

SHARK

Newsletter
of the IUCN SSC Shark
Specialist Group
#12 | September 2025

NEWS



Our Vision

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

Our Mission

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

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Front and Back Cover:
Bluespotted Lagoon Ray
Taeniura lymma
Photo by Simon J Pierce |
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Editorial

A note
from
the Chair
Rima
Jabado

Dear readers,

It often feels like the world of shark, ray, and chimaera conservation is moving faster than I can keep up—and this issue of *Shark News* is a perfect reflection of that. The diversity of stories, the dedication of the people behind them, and the sheer scope of work happening globally is both humbling and energizing. From the Mediterranean Sea to the Mekong River, from deepwater sharks off Namibia to nursery grounds in Brazil, these stories remind us that science, collaboration, and creativity can drive real change. 🦈 Our Q&A series once again introduces us to inspiring early career scientists—this time working across countries and regions from the US, to the Bahamas, the Dutch Caribbean, and West Africa—each bringing fresh perspectives and innovative approaches to their research. Alongside them, we explore management measures for sharks and rays within the General Fisheries Commission for the Mediterranean, a region where coordinated action remains vital. We also continue with our Spotlight feature of Data Deficient species, underscoring how much there is still to learn and protect in the ocean's depths. 🦈 Trade is a recurring theme. A deep dive into manta and devil ray exploitation reveals the growing and dynamic markets for meat and gill plates, and how data from multiple sources can strengthen our understanding of utilization and inform policy responses. In Thailand, shark products in the fin trade now include cartilage-based pet snacks—an example of product diversification and why monitoring needs to evolve with market trends. From Indonesia, the largest shark, ray, and chimaera fishery in the world, we are taken on a photographic journey into fisheries and trade, offering insight into cultural traditions that have shaped them for generations. 🦈 Habitat stories are equally compelling. In São Paulo, Brazil, knowledge exchange between researchers and local communities led to the identification of a new nursery area for the Whitespotted Eagle Ray. In the Black Sea, experts outline the conservation challenges for sharks and rays and recommend priority actions. The Mekong River, home to record-breaking freshwater rays, urgently needs community-led solutions to reduce fishing impacts. In Türkiye, fisheries trawl data revealed a nursery for the Longnose Spurdog, while in Cabo Verde, tagging, Baited Remote Underwater Video Stations (BRUVs), and capacity building are ensuring long-term conservation outcomes. 🦈 Innovation is front and centre. New tools like the necromone repellent could help reduce shark bycatch in tuna purse seine fisheries. "Pilaut", a role-playing game, enables fishers to test management scenarios and predict compliance. In Maluku Barat Daya, researchers are combining BRUVs, underwater census, and eDNA to link biodiversity data to CITES listings and MPA designations. The TSHARK platform is coordinating shark movement data across the Mediterranean while engaging fishers directly in science. The Angel Shark Project is using long-term datasets to propose a connected network of protected areas, while citizen science efforts have led to the rediscovery of angel sharks where they were thought extinct. 🦈 The Important Shark and Ray Areas (ISRA) initiative also continues to grow. With delineations for the South American Atlantic and Inland Waters now complete and several publications released, we are preparing for our 10th global workshop in Australia. Every new ISRA puts us closer to completing our global map of critical habitats and ensuring these are recognized and safeguarded. 🦈 This issue also celebrates the value of practical tools and shared knowledge. Newly released identification guides will support fisheries monitoring and CITES implementation in multiple countries. From field surveys to photo journeys, from nursery discoveries to technological innovations, the work you will read about here shows what is possible when people, data, and ideas come together. 🦈 As always, my deepest thanks to all of you—our contributors, members, and partners—for your passion and commitment. And of course, I remain especially grateful to Michael and Peter Scholl, whose behind-the-scenes dedication ensures *Shark News* reaches you. With the breadth of action and innovation in these pages, I am optimistic for the months ahead and motivated to keep pushing for the future these species deserve. **Rima**



Southern Stingray [*Hypanus americanus*] in Anguilla

Photo by Guido Leurs



Early career scientists within the SSG

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

Guido Leurs with Caribbean Reef Shark (*Carcharhinus perezii*) in the Bahamas in 2012

Photo by Amanda Nicholls



Photo by Chelle Blais

Jasmin with a large juvenile Smalltooth Sawfish (*Pristis pectinata*). All work conducted under appropriate permits.

Q&A

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, many early career scientists are pursuing exciting work on shark, ray, and chimaera research, policy, and conservation.

In this Q&A series, we'll showcase some of these members, sharing their roles within the SSG and their ongoing work.

- **Jasmin Graham**, President / CEO of Minorities in Shark Sciences, SSG North America Region
- **Guido Leurs**, Postdoc researcher at Wageningen University & Research, SSG Africa Region

What type of research do you focus on?

Jasmin: My work focuses on shark and ray movement ecology, bycatch reduction, and understanding anthropogenic impacts on these species.

Guido: My research is mostly characterized by studying the ecological roles of sharks and rays in a variety of ecosystems (e.g., large intertidal systems and coral reefs) under different levels of fishing. For that reason, I also work on small-scale fisheries in the West African region and my work includes studying the genetics, trophic ecology, and movement ecology of sharks and rays in West Africa and the Caribbean Sea.

What project(s) are you currently working on?

Jasmin: The two projects I am working on now are 1) understanding how brevetoxins from the harmful algal bloom Florida Red Tide impacts sharks; and 2) understanding how Bull Sharks (*Carcharhinus leucas*) are using the newly established nursery area in Pamlico Sound, North Carolina.

Guido: Currently, the majority of my work focuses on shark and ray catches in small-scale fisheries in the Bijagós Archipelago (Guinea-Bissau), the movement and trophic ecology of sharks and rays in large intertidal ecosystems (West Africa), and on coral reef systems (Caribbean Sea). From this year onwards, I will also start working on the trophic ecology and movement ecology of sharks and rays in the Dutch North Sea.

In Guinea-Bissau, I work with the Regional Partnership for the Conservation of the Coastal and Marine Zone (PRCM) and the National Institute for Fisheries Research and Oceanography (INIPO) to implement a new monitoring program of shark and ray landings. The data are automatically analyzed and provided back to INIPO for

implementation into fisheries and protected area management. We link these catches with the ecological roles and lifecycle of the shark and ray species included in the fishery.

In the Dutch Caribbean, my work focuses on the movement and diet of Caribbean Reef Sharks (*Carcharhinus perezi*), Atlantic Nurse Sharks (*Ginglymostoma cirratum*), and juvenile Silky Sharks (*Carcharhinus falciformis*).

I also organize the annual Azores Shark & Ray Safari with a friend, during which we try to spot as many sharks and ray species as possible around Pico and Faial, and I also give evening presentations about these fascinating species!

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

Jasmin: I assisted with the Smalltooth Sawfish (*Pristis pectinata*) [IUCN Red List of Threatened Species] reassessment, where I learned a lot about how species are assessed and the IUCN procedures and guidelines for assessments. I also used to be on the communications team.

Guido: I assisted in the [IUCN Red List] reassessment of multiple shark and ray species occurring in the West African region and provided new data that came out of my PhD research. This included an expansion of the range of the Thorny Whipray (*Fontitrygon ukpam*) to the waters of Guinea-Bissau. We found this species around one of the most outer islands of the Bijagos Archipelago, whereas it was previously mostly known from freshwater systems in Cameroon and Congo. At first, we were not too sure about the species, but further genetic testing by Gavin Naylor's lab in Florida confirmed this and warranted its inclusion in the reassessment of this species. Although I am not as active within the Shark Specialist Group as I would like to, I was also a part of the initial Important Shark and Ray Areas team where we designed and selected the criteria that are currently used for the designation of areas.

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

Jasmin: I am really excited by the evolution of this group of animals and how these adaptations will come into play in this rapidly changing world. My interest in sharks began during my undergraduate studies when I was working on hammerhead shark phylogeny. I was fascinated by the rich evolutionary history of this group of animals.

I was then inspired to start the non-profit organization Minorities in Shark Sciences because I wanted to create a space where we could address the challenges faced by marginalized communities entering the marine science field, particularly shark science. My co-founders and I often felt alone and unwelcome, being some of the only people of color in higher education STEM (science, technology, engineering, and mathematics) classes. Basically,

I wanted to make an easier and more welcoming path for those who came after me. I am proud to share that this year we are celebrating our 5-year Missiversary!

Guido: Seeing these species in the wild while diving or seeing them swimming away (after release for a quick work-up to take measurements or apply transmitters) never gets old! I love to work on data analysis, but do once in a while need to see a shark in the wild, although it always leads to more and more questions than it answers! That can be quite daunting, but also exciting (and I guess it makes sense when we try to get to know everything about these species that have been evolving for hundreds of millions of years). Unfortunately, in some of the areas where I work, shark and ray management cannot come fast enough due to their worrying status, but it also makes this work more impactful, especially if we can strengthen research capacity—a must for long-term sustainability of any conservation efforts.

What is your favourite shark, ray, or chimaera species? And why?

Jasmin: My favorite species is the Bonnethead Shark (*Sphyrna tiburo*) because it was one of the first species I interacted with in the wild. I think it is super cool they changed our perceptions of shark diet entirely due to their omnivorous diet.

Guido: Does anybody just mention one species here? My favorite sharks are Scalloped Hammerhead (*Sphyrna lewini*), Great Hammerhead (*Sphyrna mokarran*), and Bull Shark. For rays, it is the Blackchin Guitarfish (*Glaucostegus cemiculus*). Each [species] have unique evolutionary adaptations, and these are reflected in their ecology (e.g., how Bull Sharks connect different ecosystems across salinity gradients) or the unique role of guitarfish in large intertidal areas. But I also have a weakness for reef sharks (Carcharhinidae) as the Caribbean Reef Shark is the first shark I ever got to study in the wild! Oh, and the Oceanic Whitetip Shark (*Carcharhinus longimanus*) in the category of ‘favorite species that I have not seen.’

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

Jasmin: I think the biggest challenge is assessing stocks in data deficient fisheries, but I also think this presents the biggest opportunity to engage researchers, community elders, and stakeholders in those regions to improve data quality.

To address this, MISS started the ICONIC Oceans program which uses an Integrated Coordinated Open Networked and Inclusive Conservation framework to tackle issues facing sharks and rays. Part of what we do with that program is work with local researchers, fishers, and community members in data deficient fisheries.

Serena: Major challenges for shark conservation are 1) the lack of species-specific data collection on (shark) fisheries in low- and middle-income countries, especially on small-scale fisheries; 2) access to more selective fishing gear to minimize bycatch; 3) and

inadequate resources for the enforcement of existing management and/or protective measures.

The majority of species occur within the waters of countries which face these challenges, which also brings the biggest opportunity: to ensure that we make strengthening local research capacity a core pillar of projects. Enabling local researchers to follow their fascination for these species will ensure that sharks and rays will remain on the national agenda for a long time to come and will also contribute to new international collaborations within shark research networks.

What’s something you’re looking forward to this year?

Jasmin: I am looking forward to my first field season in North Carolina! From May 15-25, the team will be investigating a newly established bull shark nursery. Hopefully we will deploy some satellite tags and do some community engagement events.

Guido: I am looking forward to start working on sharks and rays within my own country: the Netherlands! For a large four-year project we will be studying the movement and trophic ecology of sharks and rays in the Dutch North Sea. I will also resume work on my projects abroad and cannot wait to shape my future research line over the next year.

What’s one fun fact about you?

Jasmin: I am also a classically trained opera singer.

Guido: Normally I would say “I would rather swim with a shark than be stuck in an elevator with a wasp,” but I guess that is not that special amongst readers of *Shark News*. So, a bonus fact: my fear of heights starts on a two-meter-high ladder.

How can we keep up with your work?

Jasmin: You can keep up with my work by visiting misselasma.org or on Instagram and Twitter/X @miss_elasmo.

Guido: You can follow along with my work on my website guidoleurs.org or on Instagram and LinkedIn @guidoleurs and Twitter/X @LeursGuido.



Release of a young Starry Smoothhound (*Mustelus asterias*) in the coastal waters of The Netherlands

Photo by Guido Leurs

Jasmin servicing
an acoustic receiver



Jasmin downloading
data from a receiver



Photos by Chelle Blais



Photo by Laura Govers

Measuring a young Bull Shark
(*Carcharhinus leucas*) in the Bijagos
Archipelago in Guinea-Bissau



Photo by Chelle Blais

Jasmin with a small juvenile Smalltooth
Sawfish (*Pristis pectinata*). All work
conducted under appropriate permits

Sharks* and the General Fisheries Commission for the Mediterranean [GFCM]

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

Written by
Alexandra Z.A. Morata
IUCN SSC Shark Specialist Group | Programme Officer

What is the GFCM?

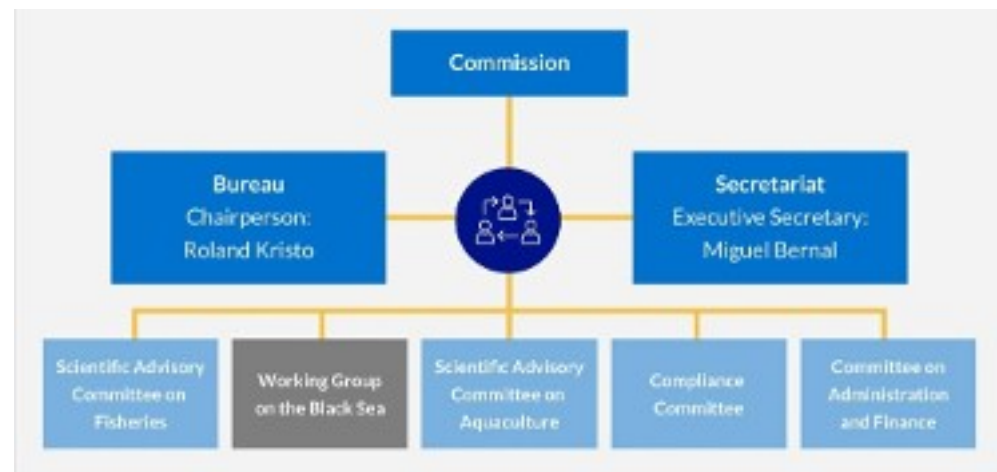
The General Fisheries Commission for the Mediterranean (GFCM) is a regional fisheries management organization (RFMO) under the Food and Agriculture Organization (FAO) of the United Nations. The GFCM aims to ensure the sustainable management and conservation of marine resources in the Mediterranean and Black Seas, as well as the sustainable development of aquaculture. The GFCM was established in 1949 and operates under the **Agreement for the Establishment of the General Fisheries Commission for the Mediterranean**, which came into force in 1952 and was last amended in 2014.

The GFCM’s Area of Application covers the entire Mediterranean Sea, the Black Sea, and connecting waters. This is divided into six subregions: Contiguous Atlantic area, Western Mediterranean, Central Mediterranean, Adriatic Sea, Eastern Mediterranean, and Black Sea.

GFCM Commission

Members

GFCM Members are States that are Members to the FAO, part of the United Nations (UN), and others based, or having fisheries that operate, in the Area of Application, and have ratified or acceded to the GFCM Agreement. Members are obligated to comply with GFCM’s Recommendations. As of 19 March 2025, there are 23 Members (19 Mediterranean States, three Black Sea States, and the European Union). This includes the following jurisdictions: Albania, Algeria, Bulgaria, Croatia, Cyprus, Egypt, European Union, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Montenegro, Morocco, Romania, Slovenia, Spain, Syria, Tunisia, and Türkiye.



Technical working groups: Review technical knowledge, collect the views and priorities of stakeholders

Cooperating Non-Contracting Parties

Cooperating Non-Contracting Parties are states that actively participate in GFCM activities, attend sessions, and implement GFCM’s Recommendations, but do not hold full decision-making rights. At the time of writing, this includes six states including Bosnia and Herzegovina [joined in 2016], Georgia [2015], Jordan [2018], Republic of Moldova [2017], Saudi Arabia [2021], and Ukraine [2015].

Structure of GFCM

The GFCM’s decision-making and advisory structure includes:

Commission – The main governing body composed of Contracting Parties (Members) and Cooperating Non-Contracting Parties (collectively known as CPCs).

Bureau – Chairs the Commission, directs proceedings, and ensures monitoring of the rules of procedure.

Secretariat – Implements its policy and activities with the GFCM’s technical units.

TECHNICAL UNITS

Scientific Advisory Committee on Fisheries [SAC] – Provides scientific, social, and economic advice on fishery stocks and ecosystems.

Scientific Advisory Committee on Aquaculture [CAQ] – Provides technical advice and promotes sustainable development of marine, brackish, and inland aquaculture.

Compliance Committee [CoC] – Assesses and ensures adherence to GFCM decisions, as well as provides advice and supports implementing GFCM Decisions.

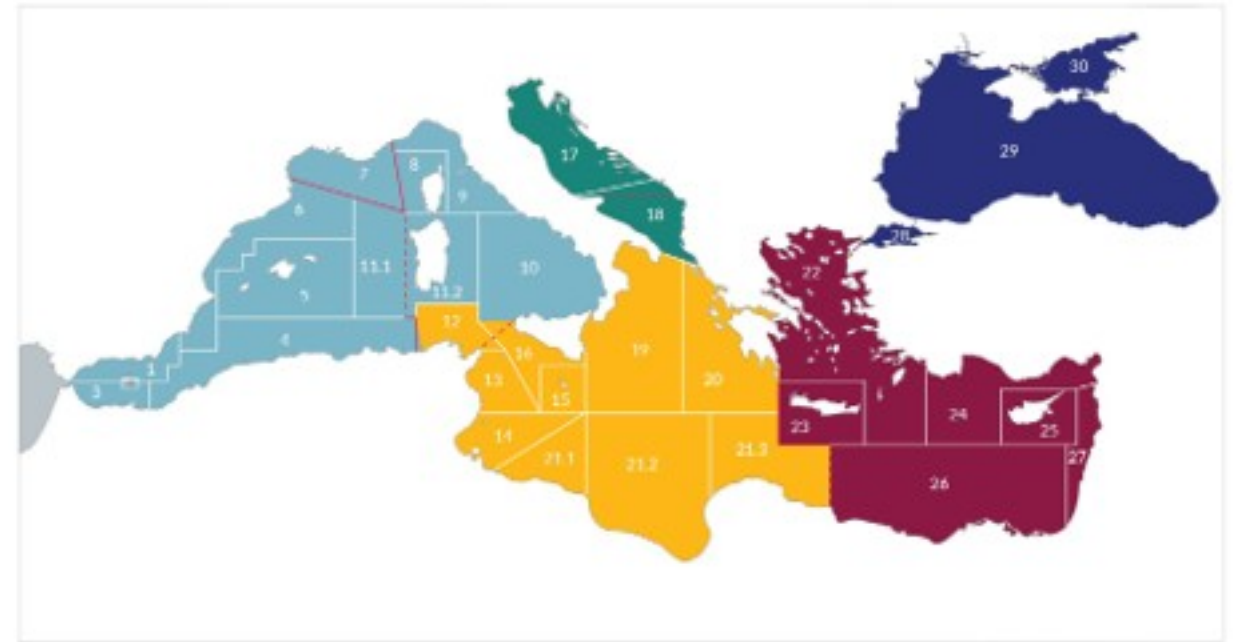
Committee on Administration and Finance [CAF] – Oversees administrative and financial matters.

Working Group on the Black Sea [WGBS] – Provides advice, conducts stock assessments, and other technical work, focusing on fisheries in the Black Sea.



GFCM Area of Application I

Source: FAO, 2025



FAO statistical divisions

GFCM geographical subareas (GSAs)

GFCM subregions

Contiguous Atlantic area

Western Mediterranean

Central Mediterranean

Adriatic Sea

Eastern Mediterranean

Black Sea

01. Northern Alboran Sea	07. Gulf of Lion	13. Gulf of Hammamet	19. Western Ionian Sea	25. Cyprus
02. Alboran Island	08. Corsica	14. Gulf of Gabes	20. Eastern Ionian Sea	26. Southern Levant Sea
03. Southern Alboran Sea	09. Ligurian Sea and northern Tyrrhenian Sea	15. Malta	21.1. Southwestern Ionian Sea 21.2. South-central Ionian Sea 21.3. Southeastern Ionian Sea	27. Eastern Levant Sea
04. Algeria	10. Southern and central Tyrrhenian Sea	16. Southern Sicily	22. Aegean Sea	28. Marmara Sea
05. Balearic Islands	11.1. Western Sardinia 11.2. Eastern Sardinia	17. Northern Adriatic Sea	23. Crete	29. Black Sea
06. Northern Spain	12. Northern Tunisia	18. Southern Adriatic Sea	24. Northern Levant Sea	30. Azov Sea

Note: At its forty-fifth session in November 2022, the GFCM agreed to divide GSA 21 (Southern Ionian Sea) into three marine subareas. The subdivision of GSA 21 into GSAs 21.1, 21.2 and 21.3 will be applied in 2023.

GFCM Structure I

Source: FAO, 2025

Which Shark Species Are Covered by GFCM?

Currently, 70 [42 sharks and 28 rays] species are specifically covered by the GFCM’s Decisions. These species are listed in Annex 1 [Vulnerable species] and all incidental catches are to be monitored and recorded.

Vulnerable species

Annex 1.a) This is based on those included in Annex II [endangered or threatened species] and Annex III [species whose exploitation is regulated] of the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean [Barcelona Convention]. This includes marine mammals, sea turtles, seabirds, sharks, and rays.

Annex 1.b) Specifically includes sharks and rays that are considered ‘sensitive’ and/or ‘rare’ in the Application Area.

Annex 1.c) Benthic species that form vulnerable ecosystems

Since being listed some species have had their taxonomy updated – hereafter all species names reflect the most updated name as listed on the IUCN Red List of Threatened Species [IUCN, 2025].

Table: List of sharks included in GFCM Resolutions

Annexe 1a	Scientific Name	Common Name
	Shark	
	Carcharhiniformes	
	CARCHARHINIDAE	
	Carcharhinus plumbeus	Sandbar Shark
	Carcharodon carcharias	White Shark
	Prionace glauca	Blue Shark
	SPHYRNIDAE	
	Sphyrna lewini	Scalloped Hammerhead
	Sphyrna mokarran	Great Hammerhead
	Sphyrna zygaena	Smooth Hammerhead
	TRIKIDAE	
	Galeorhinus galeus	Tope
	Hexanchiformes	
	HEXANCHIDAE	
	Heptranchias perlo	Sharpnose Sevengill Shark
	Lamniformes	
	ALOPIIDAE	
	Alopias vulpinus	Common Thresher
	LAMNIDAE	
	Isurus oxyrinchus	Shortfin Mako
	Lamna nasus	Porbeagle
	CETORHINIDAE	
	Cetorhinus maximus	Basking Shark
	ODONTASPIDIDAE	
	Carcharias taurus	Sand Tiger Shark
	Odontaspis ferox	Smalltooth Sandtiger
	Squaliformes	
	CENTROPHORIDAE	
	Centrophorus granulosus	Gulper Shark
	OXYNOTIDAE	
	Oxynotus centrina	Angular Roughshark
	Squatiniformes	
	SQUATINIDAE	
	Squatina aculeata	Sawback Angelshark
	Squatina oculata	Hidden Angelshark
	Squatina aculeata	Angelshark
	RAY	
	Myliobatiformes	
	MYLIOBATIDAE	
	Mobula mobular	Spinetail Devil Ray
	GYMNURIDAE	
	Gymnura altavela	Spiny Butterfly Ray
	Rajiformes	
	RAJIDAE	
	Dipturus batis	Common Blue Skate
	Leucoraja circularis	Sandy Skate
	Leucoraja melitensis	Maltese Skate
	Rostroraja alba	White Skate
	Rhinopristiformes	
	PRISTIDAE	
	Pristis pectinata	Smalltooth Sawfish
	Pristis pristis	Largetooth Sawfish
	RHINOBATIDAE	
	Rhinobatos rhinobatos	Common Guitarfish

Annexe 1b	Scientific Name	Common Name
	Shark	
	Carcharhiniformes	
	CARCHARHINIDAE	
	Carcharhinus altimus	Bignose Shark
	Carcharhinus brachyurus	Copper Shark
	Carcharhinus brevipinna	Spinner Shark
	Carcharhinus falciformis	Silky Shark
	Carcharhinus limbatus	Blacktip Shark
	Carcharhinus melanopterus	Blacktip Reef Shark
	Carcharhinus obscurus	Dusky Shark
	Galeocerdo cuvier	Tiger Shark
	Rhizoprionodon acutus	Milk Shark
	PENTANCHIDAE	
	Galeus atlanticus	Atlantic Sawtail Catshark
	SPHYRNIDAE	
	Sphyrna tudes	Smalleye Hammerhead
	Hexanchiformes	
	HEXANCHIDAE	
	Hexanchus nakamurai	Bigeyed Sixgill Shark
	Lamniformes	
	ALOPIIDAE	
	Alopias superciliosus	Bigeye Thresher
	LAMNIDAE	
	Isurus paucus	Longfin Mako
	Squaliformes	
	CENTROPHORIDAE	
	Centrophorus uyato	Little Gulper Shark
	ECHINORHINIDAE	
	Echinorhinus brucus	Bramble Shark
	SOMNIOSIDAE	
	Centroscymnus coelolepis	Portuguese Dogfish
	Somniosus rostratus	Little Sleeper Shark
	SQUALIDAE	
	Squalus megalops	Shortnose Spurdog
	Ray	
	Myliobatiformes	
	DASYATIDAE	
	Bathytoshia centroura	Roughtail Stingray
	Dasyatis marmorata	Marbled Stingray
	Dasyatis pastinaca	Common Stingray
	Dasyatis tortonesei	Tortonese’s Stingray
	Himantura uarnak	Coach Whipray
	Taeniurops grabatus	Round Stingray
	MYLIOBATIDAE	
	Aetomylaeus bovinus	Duckbill Eagle Ray
	RHINOPTERIDAE	
	Rhinoptera marginata	Lusitanian Cownose Ray
	Rajiformes	
	RAJIDAE	
	Dipturus nidarosiensis	Norwegian Skate
	Leucoraja fullonica	Shagreen Skate
	Leucoraja naevus	Cuckoo Skate
	Raja brachyura	Blonde Skate
	Raja montagui	Spotted Skate
	Raja polystigma	Speckled Skate
	Raja radula	Rough Skate
	Raja undulata	Undulate Skate

Scientific Name	Common Name
Ray	
Torpediniformes	
TORPEDINIDAE	
Tetronarce nobiliana	Great Torpedo Ray
Torpedo sinuspersici	Gulf Torpedo
Additional species specified in GFCM Decisions	
Shark	
Carcharhiniformes	
TRIAKIDAE	
Mustelus asterias	Starry Smoothhound
Mustelus mustelus	Common Smoothhound
Mustelus mustelus	Blackspotted Smoothhound
Squaliformes	
SQUALIDAE	
Squalus acanthias	Spiny Dogfish

Conservation and Management Measures Related to Sharks

The GFCM has implemented several Decisions for shark and ray conservation, which are split into the legally binding measures [Recommendations, Rec] and non-binding measures [Resolutions, Res]. Currently there are six active Decisions that specifically cover sharks.

A summary of the information contained in each active resolution is provided. Resolutions are structured as GFCM/xx/yyyy/z, where “xx” refers to the session of the GFCM, “yyyy” refers to the year it was implemented, and “z” the order it was listed that year.

All Resolutions are available online here.

Table: Summary of GFCM Decisions Related to Sharks

Category	Measure	Description
Rec	GFCM/45/2022/13	On establishment of a GFCM logbook, amending Recommendation GFCM/35/2011/1
Rec	GFCM/44/2021/16	On additional mitigation measures for the conservation of elasmobranchs in the Mediterranean Sea
Rec	GFCM/42/2018/2	On fisheries management measures for the conservation of sharks and rays in the GFCM area of application, amending Recommendation GFCM/36/2012/3
Rec	GFCM/39/2015/4	On management measures for piked dogfish in the Black Sea
Rec	GFCM/36/2012/3	On fisheries management measures for conservation of sharks and rays in the GFCM area
Rec	GFCM/35/2011/1	Concerning the establishment of a GFCM Logbook, amending Recommendation GFCM/34/2010/1

Recommendation GFCM/45/2022/13 on the establishment of a GFCM logbook, amending Recommendation GFCM/35/2011/1

This Recommendation amends GFCM/35/2011/1 [see below] to ensure that all species listed in Annex 1 are reported. In the case of sharks and rays, all species listed in Annex 1.a should be released if incidentally caught.

Recommendation GFCM/44/2021/16 on additional mitigation measures for the conservation of elasmobranchs in the Mediterranean Sea

This Recommendation encourages all CPCs to improve measures to mitigate incidental catches and lower fishing mortality rates of sharks and rays listed in Annex 1.a, and some additional species. Such measures include training the crew, researching on improving fishing gear, implementing time-area restrictions/closures if appropriate, use of magnetic deterrent devices, etc.

The CPCs are also mandated to report any incidental catches based on FAO’s technical manual and Task 3 of the Data Collection Reference Framework [DCRF]. Additionally, CPCs are encouraged to collect biological information such as identifying important habitats for sharks and rays.

Based on reported data the SAC are to provide advice and suggest measures to mitigate incidental catches, such as setting a maximum percentage in weight or of a catch limit, adopting maximum and minimum landing sizes, and restricting recreational fishing of sharks and rays.

Species specified in GFCM/44/2021/16

Starry Smoothhound [<i>Mustelus asterias</i>]	Common Smoothhound [<i>Mustelus mustelus</i>]
Blackspotted Smoothhound [<i>Mustelus punctulatus</i>]	Common Thresher [<i>Alopias vulpinus</i>]
Sandbar Shark [<i>Carcharhinus plumbeus</i>]	Gulper Shark [<i>Centrophorus granulosus</i>]
Sharpnose Sevengill Shark [<i>Heptranchias perlo</i>]	Spiny Dogfish [<i>Squalus acanthias</i>]
Blue Shark [<i>Prionace glauca</i>]	

Recommendation GFCM/42/2018/2 On fisheries management measures for the conservation of sharks and rays in the GFCM area of application, amending Recommendation GFCM/36/2012/3

The 2018 amendment updates the objective of the GFCM Agreement to explicitly include biological, social, economic, and environmental sustainability, whereas the 2012 version focuses more on conservation and management.

This Recommendation specifies that finning is prohibited onboard but fins can be partially sliced for storage purposes.

Furthermore, this Recommendation updates reporting requirements to align with the GFCM Data Collection Reference Framework [DCRF] and mandates all CPCs to report their data to the SAC.

Recommendation GFCM/39/2015/4 on management measures for piked dogfish in the Black Sea

Sets restrictions on catching Spiny Dogfish [*Squalus acanthias*; also known as Piked Dogfish] within the Black Sea. Such restrictions include measures where all specimens smaller than 90 cm total length are not to be targeted, and if caught, to be released unharmed to the extent possible; prohibits any discards; and if landed, CPCs are to report this and animals may not be displayed or sold.

In addition to trawling restrictions from other Recommendations, a minimum target on the percentage of fishing grounds to be covered by protective measures should be identified by each CPC.

CPCs are also encouraged to collect data on Spiny Dogfish’s biology such as population dynamics, migration, nursery areas, etc.

Recommendation GFCM/36/2012/3 on fisheries management measures for conservation of sharks and rays in the GFCM area

CPCs are obligated to ensure that incidentally caught Annex 1.a species are recorded and released unharmed, to the extent possible. Other shark and ray species may be retained on board, transhipped, landed, and marketed, but they must be identifiable. This Recommendation prohibits finning, beheading, and skinning until animals are marketed; products that neglect this are not to be purchased or sold.

Trawl nets are to be set within three nautical miles from the coastline or within the 50 m isobath. Exceptions are if the entire continental shelf of the CPC is limited, or the trawling vessel is less than equal to 12 m long, or there are a limited number of vessels operating in a season and it has no significant impact [the exact definition of ‘significant impact’ is not clearly defined] on the environment.

Recommendation GFCM/35/2011/1 concerning the establishment of a GFCM Logbook, amending Recommendation GFCM/34/2010/1

This Recommendation requires fishing vessels over 15 m in length to maintain a logbook recording their daily operations for at least one year and to be submitted to their respective national authorities. CPCs must report the species caught (above 50 kg per species), fishing gear used, date and location of the catch, and whether the weight is estimated or measured.

For tuna and swordfish, as well as ‘highly migratory’ sharks and rays, catches are to be recorded both in kilograms and the number of individuals caught. Shark and ray species must be identified using FAO species codes to the extent possible. Landings and transshipments must include the date, time, port, number of fish or containers, and total weight, with a 10% margin of tolerance for weight estimation.

Vessels must use the GFCM statistical grid system to report their fishing positions. Countries may impose stricter rules if necessary, and all data must be reported according to GFCM standards for monitoring and management.

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Prickly Shark

[Echinorhinus cookei]

Alexandra Morata

IUCN SSC Shark Specialist Group | Programme Officer

Shark
Spotlight





Photo by Jeremy Jodoin | iNaturalist.org | CC BY-NC

Prickly Shark
[*Echinorhinus cookei*]

Taxonomy

The order Squaliformes includes 141 valid species from 23 genera and seven families: *Centrophoridae* (gulper sharks), *Dalatiidae* (kitefin sharks), *Echinorhinidae* (bramble sharks), *Etmopteridae* (lantern sharks), *Oxynotidae* (rough sharks), *Somniosidae* (sleeper sharks), and *Squalidae* (dogfish sharks).

The Prickly Shark *Echinorhinus cookei* Pietschmann, 1928 and Bramble Shark *Echinorhinus brucus* (Bonnaterre, 1788) are the only two species in the *Echinorhinidae* family. The elusive Prickly Shark is a deepwater species that gets its name from the rough, thorn-like dermal denticles covering its body, giving it a ‘prickly’ appearance.

Morphology

The Prickly Shark is a large species that can reach up to 394 cm in total length (TL). It has a cylindrical body with a uniformly brown to salty grey to black coloration. It has large and coarse dermal denticles, contributing to its distinctive rough texture. The Prickly Shark is often confused with the Bramble Shark, but the former has more regularly spaced and pronounced denticles.

Distribution and Range

The Prickly Shark occurs in patchy distributions across the Pacific Ocean. It inhabits the upper and mid continental slope and seamounts, at depths ranging from 4 to 1,100 m, but is known to

primarily remain at lower depths. Some populations of this species that have been studied have shown high site fidelity, such as in New Zealand. This species is known to move sluggishly and is relatively docile, occasionally exploring submersibles and interacting with divers.

Conservation measures and IUCN Red List status

The Prickly Shark is currently assessed as Data Deficient (DD) on the IUCN Red List of Threatened Species. This classification is due to the lack of comprehensive data on its population size, ecology, and the impact of fisheries. Currently, no species-specific management measures are in place.

The Prickly Shark is generally not targeted and is rarely caught in deepwater fisheries as incidental catch. However, due to its resemblance to the Bramble Shark, which is often sought for its liver oil then is discarded, catches of this species may be underreported. Considering this, and the Prickly Shark’s slow growth and reproductive rates, its DD status, and high site fidelity, this species is likely to be threatened.

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Global Assessment of Manta and Devil Ray Gill Plate and Meat Trade

Photo by Jasmine Corbett



Bentfin Devil Ray *Mobula thurstoni*
landings in Muncar, Indonesia



Photo by Daniel Fernando

Mobulid gill plates in Sri Lanka

Marta D Palacios

IUCN SSC Shark Specialist Group | Important Shark and Ray Areas
Mobula Conservation, Mexico | The Manta Trust, UK

Mobulid rays, a group of nine species of filter-feeding pelagic rays, are among the most threatened and vulnerable shark and ray species. These ocean giants face severe population declines worldwide, primarily due to targeted and incidental fishing pressure. These fisheries are driven by demand for local consumption of their meat as well as the export of their gill plates (prebranchial appendages used for filtering zooplankton) to Asian markets, where they are valued in traditional medicine. However, there is no scientific evidence to support the efficacy of these products, and recent studies have shown that gill plates and meat of several mobulid species contain harmful levels of heavy metals. The unfavorable conservation status of these species and ongoing anthropogenic pressures led to the inclusion of all mobulid species in Appendix I and II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), Annex I of the CMS Sharks Memorandum of Understanding, and Appendix II of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) between 2011 and 2016. These listings were designed to prohibit fishing and landings in the 120+ CMS signatory countries, and to regulate and reduce trade in the 180+ CITES signatory nations.

