we urge you to subscribe to these channels to stay updated. 🦈 Again, thank you to all our contributors who keep making Shark News a reality. As usual, this could not happen without the dedication and support provided by Michael and Peter Scholl. I am so very grateful. → Rima



Lemon Shark [*Negaprion brevirostris*] eye |  
Bimini, The Bahamas



# Early-Career Scientists within the SSG

In this Q&A series, get to know members across the group's nine regions.

Written by Chelsea Stein

With 237 members from 83 countries and territories, the IUCN SSC Shark Specialist Group is one of the largest specialist groups within the IUCN Species Survival Commission. Across the group's nine regions, we have many early-career scientists pursuing exciting work for shark, ray, and chimaera research, policy, and conservation.

In this Q&A series, we will showcase some of these members, sharing their input into the SSG's work and their ongoing work.

- Dr Natascha Wosnick, Postdoctoral Fellow at Universidade Federal do Paraná, SSG South America region
- Issah Seidu, Founder and Team Leader of AquaLife Conservancy, SSG Africa region
- Benaya Simeon, Shark and Ray Senior Officer at Wildlife Conservation Society, SSG Asia region

## What type of research do you focus on?

**Natascha:** Conservation physiology applied to elasmobranch fisheries management, and human dimensions of elasmobranch artisanal fishing in Brazil

**Issah:** Shark fisheries in Ghana

**Benaya:** Shark fisheries management in Indonesia

## What project(s) are you currently working on?

**Natascha:** My current research focuses on the sublethal effects of commercial fishing on elasmobranchs. More specifically, I investigate how commercial capture impairs elasmobranch recruitment and survival rates during the reproductive period, aiming to improve artisanal fisheries management in Brazil.

I also investigate the impacts of pollution on coastal species'



Photo by Issah Seidu

Specimens of the Blackchin Guitarfish (*Glaucostegus cemiculus*)

resilience and physiology, and how environmental contamination can reduce species' ability to recover from the stress imposed by commercial fisheries. Lastly, I investigate the conflicts between artisanal communities and current legislation and potential strategies to reduce the lack of compliance with fishing bans on threatened species.

**Issah:** I am currently working on a Zoological Society of London [ZSL] Evolutionarily Distinct and Globally Endangered (EDGE) of Existence and Rufford Foundation supported project, which seeks to assess the catch characteristics, size and maturity structure, as well as socio-economic and trade dynamics of EDGE Sharks and Rays, with a focus on guitarfishes in Western Ghana.

In addition, I am supplementing these objectives with building a strong collaboration with fishers, traders, and government officials to develop conservation strategies for sharks and rays in Ghana in the near future.

**Benaya:** I am currently working on saving sharks in Indonesia through developing and implementing science-based management reforms. Promoting shark fisheries management through critical habitat protection, fisheries input and output control, raising awareness and capacity building, and building some economic support for shark fishers families affected by the shark fishing limits. As a large fishing country, Indonesia has its own complexity with shark fisheries management, with each island having a diverse culture and fishing behaviour. Implementing fisheries management to protect shark populations needs a science-based approach. I always aim to support and collaborate with governments, universities, and local communities in my projects.

## As a member of the IUCN SSC Shark Specialist Group, what does your role involve?

**Natascha:** I am part of the Bycatch Working Group, the Assess Working Group, and as a regional member for South America, I support the Regional Vice-Chairs in any request for the region.

**Issah:** My current roles involve contributing to the updated Red List assessments of West African endemic and near-endemic sharks and rays. I also circulate information on sharks and rays through conferences, publications, and newsletters relevant to members.

**Benaya:** I am contributing to any updates to the Red List assessments of sharks and rays from Indonesia, including population, distribution, fishing pressure, social economics, etc., based on my experiences from some sites across Indonesia. I circulate information and international updates for local partners to improve shark conservation action in Indonesia.

## What gets you excited about sharks, rays, and/or chimaeras?

**Natascha:** What excites me most about Chondrichthyes is their diversity and ability to cope with several stressors of both human and environmental origin. It is incredible to study the physiological aspects of these animals and discover incredible adaptations that make them unique.

**Issah:** Growing up, we were made to believe that sharks are "man eaters." This perception stuck with me until I started studying sharks to determine that sharks' diet does not contain humans. I understood that sharks are really intelligent and curious animals and may bite humans out of curiosity, but will definitely swim away disinterested.

**Benaya:** Located in the core of the Indo-Pacific, Indonesia has a high diversity of shark species; some of them are too cute, and some





Educating children about the conservation of guitarfish in Brazil



Canoe vessels landed at Dixcove landing site in Ghana



Photos by Natascha Wosnick



Team members at Dixcove community measuring Blue Shark (*Prionace glauca*)

Photos by Issah Seidu



species seem too fierce even though they are not. It was fun to discover more facts and science about sharks in Indonesia, and I hope they are still here in our Indonesian waters. Whether we realize it or not, we have old connections with the marine world, including sharks, not only as shallow as fishers and fish. Understanding each culture's relations between humans and sharks from each island and region, which support the conservation actions would keep working on this world interesting.

**What is your favourite shark, ray, or chimaera species?**

**Natascha:** For sure, guitarfishes and the Atlantic Nurse Shark (*Ginglymostoma cirratum*). Their ability to deal with extreme situations always mesmerized me.

**Issah:** Guitarfish

**Benaya:** Silky Shark (*Carcharhinus falciformis*), Dusky Shark (*Carcharhinus obscurus*), Rhino Rays [order Rhinopristiformes], and mobulids (family Mobulidae).

**What do you think is the biggest challenge for shark conservation vs the biggest opportunity?**

**Natascha:** I strongly believe that the biggest challenge is also the biggest opportunity: the human dimensions involved in the capture and commercialization of elasmobranchs. In countries where fishing and consumption of sharks and rays are high, inspection is scarce, and the lack of resources is limiting, including the capture production sector and especially traditional communities in decision-making is a promising way to find a middle ground where the animals will benefit the most.

In the last 11 years, I have been in close contact with artisanal fishers. The punitive measures that are the main conservation measure in my country have done very little for the effective conservation of the species. Hearing what fishers and traders have to say helps us look at conservation through a different lens, allowing us to create bonds of trust with those directly affected by fisheries management. It's been a long and time-consuming journey, but it has yielded incredible results in the fishing communities my team and I work with.

**Issah:** First, unregulated fishing activities leading to under-managed shark fishing mortality is one key challenge to shark conservation worldwide. National instruments mostly adopted are characterized by insufficient and poor enforcement, such as excessive quotas set higher than catches and area or seasonal closures without overall catch limits, which lead to excessive exploitation.

Second, high demand for shark products, especially their meat and fins globally, is a key driver for shark exploitation. Shark meat is mostly a cheap source of protein for human sustenance, which is consumed locally, while their high-value fins are destined for the international market.

Finally, the contribution of sharks to food security in poor and developing nations makes it extremely difficult for the government in countries facing poverty and food security issues to prioritize shark conservation. This is particularly concerning when there is a lack of scientific advice for sustainable catch.

**Benaya:** Based on our experience in Indonesia, some success stories showed that shark conservation is possibly implemented in the real world, even in the biggest shark fishing country in the world. Some fishers are willing to release juvenile wedgefishes (family Rhinidae), Manta Rays, and Whale Sharks (*Rhincodon typus*). Shark traders register their business to make it legal, their product traceable, and support quotas from the government. Support from many stakeholders across Indonesia also strengthens conservation action and makes us feel more optimistic. Shark conservation now is a big marine conservation movement in Indonesia. However, this effort and spirits need to be duplicated as much as possible in many sites

across Indonesia. Globally, there is also a strong driver to make people more concerned and aware that shark conservation is an issue which should be solved soon.

However, we are also still facing challenges because sharks are a fishery commodity, which creates a complex situation in some ways. Changing people's perceptions from generation to generation is quite challenging. As a large shark fishery and producer, Indonesia has a wide area and all kinds of diversity (fishery scale and methods, culture, etc.).

**What's something you're looking forward to this year?**

**Natascha:** This year, we have several projects underway, and we hope to share the results with the community soon! Among the investigations we are carrying out, we highlight the studies on conservation physiology, focusing on the effects of fishing on the recruitment of the species most commonly caught in our study region; studies aimed at reducing the negative impacts of bycatch on sharks and rays in a global hotspot; and our guitarfish release program, which is carried out in partnership with artisanal fishing communities in the state of Paraná, southern Brazil. In 11 years of existence, it has already returned more than 2,000 guitarfish caught as bycatch to nature.

Alongside the SSG, I am working on my first assessment, helping SSG Chair Dr Rima Jabado with the evaluation of a new wedgefish species. In addition, I was a participant in the Important Shark and Ray Areas (ISRAs) workshop hosted by the IUCN SSC Shark Specialist Group, IUCN Ocean Team, and the IUCN Task Force on Marine Mammal Protected Areas, and with support from the Save Our Seas Foundation. In the next months, I will be working with my Brazilian colleagues on the update of the book "Sharks, Rays, and Chimaeras: The Status of the Chondrichthyan Fishes" and also finishing up my training at the "Facilitating Species Conservation Planning Workshops" course hosted by the IUCN SSC Conservation Planning Specialist Group (CPSG), to provide me with the necessary tools to develop management plans in Brazil with the species I work the most.

**Issah:** I am looking forward to working closely with migrant fishers in the Central Region of Ghana, targeting a high number of the large rhino rays for their fins and meat. These migrant fishers travel along the West African coastline (mainly Togo, Ghana, Ivory Coast, Benin, and Nigeria) in diverse seasons to target these species. I am looking for opportunities to work closely with them to mitigate their impact on these threatened species.

**Benaya:** Actually, every year is a thrilling year for me; we need to conduct monitoring evaluations for shark conservation actions in some provinces in Indonesia, compliance levels, evaluating progress, or even doing a reverse step. I'm not looking for some bombastic news, yet consistent things with good progress every year. This year we will try a project which would involve the fisher community to discover, track, and identify the critical habitats of rhino rays in Indonesia, looking forward to the good news about that project, wish me luck! I also hope this year I can work more to collaborate on shark conservation and fisheries management in Indonesia through more strategic and impactful steps.

**What's one fun fact about you?**

**Natascha:** Even though I work with sharks, I avoid going into the sea as I am very afraid of bony fish and crabs.

**Issah:** My favourite hobby I could never give up on is watching sharks swim.

**Benaya:** I came from a city that loves to eat smoked rays. When I was a teenager, I was a piano teacher in my hometown, and now I am a "shark trainer" in Indonesia; I named my dogs Silky, Dusky, and Paucus (poci).

**How can we keep up with your work?**

**Natascha:** You can keep up with my research through my ResearchGate profile [researchgate.net/profile/Natascha-Wosnick] and on the social networks of my study group [@elasmobranquios.parana] and my research projects [@tintureirapr and @programarebimar].

**Issah:** You can keep up with my work at the following sites: aqlico.org saveourseas.com/project-leader/seidu-issah/researchgate.net/profile/Issah-Seidu-2

**Benaya:** You can keep up with my work on my Research Gate profile [researchgate.net/profile/Benaya-Simeon-2], Twitter @benayasimeon and our website (perikanan.org).



Livelihood support as incentive for shark fisher family who conducted shark fisheries management. Wives of shark fishers pack shredded fish to be sold to local markets. in Indonesia

Photo by Abdul Kohar







Sharks caught with size limitation, catch quota, and fishing effort control

Photo courtesy of David Shiffman





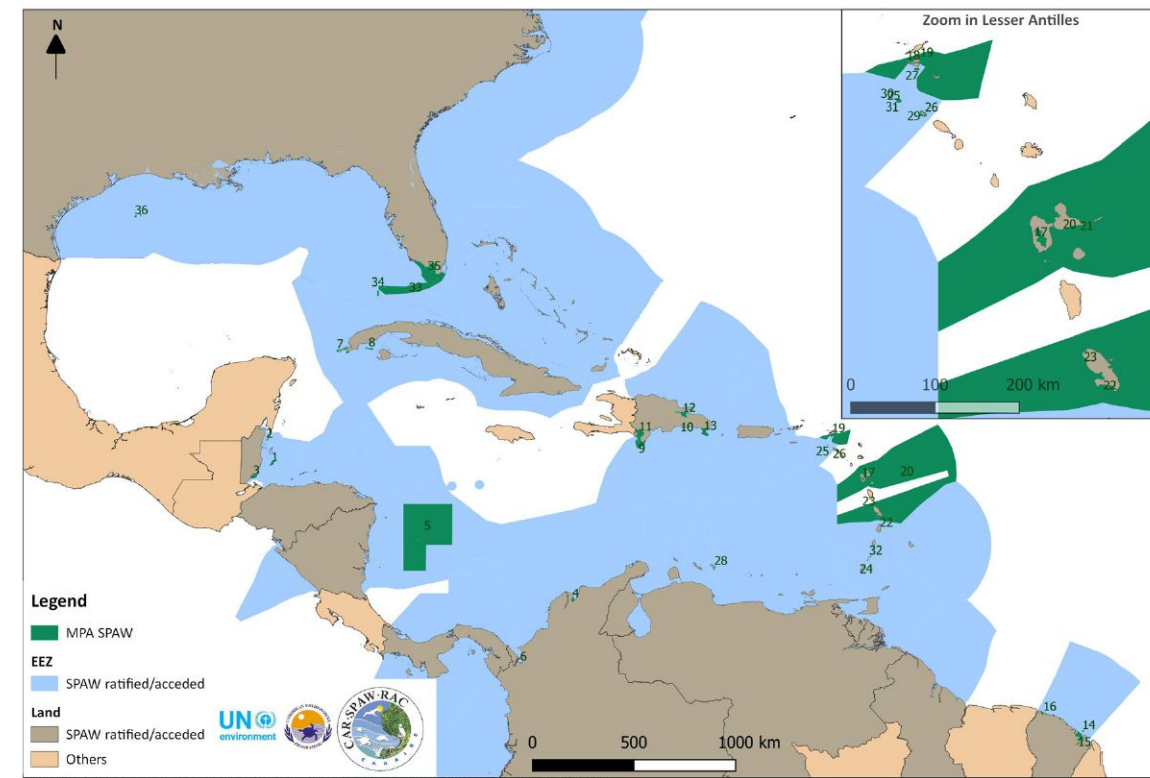
Wives of shark fishers tidy up the handmade woven fabric which would be brought to an exhibition in Indonesia



# Sharks\* and the SPAW Protocol in the Wider Caribbean Region

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

Alexandra Morata  
IUCN SSC Shark Specialist Group | Programme Officer



## What is the SPAW protocol?

The Specially Protected Areas and Wildlife (SPAW) Protocol is one of three regional agreements in the Wider Caribbean Region (WCR) signed in 1990 under the Cartagena Convention. It has been implemented since 2000 and is the legal framework which prioritizes the protection and sustainable use of coastal and marine biodiversity.

Contracting Parties under the SPAW Protocol adopt measures set by Specially Protected Areas and Wildlife - Regional Activity Center (SPAW-RAC). SPAW-RAC aims to protect areas of ecological value and threatened or endangered species of flora and fauna; and other measures to protect WCR's biodiversity.

## SPAW's areas of focus

- Marine Protected Areas and Wildlife
- Threatened and Endangered Marine Species
- Marine and Coastal Ecosystems
- Guidelines for Protected Areas and Species

## The Wider Caribbean Region (WCR)

WCR comprises States and Territories with coasts on the Caribbean Sea, Gulf of Mexico, and parts of the Atlantic Ocean adjacent to these States and Territories.

## The Convention for the Protection and Development of the Marine Environment in the WCR or Cartagena Convention

The regional convention signed in 1983 acts as a legal agreement in the WCR. It functions under the auspices of the United Nations Environment Programme (UNEP). The United Nations - Caribbean Environment Programme (UN-CEP) is one of the 18 Regional Seas Programmes administered under UNEP since 1981. The Cartagena Convention is dedicated to protecting the Caribbean Sea through three protocols or technical agreements:

- a. Oil Spills Protocol;
- b. Specially Protected Areas and Wildlife (SPAW) Protocol; and
- c. Land-Based Sources (LBS) of Marine Pollution Protocol.

## SPAW Definitions:

**Endangered species** "are species or sub-species of fauna and flora, or their populations, that are in danger of extinction throughout all or part of their range and whose survival is unlikely if the factors jeopardizing them continue to operate".

**Threatened species** "are species or sub-species of fauna and flora, or their populations:

- I. that are likely to become endangered within the foreseeable future throughout all or part of their range if the factors causing numerical decline or habitat degradation continue to operate; or
- II. that are rare because they are usually localized within restricted geographical areas or habitats or are thinly scattered over a more extensive range and which are potentially or actually subject to decline and possible endangerment or extinction."

## Structure of SPAW

The Cartagena Convention and its Protocols' Secretariat is located in Kingston, Jamaica. The **Regional Activity Centres [RACs] and Regional Activity Networks ["RANs"]** coordinate the activities of Contracting Parties in implementing the three Protocols. The **Scientific and Technical Advisory Committees [STAC]** of each Protocol have their own committees that act as Contracting Parties' advisors. The **Working Groups [WGs]** support the STAC with handling proposals from Contracting Parties:

- **Protected Area [PA] WG:** reviews proposals on adding new Protected Areas [PAs].
- **Species WG:** reviews proposals on adding/removing/transferring species into Protocol Annexes.
- **Exemption WG:** reviews exemption proposals from Parties.
- **Sargassum WG:** coordinates WGs and "promotes maximum impact of synergies and solutions to the Sargassum outbreaks".







Photo by Gabry Barathieu | Ocean Image Bank | theoceanoagency.org

Whale Shark [*Rhincodon typus*]  
swimming at surface





Photos by Philip Hamilton | Ocean Image Bank | theoceanagency.org



Which shark species are covered by SPAW?

The SPAW Protocol mandates countries to take the necessary measures to protect all relevant species listed under the SPAW Annexes rather than having species-specific articles. The degree of action to be taken varies depending on which Annex a given species is listed under.

Sharks were first proposed to be included in SPAW’s Protocol Annexes during STAC7 in 2016 due to their status as ‘endangered’ or ‘threatened’ in the WCR. Nine species were added in 2017, followed by two additional species in 2019.

**Annex I:** Contains the list of flora species which require Contracting Parties to provide the highest level of protection. It prohibits all forms of destruction or disturbance to listed flora species.

**Annex II:** Contains the list of fauna species which require Contracting Parties to provide the highest level of protection. It prohibits all forms of disturbance, possession or killing, and commercial trading of listed fauna species.

**Annex III:** Contains the list of flora and fauna species which Contracting Parties to regulate their exploitation, to maintain their population at the highest possible levels.

- For fauna: prohibits non-selective methods that could disturb listed species; seasonal hunting periods; regulate possessing and trading of parts, products, or whole species.
- For flora: including their parts or products, the regulation of their collection, harvest and commercial trade.

Countries ratified under the SPAW protocol:

A total of 18 countries and 14 overseas territories have signed the SPAW protocol.

Country/State	Date of Ratification or Accession	Country/State	Date of Ratification or Accession
The Bahamas	24/06/2010	Honduras	13/10/2018
Barbados	14/10/2002	Netherlands**	02/03/1992
Belize	04/01/2008	Nicaragua	04/05/2021
Colombia	05/01/1998	Panama	27/09/1996
Cuba	04/08/1998	Saint Lucia	18/05/2000
Dominican Republic	24/11/1998	St. Vincent and the Grenadines	26/07/1991
France*	05/04/2002	Trinidad and Tobago	10/08/1999
Grenada	05/03/2012	The United States of America***	16/04/2003
Guyana	14/07/2010	Venezuela	28/01/1997

France\* [Guadeloupe, Guyana, Martinique, Saint-Barthélemy, Saint-Martin], the Netherlands\*\* [Aruba, Bonaire, Curaçao, Saba, Saint-Eustache, Sint Maarten], USA\*\*\* [the states bordering the Gulf of Mexico, the American Virgin Islands, Puerto Rico]

Currently, a total of 11 shark species are listed under either Annex II or III, which cover fauna only and both flora and fauna, respectively. [see Article 11: Co-operative measures for the protection of wild flora and fauna]

Order	Family	Scientific Name	Common Name	Annex	Year listed
Carcharhiniformes	Carcharhinidae	<i>Carcharhinus falciformis</i>	Silky Shark	Annex III	2019
Carcharhiniformes	Carcharhinidae	<i>Carcharhinus longimanus</i>	Oceanic Whitetip Shark	Annex III	2017
Carcharhiniformes	Rhincodontidae	<i>Rhincodon typus</i>	Whale Shark	Annex III	2017
Carcharhiniformes	Sphyrnidae	<i>Sphyrna lewini</i>	Scalloped Hammerhead Shark	Annex III	2017
Carcharhiniformes	Sphyrnidae	<i>Sphyrna mokarran</i>	Great Hammerhead Shark	Annex III	2017
Carcharhiniformes	Sphyrnidae	<i>Sphyrna zygaena</i>	Smooth Hammerhead Shark	Annex III	2017
Myliobatiformes	Mobulidae	<i>Mobula alfredi</i> *	Reef Manta Ray	Annex III	2017
Myliobatiformes	Mobulidae	<i>Mobula birostris</i> *	Oceanic Manta Ray	Annex III	2017
Myliobatiformes	Mobulidae	<i>Mobula sp. cf. birostris</i> *	Atlantic Manta Ray	Annex III	2017
Rhinopristiformes*	Pristidae	<i>Pristis pectinata</i>	Smalltooth Sawfish	Annex II	2017
Rhinopristiformes*	Pristidae	<i>Pristis pristis</i>	Large tooth Sawfish	Annex II	2019

\* indicates that the taxonomy of these species has been updated since they were listed, and changes have been made to their names.





Silky Sharks [*Carcharhinus falciformis*] | Cuba



Articles under SPAW Protocol

The SPAW Protocol consists of articles addressing several topics, from general information on its structure to measures to be taken to protect SPAW listed areas and species. Collectively, the articles are designed to support countries that have ratified the Protocol in implementing actions for the conservation of priority areas and threatened species in the WCR.

An\* indicates articles that are directly applicable to sharks. A summary of the information in articles about sharks and exemptions to compliance with articles is provided.

The full SPAW Protocol can be downloaded here.

Article Number	Title	Article Number	Title
1	Definitions	15*	Changes in the Status of Protected Areas or Protected Species
2	General Provisions	16	Publicity, Information, Public Awareness and Education
3	General Obligations	17	Scientific, Technical and Management Research
4	Establishment of Protected Areas	18	Mutual Assistance
5*	Protection Measures	19	Notifications and Reports to the Organization
6	Planning and management regime for protected areas	20	Scientific and Technical Advisory Committee
7	Cooperation Programme for, and Listing of, Protected Areas	21	Establishment of Common Guidelines and Criteria
8	Establishment of Buffer Zones	22	Institutional Arrangements
9	Protected Areas and Buffer Zones Contiguous to International Boundaries	23	Meetings of the Parties
10*	National Measures for the Protection of Wild Flora and Fauna	24	Funding
11*	Co-operative measures for the protection of Wildlife	25	Relationship to Other Conventions Dealing with The Special
12	Introduction of Non-Indigenous or Genetically Altered Species	26	Transitional Clause
13	Environmental impact assessment	27	Entry Into Force
14	Exemptions for traditional activities	28	Signature

Article 5: Protection Measures

Where appropriate, Parties are obliged to adopt the following measures to protect their given area and threatened species:

- a. the regulation or prohibition of the dumping or discharge of wastes and other substances that may endanger protected areas;
- b. the regulation or prohibition of coastal disposal or discharges causing pollution, emanating from coastal establishments and developments, outfall structures or any other sources within their territories;
- c. the regulation of the passage of ships, of any stopping or anchoring, and of other ship activities that would have significant adverse environmental effects on the protected area, without prejudice to the rights of innocent passage, transit passage, archipelagic sea lanes passage and freedom of navigation, in accordance with international law;
- d. the regulation or prohibition of fishing, hunting, taking or harvesting of endangered or threatened species of fauna and flora and their parts or products;
- e. the prohibition of activities that result in the destruction of endangered or threatened species of fauna or flora and their parts and products, and the regulation of any other activity likely to harm or disturb such species, their habitats or associated ecosystems;
- f. the regulation or prohibition of the introduction of non-indigenous species;
- g. the regulation or prohibition of any activity involving the

- exploration or exploitation of the sea-bed or its subsoil or a modification of the sea-bed profile;
- h. the regulation or prohibition of any activity involving a modification of the profile of the soil that could affect watersheds, denudation and other forms of degradation of watersheds, or the exploration or exploitation of the subsoil of the land part of a marine protected area;
- i. the regulation of any archaeological activity and of the removal or damage of any object which may be considered as an archaeological object;
- j. the regulation or prohibition of trade in, and import and export of threatened or endangered species of fauna or their parts, products, or eggs, and of threatened or endangered species of flora or their parts or products, and archaeological objects that originate in protected areas;
- k. the regulation or prohibition of industrial activities and of other activities which are not compatible with the uses that have been envisaged for the area by national measures and/or environmental impact assessments pursuant to Article 13;
- l. the regulation of tourist and recreational activities that might endanger the ecosystems of protected areas or the survival of threatened or endangered species of flora and fauna; and
- m.any other measure aimed at conserving, protecting or restoring natural processes, ecosystems or populations for which the protected areas were established.

Article 10: National Measures for the Protection of Wild Flora and Fauna

Each Party is required to identify all threatened flora and fauna species within their jurisdiction and apply appropriate regulations and/or prohibitions based on their laws to prevent endangering species or improve their population numbers. Threatened flora and fauna identified may or may not be currently listed under the SPAW Protocol Annexes; if not listed, a Party may nominate the species into the Annexes [see below in Article 15: Changes in the Status of Protected Areas or Protected Species].

Protection measures [see Article 5: Protection Measures] applied are required to avoid all forms of disturbance to Annex I and II species and minimize exploitation to Annex III species. The measures also apply to migratory species whose range extends into areas under their jurisdiction.

Article 11: Co-operative measures for the protection of wild flora and fauna

The Parties shall adopt co-operative measures to ensure the protection and recovery of endangered and threatened species of flora and fauna listed in Annexes I, II, and III of the present Protocol. In Article 11(1)(b): Each Party shall ensure total protection and recovery to the species of fauna listed in Annex II by prohibiting:

- i. the taking, possession or killing (including, to the extent possible, the incidental taking, possession or killing) or commercial trade in such species, their eggs, parts or products;
- ii. to the extent possible, the disturbance of such species, particularly during periods of breeding, incubation, estivation or migration, as well as other periods of biological stress.

