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.
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
In this Q&A series, get to know members across the group’s nine regions.
Written by Chelsea Stein

Early-Career Scientists within the SSG

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’ 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 are disinterested.

Written by Chelsea Stein
Canoe vessels landed at Dixcove landing site in Ghana

Team members at Dixcove community measuring Blue Shark (Prionace glauca)
species seem too fierce even though they are not. It was fun to
cover 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 (Ginglystoma cirratum). Their ability to deal with extreme situations
Rhincodon typus
@elasmobranquios.parana
-), Twitter
-), Rhino Rays (order Rhinopristiformes), and mobu
-), Guitarfish
-), Silky Shark (Carcharhinus falciformis), Dusky Shark (Carchar
-), Gymnura (order Gymnuriformes), and by-catch (family Mobulidae).

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

Natascha: I strongly believe that the biggest challenge is also the
biggest opportunity: the human dimensions involved in the cap
ture 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 deci
sion-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 con
servation 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, while their high-value fins are destined for the international market.

Finally, the contribution of sharks to food security in poor and de
veloping 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.

Issah: 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 stake
holders 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. Chuan’s memorable perceptions from generation to generation is quite challenging. As a large shark fishery and producer, Indo
nesia 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 Chimae
ras: 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.

Issah: Actually, every year is a thrilling year for me; we need to con
duct 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 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 (pocil).

Issah: I am very afraid of bony fish and crabs.

How can we keep up with your work?

Natascha: You can keep up with my research through my Research
Gate profile (researchgate.net/profile/Natascha-Wosnick), and on
the social networks of my study group (@elasmobranquios.paranal)
and my research projects (@tintureirapr and @programarebimarl).

Issah: You can keep up with my work at the following sites: aplico.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 @benayasim-
een and our website (perikanan.org).
Sharks caught with size limitation, catch quota, and fishing effort control.
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 1980 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 Centre (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:
- Oil Spills Protocol;
- Specially Protected Areas and Wildlife (SPAW) Protocol; and
- 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 through-out 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.”
Whale Shark (Rhincodon typus) swimming at surface

Photo by Gaby Barathieu | Ocean Image Bank | theoceanagency.org
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. 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.

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.

<table>
<thead>
<tr>
<th>Order</th>
<th>Family</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Annex</th>
<th>Year listed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcharhiniformes</td>
<td>Carcharhinidae</td>
<td>Carcharhinus falciformis</td>
<td>Silky Shark</td>
<td>II</td>
<td>2019</td>
</tr>
<tr>
<td>Carcharhiniformes</td>
<td>Carcharhinidae</td>
<td>Carcharhinus longimanus</td>
<td>Oceanic Whitetip Shark</td>
<td>III</td>
<td>2017</td>
</tr>
<tr>
<td>Carcharhiniformes</td>
<td>Rhincodonidae</td>
<td>Rhincodon typus</td>
<td>Whale Shark</td>
<td>II</td>
<td>2017</td>
</tr>
<tr>
<td>Carcharhiniformes</td>
<td>Sphyridae</td>
<td>Sphyra lewini</td>
<td>Scalloped Hammerhead Shark</td>
<td>III</td>
<td>2017</td>
</tr>
<tr>
<td>Carcharhiniformes</td>
<td>Sphyridae</td>
<td>Sphyra mokarran</td>
<td>Great Hammerhead Shark</td>
<td>III</td>
<td>2017</td>
</tr>
<tr>
<td>Carcharhiniformes</td>
<td>Sphyridae</td>
<td>Sphyra zygaena</td>
<td>Smooth Hammerhead Shark</td>
<td>III</td>
<td>2017</td>
</tr>
<tr>
<td>Myliobatiformes</td>
<td>Mobulidae</td>
<td>Mobula alfredi*</td>
<td>Reef Manta Ray</td>
<td>II</td>
<td>2017</td>
</tr>
<tr>
<td>Myliobatiformes</td>
<td>Mobulidae</td>
<td>Mobula birostris*</td>
<td>Oceanic Manta Ray</td>
<td>III</td>
<td>2017</td>
</tr>
<tr>
<td>Myliobatiformes</td>
<td>Mobulidae</td>
<td>Mobula sp. cf. birostris*</td>
<td>Atlantic Manta Ray</td>
<td>III</td>
<td>2017</td>
</tr>
<tr>
<td>Rhineopteriformes</td>
<td>Pristidae</td>
<td>Pristis pectinata</td>
<td>Smalltooth Sawfish</td>
<td>II</td>
<td>2017</td>
</tr>
<tr>
<td>Rhineopteriformes</td>
<td>Pristidae</td>
<td>Pristis pristis</td>
<td>Large-tooth Sawfish</td>
<td>II</td>
<td>2019</td>
</tr>
</tbody>
</table>

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

Countries ratified under the SPAW protocol:
A total of 18 countries and 14 overseas territories have signed the SPAW protocol.