A recent study, *Global Assessment of Manta and Devil Ray Gill Plate and Meat Trade: Conservation Implications and Opportunities*, published in *Environmental Biology of Fishes*, reveals that despite international and national protections in place for over a decade,

local consumption and international trade remain widespread. These findings represents the first global-scale assessment of the consumption and trade of mobulid species since the implementation of international protections.

In collaboration with an international network of experts, we conducted a global assessment across 75 countries using a mixed-methods approach. This included country-focused online surveys to 109 experts, comprising shark and ray researchers and fisheries specialists from 71 countries, in-person questionnaires with 21 experts across 19 countries, and an analysis of *Mobula* ray landings in the Food and Agriculture Organization of the United Nations (FAO) Total Production Database (2000–2021) as well as trade data from the CITES Trade Database (2017–2021). Once data were compiled, countries were ranked based on activities that were negatively impacting mobulid populations, highlighting those in urgent need of focused conservation, management, and research efforts. This mixed-methods approach allowed us to understand the true scope and nuance of mobulid landings and trade in practice, something that is not always captured in an analysis of official fisheries landings/trade data alone.

A global picture of the consumption and trade

The findings reveal that both gill plate and meat consumption are key drivers of mobulid fisheries and trade. In Latin America, fisheries are primarily fuelled by meat consumption; whereas in Africa and Asia, demand stems from a combination of meat and gill plates. *Mobula* fisheries operate in 43 countries where landings

have been confirmed, and *Mobula* meat is locally consumed in at least 35 countries. International meat trade spans 10 countries across three continents, with five key destination countries (i.e., mainland China, Myanmar, Thailand, Peru, and the United Arab Emirates - UAE), although trade primarily occurs between neighbouring countries. Meat consumption, primarily sourced from pectoral fins, is not merely a by-product of captures for gill plates, it is a distinct product with well-established markets. Meat is sold at prices ranging from 0.24 to 10 USD/kg and is prepared and consumed in various forms, including fresh or dried fillets, strips, or processed fish meal. Although generally considered low in quality and value, *Mobula* meat holds cultural significance in some regions. For example, in Guatemala, it is traditionally consumed during Easter as an affordable fish option, while in Bangladesh, it is used to create fertility talismans.

On the other hand, *Mobula* gill plates are harvested in 14 countries across Asia, Africa, and Middle Eastern countries, and exported to five major destinations in Asia (i.e., mainland China, Hong Kong Special Administrative Region (SAR), Singapore, South Korea, and Thailand). Larger species, such as the Oceanic Manta Ray (*Mobula birostris*), Spinetail Devil Ray (*M. mobular*), and Sicklefins Devil Ray (*M. tarapacana*), are the primary targets of this trade. Gill plate prices vary significantly depending on the country and species, ranging from 4.80 to 1,260 USD/kg. Countries identified as high priorities for conservation due to significant mobulid landings, participation in the meat and gill plate trade, or direct consumption, are ranked in order of urgency and include Myanmar, Sri Lanka, Bangladesh, India, Indonesia, Senegal,

the Republic of Congo, UAE, China, the Philippines, Ghana, Thailand, and Gabon. Among the five high-priority countries, Myanmar stands out as a critical conservation focus, serving as both a consumer and exporter of mobulid products as well as a transit hub for gill plates imported from neighbouring countries.

Trade moving online

As part of the study, we examined the online trade of gill plates across five major web-based platforms in Asia and conducted physical store surveys in China and Hong Kong SAR. Our findings revealed a significant rise in the total number of retailers, increasing from 41 in 2011 to 135 in 2023. While physical retailers in Guangzhou and Hong Kong SAR declined over the past decade, online sellers surged, creating new challenges for monitoring and enforcement.

Conservation implications and opportunities

Despite nearly a decade of international protective measures under CITES Appendix II and CMS Appendices I and II, as well as national protections in over 40 countries, our study found that trade in mobulids persists at unsustainable levels. These findings underscore the urgent need for more robust and effectively enforced protections to prevent further population declines. Not only do existing international, regional, and national regulations (e.g., CITES, CMS, and regional fisheries management organisations - RFMOs) require stricter enforcement, but further actions can be taken to address the market-driven impacts. Enhanced international

protections, such as the uplisting of mobulid rays to CITES Appendix I could reflect their Critically Endangered status and susceptibility to trade-driven population declines; effective fisheries management could drastically reduce both targeted and incidental catch; improved monitoring of mobulid catch and trade routes along with reinforced customs enforcement at airports and land crossings; surveillance of online marketplaces to curb the rise in digital sales; and stronger international collaboration to preserve critical habitats and mitigate climate impacts.

Ecuador leading the change

Building on this study and several others documenting recent global population declines (Carpenter et al. 2023; Laglbauer et al. in press; Rojas-Perea et al. 2024; Venables et al. 2024), Ecuador submitted a proposal to uplist all mobulid species from Appendix II to Appendix I of CITES. This change would prohibit international trade in mobulids except for non-commercial purposes, such as scientific research. Supported by the implementation of CMS Appendix I listings and fishing prohibitions in Regional Fisheries Management Organizations (RFMOs), it could provide a crucial opportunity to conserve mobulid species. As we approach the Twentieth Meeting of the Conference of the Parties this November 2025 in Samarkand, Uzbekistan, where a decision will be made on this critical issue, we can only hope that the tides turn in favour of the mobulids, granting them a future where they may continue to roam the open seas.

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Oceanic Manta Ray *Mobula birostris* captured in fisheries in Sri Lanka | Simon Hilbourne

Photo by Simon Hilbourne

Global Assessment of Manta and Devil Ray GILL PLATE AND MEAT TRADE: Conservation Implications and Opportunities

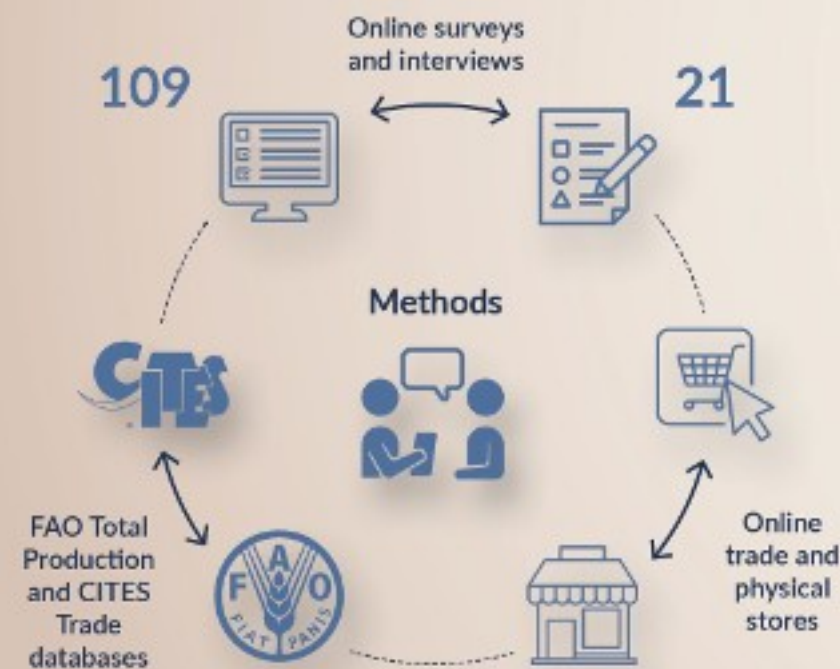
Marta D. Palacios, Laura Weland, Betty Laglbauer, Melissa R. Cronin, Sarah Fowler, Rima W. Jabado, Thanda Ko Gyl, Daniel Fernando, Godefroy De Bruyne, Stanley K. H. Shea, Paul Hilton, Yi-Li Gao, and Guy M. W. Stevens

Infographic by: Jasmine Corbett
Illustrations by: Marc Dando



Environmental Biology of Fishes DOI: 10.1007/s10641-024-01636-w

Mobulid rays are among the most threatened of elasmobranch families, due to overexploitation in fisheries partly driven by international trade demand. We conducted a global assessment of the state of manta and devil ray trade, employing expert elicitation through a combination of surveys, database analysis, and trade analysis. By linking country-specific mobulid management data to their roles in the meat and gill plate trade, price ranges, consumption patterns, and landing data, we ranked 75 countries from highest to lowest impact upon mobulid populations, identifying 14 as high-priority.



Physical retailers of gill plates in Guangzhou (China) and Hong Kong declined in the past decade, while online retailers increased, but overall, the total number of retailers rose from 41 to 135 between 2011–2023. Manta and devil rays were added to CITES Appendix II in 2013 and 2016, respectively.



Gill plate trade

14 countries extract gill plates



14 countries across Asia and Africa export gill plates

5

major destination countries for importing gill plates (see below)



Oceanic manta ray
(*Mobula birostris*)
gill plate filaments

EN



Sicklefin devil ray
(*Mobula tarapacana*)

EN

Demand for gill plates in the Asian market is the main driver of international trade, with exports originating from African and Asian countries, by land, air or sea.

4.8 – 1260
USD/kg

Gill plate

Hong Kong and mainland China's gill plate markets are shifting from physical storefronts to online platforms, making tracking more challenging.



Meat trade

Meat trade occurs more at a domestic level, in South America, Africa and Asia, with a few countries trading across land and sea.



0.24 – 10
USD/kg

A fillet of
mobulid meat

35

countries consume mobulid meat



10

countries export mobulid meat

5

major destination countries for mobulid meat

The spintetail devil ray is the top landed and traded mobulid species for its meat, and the most traded for its gill plates worldwide.



Spintetail devil ray
(*Mobula mobular*)

EN



Right: gill plate filaments



Myanmar ranks highest among the five priority countries for conservation action (Myanmar, Sri Lanka, Bangladesh, India, and Indonesia) due to its significant domestic consumption and export of meat and gill plates. Additionally, it serves as a key transit hub, importing and redistributing gill plates regionally.

43

countries were found to have significant mobulid landings



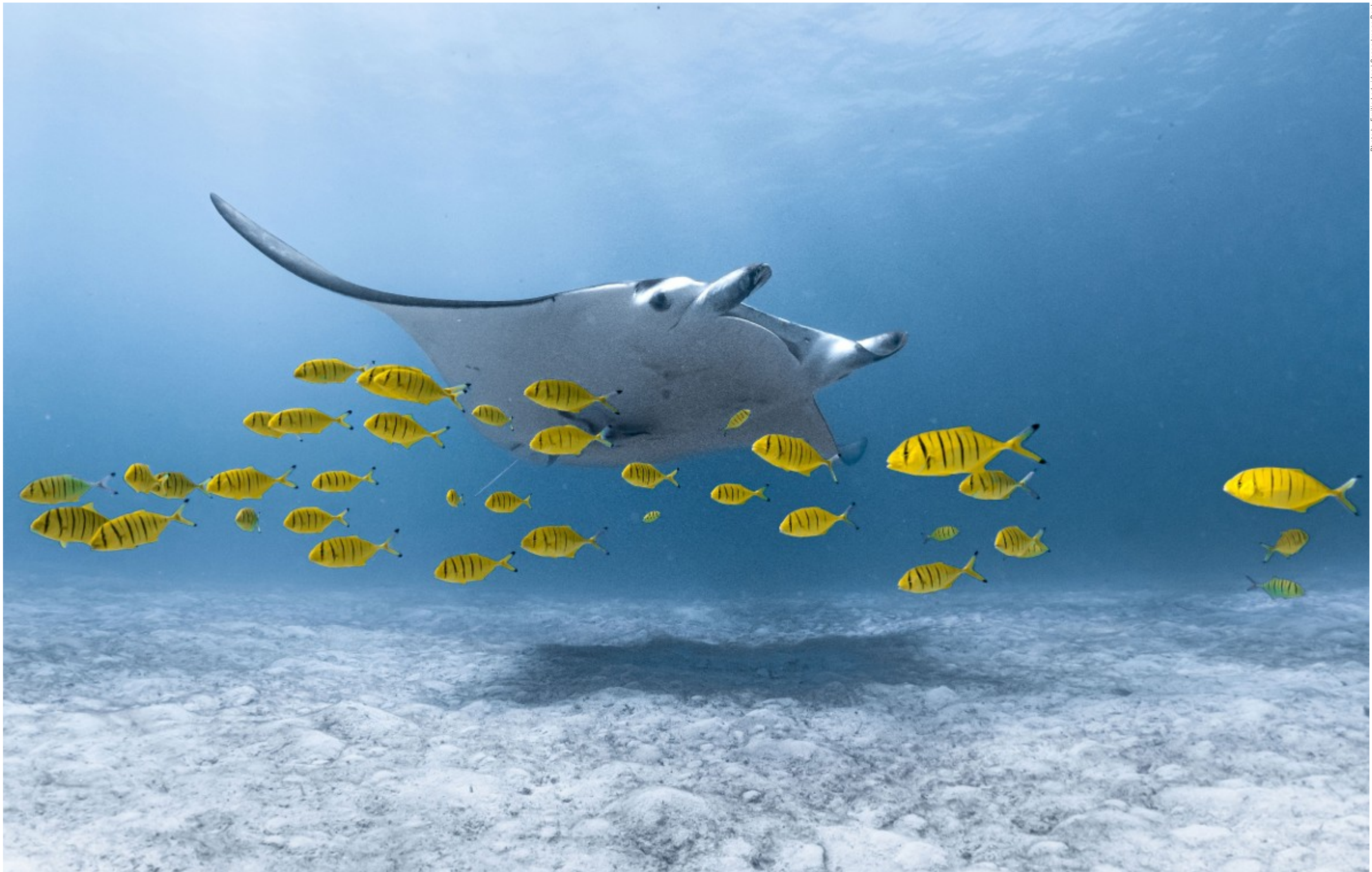
Out of 43 countries with mobulid landings, only nine had reported them to the FAO.



Out of 20 countries involved in the mobulid meat and gill plate trade, only five countries had reported it to the CITES Trade Database (2017–2021).

Recommendations and conservation implications

Given the declining population trends of mobulids globally, our findings underscore the urgent need for enhanced fisheries management and enforcement measures to combat the unsustainable consumption and trade of these threatened creatures.













Oceanic Manta Ray (*Mobula birostris*) fisheries in Sri Lanka

Photo by Miriam Staiger

Anchieta Island: A key reproduc- tive area for Whitespotted Eagle Rays

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Whitespotted Eagle Ray (*Aetobatus
narinari*) in shallow waters, Fazenda
Beach, Ubatuba (SP), Brazil

Once thought to be a globally distributed species, the Whitespotted Eagle Ray (*Aetobatus narinari*) is now recognized as occurring primarily in the Caribbean Sea and southwestern Atlantic Ocean. Much of what was known about the species' biology and ecology was based on studies of other species within the same genus. As a result, key gaps remain in our understanding of fundamental aspects, such as where the species occurs, how it uses those areas, and whether the species can thrive in its natural environment. To help fill these gaps, the Diving into Conservation project, led by the marine ecologist Thamiris Karlovic and the oceanographer Lucas Candido, has been monitoring populations of the Whitespotted Eagle Ray along the northern coast of São Paulo, Brazil.

Thriving in a challenging environment

Sharks and rays along the northern coast of São Paulo face multiple human-induced threats, including fishing, noise and chemical pollution, and harbor operations. While some activities are regulated, especially within the local Marine Protected Areas (MPAs), the impact of human activities increases beyond MPA boundaries. Locally, the Whitespotted Eagle Ray is classified Near Threatened (while it is globally listed as Endangered on the IUCN Red List of Threatened Species) and is commonly caught by traditional fishing fleets and sold in local markets. However, population trends remain unclear, and the effects of other stressors are still poorly understood.

Bounding science and society

Continuously monitoring the 400 km stretch of São Paulo's northern coast is unfeasible due to both human effort and budget constraints. Aligning efforts between science and society is primordial to encompass a wider range of the species distribution. But this is not the project's only success! While citizen engagement enhances data collection, the exchange of knowledge between people with diverse life experiences helps to shape local leaders who are aware about their rights and responsibilities. Altogether, these efforts have the potential to drive innovation in science and conservation. With this in mind, the project merges scientific surveys using drones and Diver Operated Videos with educational activities that empower the local community to survey and share opportunistic records of the Whitespotted Eagle Rays.

Identifying a mating sanctuary

The use of coastal and insular regions by sharks and rays for mating and parturition is well documented, highlighting the importance of protecting these areas. However, significant shortfalls remain in identifying and differentiating the specific bays, islands, estuaries, and other habitats that various species rely on for reproduction. Since 2022, the number of Whitespotted Eagle Rays recorded around the Anchieta Island State Park (AISP) has increased, particularly during the austral summers. Among them we unveiled the first record of courtship and mating events of this species along the Brazilian coast.

Implications for conservation of local habitats

Our discovery reveals the critical role of the AISP as a potential reproductive area for Whitespotted Eagle Rays, reinforcing the need for targeted conservation measures. Nowadays, the AISP is a protection area covering only the island's terrestrial portion, with its surrounding waters safeguarded by a marine no-take



Environmental education with visitors at Anchieta Island State Park (Ubatuba, SP) in February 2025, featuring local marine fauna and their ecological roles | Thamiris Christina Karlovic de Abreu

zone. Designating a Marine State Park (IUCN Category II), similar to the Hawksbill Turtle Marine State Park, would provide a stronger legal framework for species and habitat protection. Beyond that, such an upgrade would enable dedicated financial resources for fully protected areas and facilitate a management plan tailored to the local specific conservation needs, including well defined usage regulations as well as enforcement and control actions.

Acknowledgements

The Diving into Conservation project has been financially and logistically supported by the Mohammed bin Zayed Species Conservation Fund for the financial support (Grant number: 212527875) and the Forestry Foundation, respectively. Finally, we are deeply grateful to all citizen scientists who have been engaging in educational and surveillance activities, providing records of Whitespotted Eagle Rays and standing with us for the conservation of this species.

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Two Whitespotted Eagle Rays near Fazenda Beach, Ubatuba (SP), Brazil – Serra do Mar State Park | Leandro Inoe Coelho



Beyond the Anchovy:

Unveiling the Black Sea's Elasmo- branches

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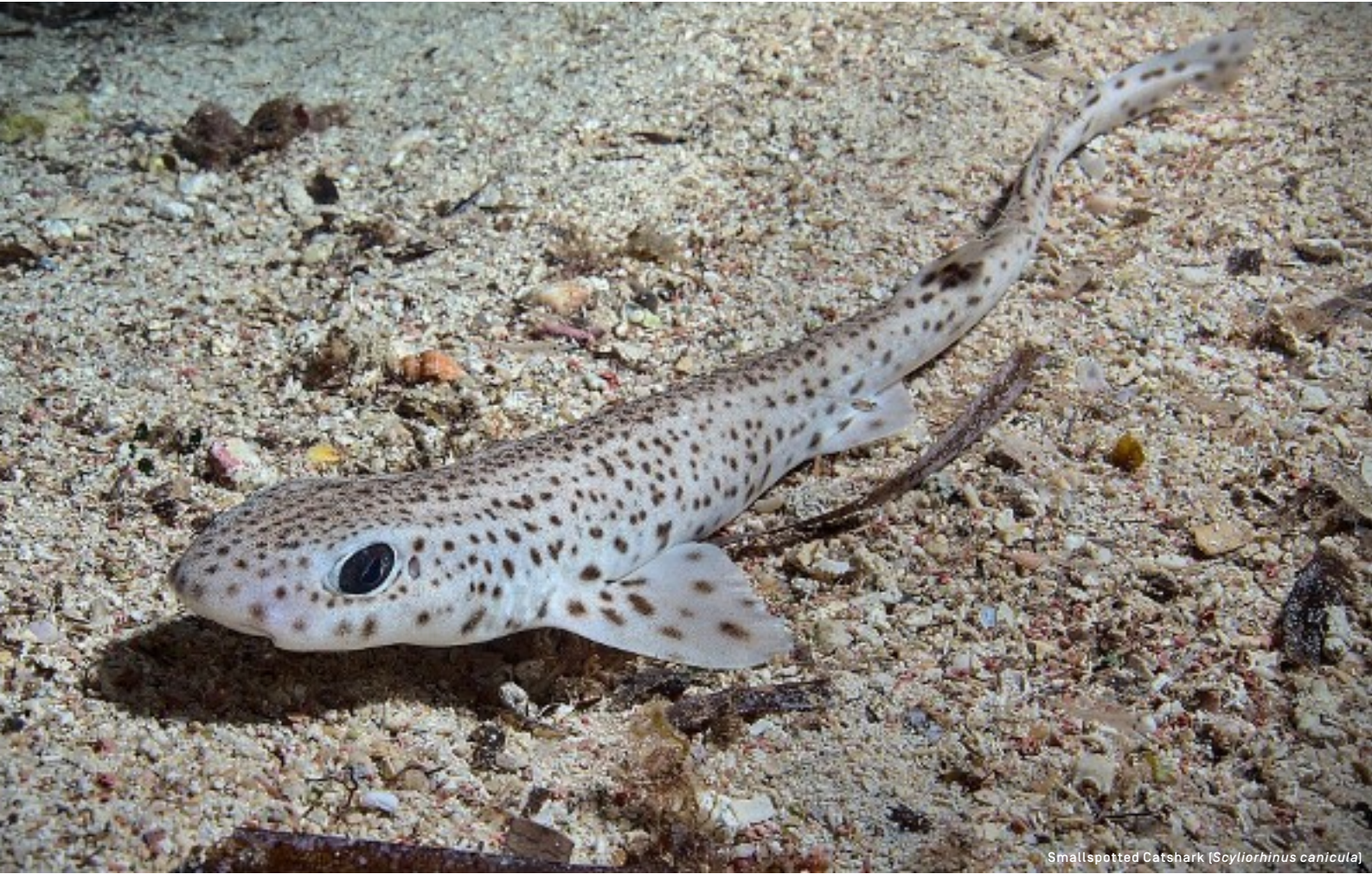


Photo by Luis Pérez Berrocal | iNaturalist.org (CC BY-NC)



Photo by Eugene Akimov | iNaturalist.org (CC BY-NC)

The Black Sea, primarily known for its storms and anchovy, is also home to an overlooked group of marine species – elasmobranchs (i.e., shark and rays). Enclosed by six countries, and neighboring the Mediterranean Sea, the Black Sea has a highly stratified water column with an oxygen-rich surface and a deep, anoxic layer, shaping a distinct fish community (Keskin, 2010). Despite its unique hydrological conditions, a small but notable presence of sharks and rays exists.

Elasmobranch Diversity in the Black Sea

Elasmobranchs inhabit diverse aquatic environments, but only three species— Spiny Dogfish (Squalus acanthias), Thornback Skate (Raja clavata), and Common Stingray (Dasyatis pastinaca)—are considered resident in the Black Sea. Ten additional shark and ray species are transient, occasionally entering the sea without establishing stable populations. Most shark and ray species occurring are demersal, except for the Common Thresher (Alopias vulpinus). The southwestern Black Sea hosts the highest shark and ray diversity, with isolated records of Smooth Hammerhead (Sphyrna zygaena) and Smallspotted Catshark (Scyliorhinus canicula) in Romanian and Russian waters.

Transient Elasmobranchs in the Black Sea

Some transient species, such as the Smooth Hammerhead and Spiny Butterfly Ray (Gymnura altavela), are referenced in older literature, but their current status remains uncertain. The presence of the Smooth Hammerhead in the Black Sea is still debated (Kabasakal & Bilecenoğlu, 2024), while the Spiny Butterfly Ray, which is tolerant of brackish waters, requires contemporary records.

Other species, including the Bluntnose Sixgill Shark (Hexanchus griseus) and Angular Roughshark (Oxynotus centrina), are considered vagrants. The Angelshark (Squatina squatina), once present in the Black Sea, is now presumed extinct in the region, with no confirmed sightings in over 20 years (Kabasakal, 2002; Ulman et al., 2020).

Challenges and Conservation Needs

Sharks and rays in the Black Sea face threats from incidental catch, habitat degradation, and climate change. Rising temperatures and increased Mediterranean Sea water inflows are altering ecosystem dynamics (Turan et al., 2009), potentially influencing shark and ray populations by facilitating new arrivals or displacing existing species.

Table: Shark and ray species inhabiting the Black Sea and their regional IUCN Red List of Threatened Species status in the Mediterranean Sea (Bengil & Erdogan-Saglam, 2024). * Where the regional assessments were not available, their global assessment status was used † While present in the Mediterranean, the presence of this species in the Black Sea is questionable.				References
Species		Common name	IUCN Red List status	
SHARKS	<i>Hexanchus griseus</i> [Bonnaterre, 1788]	Bluntnose Sixgill Shark	LC	1. Bengil, E.G.T. & Erdoğan Sağlam, N. (2024). Beyond the anchovy: Unveiling the Black Sea's elasmobranchs. Zoology in the Middle East, 1-11.
	<i>Scyliorhinus canicula</i> [Linnaeus, 1758]*	Smallspotted Catshark	LC	2. Bilecenoglu, M., Taskavak, E., Mater, S., & Kaya, M. (2002). Checklist of the marine fishes of Turkey. Zootaxa, 113, 1-194.
	<i>Alopias vulpinus</i> [Bonnaterre, 1788]	Common Thresher	EN	3. Dulvy, N.K., Fowler, S.L., Musick, J.A., Cavanagh, R.D., Kyne, P.M., Harrison, L.R., ... White, W.T. (2014). Extinction risk and conservation of the world's sharks and rays. eLife, 3, e00590.
	<i>Oxynotus centrina</i> [Linnaeus, 1758]	Angular Roughshark	CR	4. Kabasakal H. (2002). Elasmobranch species of the seas of Turkey. Annales: Series Historia Naturalis, 12, 15-22.
	<i>Mustelus mustelus</i> [Linnaeus, 1758]	Common Smoothhound	VU	5. Kabasakal, H. & Bilecenoglu, M. (2024). A review of occurrences of hammerhead shark (Carcharhiniformes: Sphyrnidae) in Turkish seas over the past five decades. Annales: Series Historia Naturalis, 34(1), 1-10.
	<i>Mustelus asterias</i> Cloquet, 1821	Starry Smoothhound	VU	6. Keskin, C. (2010). A review of fish fauna in the Turkish Black Sea. Journal of Black Sea/ Mediterranean Environment, 16(2), 195-210.
	<i>Sphyrna zygaena</i> [Linnaeus, 1758] †	Smooth Hammerhead	CR	7. Turan, C., Boero, F., Boltachev, A., Düzgün, İ., Kideys, A., ... Briand, F. (2009). Climate forcing and its impacts on the Black Sea marine biota. CIESM Workshop Monographs, 39, 5-24. Trabzon, Turkey.
	<i>Squalus acanthias</i> Linnaeus, 1758	Spiny Dogfish	EN	8. Ulman, A., Zengin, M., Demirel, N., & Pauly, D. (2020) The lost fish of Turkey: A recent history of disappeared species and commercial fishery extinctions for the Turkish Marmara and Black Seas. Frontiers in Marine Science, 7, 650.
	<i>Squalus blainville</i> [Risso, 1827]	Longnose Spurdog	DD	
	<i>Squatina squatina</i> [Linnaeus, 1758]	Angelshark	CR	
RAYS	<i>Dasyatis pastinaca</i> [Linnaeus, 1758]	Common Stingray	VU	
	<i>Gymnura altavela</i> [Linnaeus, 1758]	Spiny Butterfly Ray	CR	
	<i>Raja clavata</i> Linnaeus, 1758	Thornback Skate	NT	

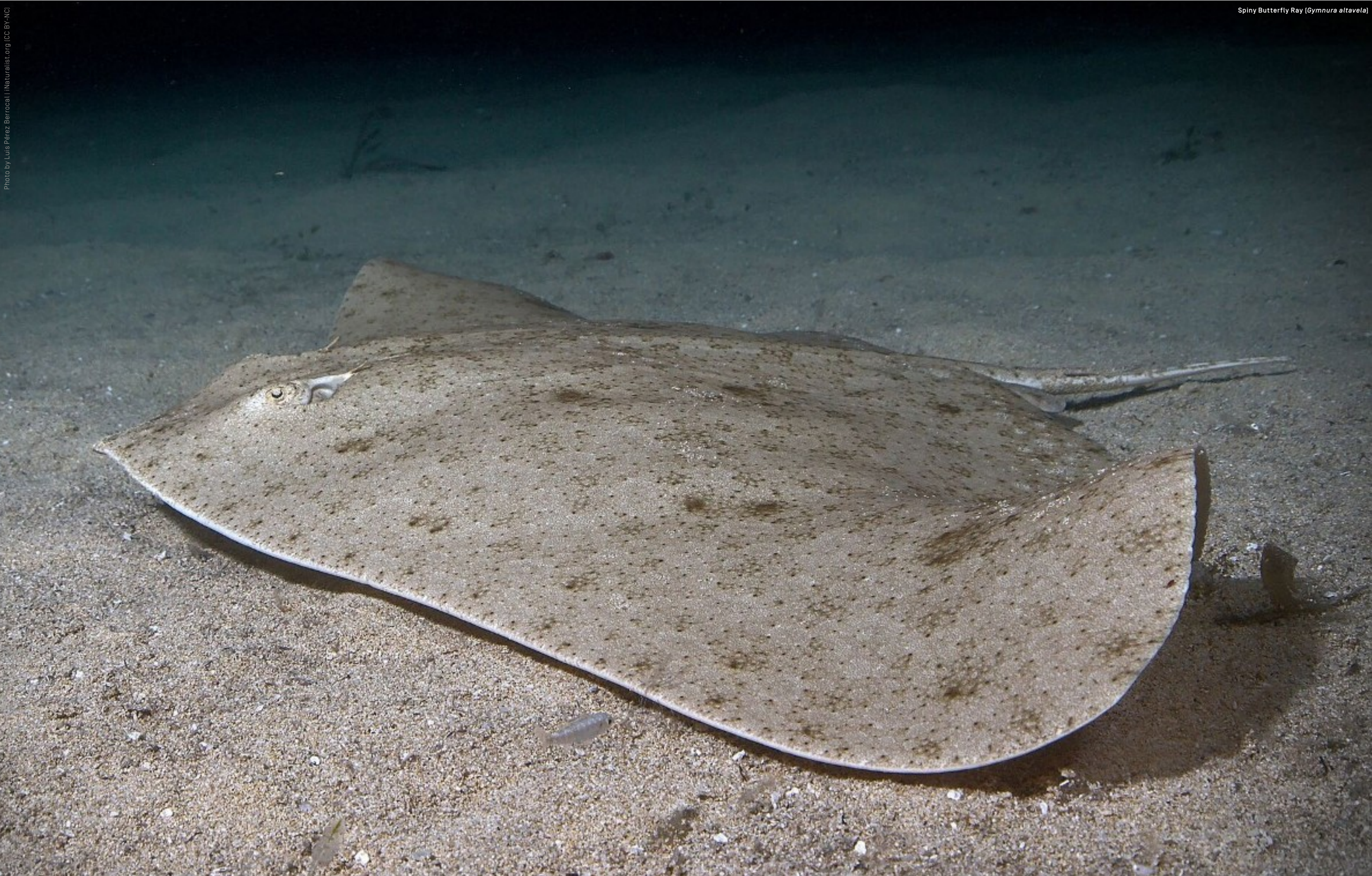
Elasmobranchs and Fisheries

Bycatch data indicate that Thornback Skate is the most frequently caught species amongst sharks and rays, while Common Stingray is the least. Historical landing data [1925–2002] suggest that Spiny Dogfish was previously commonly harvested, with catches varying from under a ton to nearly 500 tons in fisheries across Bulgaria, Romania, Ukraine, and Russia (Bengil & Erdogan-Saglam, 2024). Trawling was responsible for 60% of captures, followed by purse seine/net fisheries (17%), and longlines (9%).

Bycatch rates are highest along Türkiye's southern coast, with additional landings in Bulgaria, Romania, and Ukraine. In Türkiye, sharks and rays are rarely consumed due to cultural preferences and regulations, leading to discards or use of animals as bait (Bengil, 2020). In contrast, Spiny Dogfish and Thornback Skate are commonly consumed in Bulgaria, Romania, Ukraine, and Russia.

Systematic monitoring and improved fisheries management are crucial for conservation. Expanding the Mediterranean Large Elasmobranchs Monitoring (MEDLEM) program to the Black Sea could provide critical population trend data. Regional cooperation is essential for implementing science-based policies that protect these species.

A multidisciplinary conservation approach, integrating oceanographic studies, fisheries assessments, and climate research, is needed to safeguard shark and ray diversity in the Black Sea. Strengthened conservation efforts will benefit not only sharks and rays, but also the overall resilience of the Black Sea ecosystem.



Endangered Species Found in Thailand's Shark Fin Trade as Demand for Shark Products Persists

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A researcher clips a tissue sample from a dried processed shark fin for DNA extraction

A DNA analysis of shark fin products sold in Thailand, conducted by researchers from King Mongkut’s Institute of Technology Ladkrabang (KMITL) in partnership with Thailand’s Department of Fisheries [DoF] and WildAid, revealed alarming findings that showed 62% of the fins sampled came from sharks considered to be at high risk of extinction according to the IUCN Red List of Threatened Species [Klangnurak et al., 2023]. The study is the first DNA-based species identification of shark fin products in Thailand with the aim to better understand the species composition of these products, including the conservation status of the species present.

The study confirmed consumers could be eating threatened (i.e., Critically Endangered, Endangered, and Vulnerable on the IUCN Red List) sharks and underscores heavy reliance on international sources for fins traded in Thai markets. A significant amount of small-sized fins were found, indicating potential exploitation of immature sharks.

Thailand holds a significant position in the global market for shark fins as one of the major exporters of low-value, processed shark fins [Dent & Clarke, 2015]. Although local consumption of shark fin has declined in recent years [WildAid, 2023], Thailand remains an active market for the fin trade, as well as other shark-related products beyond fins.

DNA Confirms Endangered Sharks Found in Thailand's Fin Trade

In 2020, 206 shark fin samples were collected from retail markets, restaurants, warehouses, seaports, and fishing ports in four locations around Thailand. Of these, 166 samples (80.58%) were identified from at least 15 unique shark species and 62% percent of the identifiable species were assessed under the threatened categories of IUCN’s Red List.

The Spottail Shark [*Carcharhinus sorrah*] and Night Shark [*Carcharhinus signatus*] were the two dominant species identified in this study. Spottail Shark, the most prevalent species, is categorized as Near Threatened globally under the IUCN Red List and Vulnerable in the 2020 Thailand Red Data, which is a status assessment of the biological resources in Thailand by the Office of Natural Resources and Environmental Policy and Planning [ONEP]. This suggests the IUCN Red List status should be re-evaluated considering its prevalence in this marketplace. Spottail Shark stocks should be assessed in all regions for better fisheries management, particularly because previous studies have found landings throughout Southeast Asia were dominated by immature size specimens [Fahmi & Sumadhiharga, 2007; Moore et al., 2012].

80% of the species found are regulated by CITES Appendix II

More than 80% of the species found in this study are now globally regulated by the Convention on International Trade of Endangered Species of Wild Fauna and Flora [CITES] Appendix II listing, including two Critically Endangered species of hammerheads: the Scalloped Hammerhead [*Sphyrna lewini*] and Great Hammerhead [*Sphyrna mokarran*].