Each Contracting Party is to implement the above for fauna using the measures given in Article 11(1)(c)(i):

- a. the prohibition of all non-selective means of capture, killing, hunting and fishing and of all actions likely to cause local disappearance of a species or serious disturbance of its tranquillity;
- b. the institution of closed hunting and fishing seasons and other measures for maintaining their population;
- c. the regulation of the taking, possession, transport or sale of living or dead species, their eggs, parts or products;

Article 14: Exemptions for traditional activities

Recognized States ratified under SPAW Protocol also need to consider and provide exemptions, as necessary, to the local people's traditional subsistence and cultural needs. However, no exemption given is allowed to:

- a. endanger the maintenance or areas protected under the terms of this Protocol, including the ecological processes contributing to the maintenance of those protected areas; or
- b. cause either the extinction of, or a substantial risk to, or substantial reduction in the number of, individuals making up the populations of species of fauna and flora within the protected areas, or any ecologically inter-connected species or population, particularly migratory species and threatened, endangered or endemic species.

Parties that allow exemptions regarding protective measures shall inform the Organization accordingly.

Article 15: Changes in the Status of Protected Areas or Protected Species

Changes in the delimitation or legal status of an area, or part thereof, or of a protected species, may only take place for significant reasons, bearing in mind the need to safeguard the environment

and in accordance with the provisions of this Protocol and after notification to the Organization.

The status of areas and species should be periodically reviewed and evaluated by the STAC based on information provided by Parties through the Organization. Areas and species may be removed from the area listing or Protocol annexes by the same procedure they were incorporated.

Procedure to delete/include/transfer species from Protocol Annexes:

- 1. Parties submit a proposal to nominate the inclusion, deletion, or transfer of species between Annexes.
- 2. Parties provide appropriate supporting documents to the mentioned proposal.
- 3. Submission of final drafts at least four months prior to the STAC meeting.
- 4. Secretariat circulates potential changes to Protocol Annexes for the Parties to review.
- 5. Parties review and comment on deletions, inclusions, and transfers and send them to the Secretariat. Any amendments require a three-fourths majority vote of the Contracting Parties.
- 6. STAC reviews nominations and comments, and ultimately decides whether to implement those changes or not. During the STAC meeting, they report the final decisions to the Conference of Parties.
- 7. The Conference of the Parties may assess, to what degree STAC-set conditions have been met.
- 8. Any Contracting Party that is unable to accept an amendment to annexes the SPAW Protocol are to contact the organization within 90 days of adopting the amendment.

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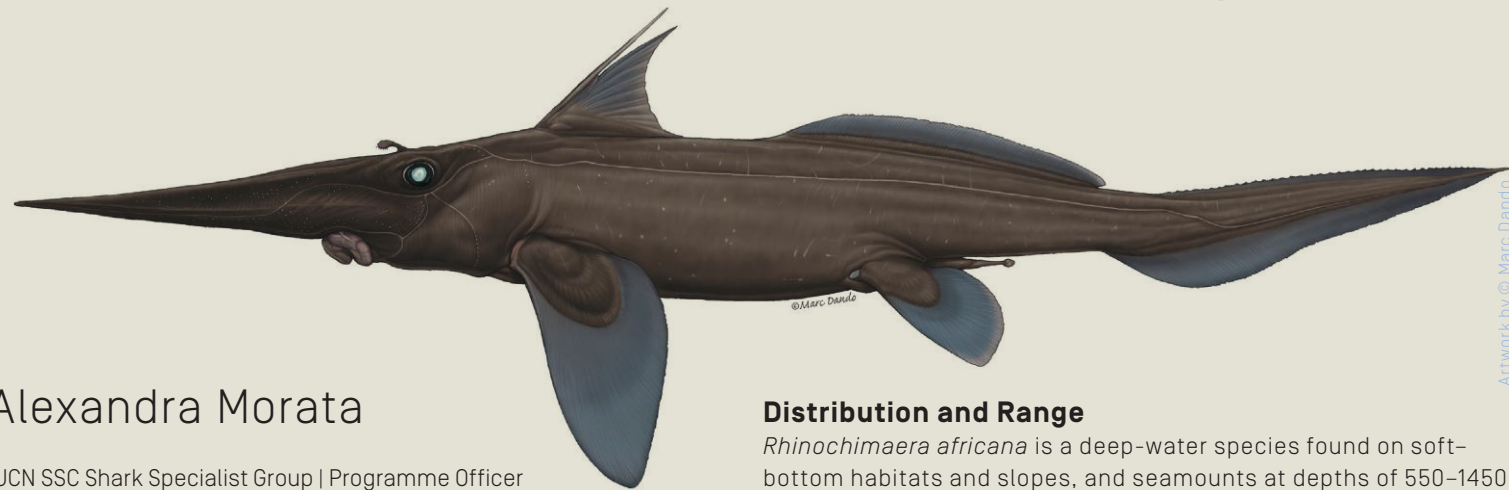
Great Hammerhead Shark  
(*Sphyrna mokarran*) with diver



# Paddlenose Spookfish

(*Rhinochimaera africana*)

Shark  
Spotlight



Alexandra Morata

IUCN SSC Shark Specialist Group | Programme Officer

## Taxonomy

The order Chimaeriformes includes 53 species from six genera and three families: Chimaeridae (short-nosed chimaeras) with 42 species from three genera, Rhinochimaeridae (long-nosed chimaeras) with eight species from three genera, Callorhynchidae (plow-nosed chimaeras) with three species from one genus.

*Rhinochimaera africana* Compagno, Stehmann & Ebert, 1990 commonly known as the Paddlenose Spookfish, belongs to the family Rhinochimaeridae and is one of three species in the *Rhinochimaera* genus. It was misidentified in South Africa as Straight-nose Rabbitfish (*Rhinochimaera atlantica*). It was only recognized when a research trawl caught one along with *R. atlantica* and Narrownose Chimaera (*Harriotta raleighana*) in a trawl off Doring Bay on the west coast of South Africa. The species was discovered in South Africa in 1986 and confirmed as a separate species in 1990.

## Morphology

Being part of the family Rhinochimaeridae, *R. africana*, has a long nose. This species is distinguishable from other Rhinochimaeridae, especially from the most-closely related Pacific Spookfish, by its wide, paddle-shaped snout, hence the common name 'Paddlenose'. Additionally, *R. africana* is distinct in its small eyes, with its body being a uniform dark-brown or black colour, with no markings/patterns. However, the oronasal region is notably paler than the rest of the body and is rarely solid white. The Paddlenose Spookfish reaches a maximum size of approximately 150 cm total length [TL].

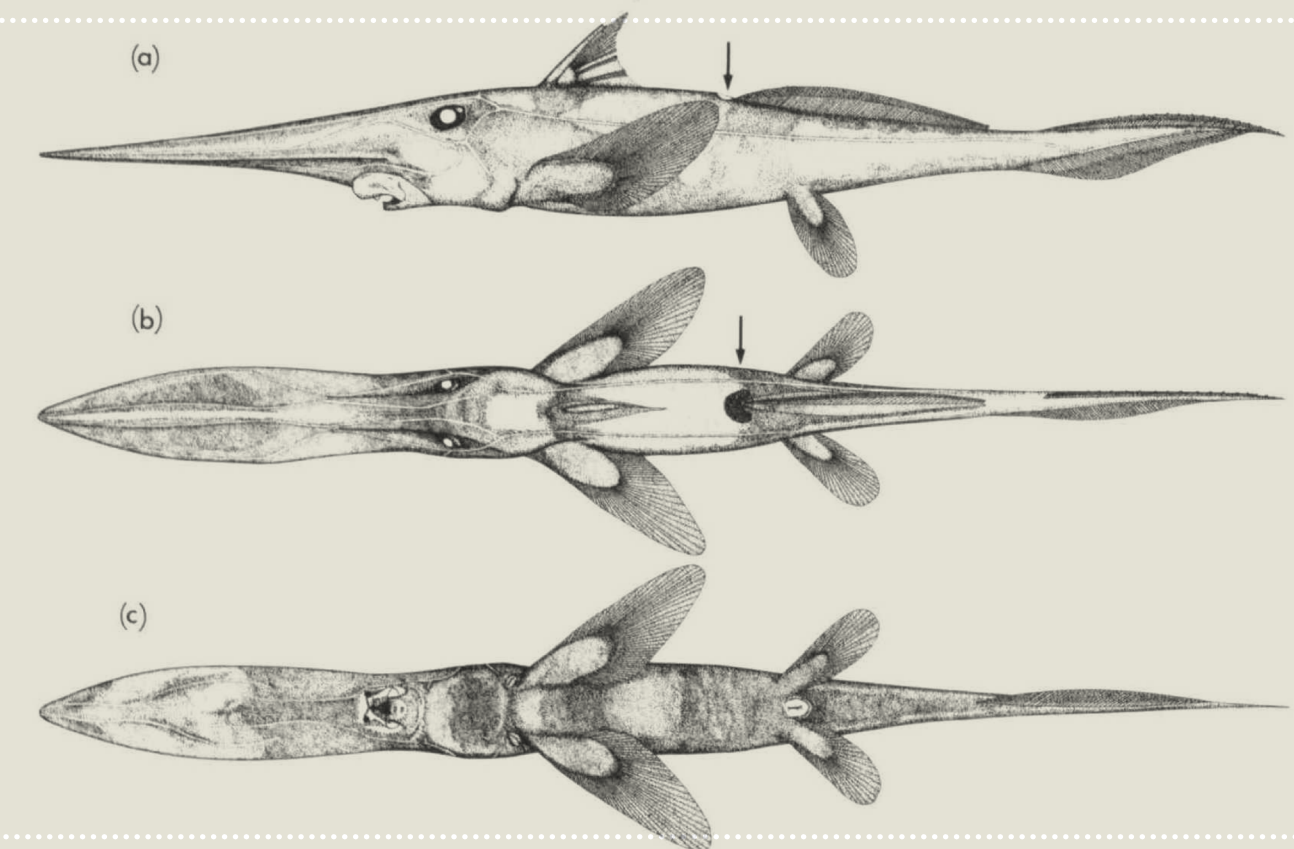
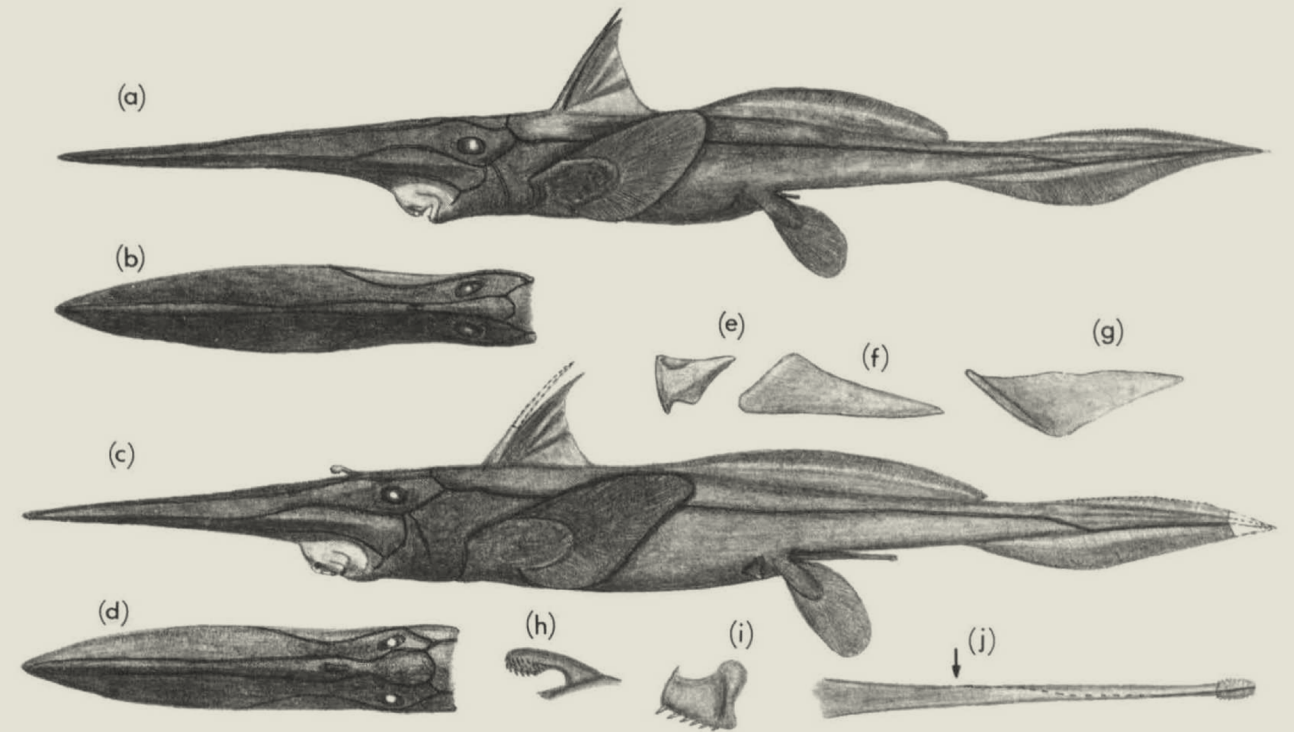
## Distribution and Range

*Rhinochimaera africana* is a deep-water species found on soft-bottom habitats and slopes, and seamounts at depths of 550–1450 m. It has a patch distribution across Africa, Oceania, and Asia and has been reported from Mozambique, South Africa, Western Australia, China, Japan, and Taiwan (Province of China). Also from Peru and Costa Rica. The Angulo et al 2014 paper documents it from Costa Rica.

## Conservation measures and IUCN Red List status

The Paddlenose Spookfish was assessed as Data Deficient on the IUCN Red List of Threatened Species in 2016. Data on the species' biology, ecology, population, or reproduction are lacking, and its range could be more widespread with a connected distribution. Since *R. africana* occurs only in deep-water, it makes the species inaccessible to most fisheries and they are likely to have no commercial value. Both factors contribute to the lack of information available, but to an extent, may also protect them from fishing pressures that Chondrichthyes at higher depths experience.

Across its known distribution, it is unknown if *R. africana* is caught as bycatch in deep-water trawls. However, in Taiwan, the Paddlenose Spookfish is accidentally caught in deep-water trawls and landed to be sold at markets for local consumption. Due to the lack of fisheries data, there is insufficient information available to assess its extinction risk. There are currently no management or conservation measures in place for this species. With marine resources at higher depths increasingly depleted, fisheries are progressing into lower depths. Given the underreporting, lack of conservation measures, and increasing fishing pressures, this likely poses a threat to deep benthic species, including the Paddlenose Spookfish.



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# The interactive Shark Alley exhibit opens at the Two Oceans Aquarium in Cape Town, South Africa

Written by Helen Lockhart

Conservation & Sustainability Manager | Two Oceans Aquarium

Southern Africa has one of the most fascinating coastlines in the world. The southern part of the continent is sandwiched between two ocean currents that have a powerful influence on terrestrial and marine flora and fauna. As a result, marine ecosystems are diverse and complex. At the southern tip of Africa, the cold Benguela Current off the west coast ‘meets’ the warm Agulhas Current that streams down the east coast. There are few places where a country is positioned between waters that differ so dramatically in temperature and the flora and fauna they support. Therefore, it is no surprise that southern Africa is a biodiversity hotspot for elasmobranchs (sharks and rays). Of the more than 500 known species of sharks in the world, 117 of these are found off the southern African coast. Currently, seven species are endemic to South Africa and 14 to southern Africa.

Like many shark species around the world, South Africa’s sharks are under threat from overfishing, pollution, habit destruction, and climate change (it is estimated that 30% of sharks and rays are threatened with extinction). Soupfin Sharks (*Galeorhinus galeus*) are listed as Critically Endangered on the IUCN Red List of Threatened Species. In contrast, the Common Smoothhound (*Mustelus mustelus*), Natal Shyshark (*Haploblepharus kistnasamyi*) and Brown Shyshark (*Haploblepharus fuscus*) are listed as Vulnerable. Puffadder Shysharks (*Haploblepharus edwardsii*) are currently Endangered. Fortunately, some sharks, such as Spotted Raggedtooth Sharks (Sand Tiger Shark)[*Carcharias taurus*] and White Sharks (*Carcharodon carcharias*), are protected species in South Africa.

Situated in Cape Town at the southern tip of Africa, the Two Oceans Aquarium is ideally situated to showcase some of the rich and diverse marine life, including elasmobranchs. The Aquarium currently houses Spotted Raggedtooth Sharks, Spotted Gully Sharks (*Triakis megalopterus*), Pyjama Catsharks (*Poroderma africanum*), Leopard Catsharks (*Poroderma pantherinum*), Puffadder Shysharks, St. Joseph Sharks (*Callorhinchus capensis*), Short-tail Stingrays (*Dasyatis brevicaudata*), Blue Stingrays (*Dasyatis chrysonota*), Common Eagle Rays (*Myliobatis aquila*) and a Coach Whipray (*Himantura uarnak*).

Sharks are among the star attractions for visitors to any aquarium and have remained a firm favourite with visitors to the Two Oceans Aquarium since it opened in 1995. Throughout its history, the Aquarium has endeavoured to shift public perception around sharks and encouraged people to view these animals not as ‘man-eaters’ but as predators, which play a critical role in maintaining the balance of marine ecosystems.

In 2004, the Aquarium joined forces with the AfriOceans Conservation Alliance and the Save Our Seas Foundation (SOSF) to deliver a multi-faceted shark conservation programme which encompasses science, education, and awareness of sharks.

As part of the science component, a number of the Aquarium’s Spotted Raggedtooth Sharks were tagged with satellite and ultrasonic tags before being released back into the wild. Several wild Spotted Raggedtooth sharks were tagged simultaneously to compare the behaviour of the released sharks and the wild sharks (Smale et al. 2012).

In October 2021, in partnership with SOSF, the Aquarium opened ‘Shark Alley’, an interactive exhibit focusing on sharks. This large-scale exhibit curves around the outer walls of the Save Our Seas Foundation Shark Exhibit and complements the viewing of live Spotted Raggedtooth Sharks with informative signage, short films, a live display of shark egg cases, and interactive exhibits that



convey fascinating shark facts. The interactive exhibits provide hands-on learning experiences, encouraging visitors of all ages to delve into various aspects of shark biology and conservation. At the same time, seeing live sharks inspires awe and admiration for these animals that have inhabited our planet’s oceans for the past 400 million years.

The natural flow of the exhibit takes visitors on a journey that starts with an introduction to various shark species, with depictions of their actual sizes, along with biological and conservation facts. The exhibit details specific biological aspects of sharks, with information about their senses, fins, teeth, respiration, reproduction, and more. Shark Alley dives deeply into sharks’ incredible adaptations for survival, highlighting how specialised and effective they are and how they have put sharks in direct competition with, and at the mercy of, humans.

The exhibit is structured so that adults can access more complex information laid out in higher exhibit areas. At the same time, children can play with the more interactive exhibits at lower levels. This was done so that children could experientially learn more about sharks while adults could answer some of the questions their children might be asking. Using these techniques to structure information helps to stimulate conversation and discussion between adults and their children. This is critical as one of the opening lines of the exhibit is “Choose your narrative of sharks carefully. Your kids should be fearful for sharks, not of them”.

Shark Alley was among the more challenging exhibits to conceptualise and develop, given our complex relationship with sharks and the fact that, although Jaws was made almost 50 years ago, negative public perception and fear are still largely pervasive.

During the initial research and conceptualisation phase, a wide range of scientists [some of whom sat on the expert panel for the recent review of South Africa’s National Plan of Action for the Conservation and Management of Sharks] were interviewed, along with conservationists and educators, to explore their thinking around two specific questions:

- 1. What is/are the key message(s) that the Aquarium needs to get across to its visitors?
- 2. What can Aquarium visitors do to help/protect sharks locally?

In response to the first question, the answers ranged from how amazing sharks are (from fear to fascination), the role of sharks in ecosystems and keeping the balance, and the diversity of sharks in South Africa, focusing less on the charismatic species and more on endemic ones, and linking the fact that every breath we take comes from the ocean. Therefore a healthy ocean means healthy ecosystems, which mean healthy sharks and, in turn, healthy humans. Many of those interviewed urged us to somehow touch people’s hearts – not an easy task when it comes to sharks!

The second question elicited responses to pressure the South African government to improve fisheries management and protect South African species; choose sustainable seafood; support shark conservation, education and research organisations and marine organisations in general, and introduce more marine protected areas.

Shark Alley frames the biology of sharks around the fact that some of the survival strategies sharks have and continue to develop are precisely those which make them susceptible to exploitation by the most efficient and dangerous predator of all – humans.

With each biological fact, the developers have tried to showcase how susceptible and misunderstood sharks really are, to put each fact in context of how sharks live and navigate their world, and hopefully, evoke some empathy in Aquarium visitors toward sharks.

For example, people often misinterpret shark behaviours such as

bumping into things, spy hopping and biting objects as indicators that they simply want to kill. Still, these are just some of the ways that sharks try to make sense of what something is or what is happening in their surroundings.

Sharks move their heads from side to side as they swim to aid their vision since they have a blind spot right in front of their snouts – they are not simply on the prowl and trying to look menacing to humans.

When people think of sharks, they often think of teeth – lots of razor-sharp, menacing teeth. This is how sharks have largely been sensationalised and portrayed, feeding our misguided fear of these animals. It is humans who fuel the frenzy of fear, not sharks. The use of scary, toothy images in Shark Alley was avoided as much as possible.

The Aquarium hopes that the Shark Alley Exhibit will showcase the magnificence of sharks and how spectacularly well-adapted they are to their environment. It is expected that visitors will leave with a deeper appreciation of just how susceptible sharks are because of the human pressures being placed on them. Shark Alley also encourages South Africans to view the diversity of sharks off the coast as a jewel in their marine heritage.

The Aquarium plans to conduct research into visitors’ responses to Shark Alley.

Phase Three of Shark Alley will open in late 2022/early 2023.

The Two Oceans Aquarium thanks the Save Our Seas Foundation for its sponsorship of the SOSF Shark Exhibit and its contribution towards Shark Alley.

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Reference:  
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Photos by Rebekah Plath | Two Oceans Aquarium





Photo by Renée Leeuwner | Two Oceans Aquarium





# Beachgoers in Durban, South Africa, come face-to-face with the world's most Dangerous Predator

Written by Lauren van Nijkerk | WILDTRUST



Photo by Mngqobi Zuma

Earlier this year, a team from WILDOCEANS, a programme of the WILDTRUST, had members of the public on a beachfront in Durban, South Africa, shivering in their slops after they were asked to come face to face with the world's most dangerous predator – which was in a mysterious tank covered in black cloth.

WILDOCEANS is the driving force behind the “Shark & Ray Protection project” – a 3-year project being implemented together with multiple partners with an overarching objective of increasing protection for sharks and rays, which include some of the most threatened species on the planet – arguably even more than rhinos and pangolins.

The Shark Attack campaign is underwriting this project. It has become known as a clever, edgy, and relatable way to educate the public on these species with a bad reputation, showing sharks as the hunted and not the hunters we have been led to believe.

As the team approached people on the beachfront, reactions were mixed, and while some were hesitant to see what was in the tank, others curiously followed onto the sand to eventually sit down in front of the display. When seated and asked to guess what could be in the tank, responses included a python, an escaped crocodile, and even plastic. “Plastic is going to kill us one day,” one participant commented.

Anxiously waiting for the WILDOCEANS team to lift the black cloth, a father and son duo argued over who should sit closest to the display. Later, two cousins jumped up and fell off the chair as the cloth was lifted. So, what did they see?

The mysterious tank housed two shark-shaped mirrors, revealing the most dangerous predator on the planet... humans.

Emotions ranged from confusion, relief and finally, acceptance that humans are far more dangerous than sharks. Humans are responsible for killing an estimated 75 million sharks globally due to a combination of fisheries (including bycatch), pollution, trade, loss of critical habitat, and negative perceptions of sharks.

“There is strong scientific evidence proving how important our sharks are in balancing our ocean ecosystem,” said Dr Jennifer Olbers, a Marine Scientist at WILDTRUST. “Surely, we as humans entering the ocean should be modifying our behaviour to protect them rather than trying to eradicate them.”

South Africa is uniquely positioned to spearhead efforts in the conservation of sharks, as our waters are home to around 200 shark and ray species and are a top five global biodiversity hotspot. South Africa can provide sanctuary for the species if we successfully promote non-consumptive and sustainable use.

“The sea is not the same without sharks,” shared a concerned citizen. “People can do better; people can choose to do better.”

“We hope our activation helped inform some of the South African public about the plight of shark (and ray) species, as well as helped shift negative perceptions about these species, and informed future behaviour,” said Campaign Lead Lauren van Nijkerk. “An ocean without sharks is an unbalanced, unhealthy ocean – and an unhealthy ocean means we will ultimately face a world without us.”

Watch the video:  
[facebook.com/SharkAttackCampaign/videos/547916020318093](https://facebook.com/SharkAttackCampaign/videos/547916020318093)

More information:  
[wildtrust.co.za](http://wildtrust.co.za) | [twitter.com/WILDOCEANSSA](https://twitter.com/WILDOCEANSSA)  
[sharkattackcampaign.co.za](http://sharkattackcampaign.co.za) | [facebook.com/SharkAttackCampaign/](https://facebook.com/SharkAttackCampaign/) |  
[instagram.com/sharkattackcampaign/](https://instagram.com/sharkattackcampaign/) | [twitter.com/sharkattacksa](https://twitter.com/sharkattacksa)





Photos by Mngqobi Zuma







Only three months to go! Digital tickets are still available for the biggest shark conference of the year!

If you need a quick recap before we jump into these exciting developments, here is a brief summary: In 2018, it was announced that Sharks International 2022 (SI2022) was coming to Europe. Due to the COVID pandemic, a hybrid event was proposed, featuring five digital days (October 10–14th) leading up to an in-person conference (October 20th–22nd) in Valencia, Spain. Since then, the shark community has been signing up on the SI2022 portal ([si2022.org](https://si2022.org)), where many of the 1200+ members have submitted abstracts, purchased tickets, and discussed shark research and conservation in the online forum.

#### Back to the latest news!

Valencia tickets! The massively popular in-person conference tickets did not last long! All 350 tickets have now been allocated, and delegates selected to present have been (or will shortly be) contacted to purchase their reserved ticket. With the conference just three months away, those attending Valencia might start planning their trip. Guidance from the SI2022 team on hotels and travel can be found by following this link [si2022.org/pages/visitor-information](https://si2022.org/pages/visitor-information)

Digital event! While the in-person tickets have now been allocated, the good news is our digital ticket gives you access to all live content across the entire conference. The online days (October 10th–14th) and the three-day physical event (October 20th–22nd) at L'Oceanogràfic in Valencia will be live-streamed to digital ticket holders. This means that as well as the five days of enhanced digital content (including talks, workshops, meetings, chatrooms, and more), you can enjoy live presentations from the big stage in Valencia.