<table>
<thead>
<tr>
<th>Country/State</th>
<th>Date of Ratification or Accession</th>
<th>Country/State</th>
<th>Date of Ratification or Accession</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Bahamas</td>
<td>24/06/2010</td>
<td>Honduras</td>
<td>13/10/2018</td>
</tr>
<tr>
<td>Barbados</td>
<td>14/10/2002</td>
<td>Netherlands**</td>
<td>02/03/1992</td>
</tr>
<tr>
<td>Belize</td>
<td>04/03/2008</td>
<td>Nicaragua</td>
<td>04/05/2021</td>
</tr>
<tr>
<td>Colombia</td>
<td>05/01/1998</td>
<td>Panama</td>
<td>27/05/1996</td>
</tr>
<tr>
<td>Cuba</td>
<td>04/08/1998</td>
<td>Saint Lucia</td>
<td>18/05/2000</td>
</tr>
<tr>
<td>France*</td>
<td>05/04/2002</td>
<td>Trinidad and Tobago</td>
<td>10/08/1999</td>
</tr>
<tr>
<td>Grenada</td>
<td>05/03/2012</td>
<td>The United States of America***</td>
<td>16/04/2003</td>
</tr>
<tr>
<td>Guyana</td>
<td>14/07/2010</td>
<td>Venezuela</td>
<td>28/01/1997</td>
</tr>
</tbody>
</table>

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 II. Co-operative measures for the protection of wild flora and fauna)
Silky Sharks (Carcharhinus falciformis) | Cuba
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 conservation measures to protect those 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 to the Annexes (see below in Article 11: Changes in the Status of Protected Areas or Species). Protection measures (see Article 5: Protection Measures) applied are to be in accordance with the 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 I or a substantial risk to, or significant adverse environmental effects on the protected area, and developments, outfall structures or any other sources of non-indigenous species; d. the regulation or prohibition of activities that result in the destruction of flora and fauna, or their parts, or products, or eggs, and of threatened or endangered species of flora or their parts, or products, and archaeological objects originating in protected areas; k. the regulation of archaeological activities and 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 any other measure aimed at conserving, protecting or restoring natural processes, ecosystems or populations for which the protected areas were established.

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 for a species or species group shall serve as a basis for the destruction of endangered or threatened species of fauna or their parts, or products, or eggs, and of threatened or endangered species of flora or their parts, or products, and archaeological objects that originate in protected areas; b. the institution of closed hunting and fishing seasons and other measures for maintaining their population; c. the taking, possession or killing (including, to the extent possible, the destruction of such species, particularly during periods of breeding, incubation or migration, as well as other periods of biological stress. Each Contracting Party is to implement the above for the species listed in Article 11(1)(c).

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

Changes in the delimitation or legal status of an area, or part there- of, 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. Changes in the status of protected areas or 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 the Protocol Annexes to include, deletion, inclusion, or transfer of species between Annexes.
2. Parties provide appropriate supporting documents to the Protocol Annexes.
3. Submission of final drafts at least four months prior to the STAC meeting.
4. Secretariat circulates potential changes to Protocol Annexes for comments to Parties.
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 meetings 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. An amendment to the Protocol that is desirable to accept an amendment to the SPAW Protocol to contact the organization within 90 days of adopting the amendment.

Article 5: Protection Measures

Some Parties are able 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 territorial sea;
c. 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 prohibition of activities that may 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 all other activities 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;

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 territorial sea;
c. 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 prohibition of activities that may 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 all other activities 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;

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 territorial sea;
c. 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 prohibition of activities that may 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 all other activities 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 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 any other measure aimed at conserving, protecting or restoring natural processes, ecosystems or populations for which the protected areas were established.

