



SOUTHERN AFRICAN
SHARK & RAY SYMPOSIUM

BOOK OF ABSTRACTS



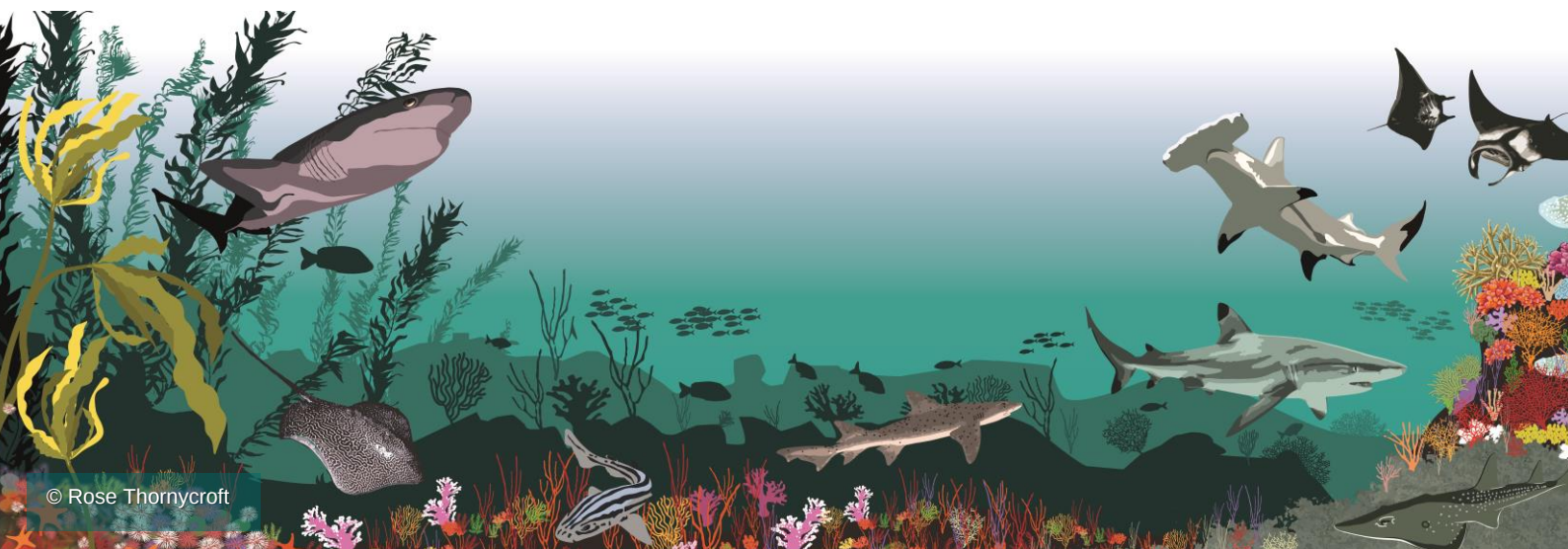
8th Southern African Shark and Ray Symposium

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ABSTRACTS

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PROGRAMME: Day 1, Tuesday 16th September

08:50 KEYNOTE: Kim Bassos-Hull – Connecting for conservation: New discoveries in pelagic ray biology and ecology while building global capacity

Biology, physiology & ecology	09:30	Mandy Lombard: A research framework to improve knowledge of reproductive biology and movement ecology in threatened chondrichthyans
	09:45	Edward Bevan: Reef manta ray reproduction: guiding conservation through underwater ultrasound-based monitoring in southern Mozambique
	10:00	François Lampen: Using elasmobranch ultrasonography to identify ecologically important habitat types and reproductive activity in the smooth hound shark (<i>Mustelus mustelus</i>) and diamond ray (<i>Gymnura natalensis</i>)
	10:15	Kristina Naidoo: Development and comparison of gonadosomatic and hepatosomatic indices for sharks caught in the KwaZulu-Natal Sharks Board bathers protection programme
	10:30	Leigh de Necker: The trophic dynamics of False Bay's top predators: Who eats who?
	10:45	Mark Fitzgibbon: Comparing subtidal and beach stranded shark egg case records in False Bay
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	11:45	Anthony Bernard: Deep sea Elasmobranchs of the Maldives – Novel insights into assemblages and behaviour across the Maldives archipelago
	12:00	Jessica Morrison: Blueprints: Validating photo-identification for endemic blue stingrays as tool for monitoring a critical aggregation site
	12:15	Jule Buschmann: Manta ray cleaning ecology: Novel insights from long-term remote camera monitoring in southern Mozambique
	12:30	Stela Fernando: Breeding behaviour of <i>Narcine rierai</i> in Mozambique coast
	12:45	Megan Maroen: The first empirical population trend assessment of white sharks, <i>Carcharodon carcharias</i> , in Gansbaai, South Africa
	13:00	Ralph Watson: Inter-dorsal fin lengths strongly correlate with other commonly-used length measurements in targeted elasmobranch species in South Africa
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	14:15	Jessica Winn: Mitogenome sequencing reveals deep phylogeographic structure and a Northern Hemisphere origin in the common smoothhound shark <i>Mustelus mustelus</i>
	14:30	Kelvin Hull: Unravelling the evolutionary history and population demographics of the pyjama shark utilising genomic data
	14:45	Michaela van Staden: Molecular taxonomy of South Africa's catsharks: How far have we come?
	15:00	Karla Redelinghuys: Update on the species delimitation of whiplays (Genus: <i>Himantura</i>) in the Western Indian Ocean
	15:15	Maëva Grondin-Bergerat: Understanding the genetic connectivity of bronze whaler sharks in the Western Indian Ocean: insights from Reunion Island
15:30 AFTERNOON TEA		
Diversity	16:00	Josh Rambahiniarison: Updating ecological knowledge on sharks and rays in Comoros
	16:15	Laure Amelia Desire: Patterns in shark and ray diversity and abundance across Seychelles: A synthesis from stereo-BRUVs surveys
	16:30	Décio Pequeno Maoze: Preliminary assessment of elasmobranch diversity using baited remote underwater video (BRUVs) in southern Inhambane, Mozambique
	16:35	Érica Tovela: Elasmobranch diversity and distribution in Mozambique: Insights from museum collections and eDNA monitoring surveys
	16:50	Melissa Nel: Evaluating elasmobranch community dynamics in Plettenberg Bay: A multi-method approach
	17:05	Abigail Eddy: Elasmobranch community structure on the continental slope offshore East London, South Africa
17:20 END OF DAY 1		
18:30 DINNER AT THE LOWLANDER (6 Worcester Street)		

Connecting for conservation: New discoveries in pelagic ray biology and ecology while building global capacity

Kim Bassos-Hull

Sharks and Rays Conservation Research Programme, Mote Marine Laboratory, USA



Pelagic rays are one of the most endangered groups of elasmobranchs globally. While capable of moving large distances they are often tied to island or coastal lagoons and estuaries for bearing live young or food resources and susceptible to human impacts such as bycatch in fisheries, habitat loss, pollution and vessel disturbances or strikes. Over the last 20 years through collaborative research, large gains in knowledge have been made about their biology and ecology which has aided in their conservation and management. One example is the whitespotted eagle ray (*Aetobatus narinari*). Since 2009, Mote's Sharks and Rays Conservation Research Program in collaboration with Brookfield Zoo Chicago's Sarasota Dolphin Research Program has conducted research with this species near Sarasota, Florida, sampling and tagging 729 rays. This research has involved over 100 high school, undergraduate and graduate students, professional colleagues and aquarium personnel to train and build capacity. Students and colleagues from over 15 countries including Mexico, Cuba, Brazil, Ecuador, Colombia, Sri Lanka, Kenya, South Africa, U.K., France, and Belgium participated in this research. Additionally, we have collaborated on in-country research in locations such as Cuba, Mexico, Bermuda, Brazil, and Galapagos Ecuador which has yielded several co-authored publications on ray biology and ecology. Some of the sampling and handling techniques pioneered with whitespotted eagle rays have allowed us to build research projects with other ray species while also involving students and collaborators. We highlight additional case studies with a few other ray species and that is takes cooperation and a village of researchers to shed light on their biology and ecology which ultimately leads to enhanced conservation measures.