Sponsored Support! Due to the generous assistance of the Shark Conservation Fund, we can now open the SI2022 online event to more delegates than ever! A massive 50% discount is now available to students and delegates from low and middle-income nations (NOTE: category now expanded to all middle-income nations). The online event should now be more accessible than ever.

**PLEASE PROMOTE THIS THROUGH YOUR NETWORKS AND ENCOURAGE ATTENDANCE.**

You can find out more about our digital tickets and purchase them here [si2022.org/events](https://si2022.org/events). NOTE: If you have registered for the Full Conference, you do not need to register for a digital ticket.

Abstract submissions! Over the last few weeks, presentation and poster submissions have been coming in fast as delegates from around the world shared their work with the SI2022 team. Deadlines and deadline extensions have come and gone for both online and in-person submissions. Delegates who submitted presentation abstracts have been (or will shortly be) contacted as the conference agenda starts to take shape. Those who submitted poster abstracts (both physical and online) will be contacted in the coming weeks. In short, the SI2022 conference is very much starting to take form, and we cannot wait to share the lineup with everyone. It is going to be a fascinating and diverse conference.

SI2026 hosts! With Sharks International 2022 approaching, it is time to consider hosts for the 2026 meeting. If you are interested, please send a short written proposal to [michelle.heupel@utas.edu.au](mailto:michelle.heupel@utas.edu.au). The successful bid for the 2026 conference will be announced at the 2022 meeting. More info here [si2022.org/news/sharks-international-2026-call-for-hosts](https://si2022.org/news/sharks-international-2026-call-for-hosts)

Whether it is online or in Valencia, SI2022 is the place to be for shark researchers, conservationists, and advocates worldwide. If you are not excited enough already, check out our promotional video here. It is more than a conference. We are building a global community of shark researchers and conservationists. We cannot wait to see you all in October!



# The IUCN Green Status of Species Webinar

Alexandra Morata

IUCN SSC Shark Specialist Group | Programme Officer

“Is avoiding extinction enough?” asked Dr Molly Grace. Generally, the IUCN Red List of Threatened Species is used to measure the conservation status of species, but is a status of Least Concern sufficient to show the progress of conservation measures implemented? Or to show that a species has recovered? Those questions ultimately led to the development of the IUCN Green Status. The purpose of the Green Status is to answer, “When has a species recovered?” and “How to recover species functions?” in a measurable and standardized manner. In July 2021, the first 181 IUCN Green Status of Species were integrated with the IUCN Red List of Threatened Species. Since then, more species have been assessed using this new tool, including five shark, ray, and chimaera species: Banded Wobbegong (*Orectolobus halei*), Blue Shark (*Prionace glauca*), Bonnethead Shark (*Sphyrna tiburo*), Whale Shark (*Rhincodon typus*), White Shark (*Carcharodon carcharias*).

Given how recently the Green Status of Species was established, many are unaware of how to use this new tool. Thus, the IUCN Green Status of Species webinar was held on Tuesday, April 12, 2022. It was organized by the IUCN SSC Shark Specialist Group (SSG) and led by **Dr Molly Grace, Co-Chair of the IUCN Green Status of Species Working Group**. The presentations focused on: “What is the Green Status?”; “How does the Green Status of Species define recovery?”; “Why go green?”; case studies on applying the Green Status of Species to shark, ray, and chimaera species; and a Q & A.

Overall, 60 participants joined the Zoom call, but many have requested that we share the video. So, for those of you who missed it, you can find below the agenda and links to the webinar uploaded to the SSG's Vimeo and YouTube accounts.

Agenda			
[GMT+4]			
Time	Title	Presenter	Affiliation
17.00 – 17.05	Opening remarks	Dr. Rima Jabado	Chair: IUCN SSC Shark Specialist Group
17.05 – 17.25	The IUCN Green Status of Species	Dr. Molly Grace	Co-Chair: IUCN Green Status of Species Working Group
17.25 –17.45	Blue Shark ( <i>Prionace glauca</i> )	Dr. Carlos Polo	Senior Researcher Universidad Jorge Tadeo Lozano
	Whale Shark ( <i>Rhincodon typus</i> )	Dr. Gonzalo Araujo	Founder & Director Marine Research and Conservation Foundation
	Banded Wobbegong ( <i>Orectolobus halei</i> )	Dr. Charlie Huveneers	Professor Flinders University
17.45 – 18.00	Q & A session	All presenters	

We thank Dr Molly Grace for taking the time to present this new approach to our members, as well as our SSG members Dr Gonzalo Araujo, Dr Charlie Huveneers, and Dr Carlos Polo for agreeing to present on how they have applied the new criteria and guidelines to various shark species.

We hope these presentations are valuable to others interested in species recovery and encourage you to share the video links with anyone you think might be interested. The webinar is available here: [vimeo.com/702312274](https://vimeo.com/702312274) and [youtu.be/8Ubat6kn1Wo](https://youtu.be/8Ubat6kn1Wo)

white shark

Advanced

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White Shark: In detail

# White Shark

*Carcharodon carcharias*

ABSTRACT

White Shark *Carcharodon carcharias* has most recently been assessed for *The IUCN Red List of Threatened Species* in 2018. *Carcharodon carcharias* is listed as Vulnerable under criteria A2bd.

DownloadText Overview

THE RED LIST ASSESSMENT

Rigby, C.L., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K...

< VULNERABLE >

VU

LAST ASSESSED

07 November 2018

SCOPE OF ASSESSMENT

Global

[Assessment in detail](#)

THE GREEN STATUS ASSESSMENT

Spaet, J.L.Y. 2021. *Carcharodon carcharias* (Green Status assessment). *The IUCN Red List of Threatened Sp...*

< MODERATELY DEPLETED >

MD

LAST ASSESSED

31 October 2021

SCOPE OF ASSESSMENT

Global

[Assessment in detail](#)

POPULATION TREND

Decreasing

NUMBER OF MATURE INDIVIDUALS

Population in detail

SPECIES RECOVERY SCORE

56% (37% - 74%)

GEOGRAPHIC RANGE




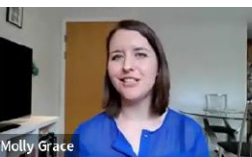


Image credit: Simone Caprodossi

# An introduction to the IUCN Green Status of Species

Molly Grace, PhD  
Department of Zoology,  
University of Oxford

Co-Chair, IUCN Green Status of Species Working Group



# Green status of gulf wobbegong

by Charlie Huveneers









## IUCN Green Status of Species

### Whale shark *Rhincodon typus*



Dr. Gonzalo Araujo, Founder & Director, Marine Research and Conservation Foundation  
Dr. Simon J. Pierce, Co-Founder & Principal Scientist, Marine Megafauna Foundation

Marine Research and Conservation Foundation is a registered charity in England and Wales (Charity No. 1190861).





# Towards a global genetic reference data-base of eDNA barcodes for elasmobranchs

Photo by Franck Pichot



It could be blood [200µL]

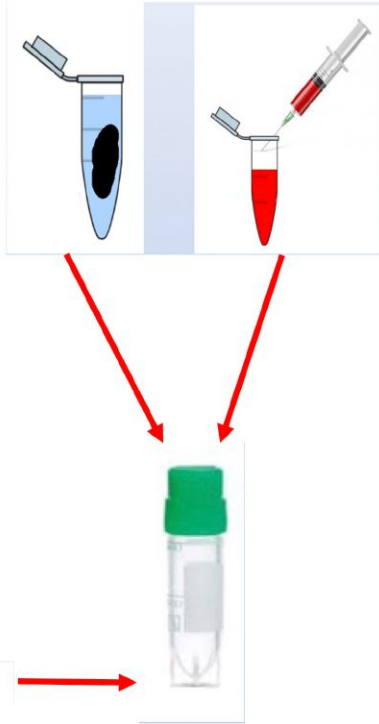


Photo by Lola Romant

PF\_Aq\_21\_001  
PF\_Aq\_21\_002  
PF\_Aq\_21\_003  
PF\_Aq\_21\_004  
PF\_Aq\_21\_005



PF\_Aq\_21\_001



A label example with a cell from an Exel file: PF (PICHOT FRANCK) / Aq (aquarium) / 22 [year] / tube number] associating the sample with the name of the species must be printed and added in the tube.

Samples should be conserved in pure alcohol [96 degrees] or frozen in a 2mL Microtube with a cap.



Photo by Chiara Pichot-Simoni

It could be a fin clip [1.5 x 0.5 cm] from the tip of the fin.

Written by Franck Pichot

franck.megafauna@gmail.com

Reviewed by David Mouillot

MARBEC | University of Montpellier

The Anthropocene is marked by a massive defaunaution affecting both terrestrial and aquatic ecosystems. Yet, the lack of knowledge about the status and distribution of many species makes assessing this biodiversity erosion challenging and uncertain. Taxonomic inventories provide the most elementary data for such assessment, but they are notoriously incomplete, particularly in the vast ocean.

In marine ecosystems, elasmobranchs (sharks and rays) are particularly affected by anthropogenic activities and are disproportionately present among threatened species on the IUCN Red List of Threatened Species. So, better detecting and monitoring these rare and elusive species is of high conservation priority. To improve the census of elasmobranchs, we propose using environmental DNA (eDNA) metabarcoding since it detects more species than traditional surveys through a non-invasive and non-destructive method.

Indeed, all living organisms release fragments of DNA in their environment through urine, gametes, blood, mucus, and skin loss...

This DNA, collected in the water column through filtration, is called environmental DNA or eDNA. The metabarcoding of this eDNA can identify species, even rare, cryptic, elusive or invasive, and then accurately estimate the level of biodiversity. Yet, this identification phase is highly dependent on the genetic reference database since we cannot identify species that have not been sequenced. The sequence barcode database is thus the cornerstone of any eDNA study in conservation.

This project aims to obtain more genetic sequences from sharks and rays at a global scale to assign more species, particularly the most threatened, to the 12S mitochondrion barcodes from eDNA samples.

We thus seek new collaborations worldwide to collect tissues (fin clip [1.5 x 0.5 cm] on the caudal fin or blood [200µL] stored in pure alcohol or frozen (cf. sampling protocol) for missing species in the current global genetic reference database for the 12S marker.

From these tissues (at least two individuals for each species), we will be able to extract the DNA and then complete the 12S marker genetic database.

Ultimately it will improve the knowledge (biogeography, presence in marine reserves, depth) and conservation of such species and will provide more exhaustive biodiversity inventories.

## How can we collaborate?

Tissue collection can be performed in two ways (blood or fin clip samples), but in all cases, we need at least two samples for each missing species in our database. When possible, the picture of the individual must also be added.

An ambitious project has already started through a collaboration with museums and aquariums. To get involved with us: the key thing is to engage. All costs (tubes, alcohol, shipping, and sequencing costs) will be covered by our laboratory (MARine Biology Exploitation and Conservation from Montpellier), while sequences will be shared.

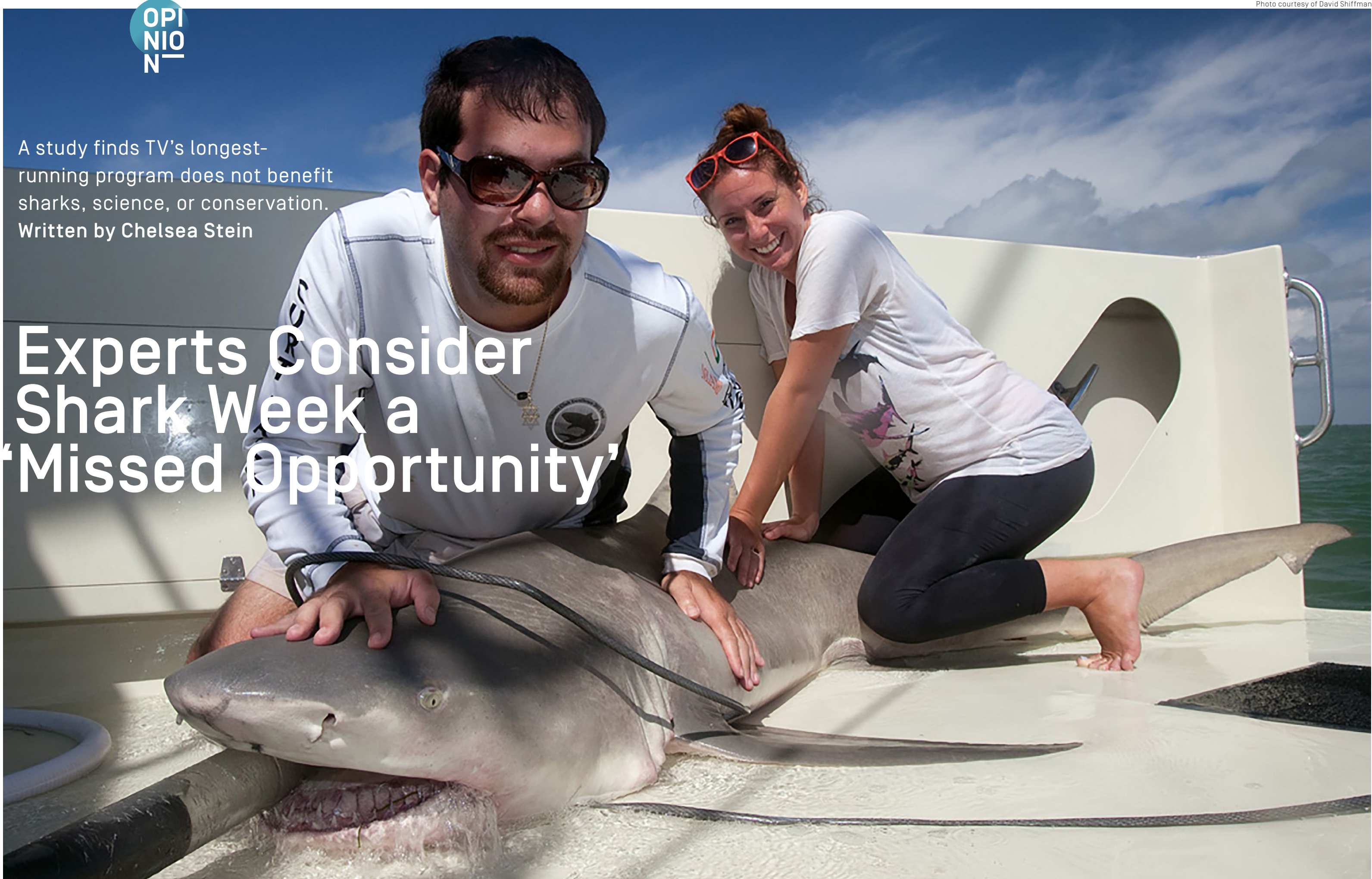
## Marine Megafauna





A study finds TV's longest-running program does not benefit sharks, science, or conservation.  
Written by Chelsea Stein

# Experts Consider Shark Week a 'Missed Opportunity'











Catherine Macdonald  
Photo by Cliff Hawkins



David Shiffman  
Photo courtesy of David Shiffman



Brady Mickley  
Photo by Sageus Truitt

Ways to turn the tide

In the paper, the researchers present a series of recommendations for how Discovery Channel can turn the tide for Shark Week to generate interest in both sharks and scientific careers for viewers and offer entertaining and educational content.

Of course, reducing harmful sensationalism is the first step. Enhancing factual accuracy and clearly distinguishing between fact-based and fictional programming is critical, along with featuring real scientists and real scientific methods and identifying credentialed scientific experts vs non-scientific people. Increasing the diversity of shark species and people, as mentioned before, is important too. Finally, the researchers say the best practice to improve the public image of sharks is to shift from negative stereotypes and provide detailed information on how conservation connects to people’s lives and how viewers can get involved.

Whitenack noted how Discovery Channel could also improve editorial processes with its producers to establish a respected relationship with scientists.

“Discovery Communications is not always billed as the producer; they have to work with the producers on the editorial process, and maybe part of the deal becomes saying how they need to work with the scientists,” she said. “Allowing scientists to have a little bit of control to make sure we’re being portrayed accurately, like simple fact checks for the narrator’s script, would go a long way.”

Whitenack also pointed out how making change has two sides: some fall on Discovery Channel, and some on the shark scientists. For the latter, this could mean sharing information and experiences interacting with production companies with peers, speaking up and asking what peers who have appeared on Shark Week were offered, and even increasing their own training and preparation.

“I think media training is really important so that scientists know how to speak to journalists or present during interviews for documentaries,” she said. “Speaking in short sentences that can’t be cut down or including part of the question into an answer, for example, are things I learned during a workshop during grad school that have stayed with me.”

As Shark Week 2022 is on the horizon, Whitenack also shared advice for viewers exploring the lineup and making plans to tune in. Her first tip is to read the episode descriptions and find episodes that aren’t focused on shark bites or attacks. In general, if you want to learn about sharks, she says to steer away from the celebrity episodes too.

“Regardless of what you do watch, one of the big things is to think about what they are presenting. Take everything with a grain of salt and do some fact-checking,” she said.

A great way to find information during Shark Week is by scoping out Twitter. Whitenack said many shark scientists – like coauthor Shiffman – live-tweet their takes on the content and fact-check episodes in real-time. Whitenack also said Twitter can complement what people see on Shark Week, offering a deeper dive into real research.

“On Shark Week, everything is outside on a boat; if this is what the public is exposed to, they think it’s the only way we can learn about sharks. And it’s not great for sharks as a whole and not great for kids who want to work in this field,” she said, noting how she didn’t realize working with sharks in a lab setting was an option until applying for her PhD program.

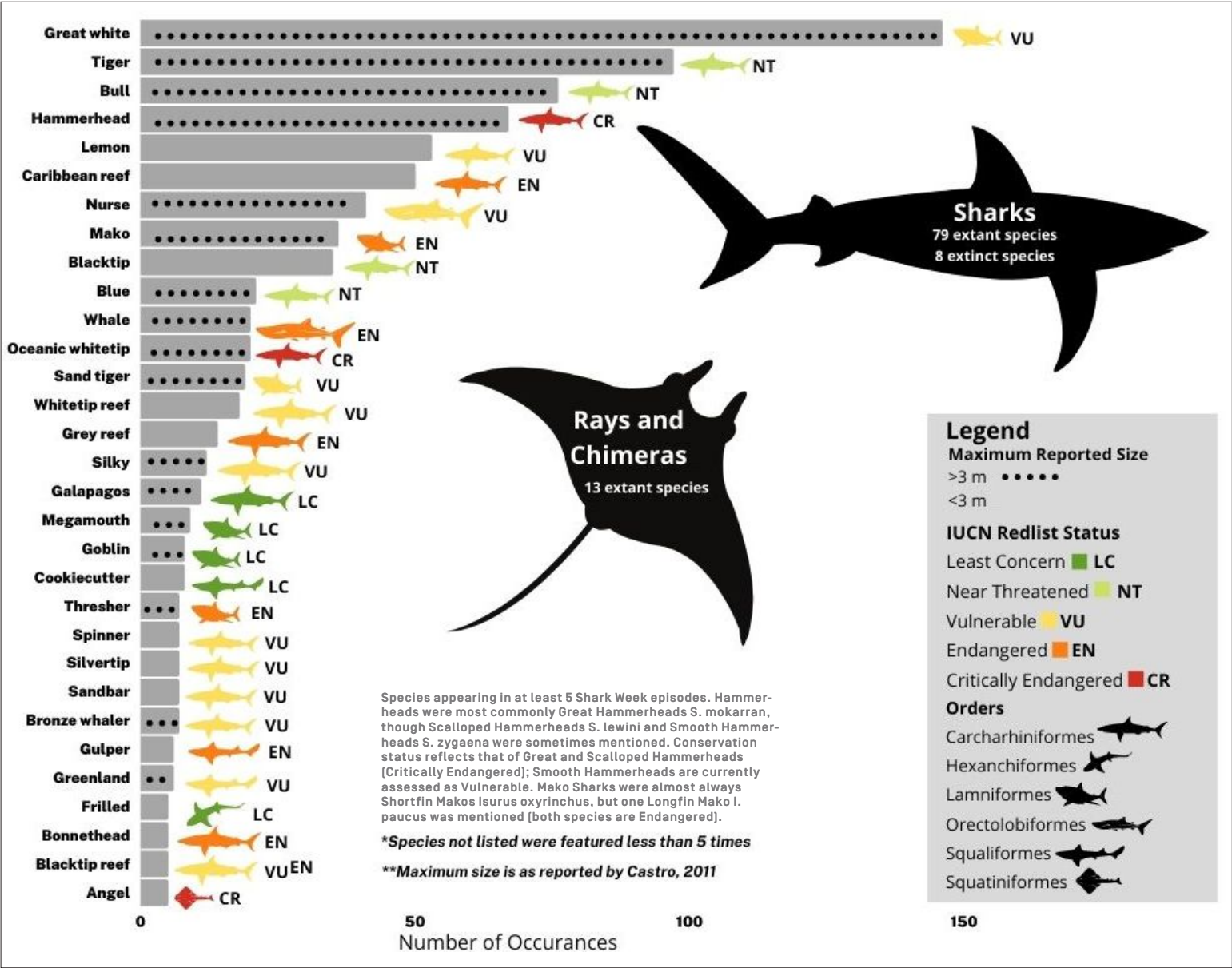
“Twitter is good for humanizing folks that are doing research and for giving exposure to research that isn’t getting exposure on TV. It’s always good for folks to interact, and Shark Week is a good time to do that.”



Julia Saltzman  
Photo courtesy of Julia Saltzman



Lead author Dr Lisa Whitenack poses with a Bull Shark (*Carcharhinus leucas*) jaw at a career event at a local elementary school  
Photo courtesy of Lisa Whitenack





# Preventing Shark and Ray Extinctions...

OPINION

# ...is Not Enough

Written by Dr Andy Cornish

Leader of WWF Sharks: Restoring the Balance, and Founder  
of Shark and Ray Recovery Initiative (SARRI)

Mobula rays for sale  
destined to a fish  
market in Vietnam



Preventing extinctions has been a primary aim of shark and ray conservation for decades, but the numbers do not lie. These efforts – including our own – have not kept pace with the threats. We all need to raise our level of ambition if we want to reverse the tragic loss of biodiversity in our oceans. More efforts are needed to actively recover depleted populations for the benefit of our ocean and the people who depend on it.

Marine fish extinctions to date have been very rare, with the first confirmed case only in 2020. The victim was the Smooth Handfish (*Sympterychthys unipennis*), an odd frogfish-like species from Tasmania that was probably doomed by habitat loss and destructive fishing practices. But fish extinctions could rise dramatically in the coming decades. More than 90 species of sharks and rays are considered Critically Endangered, and three are probably already extinct, according to the IUCN Red List of Threatened Species. The greatest driver of this threat to marine sharks and rays is overfishing, propelled by demand for their products locally (meat) and internationally (fin).

Momentum is growing now to conserve sharks and rays, as seen by the 35 species listed on CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna) since 2014, the first global conservation strategy, as well as the creation of the Shark Conservation Fund in 2015, the biggest funder of shark and ray conservation work globally today.

Conserving highly threatened species or preventing extinctions could be interpreted simply as preventing further declines. Indeed, this seems to be the rationale for adding species to protected lists or prohibiting fishers from catching or keeping them. Yet these lists and regulations may have little impact if the fishing methods that snag the animals are still used, if the animals tend to die before they are discovered and released, and if there is little enforcement.

Instead, the goal of conservation efforts to save highly threatened sharks and rays should be recovery, meaning declines are halted, and populations start to increase. This level of ambition – explicitly acknowledged in the Global Shark and Ray Initiative conservation strategy – is important because it aims to recover the ecological function of the species while minimising the risk of extinction. Recovery also provides greater insurance for the survival of populations in the face of climate change.

The restoration of ecological function does not seem to have been well studied for the handful of successful shark and ray recoveries, but there are some inspiring examples from land animals. One example is the recovery of wolves in Europe, leading to healthier and more diverse ecosystems. Wolves, which are apex predators, not only eat other widespread predators such as foxes – but their presence influences the behaviour of other animals. The ripple effect has been observed in species as diverse as beavers, birds, fish and butterflies.

Similarly, Tiger Shark (*Galeocerdo cuvier*) have been shown to influence the behaviour of dugongs and turtles in seagrass meadows. Sharks keep these grazers moving, limiting overgrazing with knock-on benefits for the climate: more seagrass means more carbon storage.

Most species of sharks and rays are not apex predators, but the example of the European Bison (*Bison bonasus*) recovery demonstrates that herbivores can also be important ecological engineers.

Bisons open up dense undergrowth by walking through it, dispersing seeds and creating open soil when they wallow that gets colonised by plants that need such spaces. The resulting increase in the diversity of landscape and vegetation supports populations of smaller mammals, other grazers, birds and invertebrates.

While no shark or ray has yet been shown to be a keystone species as the wolf and European Bison are, this may be because the ecological role of most of the 1,250+ species has yet to be studied in any depth. Nevertheless, we know how important sharks and rays are for coral reefs, for example. Grey Reef Sharks (*Carcharhinus amblyrhynchos*) help distribute nutrients around reefs simply by defecating – it has been shown that these “top-ups” contribute to the health of coral reefs, which are generally nutrient-poor. On the other hand, oceanic species help maintain the ocean nutrient pump and fuel plankton productivity by feeding in the deep and excreting in the shallows, where nutrients are typically lacking.

There is still much left to discover and understand about the ecological roles of many shark and ray species (and this will be increasingly difficult with populations of some species already too low to even study them). However, as until 100 years ago, these animals were abundant in the tropical and temperate seas, it is reasonable to assume that collectively at least these predators were playing important ecological roles beyond those already known to science.

Halting declines and bending population curves upwards is the primary aim of the recently launched Shark and Ray Recovery Initiative (SARRI). It is a direct response to the growing shark and ray crisis and has been designed from the start to trigger a much broader wave of recovery efforts beyond the initiative itself. SARRI will provide open access to its recovery tools and methodologies and free training for practitioners interested in recovering sharks and rays.