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 territorial sea;
c. 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 prohibition of activities that may 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 all other activities 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 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 any other measure aimed at conserving, protecting or restoring natural processes, ecosystems or populations for which the protected areas were established.
Great Hammerhead Shark (*Sphyrna mokarran*) with diver

Photo by Amanda Cotton | Ocean Image Bank | theoceanagency.org
Paddlenose Spookfish
(Rhinochimaera africana)

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, Callirhinchidae (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 Narrow-nose 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 Rhinochimaeraeae, 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 650–1450 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 underreporting, 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 available, but to an extent, may also protect them from fishing pressures that Chondrichthyes at higher depths experience.

References


© CSIRO National Fish Collection from: Reardon, M.B. and Bray, D.J. Rhinochimaera africana in Fishes of Australia, accessed 20 Apr 2022, fishesofaustralia.net.au/home/species/3292

Image References:
© CSIRO National Fish Collection from: Reardon, M.B. and Bray, D.J. Rhinochimaera africana in Fishes of Australia, accessed 20 Apr 2022, fishesofaustralia.net.au/home/species/3292
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, habitat 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 (*Carcharias taurus*), 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 chrysodon*), 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...
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 is dependent on healthy oceans and 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 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 NSF Shark Exhibit and its contribution towards Shark Alley.

Two Oceans Aquarium
Dock Road, V&A Waterfront, Cape Town, South Africa.
Email: helen.lockhart@aquarium.co.za
Website: aquarium.co.za

Social media:
LinkedIn @2OceansAquarium
Instagram @2oceansaquarium
Facebook @TwoOceansAquarium
Twitter @2OceansAquarium

Reference:
Migration and natatal use of formerly captive and wild Raggedtooth Sharks (Carcharias taurus) on the southeast coast of South Africa.
Photo by Renée Leeuwner | Two Oceans Aquarium
Beachgoers in Durban, South Africa, come face-to-face with the world’s most Dangerous Predator

Earlier this year, a team from WILDOCEANS, a programme of the WILDTURST, 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 WILDTURST. “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
More information:
wildtrust.co.za| twitter.com/WILDOCEANSSA | sharkattackcampaign.co.za | facebook.com/SharkAttackCampaign | instagram.com/sharkattackcampaign | twitter.com/sharkattacksa

Written by Lauren van Nijkerk | WILDTURST
COME FACE-TO-FACE WITH THE WORLD'S MOST DANGEROUS PREDATOR
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), 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.

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. 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. 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.

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!
"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? These 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

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:00 - 17:05</td>
<td>Opening remarks Dr. Rima Jabado</td>
<td>Chair: IUCN SSC Shark Specialist Group</td>
<td></td>
</tr>
<tr>
<td>17:05 - 17:25</td>
<td>The IUCN Green Status of Species Dr. Molly Grace</td>
<td>Co-Chair: IUCN Green Status of Species Working Group</td>
<td></td>
</tr>
<tr>
<td>17:25 - 17:45</td>
<td>Blue Shark (Prionace glauca) Dr. Carlos Polo</td>
<td>Senior Researcher, Universidad Jorge Tadeo Lozano</td>
<td></td>
</tr>
<tr>
<td>17:45 - 18:00</td>
<td>White Shark (Rhincodon typus) Dr. Gonzalo Araujo</td>
<td>Founder &amp; Director, Marine Research and Conservation Foundation</td>
<td></td>
</tr>
<tr>
<td>18:00 - 18:45</td>
<td>Banded Wobbegong (Orectolobus halei) Dr. Charlie Huveneers</td>
<td>Professor, Flanders University</td>
<td></td>
</tr>
</tbody>
</table>

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 and youtu.be/8Ubat6kn1Wo

---

**White Shark**

*Carcharodon carcharias*

**ABSTRACT**

White Shark: *Carcharodon carcharias* has most recently been assessed for the IUCN Red List of Threatened Species in 2019. *Carcharodon carcharias* is listed as Vulnerable under criteria A2bd.
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
The Anthropocene is marked by a massive defaunation 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 (MARBEC | University of Montpellier), while sequences will be shared.
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’
For Lisa Whitenack, Associate Professor of Biology and Geology at Allegheny College, everything changed when “Megalodon: The Monster Shark Lives” aired on Discovery Channel in 2013. “As a shark paleobiologist, that [show] was very frustrating because I had anywhere from three-to 90-year-olds asking me, ‘Is megalodon still out there?’ and that never happened before that episode aired,” she said.