Findings also revealed that many of the threatened species found were identified through small-size fins, including the Scalloped Hammerhead, highlighting the high prevalence of immature sharks being caught and traded. “The discovery of sharks that are Vulnerable to Critically Endangered highlights the urgent need to protect these species. Many threatened species were identified through small fins, which

demonstrates that further research is needed to confirm the presence of immature sharks. Young sharks play a crucial role in the recovery of shark populations, and finding them within the trade is concerning,” said Dr. Wanlada Klangnurak, lead researcher at the Faculty of Agricultural Technology, KMITL.

The geographical origin of the shark fin supply in the country is hard to trace due to the obscure nature of this occasionally illegal trade. Of identifiable fins, 34% were from sharks that have not been recorded in or near Thai waters, indicating that Thai markets rely heavily on sources from outside the country and may be imported to satisfy local demand or for re-export.

“The findings of this study provide a strong indication that Thailand plays a sizable role in the global shark fin trade, which concurs with similar reports addressing the country’s involvement. While there has been a notable decrease in the practice of shark finning (i.e., removing the fins and discarding their bodies at sea) in Southeast Asia—as fins are now commonly sourced from sharks landed whole after being caught in industrial fishing gear—we cannot ignore the damage that the industry has inflicted on shark populations worldwide. Conservation efforts of sharks need to be strengthened to ensure the survival of these threatened species,” said Sirachai Arunrugstichai, a marine scientist, photojournalist, and a researcher contributing to this study.

The findings demonstrate the need for a traceability system to be established both in Thailand and internationally to increase law enforcement and trade monitoring to comply with the existing and new CITES Appendix II listings of 54 requiem shark species (family Carcharhinidae). As a result of this listing, almost all internationally traded species of sharks are now be subject to CITES regulations. Thailand has requested a reservation on the inclusion of requiem sharks valid for a period of six years or until November 2028 to set up systems for monitoring shark landings and trade.

Thailand's Shark Fin Consumption Declines but Demand Persists Beyond Fins

Meanwhile, WildAid’s 2023 survey of 1,007 urban Thais, independently conducted by Rapid Asia, showed Thailand’s shark fin consumption declined by 34% between 2017-2023, equivalent to an estimated 8.1 million fewer servings of shark fin per year. However, more than half (56%) of urban Thais still want to try shark fin, indicating that the country remains an active market for shark fin consumption.

Social gatherings remain the primary occasions for shark fin consumption. While the COVID-19 pandemic likely reduced demand due to fewer weddings and social gatherings, the survey found evidence to suggest that campaign initiatives such as WildAid’s “Celebrate with #NoSharkFin” are also likely to have contributed to the reduction in demand seen between 2017-2023.

Alarminglly, one in every three urban Thais plan to try shark meat in the future out of curiosity, a strong indication that that market could be growing. The local demand for shark meat is consistent with the recent study ‘Global shark fishing mortality still rising despite widespread regulatory change’, which estimated global fishing mortality increased from 76 million sharks in 2012 to between 79-80 million between 2017-2019 as a result of increasing utilization of sharks and global demand for shark meat and non-fin products [Worm et al., 2024].

Most Urban Thais Now Recognized Sharks’ Role in Marine Ecosystems

Consumers of shark fin have become more aware of the negative consequences of shark fin consumption and are beginning to

question what it means when tens of millions of sharks are killed every year for their fins and meat. The majority of respondents (88%), including shark fin consumers, now understand that sharks are key to maintaining the balance of marine ecosystems, a significant increase from 68% in 2017.

“Ongoing efforts to reduce consumption of shark products must continue and evolve. While shark fin consumption has declined in recent years, reflecting a positive societal shift, demand for sharks remains worryingly persistent. We are now seeing increased use of sharks beyond fins—in products like pet food and snacks—which poses a new threat,” said Petch Manopawitr, conservation scientist and advisor to WildAid.

Emerging Trend in Pet Snacks Made from Sharks

Over the past few years, WildAid has observed an emerging trend in Thailand for pet snacks advertised as ‘made from sharks’. WildAid’s initial online market investigation in January 2024 found as many as 100 online vendors selling these products to supply the market for Thailand’s booming pet industry.

Our desktop research found more than 10 different types of dog and cat treats and dental snacks advertised to be dried shark products, including cartilage, fins, whole sharks, shark jerky, meat, etc. Vendors claim these products contain high protein, calcium, and nutrients needed for dogs and cats. However, by mid-2024, many vendors no longer advertised these products as ‘sharks’,

but instead branded them as fish cartilage or bone. This change in marketing strategy may reflect a shift in the public’s perception of products made from sharks.

To further investigate the impact of this pet snack market and possible ways to curb it, WildAid, Ocean Blue Tree, and KMITL re-searchers conducted research to ascertain the species makeup and nutritional value (as well as heavy metal contaminant level) of these shark-containing snacks. Results will be published in 2025 and will inform future communications aimed at discouraging pet owners from purchasing these products.

Petch Manopawitr added, “To truly protect sharks and restore marine ecosystems, we need stronger area-based research and conservation efforts. Sharks should no longer be seen as commodities, but as powerful symbols of hope for ocean rewilding and regeneration.”

WildAid recommends relevant government agencies to prioritize implementation of the National Plan of Actions for Conservation and Management of Sharks, Thailand (NPOA-Sharks), including increasing effectiveness in fisheries management to limit bycatch of sharks, improving the traceability system of trade in sharks, protecting priority habitats, and fostering understanding and engagement of stakeholders in protecting sharks. These priorities are imperative to the survival of vulnerable shark populations in Thailand and around the world.



Photo by Sirachai Arunrugstichai | WildAid



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Raw shark fin for sell in a local restuarant at Yaowarat, Bangkok, Thailand



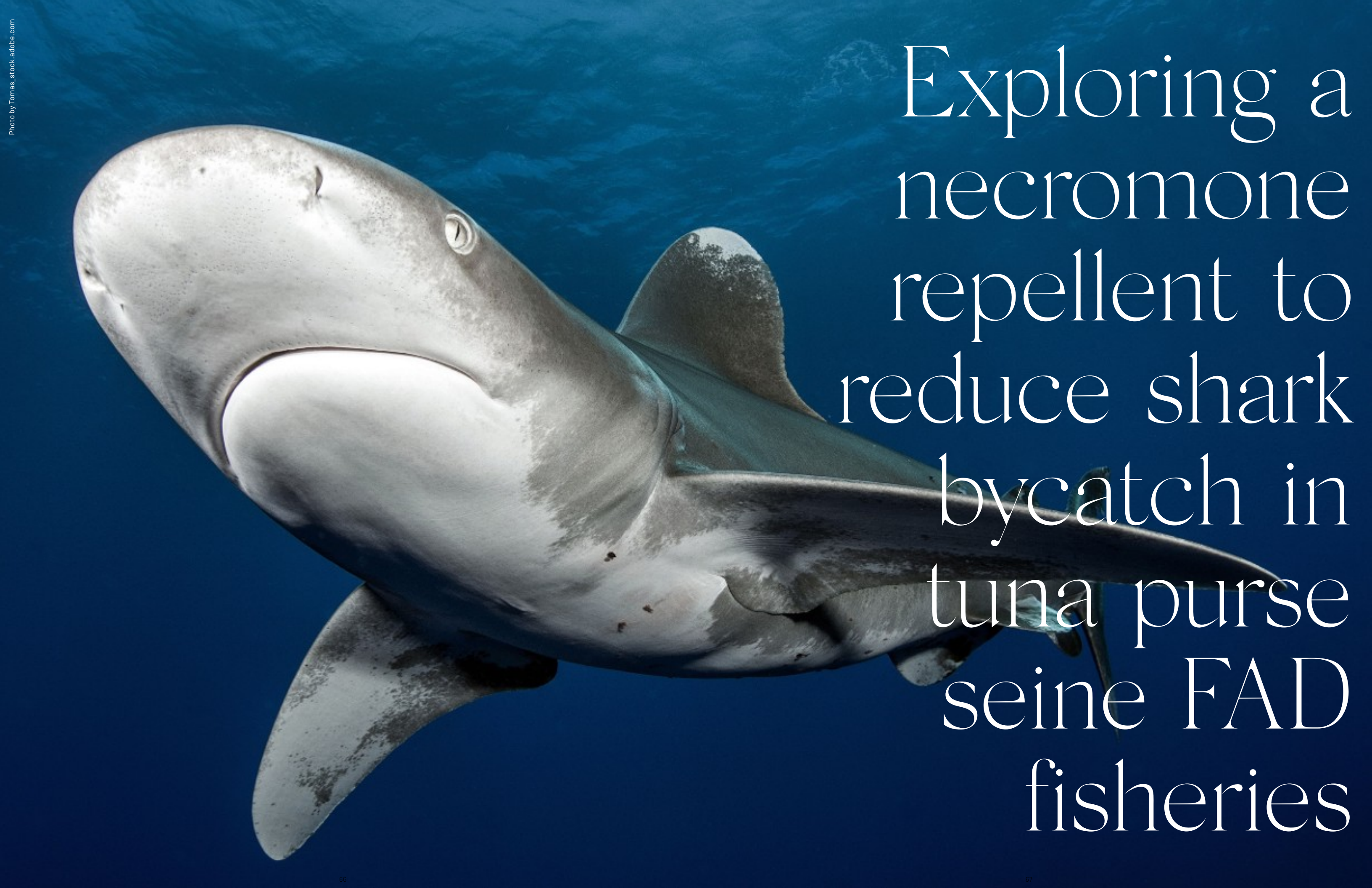
Shark fin sold in Chinese restaurant in Chinatown, Bangkok, Thailand

Photo by ICHAILAO | stock.adobe.com



A waitress is seen serving shark fin soup in a clay pot at a roadside seafood restaurant in Bangkok's Chinatown

Photo by WildAid



Exploring a
necromone
repellent to
reduce shark
bycatch in
tuna purse
seine FAD
fisheries



A skiff finishes retrieving equipment used in the shark repellent experiment as the tuna purse seine fishing vessel Nanmadol completes a set

Photo byEric Gilman

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Epipelagic Shark Bycatch in Tuna Purse Seine Fisheries

There is growing concern over the conservation status of sharks, rays, and chimaeras exposed to incidental fisheries bycatch (Jackson et al., 2001; Dulvy et al., 2021; Pacoureau et al., 2021; Juan-Jorda et al., 2022). This includes the bycatch of at-risk stocks of pelagic sharks in tuna purse seine fisheries, particularly in sets made on floating objects such as drifting Fish Aggregating Devices (FADs). There are, unfortunately, few effective and commercially viable methods available to mitigate this human-wildlife conflict (Gilman, 2011; Hall et al., 2017; Gilman et al., 2024). In tuna purse seine fisheries, shark captures occur through encircling in seine nets as well as entanglement in netting of drifting FAD appendages (the component of the FAD that hangs below a raft and floats) (Filmlalter

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et al., 2013). However, the latter threat is expected to be declining as global tuna purse seine fleets are now required to use only non-entangling FAD designs (ISSF, 2019). There are high mortality rates of sharks that are brailled onboard purse seiners, where employment of prescribed handling and release methods could reduce shark mortality rates (Poisson et al., 2014a, 2016; Murua et al., 2022). Identifying methods that effectively minimize shark capture are the highest priority for tuna purse seine fisheries.

The Silky Shark (*Carcharhinus falciformis*) makes up about 90% of the number of the shark catch while the Oceanic Whitetip Shark (*C. longimanus*) is the next most frequently captured shark species in tuna purse seine sets on floating objects (Dagorn et al., 2013; Hall & Roman, 2013; Poisson et al., 2014b; Filmlalter et al., 2021). The Silky Shark is categorized as Vulnerable and Oceanic Whitetip Shark Critically Endangered on the IUCN Red List of Threatened Species (IUCN, 2025a,b). The western and central Pacific Ocean (WCPO) stock of Oceanic Whitetip Shark is overfished and overfishing is occurring (Tremblay-Boyer et al., 2019; WCPFC 2019). Overfishing of the WCPO Silky Shark stock is very unlikely to be occurring, while the status of the stock is highly uncertain (the stock is about as likely as not to be overfished. However, there is very high uncertainty of abundance and depletion estimates (Neubauer et al., 2024; WCPFC, 2025).

Exploring a Chemical Shark Repellent to Mitigate Bycatch

Our research team is conducting a study that explores the potential of a chemical repellent to mitigate shark bycatch. Necromones, or

chemical odors from decomposing conspecifics or close relatives, are purported to elicit an avoidance response and hold promise for repelling sharks from fishing gear and fishing aids, such as FADs, without affecting the behavior and hence catchability of commercial species of bony fishes (Stroud et al., 2014; Hart & Collin, 2015). Previous necromone research for pelagic longline fisheries found a 79% reduction in shark and ray catch rates during the initial four hours of the gear soak on bait treated with a synthetic necromone (Rice et al., 2015). Research on reef sharks found 60% to 73% reductions in shark density 10 minutes after deploying a shark necromone and no effect on the density of bony fishes (Stroud et al., 2014). No previous shark necromone research has been conducted in purse seine or FAD fisheries.

In early 2025, we conducted an exploratory trial during two drifting FAD sets, conducted by the tuna purse seine vessel Nanmadol of the Federated States of Micronesia. Preliminary findings found that the deployment of the necromone treatment resulted in a reduction in Silky Shark density in the school aggregated at drifting FADs, reducing these species' catch risk by an estimated 67% and 80% in the two sets. These preliminary results suggest that the shark necromone repellent holds promise and warrants further research.

Next Steps

We plan to conduct a controlled experimental field trial in tuna purse seine fisheries in the western and central Pacific Ocean to assess the effect of necromone repellents on the catch rates of shark and commercial tuna species. Camera trap analysis of imagery derived from an *in situ* video monitoring system will be used to estimate

changes in shark and tuna relative abundance within aggregations at each FAD following deployment of either the experimental necromone treatment or the control. Estimates of change in school biomass following deployment of the treatment or control will also be derived from satellite-linked echosounder buoys attached to the FADs (e.g., Lopez et al., 2014; Uranga et al., 2022). A Bayesian multilevel regression modelling framework will be used to evaluate whether there are any differences in species-specific shark and combined tuna species relative abundance and catch rates between the necromone treatment and the control. For the catch rate evaluation, effort will be conditioned on the estimated abundance within an aggregation prior to treatment or control deployment as determined from the camera trap image analysis and the echosounder biomass estimates, by current velocity and on necromone weight for treatment sets. The latter two variables provide an index of necromone concentration within the school aggregated at each FAD.

Findings will provide evidence on the efficacy of a fisheries shark chemical repellent that holds promise to improve the conservation status of threatened pelagic shark species. If findings indicate that the Silky Shark and Oceanic Whitetip Shark necromones hold promise for reducing bycatch in tuna purse seine FAD fisheries, then a subsequent research priority would be to develop synthetic Silky Shark and Oceanic Whitetip Shark necromones. Another research priority would be to identify an alternative necromone delivery system to enable controlled release to achieve a desired concentration of the necromone in the requisite area and time period (e.g., Broadhurst & Tolhurst, 2021). Similar studies of necromone repellents could be conducted in fisheries using other gear types that have problematic and unwanted shark bycatch.

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A school of Skipjack Tuna [*Katsuwonus pelamis*] and Yellowfin Tuna [*Thunnus albacares*] at a drifting fish aggregating device, viewed from an in situ video monitoring system

Photo byEric Gilman

The Important Shark and Ray Areas of the South American Atlantic & Inland Waters regions

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The Important Shark and Ray Areas (ISRA) initiative has been successful in the first six regions that have been investigated with over 600 ISRAs identified across the Central and South American Pacific, the Mediterranean and Black Seas, the Western Indian Ocean, the Polar Waters, Asia, and New Zealand and Pacific Islands. In January 2025, we put sharks on the map for two ISRA regions at the same time. How did we do?

The South American Atlantic and South American Inland Waters regions were the seventh and eighth (of thirteen) regions to be investigated. The ISRA team hosted a regional expert workshop in Montevideo, Uruguay from 13–17 January. The best available science (such as local ecological knowledge and peer-reviewed scientific articles) was collated at the workshop, which facilitated conversations between the contributors. This was crucial in developing representative proposals of areas that may meet the ISRA Criteria – including the definition of accurate spatial boundaries.

For the South American Atlantic, 192 experts contributed to the process either in-person and/or online. The result of this international effort was the delineation of 81 ISRAs – the first of the region. Two areas remained as candidate ISRAs, which will benefit from ongoing research that may help define its importance over the coming years. Also, 14 Areas of Interest were mapped to highlight areas for potential future investigation. ISRAs in this region range in size from small areas of 0.27 km² at depths of 0–42 m (Laje de Santos in Brazil) to large areas of 106,490 km² (Plata Canyon System which spans waters of Uruguay, Argentina, Brazil, and areas beyond national jurisdiction) from 0–1,792 m.

During the same workshop, 36 experts contributed either in-person or online to the South American Inland Waters region. This region encompasses the extensive freshwater ecosystems across the South American continent that are also home to the endemic group of the South American Freshwater Rays. Here, 21 proposals were accepted as ISRAs and 11 Areas of Interest delineated. Identified ISRAs in this region range in size from small areas of 0.4 km² at depths of 0–4 m (Aqualasal-Catatumbo in Colombia) to large areas of 19,495 km² (Amazon River Mouth in Brazil) from 0–50 m.

The completion of South American Atlantic and Inland Waters regions allowed us to update the ISRA e-Atlas. All mapped areas

can be filtered to display ones specific to your requirements or interest. For example, you can choose areas which were delineated in a particular jurisdiction or ISRA region, those that meet particular criteria, or those delineated for specific Qualifying Species. Every area has a unique factsheet which details the species, ISRA Criteria met, and geographic information. The recently published compendiums 'South American Atlantic: A Regional Compendium of Important Shark and Ray Areas' and 'South American Inland Waters: A Regional Compendium of Important Shark and Ray Areas' collate all the regional information at the jurisdictional level. This is free to download from the ISRA website (sharkrayareas.org) to ensure the information is available to everyone, including scientists, policy makers, and the general public.

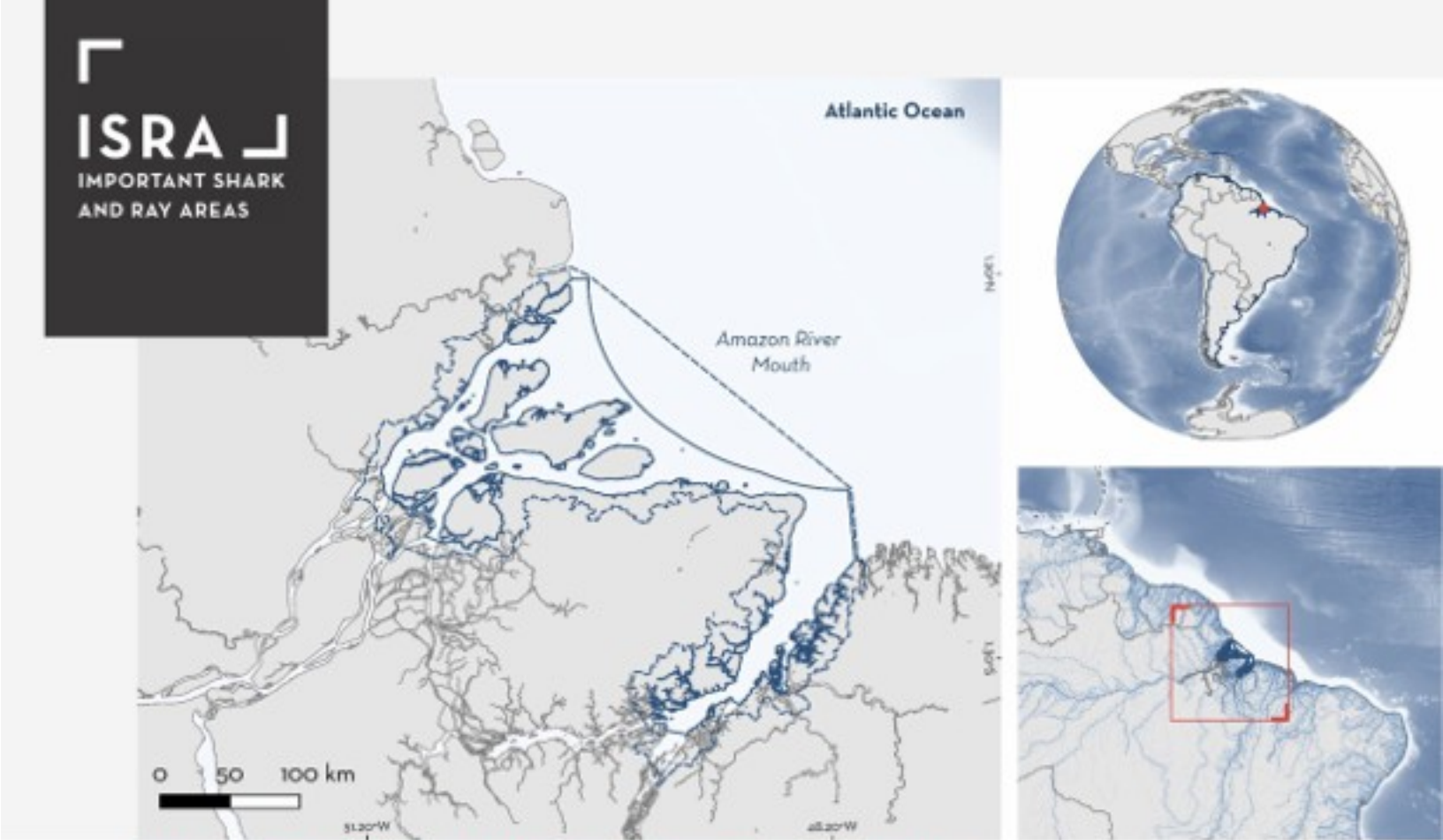
ISRAs in these regions were mapped using every ISRA Criteria. This means that some delineated areas were mapped for species threatened with extinction (e.g., American Elephantfish, *Callorhinchus callorynchus*) as well as some range-restricted species (e.g., Angular Angelshark, *Squatina guggenheim*). Focus was also put on the freshwater counterparts, including the threatened Suriname Freshwater Stingray (*Potamotrygon boesemani*) and range-restricted Tiger Freshwater Stingray [*P. tigrina*]. Regular and predictable observations were used to demonstrate the importance of areas for reproductive purposes, resting, feeding, movement, and undefined aggregations. Other areas had special attributes, such as having a high diversity of sharks (such as the North Brazil Shelf ISRA) or having distinct features. For example, Smalltail Sharks [*Carcharhinus porosus*] exhibit a globally distinct behaviour in Bocas de Ceniza-Salamanca ISRA in Colombia, where they are suspected to travel upstream into the freshwater habitat of the Magdalena River to feed.

At the time of writing, the ISRA team have worked with international experts to map 692 ISRAs, 24 candidate ISRAs, and 104 Aol in eight regions of the world. The ISRA team are currently finalising the proposals made for areas within the European Atlantic. The call for preliminary Area of Interest submissions has opened for Australia and the South-East Indian Ocean – the tenth region to be investigated, before even more areas will be put on the map!

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Jabado, R.W., Gonzalez-Pestana, A., García-Rodríguez, E., Batlle-Morera, A., Armstrong, A.O., Rohner, C.A., ... Palacios, M.D. 2025. *South American Inland Waters: A regional compendium of Important Shark and Ray Areas*. Dubai: IUCN SSC Shark Specialist Group. doi.org/10.59216/ssg.isra.2025.r13



Blue lines indicate the area meeting the ISRA Criteria; dashed lines indicate the suggested buffer for use in the development of appropriate place-based conservation measures. Buffers for freshwater areas are determined based on hydroBASINS to capture watershed boundaries.

AMAZON RIVER MOUTH ISRA

South American Inland Waters Region

SUMMARY

Amazon River Mouth is located in northern coastal Brazil, along the Amapá and Pará states. This area is formed by the confluence of the Amazon and Tocantins rivers with the Atlantic Ocean, creating a complex estuarine system. It is influenced by tides, river discharge, ocean currents, and seasonal variations, which impact water salinity, sedimentation, and biodiversity. This area overlaps with Amazon Estuary and its Mangroves Ramsar Site and Reserva Biológica do Parazinho. Within this area there are: **reproductive areas** (e.g., Whitespotted Freshwater Stingray *Potamotrygon scobina*) and the area sustains a **high diversity of rays** (four species).

CRITERIA

Sub-criterion C1 – Reproductive Areas; Sub-criterion D2 – Diversity



SOUTH AMERICAN ATLANTIC

A REGIONAL COMPENDIUM OF
IMPORTANT SHARK AND RAY AREAS

IUCN SSC SHARK SPECIALIST GROUP

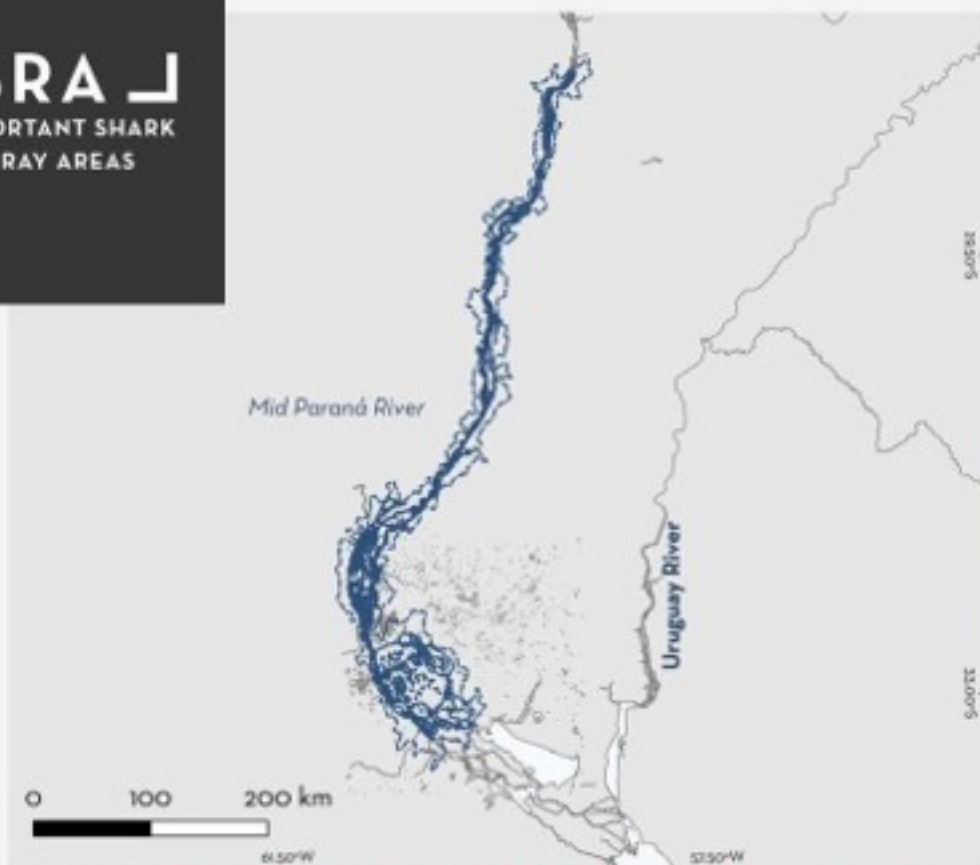
MAY 2025

— SOUTH AMERICAN INLAND WATERS —

A REGIONAL COMPENDIUM OF
IMPORTANT SHARK AND RAY AREAS

— IUCN SSC SHARK SPECIALIST GROUP —

— APRIL 2025 —



Blue lines indicate the area meeting the ISRA Criteria; dashed lines indicate the suggested buffer for use in the development of appropriate place-based conservation measures. Buffers for freshwater areas are determined based on hydroBASINS to capture watershed boundaries.

MID PARANÁ RIVER ISRA

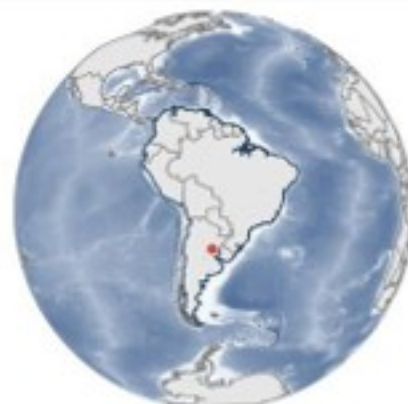
South American Inland Waters Region

SUMMARY

Mid Paraná River is located in the province of Santa Fe in the northeastern part of Argentina. This area is characterised by gallery forests, extensive shrublands, grasslands, and large stands of aquatic macrophytes. This area overlaps with the Parque Nacional Pre-Delta Key Biodiversity Area, two Ramsar sites (Delta del Paraná and Jaaukanigás), and partially overlaps with two protected areas (Parque Nacional Pre-Delta and Islas de Santa Fé.) Within this area there are: **threatened species** and **range-restricted species** (Giant Freshwater Stingray *Potamotrygon brachyura*).

CRITERIA

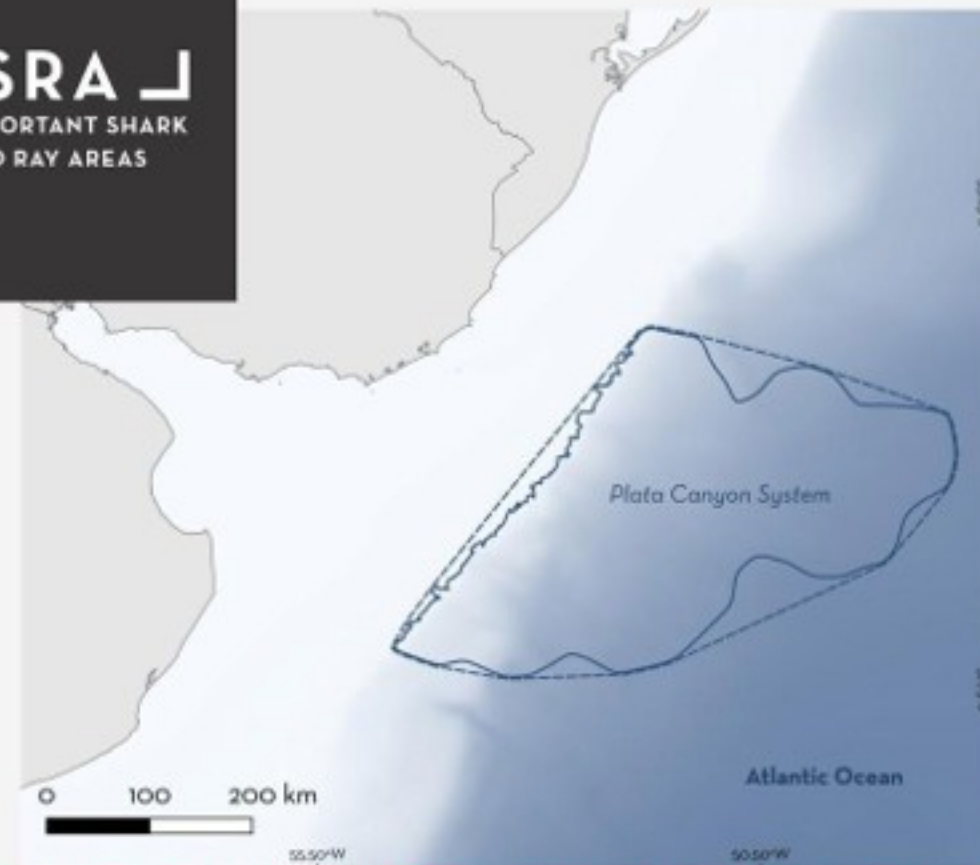
Criterion A - Vulnerability; Criterion B - Range Restricted



ARGENTINA

0-8 metres

1,892.6 km²



Blue lines indicate the area meeting the ISRA Criteria; dashed lines indicate the suggested buffer for use in the development of appropriate place-based conservation measures

PLATA CANYON SYSTEM ISRA

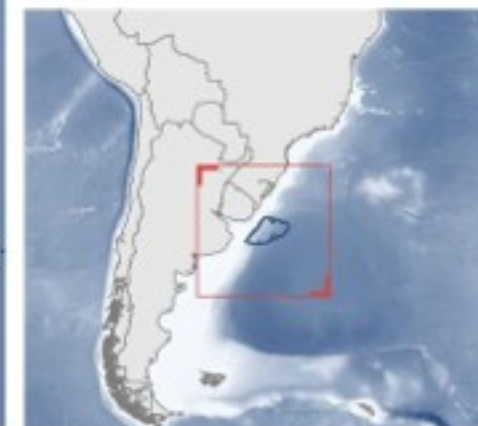
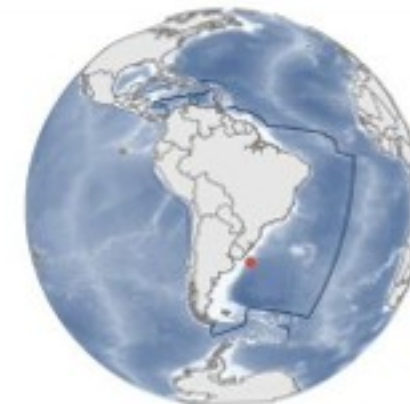
South American Atlantic Region

SUMMARY

Plata Canyon System is located on the shelf break off Uruguay, northern Argentina, and southern Brazil, and extends into offshore waters in areas beyond national jurisdiction (ABNJ). This area is influenced by the warm, southward Brazil Current and the cool, northward Falkland-Malvinas Current. The habitat is characterised by pelagic waters, with many canyons and terraces along the shelf slope. It partly overlaps with the Southern Brazilian Sea Ecologically or Biologically Significant Marine Area. Within this area there are: **reproductive areas** (Blue Shark *Prionace glauca*).