Keywords: Mote Marine Laboratory, whitespotted eagle ray, elasmobranchs

A research framework to improve knowledge of reproductive biology and movement ecology in threatened chondrichthyans

Amanda Lombard, Grant Smith, Ryan Daly, François Lampen, Jennifer Olbers, Angus Van Wyk, Rhett Bennett, Aletta Bester-van der Merwe, Jeremy Cliff, Matt Dicken, Marcus Drymon, Nick Dulvy, Taryn Murray, Amber Peters, Malcolm Smale, Brendan Talwar, David Wells

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Chondrichthyan populations are globally threatened by climate change, pollution and habitat destruction, but fishing pressure is considered the primary threat, with 99.6% of known species being exploited and exposed to fisheries mortality. With ~194 species, South Africa ranks in the top five countries of chondrichthyan diversity and endemism and has a significant fraction of the most evolutionary distinct species. Further, many wide-ranging threatened species spend a significant portion of time in South African waters. South Africa thus has a significant role to play in both local and regional chondrichthyan conservation. The lack of coherence and effectiveness in fisheries bycatch and spatial management is a further impediment to reducing the threatened status of many of these species. In addition, we know little of the reproductive status, movement ecology, and overlap with fisheries of many threatened species. This is true even within MPAs. Here we present a collaborative research framework that is currently being implemented to improve knowledge and management of chondrichthyans in the iSimangaliso MPA. The MPA is a chondrichthyan hotspot, hosting ~46 species with 33 assessed as threatened by the IUCN Red List. The framework builds on previous research and includes methods such as DNA barcoding for species identification, photo-ID monitoring of pregnant sharks, underwater ultrasonography to determine reproductive status, passive acoustic monitoring of tagged individuals of many species, and stereo-baited remote underwater video assessments of species within different management zones. With a focus on the movement ecology and reproduction of chondrichthyans in the MPA, we aim to determine the fine scale and transboundary movements of these species, delineate their aggregation sites and movement corridors, and confirm their reproductive status, in order to provide fisheries and conservation management recommendations for their effective protection, both within the MPA and regionally.

Keywords: Spatial management, fisheries management, management effectiveness, iSimangaliso MPA

Take home message

The reproductive status and overlap with fishing activity of threatened chondrichthyans in South Africa is not well understood, even within MPAs that have management objectives to protect them, such as the iSimangaliso MPA. The collaborative research framework we present here, which includes the MPA managers, aims to deliver evidence-based recommendations for the MPA authority to provide better protection for these species, by improved spatial, temporal and fisheries management measures.

Reef manta ray reproduction: guiding conservation through underwater ultrasound-based monitoring in southern Mozambique

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Despite widespread declines in the sightings of reef manta rays (*Mobula alfredi*) throughout Mozambique, Závora remains a critical area used primarily for cleaning, socialising, courtship and mating. This site has recently been identified as one of the few remaining areas in southern Mozambique where reproductive activity persists, with seasonal sightings of courtship behaviour and large, visibly pregnant females. With only a few studies conducted on the reproductive biology of manta rays, estimates of sexual maturity in females are imprecise and require obvious external signs of mating or pregnancy. We use a combination of underwater ultrasonography and paired-laser photogrammetry, to determine a more accurate estimate of size at sexual maturity and reproductive output for female *M. alfredi* in southern Africa. During a pilot study between October and December 2024, thirteen *in situ* underwater ultrasound scans were taken on five female reef mantas, with four of those individuals being in late stage pregnancy. Notably, one individual that was scanned in late stage pregnancy then was resighted two days later, no longer pregnant, suggesting a potential nearby birthing area. Preliminary insights from the pilot study provide the first evidence from Mozambique that: (1) ultrasonography can be successfully applied to free-swimming manta rays to assess pregnancy and sexual maturity, and (2) Závora Bay provides a unique opportunity to directly monitor reproductive status, offering rare insights into the species' reproductive biology in the region. With additional *in situ* ultrasound scans planned for the 2025 manta ray season (July–November), we aim to advance our understanding of female sexual development—addressing a key gap in the life history of reef manta rays in southern Africa. By further quantifying reproductive output, we can inform spatial management strategies such as time-area closures, ensuring more effective, evidence-based conservation of this vulnerable population.

Keywords: *Mobula alfredi*, life history, ultrasonography, paired-laser photogrammetry

Take home message

Závora represents one of the last known reproductive habitats for reef manta rays in southern Mozambique, highlighting its importance for the conservation of this vulnerable population. Improved understanding of their reproductive biology can directly inform targeted management strategies, including the establishment of MPAs or other conservation measures. Currently, Závora, and much of the southern Mozambican coastline, remains unprotected, leaving manta rays susceptible to anthropogenic threats such as bycatch. Seasonal closures during key reproductive periods may offer a valuable opportunity for population recovery in this previously exploited region.

Using elasmobranch ultrasonography to identify ecologically important habitat types and reproductive activity in the smooth hound shark *Mustelus mustelus* and diamond ray *Gymnura natalensis*

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Reproductive ultrasonography has emerged as a critical procedure in shark conservation. This technology makes it possible to evaluate the reproductive biology of a species in a non-invasive manner and allows researchers to determine sexual maturity, the reproductive life cycle, pregnancy and gestation in live sharks. Sonograms were performed on female smooth hound sharks *Mustelus mustelus* and diamond rays *Gymnura natalensis*, caught by shore anglers in an unfished harbour (Port of Ngqura) in the Eastern Cape in March 2025 as part of an ongoing spatiotemporal movement pattern study. A portable IMV ExaPad ultrasound, with a Convex C360 probe was used to conduct the sonograms. Uterine anatomy, as well as the presence of fetuses in advanced stages of development were observed in both species, indicating that the port may be functioning as an important pupping and/or nursery area for these species. Although both species utilise the same general habitat, they differ both in their movement patterns as well as their reproductive strategies and methods. While both species use a matrotrophic mode of reproduction, they use different forms. The diamond ray exhibits a lipid histotrophic form, whereas the smooth hound shark utilises lipid histotrophy. There is currently very little known about the reproductive biology of these chondrichthyans. The sonograms clearly identified the different reproductive methods used. This information is critical to determine key reproduction parameters for threatened species and can inform and guide regional and national shark conservation management plans and programs.

Keywords: Sonography, viviparity, reproductive assessment, reproductive biology

Take home message

Understanding and determining the reproductive biology of elasmobranchs is a crucial element in assessing and managing their populations. These preliminary sonographic evaluations clearly demonstrates that the Port of Ngqura is an important reproduction area for smooth hound sharks and diamond rays. Further investigations into the reproductive activity of both these, and indeed other elasmobranchs commonly encountered within the Port, are warranted.

Development and comparison of gonadosomatic and hepatosomatic indices for sharks caught in the KwaZulu-Natal Sharks Board bather protection programme

Kristina Naidoo, Jeremy Cliff, Matt Dicken

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The Gonadosomatic Index (GSI), the ratio of gonad weight to total body weight, and the Hepatosomatic Index (HSI), the ratio of liver weight to body weight, are important indicators of reproductive activity and energy reserves in sharks. Despite their importance, data on these indices in South African shark species remain limited. This study compiled and analysed GSI and HSI data from various shark species collected over 46 years (1978–2024) from the bather protection gear along the KwaZulu-Natal coastline. These indices were examined in relation to factors such as sex and reproductive stage. Morphological data (i.e., liver, gonad, and total body mass) collected during necropsy were used to calculate GSI and HSI, with results expressed as median± interquartile ranges. Statistical significance was tested using ANOVA with a p-value < 0.05 using the GraphPad Prism statistical package. The analysis revealed variations in energy reserves (indicated by HSI levels) and reproductive investment (reflected by GSI levels) across different (1) maturity and (2) sexual stages, with species ranked accordingly. The results highlighted the complex relationship between energy reserves, reproductive effort, and the biological stages of the sharks, offering insights into how these factors interact in shark species with varying life histories. These indices can serve as a reference tool and provide a more comprehensive understanding of shark health and reproduction. Monitoring GSI can inform conservation strategies by identifying key reproductive periods, aiding in the establishment of Marine Protected Areas or fishing restrictions. Assessment of HSI levels can help evaluate the impact of pollution on shark populations and guide conservation of critical habitats. Long-term monitoring of both metrics can help implement more effective shark and marine management strategies.