This episode was presented as a factual documentary, although it was pure fiction. “Now, every year, I post on social media: ‘This is your annual Shark Week reminder that megalodon has been extinct for at least 3.5 million years.’ While this [post] gets lots of retweets and people think it’s funny because we still have to talk about this, I always get serious responses of people asking, ‘But, how do you know it’s extinct?’

As you might already know, Shark Week is TV’s longest-running program, airing on Discovery Channel every summer since 1988. It showcases sharks at the center stage and reaches millions of people worldwide. In 2020 alone, Discovery shared that 21 million viewers tuned into Shark Week – casting an extremely wide net for Carcharodon (or Bull Sharks) – Sphyrna, Squalus, and Carcharhinus (or hammerheads) spp. – known to many as the charismatic species.

Species concept considered threaten the IUCN Red List of Threatened Species were less likely to be featured than large, well-known species.

Several recent episodes showed celebrities wading through unnecessary, artificial danger, or having inappropriate interactions with animals.

While 53% of episodes briefly mention something about conservation, only six episodes – 3% – mentioned specific conservation policies or ways for viewers to help protect sharks, most of which were not action-oriented.

Of the 204 people featured on Shark Week who were listed as experts, 23% turned out to be activists, divers, or camera people, without scientific publications.

Two male experts were referred to as “Dr” when they were found without scientific publications.

Whitenack explained how her peers, colleagues, and friends have been frustrated by the program, and her research team was inspired to conduct a thorough analysis, categorizing the content and studying show titles, the content of episodes (including filming location, shark species featured with research methods), gender, racial diversity, and scientific validity of experts featured.

Here is what rose to the surface:

Frequency of occurrence of little words. The word “Shark(s)” occurred 4.7 times more frequently than the next most common word, “Jaws,” and was omitted, along with words that occurred only once. Words with a caption were also omitted, along with words that occurred only once. The size of the word reflects the frequency of occurrence.

What is so bad about Shark Week?

“My colleagues and I joked about how the working title for the paper should be: ‘We watched 201 episodes of Shark Week so that you didn’t have to,’” Whitenack said. “It took about one and a half years because it was 201 episodes spread over four people.”

Across this bounty of Shark Week episodes, scientists and experts have criticized how the content has drifted from educational and science-based to fictional, fearmongering, and sensational. And there has not been comprehensive data to back this up – until now. In the eyes of the research team – and many critics of Shark Week – the ideal episode would be focused on actual science, feature diverse species and scientists from around the world, and share actionable conservation methods for viewers to get involved. While this type of content was rare, Whitenack noted a few episodes worth viewing, like “American Shark” (2005) and “Alien Sharks” (2013), for example.

There were several episodes that ticked several boxes, but never all the boxes for me,” she said. “The whole Alien Sharks series is amazing. That’s the closest they’ve come so far, featuring unusual sharks that aren’t the stuff we typically see, and lots of them. ‘Stranger Fins’ (2017) did a wonderful job because there is diversity in the people, scientists and students, positive messaging, and if I remember correctly, it does have some conservation content in it.”

The team also assessed scientist attitudes toward Shark Week, receiving 102 shark expert responses to a survey. Of the respondents, 64% believe public attitudes towards sharks are significant to conservation, and 86% believe mainstream media coverage of shark-related issues is not factually accurate – many referenced problems with Shark Week unprompted. The data also revealed an important trend: scientists want to see programming improved on Shark Week but do not want to be involved in those improvements.

Whitenack explained how her peers, colleagues, and friends have had their words selectively edited by episode producers, making it appear as if they were responding to questions that they weren’t asked and taking their expertise and commentary completely out of context. Ultimately, this can reduce trust in science from the public, leading many scientists to disengage.

For example, in 2020 alone, Discovery shared that 21 million viewers tuned into Shark Week – casting an extremely wide net for Carcharodon carcharias (Tiger Sharks) – Sphyrna lewini (Cownose-Ray), Carcharhinus (or hammerheads) spp. – known to many as the charismatic species.

Species concept considered threaten the IUCN Red List of Threatened Species were less likely to be featured than large, well-known species.

Several recent episodes showed celebrities wading through unnecessary, artificial danger, or having inappropriate interactions with animals.

While 53% of episodes briefly mention something about conservation, only six episodes – 3% – mentioned specific conservation policies or ways for viewers to help protect sharks, most of which were not action-oriented.