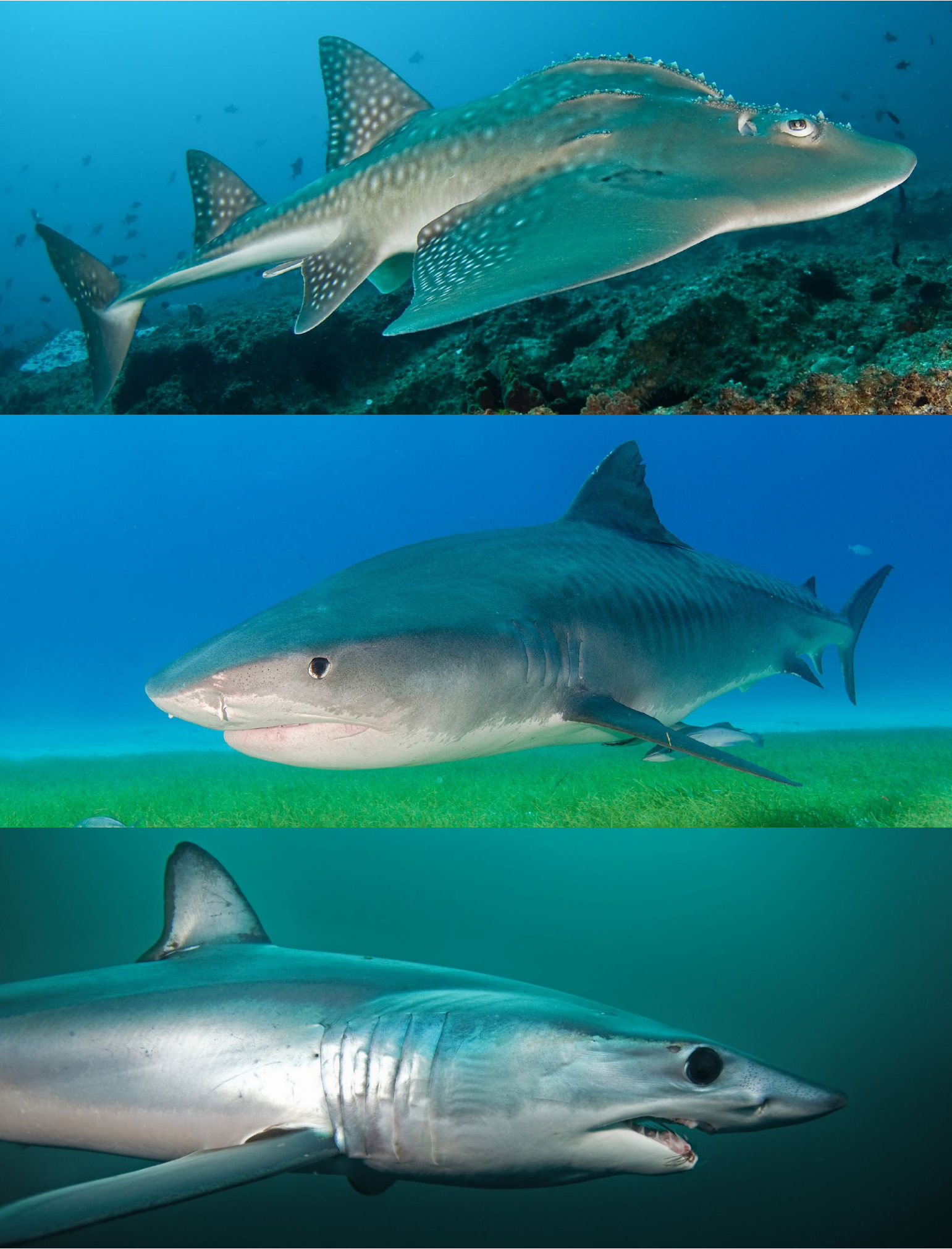
Working closely with coastal communities, local partners, and other experts, SARRI will initially introduce comprehensive recovery plans in at least eight sites, which will include securing “shark recovery zones” to protect critical habitats of the most threatened species. These will be enhanced by other management measures tailored for each location and species, such as methods to reduce bycatch in the surrounding areas. By testing and constantly improving the recovery approach in the field, SARRI aims to create a blueprint for recovering threatened sharks and rays worldwide. Those already working in this field or interested in doing so are encouraged to get in touch and join the community through sarri.org.

SARRI is a partnership of leading shark and ray conservation experts from WWF, Elasmobranch Project, James Cook University (JCU), and the Wildlife Conservation Society (WCS).

↑↑ Bowmouth Guitarfish (*Rhina ancylostoma*) – Critically Endangered according to the IUCN Red List  
Photo by Tomas Kotouc | Shutterstock | WWF

↑ Tiger Shark (*Galeocerdo cuvier*) over seagrass at Fish Tales, The Bahamas  
Photo by Marion Kraschl | Shutterstock | WWF

→ Shortfin Mako Shark (*Isurus oxyrinchus*)  
Endangered according to the IUCN Red List of Threatened Species  
Photo by Martin Prochazkacz | Shutterstock | WWF







Bowmouth Guitarfish  
(*Rhina ancylostoma*) caught  
in a driftnet in Raja Ampat,  
Indonesia, 2011





# Future Oceans: Priority Areas for Biodiversity Conservation

Written by Dr Lauren De Vos

Gray Whales [*Eschrichtius robustus*] |  
Baja California Sur, Mexico

*Like puzzle pieces that slot together across our oceans to create a picture, scientists hope to create a holistic overview of the key places we must prioritize for protection. As processes for the Important Birds, Marine Mammal, Shark and Ray, and Marine Turtles unfold in parallel to one another, a new tapestry of hope might be woven from these fragments of wilderness. Those involved in the International Union for the Conservation of Nature (IUCN) Species Survival Commission (SSC) Shark Specialist Group's Important Shark and Ray Areas (ISRAs) process are looking ahead to how this latest initiative will contribute to our planet's protected area footprint.*

Half of our planet. It is undoubtedly ambitious; indeed, idealistic. But when the late Professor Edward O. Wilson presented what he had termed his “moonshot” conservation idea, he found a degree of enthusiasm for a grand protection plan to safeguard our planet's biodiversity. The figure itself seems a sweeping statement, but it stems from Wilson's early work on island biogeography: how much protected habitat is enough for our planet to be in the “safe zone”? Indeed, it is a question that has resulted in much mathematics (Wilson posits that at 50% protection of the earth's surface, 85% of life on earth will survive). However, many other ideas were already in existence, and many others have only just emerged. The basis for all of them lies in the fact that biodiversity – that critical richness of life on planet earth – is being lost at unprecedented rates. Without suitable protection, we will lose many of the functions that biodiversity gives us to aid our own survival.

Brought into effect in 1993 and signed by 168 nations, the Convention on Biological Diversity (CBD) commits signatories to the conservation of biodiversity, its sustainable use, and fair sharing of benefits. The CBD set out a target of 10% of oceanic protected area for countries in what was called the Aichi Targets (Target 11), which had a timeframe from 2011 – to 2022. With biodiversity loss continuing unabated (and, for some species, exacerbated), the United Nations (UN) now champions the CBD's Post-2020 Framework, which calls on governments to protect at least 30% of their land and 30% of sea areas by 2030. The CBD Secretariat declare on their website that this framework: “Sets out an ambitious plan to implement broad-based action to bring about a transformation in society's relationship with biodiversity, ensuring that by 2050 the shared vision of ‘living in harmony with nature’ is fulfilled”. The question of where these protected areas should be placed and how they are prioritized and then implemented is the current focus of several different processes.

## Why protection and priorities?

The year 2030 is one of planetary milestones. It is set in the 30 X 30 campaign as the vision for achieving 30% protection of our oceans. It is also the year in which the Intergovernmental Panel on Climate Change (IPCC) has advised, in its latest working group report, that we need to halve our greenhouse gas emissions to avoid the most

catastrophic effects of climate change. If there is anything that we are not doing by half measures, it is the extent of our footprint on this planet – and the impact of our actions on biodiversity and our planetary functions. In its latest assessments for the Red List of Threatened Species, the IUCN has warned explicitly that an estimated 37% of sharks, rays, and chimaeras (ghost sharks), are at risk of extinction. A global assessment of sharks across our planet's coral reefs by Dr Aaron MacNeil and his co-authors from the Global Fin Print Project revealed that reef sharks were functionally extinct in 20% of these vital underwater ecosystems. This study raises the worrying linkages that are intricately woven throughout nature. Coral reefs are already most beleaguered, with frightening prospects that posit their total disappearance due to rising sea temperatures and changing ocean chemistry. The loss of the sharks that are an integral part of this system is a further blow, weakening any potential resilience to climate change. And yet coral reefs are precisely what would help us survive a changing climate and thrive on an equitable, protected planet. But there is a reason why EO Wilson did not suggest 100% protection for the planet. Fisheries, shipping, and (as long as we are bound to fossil fuels) oil and gas exploration: any protection needs to balance competing interests and a need for ocean space. Protection is, therefore, a planned process: identifying the areas and species that need it most and directing (often scarce) resources for designation and enforcement.

## How much of our oceans are protected?

The map of marine protected areas (MPAs) on the World Database of Protected Areas (WDPA) website reflects faint green outlines in wedges and rectangles; some are angled to hug the coastline, and others hover over a patch of open ocean. Currently, approximately 8% of our oceans are protected. Of that, 3% is considered highly protected. In some countries, new networks of MPAs have been announced. South Africa's Operation Phakisa added 22 new MPAs to its existing coastline of conserved areas, taking its territorial protection to 5% (a step short of its 10% CBD commitment, but a mammoth increase nonetheless). The Seychelles Marine Spatial Plan (MSP) is the island nation's ambitious program to move the protection needle from 1% to 30% by 2030. In other countries, existing MPAs have been expanded. Earlier this year, the government of Ecuador expanded the Galapagos Marine Reserve by 60,000 square kilometres (23,166 square miles). The move brought the protection footprint in the region to 198,000 square kilometres (76,448 square miles). And yet many nations are struggling to reach the original 10% protection outlined by the CBD, let alone aiming for the more ambitious 30% within its critical timeframe.

## How do we choose what to protect?

Whether or not countries are committed to 10% or 30%, by far, the majority still need to expand significantly their national ocean protection footprint if they hope to cling to any remnants of their CBD target undertakings. Ensuring that governments select areas for protection to meet these targets whilst addressing the current plight of sharks and rays, with the best available scientific information to make effective decisions, is the subject of the IUCN SSC Shark Specialist Group (SSG) Important Shark and Ray Areas (ISRA) process. “We need new tools that can be used in conjunction with fisheries and trade management to ensure there is some hope for certain species in critical areas”. Dr Rima Jabado is the IUCN SSC SSG Chair and is part of a host of team members and interested stakeholders working together to put sharks and rays onto the protection map. “Most countries signed up to the Aichi Targets:





Humpback whales (*Megaptera novaeangliae*) | Reunion Island



they committed to protecting 10% of their ocean. Many countries have already pledged 30% by 2030. The key thing is that we may not even need to protect 30% of our ocean if we are protecting the right places.” Rima brings us back to the mathematics of conservation planning. What is the biggest bang for your biodiversity buck that costs the least for competing for commercial [or other] interests? “Where are these right places? This is the exercise we are doing for sharks and rays in the ISRA process”.

The ISRAs will be plotted out onto an ocean that already reflects several other prioritization processes for different species groups. The Important Bird and Biodiversity Areas (IBAs), Important Marine Mammal Areas (IMMAs), and Important Marine Turtle Areas (IMTAs) are aiming for the same vision: consolidating the latest information for each taxonomic group, identifying areas of critical habitat needed for their survival, and making the information and locations available to governments and marine users. “At some point, we will have, for instance, in the north-west Indian Ocean, a set of IBAs, IMMAs, ISRAs, and IMTAs. Many of them will overlap.” Dr Giuseppe Notarbartolo di Sciarra is part of the IUCN SSC’s SSG and has led much of the work on the IMMAs process. His outlook, therefore, on the power of each of these parallel scientific reviews is one that sees the value in a patchwork quilt of priorities: “There will be different reasons underlying why these areas are important for species, and this will determine whether the area is important for a diverse range of species and taxonomic groups, or is essential to the survival of just one taxonomic group. In a very productive area, we will have birds, sharks, dolphins, and perhaps turtles aggregating, and the reason for that area’s importance might be food availability. Other areas that are essential for nesting turtles, breeding whales, or nesting birds, will likely be separate. Therefore, there will be both discrete areas and areas that overlap. In the end, you will have a mosaic of areas that are very important for a number of different species”. Rima agrees and knows that the information will be useful beyond the scientific community: “We will have all of these amazing layers of data that, over the next five to 10 years, can help support decision-making”.

But the Important Areas are not the only priority patches being overlaid onto this ocean map. In the Benguela Current Large Marine Ecosystem (BCLME) countries of Angola, Namibia, and South Africa, Dr Linda Harris and her colleagues describe the process of implementing practical management measures for Ecologically or Biologically Significant Marine Areas (EBSAs). The classification of important marine areas as EBSAs requires that at least one of seven CBD Conference of Parties (COP) criteria are met. These include uniqueness, productivity, vulnerability, importance for endangered species, biological diversity, naturalness, and importance for life-history stages of species. The original idea was to use EBSAs to promote international cooperation for conservation in areas outside national Exclusive Economic Zones (EEZ), but they were soon described at the national level in a series of regional workshops starting in 2011. At the time of the publication (in March this year) of Linda and her colleagues’ paper in *Frontiers in Marine Science*, 321 EBSAs had been described. But much like the Important Areas process, the description of an EBSA does not automatically translate to a protected or managed area. The example of the BCLME is, therefore, a rarity and represents one of the very first processes to move from designation to some form of implementation.

The description of another essential area tool, Key Biodiversity Areas (KBAs), relies on assessing several things: including populations of species, habitats, and ecosystems. These areas are deemed sites that contribute greatly to our global biodiversity heritage. So, what is the difference? Are the Important Areas

processes simply the same thing as EBSAs and KBAs, but split into taxonomic groups rather than looking at the ecosystem as a whole? Giuseppe disagrees somewhat: “The EBSA process is ideally very similar to what we are doing in the Important Areas process, keeping in mind that EBSAs are for all marine diversity (as opposed to one taxonomic group at a time). However, the main difference is that the EBSA process, despite its declared scientific nature, is animated by the Secretariat of the CBD, which acts on a mandate from governments. The result is that the EBSA workshops and processes are sometimes influenced by political considerations, despite the best intentions. The Important Areas process only involves scientists.” Giuseppe also speaks about his experience with the Marine Mammal process: “We are encouraging the IMMAs to be converted to KBAs whenever possible, in those cases in which quantitative criteria are applicable (e.g., when one IMMA contains a sufficiently large proportion of individuals of any particular species). Ultimately, it will be good to have an ocean that is covered with KBAs, either for sharks, marine mammals, birds, or any number of species. Eventually, when a greater amount of marine mammal data becomes available in the future, I would be delighted to see lots of IMMAs being transformed into KBAs. This, however, is impossible in the current state of things”.

### What happens after prioritization?

The ISRAs are a scientific resource; they amalgamate information that can be used to guide policy and management of critical habitats for sharks and rays. Rima is enthusiastic on this point: “A minister of the environment deals with everything from MPAs to the conservation of a particular insect. They have a lot on their agenda. I see this (the ISRAs) as a supportive tool. There is pressure to achieve these biodiversity targets. I believe we’re saying: you know where your mammal areas are, where your birds are, where your sharks are, and you’ve worked out your KBAs and EBSAs. Now you can go online and see a map of your country, with all of these key areas and critical habitats, including your marine megafauna, overlaid”.

The Important Areas are not a legal tool or prescriptive of any particular management agenda. It is this distinction that Giuseppe has made clear is necessary for there to be buy-in for the ISRA process. But there is the potential, of course, for the ISRAs to become priorities for countries’ MPA expansion programmes. As Rima points out, the ISRAs will hopefully be the means by which sharks and rays can be included in our growing protection footprint: “Can we give environmental ministries the necessary tools to develop their marine protected area networks?” The question of whether MPAs work for sharks is somewhat contentious, but we may stand to measure their efficacy differently where taxonomic specific information and prioritization have been used to guide new MPA designations. “We’ve never done the exercise where we consolidate information on critical habitats for species. Providing this information will be useful to help prioritize research and catalyze new efforts, support fisheries management in terms of input/output control. Still, it’s going to help decision-makers ascertain what they can do to protect not only sharks, but their species diversity across the board”. Rima and those involved with the ISRA process will be launching the document to guide the ISRA process at the 5<sup>th</sup> International Marine Protected Areas Congress (IMPAC5).

You can follow the process at the new ISRA website: Important Shark and Ray Areas - an IUCN SSC SSG project ([sharkrayareas.org](http://sharkrayareas.org)) and through their social media channels on Facebook, Twitter and Shark News (the SSG newsletter).



Humpback whales [*Megaptera novaeangliae*] | Reunion Island









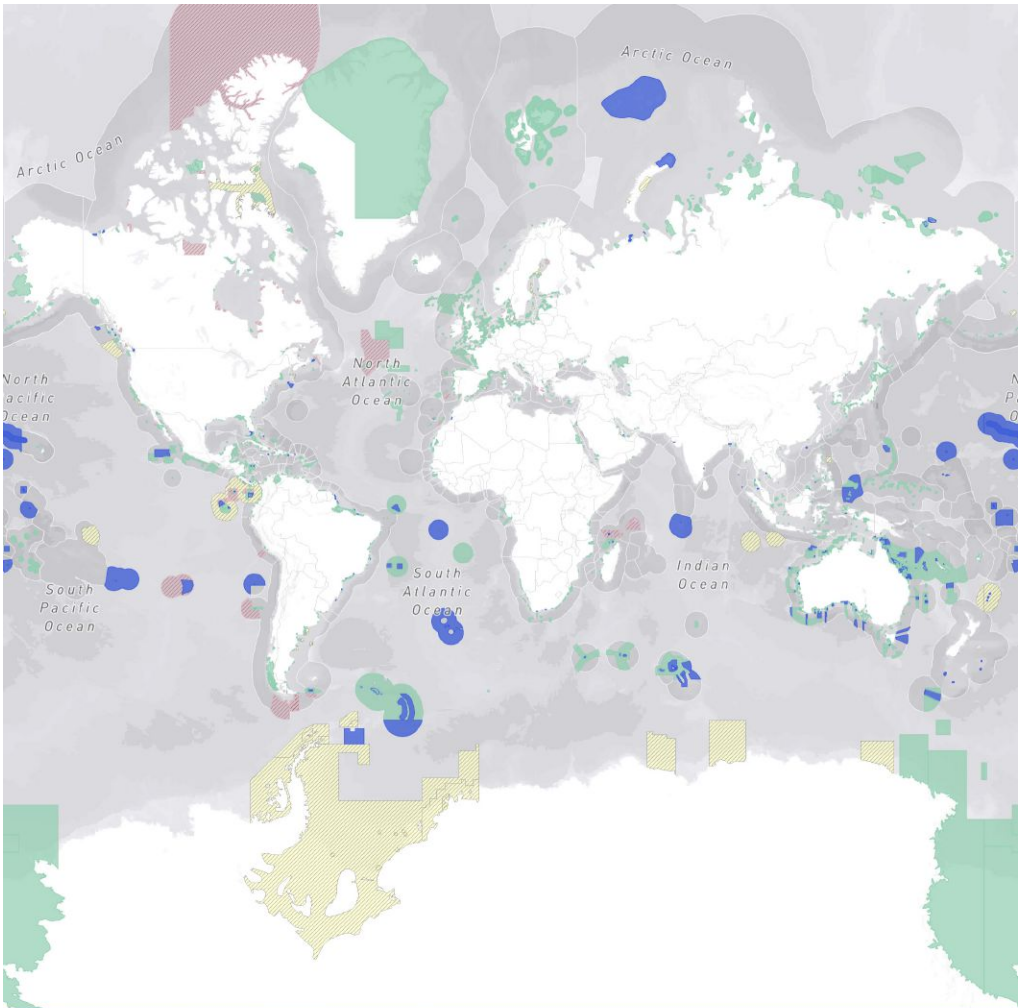
Adult and juvenile Atlantic Spotted Dolphins  
[*Stenella frontalis*] | Bimini, The Bahamas





Tasselled Wobbegong  
[*Eucrossorhinus dasypogon*]

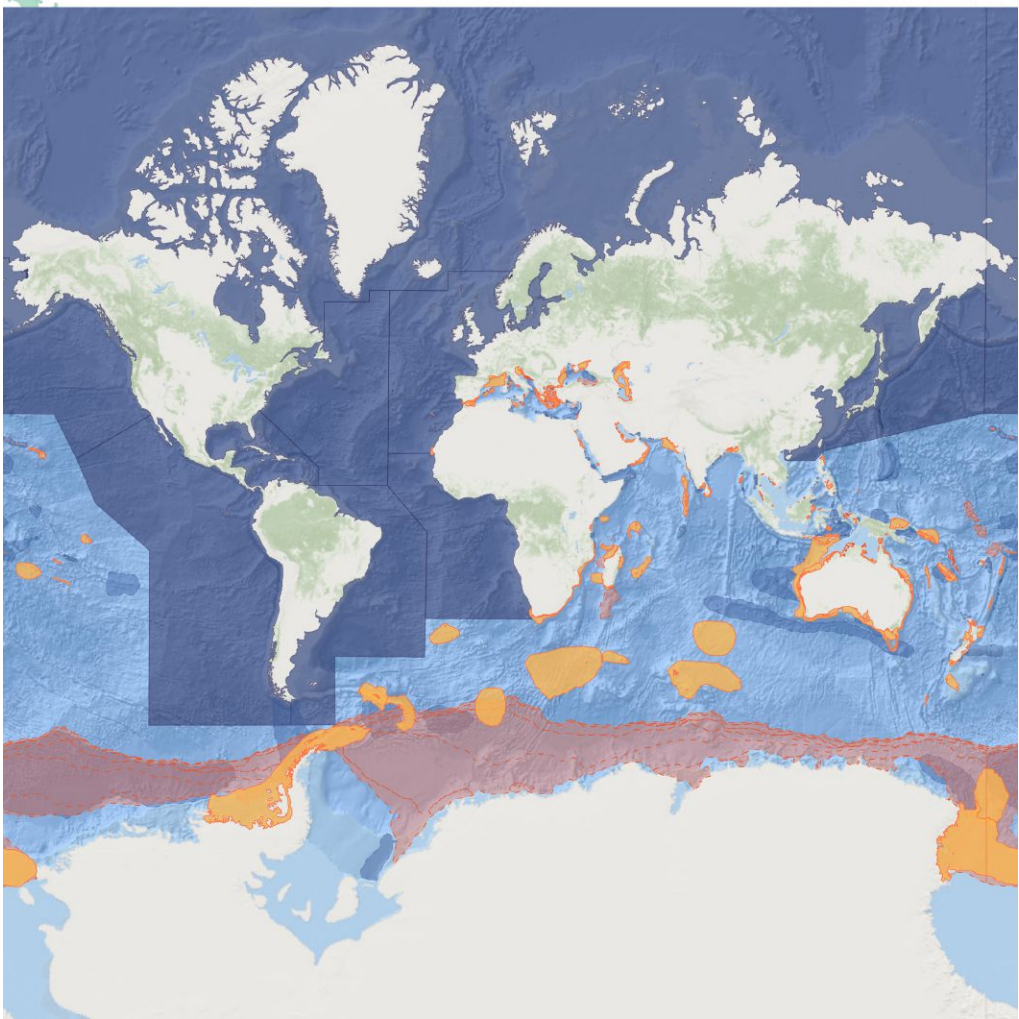




### Marine Protected Area Zones by Fishing Protection Level

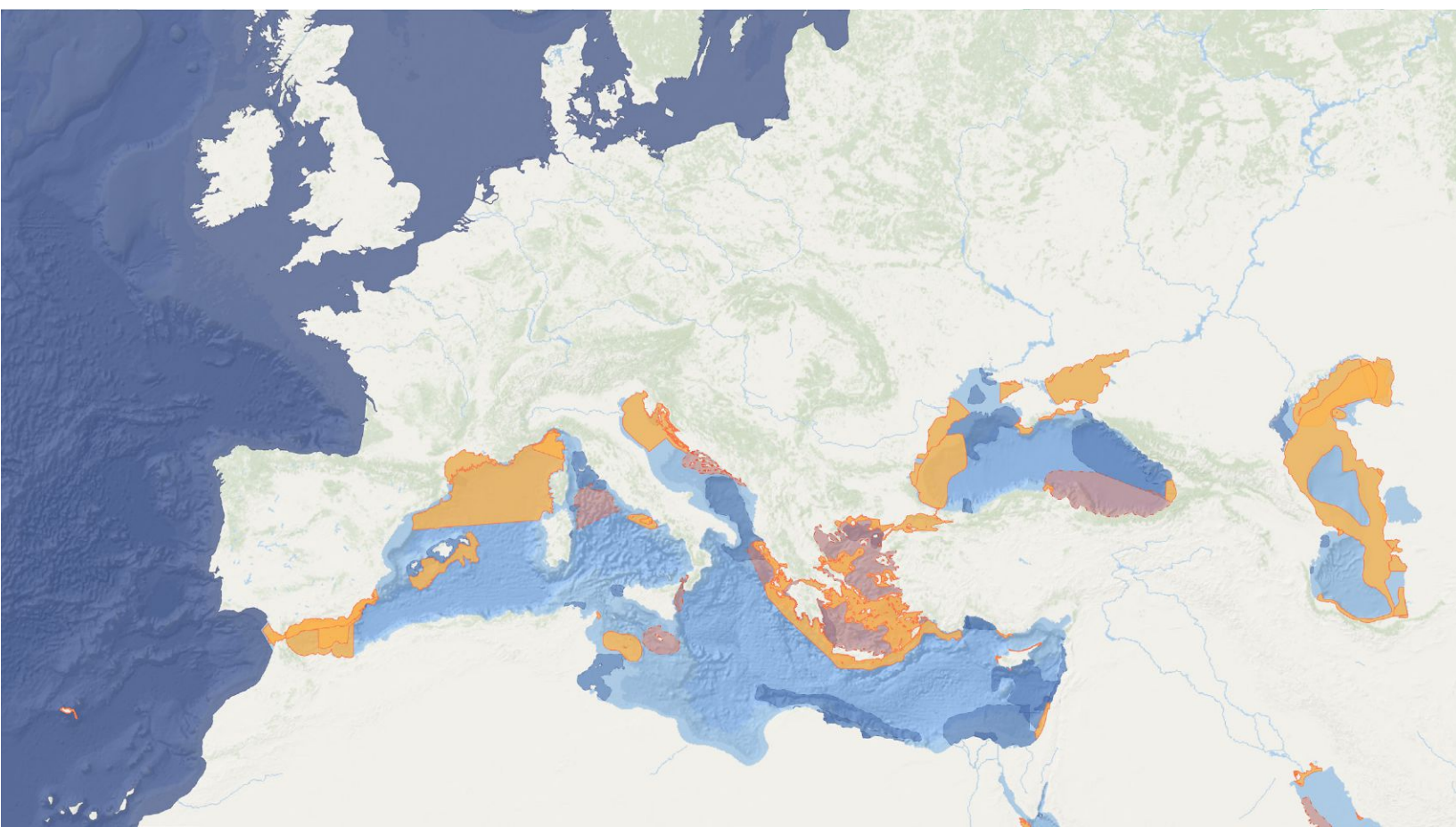
- Fully / Highly Protected
- Less Protected / Unknown
- Designated & Unimplemented
- Proposed / Committed