Keywords: Health, indices, liver, ovary, reproduction

Take home message

The creation of a broader South African database for GSI and HSI will assist with the development of better management and conservation strategies for elasmobranchs. Regular bi-annual assessments will enable indices trends to be tracked to facilitate the adjustment of management strategies accordingly. In addition, environmental monitoring and pollution regulatory authorities (e.g. South African Environmental Protection Agency (SAEPA)) will be able to use HSI data to monitor (and manage) the effects of pollutants on elasmobranchs.

The trophic dynamics of False Bay's top predators: Who eats who?

Leigh de Necker, Alison Kock, Justin O'Riain, Adam Barnett, Katja Abrantes, Matthew Lewis, Simon Elwen

WILDTRUST; Shark Spotters; University of Cape Town

Predation is a key driver of community structure and ecosystem function, with predator assemblages often forming hierarchical systems where larger predators influence smaller ones. In ecosystems with multiple predator tiers, intraguild predation and trophic overlap can drive niche partitioning, shape resource use and influence species interactions and behaviours. In False Bay, South Africa, trophic dynamics are particularly complex due to the presence of multiple high trophic level consumers, including broadnose sevengill sharks (*Notorynchus cepedianus*), white sharks (*Carcharodon carcharias*), and killer whales (*Orcinus orca*). Historically, False Bay hosted key aggregation sites for sevengill and white sharks, supporting a diverse predator-prey hierarchy, with these sharks preying on teleosts, elasmobranchs, seals, and cetaceans. The recent arrival of shark-specialist killer whales, documented preying on both shark species, has disrupted this order, necessitating a re-evaluation of trophic relationships and consideration of potential trophic cascades and ecosystem impacts. Stable isotope analysis was employed to elucidate the trophic dynamics of key apex predators in False Bay, including sevengills ($n = 40$), white sharks ($n = 7$), two individually identified killer whales ("Etty" and "Starboard"), and potential prey. Sevengills exhibited the highest $\delta^{15}\text{N}$ with high $\delta^{13}\text{C}$, indicating relatively consistent foraging on high trophic level prey (i.e. seals), and reliance on coastal, benthic food webs. Notably, sevengills ≤ 192 cm had lower $\delta^{13}\text{C}$ and higher $\delta^{15}\text{N}$ than larger individuals. Large sevengills primarily consumed benthic sharks (*Scyliorhinidae*) while smaller sevengills relied more on seals, aligning with telemetry data showing only immature females frequenting Seal Island. White sharks displayed lower $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ suggestive of a diet incorporating more offshore, pelagic prey and seasonal exploitation of seals. The killer whales showed distinct isotopic signatures: Etty's low $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ indicated minimal reliance on coastal food webs, while Starboard's higher values aligned with False Bay prey, particularly sharks, as supported by observational data. This study provides key insights into the unique trophic relationships and ecological roles of multiple top predators within a dynamic ecosystem.

Keywords: Intraguild predation, niche partitioning, stable isotope analysis, ecology

Take home message

Stable isotope analysis of sevengill and white sharks in False Bay, South Africa, reveal their distinct trophic roles as apex predators, suggesting that these two species are important in maintaining structure and function within this unique ecosystem. However, there is evidence that the arrival of shark-specialist killer whales, has disrupted the established trophic hierarchy. Shifts in trophic dynamics, triggered by intraguild predation, may alter ecosystem stability, necessitating further study to understand the cascading effects on lower trophic levels and overall ecosystem function.

Comparing subtidal and beach stranded shark egg case records in False Bay

Mark Fitzgibbon, Mike Mark Barron, Dylan Irion

Cape RADD (Research and diver development)

Shark egg cases provide insights into reproductive ecology of oviparous chondrichthyans. Citizen science has become a valuable tool in collecting a large quantity of beach stranded egg case data. Previous study has shown that the involvement in marine monitoring projects in eco-tourism activities, such as snorkeling and SCUBA diving, enhances the experience while simultaneously collecting large quantities of data. This on-going project utilizes both SCUBA and snorkel surveys to investigate the spatial distribution and the abundance of shark egg cases in False Bay. It then compares the in-situ observations with existing beach stranded egg case data, collected both locally and through citizen science initiatives. The in-water data were collected by both trained and recreational divers/snorkelers across multiple dive sites in False Bay. Photographic documentation was used for species identification of the egg cases and the attachment structures. Using these photographs, the author then identified the species of the shark as well as the attachment structure, collected morphometric data as well as evidence of depredation. As this project is still on-going results are not yet available, however initial data shows the following. The dark shyshark (*Haploblepharus pictus*) and puffadder shyshark (*Haploblepharus edwardsii*) prefer shallower habitats for egg deposition and attach egg cases mainly to seaweeds like *Bifurcariopsis capensis* and *Sargassum incisifolium*. The leopard catshark (*Poroderma pantherinum*) and pyjama catshark (*Poroderma africanum*) egg cases were found at deeper, attached mainly to *Eklonia maxima*, *Laminaria pallida* and *Eunicella tricornata*. So far, the abundance of *P. pantherinum* and *P. africanum* egg cases are greater in-situ than found stranded on the beach. These findings contribute to the baseline knowledge of local shark reproduction and highlights sites with increased numbers of egg cases. Management and regulating bodies should encourage the use of citizen science projects within eco-tourism and use it as a tool to further gain valuable knowledge of the marine environment.

Keywords: Elasmobranch, reproduction, citizen science, eco-tourism

Take home message

Citizen science within eco-tourism activities is further being proven to be a valuable tool in data collection and community engagement. This project may further highlight important areas for shark reproduction within marine protected areas. Eco-tourism operators can enhance knowledge and public perceptions with citizen science involvement.

Investigating the ecological role of white sharks in a Cape fur seal rabies outbreak

Alison Kock

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The recent outbreak of rabies, a viral disease affecting the nervous system of mammals, including humans, in Cape fur seals *Arctocephalus pusillus pusillus*, is unprecedented in marine mammal health. With dozens of confirmed cases and increasing public concern over aggressive seal behaviour, the situation prompts an urgent ecological question: has the decline of white sharks *Carcharodon carcharias* along South Africa's southern coast contributed to the scale or persistence of this outbreak? Although causality cannot be established, the hypothesis is ecologically plausible. Apex predators such as white sharks exert both direct effects (through predation of individuals) and indirect or "risk effects" that shape prey behaviour and physiology. Historically, white sharks have seasonally targeted Cape fur seals, particularly in regions like False Bay, Gansbaai and Mossel Bay. Under this predation pressure, seals exhibited high vigilance, reduced surface time, and stress responses, behaviours that reduced their vulnerability to attack. In contrast, rabid seals exhibit abnormal boldness, disorientation, and impaired diving ability, traits that, under historic levels of shark predation, would have made them vulnerable and less likely to survive long enough to spread infection. Without white sharks, infected individuals may persist longer, interact more widely with conspecifics, increasing the potential for transmission, and encounter other mammals and humans more frequently. This hypothesis aligns with theoretical models in disease ecology, which predict that predators can lower disease prevalence by removing infected individuals, a dynamic well-documented in terrestrial systems but underexplored in marine contexts. Addressing this question requires long-term monitoring of predator and prey dynamics, fine-scale behavioural tracking, and disease surveillance. The rabies outbreak may represent more than a disease event and could signal more profound systemic changes following predator decline. Understanding this potential link is critical for marine ecosystem resilience and highlights the broader, underappreciated consequences of apex predator loss.