CRITERIA

Sub-criterion C1 - Reproductive Areas



URUGUAY BRAZIL ARGENTINA ABNJ

0-1,792 metres

106,490 km²

Important Shark and Ray Areas can inform conservation planning in the Mediterranean and Black Seas



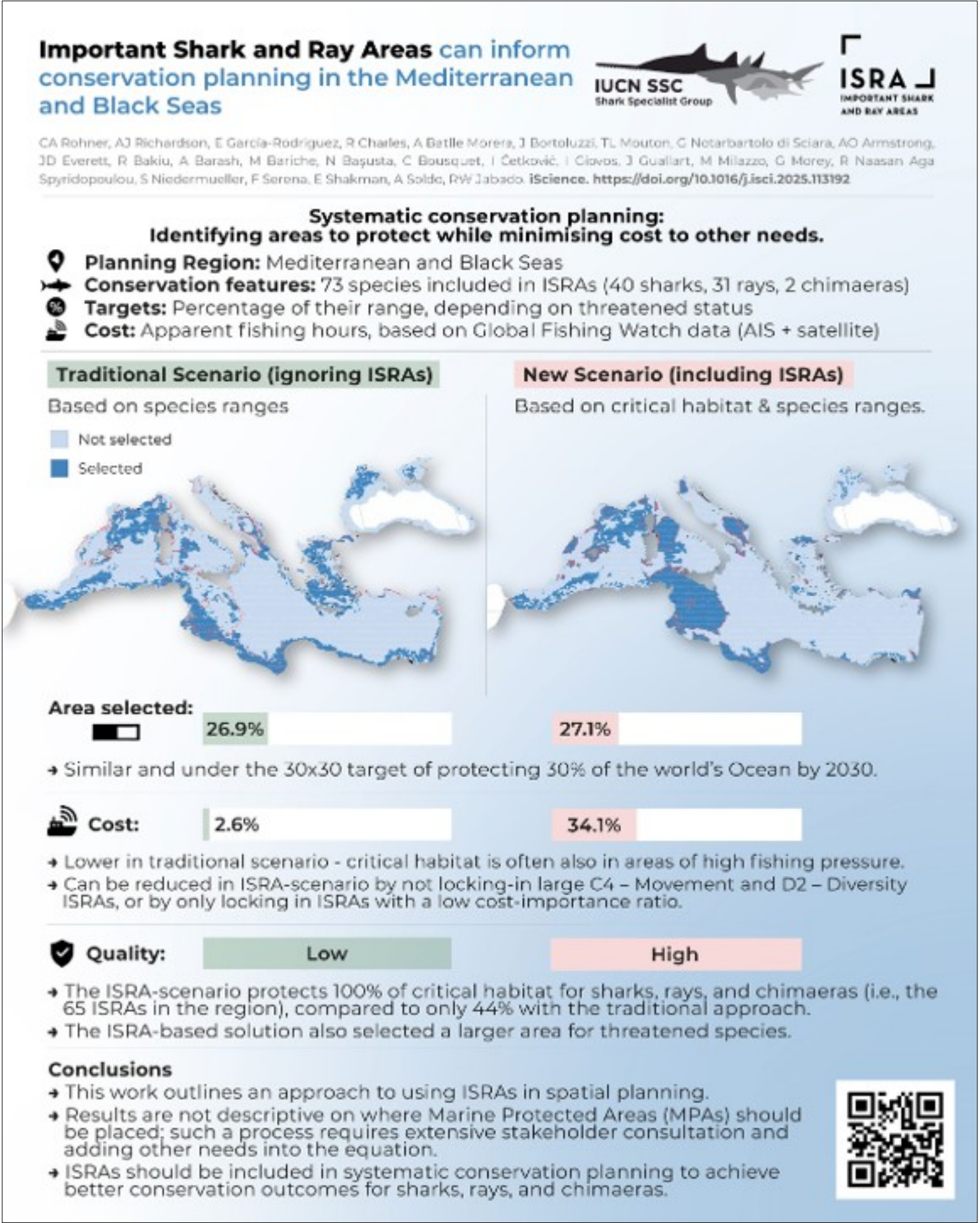
Read the latest publication from the Important Shark and Ray Areas (ISRA) project in the journal iScience highlighting: Important Areas are tools to support effective marine conservation planning;

- Adding critical habitats to range maps enhances systematic conservation solutions;
- Including critical habitats in solutions can cover a similar area but differ in cost; and
- Considering Important Areas will enhance outcomes for threatened species protection

The designation of protected areas needs to accelerate rapidly to achieve Target 3 of the Global Biodiversity Framework (GBF), raising concerns that protected area quality will be overlooked. Rather than basing systematic conservation planning primarily on species ranges, critical habitats for life history functions should be prioritized to enhance conservation outcomes. Such critical habitats are being identified as “Important Areas,” including Important Shark and Ray Areas (ISRA) for chondrichthyans. Solutions from systematic conservation planning scenarios with 73 chondrichthyan species in the Mediterranean and Black Seas greatly differed between approaches that ignore or include ISRAs. Including ISRAs led to higher costs for fisheries but protected a similar surface area [27% in both scenarios], while achieving better conservation outcomes. We highlight ways of reducing fishing costs while maintaining ISRA-based solutions. Systematic conservation planning using Important Areas gives decision makers a tool to balance cost with improved conservation quality, ultimately enhancing protected area network effectiveness by prioritizing critical habitats.

Hot to cite this paper as: Rohner, C.A., Richardson, A.J., García-Rodríguez, E., Charles, R., Batlle-Morera, A., Bortoluzzi, J.R., ... Jabado, R.W. (2025). Important Shark and Ray Areas can inform conservation planning in the Mediterranean and Black Seas. *iScience*. doi.org/10.1016/j.isci.2025.113192

[Click here to read more online](#)



Mapping Important Shark and Ray Areas ISRA in the Central and South American Pacific: Existing knowledge and data needs

The Important Shark and Ray Areas (ISRA) team is excited to share their latest paper: ‘Mapping Important Shark and Ray Areas (ISRAs) in the Central and South American Pacific: Existing knowledge and data needs.’ This research looked at what data sources were used to support the delineation of Important Shark and Ray Areas (ISRAs) in the Central and South American Pacific ISRA region

Abstract

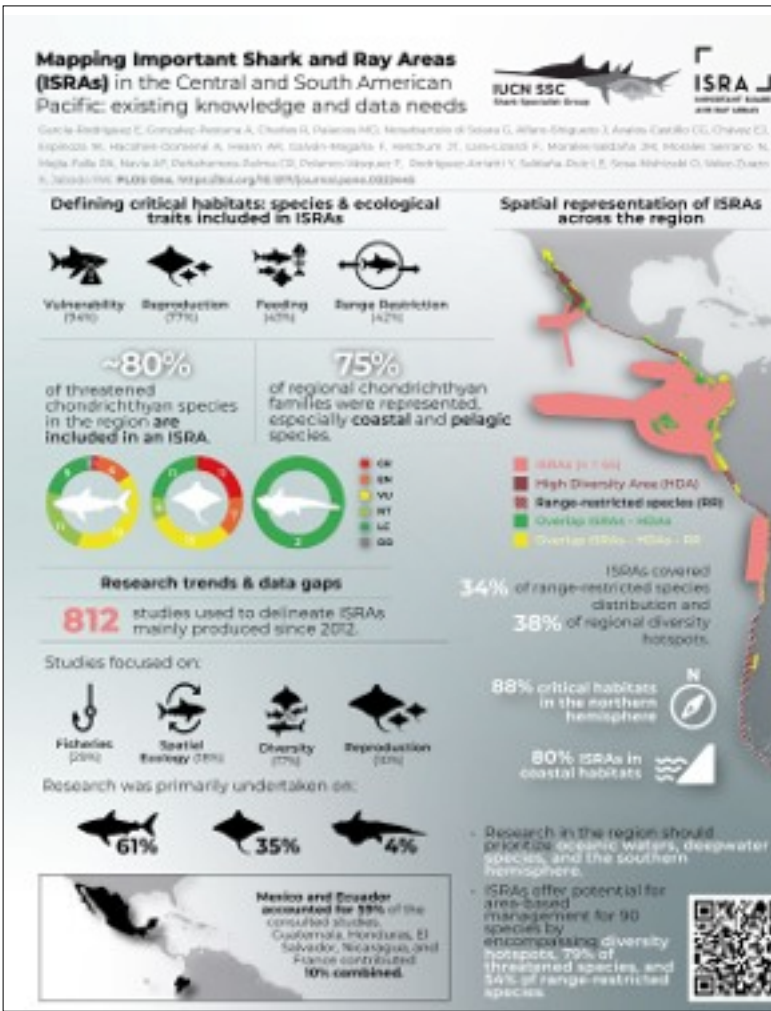
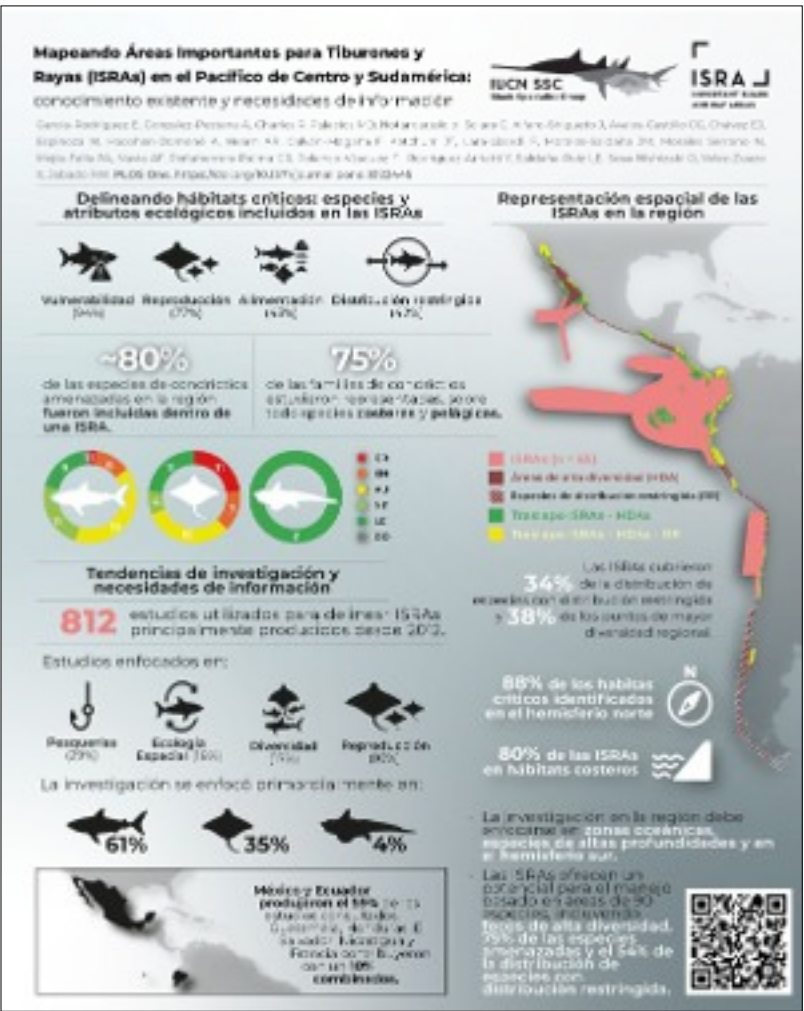
Identifying critical habitats is key to the conservation and recovery of threatened species. A third of chondrichthyans (sharks, rays, and chimaeras) are threatened with extinction but robust biological and ecological information to delineate critical habitats for many species remains limited. Here, we investigated (1) research outputs and trends across the Central and South American Pacific region to determine whether sufficient information was available to identify critical habitats; (2) whether regional Important Shark and Ray Areas (ISRAs) were spatially representative; (3) what species and which ecological traits were most commonly used in the delineation of critical habitats; and (4) discuss how ISRAs can inform research priorities and area-based management in support of chondrichthyan conservation. Sixty-five ISRAs were identified for 97 of 190 chondrichthyan species occurring in the region (51%). Across key life-history processes, reproductive areas were most identified (n = 50). Of 821 published studies (2,160 entries), 31.48% (28% entries) primarily focused on fisheries and 48.51% included enough information to inform the ISRA process. Most

(58.98%) of these studies originated from Mexico (n = 342, 744 entries) and Ecuador (n = 147, 276 entries). France and Honduras had the least regional research outputs relevant to apply the ISRA Criteria. Significant ecological data gaps were identified in oceanic (including areas beyond national jurisdiction), deepwater (>200 m), and along the southern part of the region (i.e., southern Chile). Deepwater species, chimaeras, and 21% of threatened species had knowledge gaps that did not allow the identification of ISRAs. If area-based management decisions in this region were based on ISRAs, and effectively implemented and enforced, diversity hotspots and at least 97 species could receive protection, including 79% of threatened species and 54% of those considered range-restricted. Increased monitoring and research efforts, with a corresponding increase in funding to fill existing gaps is key to support the identification of important habitats across this region.

Explore the key findings and their implications for the conservation of sharks, rays, and chimaeras across the region. The full publication can be found online here.

How to cite the document:

García-Rodríguez, E., González-Pestana, A., Charles, R., Palacios, M. D., Notarbartolo di Sciarra, G., Alfaro-Shigueto, J., Avalos-Castillo, C.J., Chávez, E.J., Espinoza, M., Hacohen-Domené, A., Hearn, A.R., Galván-Magaña, F., Ketchum, J.T., Lara-Lizardi, F., Morales-Saldaña, J.M., Morales Serrano, N., Mejía-Falla, P.A., Navia, A.F., Peñaherrera-Palma, C.R., Polanco-Vásquez, R., Rodríguez-Arriatti, Y., Saldaña-Ruiz, L.E., Sosa-Nishizaki, O., Velez-Zuazo, X. Jabado, R.W. (2025). Mapping Important Shark and Ray Areas (ISRAs) in the Central and South American Pacific: Existing knowledge and data needs. PLoS One 20(5): e0322445. doi.org/10.1371/journal.pone.0322445



Exploring shark governance in the Mediterranean

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Photo by Rasmus Loeth Petersen

Common Stingray (*Dasyatis
pastinaca*) in Golden Bay, Malta

The question

At the time, I, Lydia Koehler, was working for the Maltese Environment & Resources Authority and in the process of drafting responses to the Regional Activity Centre for Specially Protected Areas, which is responsible for the implementation of the Barcelona Convention for the Protection the Mediterranean Sea. They had asked the Focal Points to report on the progress in implementing the regional action plan for cartilaginous fishes [i.e., sharks, rays, and chimaeras]. I felt that some efforts I knew about were not well reflected in the questionnaire or the last implementation report. So, I asked myself what measures and actions are (or have been) taken by countries in the region to support shark, ray, and chimaera conservation and management at the national and regional level?

Proposing this idea/question to Jason Lowther, an associate professor at Plymouth University, who teaches, researches, and publishes on matters relating to environmental law, led to a three-year (PhD) commitment to investigate this.

The work and support we received

The Barcelona Convention is not the only legal framework under which countries have obligations to protect and manage threatened or endangered species such as sharks. Internationally, the Convention on Migratory Species (CMS), the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Biological Diversity (CBD), and even the United Nations Convention on the Law of the Sea (UNCLOS) all have a legal mandate that in some way, whether general or specific, has application to sharks, rays, and chimaeras. Furthermore, Regional Fisheries Management Organisations (RFMOs) have the capability and responsibility of developing legally binding conservation measures for sustainable management of species including those that are affected by the fisheries they manage, including sharks, rays, and chimaeras.

So, the work started by reviewing all the publicly available information related to countries' reporting on national progress in the region. Going through over 360 documents uncovered various insights not only on the quality or detail of reporting, but also which reports are useful to track progress in management and conservation. Additionally, we asked regional experts, non-governmental organisations (NGOs), and government bodies to update us on their progress via questionnaires.

Insights into Mediterranean shark, ray, and chimaera governance

The research identified significant complexities in shark, ray, and chimaera management and conservation efforts in the Mediterranean Sea region, which are enduring today. Some of these complexities relate to the variety of governance mechanisms applied within and between the Mediterranean states, including those applied to the significant percentage of Areas Beyond National Jurisdiction (ABNJ) in this basin. Progress

has been made, both at the European Union (EU) and regional level. However, there are still gaps and challenges in the implementation of existing regulations and commitments, such as mislabelling, high incidental catch rates, and lack of species-specific reporting. Furthermore, a clear gap was the use of spatial protection measures (e.g., Marine Protected Areas, MPAs). This has many underlying reasons, which, for example, include data gaps, limited resources, but also the lack of strong legal commitments to designate such areas for sharks, rays, and chimaeras.

A very positive trend, however, are the increasing efforts from NGOs, who not only raise awareness, but actively contribute to science and even policy development in the region.

Take home messages and next steps

To summarise only three key messages from this work:

1. Sharks, rays, and chimaeras in the Mediterranean are still under pressure, despite progress in protection and management measures at different levels (international, regional, and national).
2. While we assessed implementation progress based on reported compliance by countries, governments (and other stakeholders) should be encouraged to report on the effectiveness of existing regulations and measures/ actions taken to accurately evaluate which measures are working and which are not.
3. NGOs are the driving forces in the region and their collaborative approach and work led to many positive changes for shark, ray, and chimaera conservation. However, more collaboration among scientists is needed and the science should be considered more in policies by focusing on specific data needs to fulfil legal obligations and policy objectives.

Publication link: Koehler, L., & Lowther, J. (2025). Tracing implementation of shark-related measures and actions in the Mediterranean Region in the context of international law. *Biological Conservation*, 302, 110930. doi.org/10.1016/j.biocon.2024.110930

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- BlueSky: Lydia: @vote4sharks.bsky.social
- Facebook: Lydia: www.facebook.com/lydia.koehler.3



Duckbill Eagle Ray (*Aetomylaeus bovinus*) in Golden Bay, Malta

Shark trade: Hunted at sea, collected in Lombok Island, shipped to China

Garry Andrew Lotulung
Photojournalist and Documentary Photographer

The majority of the population in Indonesia lives in coastal areas and relies on the marine ecosystem for their livelihoods and food security. Sharks and rays play an important role in the ecosystem from an ecological point of view but are also a source of livelihood for many of these coastal communities. Indonesia is one of the world's largest shark and ray fishing nations and a major exporter of shark and ray products, including fins, liver oil, meat, and skin. Two-hundred-eighteen (218) of the world's 1,250+ shark and ray species are found patrolling reefs and deep-sea troughs across Indonesia. Overfishing is driving most of these species to extinction, with Indonesia, Spain, and India amongst the world's largest shark and ray fishing nations. Indonesia is also put in a negative spotlight, along with other countries in the tropics, such as Brazil, Mauritania and Mexico, as major international suppliers of shark meat or domestic consumers.

Tanjung Luar is one of the largest shark and ray markets in Indonesia and Southeast Asia. It is located in a fishing village facing the Indian Ocean in East Lombok, West Nusa Tenggara Province. Fishers sail from here using wooden boats with 15-30 gross tonnage (GT) engines. The operational costs of going to sea are relatively high, reaching IDR 15 million (~USD 896.63) per trip. They use drift longline and bottom longline fishing rods. Once they return, at the edge of the pier, several fishers can be seen moving sharks from their boats to the shore and then taking them to the Fish Auction Place / Tempat Pelelangan Ikan (TPI). At such landing sites, fishers take turns placing their catches, among other sharks, to be sold. Fishers cut the fins from the shark's body and sell the fins and meat separately. In Tanjung Luar, most fishers sell shark meat directly to the community at the landing site or sell the meat at local markets. If there is a large catch (more than three specimens), they usually sell it to shark meat traders.

"We [fishers] here know what is prohibited," said Superman, one of the collectors in Tanjung Luar. Three types of species are prohibited, namely manta rays [*Mobula* spp.], sawfish (Pristidae family) and Whale Sharks [*Rhincodon typus*]. Superman stated that if a Whale Shark was auctioned, he would not want to buy it. Even if given for free, he would refuse. The fishers know the consequences of violating the prohibition. "[Fishers] do not dare to catch them at all," said Superman, who has been a shark collector since 1995.

Long before the ban on Whale Sharks, Tanjung Luar fishers believed that this species brought good luck and should not be hunted. The presence of Whale Sharks indicates that the waters are full of small fish. Fishers will specifically fish around the path Whale Sharks pass. "[Fishers] believe that Whale Sharks should not be caught," Superman said.

On the other hand, for other species of sharks and rays, if they are not prohibited and there is high demand for their fins and meat, fishers will continue to catch them. "[Fishers] in Tanjung Luar need 15 to 20 days to [target] sharks before the number of catches reaches dozens," said Safruddin while carrying the day's shark catches from his boat. He noted that fishers operate in the waters of Sumbawa to Sumba in East Nusa Tenggara.

According to Safruddin, it is difficult to stop fishers from catching sharks in East Lombok, "This has been a traditional job from the previous generation that has passed to our generation and this has become a daily livelihood for the people here trying to make a living and the market price is still promising". Specifically, there is still demand for fins, meat, skin, bones, and teeth.

Fishers in Tanjung Luar Village can only bring around 10-30 sharks a day weighing 20-30 kg each. The sharks are sold at the Tanjung Luar Fish Auction Place (TPI) for IDR 600,000-1,000,000 (~USD 35.94-59.90) per shark. Currently, shark catches cannot meet the market demand of 200 sharks a day. However, just a decade earlier, that demand could be met.

Historically, in Indonesia, sharks were discarded after the fins were cut, but currently the local community retain shark meat to process into foods such as meatballs, satay, and smoked meat. The meat's lower price is the reason why shark meat sells well. A commonly found shark dish is shark satay. One skewer of shark satay is priced at IDR 5 thousand (~USD 0.30). Shark products are often processed in Rumbuk Village, Sakra District, East Lombok. The shark products are distributed to several traditional markets in East Lombok. The trade of shark fins in East Lombok Island is regulated by the Indonesian Government under the Ministry of Marine Affairs and Fisheries (KKP). Its implementation is the responsibility of the Coastal and Marine Resources Management Centre (BPSPL). BPSPL has the authority to provide permits and legalization for traders. In Tanjung Luar, there are only two traders who have permits for the shark fin trade. Currently, licensing and implementing regulations have improved as there are legal traders who work with shark fishers to catch sharks according to the quota given by the government. Monitoring is under the authority of the BPSPL, the Marine Resources and Fisheries Monitoring (PSDKP), and the Fish Quarantine Centre for Quality Control and Safety of Fishery Products (BKIPM). Smooth Hammerhead (*Sphyrna zygaena*), Scalloped Hammerhead (*Sphyrna lewini*), Great Hammerhead (*Sphyrna mokarran*), and Silky Shark (*Carcharhinus falciformis*), are the target of illegal trade. In fact, they are listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II. Therefore, these species are threatened with extinction



Safruddin carries a fresh-caught shark from a fishing boat at a traditional fish market in Tanjung Luar, Lombok Island, West Nusa Tenggara



Safruddin carries a fresh-caught shark from a fishing boat at a traditional fish market in Tanjung Luar, Lombok Island, West Nusa Tenggara

Photos by Garry Andrew Lotulung



A worker is cutting up sharks that are being prepared for cooking at a shark warehouse in Rumbuk village on the Indonesian island of Lombok

if unsustainable trade continues. The Indonesian government controls the capture and use of sharks and rays through the Regulation of the Minister of Marine Affairs and Fisheries Number 61 of 2018. This regulation regulates the capture, maintenance, and trade of species included in CITES appendices. Thus, traders are legally obliged obtain a letter of recommendation to capture, trade, or retain caught species.

Shark fins have been controversial but also the most expensive derivative product. Shark finning involves catching sharks, removing their fins, and often discarding the rest back into the ocean and left to drown. Shark fins are in demand due to their monetary and cultural value. An estimated 23 to 73 million sharks are caught each year for their fins. However, in Indonesia, all parts of the shark's body are sold. The price of shark fins can reach IDR 3 million (~USD 179.36) per kg, or ranging from IDR 300,000-660,000 (~USD 17.93-39.45) for 50 grams. Shark fins are exported to several countries including China, Thailand, Hong Kong SAR, and Japan via Surabaya, East Java, the second largest city in Indonesia.

In China, shark fins are a delicacy, namely in shark fin soup, and used for their medicinal qualities that are said to be an aphrodisiac and a cure for cancer. Shark fins soup has become one of the most expensive dishes in the world, and with the rise of the middle class in China, the demand for shark fins has skyrocketed. As such, China is the main export destination from Indonesia, with a total export value in 2017 reaching IDR 626 billion (~USD 37.4 million), followed by Thailand (IDR 356 billion or ~USD 21.3 million). Meanwhile, live sharks are mostly exported to Hong Kong SAR with around 1,098 specimens reported annually. However, Japan is also a major market, with more than half of Indonesia's shark fin exports in 2024 worth USD 1.63 million flowing there. In the past five years, Japan has imported more than USD 2 million worth of shark fins from Indonesia, reflecting a high demand despite the global push for shark conservation.

According to various studies, an estimated 80-100 million sharks may be killed annually, averaging almost 274,000 sharks every day, or over 11,000 sharks every hour, and around three sharks every second. Often targeted for their fins, this practice affects many different shark species, including Whale Sharks.

The latest IUCN SSC Shark Specialist Group report (Jabado et al. 2024) indicates that in the last 20 years, since the publication of a similar 2005 report, the global demand for shark meat has nearly doubled, with the value of shark and ray meat now 1.7 times the value of the global fin trade. Over that time, the trade has diversified significantly and today, products such as ray gill plates, liver oil, and skins, are valued at nearly USD 1 billion each year.

Sarah Fowler, a scientific advisor from Save Our Seas Foundation, who led the publication of the 2005 report and contributed to 2024 report said "The conservation and management of sharks is difficult for a variety of reasons, but many governments are breaking down the silos that separate how we deal with sharks and rays as a fisheries resource and as wildlife to be conserved."

"Almost 20 years after the first report, there have been drastic changes, with sharks and rays now among the most threatened vertebrates on the planet," said Alexandra Morata, Programme Officer of the IUCN Species Survival Commission's Shark Specialist Group.

But armed with two decades of research and major policy changes, solutions are now being outlined country by country to guide governments in implementing conservation measures and sustainable fisheries.

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A fisher drying the fin near a traditional market in Tanjung Luar, on the Indonesian island of Lombok



A woman preparing the satay sharks for public consumption at a shark warehouse in Rumbuk village on the Indonesian island of Lombok





Women grills skewered shark meat for sale at a warehouse in Rumbuk village, Lombok Island, West Nusa Tenggara



Dead baby sharks lie on the floor of a fish market after being hauled up from the hold of a ship, ready to be sold in Tanjung Luar



A woman cuts the freshly-caught baby sharks at a traditional market in Tanjung Luar, on the Indonesian island of Lombok



Dead thresher sharks lie on the floor of a shark warehouse after being hauled up from the hold of a ship, ready to be cooking for public consumption in Rumbuk village



A worker drying shark skin during preparation for public consumption at a shark warehouse in Rumbuk village on the Indonesian island of Lombok



Shark fins are laid out to dry near a traditional market in Tanjung Luar, on the Indonesian island of Lombok



The game features tokens with different species icons, each having variable values that could be change based on social and fishery contexts

Pilaut

A Behavioral Research Tool for South-east Asian Shark and Ray Fisheries



Region
Update:
Asia

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In 2023, a mini-game session in Singapore with shark and ray enthusiasts from Southeast Asia (SEA) sparked the idea for a new tool. The game, based on the Common Pool Resource (CPR) approach (Travers et al., 2011), explored how players manage limited resources while competing for individual rewards. Despite its simplicity, the game revealed a surprising balance of cooperation and tension. This inspired us to develop a tabletop game to help fishers understand decision-making in real-life fisheries management. Aimed at scientists, conservationists, and resource managers, the game focuses on the human aspect of shark and ray conservation in SEA, where small-scale fisheries and shark-ray interactions happened occasionally (Mustika et al., 2021; Booth et al., 2023). It allows fishers to role-play scenarios and predict responses to management measures like compliance or retention rates. Conventional approaches to gathering social insights - interviews, focus group discussions, and case study analyses - often feel forced when species conservation is the primary goal (Foale et al., 2016). This creates an issue where communities might see conservation differently than the enforced view we bring (Foale, 2024). Moreover, this may lead to disingenuous engagement and misinterpretation, where respondents may provide answers they think we want to hear (Podsakoff et al., 2012).

When we set out to create a board game that truly resonated with Southeast Asian professionals, we knew it had to be more than just a game—it had to reflect the realities of shark and ray conservation in the region. To do this, we reached out to 12 conservation experts. A pattern quickly emerged from their stories, sharks and rays were still mostly caught as incidental catch and retained in small-scale fisheries. Many of these species—like the Scalloped Hammerhead (*Sphyrna lewini*), Pelagic Thresher (*Alopias pelagicus*), Bottlenose Wedgefish (*Rhynchobatus australiae*), and various *Himantura* (Dasyatidae family) rays—were already threatened. Yet, fishers often kept them, alive or dead, drawn by their high market value for fins and meat or simply to feed their families. Despite existing

policies—such as marine protected areas (MPAs), species-specific protections, and trade regulations—in many cases, enforcement was weak, and compliance remained low. However, there is hope. Some communities were beginning to adopt conservation measures, like temporarily closing nursery areas and releasing juvenile sharks and rays. These shifts were the result of trust-building efforts, and collaborative decision-making between conservationists and fishers. When fishers understood the value of conservation, compliance wasn't forced; it became a choice. This was the essence we wanted to capture in our game. Beyond a fisheries management simulation—could spark real conversations, reveal behavioral insights, and help decision-makers understand the complexities of conservation on the ground. Our contributors agreed: if the game could mirror these dynamics, it could be a powerful tool not just for learning, but for change.

The first time we saw our board game come to life, it was among close friends and fellow board game enthusiasts. We gathered around tables, testing every rule, rolling dice, and moving tokens across the board, eager to see if the mechanics held up. Were the rules clear? Did the game flow smoothly? These early playtests helped us refine the core aspects of the game—ensuring the physical components felt intuitive and aligned with the game's theme. To truly test if our games could reflect real-world fisheries, capturing the complex human dimension aspects; we needed to bring it to the people who knew these challenges firsthand—the fishers themselves. As the game sessions unfolded across the seas—in Karimunjawa, Indonesia and Tun Mustapha Park, and Bintulu, Malaysia—we saw a fascinating range of strategies emerge. Some players weighed their options carefully, calculating the risks of breaking the rules and getting caught. Others took an aggressive approach, prioritizing immediate gains despite the consequences. Some chose collaboration, discussing with one another to ensure catches stayed within sustainable limits. And then there were those who observed quietly, watching their peers' moves before following suit.

After six months of development, Pilaut was born - a name derived from the combination of the words pilihan (choice) and laut (sea) - from Bahasa Indonesia, Melayu, and Filipino. As its literal translations, Pilaut depicts and engrosses fishers in a decision-making game related to fishing in the sea. It brings out three gameplays with different game mechanics allowing users to adjust the use of Pilaut to their research and conservation needs. This highlights, including but not limited to, the varying species, fisheries characteristics, and conservation challenges in the SEA shark and ray conservation field. Most importantly, in most cases, it allows Pilaut to be used with high adjustability.

The first gameplay sets fishers to play as if they receive randomized catches - small /big fish, small/ big shark and ray -and must decide which to retain or release based on the rules played. The dilemma? A single big shark and ray can be worth more than many small or big fish, influencing fishers' decision making in retaining or releasing sharks or rays, spicing up the game, and ensuring interactions and influences are present as in real life.

The second one revolves around the decision making of each fisher in choosing where to fish. However, the randomized catches is the same as the first gameplay. Fishers will not be able to guess what they would catch in which fishing ground. The only visible object is the marker of a no-take zone or MPA. Fishers are given the freedom to choose: risk fishing in MPAs where valuable sharks or rays could be abundant, with a potential penalty, or losing an incentive benefiting the local communities. The 'go big or go home' scenario often emerges, especially after seeing their fellow fishers have scooped up higher points than them.

The last gameplay puts fishers in a situation where they know which fishing grounds have an abundance of a primary fish species. Whether it is the small fish, big fish, or the sharks and rays, the play brought up the essence where fishers understand species-specific habitat better than us. Excitingly, each fishing ground has different fishing limitations, with some being only once while others twice, to simulate an overfishing scenario. Moreover, fishers have the same opportunity to be able to choose to retain or release the fish they catch.

Depending on research questions, the game masters could introduce different types of incentives (positive or negative) and rules that are suitable in their project site social and management context. Despite its flexibility and adjustability, Pilaut underlines the need to allow the game to run as a research tool. First, it needs to be able to answer the research questions, hence the choice of gameplay is crucial. Then, the prevention of bias in response is minimized through the use of actual rewards for the winner of each game using different scenarios or rules (Travers et al., 2011). Additionally, a group reward may also be set to incentivize actions related to the dilemma of prioritizing personal or group benefit. Lastly, the use of rewards should not be mixed with the use of punishment. Although in the real life application it may be necessary to use both, separating their use will help scientists and conservation practitioners understand which works better.

So, is Pilaut for you? Let's hear from a few of our friends below about what they think.

"Games also provide fun and engaging ways to understand people's behavior and decision which can be used alongside other methods like interview and focus group discussion to start conversations about

conservation problems and build relationship, mutual understanding and trust with communities" - Hollie Booth, Researcher at Oxford University, Member, IUCN SSC Shark Specialist Group

"The research for Pilaut was comprehensive, combined with a well thought of game mechanics produced an excellent and fun game-based research game." Effendy Norzaman, Malaysia Board Game Designer, Founder, FnD Mindspot

"Pilaut is an amazing and interesting game that combines human behavioral thought process and decision making in different scenarios through gamification. This innovative fun approach can easily be picked up by any level of stakeholder and allows researchers to document, understand, and measure decision making outcomes. This collated information can then be used to influence conservation management and policy making approaches that are more realistic to everyday life on the ground." - Adam Lim Chee Ooi, Member, IUCN SSC Seahorse, Pipefish & Seadragon Specialist Group

We would like to thank the Young Southeast Asian Leadership Initiatives (YSEALI) Seeds for the Future Program for funding this work. To all our case study contributors, mentors, and advisors, we would like to thank you for your time and valuable insights.

If you have any questions, or are interested to further explore the Pilaut application in your research. Don't hesitate to reach out to us at info.wcqgame@gmail.com

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The player screen and player board doubling as a small fishing boat add both immersion and functionality. It reinforces the secrecy of each fisher's catch, making the decision to retain or reveal more engaging.



Pilaut key indicator specieshopes to represent coastal fish, shark and ray species-recognizable by fishing communities in Southeast Asia region

Photo by Wildlife Coexistence Quest



Playtesting session with local fishers in Bintulu, Sarawak, Malaysia

Catch the wave at the forgotten island, Maluku Barat Daya: Discover the diversity and threats to sharks and rays



Region
Update:
Asia

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The Maluku Barat Daya [MBD] is an archipelago between Banda and Timor Sea in the eastern part of Indonesia. The area encompasses 72.427,2 km² [about 2.5 times larger than the Hawaiian archipelago] and consists of 48 islands, seven of which are among Indonesia’s outermost islands. MBD is under-developed and distant from the mainland, far from any well-travelled routes, remaining remote from both Indonesia and the rest of the world, hence, the nickname the ‘Forgotten Islands’. However, this isolation has allowed the MBD to remain one of Indonesia’s most biodiverse regions and nestled within Indonesia’s Coral Triangle. It provides critical habitats for a wide range of shark and ray species making it a vital stronghold for species conservation.

The biodiversity expeditions conducted by the World Wildlife Fund (WWF) Indonesia in 2014, 2022, and 2024 recorded a variety of shark and ray species in the MBD. This included the elusive Scalloped Hammerhead [*Sphyrna lewini*], the majestic Reef Manta Ray [*Mobula alfredi*], the gentle Indo-Pacific Leopard Shark [*Stegostoma tigrinum*], and the Critically Endangered Bottlenose Wedgefish [*Rhynchobatus australiae*]. The team used Baited Remote Underwater Video [BRUV] systems, performed underwater visual censuses, conducted environmental DNA (eDNA) sampling, used drone surveys, collected data from fishing activities, and interviewed local communities during the expeditions. They also surveyed other keystone species such as sea turtles and marine mammals, and confirmed this area as a corridor for whales,

dolphins, and Dugong [*Dugong dugon*] movements. The relative abundance of sharks and rays (SPUE/Sighting Per Unit Effort) is 0.44 individuals/hour, and the Whitetip Reef Shark [*Triaenodon obesus*] was the most frequently recorded species, followed by the Grey Reef Shark [*Carcharhinus amblyrhynchos*]. This finding may indicate the importance of the region in terms of supporting shark and ray populations associated with coral reefs.

The species richness of MBD’s sharks and rays might be higher, as some of the animals observed could not be identified due to a lack of picture resolution and the need for further genetic analysis [for samples from the meat / fins found in the village and local market].

Unfortunately, these pristine waters are not without threats; there are also indications of overfishing and incidental catch occurring in the MBD. The utilization of shark and ray products contributes significantly to local livelihoods and the economy. Sharks and rays are caught using various fishing gear, including gillnets, longlines, and spearfishing. In Metimarang Island, a fishing base, bycatch rates are estimated to be 182 individual sharks per year with an average of 15-20 fishing trips per month. Fishers can operate with 13 boats [0.3-0.5 gross tonnes, GT] and target groupers [*Epinephelus* spp., *Plectropomus* spp., and *Cephalopholis* spp.] and Snappers [*Lutjanus* spp.] using handlines, while Needlefish [*Hemiramphus* spp.] and Yellowstripe Scad [*Selaroides leptolepis*] are caught with bottom gillnets. These bycatch rates are likely higher on larger islands, where fishing fleets are more numerous

Table 1. Shark and ray species (n=17 species) found in MBD waters and their IUCN Red List of Threatened Species status. Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES, Critically Endangered – CR, Endangered – EN, Vulnerable – VU, Least Concern – LC. *Evidence based on landing data and fishers’ knowledge.