Of the 204 people featured on Shark Week who were listed as experts, 23% turned out to be activists, divers, or camera people, without scientific publications.

Two male experts were referred to as “Dr” when they were found without scientific publications.

Whitenack explained how her peers, colleagues, and friends have been frustrated by the program, and her research team was inspired to conduct a thorough analysis, categorizing the content and studying show titles, the content of episodes (including filming location, shark species featured with research methods), gender, racial diversity, and scientific validity of experts featured.

Here is what rose to the surface:

Frequency of occurrence of little words. The word “Shark(s)” occurred 4.7 times more frequently than the next most common word, “Jaws,” and was omitted, along with words that occurred only once. Words with a caption were also omitted, along with words that occurred only once. The size of the word reflects the frequency of occurrence.

What is so bad about Shark Week?

“My colleagues and I joked about how the working title for the paper should be: ‘We watched 201 episodes of Shark Week so that you didn’t have to,’” Whitenack said. “It took about one and a half years because it was 201 episodes spread over four people.”

Across this bounty of Shark Week episodes, scientists and experts have criticized how the content has drifted from educational and science-based to fictional, fearmongering, and sensational. And there has not been comprehensive data to back this up—until now.

In 2020 alone, Discovery shared that 21 million viewers tuned into Shark Week—a fact that Whitenack found frustrating because she still had to talk about this. “I always get serious responses of people asking, ‘But, how do you know it’s extinct?’

As you might already know, Shark Week is TV’s longest-running program, airing on Discovery Channel every summer since 1988. It showcases sharks at the center stage and reaches millions of people worldwide. In 2020 alone, Discovery shared that 21 million viewers tuned into Shark Week—casting an extremely wide net for people of all ages and backgrounds to dip their toes into the world of marine biology and sharks.

Across Shark Week’s 34-year history, scientists and experts have criticized how the content has drifted from educational and science-based to fictional, fearmongering, and sensational. And there has not been comprehensive data to back this up—until now. In the eyes of the research team—and many critics of Shark Week—the ideal episode would be focused on actual science, feature diverse species and scientists from around the world, and share actionable conservation methods for viewers to get involved. While this type of content was rare, Whitenack noted a few episodes worth viewing, like “American Shark” (2005) and “Alien Sharks” (2013), for example.

There were several episodes that ticked several boxes, but never all the boxes for me,” she said. “The whole Alien Sharks series is amazing. That’s the closest they’ve come so far, featuring unusual sharks that aren’t the stuff we typically see, and lots of them. ‘Stranger Fins’ (2017) did a wonderful job because there is diversity in the people, scientists and students, positive messaging, and if I remember correctly, it does have some conservation content in it.”

The team also assessed scientist attitudes toward Shark Week, receiving 102 shark expert responses to a survey. Of the respondents, 64% believe public attitudes towards sharks are significant to conservation, and 86% believe mainstream media coverage of shark-related issues is not factually accurate—many referenced problems with Shark Week unprompted. The data also revealed an important trend: scientists want to see programming improved on Shark Week but do not want to be involved in those improvements.

Whitenack explained how her peers, colleagues, and friends have had their words selectively edited by episode producers, making it appear as if they were responding to questions that they weren’t asked and taking their expertise and commentary completely out of context. Ultimately, this can reduce trust in science from the public, leading many scientists to disengage.

What is so bad about Shark Week?

“My colleagues and I joked about how the working title for the paper should be: ‘We watched 201 episodes of Shark Week so that you didn’t have to,’” Whitenack said. “It took about one and a half years because it was 201 episodes spread over four people.”

Across this bounty of Shark Week episodes, scientists and experts have criticized how the content has drifted from educational and science-based to fictional, fearmongering, and sensational. And there has not been comprehensive data to back this up—until now.

In 2020 alone, Discovery shared that 21 million viewers tuned into Shark Week—a fact that Whitenack found frustrating because she still had to talk about this. “I always get serious responses of people asking, ‘But, how do you know it’s extinct?’

As you might already know, Shark Week is TV’s longest-running program, airing on Discovery Channel every summer since 1988. It showcases sharks at the center stage and reaches millions of people worldwide. In 2020 alone, Discovery shared that 21 million viewers tuned into Shark Week—casting an extremely wide net for people of all ages and backgrounds to dip their toes into the world of marine biology and sharks.