Keywords: Disease ecology, predator-prey dynamics, behavioural change, marine conservation

Take home message

Targeted monitoring of Cape fur seal behaviour and health should be sustained and expanded at South African Cape fur seal colonies, in areas formerly frequented by white sharks and at control sites, to evaluate disease dynamics and ecological changes and to improve understanding of the ecological roles played by sharks. This should be undertaken collaboratively by conservation authorities, veterinarians, and researchers.

Deep-sea elasmobranchs of the Maldives – Novel insights into assemblages and behaviour across the Maldives archipelago

Anthony Bernard, Kaylee Smit, Lilou Porier, Khadeeja Ali, Lucy Woodall, Shafiya Naeem

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Deep-sea elasmobranchs face increasing threats from overfishing and climate change, yet their diversity, distribution, and behaviour remain poorly understood. We used stereo-BRUV landers to investigate elasmobranch assemblages on upper slope ecosystems (216–947 m) at six islands in the Maldives archipelago, providing new insights into community structure, environmental drivers, and foraging behaviour. Fourteen species (13 sharks and one ray) were recorded from 36 deployments, including six threatened and four near-threatened species. Assemblages were dominated by *Centrophorus granulosus* and *Hexanchus griseus*, with encounter frequencies of 41.7% and 55.6%, respectively. Depth was the primary driver of community structure, while island location and seafloor slope also contributed significantly. Species showed distinct depth associations: *Mustelus mosi* and *Cirrhigaleus asper* occurred shallower than 500 m, whereas *Etmopterus pusillus*, *Pseudotriakis microdon*, *Odontaspis ferox*, *Echinorhinus brucus*, and *H. griseus* occurred deeper than 500 m. Broad depth ranges were observed for *Galeocerdo cuvier* (216–831 m) and *C. granulosus* (300–947 m). Comparing abundance metrics revealed that IndiCount (cumulative counts of identified individuals) estimated ~2.5× higher abundances than MaxN for dominant species, although its use was limited by the lack of distinctive features in most taxa. Behavioural analysis of *H. griseus* (115 observations) using IndiCount showed repeated site visits separated by foraging excursions (10–400 min), with five foraging strategies identified, ranging from single assessments to systematic area cycling. These patterns suggest optimal foraging theory applies in resource-poor deep-sea environments. The Maldives' comprehensive shark fishing ban (in place since 2010) appears effective, as no north–south abundance gradient reflecting historical fishing pressure was detected. Our results demonstrate the value of stereo-BRUV landers for non-invasive deep-sea research and underscore the need for depth-stratified management to conserve elasmobranchs in the Indian Ocean.

Keywords: Stereo-BRUV landers, tiger shark, non-invasive techniques

Take home message

Deep-slope elasmobranch assemblages in the Maldives are structured primarily by depth, with several threatened species concentrated deeper than 500 m. To ensure effective conservation, fisheries managers and policymakers in the Indian Ocean should adopt depth-stratified management approaches while sustaining the Maldives' shark fishing ban as a regional model. This study also demonstrated that stereo-BRUV landers are a powerful, non-invasive tool for long-term monitoring of deep-sea elasmobranch communities and should be incorporated into future management and research programs.

Blueprints: Validating photo-identification for endemic blue stingrays as tool for monitoring a critical aggregation site

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Rays are known to aggregate in certain areas around the world, where they may fill proportionately larger ecological roles, however, the mechanisms and reasons behind this aggregatory behaviour remain not well understood. This lack of knowledge hinders conservation efforts and effective management strategies. In the Knysna Estuary in the Western Cape, South Africa, blue stingrays (*Dasyatis chrysonota*) aggregate at a predictable time of the year, likely for reproductive purposes, making them vulnerable to multiple threats, including human disturbances, such as fishing activities and boat traffic. This is particularly concerning as they are listed as Near Threatened, with a declining population trend according to the IUCN Red List for Threatened Species. To study the characteristics and function of this unique aggregation, a non-invasive photo-identification method was tested to determine if unique individuals could be identified. First, to determine whether individual stingrays could be reliably identified over time, a captive blue stingray at the Two Oceans Aquarium in Cape Town, South Africa, was photographed over several months, and pattern recognition programs (Finspotter and I³S Pattern) were used to assess whether its markings remained stable over time. Second, photographs of multiple individuals at the aggregation site were analysed to determine if patterns were variable enough between individuals to identify them. This study will validate photo-identification as an effective method for monitoring and tracking blue stingrays for the first time, and if successful, photographic monitoring will be used to understand the aggregation behaviour in the Knysna Estuary and determine if individuals show inter-annual philopatry to the site. This work will aid in informing management policies to protect blue stingrays during this vulnerable life stage in the Knysna Estuary.

Keywords: *Dasyatis chrysonota*, threatened species, Knysna Estuary, non-invasive survey, pattern recognition

Take home message

Southern African endemic blue stingrays aggregate at the Knysna Estuary Harbour every year in spring for reproductive purposes. During this time, they are susceptible to disturbances, including fishing and boating activities, boat noise, and reduced estuarine health. Photo-identification was tested as a tool to determine if individuals could be reliably identified and then used to characterise and understand this unique aggregation. Recommendations to SANParks include that, during the aggregation period (October to December), disturbances to the aggregation site should be limited, comprising of restricting boating activity during high tide when stingrays are most exposed, prohibiting boat deployment from the slipway if stingrays are present, and a seasonal ban on kayak polo in the harbour, as well as active targeting of blue stingrays.

Manta Ray Cleaning Station Use and Behaviour Revealed Through Long-Term Remote Camera Monitoring in Southern Mozambique

Jule Buschmann, Kim Roques, Jaime Davies, Awantha Dissanayake, Jennifer Keeping

All Out Africa Marine Research Centre, Praia do Tofo, Mozambique; University of Gibraltar, Gibraltar

Understanding elasmobranch behaviour and habitat use is critical for the conservation of threatened species, particularly in understudied regions such as the Inhambane coastline of southern Mozambique. This study used long-life remote underwater video (LL-RUV) cameras to collect 610 hours of footage between 2021 and 2024 at cleaning stations near Praia do Tofo, aiming to document species occurrence, interactions with cleaner species and responses to human activity. Fourteen threatened or data-deficient elasmobranch species were recorded, with reef manta rays (*Mobula alfredi*), oceanic manta rays (*Mobula birostris*), and small-eye stingrays (*Megatrygon microps*) identified as the primary cleaning station users. 174 manta ray sightings were documented across 106 sampling days. Both species showed distinct diurnal visitation patterns, with significantly higher sighting rates during morning and mid-day and marked declines in the afternoon. Visit durations varied widely (mean $\pm$ SD: 40.6 $\pm$ 66.6 minutes) and ranged from 2 seconds to 4.2 hours, with no significant differences between species. Manta rays were cleaned by bluestreak cleaner wrasse (*Labroides dimidiatus*) and white-spotted butterflyfish (*Chaetodon kleinii*), with cleaning occurring across various body patches. Cleaner fish showed species-specific spatial preferences: White-spotted butterflyfish aggregated in groups of up to 15 individuals around the dorsal fin and dorsal body, whereas cleaner wrasse were more broadly distributed across the body and found in smaller groups. Cameras also captured rare interspecific interactions, including co-occurrences of manta rays with small-eye stingrays and bowmouth guitarfish. Preliminary observations on diver impact suggest that while some manta rays temporarily leave cleaning stations prior to diver arrival, many return within 45 minutes, suggesting tolerance to limited human disturbance. These findings demonstrate the effectiveness of LL-RUV cameras for long-term, non-intrusive behavioural monitoring and highlight their potential for informing targeted conservation and management strategies for manta rays and other vulnerable elasmobranchs.