Marine Conservation Institute [2022].  
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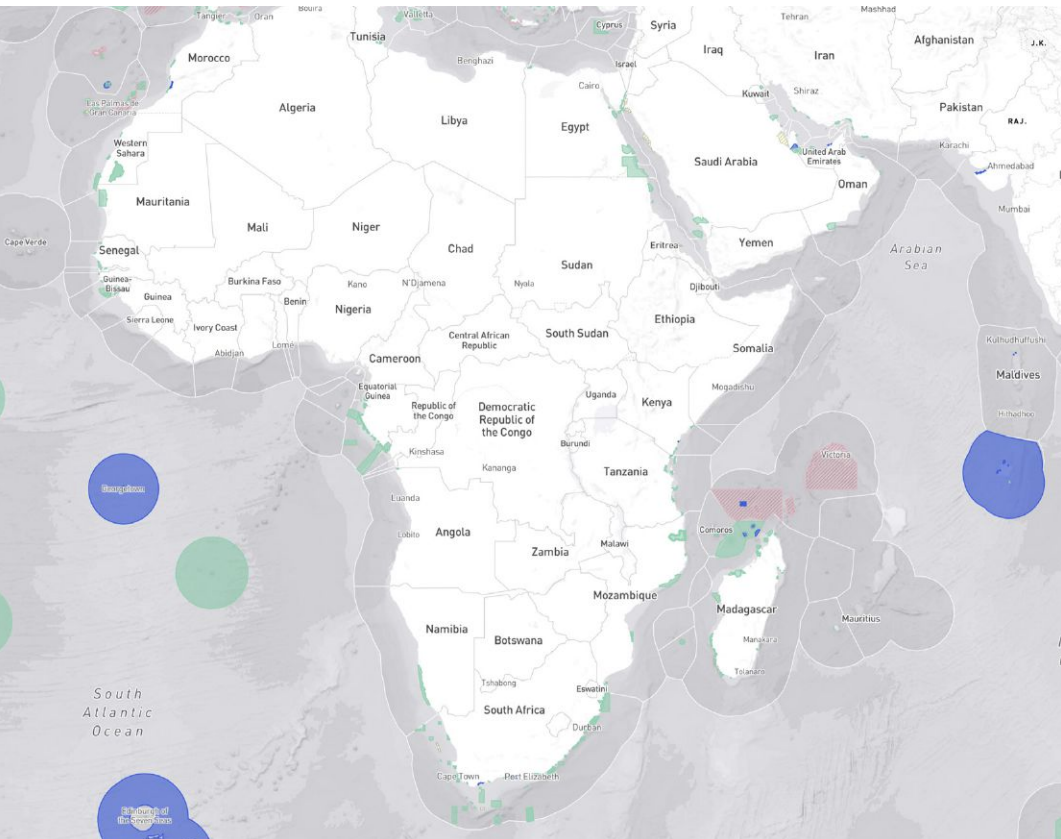


- Important Marine Mammal Area
- Candidate Important Marine Mammal Area
- Area of Interest
- Not yet assessed Area

IUCN-MMPATF[2022] Global Dataset of  
Important Marine Mammal Areas (IUCNIMMA).  
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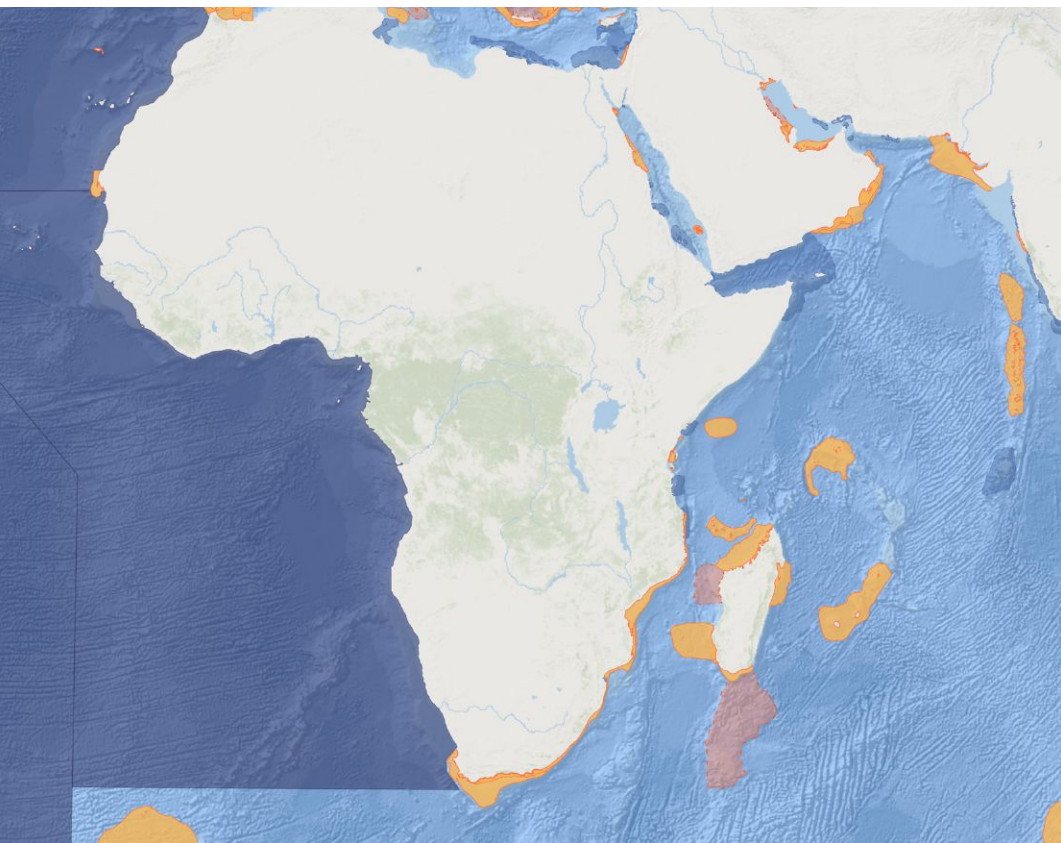




## Marine Protected Area Zones by Fishing Protection Level

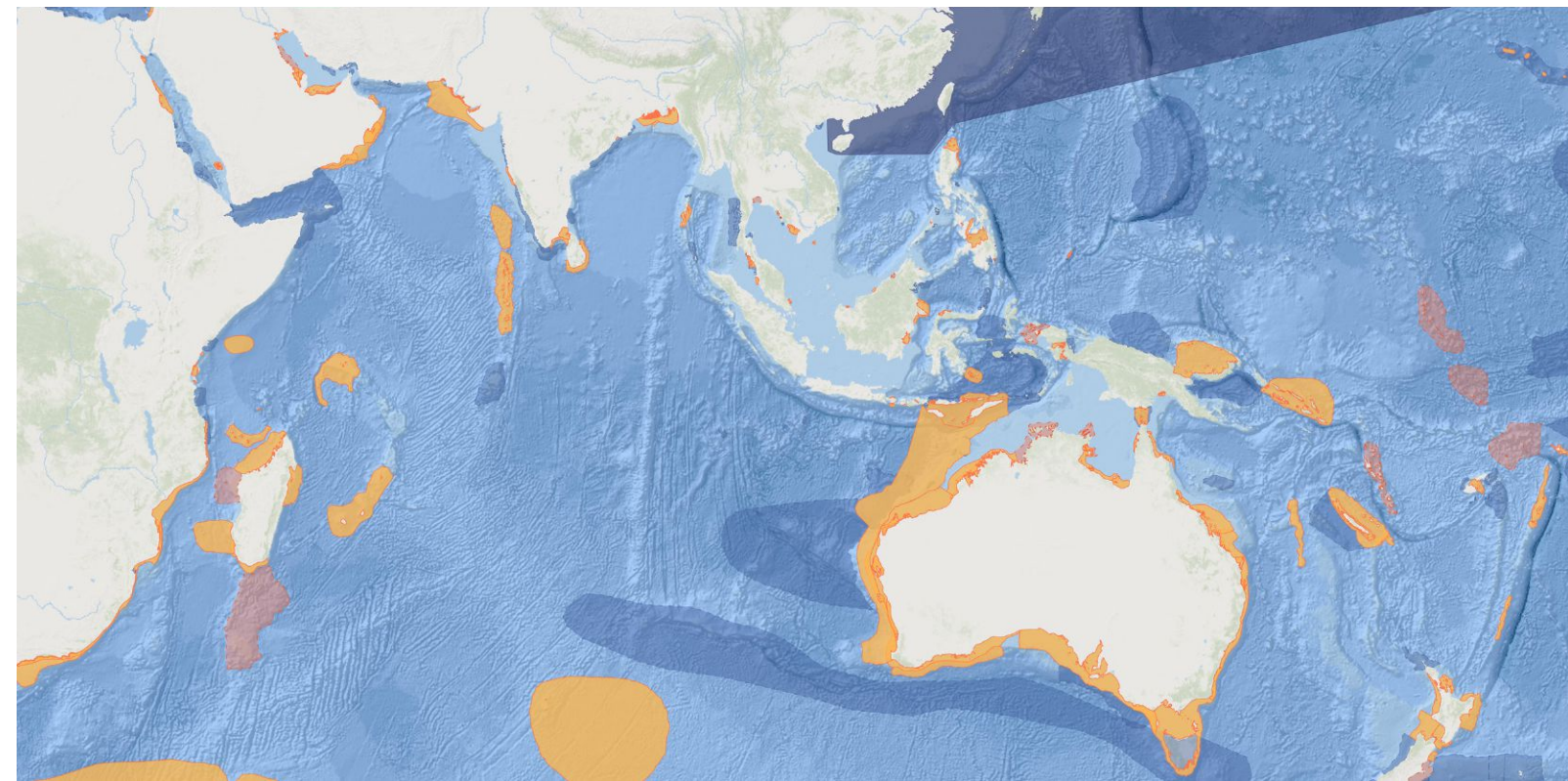
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Marine Conservation Institute (2022), MPAtlas [On-line]. Seattle, WA. Available at: [www.mpatlas.org](http://www.mpatlas.org) [Accessed 06/06/2022].



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IUCN-MMPATF(2022) Global Dataset of Important Marine Mammal Areas (IUCNIMMA). 06/2022. Made available under agreement on terms and conditions of use by the IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force and accessible via the IMMA e-Atlas [marinemammalhabitat.org/imma-eatlas/](http://marinemammalhabitat.org/imma-eatlas/)







Blue Shark (*Prionace glauca*) |  
Baja California Sur, Mexico







# The First Record of a Saw Shark *Pristiophoriformes* from Namibia

Written by Dr Ruth H. Leeney

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Region  
Update:  
Africa

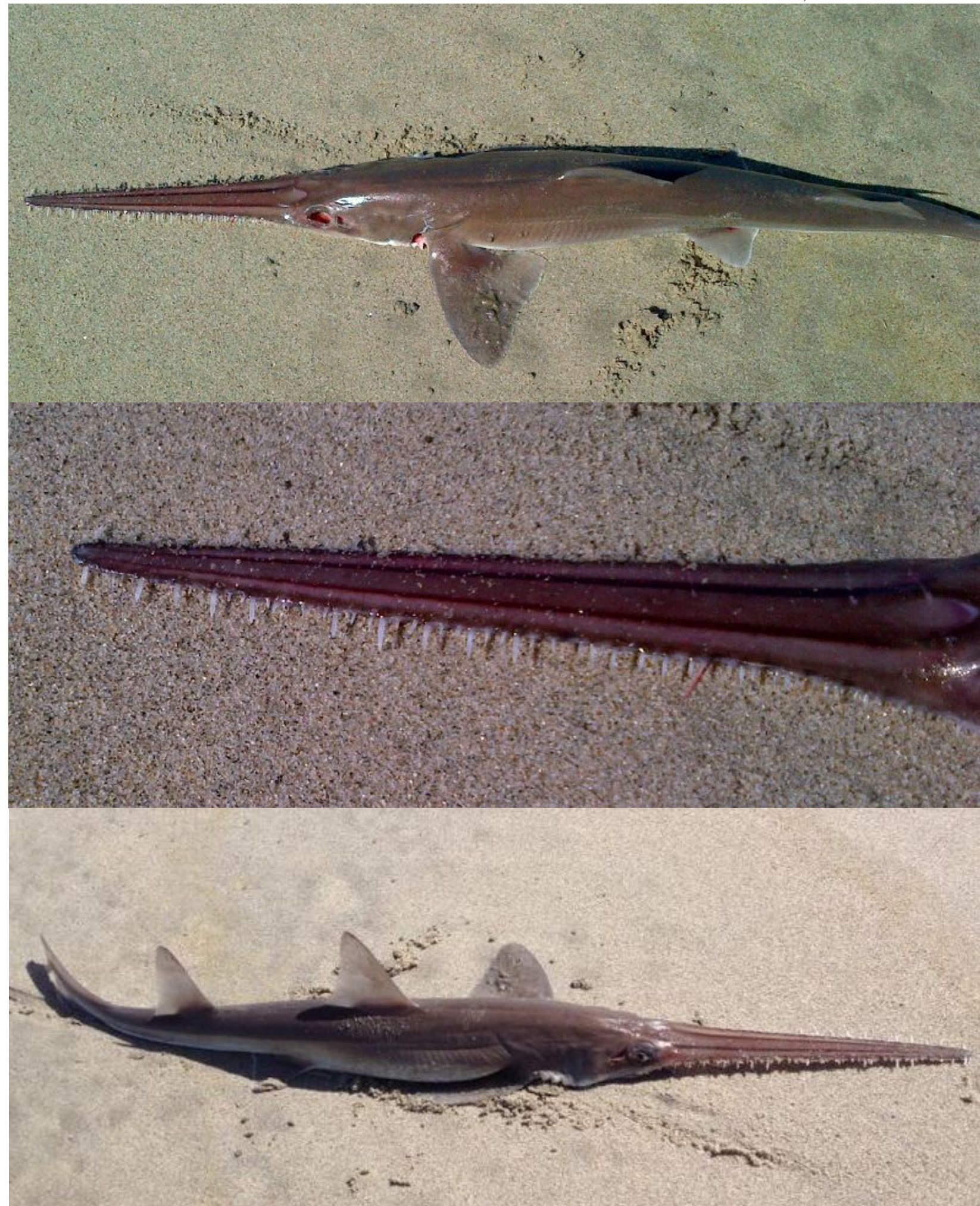


There are currently ten known species of Saw Sharks [order *Pristiophoriformes*] worldwide. Of those ten species, the African Dwarf Sawshark (*Pristiophorus nancyae*), Kaja's Sixgill Sawshark (*Pliotrema kajaë*), and Anna's Sixgill Sawshark (*Pliotrema annae*) have been recorded from the western Indian Ocean, and Warren's Sixgill Sawshark (*Pliotrema warreni*) has been recorded off South Africa and Mozambique only. No Saw Shark species has, to date, been formally recorded from Africa's west coast.

On the 23rd of August 2014, recreational anglers Melanie and Morne Honiball were fishing from the shore in an area known as the Canopy Area, about 60 km north of Henties Bay, Namibia. They came across a saw shark on the beach, which they estimated to be between 70 and 100 cm in total length and weighing about 1 kg. Apart from a scavenged eyeball, the shark was relatively fresh, suggesting that it was recently dead or perhaps even alive when it washed ashore.

Unfortunately, neither the number of gill slits nor any serration on the large rostral teeth is visible from the available photographs. No image of the underside of the rostrum was taken to allow for the positioning of barbels to be ascertained. However, based on the size of the animal and the shape of the fins, it is likely to be a *Pliotrema* species. The only species in this genus known to occur in the south-east Atlantic Ocean is Warren's Sixgill Saw Shark. This would be the first record of this species in Namibian waters and the northernmost record for the southeast Atlantic if it is this species. Alternatively, it may be an as-yet undescribed species occurring in Namibian waters. Staff from Namibia's Ministry of Fisheries and Marine Resources who take part in annual research cruises have been shown these images and asked whether saw sharks have been caught on these surveys. Still, thus far, no other recollections of saw shark encounters in Namibian waters have been reported. Melanie and Morne have been angling off Namibia's coast for over 20 years but have never encountered any other saw sharks during that time.

If anyone has recorded a Saw Shark in Namibia or elsewhere on the west coast of Africa, please contact Ruth Leeney (ruth.leeney@gmail.com).





A fishing boat in the Bijagós from above. The team of researchers work closely with local fishers and sport fishers.

# Tracking Threatened Sharks and Rays in West Africa

Region Update: Africa



The first time that a Critically Endangered Blackchin Guitarfish (*Glaucostegus cemiculus*) was released with a satellite transmitter. This mature male was named after the Bijagó fisher, Titi (left), with whom the team has been collaborating for over three years. This guitarfish will help researchers study how these highly threatened species use West African waters and where they migrate.



A Blackchin Guitarfish (*Glaucostegus cemiculus*) is released with a satellite transmitter. This mature female named Aissa (named after a conservationist of the biodiversity institute IBAP of Guinea Bissau) will help scientists study how these highly threatened species use West African waters.

Photos by Maarten Zwarts | University of Groningen





Guido Leurs releasing a newborn Blackchin Guitarfish (*Glaucostegus cemiculus*).



A Critically Endangered Scalloped Hammerhead (*Sphyrna lewini*) receives fresh seawater during a quick sampling process. Researchers take small tissue samples for genetic and foodweb analyses and give the shark a unique tag.

## Written by Guido Leurs

University of Groningen, The Netherlands  
IUCN SSC Shark Specialist Group | Africa Regional Group | Member

In a first for the region, highly threatened sharks and rays have been tagged and released by scientists in the Bijagós Archipelago, off the coast of Guinea-Bissau in West Africa. The expedition's main goal was to determine why these species use the archipelago's shallow waters and if these species leave these shallow waters to migrate to other areas. During the expedition, a team of researchers from the University of Groningen (The Netherlands), collaborated with local conservationists from the Institute of Biodiversity and Protected Areas (IBAP) and local fishers, to place satellite transmitters on the Critically Endangered Blackchin Guitarfish (*Glaucostegus cemiculus*). In addition, the team studied various threatened shark species, such as Hammerhead Sharks (Sphyrnidae), Bull Sharks (*Carcharhinus leucas*) and Blacktip Sharks (*Carcharhinus limbatus*), to collect essential data to support the protection of these species within the archipelago and the wider region.

### Highly threatened species

According to the latest estimates, approximately 33% of all shark and ray species (hereafter 'sharks') worldwide are now threatened with extinction (Dulvy et al. 2021). Within the West African region, species like the Blackchin Guitarfish (*Glaucostegus cemiculus*) and Scalloped Hammerhead Shark (*Sphyrna lewini*) are classified as Critically Endangered, the most precarious category of the IUCN Red List of Threatened Species (Kyne and Jabado 2019, Rigby et al. 2019). Fisheries have captured sharks mostly as bycatch, but over the past decades, these species groups have become targeted (Diop and Dossa, 2011). A variety of (endemic) shark species are thought to use coastal areas like the Banc d'Arguin (Mauritania) and the Bijagós Archipelago (Guinea-Bissau) during their early life stages. This means that these species might be at risk from industrial fisheries concentrated on the border of these coastal areas (Leurs et al. 2021). "We are afraid that these species of sharks and rays might disappear from the Bijagós Archipelago, or even from the entire West African region, just like what happened with the sawfishes," says Emanuel Dias, the Director of the Orango National Park within the Bijagós. Dias continues: "The organization that I work for, the Institute for Biodiversity and Protected Areas (IBAP), has management plans for the national parks within the Bijagós, but we see that fishing by boats from other countries is threatening sharks and rays both in and outside the parks. The Bijagós is a large area, and controlling the fisheries is a big challenge. That is why research on sharks and rays is important to ensure that we can protect these species more effectively".

### Socio-cultural value of sharks

Sharks have played an important historical role in the cultural ceremonies and celebrations of local Bijagó communities in Guinea-Bissau. These communities inhabit 20 of the 88 islands in the Archipelago. All islands are lined by dense mangrove forests, extensive

sand- and mudflats and are connected through a complex system of tidal channels. During the traditional ceremonies, the Bijagó communities wear shark-inspired costumes, with masks and fins resembling hammerhead sharks or sawfishes. Within some villages, one can find buildings in the shape of sawfishes. Sawfish – a group of large ray species - that were once common in the region are now considered extinct in West Africa. The Bijagós Archipelago was one of the last places where these species could be found in the region.

### Tracking Guitarfish

In our most recent expedition, a team consisting of researchers, conservationists, and fishers of the University of Groningen (The Netherlands) and IBAP managed to catch, sample, and safely release over 50 sharks belonging to ten different species. The biggest achievement? Deploying the first satellite transmitters on the Critically Endangered Blackchin Guitarfish (*Glaucostegus cemiculus*) and achieving this milestone in close collaboration with local fishers. Bijagó fishers know how important these species are to their culture.

No historical data exist for the local fisheries within the Bijagós. Still, in close collaboration with two local research students, the team was able to reconstruct trends based on the expertise of local fishers. This shows that guitarfishes have declined rapidly over the past decades. These satellite transmitters allow us to track these animals for almost a year to determine how these species use coastal areas like the Bijagós and how they connect different ecosystems. This information is crucial for our local partner organizations like IBAP to enhance the protection of these species across their migrations and during their life cycle.

### A future for sharks in West Africa

The team also discovered a possible multi-species nursery area for newborn sharks during the expedition, including Scalloped Hammerheads (*Sphyrna lewini*) and Bull Sharks (*Carcharhinus leucas*). This indicates that species like the Scalloped Hammerhead use the Bijagós for only the early part of their lifecycle, after which they move to more pelagic habitats. As industrialized fisheries are concentrated on the outer border of the Bijagós (Leurs et al. 2021), these sharks might get in trouble once they are big enough to migrate offshore. With this research, the team wants to find out how significant that risk is and how important areas like the Bijagós are for sharks in West Africa. Over the past year, the team has collected data on the ecological role of sharks in ecosystems in West Africa to determine what happens if sharks disappear from large intertidal areas. For the Bijagós, the disappearance of sharks might have ecological implications and should also be looked at from a socio-cultural perspective.

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# Improving synergies between Regional Fishery Bodies and CITES Parties for the sustainable catch, trade and management of sharks\*

Written by Sarah Fowler

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Northern Europe Regional Group | Member  
Scientific Advisor | Save Our Seas Foundation (SOSF)

Amie Bräutigam | Nicola Oakes  
Project Manager

and Glenn Sant

IUCN SSC Shark Specialist Group | Oceania Regional Group | Member  
Senior Advisor | Fisheries Trade and Traceability | TRAFFIC

## Background

A new report summarizes the findings of a review of the threats to shark species, their conservation, trade and management status, and the contributions of Regional Fisheries Bodies (RFBs) to the implementation of the Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES) shark listings. Fourteen species of pelagic sharks, 11 pelagic rays and 16 coastal rays have been progressively listed in CITES Appendix II, commencing in 2002. The majority of these species were historically targeted by fisheries, and many of those listed by CITES in 2013, 2016 and 2019 are still significant in fisheries and trade. The Food and Agriculture Organization of the United Nations (FAO) Members and CITES Parties have for many years, at their respective meetings, urged closer engagement and coordination between national environment and fisheries departments in order to improve the conservation and management of sharks. The important role of RFBs has also been recognized. Indeed, several tuna Regional Fisheries Management Organizations (RFMOs) had already prohibited the retention of some threatened pelagic shark species before they were listed in Appendix II of CITES.

During the eight years since CITES Conference of Parties 16 (CoP16), an unprecedented number of projects and activities have been delivered to assist Parties with the implementation of these listings. These capacity-building activities have been undertaken with funding from the European Union, the support of many other Parties and stakeholders, and in close collaboration between the CITES and FAO Secretariats. Despite these efforts, however, there has not been a global evaluation of individual RFB activities directed at improving the conservation and management status of the shark species listed in Appendix II. Neither has there been an assessment of the overall contribution of the CITES listings to improving the conservation and management of pelagic shark species. The review commissioned by the German government forms the basis for an analysis of the potential for further harmonizing the efforts of RFBs and CITES to deliver more effectively the protection and sustainable use of sharks, recognizing that their common objectives are the recovery of depleted stocks, delivering sustainable fisheries and trade, and reducing the future need for strict protection measures.

## Summary of findings

### 1.Conservation Status

The global conservation status of major commercial shark and ray species is poor and still deteriorating for many species, although there are some early signs of recovery for a few. Poor conservation status is particularly notable for the oceanic pelagic sharks that are the largest source of fins in international trade (77% of pelagic elasmobranchs are threatened), and the shark-like rays from shallow coastal habitats that are among the world’s most threatened cartilaginous fishes. These species groups dominate the chondrichthyan fish taxa listed in the CITES Appendices. The Red List status of most CITES Appendix II sharks has now been reassessed by the International Union for Conservation of Nature (IUCN), and several are now known to be more seriously threatened than understood when they were listed in CITES. The Oceanic Whitetip Shark (*Carcharhinus longimanus*), Scalloped Hammerhead (*Sphyrna lewini*) and Great Hammerhead Sharks (S. mokarran) have been reclassified as Critically Endangered; Basking Shark (*Catorhinus maximus*), Whale Shark (*Rhincodon typus*), and Pelagic Thresher Shark (*Alopias pelagicus*) as Endangered.

### 2. Threats

Fishing is the most widespread threat, affecting virtually 90% of chondrichthyans and every species listed in the CITES Appendices. Over 90% of CITES-listed species are targeted by at least some fisheries, versus only 26% of all the chondrichthyans. Bycatch impacts 83% of chondrichthyans in large-scale fisheries and 52% of species in small-scale fisheries (the latter target a wider range of species, the former have a more diverse bycatch), but all CITES-listed species are a bycatch in a fishery somewhere. Strengthened fisheries management is urgently required to reduce excessive or unsustainable mortality in target and bycatch fisheries. This is equally important for unlisted species as it is for the pelagic shark and ray species listed in CITES.