Across Shark Week’s 34-year history, scientists and experts have criticized how the content has drifted from educational and science-based to fictional, fearmongering, and sensational. And there has not been comprehensive data to back this up—until now. In the eyes of the research team—and many critics of Shark Week—the ideal episode would be focused on actual science, feature diverse species and scientists from around the world, and share actionable conservation methods for viewers to get involved. While this type of content was rare, Whitenack noted a few episodes worth viewing, like “American Shark” (2005) and “Alien Sharks” (2013), for example.

There were several episodes that ticked several boxes, but never all the boxes for me,” she said. “The whole Alien Sharks series is amazing. That’s the closest they’ve come so far, featuring unusual sharks that aren’t the stuff we typically see, and lots of them. ‘Stranger Fins’ (2017) did a wonderful job because there is diversity in the people, scientists and students, positive messaging, and if I remember correctly, it does have some conservation content in it.”

The team also assessed scientist attitudes toward Shark Week, receiving 102 shark expert responses to a survey. Of the respondents, 64% believe public attitudes towards sharks are significant to conservation, and 86% believe mainstream media coverage of shark-related issues is not factually accurate—many referenced problems with Shark Week unprompted. The data also revealed an important trend: scientists want to see programming improved on Shark Week but do not want to be involved in those improvements.

Whitenack explained how her peers, colleagues, and friends have had their words selectively edited by episode producers, making it appear as if they were responding to questions that they weren’t asked and taking their expertise and commentary completely out of context. Ultimately, this can reduce trust in science from the public, leading many scientists to disengage.
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 documentaries, “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.”

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 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.

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 documentaries, “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.”

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 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 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.
Preventing Shark and Ray Extinctions...

Mobula rays for sale destined to a fish market in Vietnam

...is Not Enough

Written by Dr Andy Cornish
Leader of WWF Sharks: Restoring the Balance, and Founder of Shark and Ray Recovery Initiative (SARRI)
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 (Sympteryx 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 80 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 36 species listed on CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) 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—aims to improve the recovery approach in the field, SARRI aims to create tailored recovery plans for each location and species, such as methods to re-introduce species to their habitats. These will be enhanced by other management measures 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.

The restoration of ecological function does not seem to have halted, and populations start to increase. This level of ambition—explicitly acknowledged in the Global Shark and Ray Initiative—aims to improve the recovery approach in the field, SARRI aims to create tailored recovery plans for each location and species, such as methods to re-introduce species to their habitats. These will be enhanced by other management measures 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.

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 Initiative, James Cook University (JCU), and the Wildlife Conservation Society (WCS).

![Photo by Marion Kraschl | Shutterstock | WWF](image)

![Photo by Tomas Kotouc | Shutterstock | WWF](image)
Bowmouth Guitarfish (Rhina ancylostoma) caught in a driftnet in Raja Ampat, Indonesia, 2011. Photo by Paul Hilton | Earth Tree Images | WWF.
Future Oceans: Priority Areas for Biodiversity Conservation

Written by Dr Lauren De Vos

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 (ISRA) 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, within a loss curve that had 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 – 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 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, yet alone aiming for the more ambitious 30% within its critical timeframe.

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, yet 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 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:

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, within a loss curve that had 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 – 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 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, yet alone aiming for the more ambitious 30% within its critical timeframe.

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, yet 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 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

Photo by François Baelen | Ocean Image Bank | theoceanagency.org
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, EBSAs, and KTAs. Many of them will overlap.” Dr Giuseppe Notarbartolo di Sciara is part of the IUCN SSC’s SSG and has led much of the work on the IMTAs process. His outlook, therefore, on the power 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 (EEZs), 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 ISRA 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 Important Marine Turtle 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 IMTAs 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: “Ministers of the environment deal with everything from MPAs to the conservation of a particular insect. They have a list on their agenda. I see this (the ISRA) 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 when taxonomic specific information and prioritization have been used to guide new MPA designations. “We have 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 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 5th International Marine Protected Areas Congress (IMPACS). You can follow the process at the new ISRA website: Important Shark and Ray Areas - an IUCN SSC SSG project and through their social media channels on Facebook, Twitter and Shark News (the SSG newsletter).
Sperm Whales (Physeter macrocephalus)

Photo by Amanda Cotton | Ocean Image Bank | theoceanagency.org
Adult and juvenile Atlantic Spotted Dolphins (Stenella frontalis) | Bimini, The Bahamas
Tasselled Wobbegong
(Eucrossorhinus dasypogon)

Photo by Grant Thomas | Ocean Image Bank | theoceanagency.org
Marine Protected Area Zones by Fishing Protection Level

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


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/
Marine Protected Area Zones by Fishing Protection Level

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

Marine Mammal Areas Task Force (2022), MPAtlas (On-line), Seattle, WA. Available at: www.mpatlas.org (Accessed 06/06/2022).