Keywords: *Mobula alfredi*, *Mobula birostris*, RUV, cleaning ecology, Mozambique

Take home message

Long-term remote camera monitoring in Praia do Tofo revealed the presence of 14 threatened or data-deficient elasmobranch species, including frequent cleaning station use by manta rays and small-eye stingrays and rare interspecific and cleaning interactions. These findings highlight the ecological significance of this site and support ongoing calls for the establishment of a marine protected area around Praia do Tofo to safeguard its diverse and vulnerable elasmobranch community.

Breeding behaviour of *Narcine rierai* in Mozambique coast

Stela Fernando, Osvaldo Chacate, Jorge Siteo, David Ebert

Oceanographic Institute of Mozambique (InOM)

The Western Indian Ocean (WIO) region is recognized as a hotspot for chondrichthyans, supporting a high diversity of species. However, most research has focused on commercially important or high-priority species, often to the neglect of deep-sea species. There is a growing need to enhance our understanding of rays, particularly regarding their ecology and key conservation habitats, which are critical for their long-term survival. This study investigated the breeding habitat preferences of *Narcine rierai*. A 30-day research expedition was conducted aboard the research vessel *Dr. Fridtjof Nansen* from 28 February to 31 March 2025. The survey covered transects from south to north and from the continental shelf to the upper slope, using bottom trawl sampling. A total of 129 specimens of *Narcine rierai* were collected across 11 stations. Data on weight, length, and maturity stage were recorded to map the species' distribution and breeding areas. Although mature females were observed in the central region of Mozambique, pregnant females were primarily found in the southern region, with the exception of one station in the northern province of Nampula. Southern Mozambique appeared to be a preferred area for females compared to males. Each pregnant female was found to carry four pupils. The species was distributed at depths ranging from 187 to 396 meters, but breeding was restricted to shallower depths between 187 and 212 meters. These findings suggest that *Narcine rierai* reproduces during the rainy season and highlight the importance of southern Mozambique as a biodiversity hotspot. This region may hold significant conservation value and could be considered for targeted management measures to protect critical habitat.

Key words: Deep-sea ray, Mozambique, reproductive biology, spatial distribution, Fritjof Nansen

Take home message

The Mozambican shelf and slope is home for deep-sea biodiversity and dedicated basic research is needed to improve its understanding. Sharks and rays, being charismatic species and key players in the balance of the ecosystem, arouse greater curiosity about their biology and ecology and scientific surveys are one of the most important sources of information.

The first empirical population trend assessment of white sharks, *Carcharodon carcharias*, in Gansbaai, South Africa

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Department of Forestry, Fisheries and the Environment, South Africa

The great white shark (*Carcharodon carcharias*) is an iconic species whose population trends are of great interest to researchers and conservation managers alike. A localised study in Gansbaai using photographic identification (photo-ID) estimated $n = 438$ (95% CI: 353 – 522) individuals between 2009 and 2011 (Period 1). Five years later, between 2016 and 2018 (Period 2), we used the same photo-ID technique to determine if there are any changes in the population since the last estimate. The open population model POPAN suggested a population of $n = 103$ (95% CI: 85 – 124), comparatively lower despite an increase in data collection efforts 298 days in Period 1 to 372 in Period 2. Our results indicate that there are 335 less sharks frequenting Gansbaai and challenges the idea that the white shark population has remained stable. It also raises concerns on the overall population health of white sharks in South Africa's waters as, a reduced presence of white sharks, may have far-reaching consequences for the structure and health of marine ecosystems. Our study highlights the urgency of understanding and addressing the causes behind their decline.

Keywords: Photo-identification, population decline, CMR model, anthropogenic threats, marine ecosystem health

Take home message

Immediate, targeted conservation actions are recommended for implementation by the South African Department of Forestry, Fisheries and the Environment to reduce the anthropogenic causes of the significant decline in white shark presence in Gansbaai. It is further recommended to enhance the monitoring and regulation of demersal and offshore longline fisheries and to re-evaluate the use of lethal shark control programs (e.g. KNSB shark-nets). The mitigation of these threats should begin as soon as possible to prevent further population decline and to safeguard marine ecosystem health.

Inter-dorsal fin lengths strongly correlate with other commonly-used length measurements in targeted elasmobranch species in South Africa

SPEED TALK

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Worldwide, elasmobranchs populations are in decline due to climate change and unsustainable fishing practices. The implementation of conservation strategies for fisheries, such as bag limits and minimum size, are strongly dependent on understanding population demographics and body morphometrics of target species. This study analyzed the correlation between inter-dorsal length (IDL) and total length/precaudal length (TL/PCL) across elasmobranch species in order to develop morphometric tools for facilitation of in-field assessment. Using historical and contemporary datasets, Generalized Linear Models were used to examine these relationships across species and sexes in selected South African elasmobranchs. Results demonstrated high predictive power ($r^2 > 0.95$) between IDL and TL/PCL in targeted Carcharhinidae (bronze whaler shark, *Carcharhinus brachyurus*), Triakidae (spotted gully shark, *Triakis megalopterus*) and Sphyrnidae (smooth hammerhead shark, *Sphyrna zygaena*), enabling accurate size estimation from IDL measurements, while correlations were weaker in Scyliorhinidae and Rhinobatidae families. The species-specific conversion factors allow fishers to efficiently estimate Total Length while the animal remains submerged, significantly reducing handling time and associated physiological stress on susceptible elasmobranch populations. These findings provide practical, non-invasive, simple measurement techniques for both commercial and recreational fisheries stakeholders, supporting rapid assessment of catch demographics and size-based regulations while minimizing handling stress. The developed morphometric relationships offer valuable tools for population monitoring and conservation management, particularly in regions with limited research capacity, ultimately contributing to sustainable fishing practices and improved elasmobranch conservation assessments.

Keywords: Elasmobranchs, morphometrics, length-length relationships, South Africa

Take home message

As a result of the findings indicating strong correlations between inter-dorsal length and body measurements in key fishery elasmobranch species, we recommend that fisheries managers implement standardized IDL measurement protocols in recreational shark fisheries monitoring programs, particularly in regions targeting Carcharhinidae, Triakidae and Sphyrnidae species. Additionally, regulatory bodies could incorporate these morphometric relationships into size-limit regulations and catch documentation systems to improve compliance monitoring while reducing handling stress and mortality.

Population genomics of the spotted gully shark *Triakis megalopterus*

Juliana Klein, Simo Juliana, Charlene da Silva, Malcolm Smale, Michelle Soekoe, Warren Potts, Snorre Hagen, Aletta Bester-van der Merwe

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Developments in next-generation-sequencing now allow for fine-scale assessment of adaptive and neutral diversity in elasmobranchs that provide a better understanding of how dispersal, geography and environment interact to shape genetic variation and to delineate relevant ecological and evolutionary conservation units. Here we analysed the distribution of genomic diversity in the Southern African endemic spotted gully shark *Triakis megalopterus* across its distribution from the Agulhas province in South Africa (Eastern and Western Cape) to the Benguela province of Namibia and southern Angola. A large genome-wide SNP (single nucleotide polymorphism) dataset was obtained through a restriction-site associated sequencing (RADseq) approach. Partial redundancy analyses showed that only around 4% of the overall genomic variability was explained by environmental factors and geographic distance with both contributing equally. The separate analysis of 449 outlier SNPs putatively under selection and 137,870 neutral SNPs revealed similar patterns of population structure. Pairwise F_{ST} , multivariate and clustering analyses demonstrated the presence of two genetic groups with connectivity between the South African sites. The other genetic cluster consisted of individuals from Angola and Namibia and showed high genetic divergence to the South African population. These results suggest that *T. megalopterus* consists of two distinct conservation units in the Agulhas and Benguela provinces that may have diverged due to the historical barrier and limited dispersal across the Agulhas transition zone. Further analysis of this dataset is expected to provide deeper insights into the demographic history of this species that will allow the evaluation of the relative importance of historical and contemporary gene flow across the Agulhas barrier.

Keywords: Southern Africa, RADseq, population structure, connectivity

Take home message

Our data support the existence of two highly divergent populations in the spotted gully shark which should be recognized as distinct conservation units, with sharks from Namibia and Angola comprising one population and South African sharks the other. Despite its distribution across a highly heterogeneous environment, the species shows limited evidence of local adaptation and genetic structure appears primarily shaped by restricted dispersal and historical barriers.