Species		Common name	IUCN Red List status	CITES listing
SHARKS	<i>Alopias pelagicus</i> *	Pelagic Thresher	EN	Appendix II
	<i>Carcharhinus albimarginatus</i>	Silvertip Shark	VU	Appendix II
	<i>Carcharhinus amblyrhynchos</i>	Grey Reef Shark	EN	Appendix II
	<i>Carcharhinus melanopterus</i>	Blacktip Reef Shark	VU	Appendix II
	<i>Carcharhinus falciformis</i>	Silky Shark	VU	Appendix II
	<i>Ginglymostoma cirratum</i>	Atlantic Nurse Shark	VU	Not listed
	<i>Nebrius ferrugineus</i>	Tawny Nurse Shark	VU	Not listed
	<i>Sphyrna lewini</i> *	Scalloped Hammerhead	CR	Appendix II
	<i>Stegostoma tigrinum</i>	Indo-Pacific Leopard Shark	EN	Not listed
	<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU	Appendix II
RAYS	<i>Aetobatus ocellatus</i>	Spotted Eagle Ray	EN	Not listed
	<i>Himantura</i> spp.	Stingrays		Not listed
	<i>Mobula alfredi</i>	Reef Manta Ray	VU	Appendix II
	<i>Pateobatis jenkinsii</i>	Jenkins' Whipray	EN	Not listed
	<i>Rhynchobatus australiae</i> *	Bottlenose Wedgefish	CR	Appendix II
	<i>Taeniurops meyeri</i>	Blotched Fantail Ray	VU	Not listed
	<i>Taeniura lymma</i>	Bluespotted Lagoon Ray	LC	Not listed



Photos © WWF Indonesia



BRUV footage [clockwise]
Grey Reef Shark [*Carcharhinus amblyrhynchos*], Blacktip Reef Shark [*Carácharhinus melanopterus*], Whitetip Reef Shark [*Triaenodon obesus*], Tawny Nurse Shark [*Nebrius ferrugineus*]

WWF Indonesia

and operate at higher capacity [in terms of GT]. There is limited information on whether fishers have appropriate permits for catching, trading, or utilizing Convention on International Trade in Endangered Species of Wild Fauna and Flora [CITES] Appendix II listed species. Of the shark and ray species caught in Indonesian waters, this includes requiem sharks [Carcharhinidae family] and hammerhead sharks [Sphyrnidae family], despite Indonesia’s strict annual quota. Additionally, CITES-listed species like thresher sharks [*Alopias* spp.] are still being landed—either in targeted fisheries or as incidental catch—for their fins and meat. Although Indonesia has ratified CITES and has a strict annual quota on protected sharks, it is common for enforcement to be challenging in remote areas, such as the MBD. Shark fins are sold to neighbouring regions, such as Saumlaki. The meat, on the other hand, is consumed locally and sold at prices ranging from IDR 30,000-50,000 [~USD 1.78-2.97] per kilogram or per piece. Additionally, shark fishers from outside MBD that use larger fishing vessels and fishing gears, for example from Makassar, South Sulawesi, target demersal and pelagic species in this area. Sharks and rays are caught incidentally as well, to distribute the meat to local communities in MBD while the fins are retained on board to sell in other regions. Considering this market demand, there is an urgent need for conservation and management plans in MBD. Without immediate action, continued overfishing and incidental catches may drive these threatened species closer to extinction, threatening the overall health of the coral reef ecosystem in MBD.

Conservation efforts in MBD have begun to take shape through Marine Protected Areas [MPAs] that were established in 2022, covering the region of Mdoná Hiera, Lakor, Moa, and Leti in Maluku Province [a total of 371.722,43 ha]. However, these newly

established MPAs are already facing a variety of challenges including inadequate MPA management authorities, limited management capacity, low commitment and budget support, ineffective enforcement and surveillance, and insufficient monitoring and evaluation to measure the MPA’s effectiveness. In addition, there are communities existing in MBD before the creation of the MPAs, meaning that MPA management should be inclusive and consider the locals’ livelihood and traditions. The communities rely heavily on marine resources for their livelihood, which includes sharks and rays.

Community engagement is essential to ensure the long-term survival of sharks and rays in MBD. Awareness raising programs for fishers on sustainable fishing practices, bycatch reduction strategies, and animal handling training, combined with encouraging alternative livelihoods, such as wildlife tourism, may significantly reduce shark and ray fishing mortality. Collaborative management between the authorities and the local communities is essential, given their role as stewards of these waters, ensuring sustainable coexistence between people and marine life.

Being part of the ‘Forgotten Islands’ does not mean that sharks and rays—or other threatened species—should be neglected. These species are not only integral to the health of marine ecosystems but also to the livelihoods of coastal communities. Their decline could trigger cascading effects on biodiversity and disrupt the balance of ocean resources that many depend on. Urgent and sustained conservation efforts are essential to ensure that these species are not just identified but actively protected and managed, securing their role in the ocean for generations to come by working closer with the communities and ensuring the long-term benefit of the ecosystem for society.



Fins of Bottlenose Wedgefish
[*Rhynchobatus australiae*] found in MBD

Photo by Hery Sishean | WWF Indonesia



Healthy coral reef
ecosystem in MBD

Photo by M. Ramadhany | WWF Indonesia



Scalloped Hammerhead
[*Sphyrna lewini*] found in MBD

Photo by Hery Sishean | WWF Indonesia



Photo by Syaqui Tuasikal | WWF Indonesia

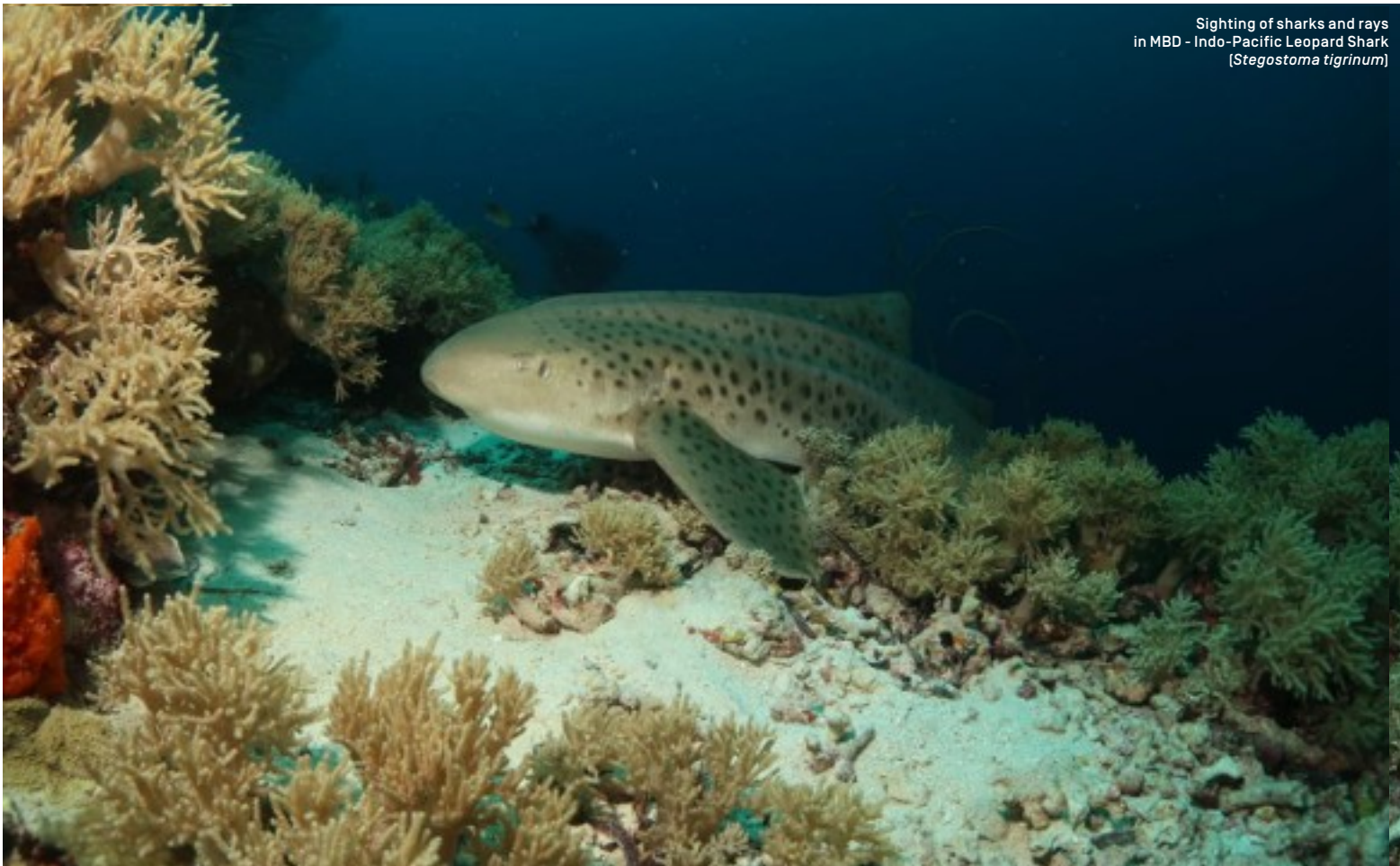
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Meet the expedition team in 2024. Expedition team (WWF, BRIN, Bionesia, Department of fisheries, Indonesian Navy, Local community)

Photo © WWF Indonesia



Sighting of sharks and rays in MBD - Indo-Pacific Leopard Shark (*Stegostoma tigrinum*)

Photo by M. Ramadhany | WWF Indonesia



Whitetip Reef Shark (*Triaenodon obesus*) found in MBD

Photo by Hery Siahaan | WWF Indonesia



Region
Update:
Asia

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On June 14, 2022, a Giant Freshwater Whipray (*Urogyrnus polylepis*) was caught in the Mekong River, weighing 300 kg [661 lbs], measuring 398 cm total length and 220 cm disc width. The female was recognized in the Guinness Book of World Records TM in 2024 as the largest freshwater fish ever verifiably measured, exceeding the previous record of 293 kg [646 lbs] for the sympatric Mekong Giant Catfish (*Pangasianodon gigas*).

The Giant Freshwater Whipray is distributed throughout the Bay of Bengal, southern mainland Asia and Southeast Asia. It is one of 10 euryhaline species of shark and ray, occurring across freshwater, estuarine, and inshore coastal habitats. They are most frequently observed in freshwater reaches of large floodplain river systems. Owing to a range of threats that have led to population declines including fishing pressure and habitat degradation from damming of rivers and development of river catchment areas for agricultural, residential, and commercial purposes, the Giant Freshwater Whipray is listed as Endangered on the IUCN Red List of Threatened Species [Grant et al. 2021].

The world record individual was caught by local fishers who contacted the Wonders of the Mekong project, a collaboration between the Cambodian Fisheries Administration and the Global Water Center at the University of Nevada, that has been studying and building capacity toward aquatic megafauna research in the lower Mekong Basin since 2017. Upon capture, the individual was acoustically tagged, which revealed in the year post-tagging her primary habitat was a deep pool in the upper Cambodian stretch of the Mekong River, near the confluence of the 3S Rivers (Sekong, Sesan, and Srepok rivers). The deep pools area of the upper Cambodian Mekong is renowned for its assemblage of Critically Endangered aquatic megafauna species, including the Mekong Giant Catfish, Giant Carp (*Catlocarpio siamensis*), Mekong Giant Salmon Carp (*Aptosyax grypus*) and supports one of three global freshwater populations of the Irrawaddy Dolphin (*Orcaella brevirostris*) [Lee et al. 2023]. Large tropical freshwater rivers are typically shallow and fast flowing, though the deep pools area of the upper Cambodian Mekong River are unique in that the area consists of a series of deep pools that reach 75 m in depth, characterized by high turbidity, low water velocity compared to the

Home of the Giants: Concern for the Mekong Rivers world record breaking Giant Freshwater Whipray population

The 300 kg female Giant Freshwater
Whipray from the Mekong River

surface, and greater stability than shallow areas during monsoons. Collectively, these environmental traits appear to provide a globally unique environment for aquatic megafauna species, potentially facilitating their evolution of large sizes. The long-term residency of the large Giant Freshwater Whipray individual solidified the importance of the deep pools area for this species. In 2024, it was recognized as an Important Shark and Ray Area (ISRA) by the IUCN SSC Shark Specialist Group (2024), on the basis that it supports distinctively large individuals of the Giant Freshwater Whipray.

Aquatic megafauna and their habitats are in critical decline worldwide. Since 1970, aquatic megafauna populations are estimated to have declined by 88% (He et al. 2019). While the Mekong River's aquatic megafauna feel the impact of these trends, the river continues to serve as a multispecies stronghold for threatened aquatic megafauna and a high value site for conservation efforts. However, conservation of aquatic megafauna in the Mekong River has its challenges. One of the threats is the development of dams within the Mekong River. According to the Stimson Centre, there are 745 dams either built or under construction within the Mekong Basin, including several in the mainstream of the river. The construction of dams alters the water flow, changes sediment loading and depth profiles, and generally degrades and fragments habitats, which is particularly problematic for migratory species. As of 2020, 45 hydropower dams have been built, proposed, or are under construction in the 3S River basin which adjoins the Cambodian deep pools area, and these dams in the lower Mekong Basin stand to pose severe risks to a range of species known to migrate into the 3S Rivers system (Eschenroeder et al. 2025). Alongside this, the Lower Mekong River supports the world's largest inland fishery, supporting the livelihoods of millions of people across Thailand, Cambodia, and Viet Nam (Ainsworth et al. 2021). The large size of the Giant Freshwater Whipray affords it some protection from fisheries, which mainly target small-bodied fish and crustaceans, however, occasional capture of even the largest Giant Freshwater Whipray individuals does occur; evidenced by the incidental capture of the 300 kg specimen. With little legislative protection, large human populations with significant livelihood dependence, and a challenging multilateral governance system, many of these threats remain unregulated, and continue to have negative impacts on the Mekong Rivers environment and aquatic megafauna populations.

While the establishment of the ISRA is an important step to safeguarding the distinctively large individuals of the Mekong Rivers Giant Freshwater Whipray population, several constraining knowledge gaps remain in the distribution of the species as well as their general biology, reproductive ecology, and migration patterns. A workshop hosted by the Wonders of the Mekong Project, with participants including the Cambodian Fisheries Administration as well as commune chiefs, community fisheries representatives, and fishers, was held in August 2022 to compile and share information about the Giant Freshwater Whipray in Cambodia. A subsequent workshop, again hosted by the Wonders of the Mekong Project, convened international species experts in November 2023 to discuss research and conservation priorities for the Mekong population. Due to constraints on logistics of data collection, such collaboration between stakeholders, such as local fishers, researchers, and policymakers is essential. For example, the communication network between local fishers in Cambodia and the Wonders of the Mekong Project that alerted the team to the capture of the world record individual highlights the importance of these collaborative community led actions and engagement in conservation initiatives.

The Mekong River supports aquatic megafauna populations within an otherwise heavily overexploited setting in mainland Asia.

There is a need to build on community fisher relationships to assist in minimizing fishery impacts on the Mekong's aquatic megafauna, and also to work with governments to prevent potentially irreversible environmental degradation of the Mekong River through overdevelopment of dam infrastructure.

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Presentation of the Guinness World Record TM in Phnom Pehn, Cambodia on the 14th November 2023. Zeb Hogan (left), Chea Seila (middle), Michael Grant (right)

Photos provided by Michael Grant



The 300 kg female Giant Freshwater Whipray from the Mekong River





Photo by Muktha Menon

An exploration of shark and ray consumption in India



Region Update: Indian Ocean

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Sharks and rays in India

Sharks and rays form an indispensable component of the multi-species marine fisheries of India and have been consumed in the country from ancient times. Nearly 174 species of sharks and rays have been reported from India, of which 67.3% are threatened on the IUCN Red List of Threatened Species [Akhilesh et al., 2023]. Given their ecological and economic value, sharks and rays have also been researched extensively in India, however, most studies have focused on fisheries, ecology, and biology. Shark and ray research from India is limited when it comes to socioeconomics, especially in relation to shark consumption and utilization patterns in the country. This lacuna led to the genesis of a study on shark trade and consumption in India by the Indian Council of Agricultural Research – Central Marine Fisheries Research Institute (ICAR-CMFRI) along with the World Wildlife Fund (WWF)-India. In this study, we attempted to map shark and ray consumption patterns in India and gauge how much consumers know about sharks and rays, their status, and conservation needs in the country.

Consumer survey results

The study was conducted across all coastal states of India, covering 309 respondents and was carried out at fishing harbours, fish landing centres, and fish markets. Respondents were selected randomly, and those willing to participate were interviewed using a semi-structured questionnaire and during stakeholder meetings. The key findings from the study were:

- Fish consumers spent a lot on fish, but their consumption of sharks and rays was relatively low;
- Sharks and rays were not regularly consumed; rather, they are preferred at some time periods or during festivals/ specific to ethno-seasons;
- Shark and ray consumers indicated that their consumption of these species has decreased over the years;
- The main constraints faced by consumers were the poor and/or irregular supply of sharks and rays, high prices, and non-availability of preferred species;
- Requiem sharks (*Carcharhinus* spp.), spadenose sharks (*Scoliodon* spp.), and stingrays (Dasyatidae family) were the most preferred species by consumers, but smaller sized sharks and rays also have regular demand; and
- Species preference differed by region. Overall, sharks were preferred over rays (including guitarfish).

Consumer perception of sharks and rays

Our study indicated that most consumers viewed sharks and rays as 'special' rather than 'regular' fish, which could be eaten daily. Consumer awareness regarding the status of sharks and rays and their conservation needs was quite poor; most of them were unaware that several species of sharks and rays were protected in India under the Wildlife (Protection) Act, 1972. Even amongst those who were aware of shark and ray conservation, many were not aware of the relevant species, but had some inherent perception that 'big sharks' were protected. This indicates that their perception of the conservation of these species was based on 'size'. From our study, it was evident that consumers should be considered for effective shark and ray conservation campaigns, which have traditionally focused on fishers and traders. Such campaigns can be situated at major retail sites, making information accessible and familiar to consumers.

Recommendations for effective conservation of sharks and rays in India

From the results of the study, we put forth several recommendations that, if implemented, can improve conservation of sharks and rays in India:

- Create a list/database of shark and ray species that need protection and those that can be sustainably harvested and consumed;
- Encourage consumption of shark and ray meat sourced from sustainable fisheries as an alternative, mainly for species that are not threatened;
- Create awareness among stakeholders and consumers (especially women) of the different shark and ray species, their conservation needs, and conservation strategies; and
- Involve the youth in conservation awareness campaigns.

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Ray cut for sale in Mumbai





Angelsharks: Key to an emerging Marine Protected Area



Region
Update:
Mediterranean

Written by
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Angelsharks: Key to an emerging Marine Protected Area

The Angelshark (*Squatina squatina*), one of the most threatened shark and ray species in the world, is currently listed as Critically Endangered on the IUCN Red List of Threatened Species. Once widespread across the coastal waters of the Northeast Atlantic Ocean and Mediterranean Sea, this species has experienced drastic population declines due to overfishing, habitat degradation, and increased anthropogenic pressures. Today, the Canary Islands are considered a critical refuge for Angelsharks, offering some of the last remaining strongholds for populations despite being at the upper end of their preferred thermal range.

Since 2014, the Angel Shark Project: Canary Islands (ASP:CI) has been leading the charge to safeguard the future of Angelsharks in the region. Coordinated by a multidisciplinary team of researchers and conservationists, ASP works to protect this species through a comprehensive programme combining scientific research, policy advocacy, education, and community engagement. ASP’s approach has been instrumental in positioning the Canary Islands as a global hub for Angelshark conservation.

As a result, the archipelago has become the focal point of several scientific and conservation initiatives that aim to better understand the ecology and space use of this elusive benthic shark, and to implement effective conservation measures informed by robust, long-term data. Two significant research initiatives—one based in La Graciosa Marine Reserve and a second underway in the proposed Lobos Marine Corridor between northern Fuerteventura and southern Lanzarote—are yielding invaluable insights that will support the long-term spatial protection and recovery of Angelsharks.

Understanding the Spatial Ecology of Angelsharks in La Graciosa Marine Reserve

La Graciosa Marine Reserve (LGMR), established in 1995, is the largest marine reserve in Spain. It comprises over 70,000 hectares of protected marine and coastal habitats in the easternmost part of the Canary Islands. In recent years, the reserve has become a cornerstone for Angelshark research, providing a controlled

environment in which to study the behavioural and ecological patterns of this elusive species.

Between 2018–2024, the ASP:CI deployed an array of acoustic receivers across key habitats in the LGMR and tagged over 100 adult Angelsharks using coded acoustic transmitters. A recent study provided the first long-term telemetry data on spatial and temporal habitat use, sexual segregation, and diel behaviour.

Key findings from the study include:

- Distinct patterns of space use between males and females, with males displaying higher mobility and a greater tendency to utilize deeper offshore habitats.
- Evidence of year-round presence of both sexes in the reserve, with clear seasonal peaks in late autumn and winter, suggesting the area may serve as an important breeding ground.
- Sexual segregation, both social and habitat-driven, indicating different spatial and environmental preferences between sexes that may be linked to mating behaviours or physiological needs.
- Nocturnal activity patterns in both sexes, with increased movement and roaming behaviour recorded during night-time hours.
- Seasonal site fidelity, with some individuals returning to the area in the following year, providing further evidence of LGMR being a breeding site.

These insights underscore the importance of considering sex-specific behavioural patterns, spatial connectivity across habitats, and seasonal variation when designing area-based protection measures. Researchers are now investigating the role of environmental conditions – especially temperature – in driving Angelshark movement and habitat use.

The Lobos Marine Corridor Project: Using Angelsharks as a flagship species to designate a new marine protected area (MPA) in the Canary Islands

Building on the success and methodologies of the LGMR project, ASP has launched a new acoustic telemetry study in the marine corridor between northern Fuerteventura and southern Lanzarote, with a special focus on the waters surrounding Lobos Islet. This area, known for its shallow straits and varied seabed, has been identified by ASP as a Critical Area for Angelsharks due to its importance as a habitat for different life stages of this threatened species. In addition, Lobos Islet is part of a Biosphere Reserve, lies within a Special Area of Conservation (ZEC) under the European Natura 2000 network, and is currently being considered for designation as a Marine Reserve (MR), highlighting its ecological richness and the need to regulate human activities and reduce environmental pressures.

Angelsharks in this region are especially exposed to human activities and multiple anthropogenic threats, in contrast to individuals living in more strictly protected areas such as LGMR. The corridor between Fuerteventura and Lanzarote is a busy zone that experiences intensive coastal tourism, recreational diving, boat traffic, as well as professional and recreational fishing, all of which contribute to increased disturbance in the marine environment. This situation offers a valuable opportunity to study and compare the behaviour and habitat use of Angelsharks in areas with different levels of protection and human impact, helping us

better understand how conservation efforts influence their ecology and resilience.

The ‘Lobos Corridor Project’, developed with the support of the Ocean Tracking Network (OTN) and funded by the MPAs: Canary Islands project, seeks to address key scientific questions that will inform future conservation planning and MPA effectiveness:

- Do Angelsharks use the marine corridor between Fuerteventura and Lanzarote for inter-island movement?
- What are the spatial and depth-related habitat preferences of Angelsharks in this corridor?
- To what extent do human activities, such as fishing and coastal development, influence the distribution and behaviour of Angelsharks?
- What is the degree of connectivity between shallow coastal zones and deeper offshore habitats within the proposed MPA?
- How much time do Angelsharks spend inside the proposed MPA boundaries, and how does this vary seasonally or across individuals?
- Are Angelsharks more exposed to higher bycatch risk in areas located outside the proposed MPA?

Strategic Objectives

The project is designed to deploy a network of acoustic receivers strategically located across key habitats in the corridor. The project’s objectives are both ecological and strategic:

- Strengthen and expand the MPA network in the Canary Islands using the Angelshark as a flagship species.
- Support the designation of the Lobos Corridor MPA as a contribution to the Convention on Biological Diversity’s Global Biodiversity Framework’s targets, including Target 3 (protecting 30% of waters by 2030).
- Generate science-based evidence to inform spatial management and fisheries policy.
- Improve ecological connectivity and protection of critical habitats for this Critically Endangered species.
- Promote stakeholder engagement and co-management approaches for effective and inclusive conservation.

Toward a Connected Network of Marine Protected Areas

The integration of data from both La Graciosa and the Lobos Corridor has the potential to significantly strengthen the MPA network in the Canary Islands. By identifying ecological linkages between populations and habitats, researchers and policymakers can develop conservation strategies that go beyond isolated reserves and promote broader ecosystem connectivity. In this context, recent genetic research has confirmed that Angelsharks from La Graciosa, Lanzarote, and Fuerteventura belong to a single, genetically connected population, forming a distinct management unit within the archipelago. These findings highlight the importance of considering these areas together when planning conservation actions and underscore the value of the Lobos Corridor as a functional extension of the La Graciosa Marine Reserve. Strengthening protection across these ecologically linked sites is essential to support the long-term viability of the species and enhance the resilience of the MPA network.

As efforts accelerate toward the protection of marine biodiversity, the Canary Islands represent a valuable case study for advancing effective, evidence-based conservation, particularly for threatened species such as the Angelshark. In close collaboration with the Ministry for the Ecological Transition and local government authorities, we are contributing to the delineation of new protected areas, the improvement of MPA management, and the integration

of scientific data into policy and planning processes. This work supports broader regional and global objectives and is fully aligned with international commitments such as the GBF Target 3, which aims to protect 30% of the ocean by 2030 through well-managed and ecologically representative MPAs. At the same time, it helps to position the Macaronesia region as a key contributor to global marine conservation efforts, highlighting its ecological importance and the need for tailored, region-specific protection strategies.

For more information visit: www.angelsharkproject.com | www.angelsharkproject.com/canaryislands

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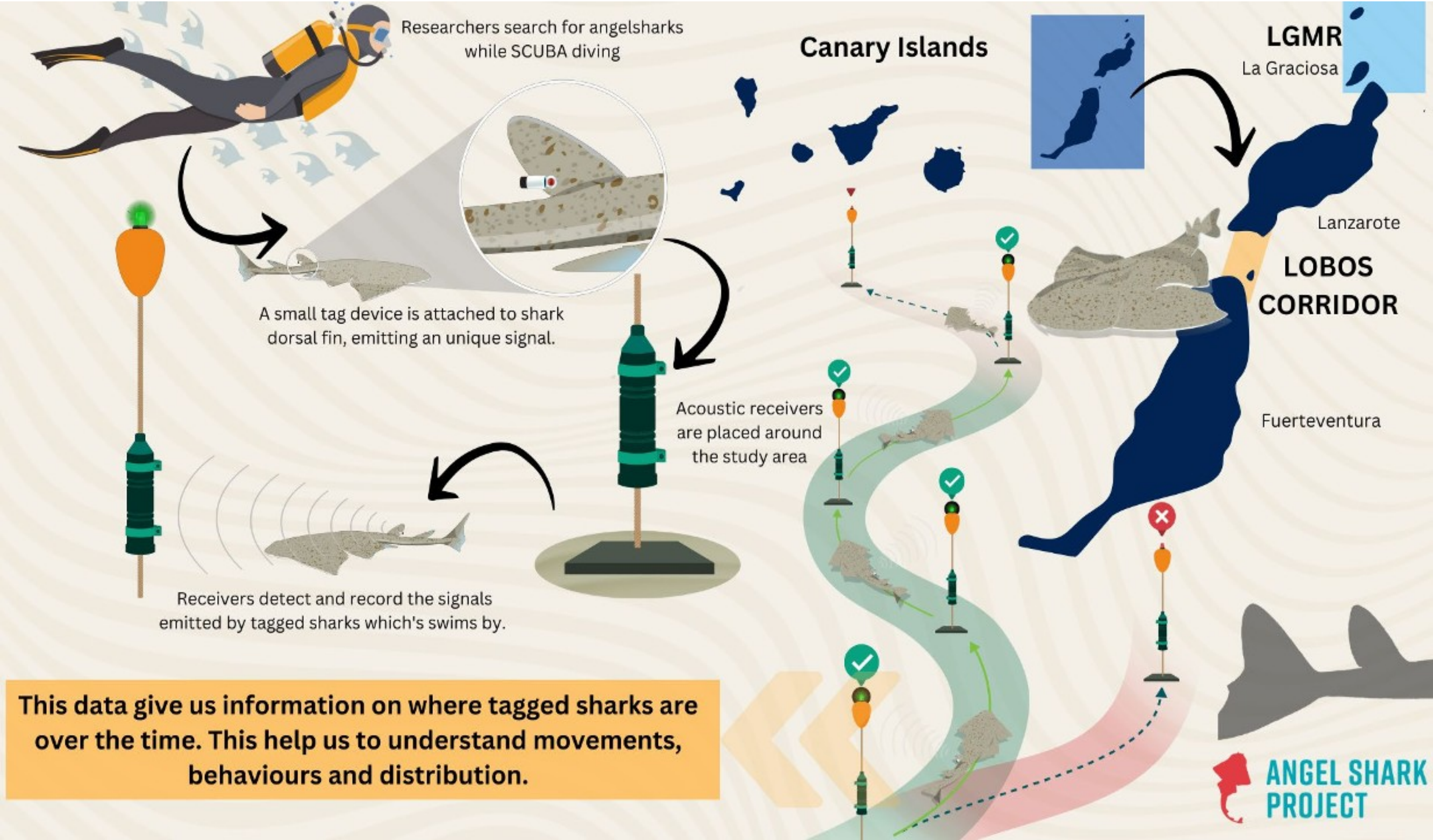
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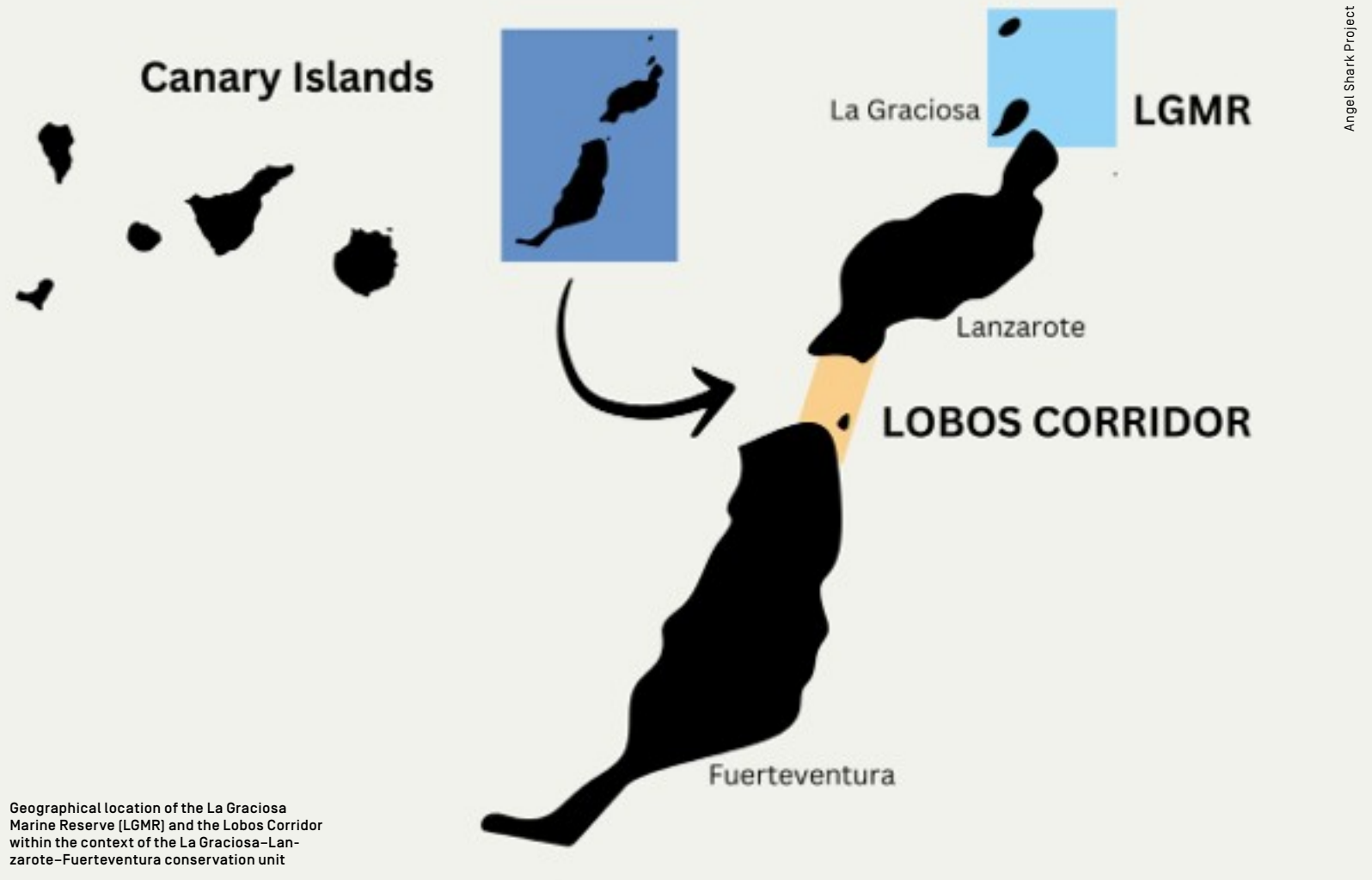
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Angel Shark Project



Photo by Michael Sealey



Photo by Michael Sealey



Photo by Nuno Vasco Rodrigues

Emerging from the abyss: Rediscovering the Angelshark along the Iberian coast



Region
Update:
Mediterranean

Written by
Angel Shark Project

The Angelshark (*Squatina squatina*) is a species of shark unlike most others, due to its physiology and unique characteristics. For centuries, it thrived in the Mediterranean Sea and along the eastern Atlantic coastline. Unfortunately, today it is listed as Critically Endangered, according to the IUCN Red List of Threatened Species.

The main driver behind this decline has been ongoing pressure from anthropogenic activities such as intensive fishing, habitat destruction, pollution, and a lack of awareness about its critical status. As a result, the Angelshark has disappeared from many areas where it was once common, now limited to a few small, partially isolated populations. In Spain, the species was considered extinct along the entire continental coastline, with its last known refuge limited to the waters of the Canary Islands, in the heart of Macaronesia.

Its absence from scientific studies, fisheries data, and species monitoring programmes along the Spanish coast led to the widespread belief that the Angelshark had been irretrievably lost from these waters. However, a small ray of hope has recently emerged. Thanks to the collaboration between local naturalists, scientists, and fishers. Along with the growing involvement of citizen science, multiple Angelshark sightings have recently been confirmed along the southern coast of Spain, specifically around Algeciras.

This discovery marks a historic moment and opens a new chapter in the conservation of this species in Spain. The return (or rediscovery) of the Angelshark in southern Spain is not only good news for the species, it also symbolises what can be achieved when scientists, fishers, and the public work together toward a common goal: species conservation.

Building on this encouraging discovery, future efforts should prioritize the implementation of proven monitoring strategies previously successful in other regions where Angelshark is present, in close collaboration with local stakeholders. A comprehensive understanding of the species' spatial distribution, identification of critical habitats such as potential nursery, mating, and seasonal aggregation areas, as well as insights into movement patterns and population connectivity, is essential. Such information will be vital to evaluating the feasibility of targeted management actions along the Andalusian coastline and may inform the development of a region-specific Recovery Plan. This plan should encompass habitat protection, long-term monitoring, and active engagement with both the scientific community and local fisheries sectors.

Furthermore, genetic analyses are recommended to verify the origin of these individuals and to assess whether they are part of a remnant local population or indicative of a recent recolonisation event. Should the presence of a stable population be confirmed, it could provide a critical foundation for initiating recovery efforts for the Angelshark along the Iberian coastline.