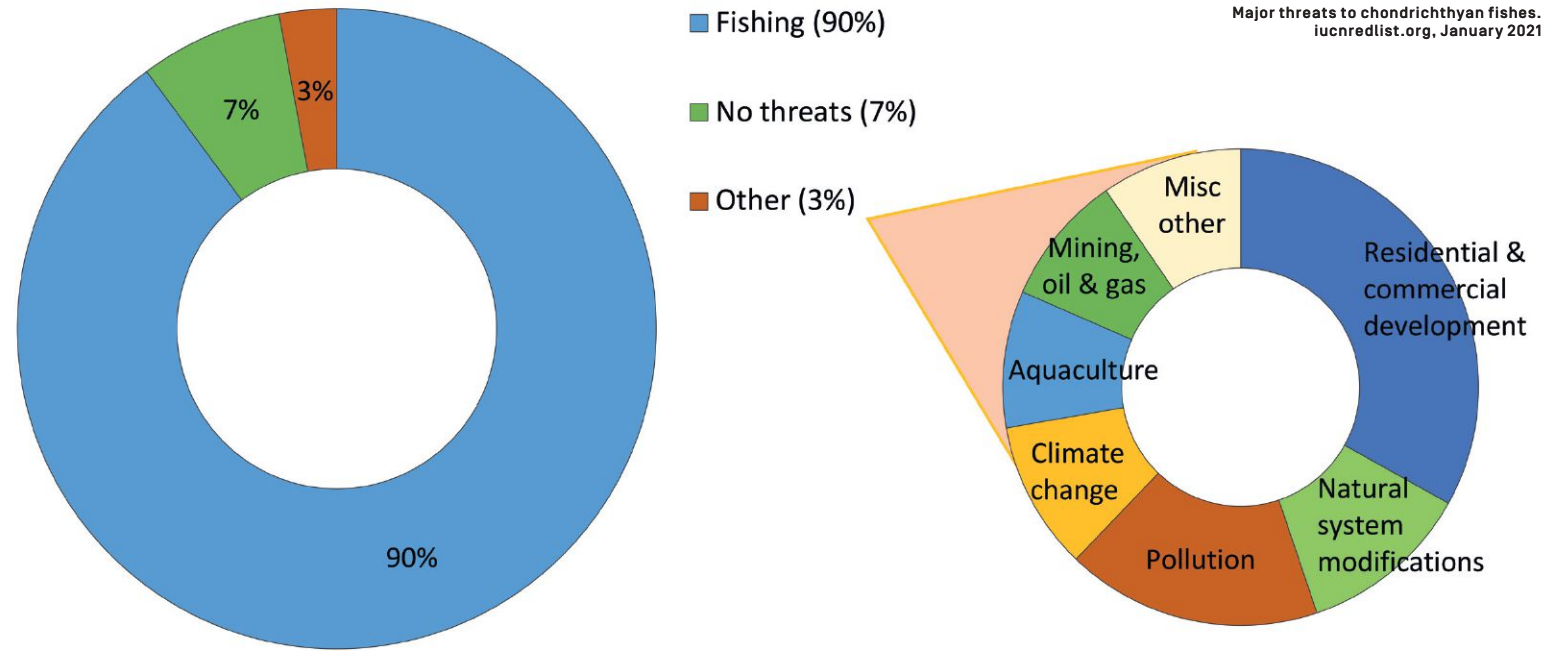
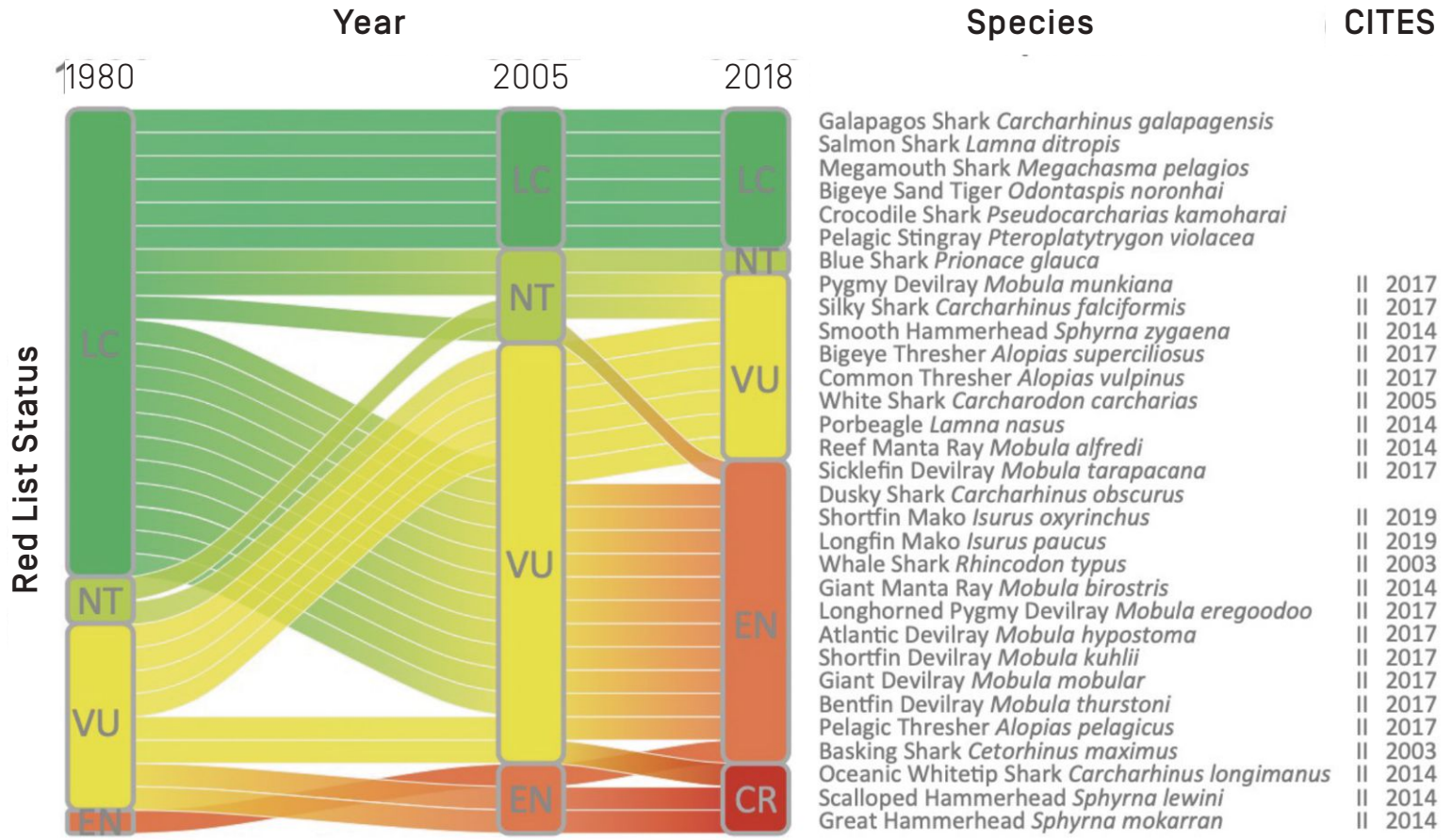
### 3. Fisheries and Trade Status

Industrial and artisanal fleets supply markets in Asia for shark and ray fins, while the meat of the same captured sharks is often diverted along separate supply channels to meet demand in growing markets in Europe and South America. Total catches of sharks and rays reported to FAO peaked in 2000, before declining slowly. Most were taken from the Atlantic Ocean and adjacent seas (37%), followed by the Pacific (33%) and Indian Ocean (26%). The largest shark catchers in this and former analyses (albeit in a slightly different order) are Indonesia, Spain and India, followed by Mexico, USA, Taiwan Province of China, and Argentina. The top 40 catchers have remained unchanged since 2000, but these top seven are now reporting a greater proportion of global catches (rising from 48% to 59%). Although the number of catchers reporting more than 1% of the global catch has fallen from 26 to 24 over the past decade, the 24 are now taking 91% of the reported world catch, compared with 85% in earlier years. These

\*The term “sharks” refers to all species of sharks, skates, rays and chimaeras (cartilaginous fishes, Class Chondrichthyes). Elasmobranch fishes include the sharks, skates and rays; batoid fishes are the skates and rays.



Change in the Red List status of oceanic sharks and rays, 1980–2018, and dates Appendix II listings entered into force.





figures exclude some major fishing nations that may under-report their shark catches, including China, Viet Nam and Myanmar.

Shark and ray meat and fin trade volumes and value have declined over the past decade. The top 20 importers of shark meat accounted for 90% of global imports over the past 12 years. Europe and South America are the largest retail markets and importers for shark and ray meat. The top meat exporting countries include Spain, Taiwan, Uruguay, USA, Argentina, Portugal, Japan, Namibia, and Indonesia. The four largest importers of shark fin (Hong Kong SAR, Malaysia, China and Singapore) account for almost 90% of the fin trade. Hong Kong Customs records report trade with an average of 83 nations annually, but the largest fin exporters and re-exporters are Singapore, Taiwan, Spain, Peru, United Arab Emirates, and Indonesia.

The taxonomic resolution of catches reported to FAO has improved slightly over the past ten years. In 2017, 62% of global reported chondrichthyan catches were recorded within taxonomic groupings, including 19% under the category ‘Sharks, rays, skates etc, nei’, and 38% at species level. Records of trade in meat and fins are still mostly not provided at species level. However, genetic analyses of fin trimmings in retail markets identified a very large number of sharks, rays and chimaeras in trade. Four species (three listed in CITES Appendix II) contributed more than 50% of samples analyzed, eight additional species contributed >1% each of the global total, and fins from CITES-listed species comprised over 20% of samples.

**4. Management status**

CITES Resolution Conf. 12.6 (Rev. CoP18) – Conservation and Management of Sharks – identifies the importance of maintaining close collaboration between FAO, Regional Fisheries Management Organisations, Regional Fishery Bodies, the Convention on the Conservation of Migratory Species of Wild Animals and other relevant international organizations to improve coordination and synergies in the implementation of CITES provisions for CITES-listed shark species. It, inter alia, encourages Parties to work through the respective mechanisms of these instruments to improve coordination with activities under CITES.

Several of the 18 Regional Seas Conventions and Action Plans (RSCAPs) coordinated through the UN Regional Seas Programme are actively engaged in the conservation and management of sharks (particularly threatened species) or are developing programmes in this area.

Some 32 RFBs (including advisory and management bodies) have potential to support the implementation of CITES for chondrichthyans, including 14 RFMOs. Ten RFMOs have adopted one or more Conservation and Management Measures (CMM) for sharks and/or rays, including eight CMMs for CITES-listed species. Most of the latter prohibit the retention of these species and mandate safe release of sharks caught accidentally; some prohibit intentional purse seine sets on Whale Sharks (*Rhincodon typus*). Additional non-species-specific time/area closures and gear restrictions should reduce fishing mortality of shark and ray species. However, there remains scope for improved data collection for and management of CITES-listed sharks taken in fisheries under the RFBs’ remit. As noted in Res. Conf. 12.6 (Rev. CoP18), this could include making information available to assist Scientific Authorities in the making of Non-Detriment Findings (NDFs) for shared stocks under the remit of the RFBs; recommending and/or adopting precautionary catch limits for CITES-listed shark species; adopting traceability systems for their products to ensure their trade is legal; and adopting comprehensive management plans to reduce overfishing, or recovery plans for overfished CITES species, such as the Oceanic Whitetip Shark (*Carcharhinus longimanus*).

Only one RFMO has adopted a Regional Shark Plan (RPOA) under the framework of the FAO International Plan of Action for the Con-

servation and Management of Sharks (IPOA–Sharks): the bilateral Comisión Técnica Mixta del Frente Marítimo/Joint Technical Commission of the Maritime Front (CTMFM). The European Union Community Shark Plan (EU POA, for all EU fisheries within and outside EU waters) operates at regional and global level. All other RPOAs and/or guidance for Shark Plans have been developed and adopted by the advisory RFBs, RSCAPs, or other regional advisory bodies.

At national level: significant progress has been made since FAO’s 2012 review of the implementation of the FAO IPOA–Sharks by the world’s largest shark catchers. Additional large catchers have drafted and/or adopted National Shark Plans (NPOAs) or NPOA Guidance. Several have revised and updated their NPOAs, a few more than once. However, other important fishing countries have still not produced an NPOA or made one publicly available. Among the new top 24 reporting shark catchers, these are: Iran, Nigeria, Oman, Tanzania, and Yemen. China, Myanmar and Vietnam, countries with major fisheries capacity but low or no reported shark catch, have also not elaborated Shark Plans.

Recommendations

- These recommendations for regional collaborative efforts by national CITES Authorities and RFBs to strengthen CITES implementation for sharks and rays were drawn up in recognition that:
- overfishing is the primary threat to the sharks and rays, particularly species listed in CITES;
  - the majority of CITES-listed species are shared stocks, taken on the high seas as well as within CITES Parties’ EEZs; and
  - fisheries and trade management measures will be most effective if adopted regionally, rather than on a country-by-country basis.

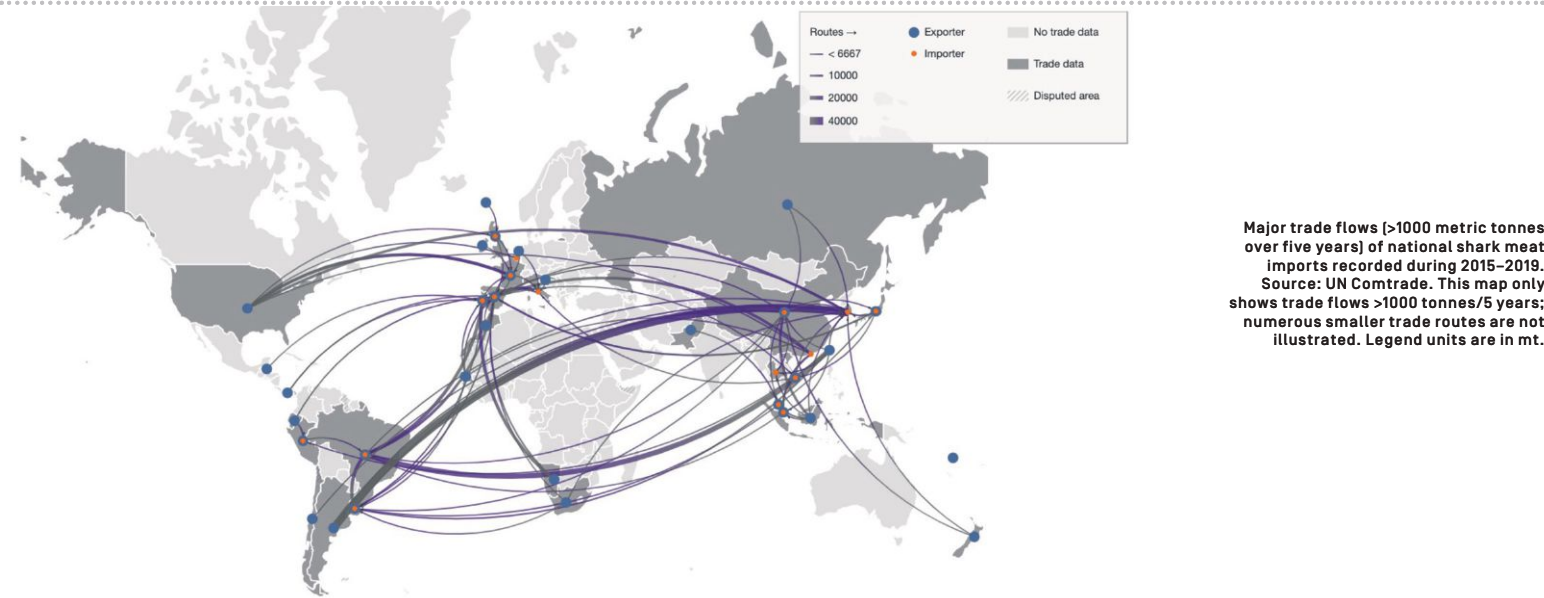
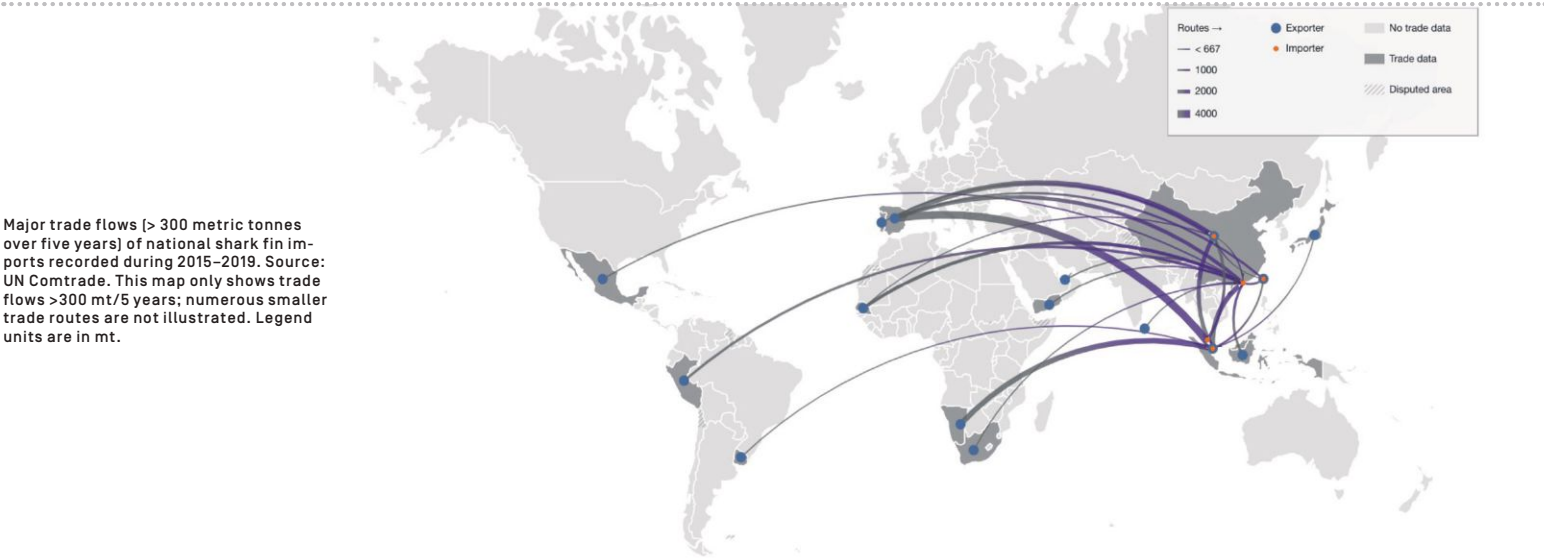
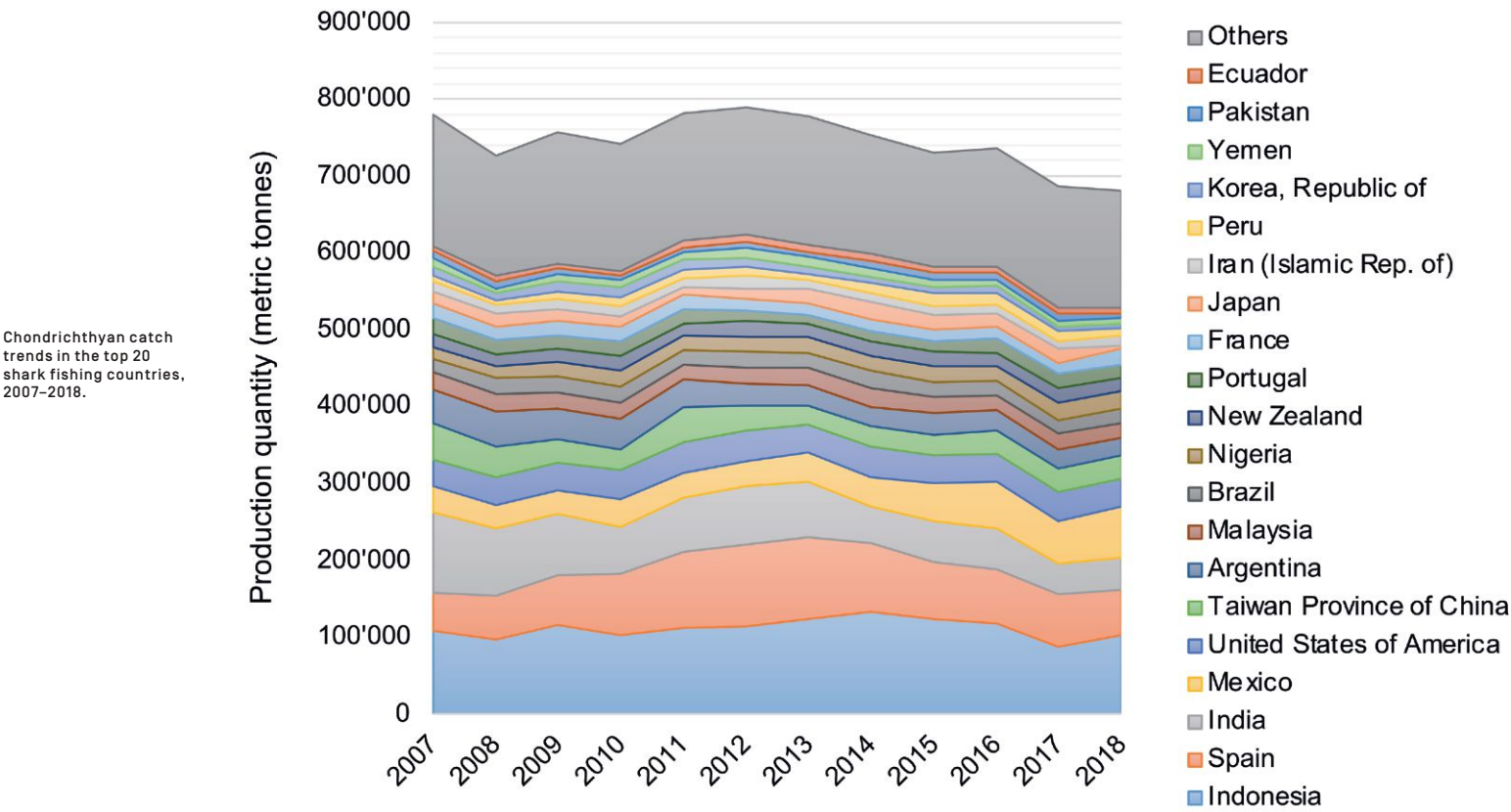
They also draw upon the recommendations of three regional workshops convened by the CITES and FAO Secretariats in 2014.

I) Strengthen Conservation and Management Measures for Sharks and Rays

- Adopt regional conservation and management measures relating to fisheries, trade, and species conservation for CITES-listed elasmobranchs through RFMOs, or as harmonized legislation across national members of RFBs. These should as a priority incorporate precautionary catch/bycatch limits to reduce overfishing, replenish depleted stocks, and recover threatened species.
- Develop and implement comprehensive regional management plans for CITES-listed sharks and rays to reduce overfishing and restore endangered populations.
- Conduct regional CITES Non-Detriment Findings (NDFs) for shared stocks of CITES-listed species, and agree protocols for authorizing national CITES exports based on regional NDFs.

II) Strengthen National Legislation, Enforcement (Monitoring, Control, Surveillance), and International Cooperation

- Improve, where necessary, national legislation for shark and ray conservation and management and promote harmonization of national legislation at the regional level, including to ensure that fishery and trade controls, sanctions and penalties, and other requirements are effective.
- Develop a harmonized regional approach for making Legal Acquisition Findings for CITES-listed shark and ray species (legal origin and sourcing), taking into account Port State measures.
- Develop a common approach for issuing CITES documentation for CITES-listed species taken on the high seas, to fulfil CITES requirements for Introduction from the Sea.





- Develop harmonized chain of custody or traceability systems (e.g., labelling, Catch Documentation Schemes, certificates) to track CITES-listed shark and ray species from catch to export, as well as for processed products at the origin/exporting/processing countries, and registration/license systems for traders and processors.
- Develop and implement harmonized regional/global species-specific Customs/tariff codes for CITES-listed shark and ray species and support the FAO proposal to the World Customs Organization for new shark species-specific tariff codes.
- Promote the use of existing regional wildlife enforcement networks and programmes of work to address CITES-listed marine species.
- Strengthen international collaboration among enforcement officers in export, import and re- export countries, e.g. through coordinated enforcement or joint enforcement operations for sharks and rays, the creation of regional enforcement networks allowing strengthened regional collaboration between enforcement authorities, and sharing of resources.
- Set up regional DNA research laboratories.

**III] Promote Harmonization and Exchange of Data on Sharks and Rays**

- Promote harmonization of data collection, recording, and reporting and international exchange of data and information on sharks and rays, including fisheries and trade data.
- Improve the collection and reporting of standardized data on CITES-listed and other shark and ray species that are caught and landed, to assist CITES Parties in making the findings needed prior to export of CITES-listed shark species.
- Develop regional data-sharing mechanisms, with protocols where relevant for shared stocks.
- Encourage and implement joint regional shark research programmes.
- Carry out Stock Assessments and Ecological Risk Assessments at regional levels.
- Define supply chains for the different products and derivatives of sharks and rays in trade.
- Conduct marketing and trade assessments of sharks and rays at regional levels.

**This study was funded by the German Ministry for the Environment, Nature Conservation and Nuclear Safety as Research and Development project (no. FKZ 3519532052).**  
Full report published here [bfn.de/sites/default/files/2021-08/Skript607.pdf] or on the following website [bfn.de/publikationen/bfn-schriften/bfn-schriften-607-conservation-fisheries-trade-and-management-status]





The following is an excerpt from Why Sharks Matter:  
A Deep Dive with the World’s Most Misunderstood Predator

# The Ecological Significance of Sharks

NEW PUBLICATION



Written by David Shiffman

**About David Shiffman**  
David Shiffman is a marine conservation biologist at Arizona State University. His work has appeared in the Washington Post, National Geographic, and Scientific American, and he writes a monthly column in Scuba Diving Magazine. He can be found on Twitter at @WhySharksMatter, where he’s always happy to answer questions about sharks

Soon after a beautiful South African sunrise, a Cape Fur Seal slowly and uneasily hauls its seven-foot-long, 500-pound body along a rocky shoreline. The five-acre island that this seal and tens of thousands of his closest friends live on is named, cleverly enough, Seal Island. Though Cape Fur Seals often enter the waters off Seal Island in small, coordinated groups, this one makes the fateful choice to go for a swim by himself. Like other seals and sea lions, Cape Fur Seals are as fast and graceful in the water as they are hilariously awkward on land. This one is setting off on his morning hunt for fish and squid.