Mitogenome sequencing reveals deep phylogeographic structure and a Northern Hemisphere origin in the common smoothhound shark

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The aim of our study was to conduct a phylogeographic and demographic analysis of the common smoothhound shark (*Mustelus mustelus*; Linck, 1790) using complete mitochondrial genomes (mitogenomes) to enhance understanding of the species' evolutionary history and assess whether mitogenome diversification has been shaped by natural selection. Complete mitogenomes of 52 common smoothhound sharks from nine sampling locations were obtained with highly accurate long-read PacBio High-Fidelity (HiFi) sequencing of M13-barcode-tagged long-range PCR amplicons. Annotated mitogenomes were aligned and analysed to assess population diversity, infer phylogeographic relationships, reconstruct demographic history, and detect signals of positive selection. Moderate to high genetic diversity was observed across the mitogenome, with distinct patterns of variation among gene regions. A total of 41 haplotypes revealed strong genetic differentiation between oceanographic regions, along with fine-scale population structure within them. In southern Africa, gene flow occurs primarily from east to west in a stepping-stone pattern, while in western Africa, the open ocean limits dispersal, isolating Cape Verde from nearby continental populations. A clear divergence between Northern and Southern Hemisphere lineages occurred around 3 Mya. Overall, mitogenome diversity in the common smoothhound is largely shaped by purifying selection ($dN/dS < 1$) in protein-coding genes, though lineage-specific amino acid changes in COX3 indicate positive selection in southern African haplotypes. A major shift in oceanographic conditions during the onset of Northern Hemisphere glaciation likely disrupted historical gene flow, driving the divergence between northern and southern common smoothhound lineages. A pronounced biogeographic barrier in the equatorial Atlantic, reinforced by climatic changes, appears to have been key in shaping the species' present-day phylogeographic structure. While biogeographic features contributed to fine-scale population structure within broader regions, evidence of local adaptation suggests that environmental differences also promoted the non-random fixation of certain mitochondrial haplotypes.

Keywords: Divergence, positive selection, local adaptation, *Mustelus mustelus*

Take home message

This study uncovers deep phylogeographic structure and signs of adaptive divergence in the common smoothhound, identifying distinct ESUs that warrant tailored management. Evidence of mitochondrial functional differentiation suggests a greater role for selection in elasmobranch evolution, with important implications for resilience to climate change. Effective conservation should integrate evolutionary history, regional pressures, and climate sensitivity.

Unravelling the evolutionary history and population demographics of the pyjama shark utilising genomic data

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Catsharks represent the largest group of extant sharks, comprising 18 genera and 165 species distributed globally. Despite this diversity, few molecular resources exist to assess population demographics or predict range shifts under anthropogenic climate change. In this study, we assembled and annotated the genome of the South African endemic pyjama shark *Poroderma africanum*, contributing to the limited genomic toolkit available for catsharks and providing a foundation to explore historical population dynamics and inform future management strategies. Comparative genomic analyses between *P. africanum* and small-spotted catshark *Scyliorhinus canicula* identified a shared core suite of 14,355 gene clusters, along with 64 gene clusters unique to *P. africanum* and 2,419 unique to *S. canicula*, likely reflecting lineage-specific adaptations to differing environmental conditions. Finally, demographic reconstruction indicated that *P. africanum* maintained a relatively small effective population size and has not fully recovered from historical population bottlenecks likely associated with reduced habitat availability during glacial periods. This study presents the first reference genome for *P. africanum*, establishing a critical resource for future fine-scale population genomics, including connectivity and genetic health assessments essential for conservation planning.

Keywords: *Poroderma africanum*, genome, comparative genomics, functional genomics, historic demography

Take home message

The first genome sequence for the endemic pyjama shark will serve as a vital molecular tool for future assessments of the species. By comparing this genome with a close relative, we identified the unique gene suite that likely represents the adaptive evolutionary processes that led to diversification of the pyjama shark from its close relative. The estimated low effective population size suggests that this species is at a greater risk for extirpation, particularly if they are unable to adapt to the projected changes driven by climate change, or off-target anthropogenic effects.

Molecular taxonomy of South Africa's catsharks: How far have we come?

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The ability to correctly identify specimens at the species level is crucial for assessing and conserving biodiversity. Despite this, species-specific data are lacking for many of South Africa's catsharks due to a high level of morphological stasis. As comprehensive and curated DNA reference libraries are required for the reliable identification of specimens from morphologically similar species, this study reviewed and contributed to the availability of cytochrome c oxidase subunit I (COI) and nicotinamide dehydrogenase subunit 2 (NADH2) sequences for South Africa's catsharks. A molecular taxonomic approach, implementing species delimitation and specimen assignment methods, was used to assess and highlight any taxonomic uncertainties and/or errors in the public databases. The investigated species were summarised into 47 molecular operational taxonomic units (MOTUs), with some conflicting specimen assignments. Two *Apristurus* specimens sampled in this study remained unidentified, revealing the presence of previously undocumented genetic diversity. In contrast, haplotype sharing within *Haploblepharus* – attributed to nucleotide ambiguities – resulted in the delimitation of three congeners into a single MOTU. This study reveals that molecular taxonomy has the potential to flag undocumented species and/or misidentified specimens, further highlighting the need to implement integrated taxonomic assessments on catsharks that represent an irreplaceable component of biodiversity in the region.

Keywords: Pentanchidae, Scyliorhinidae, DNA barcoding, heteroplasmy

Take home message

Since accurate species-level identification forms the basis of conservation assessments, the need for integrative taxonomic revisions of the genera *Apristurus* and *Haploblepharus* are highlighted.

Update on the species delimitation of whiprays (Genus: *Himantura*) in the Western Indian Ocean

Karla Redelinghuys, Juliana Klein, Bruce Mann, Ryan Daly, Stephanie Venables, Andrea Marshall, Rhett Bennett, Dave van Beuningen, Jorge Siteo, Collin Williams, Ashlie Mclvor, Michael Berumen, Philippe Borsa, Aletta Bester-van der Merwe

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The *Himantura* spp. complex is comprised of large, demersal whiprays facing severe population declines due to overfishing. Unresolved taxonomic classifications hinder conservation efforts, making regional diversity assessments crucial for effective fishery management. This study aimed to clarify the evolutionary history of *Himantura* spp. within the Western Indian Ocean (WIO) using advanced species delimitation techniques. Tissue was sequenced from specimens collected across the region (South Africa: n = 27, Mozambique: n = 30, Tanzania: n = 28, Saudi Arabia: n = 5), which were analysed alongside publicly available sequences throughout the greater Indian Ocean. Both genetic distance-based and tree-based methods were applied to identify molecular operational taxonomic units (MOTUs) using three mitochondrial markers—cytochrome c oxidase subunit 1 (COI), cytochrome b (cytb), and NADH dehydrogenase subunit 2 (ND2). The analysis revealed multiple MOTUs within the *Himantura* genus, but only two MOTUs included the WIO specimens. All methods consistently indicated deep divergence between these two units, suggesting they represent distinct species. One MOTU was identified in the Tanzanian region, while the other occurred in South African waters. An overlap between the two units occurred in Mozambique, highlighting this as a priority area for conservation. However, species identity remains to be confirmed due to discrepancies across public databases and unresolved taxonomic uncertainties surrounding *Himantura* species. These findings underscore the need for further investigation using an integrated taxonomic approach that combines molecular, morphological, and ecological data to resolve species boundaries and inform targeted conservation strategies.

Keywords: Leopard whipray, coach whipray, Dasyatidae, evolutionary history, taxonomy

Take home message

Our research identifies two Endangered *Himantura* whipray species in the WIO, overlapping in Mozambican waters. Due to taxonomic confusion and unreliable pattern-based identification, integrative approaches combining molecular, morphological and ecological data are urgently needed. Resolving these uncertainties is essential for effective cross-boundary conservation, as management strategies rely entirely on accurate information.