While significant challenges remain, each informed and strategic action taken will enhance the prospects of restoring this species and reestablishing its ecological role in the region's marine ecosystems.



Angelshark (*Squatina squatina*) in Spain



Surviving in a drowning sea

Written by
Hakan Kabasakal

IUCN SSC Shark Specialist Group Mediterranean and Black Sea
Region | WWF Türkiye

The recent discovery of a possible nursery ground of Longnose Spurdog, *Squalus blainville*, in the Sea of Marmara raises hopes for the future survival of threatened shark species in a marine region susceptible to dead zone formation in deep shelf and bathyal waters.

Just two days after leaving the port of Haydarpaşa in Istanbul, Türkiye all was well on board the research vessel Yunus-S. Being operated by the Faculty of Aquatic Sciences, Istanbul University, since the 1990s, the R/V Yunus-S is a sea-proven, enduring boat. Despite her ageing but strong hull, the old-school research vessel has been equipped with state-of-the-art scientific instruments and is capable of bottom trawling at depths of more than 1,000 metres. On a cold February morning, the research vessel was on its way to a trawling station a few miles off the eastern coast of the Sea of Marmara. The steep coastal hills with their misty peaks form a sculptural border between the blue sky and the green landscape. As I sipped my morning coffee, this magnificent view made me forget for a moment the fact that the deep Sea of Marmara was becoming increasingly deoxygenated and drowning its inhabitants.

The captain's metallic voice over the intercom, warning us of our arrival at the station, jolted me out of my morning dreams. The crew, with a routine well learned over the years, went to their stations to prepare the bottom trawl, rigged according to the protocol of the International Bottom Trawl Survey in the Mediterranean (MEDITS). The depth between the boat's hull and the seabed was 125 m, and between the two positions - the start and end points of the bottom trawl - marked on the chart, there was an average depth of 123 m. After the final checks, the trawling gear was deployed to sweep the bottom at a speed of 2.5 nautical miles for 30 minutes.

Officially, the week-long expedition, with ten stations in the eastern region, is part of a wider project to monitor pollution and the state of marine life in the Sea of Marmara that has been underway for the past decade. Like almost all other scientific expeditions before us, our main objective was well defined, and our official boundaries well drawn. But we were curious and our curiosity was not limited, pushing us to see everything our eyes could accommodate and to record what we found each time the codend was brought up from the seabed. About an hour after the trawl net was deployed, a small hill of benthic life was rising on the aft deck.

The species captured in the bottom trawl hauling did not surprise us at first. Based on the number of individuals per square kilometre of the swept area, crustaceans, Deep-water Rose Shrimp [*Parapenaeus longirostris*] and Soldier Striped Shrimp [*Plesionika edwardsii*], were the most abundant species, followed by bony fishes, *Trachurus* spp., European Hake [*Merluccius merluccius*], Brown Comber [*Serranus hepatus*], etc. After weighing and measuring a few Thornback Skates [*Raja clavata*], struggling with the shock of being out of the water, we immediately released them back into the sea. The marine litter coming up from the lower depths was evidence of the inevitable pollution in the inland sea stuck between

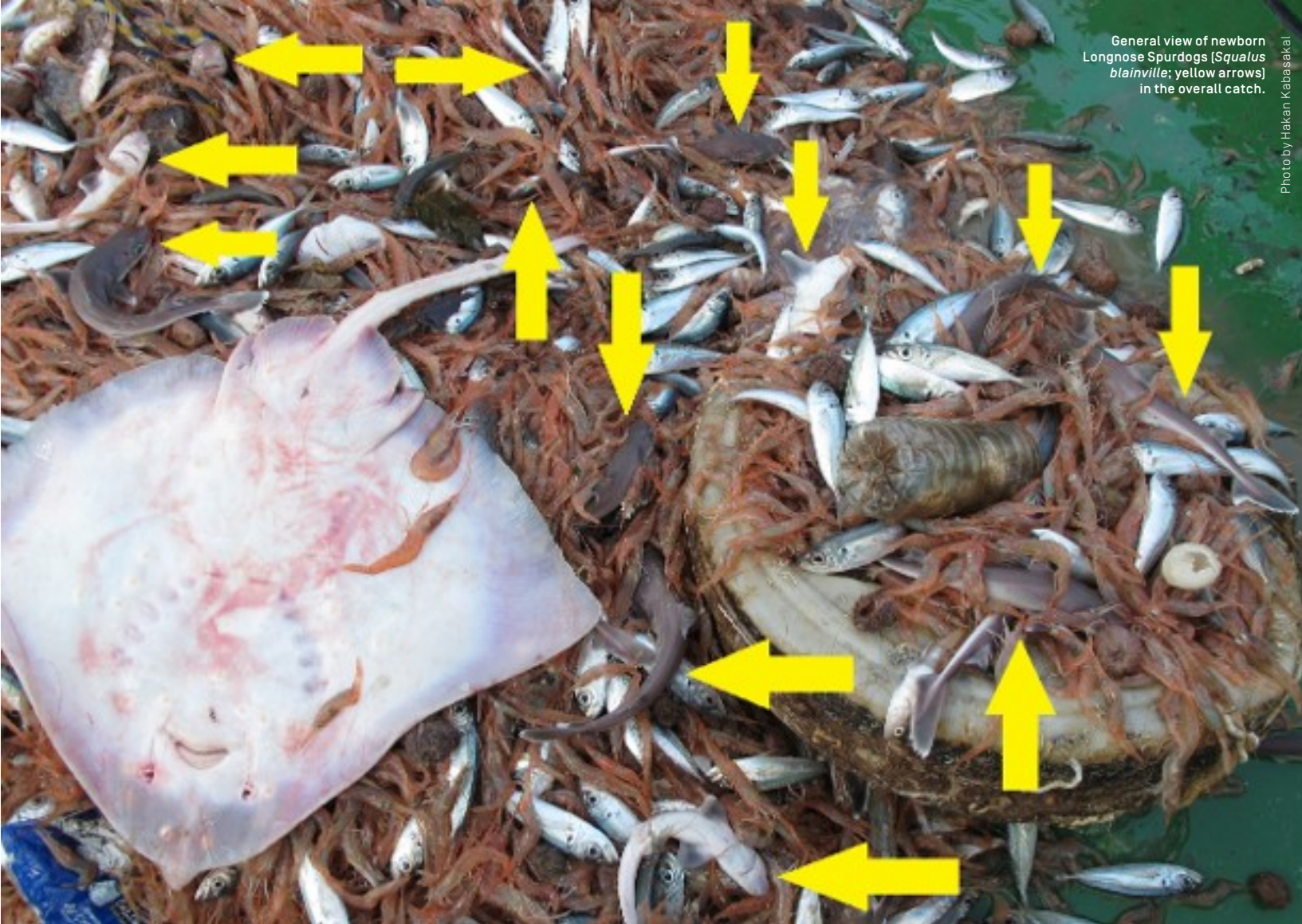
the metropolises. Even the small sharks that wriggled in the pile with hasty movements were not an unusual encounter. Nevertheless, we improvised a survival tank with the materials available - a large volume container and a water hose with an adjustable tube to supply seawater - and then we kept all the sharks in it. After keeping the newborns in the improvised survival tank, a few numbers [<10 individuals] were transferred to the second container where the specimen was turned upside down for a few seconds for tonic immobilisation, then weighed and measured as quickly as possible while holding the specimen gently. After examination the specimen was returned to the second container for resuscitation, once the newborn could swim freely, they were released to the sea. This standard procedure was repeated for each of the 176 newborns released alive into the sea. On closer inspection, however, all the pups had a distinct birthmark on their ventral surfaces, right between their pectoral fins, and in most of them this wound was still fresh and unhealed. This small but important detail provided the first evidence of a potential shark nursery in the eastern Marmara.

We identified all these newborns as Longnose Spurdog, a well-known resident of the Sea of Marmara since the early 20th century; however, this is the first time that solid evidence has been provided to suggest a potential nursery ground for this species in the region. In addition, the number of Longnose Spurdogs caught in the region, where we conducted our research over the last ten years, is statistically significantly higher than in other stations, supporting the possibility of a potential breeding area. However, this discovery, which raises hopes of survival in the Marmara Sea, at least for Longnose Spurdog, brings to mind other problems. It should be noted that Longnose Spurdog is a protected shark species under the Turkish fisheries law, which prohibits the targeted capture, taking on board, and landing and trade of live individuals. This ban has provided some protection against overfishing, which is recognised as the main threat to the survival of sharks, rays, and chimaeras worldwide. I cannot deny this, but habitat degradation and loss and marine pollution, which are also serious threats to sharks, rays, and chimaeras worldwide, seriously threaten the future survival of the Longnose Spurdog and other demersal species in the Sea of Marmara.

Despite being one of the most disturbed marine ecosystems of the Mediterranean basin today, the Sea of Marmara has always been considered as one of the most productive fishing grounds in Türkiye. As the suggested nursery is located close to the continental slope extending to the deepest (1,390 m) trench in the Marmara Sea, it can be predicted that neonates can easily reach areas at the deep ends of their natural habitat during their adult stages. However, due to anthropogenic impacts, the dissolved oxygen [DO] levels in the deep regions of the inland sea have decreased severely below the hypoxia threshold [DO < 2 mg/L] over the last 40 years, and even anoxia appears to be becoming more widespread. The average DO level in the potential breeding area was 1.38 mg/L.

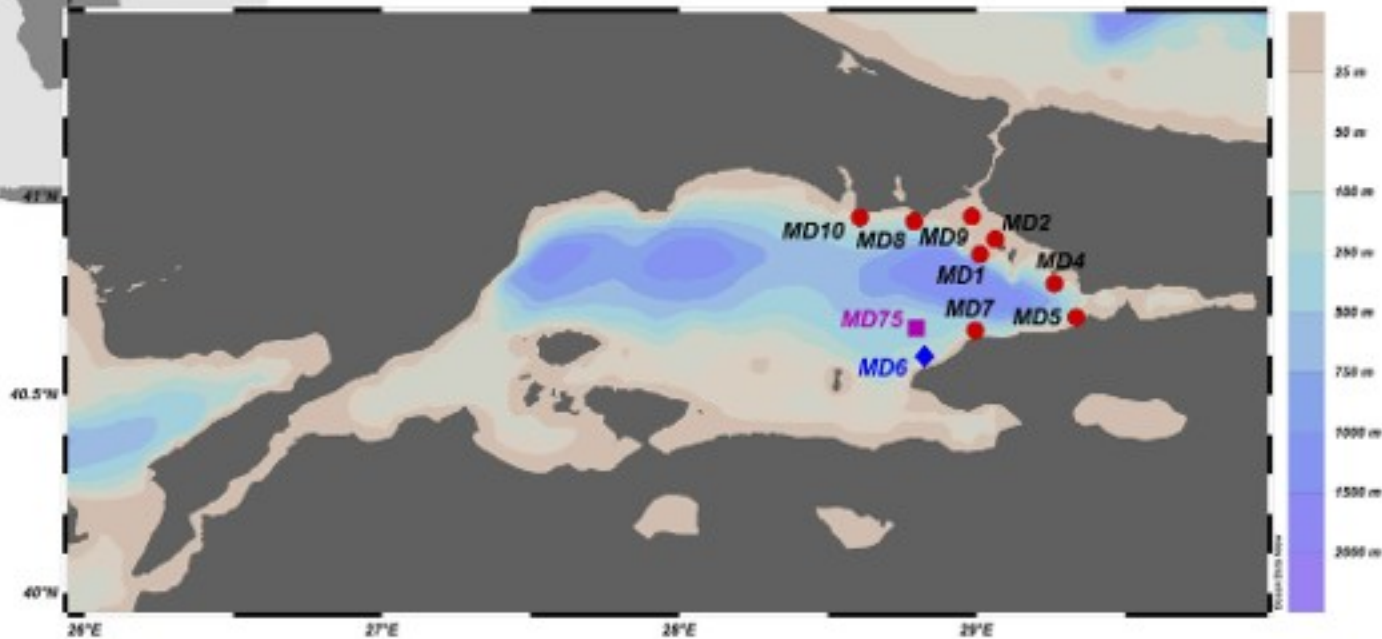


Region
Update:
Mediterranean



General view of newborn Longnose Spurdogs (*Squalus blainville*; yellow arrows) in the overall catch.

Photo by Hakan Kabasakal



Map showing the location of the investigated area in the Sea of Marmara with indicated potential nursery (MD6 station, blue solid diamond) and the deep station (MD75, purple solid square), where anoxia prevails.

As several researchers have pointed out in the past, deep-sea sharks may be forced to migrate to the shallows of the continental shelf in response to ongoing bathyal deoxygenation, leading to vertical habitat compression. And as the next step in the predicted vertical habitat compression due to bathyal deoxygenation occurs in the Sea of Marmara the Longnose Spurdog is expected to be trapped on the continental shelf, which is already affected by both intensive fishing activities and hypoxia. Therefore, in addition to reducing fishing pressure on the species by prohibiting targeted fishing, area-based conservation measures based on closing areas critical for sharks, rays, and chimaeras (e.g. nurseries) to fishing, either on a year-round or seasonal basis, should now be included in the conservation plans for Longnose Spurdog in the Sea of Marmara, where several Important Shark and Ray Areas (ISRAs) have already been identified in the northern regions of the sea.

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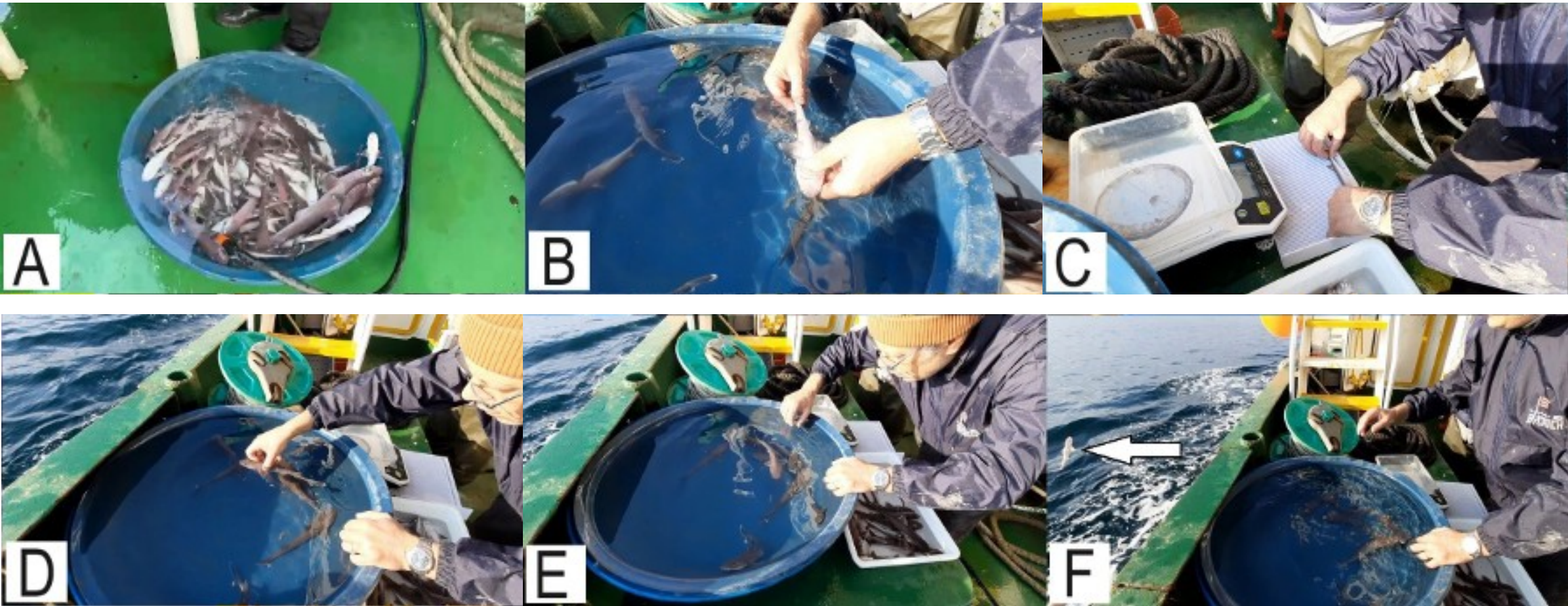
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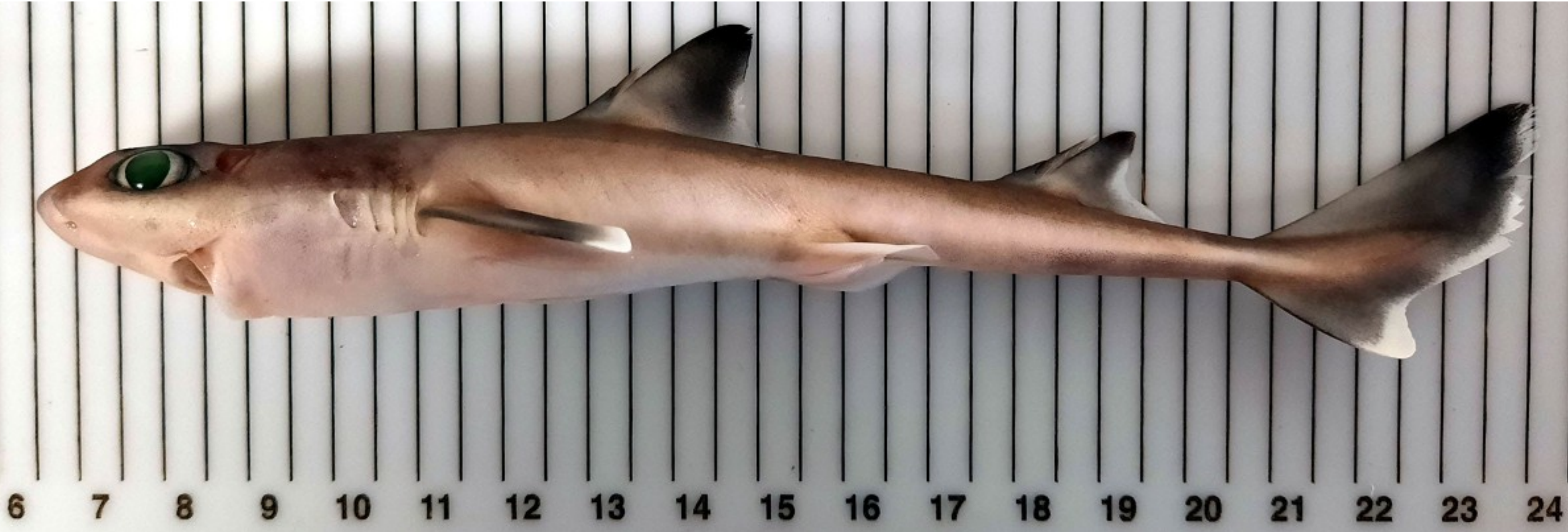
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Neonate Longnose Spurdog (*Squalus blainville*; total length [TL] 169 mm).

[a] Survival tank, [b] tonic immobilisation, [c] weighed and measured, [d] transferred for resuscitation, [e] observed if swimming freely, [f] released to the sea



Photos by Hakan Kabasakal



New Collaborative Portal Enhances Conservation Efforts in the Mediterranean



TSHARK addresses the urgent need for improved understanding of shark and ray movements and habitat use

In a significant step towards shark and ray conservation in the Mediterranean, a new online portal called 'TSHARK' has been launched to enhance data collection and collaboration efforts.

TSHARK, hosted by the University of Padova, aims to address the urgent need for improved understanding of shark and ray movements and habitat use. The portal facilitates conventional tagging campaigns by allowing researchers to deposit tagging data and providing fishers with an easy-to-use tool to report recaptures. Starting with seven collaborating institutions and over 2,500 tagged animals, the initiative seeks to expand participation for better conservation outcomes.

A Collaborative Approach to Address Data Gaps

Tagging campaigns can be key for gathering essential data on the spatial distribution and behaviour of sharks and rays. However, the success of these efforts depends on collaboration among research institutions, fishers, conservation organisations, and policymakers.

By streamlining data collection and sharing processes, the portal ensures that valuable information on movements is recorded efficiently. In addition to support from the Department of Biology of the University of Padova (Italy), the initiative is supported by the Environment Agency of Corsica (France), WWF Mediterranean Marine Initiative, iSea (Greece), WWF Adria, the Institute of Oceanography and Fisheries (Croatia), and the Leibniz Institute for the Analysis of Biodiversity Change (Germany).

Encouraging Participation

One of the biggest hurdles in collecting recapture data is ensuring that fishers report their catches of tagged animals. The TSHARK platform aims to make this process as simple as possible, offering an intuitive interface for data submission. By engaging fishers in science, the initiative hopes to enhance local engagement, fostering a sense of ownership and shared responsibility for shark and ray conservation.

Moreover, the project respects data ownership by granting each contributing institution exclusive access to its own dataset. This ensures that researchers retain control over their collected data while still benefiting from the collective insights gained from a regional-scale effort.

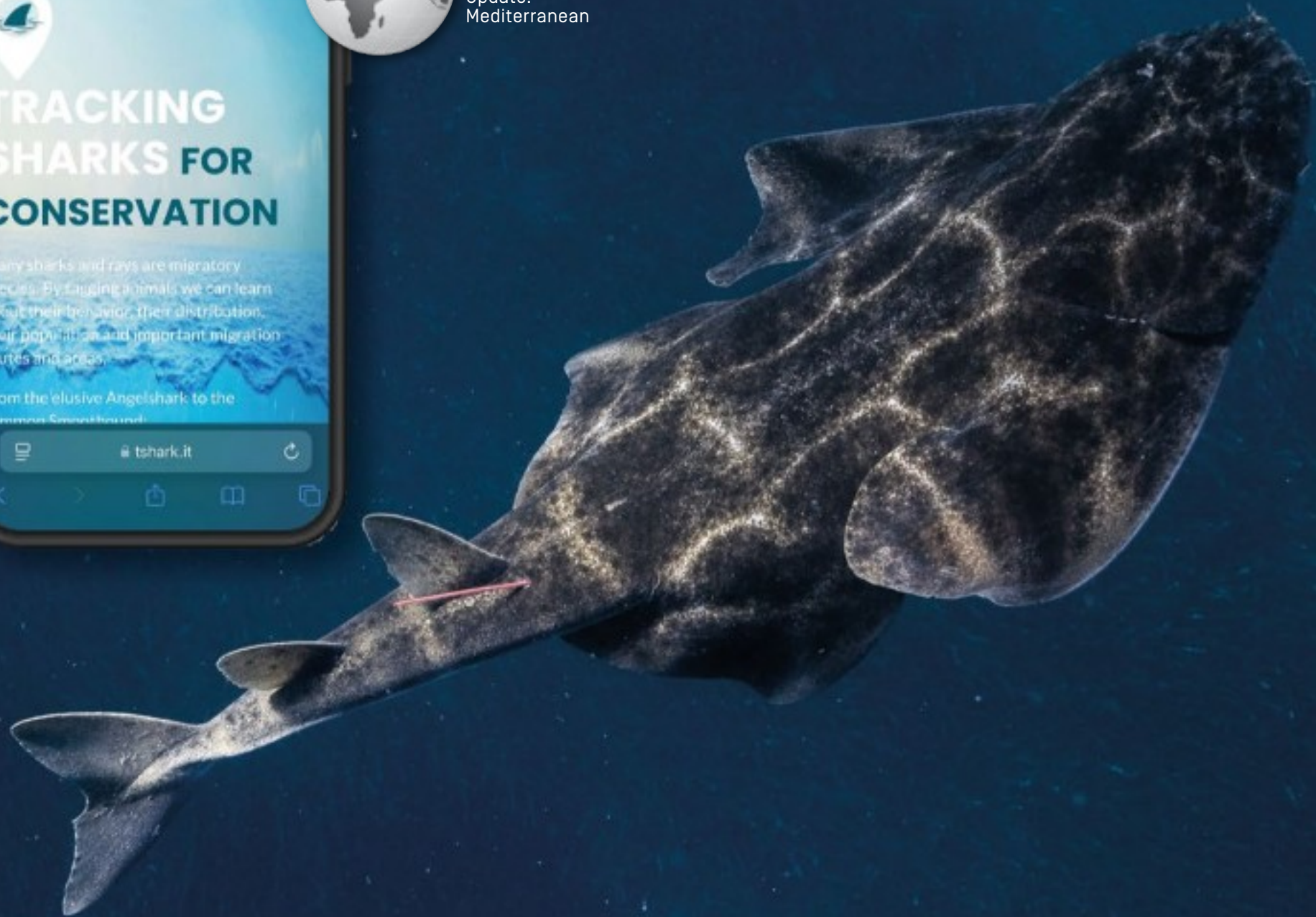
Beyond data collection, TSHARK also serves as an educational resource. The website includes information on elasmobranch conservation, aiming to engage a broad audience.

Looking ahead, TSHARK aims to broaden the network of collaborators and is open to more institutions and conservationists to join its efforts. By fostering a Mediterranean-wide cooperative approach, the initiative seeks to significantly enhance data collection and sharing and support a unified and sustainable framework for shark and ray conservation across the Mediterranean region.

For more information or to contribute to this initiative, visit www.tshark.it



Region
Update:
Mediterranean



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New depth record for a Southern Sleeper Shark [*Somniosus antarcticus*] in the southeast Atlantic Ocean

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Africa Regional Member

A recent report of a Southern Sleeper Shark [*Somniosus antarcticus*] in Namibian waters has provided new insight into the depth range for this species.

In February 2025, an unmanned submersible captured footage of a Southern Sleeper Shark at a depth of 2,671 m, off the coast of Namibia. The depth range for this species has previously been reported as between 245 and 1,540 m, whilst maximum depth records for the Greenland Shark [*S. microcephalus*] and the Pacific Sleeper Shark [*S. pacificus*] are at 2,647 m and 2,008 m, respectively (Ebert et al. 2021).

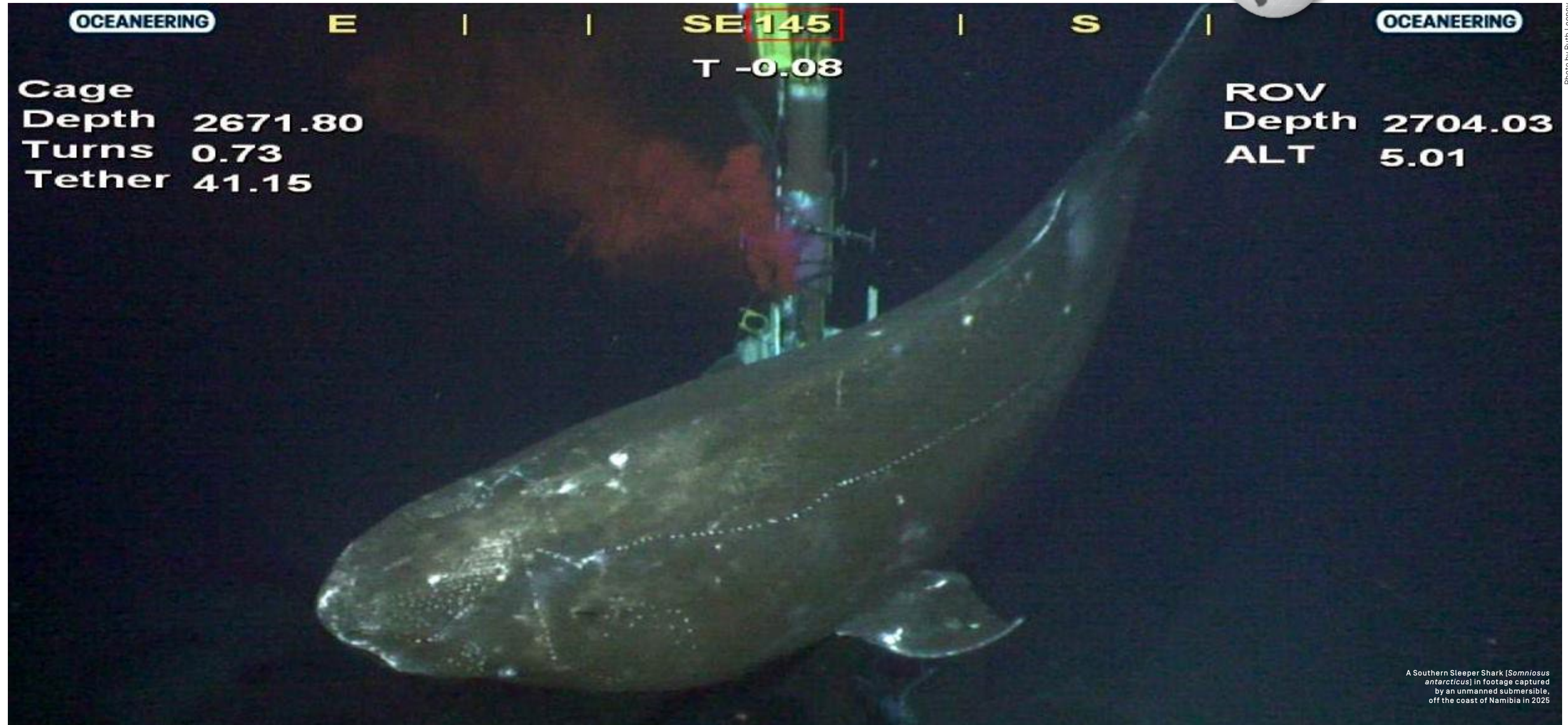
This recent record indicates that Southern Sleeper Sharks can occur at significantly greater depths than previously thought, setting a new depth record for the *Somniosus* genus. This record occurred in the Orange River Basin, approximately 320 km from the Namibian coast, in the far south of Namibia's Exclusive Economic Zone.

The submersible recorded the shark near to the casing pipe of an oil drilling operation (visible in the screenshot from the footage). Staff of the oil company advised that the casing protrudes 2 m above seafloor and is 50 cm wide, suggesting that the shark was at least 4 m in length.

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Ebert, D., Dando, M., & Fowler, S. (2021). *Sharks of the World: A Complete Guide*. Princeton University Press, Princeton/ Woodstock.



Region
Update:
Africa



Santa Luzia An Essential Refuge for Sharks and Rays in Cabo Verde



Region
Update:
Africa

Photo © BioSfera

Two individual Lemon Sharks
(*Negaprion brevirostris*) swimming
on a beach on the island of
São Vicente during a drone sampling

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Santa Luzia, the largest Marine Protected Area (MPA) in Cabo Verde, plays a key role in the conservation of sharks and rays. Since 2019, the Shark and Ray Research and Conservation Program has been crucial in understanding and protecting these species, using innovative monitoring methods.

Biosfera I, a nature conservation non-governmental organization (NGO) founded in 2006, has led these efforts in collaboration with national and international institutions such as Dalhousie University, Ocean Tracking Network (OTN), and Shark and Ray Conservation Center (SHARCC). In 2020, Biosfera I joined as a member organization of IUCN, strengthening its commitment to environmental protection and sustainability in Cabo Verde.

Santa Luzia island is currently uninhabited but frequently used by fishers as a shelter during fishing trips. With a surface area of 35 km², it is one of the most extensive MPA in Cabo Verde. Despite its arid and dry climate, it harbors unique species found nowhere else in the archipelago, making it a key site for conservation efforts. The island serves as a sanctuary for highly threatened species such as the Blackchin Guitarfish (*Glaucostegus cemiculus*) and the Atlantic Weasel Shark (*Paragaleus pectoralis*). Given its ecological importance, Santa Luzia has become a major focus of field interventions led by Biosfera I, reinforcing its role in marine protection and biodiversity research in Cabo Verde.

The confirmed presence of the Blackchin Guitarfish in the Santa Luzia Reserve (Freitas et al., 2018) marked an important milestone for the conservation of the species, which is classified as Critically Endangered on the IUCN Red List of Threatened Species. However, this confirmation may be too late, as it is a critical time with the species facing an high risk of extinction and is heavily exploited throughout much of its habitat. Both artisanal and industrial fishing pressures present a constant threat. The presence of the Blackchin Guitarfish in the Santa Luzia Marine Reserve highlights the area's importance as a sanctuary for threatened species, requiring ongoing efforts for their protection.

Meanwhile, the Atlantic Weasel Shark, once shrouded in uncertainty regarding its conservation status [Data Deficient until 2019], was reclassified as Endangered (EN) on the IUCN Red List 2020, reflecting its high susceptibility and life history characteristics. In Cabo Verde, where all small sharks are generically referred to as ‘Cação’ or ‘Sarda,’ this species is often confused with the true Cação, leading to rampant capture. As a result, it has become a common component of traditional consumption, particularly in the local dish known as ‘Dandan’, further intensifying the pressure on its populations.

To monitor and study these species, methods such as mark-recapture with external passive tagging and Baited Remote Underwater Video Stations (BRUVs) have been used. Passive tagging has enabled the tagging of 620 sharks and rays from 10 species in the Santa Luzia Marine Reserve between 2019 and 2024, including 239 Blackchin Guitarfish and 84 Atlantic Weasel Shark.

The use of BRUVs allowed 483 observations of 12 different species in the area. The Atlantic Weasel Shark was the most frequently observed species, with 264 sightings in key areas of the Marine Reserve (without considering MaxN, the maximum number of individuals in a single frame). Additionally, acoustic tagging and the use of drones in the region have shown that Santa Luzia functions as a hotspot and potential nursery for several species.

These data are essential for continuous monitoring and to analyze the threats these species face, especially from illegal fishing in the Marine Reserve.

The Importance of Conservation and Monitoring

The presence of these threatened species in the Santa Luzia Marine Reserve emphasizes the need for effective conservation and enforcement strategies. The implementation of continuous monitoring programs, combined with raising awareness among the fishing community and the strict enforcement of environmental laws, is crucial to ensure the long-term survival of sharks and rays. Initiatives such as individual tagging and tracking, along with the creation of specific management plans, can significantly contribute to scientific knowledge and the protection of these populations.

Impact on Conservation and Local Training

To ensure a lasting impact, Biosfera I has trained other NGOs in Cabo Verde, sharing methodologies and best practices. Currently, some of these organizations are applying similar techniques, expanding the reach of monitoring efforts and deepening the understanding of shark and ray population dynamics in the archipelago. In the northern islands, BRUV surveys have been conducted in São Nicolau, while in São Vicente, both BRUV and tagging expeditions have provided valuable insights into local shark populations. These efforts contribute not only to conservation but also to raising awareness and engaging local communities in marine protection initiatives.

Next Steps and Perspectives for Conservation

The data gathered so far are essential for assessing the conservation status of the species and supporting effective management measures. The next step involves a detailed analysis of habitat connectivity and fishing pressure in the region. These efforts aim to influence policy decisions and strengthen the protection of these vital animals for the marine ecosystem.

Conservation of sharks and rays in Cabo Verde remains a challenge but monitoring initiatives and local capacity-building show that significant progress is possible through scientific studies and community engagement.

Species	Common name	Status	2019	2020	2021	2022	2023	2024	Total
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU	9	33	68	50	29	58	247
<i>Glaucostegus cemiculus</i>	Blackchin Guitarfish	CR	6	81	37	26	44	45	239
<i>Paragaleus pectoralis</i>	Atlantic Weasel Shark	EN	2	20	22	19	10	11	84
<i>Ginglymostoma cirratum</i>	Atlantic Nurse Shark	VU		4	2	7	2	6	21
<i>Negaprion brevirostris</i>	Lemon shark	VU			2	3	3	2	10
<i>Mustelus mustelus</i>	Common Smoothhound	EN			5	4			9
<i>Taeniurops grabatus</i>	Round Stingray	NT		1		1		1	3
<i>Rhizoprionodon acutus</i>	Milk Shark	VU					3		3
<i>Carcharhinus</i> sp.		***						2	2
<i>Carcharhinus altimus</i>	Bignose Shark	NT	1		1				2
Total			18	139	137	110	91	125	620

Table 1. Species captured and tagged in Santa Luzia from September 2019 to October 2024 with their conservation status. The table below shows the number of individuals tagged for each species, with a focus on the three most prevalent species.