Chris Fallows, a shark ecotourism operator, photographer, and naturalist, beautifully describes what happens next in his book, Great White and Eminent Grey:

**Deep below the seals, a shark follows like a cork poised to pop, biding its time. Upon an unseen cue, the great fish comes to life, knowing the time to strike is now. With two serpentine-like sweeps of its crescent shaped tail, the massive shark hurtles towards the surface at full speed . . . a thousand kilograms of shark breaks the water’s surface and then blasts free, sending gallons of water cascading down its glistening back and streamlined features. In a heartbeat, the shark’s raw**

**power, graceful athleticism, and hunter’s determination are indelibly imprinted upon those fortunate enough to witness the show. This is unquestionably one of nature’s greatest spectacles.**

If the seal had survived this initial strike, he might have engaged in a complex defensive maneuver, zigzagging through the water to take advantage of his superior agility in the water. Alas, he’ll never get the chance. He is now an ex-Cape fur seal.

Dramatic “nature red in tooth and claw” moments like this one are what many people visualize when they think of sharks as predators, and watching this kind of behavior from Chris Fallows’s boat was one of the coolest things I’ve ever done. While I could pretty happily witness this spectacular behavior over and over again, it’s important to remember that sharks are an incredibly diverse group of animals with an equally diverse set of prey and feeding behaviors. (As it turns out, this famous South African great white breaching behavior isn’t happening much anymore).

If not all sharks dramatically hunt seals, what do sharks eat? It varies a lot. For example, despite being the largest fish in the ocean, Whale Sharks eat microscopic plankton, slurping up clouds of it and filtering the food out of the water, a feeding strategy familiar to fans of the great baleen whale. (That’s why they’re called Whale Sharks, along with their size. They are definitely sharks, not whales—and no matter what Sharknado co-star Tara Reid says, they are assuredly not half-shark half-whale hybrids.) Notably, Whale Sharks and other filter feeders are still predators; eating lots of tiny animals is still eating animals.

Bonnethead Sharks (*Sphyrna tiburo*), a small hammerhead relative, have been found to digest seagrass, and are the only known omnivorous shark species. We knew that they sometimes ingest seagrass while hunting for crabs in seagrass beds, a process which I’ve compared to accidentally failing to pick all the lettuce off my deli sub; the fact that some plant matter ends up in my stomach sometimes doesn’t make me a vegetarian. But a 2018 study by Dr. Samantha Leigh found that the bonnetheads are able to digest the plant matter, something we’ve long assumed they couldn’t do. This paper, which changed our understanding of sharks dramatically, resulted in one of many times I needed to change this book while writing it. Before Leigh’s paper was published, scientists were pretty certain that all sharks were exclusively carnivores.

Tiger Sharks, on the other hands, eat sea turtles, shell and all. They have famously been found with all kinds of stuff in their stomachs, including license plates. My favorite unexpected things found in a Tiger Shark’s stomach, though, are penguins. Scientists have even found porcupines in Tiger Shark stomachs. Tiger Sharks have also been known to eat songbirds that grow exhausted during a long migration over water. One time, a Tiger Shark vomited all over my colleague, Dr. Austin Gallagher. When he looked down and saw some unusual stomach contents splattered on his shirt and bathing suit, he collected and analyzed them, then wrote a paper about what he discovered.

Some sharks are specialist predators, which means that they are picky eaters and only devour one (or a very few) types of prey. This makes them well-adapted to a healthy ecosystem that contains lots of that prey, but vulnerable if something happens to that prey. Other sharks are generalist predators; in other words, they’ll eat just about anything. When I was preparing my master’s defense presentation on Sandbar Shark (#Best-Shark) feeding ecology, I noted with amusement that Sandbar Sharks eat a large variety of foods, including the study organism of almost every other student in my graduate program.

Shark hunting behavior is as diverse as sharks’ diets. Hammer-head sharks use their unusual head shape to pin flat prey animals like stingrays to the seafloor. They also use their extra-wide heads as extra-large surface areas for their extra-powerful electrosensory systems. Since the Ampullae of Lorenzini needed for electrosensing are found on the front of a shark’s head, a wider head means more ampullae and a stronger system. Thresher sharks use their tails, which can be as long as the rest of their whole body, to stun fish with a whip-like motion before eating them. Although many sharks prefer to hunt alone, Whitetip Reef Sharks hunt in large groups, wedging their slender bodies into crevices in coral reefs to get at fish trying to hide for the night. Nurse sharks use their unusually shaped teeth and powerful jaws to crush the shells of crustaceans. Angel sharks lie perfectly still just under the sand until prey comes close enough for them to strike.

Most frequently, sharks eat small and medium-sized fishes, as well as crustaceans like crabs and shrimp. But some eat birds. Some eat marine mammals. Some eat squids or octopuses (yes, it’s octopuses, not octopi). Some eat sea snakes. So what do sharks eat? Just about anything in the ocean, including other sharks!

While not all shark predation is as awe-inspiring as the breaching behavior of South Africa’s Great White Sharks, sharks’ eating habits can still have important effects on the ocean ecosystems they call home. In biological research, a common way to learn what a particular gene, organ, or body part does for an organism is to break it and see what body systems stop working. (If we turn off Gene X then the animal can’t see anymore? Gene X must be associated with sight.) In ecological research, there’s a similar principle: to learn about the ecological role of a species, see what happens to the ecosystem when the species isn’t there anymore. Sometimes this involves predator exclusion experiments: installing fences that prey can move through but predators can’t, for instance. Sadly, though, humanity is engaging in a large-scale natural experiment, creating ecosystem changes by overfishing many shark species all over the world. This sometimes also leads to something called fisheries-induced evolution in which the very act of heavily fishing a species causes measurable changes in their biology or behavior, including how fast they grow and reproduce.

From Why Sharks Matter:  
A Deep Dive with the World’s Most Misunderstood  
Predator by David Shiffman. Copyright 2022.  
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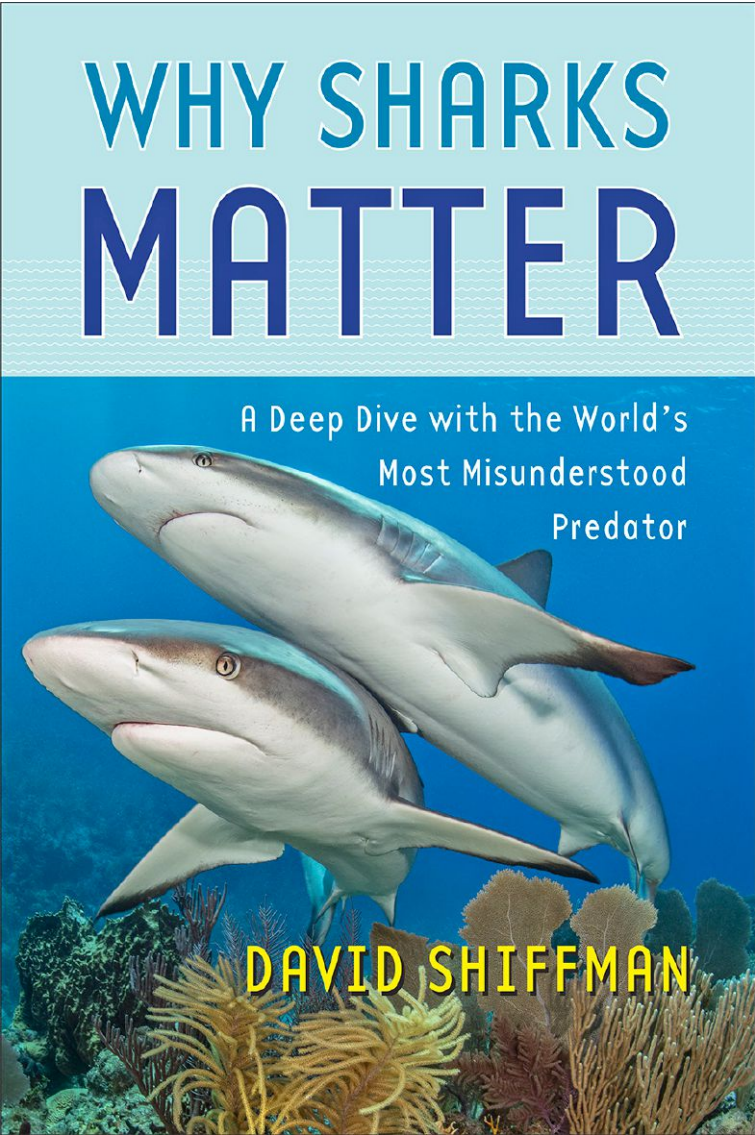
“Follow David Shiffman’s humorous and educational journey into the underwater world of sharks. A dedicated scientist and a masterful storyteller, he advocates for the conservation of these misunderstood predators at the same time as he dispels many longstanding shark myths.”

**Hanne Strager, The Whale, Norway, author of A Modest Genius: The Story of Darwin’s Life and how His Ideas Changed Everything**

“Providing a wealth of information about a vitally important group of animals, this topical and accessible book will attract a broad audience.”  
**Jeffrey C. Carrier, Albion College, author of Sharks of the Shallows: Coastal Species in Florida and the Bahamas**

“David Shiffman shines in this enjoyable, illuminating, and important book. One of David’s strengths is communicating with generosity, accuracy, insight, wit, and heart, and here he has succeeded in producing a book that presents sound principles of shark science and conservation (and more) and, at the same time, is highly readable.”  
**Daniel C. Abel, Coastal Carolina University, author of Shark Biology and Conservation: Essentials for Educators, Students, and Enthusiasts**

“Why Sharks Matter is a smart, engaging, and persuasive book that is perfect for readers who have a serious interest in marine conservation. With one third of all sharks and rays currently facing extinction due to overfishing, this timely volume is poised to make a positive and authentic impact.”  
**Robert W. Shumaker, Indianapolis Zoo, editor of Saving Endangered Species: Lessons in Wildlife Conservation from Indianapolis Prize Winners**





# All About Sawfishes

*An educational book on sawfishes, their habitats and how we can protect them.*

Dr Ruth H. Leeney  
IUCN SSC Shark Specialist Group | Africa Regional Group | Member

Sawfishes are one of the most threatened groups of elasmobranchs (sharks and rays) globally. All five species – Dwarf Sawfish (*Pristis clavata*), Green Sawfish (*Pristis zijsron*), Large-tooth Sawfish (*Pristis pristis*), Smalltooth Sawfish (*Pristis pectinata*), and Narrow Sawfish (*Anoxypristis cuspidata*) – are classified as Critically Endangered or Endangered on the IUCN Red List of Threatened Species. Despite looking highly unusual and capturing the imagination of many people, they are not as well-known as other large marine animals such as Manta Rays (Mobulidae family), Great White Sharks (*Carcharodon carcharias*), or whales and dolphins. There are relatively few educational resources for the general public on sawfishes. In the public presentations, university lectures and school lessons I have given at home, in Europe, and where I did research, I have been asked many questions about sawfishes. I realised that there was no single resource I could point people to if they wanted to learn about sawfishes at home and that there was scope for a much more comprehensive and accessible book about sawfishes.

‘All About Sawfishes’ started as a book to convey some of what scientists know about sawfishes – where they live, how to identify the different species, how they use their saw or ‘rostrum’, and why they are threatened – to a broad audience, including younger readers. But I also wanted to convey the extraordinary variety of countries and diversity of habitats where sawfishes live: rivers, mangroves and coastal waters teeming with a huge array of different marine and terrestrial species. Sawfishes are part of these ecosystems and, I believe, have the best chance of survival in places where those whole ecosystems are protected and healthy.

I worked with the talented South African illustrator Alexis Aronson to bring these ecosystems to life. Alexis’s illustrations combine precision – in the maps and the physical features of sawfishes and other animals – with an ethereal quality that conveys the beauty and fluidity of the underwater world. Her watercolours have made the book a visual feast and, I think, bring to life the fascination that sawfishes inspire in so many people.

The book also emphasises diversity in many ways. The illustrations depict ecosystems where sawfishes live around the world and include many other animals and plants that would live in those ecosystems so that readers can understand their interconnected nature and see what those habitats look like in parts of the world like Madagascar, Papua New Guinea, West Africa, and Australia. It also highlights some of the fascinating traditional cultures around the world in which sawfishes feature. In addition, the illustrations depict people of diverse ethnicities and backgrounds, who live alongside, protect and study sawfishes. One of the primary aims of the book is to show readers from all around the world that they can play a role in protecting our environment, regardless of their age, background or abilities, and that there are many different ways in which they can help.

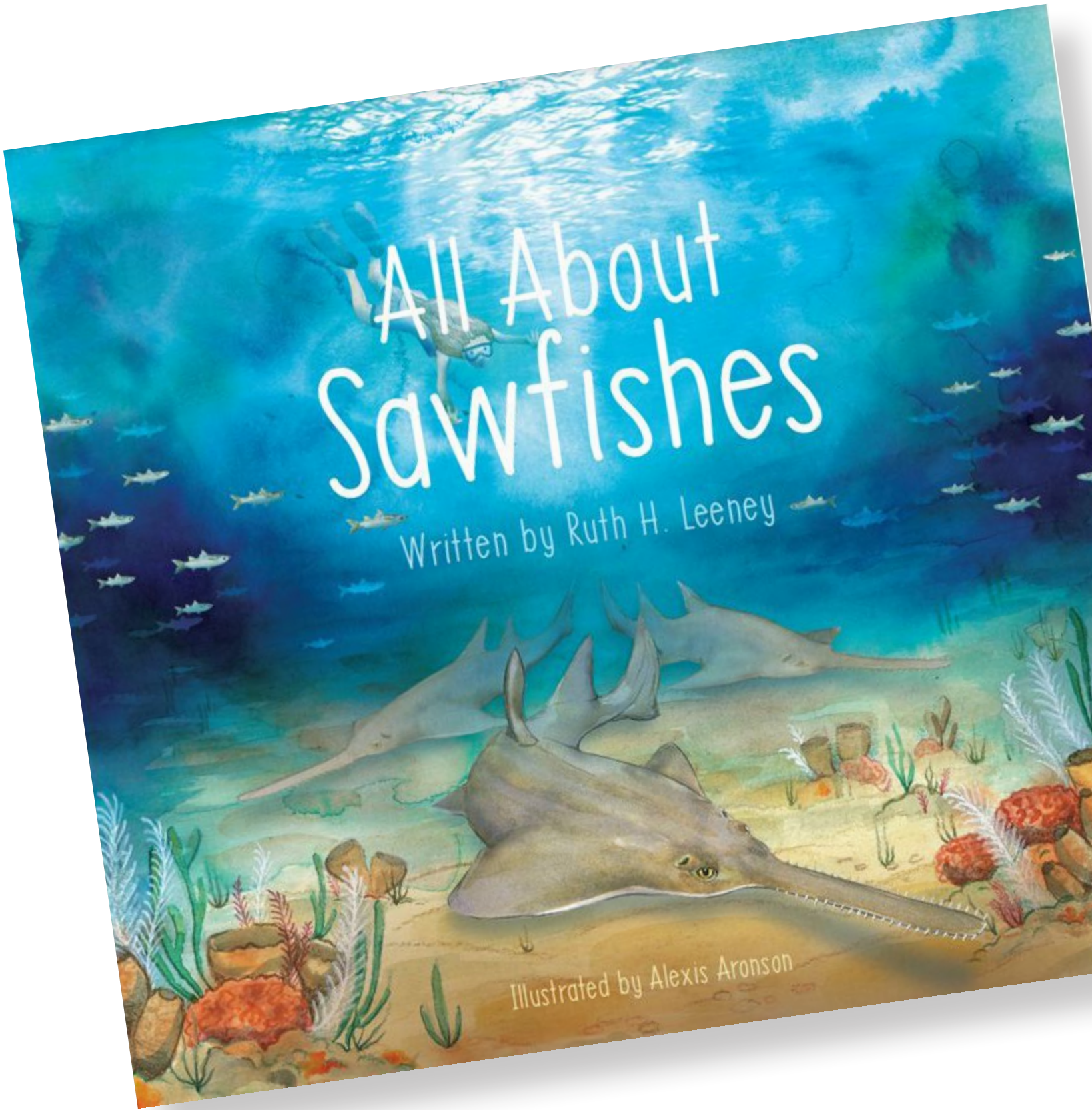
It is the first book of its kind on sawfishes and, whilst aimed at young people (reading ages 8–14), is likely to be appealing to readers of all ages. The book also includes a section at the back where some of the ecosystem scenes are replicated in black and white, with the outlines of all the species numbered and a species list on each page, allowing readers to find out the names of many other animals and plants. They also double as colouring-in pages!

The production and printing costs of the book were made possible by a crowd-funding campaign. Many campaign supporters took the ‘buy-one, donate-one’ option, which funded the production of extra books to donate to schools in underserved communities or to communities living alongside and working to protect sawfishes. So far, 18 books have been sent to indigenous ranger groups in northern Australia – one of the last strongholds for several species of sawfish. Five books have been sent to the non-governmental organization Dakshin, which works with small-scale fishing communities in India, and four books have been sent to DEIS schools in Ireland, which work with students with educational disadvantages.

I hope that this book will inspire readers to protect sawfishes and our rivers and oceans in whatever way they can.

All about Sawfishes  
Written and designed by Ruth H. Leeney  
Illustrated by Alexis Aronson  
Published by Protect Africa’s Sawfishes, 2021. ISBN: 978-1-3999-1276-1

Limited copies of the book are available to purchase upon request from the author. Please email [ruth.leeney@gmail.com](mailto:ruth.leeney@gmail.com) for details.







But their heads are flat and...  
wait,  
what's that attached to their head?

It looks like a chainsaw!

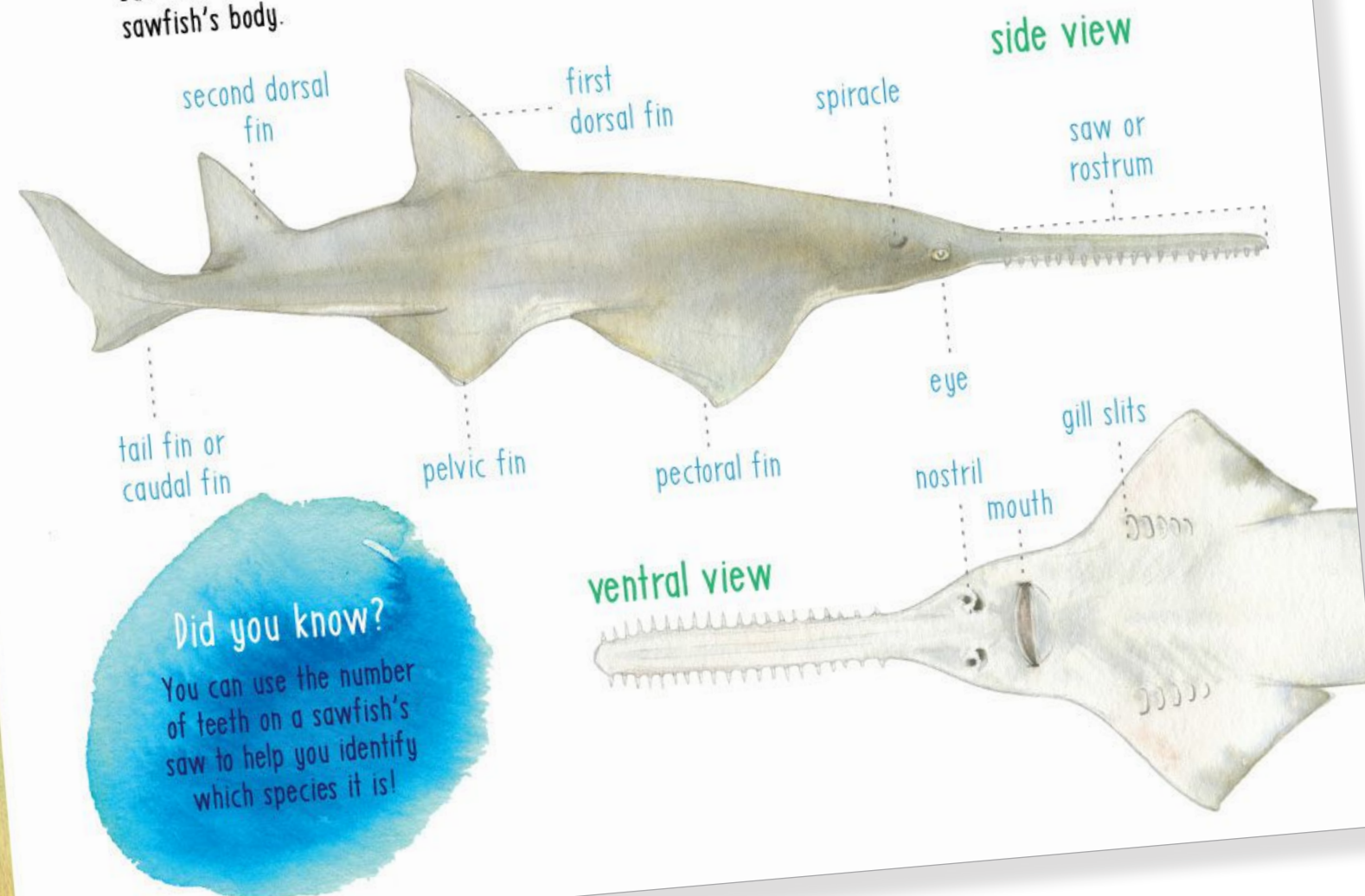
That's a Sawfish!



## How many types of sawfish are there?

There are actually five different kinds, or species, of sawfish.

But before we learn all about them, let's look at the names for the different parts of a sawfish's body.





If you want to help make sure  
that future generations of  
people can see these weird  
and wonderful animals, maybe  
you can become a sawfish  
researcher!





The most recent research efforts focus on analyses of environmental DNA from sawfishes at key locations. In the photo: Nathalie Goebel, project member.

NEW PUBLICATION

# A New Diagnostic Book on Sawfishes Has the Potential to Guide Future Research and Conservation Efforts in Costa Rica and the Central American Region

Written by  
Lucia Vargas  
University of Costa Rica

& Mario Espinoza  
University of Costa Rica  
Regional Vice-Chair | Central  
America and Caribbean



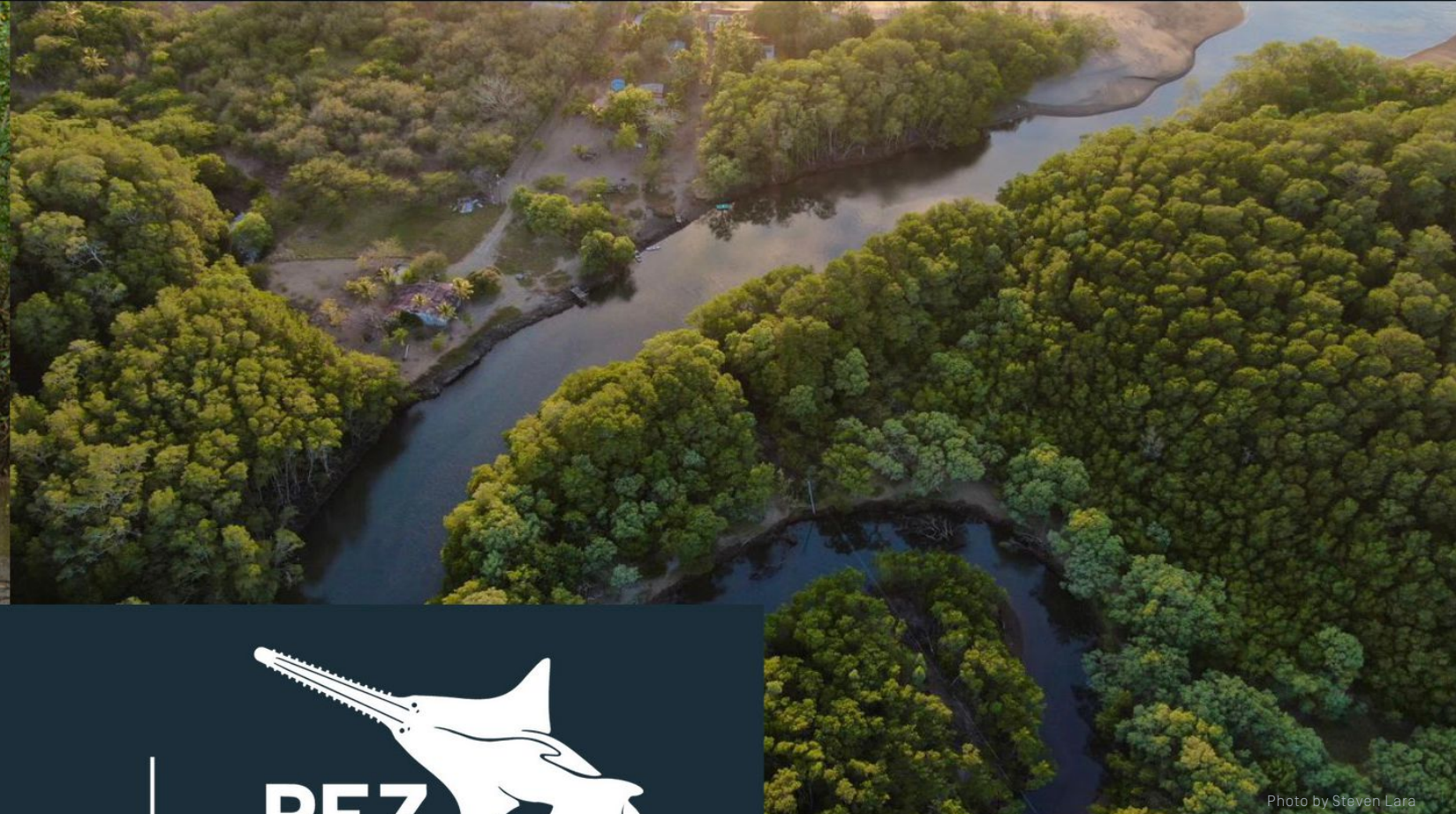


Photo by Steven Lara

Costa Rica **wildlife**  
Foundation



Photo by Gustavo Arce Avila



The Pez Sierra Costa Rica project is a new component of the Costa Rica Wildlife Foundation's marine conservation program. It comprises an interdisciplinary team doing research, environmental education, outreach, and community engagement.



A new online book entitled “Diagnostic of sawfishes in Costa Rica: towards a regional overview” provides a detailed understanding of the current status of the Largetooth Sawfish (*Pristis pristis*) and Smalltooth Sawfish (*P. pectinata*) in Costa Rica and Central America. Its aim is to guide future research and conservation efforts in the region. This book is also a first step toward designing a Sawfish Conservation Strategy for Costa Rica that can also be replicated in other countries. The book is written for a wide range of audiences, including national environmental authorities, fisheries agencies, non-governmental organizations (NGOs), local stakeholders, and researchers working or planning to work with sawfishes in the region.