Understanding the genetic connectivity of bronze whaler sharks in the Western Indian Ocean: insights from Reunion Island

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The bronze whaler (*Carcharhinus brachyurus*) is a large-bodied coastal elasmobranch found across temperate and subtropical regions. Despite its wide distribution and ecological importance, the species remains poorly studied in the Western Indian Ocean, where pressures from fisheries and both habitat loss and degradation are increasing. While prior genetic studies have revealed strong phylogeographic structuring across the Southern hemisphere including populations from southern Africa, Australia, and South America, little is known about connectivity within the Indian Ocean, particularly around Reunion Island, where its presence was recently suggested. This study investigates the genetic diversity and population connectivity of *C. brachyurus* individuals sampled through the local shark control program in Reunion Island between 2023 and 2024. Mitochondrial DNA markers were used to explore patterns of genetic variation and assess potential matrilineal connectivity with populations from South Africa and Australia. Preliminary results provide valuable insights into the genetic identity of *C. brachyurus* in Reunion Island and raise new questions about regional-scale movements and population structure. These findings will contribute to a better understanding of conservation needs for this species in the Western Indian Ocean and highlight the importance of coordinated regional management strategies for wide-ranging coastal sharks.

Keywords: *Carcharhinus brachyurus*, mitochondrial DNA, population differentiation, Western Indian Ocean

Take home message

Genetic analyses indicate strong connectivity between copper shark populations in Reunion Island, South Africa, and Namibia, suggesting that individuals observed in Reunion Island are likely transient migrants from southern Africa. Therefore, fisheries managers and conservation authorities should coordinate monitoring and management efforts, acknowledging that these three regions are part of a single, interconnected population. Regional management measures, such as harmonized catch regulations and improved tracking of migratory individuals, are recommended to ensure the sustainability of this wide-ranging species.

Updating ecological knowledge on sharks and rays in Comoros

Joshua Rambahiniarison, Clare Thouless, Nadjim Ali Boina, Melita Samoilys

CORDIO East Africa, Moroni, Comoros

Sharks and rays are essential to marine ecosystems, acting as apex predators and maintaining biodiversity. Despite their ecological significance, comprehensive assessments of elasmobranch species in the Comoros archipelago remain limited. Consequently, we set out to update knowledge on the diversity, distribution, and relative abundance of shark and ray species in the waters of the Union of Comoros. Methods comprised a combination of literature reviews, dedicated surveys, including underwater visual census, baited remote underwater video systems, mark-recapture and citizen science data, collating information over the past two decades. Preliminary findings provide evidence of important shark and ray areas and a total of 40 species have been recorded to date, including 24 shark species, 15 ray species, and a skate. Our next step will be to gather traditional ecological knowledge which we will integrate with the scientific assessments to provide inclusive evidence-based conservation planning, support national policy development and regional conservation initiatives in the Western Indian Ocean.

Keywords: Elasmobranchs, conservation, threatened Species, habitat assessment

Take home message

A revision of national legislation of Comoros related to sharks and rays on the basis of this study will provide a robust legal and policy framework supporting the conservation of sharks and rays, with Comoros actively participating in regional conservation efforts and initiatives.

Patterns in shark and ray diversity and abundance across Seychelles: A synthesis from stereo-BRUVs surveys

Laure Amelia Desire, Kaylee Smit, Stuart Laing, Nico Fassbender, Anna Koester, Rob Bullock, Henriette Grimmel, Eleanor Brighton, Rosabella Mangroo, Wilna Accouche, Anthony Bernard

University of Seychelles

Despite their critical role in maintaining the balance of tropical marine ecosystems, sharks and rays are vanishing faster than we can understand their full ecological impact. This decline, driven by overfishing, habitat degradation, and climate change, poses serious risks not only to biodiversity but also to the functioning and resilience of these ecosystems. In Seychelles, while multiple field surveys using Baited Remote Underwater Stereo-Video systems (stereo-BRUVs) have documented elasmobranchs across the archipelago, these data remain fragmented across institutions. This study represents the first national synthesis of shark and ray observations from Seychelles, collating data from multiple partners to explore patterns in species diversity, relative abundance, and potential spatial hotspots.

Using a collated dataset of more than 700 stereo-BRUVs samples collected from multiple projects, we assessed elasmobranch occurrences and relative abundance (MaxN) across major island groups, depth gradients, and marine protected areas (MPAs). Analyses focused on broad spatial patterns in species richness and abundance, with comparisons between MPA and non-MPA sites to evaluate protection efficacy. We also explored spatial clustering to identify high-use areas that may support future conservation prioritisation.

Results showed a higher diversity and relative abundance in the remote outer islands compared with sites around Mahe; however, local hotspots of elasmobranch abundance were also observed in some of the inner island MPAs, particularly in the Silhouette and Denis Island. The most frequently observed shark species included *Carcharhinus amblyrhynchos*, *Carcharhinus limbatus* and *Nebrius ferrugineus*.

This synthesis provides a foundation for understanding national-scale patterns in Seychelles' elasmobranch assemblages and demonstrates the power of data sharing and collaboration. As an ongoing and growing effort, this work also establishes a platform for more advanced ecological modelling, long-term monitoring, and alignment with regional shark and ray research initiatives in the Western Indian Ocean.

Keywords: Elasmobranch, national assessment, marine protected areas, management, inner and outer islands

Take home message

This study provides the first national-scale assessment of shark and ray diversity and abundance in Seychelles, supporting evidence-based conservation. By pooling data across partners, it highlights critical habitats, supports MPA evaluations, and demonstrates the value of collaborative research for informing management and regional elasmobranch monitoring networks.

Preliminary assessment of elasmobranch diversity using Baited Remote Underwater Video (BRUVs) in Southern Inhambane, Mozambique

SPEED TALK

Dércio Maoze, Emildo Notisso, Nilza de Catarina

Marine Megafauna Foundation Research Center, Praia do Tofo, Inhambane, Mozambique; Faculty of Natural Sciences, Lúrio University, Pemba, Cabo Delgado, Mozambique

The limited baseline data on elasmobranchs along Mozambique's coast hinders effective conservation and management efforts. Reef fish assessment using Baited Remote Underwater Video Systems (BRUVs) was conducted in Inhambane between 2017 and 2024. Authors examined elasmobranch sightings across reefs in Zavora, Guinjata, Rocha, Tofo, Barra, and Morrungulo. A total of 266 hours of footage from 228 deployments across 34 reefs (4–40m depth) were analyzed. Elasmobranchs were noted in 21% of the deployments ($n = 48$), with 74 individuals from 17 species, 11 genera, and eight families recorded. Of these, 79% ($n = 11$) are classified as Threatened by the IUCN Red List of Threatened Species, and 21% ($n = 3$) are protected under Mozambican law. The frequency of occurrence of rays (60.3%) was higher than of sharks (39.7%), particularly *Mobula kuhlii* (17.6%) and *Aetobatus narinari* (13.5%), while *M. birostris* and *Taeniura lymma* were the least frequent (1.4%). *Carcharhinus amblyrhynchos* and *Triaenodon obesus* (10.8% each) were common sharks, while *C. leucas* (2.4%) and *C. limbatus* (1.4%) were rare. When comparing the different locations, Morrungulo and Barra (within the Tofo region) showed the highest diversity (8 species, 21 individuals), followed by Zavora (4 species, 7 individuals) and Guinjata (2 individuals). Elasmobranch interactions with BRUVs were mainly incidental (72%, $n = 56$), exploratory (18%, $n = 14$), cautionary (9%, $n = 7$), and aggressive (1%, $n = 1$). This preliminary assessment provides insights into the effectiveness of BRUVs as a non-invasive and cost-effective method for long-term monitoring of shark and ray diversity in reef systems. These findings contribute to the growing understanding of Mozambique's elasmobranch populations and priority areas for conservation, offering valuable information to support the development of national shark and rays conservation and management strategies.