Species	Common name	Status	2022	2023	2024	Total
<i>Paragaleus pectoralis</i>	Atlantic Weasel Shark	EN	6	53	205	264
<i>Carcharhinus limbatus</i>	Blacktip Shark	VU			51	51
<i>Taeniura grabatus</i>	Round Stingray	NT	7	17	12	36
<i>Mustelus mustelus</i>	Common Smoothhound	EN	4		30	34
<i>Glaucostegus cemiculus</i>	Blackchin Guitarfish	CR	8	9	16	33
<i>Galeocerdo cuvier</i>	Tiger Shark	NT			29	29
<i>Ginglymostoma cirratum</i>	Atlantic Nurse Shark	VU	3	1	17	21
<i>Carcharhinus altimus</i>	Bignose Shark	NT		2	4	6
<i>Carcharhinus</i> sp.		***			4	4
<i>Carcharias taurus</i>	Sand Tiger Shark	CR		3		3
Unknown shark		***			1	1
<i>Negaprion brevirostris</i>	Lemon Shark	VU			1	1
Total			28	85	370	483

Table 2: Species Observed in Baited Remote Underwater Video Stations (BRUVs) in Santa Luzia from 2022 to 2024. The table below shows the number of observations/sightings of each species recorded in Santa Luzia during the BRUVs monitoring from 2022 to 2024.



Photo by Bob Lima | Biosfera

Tagging expeditions on the island of Santa Luzia where a Blackchin Guitarfish (*Glaucostegus cemiculus*) was captured & tagged. A Biosfera technicians is pouring water to maintain hydration and oxygenation.



Photo by Bob Lima | Biosfera

During one of Biosfera's tagging expeditions to the island of Santa Luzia handling a shark caught. Photos were taken while explaining the correct handling of caught species



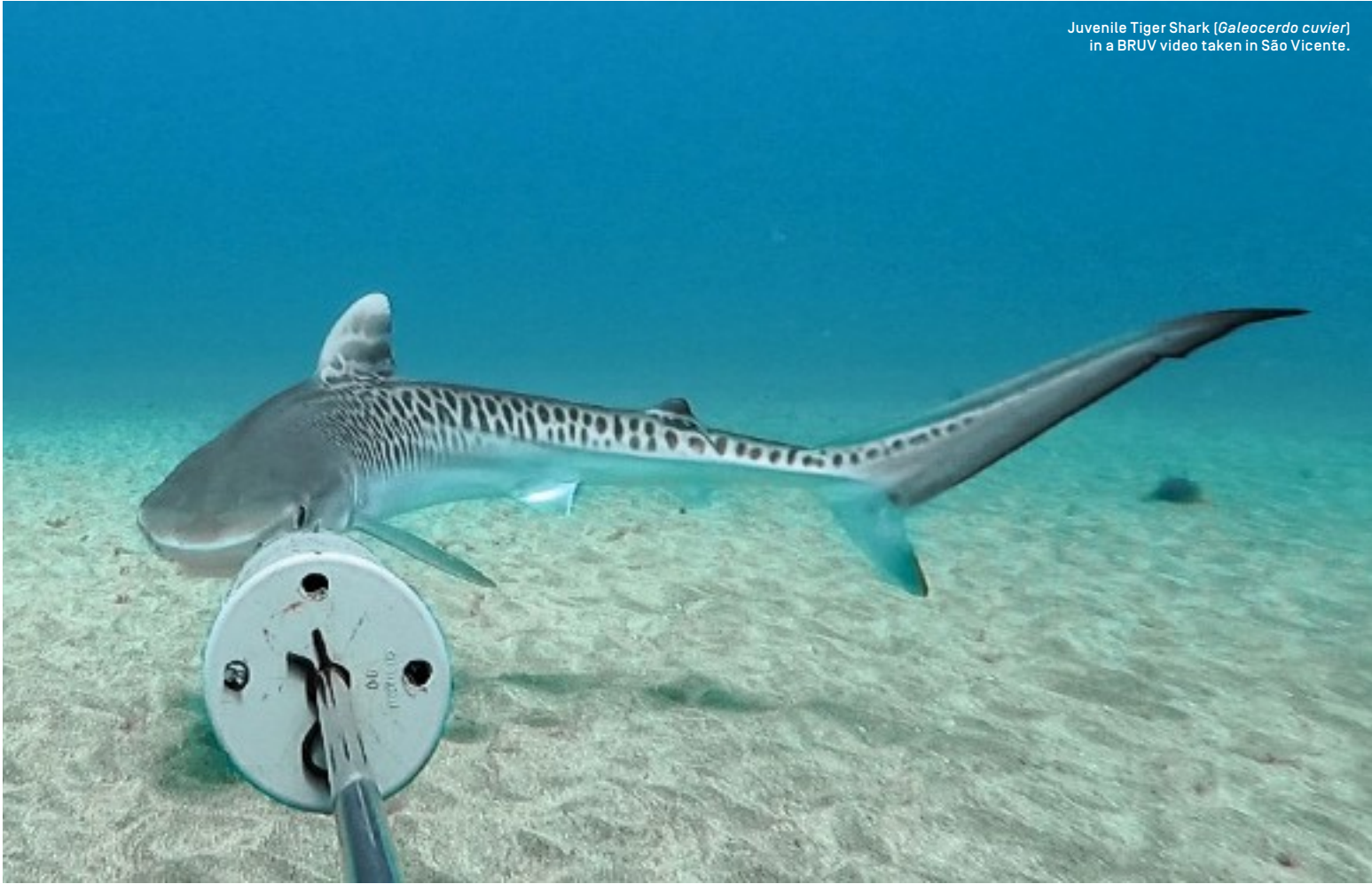
Photo © Biosfera

Vitó Project training in shark and ray monitoring techniques on the island of Fogo. During a field trip to practice catching and deploying BRUV structures in the coastal regions of the island of Fogo.



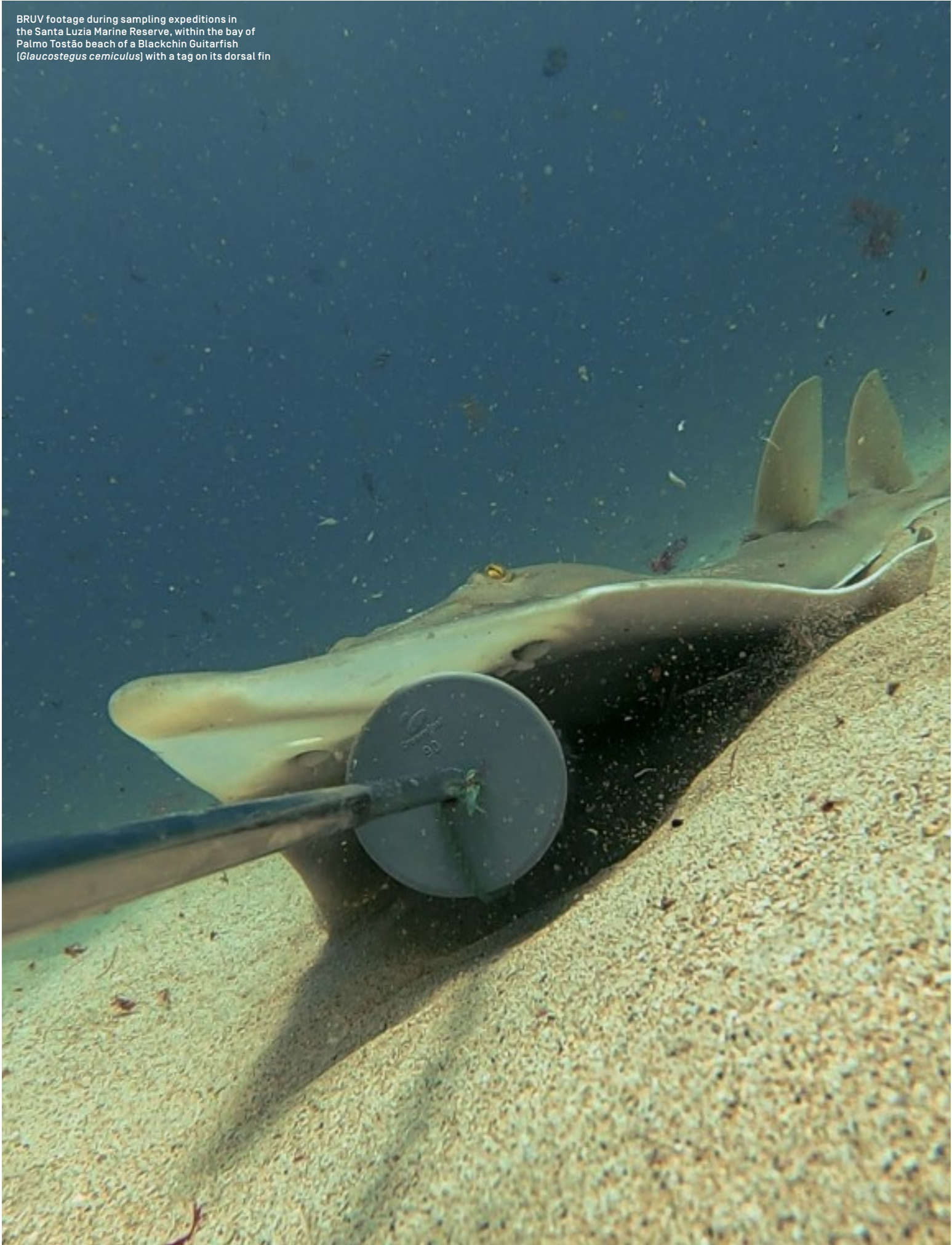
Photo © Biosfera

On the island of Sal during training in shark and ray monitoring and tagging techniques given by Biosfera, through the coordinator of the shark and ray program for the Associação Projeto Biodiversidade



Juvenile Tiger Shark (*Galeocerdo cuvier*) in a BRUV video taken in São Vicente.

Photos © Biosfera



BRUV footage during sampling expeditions in the Santa Luzia Marine Reserve, within the bay of Palmo Tostão beach of a Blackchin Guitarfish (*Glaucostegus cemiculus*) with a tag on its dorsal fin

Photos by Biosfera



Atlantic Weasel Shark (*Paragaleus pectoralis*) tagged and released during a tagging expedition on the island of Santa Luzia

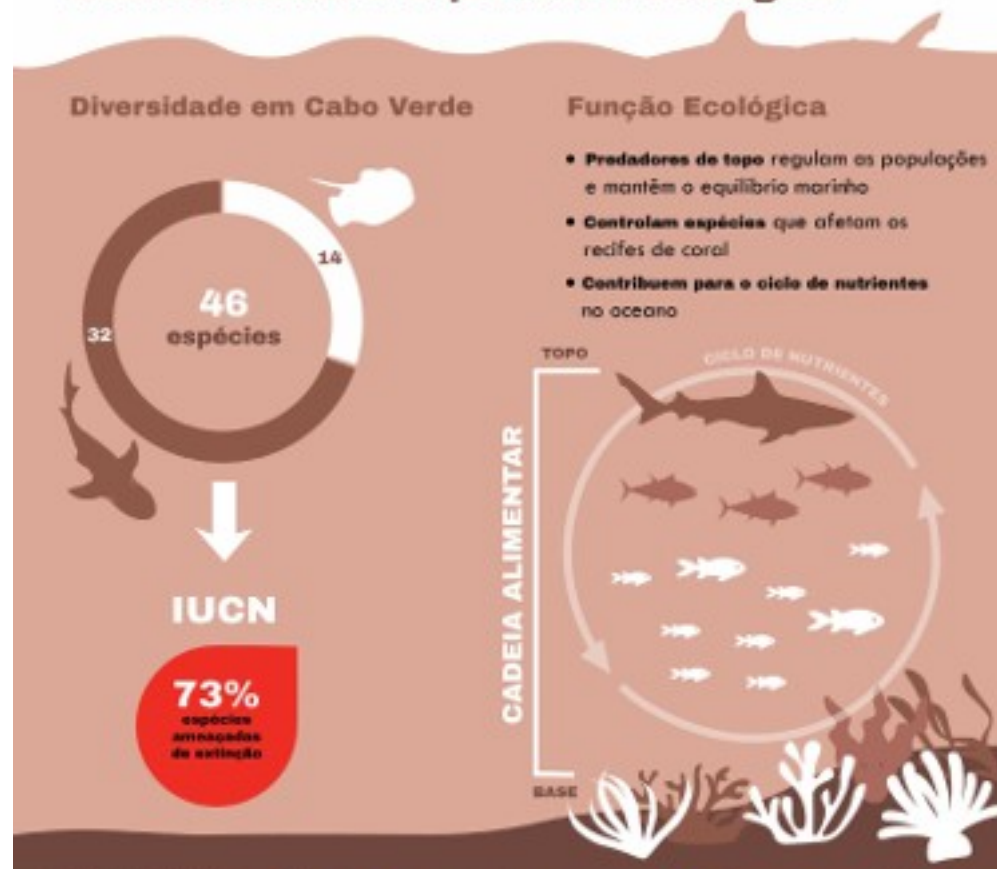
The Status of Sharks, Rays, and Chimaeras in Cabo Verde

For the first time, Cabo Verde is part of the IUCN SSC Shark Specialist group report: The global status of sharks, rays, and chimaeras.

These infographics highlight information from the report and the chapter dedicated to Cabo Verde, providing an overview of the main threats, population trends, and the conservation status of the species in the country.



Biodiversidade e Importância Ecológica



RELATÓRIO GLOBAL DE TUBARÕES, RAIAS E QUIMERAS, IUCN 2024

Importância Cultural e Económica



RELATÓRIO GLOBAL DE TUBARÕES, RAIAS E QUIMERAS, IUCN 2024

Pesca e Impactos



RELATÓRIO GLOBAL DE TUBARÕES, RAIAS E QUIMERAS, IUCN 2024

Ameaças aos Tubarões e Raias



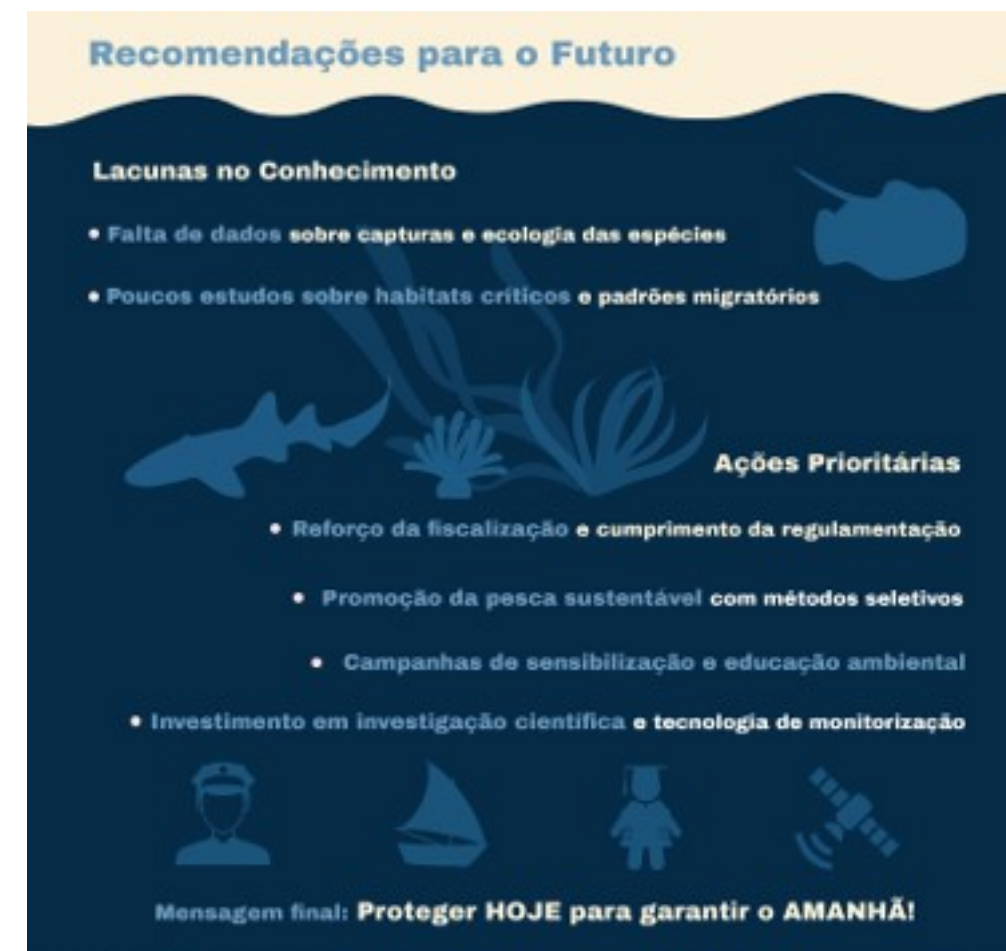
RELATÓRIO GLOBAL DE TUBARÕES, RAIAS E QUIMERAS, IUCN 2024

Conservação em Cabo Verde

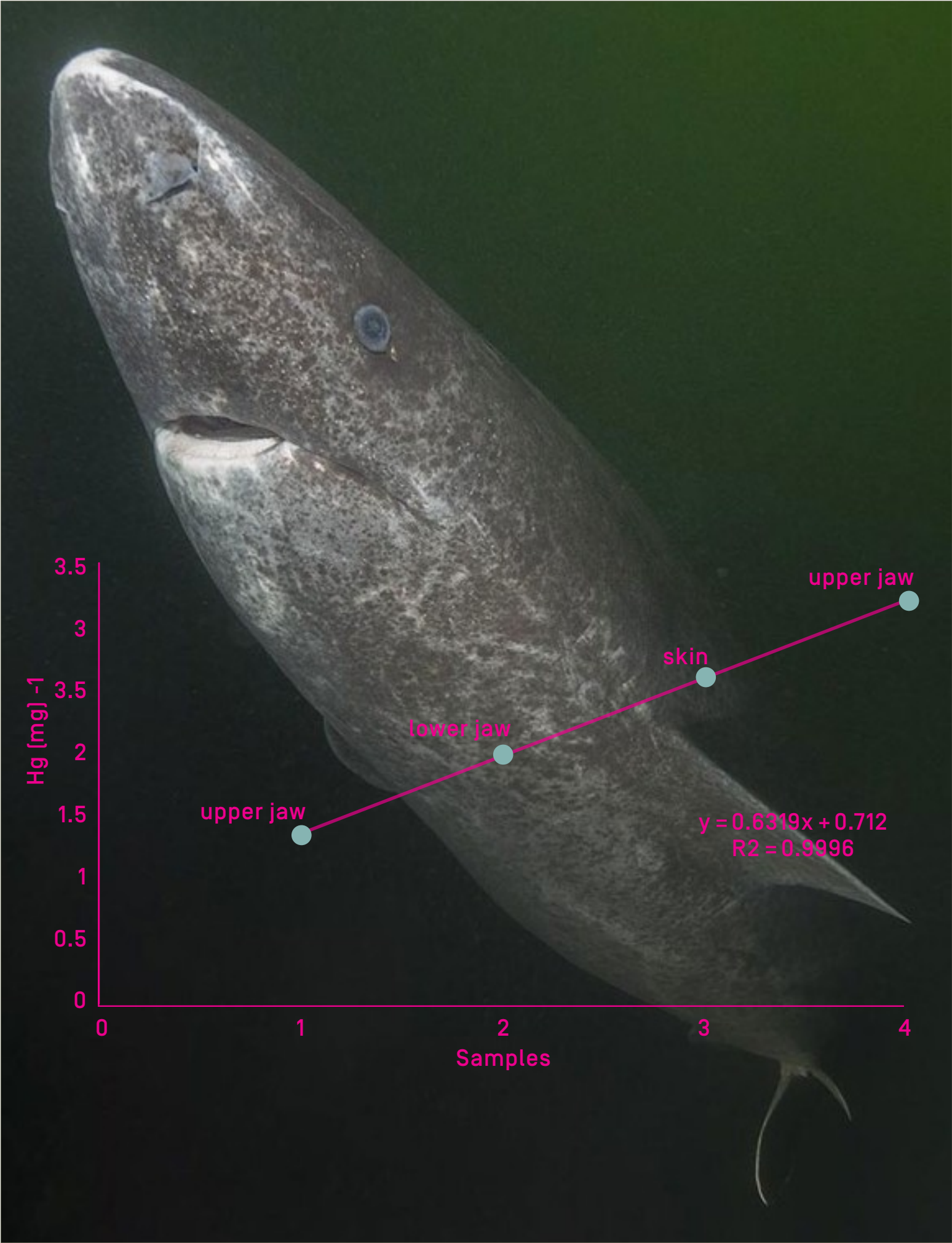


RELATÓRIO GLOBAL DE TUBARÕES, RAIAS E QUIMERAS, IUCN 2024

Recomendações para o Futuro



RELATÓRIO GLOBAL DE TUBARÕES, RAIAS E QUIMERAS, IUCN 2024



High level of mercury (Hg) in the Greenland shark (*Somniosus microcephalus*)

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The jaws of the Greenland Shark (*Somniosus microcephalus*) have high levels of mercury (Hg), the highest levels among shark species. This result from Biton-Porsmoguer et al. (2024) is in accordance with previous studies. The Hg of the cartilage in comparison with the skin and muscle from the same specimen makes it possible to assess the distribution of the pollutant in the body. The level of the pollutant between the jaw, skin, and fresh meat (muscle) shows a strong correlation. The muscle is the most contaminated element in comparison with the skin and cartilage. Elevated Hg levels were analysed in all tissues of the shark's body, ranging from 1.332 mg kg⁻¹ dw (upper jaw) to 3.225 mg kg⁻¹ dw (muscle).

In accordance with previous studies, the species presents the highest levels among different groups of sharks. Marine ecosystems in the Arctic are globally contaminated by mercury from the atmosphere, water, sediments, and food webs (Braune et al., 2015). Methylmercury reduces blood calcium levels, directly affecting the metabolism of cartilage cells. Even if cases of malformations could not be observed in the Greenland Shark, numerous cases for other shark species have been documented in connection with heavy metals (including Hg), and in particular for aplacental, viviparous sharks, with a higher potential for morphological anomalies in embryos. This raises concerns for the Greenland Shark due to its conservation status, catch rates in fisheries, its conservative life history including late sexual maturity and slow reproduction, impacts of climate change, and their high levels of mercury.

Considering the substantial amount of data that corroborate the elevated mercury levels found across various tissues of the Greenland Shark (including cartilage); the observed morphological anomalies in numerous other shark species (raising suspicions of environmental pollution); and their declining population in Europe (Burgess et al., 2015), shouldn't precautionary measures be implemented as a principle of safeguard these species? To better protect the environment, applying the precautionary approach according to the capability of nations is urgently needed. Additionally, studying the Greenland Shark is difficult

due to its different life-history stages, its geographical area, and difficult sampling conditions. Where there are threats of serious or irreversible damage, the lack of full scientific certainty should not be used as an excuse to postpone cost-effective measures to prevent environmental degradation [Principle 15 of the 1992 Rio Declaration States] (United Nations, 1992).

These results require actions and recommendations on ecological, environmental, and fisheries management measures are provided here. These measures could include: 1) that fleets operating in the Icelandic and Arctic can develop and/or improve existing measures to reduce incidental catch, such as using turtle excluder devices and Nordmore grates, and releasing captured animals alive; 2) implementing fisheries closures to protect the areas beyond national jurisdiction in the central Arctic Ocean; 3) actively contributing to the fight against global warming and reducing industrial production that contributes to mercury (and other pollutant) emissions in the Arctic Ocean; and 4) initiating research programs to better understand the movement and distribution of the Greenland Shark, especially considering the inevitable space use due to climate change, with the aim of possibly limiting fishing activities in those areas.

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Monitoring Sharks and Rays in Mozambique using Remote Underwater Video Cameras

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Southern Mozambique's coastline is home to an incredible array of marine life, making it a hotspot for divers and researchers alike. The region's waters are inhabited by a diverse range of shark and ray species, including year-round sightings of manta rays (*Mobula* spp.) and Whale Sharks (*Rhincodon typus*). What most visitors do not realise is how much more biodiversity there is. Southern Mozambique houses some of the rarest and most threatened marine species in the world, such as the Smalleye Stingray (*Megatrygon microps*) and the Bowmouth Guitarfish (*Rhina ancylostomus*). Recognising the ecological importance of this area, the Southern Inhambane Province was designated as an Important Shark and Ray Area (ISRA). Despite this designation, many of these animals are still likely to be severely declining, lacking sufficient information for more tangible localised conservation. To bridge this knowledge gap, researchers at All Out Africa have taken an innovative and non-intrusive new approach: using long-life remote underwater video (LL-RUV) cameras to observe elusive species for up to 12 consecutive days per deployment.

Protecting threatened shark and ray species starts with identifying key habitats essential to their lifecycle. 'Cleaning stations' are stretches of coral reef where 'client' shark and ray species visit to have parasites and dead skin removed, and wounds cleaned by 'cleaner' fish. These cleaning stations are believed to be particularly important sites to maintain the health of sharks and rays.

Traditional observation methods, such as diver surveys, are limited by dive duration and may unintentionally alter the natural behaviour of the animals. Moreover, human presence can scare away the rarer and more elusive species that researchers aim to study. Satellite tracking provides insights into large-scale movements but lacks fine-scale behavioural information. Baited remote underwater video (BRUV) systems attract animals using bait, potentially altering their natural behaviour. To overcome these challenges, this study used non-baited LL-RUV cameras, allowing researchers to capture natural, undisturbed behaviours over extended periods. For this study, LL-RUV systems were deployed at cleaning stations on the reefs of Praia do Tofo, Mozambique to observe shark and ray occurrence and behaviour.

Between July 2021 and March 2024, researchers collected 524 hours of video data, documenting 14 different shark and ray species. Among the more frequently recorded species were Reef Manta Rays (*Mobula alfredi*), Oceanic Manta Rays (*Mobula birostris*), devil rays (*Mobula* spp.), Smalleye Stingrays, eagle rays (Aetobatidae and Myliobatidae), blacktip shark complex, and Bowmouth Guitarfish. Some species, such as Scalloped Hammerhead (*Sphyrna lewini*) and Whitespotted Wedgefish (*Rhynchobatus djiddensis*), were only observed once. The video footage of the LL-RUV camera system is of a high enough quality to both identify the presence of these species and their behaviours. The most frequently observed visitors to the studied reef were Oceanic Manta Ray, Reef Manta Ray, and Smalleye Stingray, all of which displayed cleaning behaviour for the majority of sightings (i.e., circling above the reef and making repeated passes over cleaning stations while cleaner fish inspected them). Other frequently observed species, such as Spotted Eagle Rays (*Aetobatus ocellatus*) and blacktip complex sharks, were solely observed cruising in mid-water or close to the reef without engaging in cleaning behaviour.

One of the most fascinating discoveries made through this study were social interactions between different species. LL-RUV footage captured both the Reef Manta Rays and Oceanic Manta Rays using the same cleaning station concurrently on multiple occasions. Additionally, Smalleye Stingrays and Reef Manta Rays

were recorded passing over the same cleaning station within seconds of each other, suggesting a level of tolerance or even cooperative behaviour. One particularly noteworthy camera deployment recorded six individual Reef Manta Rays (identified by wound patterns and tail length), two Smalleye Stingrays, and one Bowmouth Guitarfish moving in and out of the LL-RUV field of view repeatedly for over 90 minutes. These observations provide valuable insights into how different species interact at cleaning stations, potentially influencing future research on species coexistence and habitat sharing.

The long-term implications of this research are significant. LL-RUV technology is revolutionising marine conservation by capturing fine-scale, undisturbed behaviours of rare and threatened species. The ability to record for up to 12 consecutive days provides unprecedented insights into species distribution, behaviour, and habitat use, which is crucial for designing marine protected areas and implementing fishing restrictions. This study marks a breakthrough in Mozambique's shark and ray research, paving the way for long-term monitoring that will uncover hidden behaviours, improve species protection, and reinforce the urgency of conservation efforts.

This research is part of an ongoing programme that relies on citizen science to support marine conservation in Mozambique. Divers, snorkelers, and ocean enthusiasts can play an active role in helping to document shark and ray sightings, contributing valuable data to ongoing studies. If you're interested in getting involved, contact All Out Africa to learn how you can support this initiative.



Spotted Eagle Ray
(*Aetobatus ocellatus*)

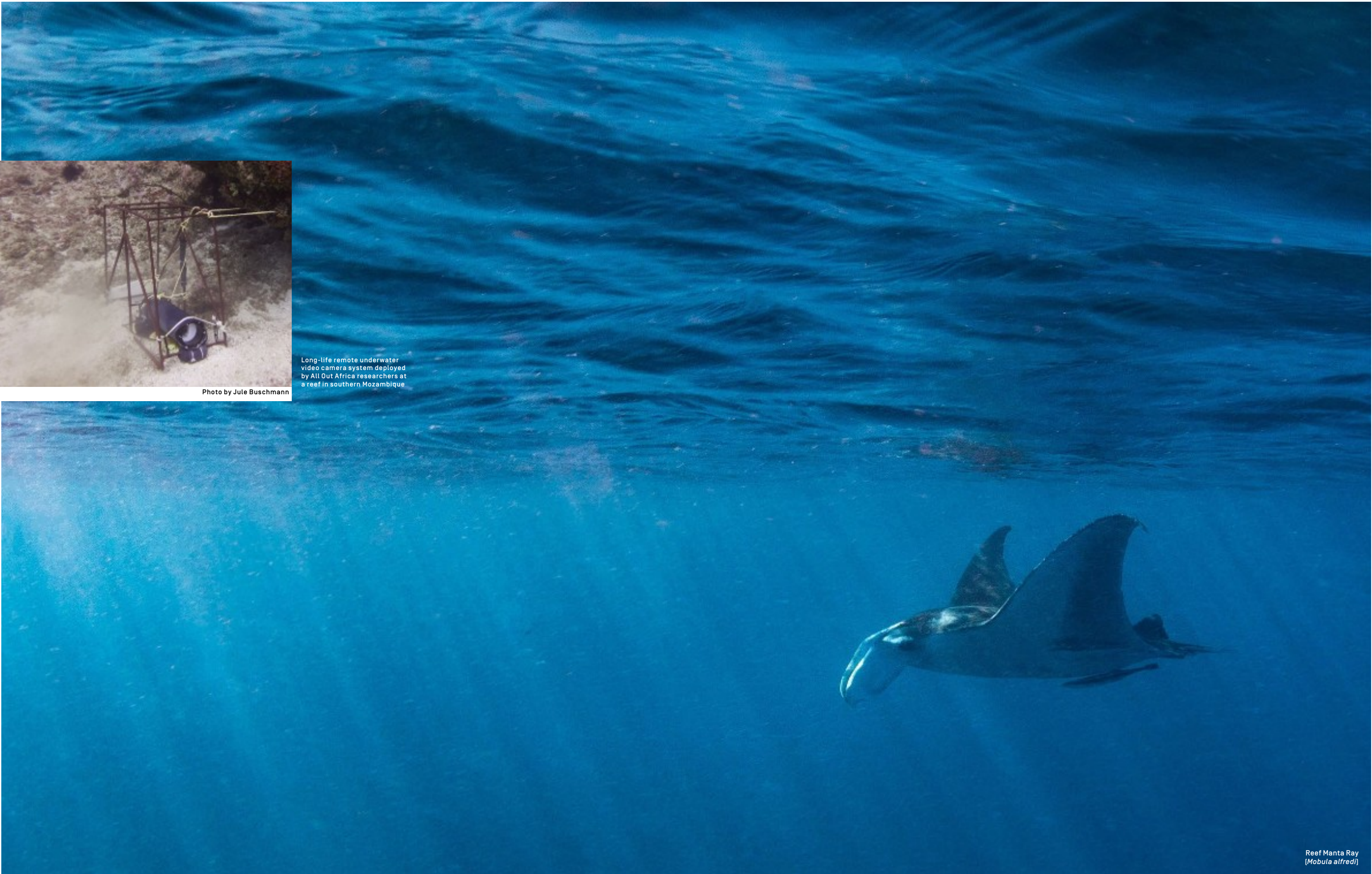


Photo by Anna Flam [CC BY-NC] from iNaturalist



Photo by Jule Buschmann

Long-life remote underwater video camera system deployed by All Out Africa researchers at a reef in southern Mozambique

Reef Manta Ray
(*Mobula alfredi*)

A Guide to Identifying Gulper Sharks

Written by
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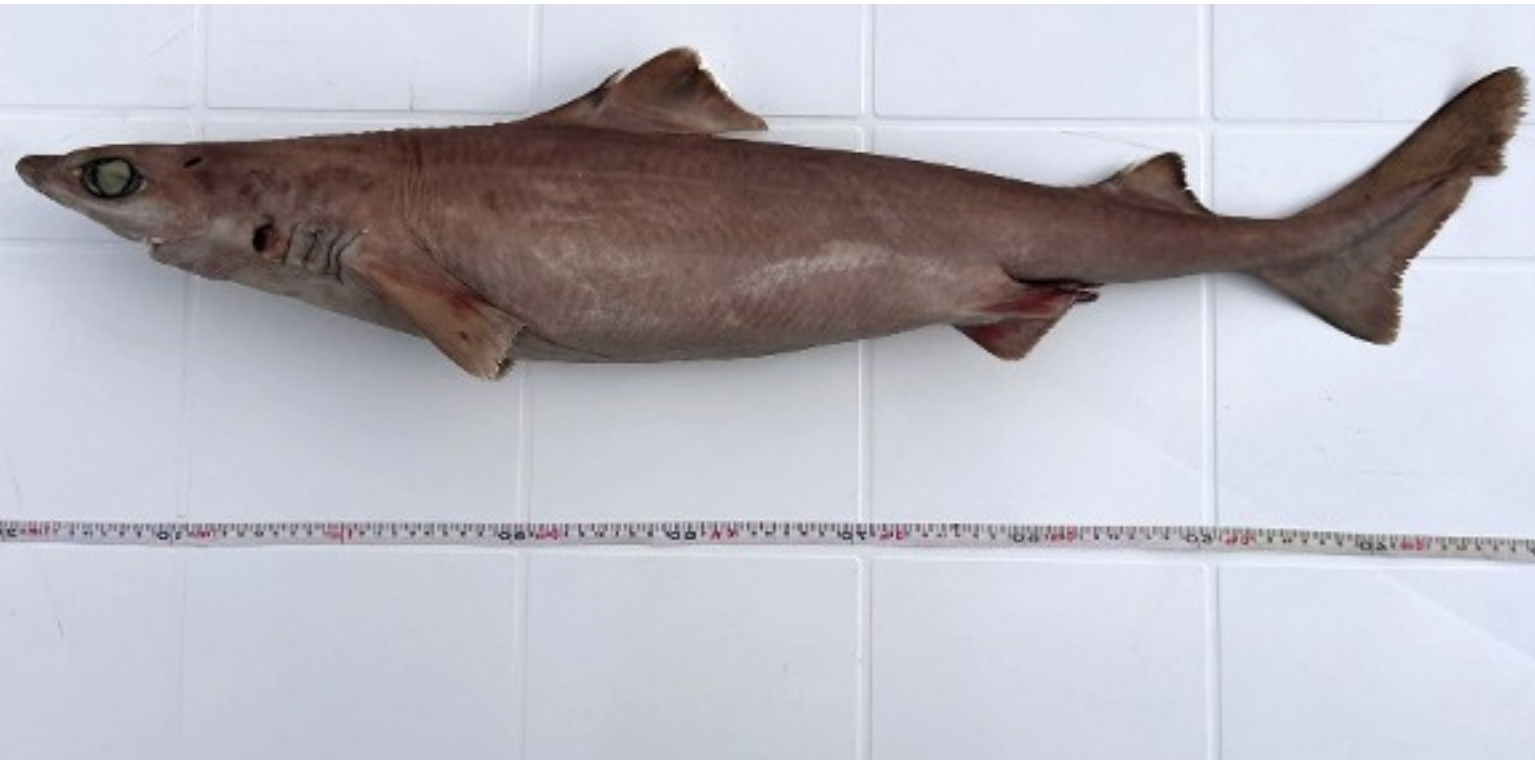
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Fish oil pills made with squalene.