The book was written by researchers from the University of Costa Rica (UCR) – Lucía Vargas-Araya, Jorge A. Valerio-Vargas, Jorge Salmerón, and Mario Espinoza (project leader). They began working with sawfishes in Costa Rica back in 2016.

The book is available online in an interactive version (online.flippingbook.com/view/278623880/). Readers can click on specific sections from the table of contents or flip through the pages.

The book starts with a broad overview of sawfishes, their distribution, life-history, and ecological importance. Thus, readers will learn about the biology and ecology of sawfishes, their current conservation status and what is being done worldwide to protect them. Finally, the book narrows down to the Central American region, emphasizing the ongoing research, education, and conservation efforts in Costa Rica.

The book's authors tried to highlight Central America as a beacon of hope for sawfishes in Latin America by providing a regional context. Over the last decade (2010–present), numerous sawfish sightings have been reported in Nicaragua, Costa Rica and Panamá, mostly for the Largetooth Sawfish. For instance, the San Juan River (natural border between Costa Rica and Nicaragua) and Barra del Colorado (north Caribbean region of Costa Rica) have been identified as hotspots for sawfish. In contrast, the Darién region in the Pacific of Panamá is likely to be one of the last remaining areas with viable sawfish populations. Therefore, the book's authors call for joint efforts between neighbouring countries in Central America to ensure connectivity of subpopulations of sawfishes and to strengthen regional conservation efforts to recover their populations.

**The Costa Rican Sawfish Conservation Project:**

The researchers from UCR started working with sawfishes in 2016 as part of a research and conservation project that was initially funded by the Rufford Foundation. This project is a key component of the Costa Rica Wildlife Foundation's marine conservation program. As an interdisciplinary team, the project seeks to promote the protection of sawfish in the country through research, environmental education, outreach, and community engagement, with the aim of expanding these efforts throughout Central America.

Costa Rican waters are home to the Largetooth Sawfish and Smalltooth Sawfish. Both species can be found in tropical and subtropical areas of America, yet their populations have declined dramatically, mainly due to overfishing and habitat loss.

Decades ago, sawfishes were common in Costa Rican waters, particularly near mangroves and wetlands. Nowadays, however, sawfish sightings are rare and restricted to specific areas of the country. Therefore, the project aspires to continuously generate information about the current state of sawfish populations, their distribution, critical habitats, and the main threats affecting these species locally. This information may help guide future conser-

vation efforts on the recovery of sawfish populations in different regions of Costa Rica.

In 2016, the Pez Sierra-CR project started by interviewing members of fishing communities around the country to identify sites where sawfishes are still found and identify the main threats affecting their survival. These data allowed the researchers to determine the historical and current distribution of sawfishes in Costa Rica. They also identified sites where these species had never been reported before. Yet, results demonstrated a general reduction in their abundance and distribution throughout the country.

The results from this project were essential to establishing legal protection for sawfish in cooperation with members of the Legislative National Assembly in 2017, through a national Decree that banned the fishing of sawfishes within Costa Rican waters. Since then, the project promoted a Law to specifically protect sawfishes, which was finally approved by the National Assembly in April 2022. This new legal tool will hopefully reduce their risk of extinction as the country now recognizes both species in critical need of additional protection.

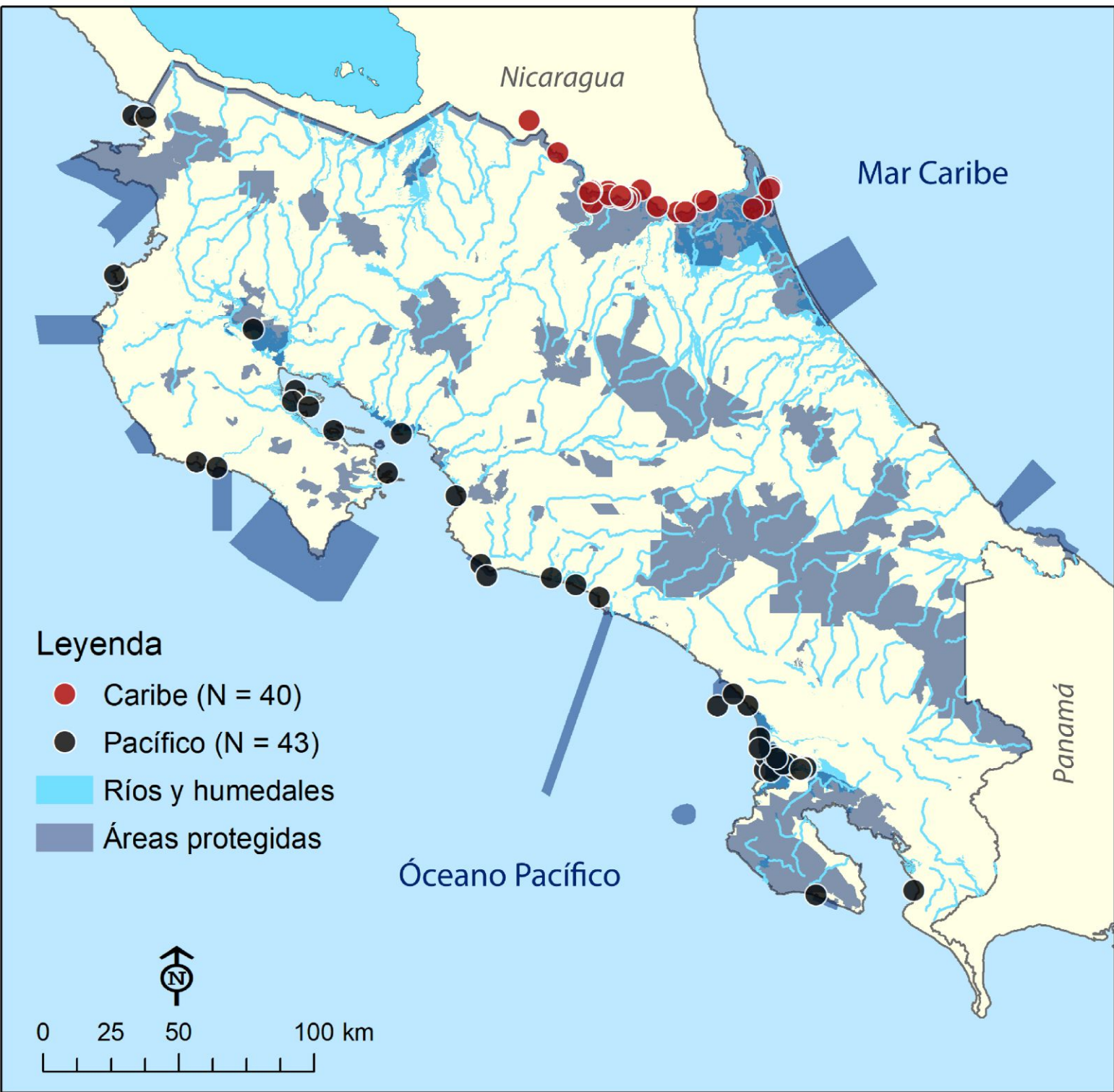
Community outreach and environmental education have also been an essential aspect of the project's efforts. Knowledge of these species has been communicated, their importance, and their dire situation in many communities around Costa Rica. Thanks to these efforts, people have contacted members of the project to report sawfish sightings on multiple occasions, contributing to the growing knowledge of these species, and allowing to become guardians of sawfishes in the country.

The critical sites identified through the interviews paved the way for the second phase of the project: fishing expeditions. The researchers visited areas like the Térraba-Sierpe National Wetland, the Northern Caribbean and the North Pacific, looking for sawfish. After much effort and little luck, the team decided to try a new strategy: searching for sawfish DNA left over in the water. Some water samples containing DNA from sawfishes in several sites were found, including the San Juan River, where Costa Rica borders Nicaragua. The current investigations aim to unravel more detailed sawfish distribution patterns in these critical sites, particularly in the north Caribbean region, by continuing the environmental DNA sampling.

Research efforts are still ongoing, as well as environmental education activities, but the book is now a further step towards a new stage of the project. With scientific information, awareness, and support from different local stakeholders, the project Pez Sierra – Costa Rica plans to design a national strategy to protect sawfishes through a participatory process involving all relevant stakeholders. Thus, the diagnostic book was intended to inform and serve as a guide during this upcoming process.

This project is now a joint effort between UCR and the Costa Rica Wildlife Foundation (costaricawildlife.org) and was supported by the Save Our Seas Foundation, the Rufford Foundation, the Shark Conservation Fund and the National Geographic Foundation.

The book is available online as an interactive book: online.flippingbook.com/view/278623880/. The PDF is also available on Research Gate.

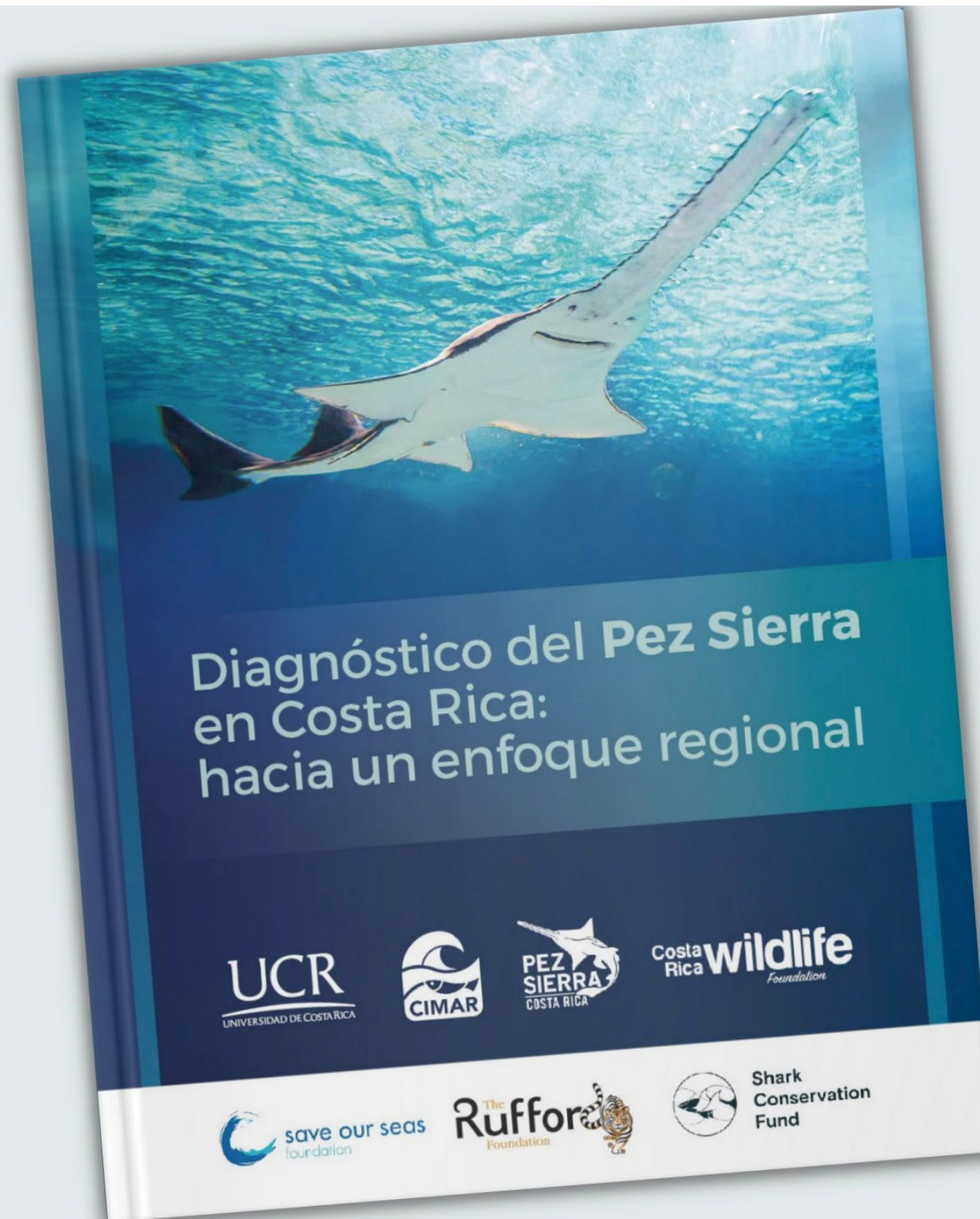




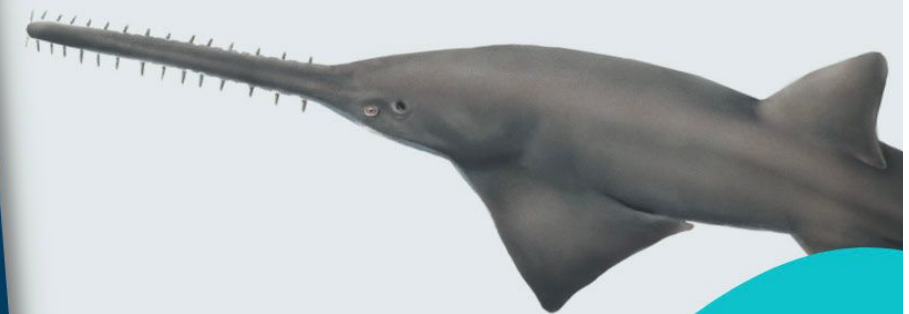
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# Diagnostic of sawfishes in Costa rica: towards a regional overview

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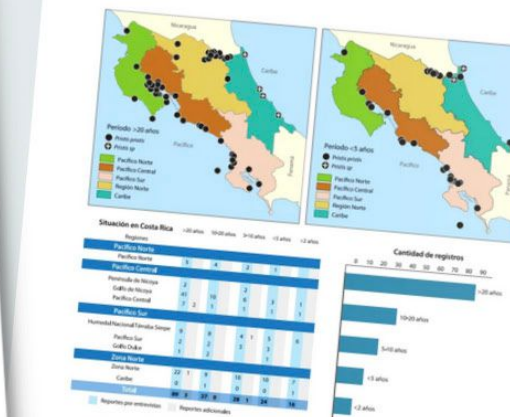
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## Contenido

Agradecimientos .....	8
Resumen .....	9
Acrónimos .....	9
<b>Parte I: El pez sierra y su situación global y regional</b>	
1. ¿Cuántas especies existen y cómo se reconocen? .....	12
2. ¿Dónde se encuentran y qué ambientes utilizan? .....	15
2.1. Distribución global .....	15
2.2. Distribución en América .....	16
2.3. Uso de hábitat .....	18
3. ¿Cuáles son las características de su historia de vida? .....	21
3.1. Biología reproductiva y crecimiento .....	21
3.2. Alimentación .....	23
4. ¿Cuál es su importancia? .....	25
4.1. Importancia ecológica .....	25
4.2. Usos y valor cultural .....	26
4.3. Usos del pez sierra .....	27
5. El estado de conservación de los peces sierra y sus amenazas .....	30
5.1. Estado de conservación global .....	30
5.2. Amenazas al pez sierra .....	33
5.2.1. Sobrepesca .....	33
5.2.2. Pérdida y degradación de hábitat .....	34
5.2.3. Tráfico ilegal .....	36
5.2.4. Cambio climático .....	37
6. ¿Qué se ha hecho para proteger a los peces sierra? .....	39
6.1. Políticas internacionales .....	39
6.2. Protecciones legales nacionales .....	40
6.3. Investigación .....	42
6.3.1. Conocimiento ecológico local y reportes públicos de avistamiento .....	43
6.3.2. Técnicas novedosas .....	44
6.3.3. Sensibilización y educación ambiental .....	48
6.4. ¿Qué es la estrategia global de conservación del pez sierra? .....	49

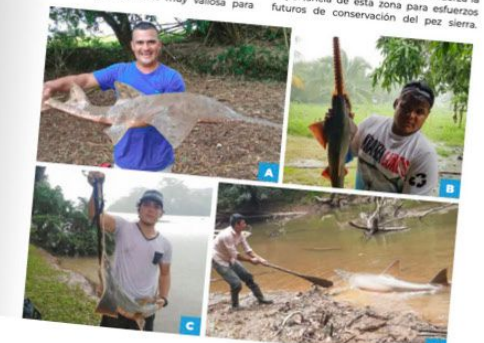


En Costa Rica, también ha habido una respuesta a la preocupación global del estado del pez sierra (Figura 20). Gradualmente, se han retomado las investigaciones sobre las especies de pez sierra presentes en el país y se han establecido esfuerzos divulgativos y educativos para seguir obteniendo información y promover su protección.

## Conservación del Pez Sierra en Costa Rica



Además, desde el inicio del proyecto Pez Sierra-Costa Rica, se han obtenido también reportes a través de redes sociales de personas, principalmente dedicada a la pesca, que se encontraron al pez sierra en años recientes (Figura 27), información que ha sido también muy valiosa para entender la situación actual del pez sierra en Costa Rica. Entre los años 2020 y 2021, ha habido múltiples capturas de juveniles del pez sierra de diámetros grandes a lo largo del río San Juan-Colorado, que refuerza la importancia de esta zona para esfuerzos futuros de conservación del pez sierra.



: sierra de  
el Río San  
tor: Marlon  
ado en Río  
Foto: Oscar  
s): E. Sibos  
ma fueron  
rio Vargas.

**Inicio de colecta y análisis de ADN ambiental  
para la detección del Per Sierra en CR  
Primeros resultados positivos mediante  
esta técnica**

Figura 20. Línea del tiempo. Avances en investigación y protección del pez sierra en Costa Rica en un contexto global. CR: Costa Rica.



# Funding Opportunities



**Marisla Foundation**  
marisla.org

Marisla Foundation® was established in 1986 as a private, non-operating charitable institution. The Foundation awards grants quarterly in two program areas - Environment and Human Services - and a Special Interests category for proposals invited by the Board of Directors.

The Environment Program concentrates on activities that promote the conservation of biological diversity and advance sustainable ecosystem management. Primary emphasis is on marine and coastal biodiversity conservation with a geographic focus on California, Northwest Mexico, Hawaii, Chile, and the Western Pacific (Melanesia, Micronesia, and Polynesia). The Environment Program also supports the search for solutions to health and environmental threats caused by toxic chemicals.



**Conservation Leadership Programme (CLP)**  
conservationleadershipprogramme.org

The Conservation Leadership Programme (CLP) is a partnership of three of the world's leading biodiversity conservation organizations. Drawing upon the expertise of conservation professionals from across the globe, we direct project funding and training to early-career leaders from developing countries who are tackling priority conservation challenges.

CLP supports high-priority biodiversity conservation by building the leadership skills of early-career conservationists who are striving to overcome major threats to nature in places where capacity and access to resources is limited. To achieve this, we identify and engage exceptional young conservationists, invest in their professional development through grants, training, and mentoring, and help them to multiply their impact across the conservation sector.

The next call for applications for all award categories is expected to be announced in July 2022.

### 1. Future Conservationist Awards

conservationleadershipprogramme.org/grants/grant-overview/future-conservationist-award/

Future Conservationist Awards are only eligible to those who have not previously been funded by CLP. Each worth \$15,000, Future Conservationist Awards are granted to teams of early-career conservationists who are conducting high-priority projects focused on protecting species listed as Data Deficient,

Vulnerable, Endangered, or Critically Endangered on the IUCN Red List. Projects must take place in an eligible country, be led (or co-led) by a national of one of these countries, involve at least three people, and last between three to 12 months.

### 2. Conservation Follow-up Award

conservationleadershipprogramme.org/grants/grant-overview/conservation-follow-up-award/

The Conservation Follow-up Award is available to CLP project teams that have previously received a Future Conservationist Award. Conservation Follow-Up Awards involve grants of up to \$25,000 and are available to teams addressing a conservation issue raised by recommendations in a project previously supported by CLP. Projects should be focused on direct conservation outputs, for example, lobbying, awareness-raising, education, training, and monitoring.

### 3. Conservation Leadership Award

conservationleadershipprogramme.org/grants/grant-overview/conservation-leadership-award/

The Conservation Leadership Award is available to CLP project teams that have received both Future Conservationist Awards and Conservation Follow-up Awards. The Conservation Leadership Awards involve grants of up to \$50,000. This is awarded to teams leading complex conservation projects that connect previous work and typically focus on creating enduring systems to ensure conservation outcomes in the long-term (for example, forming a new, self-supporting NGO). Award-winners should be high

potential, early- to mid-career conservationists, who through training and experience are now able to build the capacity of others. Projects should be sustainable and effective, increasing the viability of threatened populations and influencing national policy.

# Funding Opportunities



**The Rufford Foundation**  
rufford.org  
apply.ruffordsmallgrants.org

The Rufford Foundation provides funding for nature conservation projects in developing countries. Grants are designed to support small-scale or pilot projects, rather than providing a small amount of funding for a large-scale project. Projects can focus on particular species or have a more general focus such as on a threatened habitat or a major issue like human-wildlife conflict or the need for community education. For projects focusing on species, we will not consider work on those listed at a global level as Least Concern in the IUCN Red List of Threatened Species.

The Rufford Foundation provides a staged funding process with five different types of grants. In sequence, these are:

- **1<sup>st</sup> Rufford Small Grant**  
(up to £6,000).
- **2<sup>nd</sup> Rufford Small Grant**  
(up to £6,000).
- **1<sup>st</sup> Booster Grant**  
(up to £10,000).
- **2<sup>nd</sup> Booster Grant**  
(up to £10,000).
- **Completion Grant**  
(up to £15,000).

On receipt of a Completion Grant, applicants cannot apply for further funding. At this stage, we expect the project we have funded to be financially stable and supported by larger-scale funders.

Applicants should be based in a developing country. Applicants can be based in a first-world country but the project itself must be in a developing country. The grant generally

funds people who are at the early stages of their conservation careers. The focus is on supporting MSc or PhD students (or equivalent) or those who have graduated from such studies in the past 3 years, though we only consider costs related to the fieldwork element of the study.



**The James E. Dutton Foundation**  
jameseduttonfoundation.org/  
jameseduttonfoundation.org/applications

The James E. Dutton Foundation is a charitable foundation providing financial support to organizations working on projects which benefit wildlife, animal causes, environmental preservation, and outdoors education.

The James E. Dutton Foundation does not have a formal grant application form. Grant requests should be written and include a cover letter with full contact information including contact name, address, phone number, and email address.

The request should also include a description of the requesting organization and its mission, a detailed description of the project or program for which the grant is being requested, along with the grant budget and schedule. The request should also include a description of how the success of the project or program will be measured and evaluated.

Grant periods may extend over two or more years depending upon the request. In addition, we will require a brief report upon completion of the project on the results achieved by our grant. Grant request submissions are due by October 12, 2022



**NOAA Fisheries FY 2021–2023: Broad Agency Announcement**  
fisheries.noaa.gov/grant/fy-2021-2023-broad-agency-announcement

This Broad Agency Announcement is a mechanism to encourage research, education and outreach, innovative projects, or sponsorships that are not addressed through NOAA's competitive discretionary programs. This announcement is not soliciting goods or services for the direct benefit of NOAA. Funding for activities described in this notice is contingent upon the availability of Fiscal Year 2021, Fiscal Year 2022, and Fiscal Year 2023 appropriations. Applicants are hereby given notice that funds have not yet been appropriated for any activities described in this notice. Publication of this announcement does not oblige NOAA to review an application beyond an initial administrative review, or to award any specific project, or to obligate any available funds.

Eligible applicants may be institutions of higher education, nonprofits, commercial organizations, international or foreign organizations or governments, individuals, state, local, and Indian Tribal governments. Eligibility also depends on the statutory authority that permits NOAA to fund the proposed activity. Funding of Federal organizations is outside the scope of this announcement.

Category of funding opportunity: Environment, natural resources, science and technology, and other research and development.

Closing Date:  
September 30, 2023



# Upcoming Meetings

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.



**37<sup>th</sup> Annual Scientific Meeting American Elasmobranch Society [AES]**  
July 27 – 31, 2022  
Spokane, WA, USA  
[elasmobranch.org](http://elasmobranch.org)  
[asih.org/meetings](http://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](http://si2022.org)

Sharks International 2022 [SI2022] is a hybrid event in October 2022 that will bring together a diverse community of people from across the world with an interest in sharks and rays, all in the name of addressing the challenge of elasmobranch conservation and research in this Decade of Ocean Science. Hosted by the Shark Trust, Submon, and Lamna, in association with the European Elasmobranch Association, the event will include five online days (October 10<sup>th</sup>–14<sup>th</sup>) 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<sup>th</sup>–22<sup>nd</sup>). The conference is funded by the Save our Seas Foundation, supported by L'Océanographe, the largest aquarium in Europe, and streamed live worldwide. Thanks to additional assistance from the Shark Conservation Fund, the online conference tickets now include a massive 50% discount for students and delegates from low and middle-income nations. If you have an interest in sharks, rays and chimaera, and want to be a part of the 1200+ member community currently shaping SI2022, check out our promo video and sign up to the portal at [si2022.org](http://si2022.org)



**19<sup>th</sup> meeting of the Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES CoP19]**  
November 14 – 25, 2022  
Panama City, Republic of Panama  
[cites.org/eng/cop19](http://cites.org/eng/cop19)

The Parties to CITES are collectively referred to as the Conference of the Parties. Every two to three years, the Conference of the Parties meets to review the implementation of the Convention. These meetings are often referred to as a 'CoP'. A 'CoP' meeting is the most important meeting in the context of CITES, as Parties take on a significant body of tasks, including the following:

- Reviewing progress in the conservation of species included in the Appendices;
- Debating proposals to amend the lists of species in Appendices I and II;
- Discussing documents and reports from Parties, the Standing Committee, the Animals Committee, the Plants Committee, or the Secretariat;
- Recommending measures to improve the effectiveness of the Convention, including the drafting and adoption of Resolutions and Decisions to be implemented by all Parties, the Standing Committee, the Scientific Committees and the Secretariat;

This will be the fourth meeting of the Conference of the Parties to CITES held in Central and South America and the Caribbean since CITES came into force on 1 July 1975, but it will be the first held in the region since 2002.



**5<sup>th</sup> International Marine Protected Areas Congress [IMPAC5]**  
February 3 – 9, 2023  
Vancouver, Canada  
[impac5.ca](http://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.

# 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 Fund**

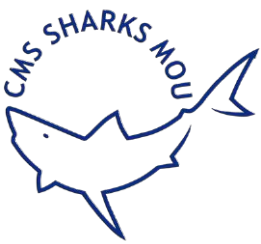


**save our seas foundation**





**ATLANTIS DUBAI**



**Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection**





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