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 (IUCNMMMA), 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 marinamammalhabitat.org/imma-eatlas/
Caribbean Reef Shark (Carcharhinus perezi) eye | Bahamas
Photo by Hannes Klostermann | Ocean Image Bank | theoceanagency.org
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 kajae*), 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).
Tracking Threatened Sharks and Rays in West Africa

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

The first time that a Critically Endangered Black-chin 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 Black-chin 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
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 Scalloped Hammerhead Sharks (Sphyrna lewini) and Blacktip Sharks (Carcharhinus leucas) and give the shark a unique tag.

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 of 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). Fishery has 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). Therefore, we are sure 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. Hermes, K., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, G. (2019). Overfishing drives over one-third of all sharks and rays toward a global extinction crisis. Current Biology, in press. Dulvy, N. K., Fraschetti, S., Perry, J. L., Gili, G., Blaber, S. J. M., Compagno, L. V., Degraer, S., Hiddink, J. G., Esteban, A., & Cheek, N. (2011). Tracking Guitarfish. The IUCN Red List of Threatened Species 2019: e.T39385A2918526. (IUCN: Gland, Switzerland). Kyne, P.M. & Jabado, R.W. 2019. Glaucostegus cemiculus. The IUCN Red List of Threatened Species 2019: e.T104050689A104057239. (IUCN: Gland, Switzerland). "We are afraid that these species of sharks disappear from large areas. During the 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. 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 migration 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 hammerhead 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. References

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 (Cetorhinus 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 chondrichthyan species and every species listed in the CITES Appendices. Of 90% of CITES-listed species are targeted by at least some fisheries, versus only 26% of all the chondrichthyans. Bycatch impacts 83% of chondrichthyan species 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 caught 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 50 catchers have remained unchanged since 2000, but these top seven are now reporting a greater proportion of global catches (rising from 46% to 59%). Although the numbers of catchers reporting more than 1% of the global catch has changed since 2000, but these top seven are now reporting a greater proportion of global catches (rising from 46% to 59%). Although the numbers of catchers reporting more than 1% of the global catch has changed since 2000, but these top seven are now reporting a greater proportion of global catches (rising from 46% to 59%). Although the numbers of catchers reporting more than 1% of the global catch has changed since 2000, but these top seven are now reporting a greater proportion of global catches (rising from 46% to 59%).
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 86% 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 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 1-10% 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. CoP 14) – 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 RFMOs (including advisory and management bodies) have potential to support the implementation of CITES for chondrichthyan species, including 14 RFMOs. Ten RFMOs have adopted one or more Conservation and Management Measures (CMMs) 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) or rays, including eight CMMs for CITES-listed species. 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).

Most additional 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 RFMOs’ remit. As noted in Res. Conf. 12.6 (Rev. CoP 14), 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 RFMOs; 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 Conservation 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 P0A, for all EU fisheries within and outside EU waters) operates at a regional and global level. All other RPoAs and/or guidance for Shark Plans have been developed and adopted by the advisory RFMs, RSCAPs, or other regional advisory bodies. At national level: significant progress has been made since FAO’s 2012 review of the implementation of the IPOA–Sharks by the largest shark catchers. Additional large catchers have adopted National Shark Plans (NPDAs) or NPDPA Guidance. Several have revised and updated their NPDAs, a few more than once. However, other important fishing countries have not yet produced an NPOA or made one publicly available. Among the 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 RFMOs 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 RFMOs. These should as a priority incorporate precautionary catch/batch 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 support national 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 sharks 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 fulfill CITES requirements for introduction from the Sea.
Develop harmonized chain of custody or traceability systems (e.g., labeling, 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 3919532052).