Gulper sharks (family Centrophoridae) are the most threatened groups of deepwater sharks. Eleven of the 15 species are listed as threatened on the IUCN Red List of Threatened Species due to population declines caused by targeted and incidental fishing. Unlike most other threatened shark species, the primary driver of gulper shark declines is not fins or meat trade, but rather their squalene-rich livers. Squalene is a valuable oil with properties that make it ideal for use in cosmetics, health foods, vaccines and various other products.

The demand for squalene, combined with the very slow life histories of gulper sharks, mean that populations decline rapidly when fished, and have very long recovery times. Most gulper sharks grow slowly, mature at over 20 years and produce very small litters often just one or two pups, only produced every few years. This makes them amongst the least productive of the sharks, highlighting the critical need for responsible science-based management if populations are to persist.

Large population declines of gulper sharks driven by international trade has led Brazil, Comoros, Dominican Republic, Ecuador, European Union, Lebanon, Nigeria, Panama, Senegal, Syrian Arab Republic and the United Kingdom of Great Britain and Northern Ireland proposing the family for inclusion within Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The proposal will be considered by the Twentieth Conference of the Parties that will be held in Samarkand, Uzbekistan in late 2025.

To support the listing proposal a guide to identifying gulper sharks has been produced. The guide is designed for use by those working at the point of capture but also has information on the identification of other product forms. The 37-page guide

is beautifully illustrated by Dr Lindsay Marshall from Stick Figure Fish Illustration (www.stickfigurefish.com.au/). Each of the 12 *Centrophorus* species and 3 *Deania* species has its own identification page featuring an illustration, size information, depth distribution, IUCN Red List status, FAO species code, a distribution map and distinguishing features. The guide also provides a range of other information useful for identification.

The taxonomy of the gulper shark family is complex and not fully resolved. This is well illustrated by the disparity in the number of species in the identification guide and the CITES proposal. The proposal includes an extra species – *Centrophorus lusitanicus* – that is not in the guide. This species has recently been synonymised with the *C. granulosus*. The guide currently includes the 15 recognized species as of 2025. Taxonomic work on the family continues, and it is likely that any future changes will require the guide to be updated.

You can get your very own copy of the guide by downloading it from the TRAFFIC website: www.traffic.org/site/assets/files/26392/gulper_id_guide_layout_a5_electronic.pdf

The guide was produced by a team of researchers from the University of Tasmania and James Cook University, with support from the Shark Conservation Fund.

GULPER SHARK IDENTIFICATION GUIDE

Brittany Finucci
Madeline E. Green
Cassandra L. Rigby
Colin A. Simpfendorfer



Illustrated by Dr Lindsay Marshall



Shark Conservation Fund

Deania calceus

Birdbeak Dogfish

DCA

Maximum length: 162 cm

IUCN Red List **NT**

Depth range: 60–1500 m



- 1 Snout extremely long and flattened
- 2 First dorsal fin extremely long and low
- 3 Second dorsal fin much shorter but taller with longer fin spine than first dorsal fin
- 4 No subcaudal keel on lower caudal peduncle
- 5 Skin delicate, easily damaged (e.g., in trawls)

Other names

FR: Squalé savate

ES: Tollo pajarito



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Centrophorus atromarginatus

Dwarf Gulper Shark

GVA

Maximum length: 99 cm

IUCN Red List **CR**

Depth range: 100–540 m



- 1 Snout short
- 2 Pectoral fin free rear tips elongate
- 3 First dorsal fin short and high, moderately long free rear tip
- 4 Second dorsal fin slightly smaller and lower than first dorsal fin
- 5 Second dorsal fin origin over pelvic fin inner margin or free rear tip
- 6 Dorsal spines moderately long and slender

Other names

ES: Quelvacho de márgenes negros



14

First Edition: Catalog of Chondrichthyan Species of Guatemala

Written by
Maria de Belen Chacón

The Guatemalan Chondrichthyan Catalog is the result of a collaborative effort by the Blue World Foundation and undergraduate Graphic Design students from San Carlos University of Guatemala. This first edition, launched in 2024, aimed to compile a comprehensive and up-to-date record of the shark, ray, and chimaera species documented in Guatemala thus far. The catalog consolidates over a decade of research led by the Blue World Foundation, generating data on species diversity, biology, and fisheries.

The catalog provides detailed descriptions of 32 shark species, 20 ray species, and one chimaera species present in Guatemalan waters. These species have been documented through extensive monitoring at fishing landing sites along Guatemala's Pacific and Caribbean coasts, including artisanal fisheries and industrial trawlers. This research effort has been crucial in generating diversity, biology, and fisheries data to support management and conservation initiatives.

The catalog serves as a valuable reference for researchers, academic institutions, and governmental and non-governmental organizations, offering in-depth species information, including:

- Taxonomy and nomenclature: Scientific classification, as well as common and scientific names.
- Morphology: Key anatomical features, including maximum recorded total length or disc width for each species.
- Distribution and habitat: Geographic range and associated ecosystems.
- Conservation status: Based on assessments on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) listing: Indicates if the species is included in the CITES Appendices.
- Ecological and biological insights: Data on behavior, feeding ecology, and reproductive strategies.

In addition to high-quality visual graphics that facilitate species identification, the catalog highlights the ecological significance of sharks, rays, and chimaeras in Guatemala's marine ecosystems. It also examines the major threats these species face, such as overfishing and habitat degradation.

This first edition represents a significant contribution to the scientific understanding and conservation of marine biodiversity in Guatemala, providing essential information to support conservation policies and the responsible management of marine ecosystems.

We are very grateful to Marvin Rodríguez, Dahianna Sagastume who designed the catalog and to, the United States (U.S.) Fish and Wildlife Service and the Luis von Ahn Foundation for their invaluable support in making this project possible.

Explore the full Guatemalan Chondrichthyan Catalog and access detailed species information by visiting:
fundacionmundoazul.com/wp-content/uploads/2025/05/CatalogoCondriictios.pdf



FACULTAD DE
ARQUITECTURA
UNIVERSIDAD DE SAN CARLOS DE GUATEMALA



USAC
TRICENTENARIA
Universidad de San Carlos de Guatemala

Having Sharks As Unintentional Allies



Photo by Rocco Canella

Diving in Lampione Island (Pelagie Islands Marine Protected Area - Italy) at Sandbar sharks (*Carcharhinus plumbeus*) aggregation site

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A new study published in Ecology has revealed an unexpected relationship where the Blue Runner [*Caranx crysos*] use Sandbar Sharks [*Carcharhinus plumbeus*] as cover to sneak up on prey. This intriguing ‘shadowing’ behaviour, observed in the Mediterranean Sea, highlights the complexity of predator-prey relationships and raises novel questions about the roles of sharks in the functioning of marine ecosystems.

Predators use various strategies to increase their hunting success. Some mimic different species, others change colour, but Blue Runners take a more strategic approach: they hide underneath much larger Sandbar Sharks. By swimming close to these sharks, Blue Runners can reduce their visibility and approach their prey undetected. This behaviour, rarely documented in marine fish, was recorded using Baited Remote Underwater Video (BRUV) and Diver Operated Video (DOV) surveys in the waters of Lampione Island (Strait of Sicily, Italy), a seasonal aggregation spot of Sandbar Sharks in the Mediterranean Sea. Over a few years, researchers captured 34 incidences where Blue Runners used Sandbar Sharks as cover, and in 11 cases this behavior was followed by high-speed attacks on small prey like damselfish and picarels.

To see how well this predatory strategy worked, the researchers checked how the prey reacted to different predator approaches. When non-shadowing Blue Runners approached a school of fish, 96% of the time the prey quickly formed defensive schools, sensing the predator’s presence. However, when a Blue Runner was shadowed by a shark, the prey reaction rate dropped to just 12.5%, which was comparable to what happened when a shark approached alone; suggesting that Blue Runners can display shadowing behavior to be less detectable and get closer their prey before attacking. The prey also took longer to react when the Blue Runners were in shadowing mode. This means that the difference between a successful hunt and an empty stomach for the predator could be as little as a few seconds.

Blue Runners’ shadowing behaviour seems to be a solitary tactic, which is different from the traditional group’s hunting strategy observed in this predatory fish. In 100% of BRUV and DOV records of these association events, only one Blue Runner was seen shadowing a shark. In the rare cases where multiple Blue Runners attempted to shadow a single shark, they actively competed to maintaining the association, often chasing each other away. This suggests that shadowing can offer a significant advantage, making it a much sought-after position for Blue Runners.

Indeed, it seems like an effective strategy, but it is not something we often see. One reason for this might be the huge drop in the number of Sandbar Sharks as a result of overfishing, meaning there are not many opportunities to see them. In just one decade, in the Strait of Sicily, the number of Sandbar Sharks have plummeted by up to 42%. With fewer sharks around, Blue Runners might be less likely to engage in this unique hunting strategy.

Shadowing sharks might give more than just a predation advantage for Blue Runners. By staying close to a large shark, Blue Runners could reduce the risk of being eaten by other predators. In addition, they could use the shark’s hydrodynamic wake to reduce energy expenditure for swimming. However, further studies are needed to confirm whether Blue Runners are gaining more than just better hunting opportunities from this behaviour.

Marine ecosystems are complex, with species constantly evolving new ways to survive. The discovery of shadowing behaviour in Blue Runners challenges previous assumptions about how predators interact with each other and their prey. It also highlights the importance of protecting spatial aggregations of large marine species such as sharks, which may play a more important role in oceanic food webs than previously thought.

By documenting this unique behaviour, this study has broadened our understanding of predator-prey dynamics and highlighted the need to further explore these fascinating underwater alliances.

The paper is available here

How to cite the paper:

Cattano C., Grancagnolo D., Badalamenti F., Aglieri G., Turco G., Milazzo M. (2025) To see and not be seen: Carangids hide behind sharks to prey on fish. *Ecology*, e70028 doi.org/10.1002/ecy.70028



A Blue Runner [*Caranx crysos*] hunts by hiding behind a Sandbar Shark [*Carcharhinus plumbeus*] in Lampione Island (Strait of Sicily, Italy)

Photo by Rocco Canella



Searching for Lost Sharks

Extinct or Alive



Photo by David Ebert

New YouTube Series Explores the Plight of “Lost Sharks” Searching for Lost Sharks: Extinct or Alive?

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The perception of sharks as large, fearsome, toothy predators belies the reality that sharks, rays, and chimaeras (a.k.a. ghost sharks) are highly diverse and can be informative of the health of the marine environment. In 2014, nearly 25% of shark, ray, and chimaera species were threatened with extinction (Dulvy et al., 2014). A follow up study found this number had increased to approximately 33% in 2021 (Dulvy et al., 2021), with at least three species considered Critically Endangered–Possibly Extinct. Since the most recent study, at least one species has now been confirmed to be Extinct!

The scale and drivers of this biodiversity loss were revealed by the IUCN Red List of Threatened Species assessment process. Overfishing, and habitat loss and degradation are the primary drivers, with pollution and climate change also being contributing factors.

Yet despite increasing extinction risk, 20% of all known species of sharks, rays, and chimaeras were described in the past 20 years. Although the number of species has been increasing, many known species have simply vanished without notice. Some groups (e.g., sawfishes, angelsharks, devil rays) have gained attention through special working groups and improved management policies, but most species have remained largely anonymous to the public.

Most of these threatened species occur in regions considered biodiversity ‘hotspots’ and where food security is of primary concern. Compounding the problem is a lack of adequate species-specific identification knowledge and guide materials. Awareness of these issues are largely absent from most western organizations where the majority of sharks, rays, and chimaeras have largely been ‘lost’ in a hyper-driven media age whereby a few large charismatic sharks overshadow the majority of species. While a few charismatic species receive much media, conservation, and scientific attention, the fate of over 1,200 species of ‘Lost Sharks’ remains largely unknown.

A new YouTube series ‘Searching for Lost Sharks: Extinct or Alive’ follows the exploits of Dr. Dave Ebert and a team of dynamic early career researchers as they travel to different parts of the world where they seek out Lost Sharks, those shark, ray, and chimaera species that have not been seen in decades, to determine if they still exist or have vanished.

In the series, Dave shares his personal journey as a shark, ray, and chimaera researcher, conservationist, and educator, highlighting his efforts to rediscover lost species and bring awareness to those that remain largely unknown. The series is dedicated to shining a light on some of the rarest sharks, rays, and chimaeras and their critical role in marine ecosystems.

Join Dave and his team as they dive into the mysterious world of sharks in this captivating new documentary series as they uncover the hidden world of Lost Sharks and discover how you can help protect these vital species.

The Save Our Seas Foundation (Project #594) provided funding for the series as part of a broader program to raise awareness of Lost Sharks.

Series Presenter, Producer & Writer Dr. David Ebert
Videographer: Denisse Sotomayor
Editor: Andrew Lewin – Cuttlefish Media & Speak Up for Blue

Media
Instagram: @lostsharkguy
Facebook: @lostsharks
X: @lostsharksguy
LinkedIn: David Ebert
Lost Shark Guy: www.lostsharkguy.com
YouTube: Beyond Jaws Podcast (co-host)

References
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Assess Working Group IUCN Red List of Threatened Species Update

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The IUCN SSC Shark Specialist Group is considered the Red List Authority on the status of all species of sharks, rays, and chimaeras. The 2025 IUCN Red List of Threatened Species' latest update was published in March and details of assessments can be found here: www.iucnredlist.org. No new assessments for sharks, rays, or chimaeras were published.

Generally, unless new information that might impact the status of a species is made available, each IUCN Red List assessment is valid for ten years. In 2025, 117 sharks, rays, and chimaeras are planned for re-assessment. A list of species currently being re-assessed is provided in Table 1.

We extend our sincere gratitude to IUCN SSC Shark Specialist Group members and non-members who have contributed to these assessments.

For any questions regarding these or upcoming assessments, please reach out to Cassandra Rigby and Brittany Finucci, Red List Authority Coordinators: redlist@iucn-ssg.org, crigby@westnet.com.au; brit.finucci@gmail.com



Pygmy Thornback Skate
[*Dentiraja flindersi*]

Photo by David Spencer Muirhead, Naturalist.org, CC-BY-NC

Table 1: Table of **upcoming** shark, ray, and chimaera IUCN Red List of Threatened Species assessments for 2025. CR – Critically Endangered, EN – Endangered, VU – Vulnerable, NT – Near Threatened, LC – Least Concern, DD – Data Deficient, NE – Not Evaluated.

Scientific name	Common name	Current IUCN Red List Category
SHARK		
Carcharhiniformes		
PENTANCHIDAE		
<i>Asymbolus funebris</i>	Blotched Catshark	DD
<i>Asymbolus pallidus</i>	Pale Spotted Catshark	LC
<i>Asymbolus parvus</i>	Dwarf Catshark	LC
<i>Asymbolus rubiginosus</i>	Orange Spotted Catshark	LC
<i>Bythaelurus incanus</i>	Dusky Catshark	DD
<i>Dichichthys bigus</i>	Short-tail Catshark	DD
<i>Figaro boardmani</i>	Australian Sawtail Shark	LC
<i>Galeus gracilis</i>	Slender Sawtail Shark	DD
<i>Halaelurus sellus</i>	Speckled Catshark	LC
SCYLIORHINIDAE		
<i>Atelomycterus marnkalha</i>	Eastern Banded Catshark	DD
<i>Cephaloscyllium cooki</i>	Cook’s Swellshark	DD
<i>Cephaloscyllium laticeps</i>	Draughtboard Shark	LC
<i>Cephaloscyllium signourum</i>	Flagtail Swellshark	DD
<i>Cephaloscyllium speccum</i>	Speckled Swellshark	DD
<i>Cephaloscyllium zebrum</i>	Narrowbar Swellshark	DD
TRIAKIDAE		
<i>Mustelus antarcticus</i>	Gummy Shark	LC
Heterodontiformes		
HETERODONTIDAE		
<i>Heterodontus portusjacksoni</i>	Port Jackson Shark	LC
Orectolobiformes		
HEMISCYLLIIDAE		
<i>Hemiscyllium hallstromi</i>	Papuan Epaulette Shark	VU
<i>Hemiscyllium ocellatum</i>	Epaulette Shark	LC
ORECTOLOBIDAE		
<i>Orectolobus floridus</i>	Floral Banded Wobbegong	LC
<i>Orectolobus hutchinsi</i>	Western Wobbegong	LC
<i>Orectolobus maculatus</i>	Spotted Wobbegong	LC
<i>Orectolobus parvimaculatus</i>	Dwarf Spotted Wobbegong	LC
<i>Orectolobus reticulatus</i>	Network Wobbegong	DD
<i>Sutorectus tentaculatus</i>	Cobbler Wobbegong	LC
PARASCYLLIIDAE		
<i>Parascyllium collare</i>	Collared Carpetshark	LC
<i>Parascyllium elongatum</i>	Elongate Carpetshark	DD
<i>Parascyllium ferrugineum</i>	Rusty Carpet Shark	LC
<i>Parascyllium sparsimaculatum</i>	Ginger Carpetshark	DD
Pristiophoriformes		
PRISTIOPHORIDAE		
<i>Pristiophorus cirratus</i>	Common Sawshark	LC
<i>Pristiophorus delicatus</i>	Tropical Sawshark	LC
<i>Pristiophorus nudipinnis</i>	Southern Sawshark	LC
Squaliformes		
ETMOPTERIDAE		
<i>Etmopterus molleri</i>	Moller’s Lanternshark	DD
Squatiniiformes		
SQUATINIDAE		
<i>Squatina albigunctata</i>	Eastern Angelshark	VU
<i>Squatina australis</i>	Australian Angel Shark	LC
<i>Squatina pseudocellata</i>	Western Angel Shark	LC
<i>Squatina tergocellata</i>	Ornate Angelshark	LC

Scientific name	Common name	Current IUCN Red List Category
RAY		
Myliobatiformes		
DASYATIDAE		
<i>Maculabatis toshi</i>	Brown Whipray	LC
<i>Neotrygon picta</i>	Speckled Maskray	LC
MOBULIDAE		
<i>Mobula birostris</i>	Oceanic Manta Ray	EN
Rajiformes		
ANACANTHOBATIDAE		
<i>Sinobatis caerulea</i>	Indigo Legskate	DD
<i>Sinobatis filicauda</i>	East Australian Legskate	DD
ARHYNCHOBATIDAE		
<i>Bathyraja richardsoni</i>	Richardson’s Skate	LC
<i>Insentiraja laxipella</i>	Eastern Looseskin Legskate	DD
<i>Irolita waitii</i>	Southern Round Skate	LC
<i>Irolita westraliensis</i>	Western Round Skate	DD
ARHYNCHOBATIDAE		
<i>Pavoraja arenaria</i>	Sandy Skate	DD
<i>Pavoraja nitida</i>	Peacock Skate	LC
<i>Dentiraja flindersi</i>	Pygmy Thornback Skate	DD
<i>Dentiraja lemprieri</i>	Australian Thornback Skate	LC
<i>Dentiraja oculus / oculata</i>	Australian Ocellate Skate	LC
<i>Dentiraja polyommata</i>	Argus Skate	LC
<i>Dipturus acrobelus</i>	Australian Deepwater Skate	LC
<i>Dipturus apricus</i>	Pale Tropical Skate	LC
<i>Dipturus canutus</i>	Grey Skate	EN
<i>Dipturus grahami</i>	Graham’s Skat	LC
<i>Dipturus gudgeri</i>	Bight Skate	NT
<i>Dipturus melanospilus</i>	Blacktip Skate	DD
<i>Dipturus queenslandicus</i>	Queensland Deepwater Skate	DD
<i>Dipturus wengi</i>	Weng’s Skate	LC
<i>Okamejei leptoura</i>	Australian Thintail Skate	LC
Rhinopristiformes		
TRYGONORRHINIDAE		
<i>Trygonorrhina dumerilii</i>	Southern Fiddler Ray	LC
<i>Trygonorrhina fasciata</i>	Eastern Fiddler Ray	LC
Torpediniiformes		
HYPNIDAE		
<i>Hypnos monopterygius</i>	Coffin Ray	LC



Epaullette Shark
[*Hemiscyllium ocellatum*]



Orange Spotted Catshark
[*Asymbolus rubiginosus*]



Draughtboard Shark
[*Cephaloscyllium laticeps*]



Round stingray, [*Taeniura grabata*] inside the cavern in Tenerife, Canary Islands, Spain

Funding Opportunities



ASAP Species Rapid Action Fund

 www.speciesonthebrink.org/rapid-action-fund

Status: Open

During a conservation project, conservation emergencies or a need for unforeseen activities may arise. In such cases, time is of the essence. Fast action can make all the difference to a species' chance of survival. That is why ASAP is offering grants of up to SGD 13,500 to ASAP Partners for urgent and emergency conservation of ASAP species. The fund will provide rapid disbursement of small amounts of funds to address urgent requests from the field for conservation actions. Grants can be used in the following ways:

- To address unforeseen conservation emergencies where urgent action is needed; and
- For the seamless continuation of important current conservation actions. Proposals to support the on-going costs of a long-term conservation project are not eligible except where there is an unforeseen funding gap, and where the seamless continuation of activities is imperative for the ongoing or long-term conservation of the ASAP species in question. They invite ASAP Partners to submit proposals to the ASAP Species Rapid Action Fund. Proposals will be reviewed on a rolling basis throughout the year; they can be submitted at any time.

ASAP Species Conservation Grant

 www.speciesonthebrink.org/species-conservation

Status: Open

ASAP Species are some of the most at risk of extinction on the planet. The ASAP Species Conservation Grant is designed to support ASAP Partners in their efforts to conserve ASAP Species and their habitats. To be considered for an ASAP Species Conservation Grant, an organisation must be an existing ASAP Partner. ASAP Partners are invited to submit pre-proposals for a maximum of SGD 16,000. The duration of the ASAP-funded project or project component should be 12 months or less. The priorities for ASAP Species Conservation Grants are:

- projects within Southeast Asia, but priority conservation actions for ASAP species outside this region will be considered where there is strong justification.
 - projects submitted by national organisations and those where the Project Lead is from the country in which the conservation actions take place.
 - ASAP Species that are receiving less conservation attention globally than is average for ASAP Species, and to applications making a clear case that the species in question is severely under-supported globally.
- Please note that funding for this opportunity is limited and the grant will close once funding is allocated.

ASAP Species Continuation Grant

 www.speciesonthebrink.org/species-continuation

Status: Open

The ASAP Species Continuation Grant is open to ASAP Partners who have previously received funding from either the ASAP Species Conservation Grant or the ASAP Species Rapid Action Fund. There are two components to the ASAP Species Continuation Grant: funding to enable follow-up conservation activities for ASAP Species and funding to address the organisational needs or priorities of ASAP Partners. Applications must address both components. Proposals should be submitted in Singapore Dollars for a maximum of SGD 30,000 a year, with activities relating to project implementation and organisational development included in each year of the grant. Up to SGD 20,000 a year can be for project activities, with up to SGD 10,000 a year to support organisational development. Proposals can be for a maximum of three years.

ASAP Partner Networking Grant

 www.speciesonthebrink.org/partner-networking

Status: Open

The ASAP Partner Networking Grant is designed to facilitate collaboration and networking between ASAP Partners to catalyse conservation action for ASAP Species. To be eligible:

- All applicants must be ASAP Partner organisations.
- The application must detail how the collaboration will further the conservation of ASAP Species. This can be for a single or multiple ASAP Species.

Proposals should be submitted in Singapore Dollars for a maximum of SGD 13,500. The duration of the ASAP-funded activities should be 6 months or less.

Funding Opportunities



The Mohamed bin Zayed Species Conservation Fund

 speciesconservation.org

Deadline: October 15, 2025

The Mohamed bin Zayed Species Conservation Fund is an innovative philanthropy providing small grants to boots-on-the-ground, get-your-hands-dirty, in-the-field species conservation projects for the world's most threatened species. The Fund has been established to provide targeted grants to individual species conservation initiatives, recognize leaders in the field and elevate the importance of species in the broader conservation debate. Its focus is global and eligibility for grants will extend to all plant, animal and fungi species conservation efforts, without discrimination on the basis of region or selected species. However, it is very competitive indeed with only around 12% of applicants receiving a grant. Grants will be awarded based on their ability to meet criteria pre-determined by the Species Fund, and are for maximum of \$25,000 for each project.

Upcoming Meetings



8th Southern African Shark and Ray Symposium

September 15–19, 2025
Makhanda, Eastern Cape, SA

The Southern African Shark and Ray Symposium is a biennial event that brings together researchers, conservationists, and enthusiasts to discuss the latest findings and strategies for the conservation of sharks and rays in the region. The 8th symposium is scheduled to take place from September 15 to 19, 2025, in Makhanda, Eastern Cape, South Africa. This event is organized by the South African Institute for Aquatic Biodiversity (SAIAB) in collaboration with the Wildlife Conservation Society.

The symposium serves as a platform for sharing research, fostering collaborations, and discussing conservation challenges and solutions related to sharks, rays, and chimaeras. Previous gatherings have featured presentations on various topics, including species behaviour, ecology, and the impacts of human activities on marine life. The upcoming event in 2025 aims to continue this tradition, providing opportunities for professionals and the public to engage in meaningful conversations about the preservation of these vital marine species.

For further details it can be found online here.



IUCN World Conservation Congress

October 9–15, 2025
Abu Dhabi, UAE

The IUCN World Conservation Congress is where the world comes together to set priorities and drive conservation and sustainable development action. IUCN’s 1400+ government, civil society and Indigenous peoples’ Member organisations vote on major issues to help guide humanity’s relationship with our planet.

The Congress is also the largest marketplace for conservation and sustainable development science, practice and policy. Scientists, policy experts, business leaders and professionals from around the globe share their experience, innovation and latest research.

IUCN’s unique convening power of state and non-state actors together gives Congress a powerful mandate to set the nature conservation agenda for decades to come.

For further details it can be found online here.



European Elasmobranch Association (EEA) Annual Scientific Conference

29–31, 2025
Rotterdam, The Netherlands

The European Elasmobranch Association (EEA) is a non-profit umbrella organisation of European organisations dedicated to the study, management and conservation of sharks, rays, and chimaeras.

The EEA holds Annual Scientific Meetings, which are attended by international researchers, non-governmental organisation (NGO) representatives, students and interested members of the public, offering high profile discussions and a presentation forum in the marine science and conservation context. In recent years, both the Annual General Meeting and Annual Scientific Meeting, have been combined and are the highlight of European shark, ray, and chimaera activities.

Dutch Elasmobranch Society together with Blijdorp Zoo Rotterdam as the host of the 2025 EEA Annual Scientific Conference. The theme for this year is “Tomorrow’s World; The next chapter in Elasmobranch science and conservation.”

For further details it can be found online here.



Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 20th Conference of Parties

November 24–December 05, 2025, Samarkand, Uzbekistan

The Parties to CITES are collectively referred to as the Conference of the Parties. Every two to three years, the Conference of the Parties meets to review the implementation of the Convention. These meetings last for about two weeks and are usually hosted by one of the Parties. The meetings are often referred to as ‘CoPs’. They provide the occasion for the Parties to:

- review progress in the conservation of species included in the Appendices;
- consider (and where appropriate adopt) proposals to amend the lists of species in Appendices I and II;
- consider discussion documents and reports from the Parties, the permanent committees, the Secretariat and working groups;
- recommend measures to improve the effectiveness of the Convention; and
- make provisions (including the adoption of a budget) necessary to allow the Secretariat to function effectively.

For further details it can be found online here.

Upcoming Meetings



Spanish National Elasmobranch Network (Red Nacional de Elasmobranchios – RNE) Canary Islands, Spain

March 2026

The RNE is a collaborative platform that connects researchers, non-governmental organisations, students, and government representatives from across Spain, all working towards the study and conservation of sharks and rays. Since its creation, the Network has organised six successful editions of its national meeting (Jornadas de la Red Nacional de Elasmobranchios, JRNE), with participation from a wide range of professionals and students involved in over 25 research and conservation projects. The initiative also benefits from the active involvement of Spain’s national biodiversity authorities.

These meetings have become a key annual event for sharing scientific knowledge, fostering collaborations, and identifying conservation priorities for elasmobranchs in Spanish waters. The upcoming 7th edition (VII JRNE) is currently being prepared and will take place in Gran Canaria (Canary Islands, Spain) in March 2026. We believe it would be of great interest to the international shark and ray community.



Northeast Pacific Shark Symposium VII

March 19–21, 2026
Newport, Oregon

The Northeast Pacific Shark Symposium (NEPSS) grew out of the smaller Cowshark Workshop, initially organized by the Seattle Aquarium in April 2012 following earlier discussions in Vancouver in 2011 organized by TRAFFIC and WWF in Canada. Building on that foundation, NEPSS launched in 2014 at the Seattle Aquarium, aimed at bringing together a broader community of shark researchers—including biologists, aquarists, and enthusiasts—from across the Pacific coast. Since its inception, the symposium has been held biennially, creating a recurring forum for presenting new findings and fostering collaboration among researchers focused on sharks of the Northeast Pacific region.

Follow Big Fish Labs’ channels for more information.



Convention on the Conservation of Migratory Species of Wild Animals [CMS] 15th Conference of Parties [CoP15]

March 23–29, 2026
Campo Grande, Brazil

This landmark United Nations wildlife conservation meeting will bring together governments, scientists, conservationists, indigenous peoples and local communities, environmental leaders, and civil society from around the world to tackle the urgent conservation challenges faced by the thousands of species of wild animals that cross international borders.

For further details it can be found online here.



Sharks International 2026

May 04–08, 2026
Colombo, Sri Lanka

si2026.org

The 5th Sharks International conference is set to take place from 4th to 8th May 2026 in Colombo, Sri Lanka. This will be the fifth edition of the world’s largest conference on sharks, rays, and chimaeras, held every four years. Sharks International 2026 will be a space to share ideas, spark new collaborations, and build lasting partnerships and friendships. This conference will also offer various exciting opportunities for networking and professional development. Attendees can look forward to a range of workshops, plenary sessions, and panel discussions featuring renowned experts in shark, ray, and chimaera research, conservation, and policy. With a particular emphasis on inclusivity, equity, and diversity, we are dedicated to ensuring that voices from across the globe – especially those from the Global South – are heard and represented.

For further details it can be found online here.

Please visit the respective websites and communication from the host organisation for more information

The Countdown to Sharks International 2026 Has Begun!

Upcoming Meetings

Written by Daniel Fernando

Blue Resources Trust
IUCN SSC Shark Specialist Group | Indian Ocean | Regional co-Vice Chair

Get ready—Sharks International 2026 (SI2026) is shaping up to be the most exciting edition yet! From 4–8 May 2026, Sri Lanka will proudly host the world’s largest conference on sharks, rays, and chimaeras, marking the first time this prestigious event will be held in Asia.

Planning is well underway, and we were thrilled by the incredible response to our call for keynote speakers, themed sessions and panels, workshops, and side events. With over 150 proposals submitted, the enthusiasm from the global shark, ray, and chimaera community has been inspiring. Our committee has carefully reviewed the submissions, and we’re very happy with the proposed programme.

We’re also excited to confirm our venue! Sharks International 2026 will take place at the Sirimavo Bandaranaike Memorial Exhibition Centre at BMICH in Colombo, a modern and spacious facility designed to foster engaging discussions, networking, and collaboration.

Accessibility, equity, and diversity remain at the heart of SI2026. We are committed to amplifying voices from the Global South and ensuring broad participation. To support this, we offer heavily subsidised registration rates, with additional small awards available for students from low-income and South Asian Association for Regional Cooperation (SAARC) countries. Registration and abstract submissions are now OPEN! Traveling to Sri Lanka is hassle-free for international attendees thanks to the simple online Electronic Travel Authorisation (ETA), available for most nationalities. And with a 30-day visa, we encourage you to extend your stay and explore Sri Lanka’s rich cultural heritage, diverse landscapes, and extraordinary wildlife. Whether you’re wandering through ancient ruins, spotting leopards on safari, or unwinding on pristine beaches, there’s something for everyone. You can also find a selection of curated excursions to join before or after the conference on our website or in the registration portal!

Stay connected for key updates

we* can’t wait to welcome you to Colombo in 2026!

*The host, Blue Resources Trust, in partnership with our funders for this conference - Save Our Seas Foundation (SOSF), Shark Conservation Fund (SCF), Marine Conservation Action Fund (MCAF) of the New England Aquarium, and the Roe Foundation - are committed to creating a dynamic, inclusive, and impactful event. Our goal is to shape the future of shark, ray, and chimaera conservation through the sharing of knowledge, the expansion of international collaborations, and the development of strategic partnerships that will lead to long-term, sustainable outcomes.

Web : si2026.org
Instagram : [instagram.com/sharks.international/](https://www.instagram.com/sharks.international/)
Facebook : [facebook.com/Sharks.International](https://www.facebook.com/Sharks.International)
BlueSky : bsky.app/profile/sharks-int.bsky.social
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Photo by Sjarhei Palishchuk



Photo by Daniel Kellin

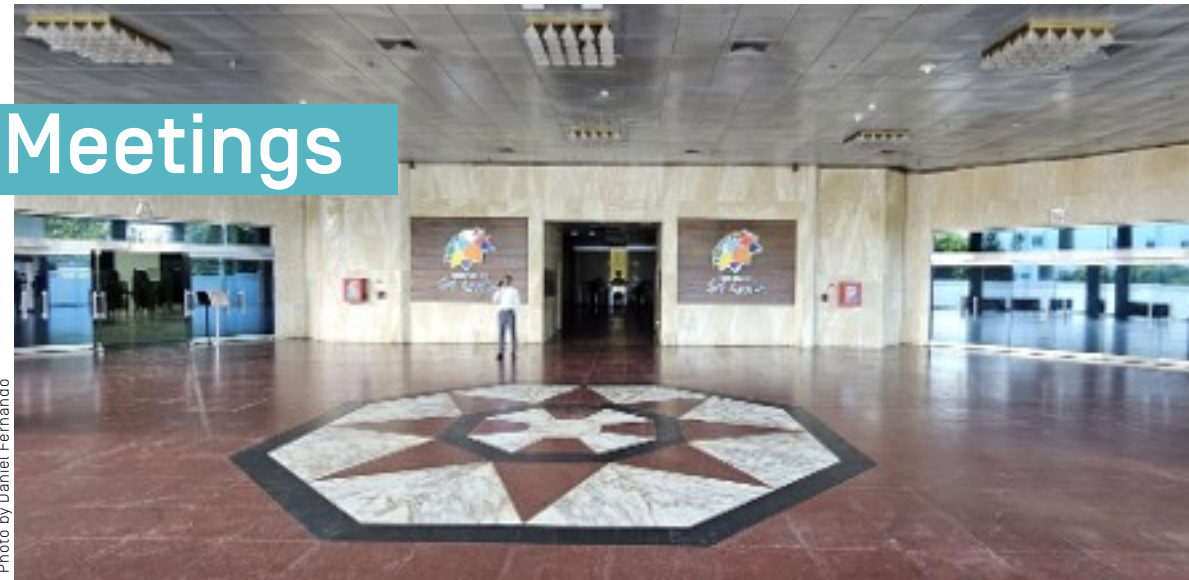


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The IUCN SSC Shark Specialist Group achievements over the last 30 years have been possible due to the generous support of funders, members, and other volunteers from countless organizations. Our members volunteer their time, effort and expertise to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

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



Great Hammerhead (*Sphyrna mokarran*) as part of our research project in Bimini, Bahamas

Photo by Guido Leurs

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