Full report published here (bfn.de/sites/default/files/2021-08/Script607.pdf) or on the following website (bfn.de/publikationen/bfn-schriften/bfn-schriften-607-conservation-fisheries-trade-and-management-status)

Photo by Ranny Yuneni | WWF-ID
The following is an excerpt from Why Sharks Matter: A Deep Dive with the World’s Most Misunderstood Predator

Written by David Shiffman

Chris Fallows, a shark ecotourism operator, photographer, and naturalist, is well-versed in the world of sharks. He has a natural ability to connect with these majestic creatures and shares his experiences with us in this excerpt from Why Sharks Matter.

**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 @DavidShiffman, where he’s always happy to answer questions about sharks.

**The Ecological Significance of Sharks**

David Shiffman

David Shiffman’s work focuses on the ecological role of sharks and how they contribute to the health of the ocean. He explores the various ways sharks interact with other marine species and how their absence can impact the ecosystem.
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 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.
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.

Did you know?

You can use the number of teeth on a sawfish’s saw to help you identify which species it is!
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!
A New Diagnostic Book on Saw-fishes 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
The Pez Sierra Costa Rica project is a new component of the Costa Rica Wildlife Foun-
dation's marine conservation program. It comprises an interdisciplinary team doing re-
search, 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 (Pristiis 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) - Lucia Vargas-Araya, Jorge A. Valerio-Vargas, Jorge Salmeron, and Mario Espinosa (project leader). They began working with sawfishes in Costa Rica back in 2016. The book is available online in an interactive version (online.flipbook.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 Panama, 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 Panama 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 Ruford 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 conservation 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 Terraba-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 Ruford Foundation, the Shark Conservation Fund and the National Geographic Foundation.

The book is available online as an interactive book: online.flipbook.com/view/278623880/ The PDF is also available on ResearchGate.
Nuevo libro
¡Ya disponible!

Accesa la versión interactiva del documento en el link o descarga el PDF en Research Gate.

Access the interactive version of the document at the link or download the PDF in Research Gate.
Diagnostic of sawfishes in Costa Rica: towards a regional overview
Funding Opportunities

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 early-career 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 £5,000. 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 or civil society citizen scientist or team from that country, 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.

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.

Funds people who are at the early stages of their conservation careers. The focus is on supporting MSc or PhD students (or equivalents) or those who have graduated from such studies in the past 5 years, though we only consider costs related to the fieldwork element of the study.

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, usually with 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 such as 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. **Future Conservationist Grant** (up to £8,000)
2. **Conservation Follow-up Grant** (up to £8,000)
3. **Conservation Leadership Grant** (up to £18,000)
4. **Conservation Follow-up Grant** (up to £18,000)
5. **Conservation Leadership Grant** (up to £30,000)

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 sustainable 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

The James E. Dutton Foundation
   - jamesedutondonationfoundation.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.

1. **Rufford Grant** (up to £6,000)
2. **Rufford Grant** (up to £6,000)
3. **Booster Grant** (up to £10,000)
4. **Booster Grant** (up to £10,000)
5. **Completion Grant** (up to £18,000)

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.

The James E. Dutton Foundation does not have a formal grant application process. 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.

Funding for activities described in this notice is contingent upon the availability of Fiscal Year 2022, Fiscal Year 2023, and Fiscal Year 2024 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 obligate 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 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

NOAA Fisheries FY 2021-2023 Broad Agency Announcement fishery.noaa.gov/grant/2021-2023-broad-agency-announcement

This Broad Agency Announcement is a mechanism to encourage research, education and outreach, innovative projects, or partnerships that are not addressed through NOAA’s competitive discretionary programs. This announcement is not soliciting or giving 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 obligate NOAA to review an application beyond an initial administrative review, or to award any specific project, or to obligate any available funds.

Sharks International 2022 (S2022) 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 new era 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 10th–14th) featuring enhanced digital content on key themes in shark research and conservation, leading up to a three-day in-person conference in Valencia (October 20th–22nd). The conference is funded by the Save our Seas Foundation, supported by OCEANografics, the largest aquarium in Europe, and streamed live worldwide. Thanks to additional assistance from the Shark Conservation Fund, the online conference tickets will include a massive 50% discount for students and delegates from low and middle-income nations. If you have an interest in sharks, rays and chimaeras, and want to be a part of the 200+ member community currently shaping S2022, check out our promo video and sign up to the portal at S2022.org

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.

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.

IUCN SSG Sponsors & Supporters

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

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.