Keywords: Underwater video analysis, shark diversity, conservation, Mozambique

Take home message

Based on this study, we recommend the implementation of annual BRUV surveys to monitor elasmobranch diversity and abundance in poorly researched areas with budget limitations.

Elasmobranch diversity and distribution in Mozambique: Insights from museum collections and eDNA monitoring surveys

Érica Tovela, Naseeba Sidat, Peter Psamodakis

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Elasmobranchs (sharks, rays, and skates) play a crucial role in marine ecosystems, yet their diversity and distribution remain poorly studied in many regions, including Mozambique. The region hosts at least 47 elasmobranch families, encompassing approximately 140 species, of which 49% are classified as threatened by the IUCN. This study investigates the diversity and distribution patterns of elasmobranchs in Mozambique, utilizing museum collections as a primary data source, supplemented by recent expeditions and environmental DNA (eDNA) monitoring. Specimens housed at the Maputo Natural History Museum provide valuable insights into historical records, species composition, and spatial distribution. Among the analyzed samples, some date back to the 1970s, with particular emphasis on nine species categorized as Near Threatened (NT), four as Critically Endangered (CR), three as Endangered (EN), five as Vulnerable (VU), and four as Least Concern (LC). Notably, several species, including *Etmopterus granulosus*, *Rhinobatos schlegelii*, *Scyliorhinus capensis*, *Haploblepharus edwardsii*, *Mustelus canis*, and *Etmopterus lucifer*, were collected along the Mozambican coast and recorded in museum databases, despite their current distribution data not listing Mozambique as part of their range. Additionally, the use of eDNA allowed for a more precise mapping of species distributions, further demonstrating its effectiveness as a monitoring tool for assessing biodiversity and detecting previously unrecorded occurrences. Data analysis reveals patterns of species richness, habitat preferences, and potential threats, while also highlighting the advantages of eDNA monitoring for assessing species presence and conservation status. We show that threatened species encompass the full extent of functional space and disproportionately include functionally distinct species. This study underscores the significance of museum collections in tracking biodiversity trends and emphasizes the urgent need for comprehensive conservation strategies to protect Mozambique's elasmobranch populations. Additionally, the findings highlight the necessity of integrating historical museum data with contemporary field surveys and genetic studies to achieve a more holistic understanding of species distribution. This study contributes to ongoing marine conservation efforts and advances knowledge of elasmobranch diversity and the impact of human activities on the environment in the Western Indian Ocean region.

Keywords: Elasmobranchs, museum collections, environmental DNA, marine biodiversity

Take home message

Sharks and rays remain among the least studied marine species in Mozambique, despite growing evidence of their vulnerability. The limited number of recorded studies, combined with species found in museum collections and landing data, suggests that several of these species may be at significant risk. This highlights the urgent need to establish targeted research initiatives and a comprehensive monitoring plan. Such efforts are essential to better understand population dynamics, assess threats, and implement effective conservation strategies to prevent further decline of these ecologically important and already vulnerable species.

Evaluating elasmobranch community dynamics in Plettenberg Bay: A multi-method approach

Melissa Nel, David Walker, Chantel Elston

Cape Peninsula University of Technology, South Africa; Plett Shark Spotters, South Africa

Understanding elasmobranch presence and diversity is critical for effective marine resource management and conservation, particularly in biodiverse and dynamic coastal regions like Plettenberg Bay, South Africa. This study aims to evaluate elasmobranch community dynamics using a multi-method approach to support local conservation and monitoring efforts. Data was compiled from six complementary methods, including structured observations, opportunistic sightings, acoustic telemetry, BRUVs, and citizen science contributions. A comparison of methods highlighted the value of using a multi-method approach to capture a broader of species diversity and distribution. The study investigates species diversity (24 species recorded), relative abundance, and community composition over seasonal and annual timescales. It also explores the influence of environmental drivers—such as sea surface temperature (SST) and lunar phase—on the presence and abundance of elasmobranchs in the region. Preliminary findings suggest that elasmobranch communities in Plettenberg Bay are shaped by both habitat type and seasonal variation. As ongoing analysis further explores environmental influences and species-specific trends, this work has the potential to inform future monitoring priorities and enhance local outreach and education initiatives. The integration of multiple survey techniques demonstrates the strength of a holistic, accessible approach to regional marine biodiversity assessment.

Keywords: Species richness, relative abundance, coastal monitoring, environmental drivers

Take home message

Preliminary findings highlight the need for long-term, multi-method monitoring of elasmobranchs in Plettenberg Bay, especially given the presence of endangered species. Early recommendations include appointing an official body to oversee fishing charter activity and enforcing a ban on all shark fishing within the Robberg Marine Protected Area.

Elasmobranch community structure on the continental slope offshore East London

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The deep sea (>200 m) is the largest yet least explored biome on Earth, despite comprising approximately 90% of the ocean and playing a vital role in global ecological processes. In South Africa, deep-sea biodiversity – even that of Elasmobranchs – remains poorly understood due to logistical and financial challenges. This study employs baited remote underwater stereo-video landers (stereo-BRUV landers) to investigate deep-sea elasmobranch communities across a depth gradient (200-1000 m) on the continental slope in the Amathole/Border region, situated beneath the dynamic Agulhas Current. Stereo-BRUV landers offer a repeatable, non-destructive method for surveying benthic motile macrofauna – including sharks and rays – in the deep-sea. Key objectives are to describe the elasmobranch assemblage and identify depth-related patterns in community structure and diversity. Additionally, the optimal soak-time for stereo-BRUV landers to sample deep-sea elasmobranch diversity will be determined. Ten samples (5h duration each) were collected along three transects and the videos are currently being annotated. However, preliminary results revealed 12 species of elasmobranchs, with 10 being correctly identified. This included a range extension for the balloon shark (*Cephaloscyllium sufflans*), as well as the detection of threatened and endangered species. The insights provided by this study will demonstrate the efficacy of stereo-BRUV landers as a deep-sea elasmobranch survey tool and contribute to the broader understanding of biodiversity patterns in South Africa's offshore waters, supporting the development of species- and ecosystem-specific marine conservation strategies.

Keywords: Deep-sea ecology, stereo-BRUV landers, Squalid, species assemblage, biodiversity monitoring

Take-home message

The first survey of the area revealed rich diversity and improved knowledge on species distributions. Elasmobranch diversity changes with depth along the continental slope with certain species being restricted to specific depth zones. Stereo-BRUV landers serve as effective, non-destructive survey tools in deep-sea environments, with an optimal soak-time within 5 hours. This research fills critical gaps in our understanding of elasmobranch species ranges and betters our ecological knowledge of the deep sea, informing conservation strategies.

PROGRAMME: Day 2, Wednesday 17th September

08:50 KEYNOTE: Miguel Gonçalves – Protecting sharks and rays in Maputo National Park: Policy pathways for sustainable marine conservation		
Conservation & management	09:30	Steve Gerber: Elasmobranch spatial ecology in a global biodiversity hotspot
	09:45	Kristina Loosen: Advancing chondrichthyan conservation along the South African coastline: an eDNA metabarcoding approach
	10:00	Dylan Irion: Integrating long-term datasets to estimate regional abundance of white sharks in southern Africa using continuous-time population models
	10:15	Naseeba Sidat: Supporting sustainable fisheries management and shark and ray conservation at Zalala Beach, in Mozambique
	10:30	Riaan Cedras: Making shark and ray monitoring matter for iSimangaliso Marine Protected Area management
	10:45	Charles Lucas Makio: Beyond data: Building conservation impact through local community-led BRUV surveys
11:00 MORNING TEA		
Conservation & management	11:30	Aseeqah Davids: The effectiveness of BRUVS in detecting and monitoring inshore elasmobranch communities within Marine Protected Areas
	11:45	Jorge Sítio: Assessing shark and ray diversity and abundance: Long-term stereo-BRUV monitoring in Maputo National Park, Mozambique – implications for Marine Protected Area (MPA) management
	12:00	Nakia Cullain: Tracking transboundary movements of manta rays to inform marine spatial planning in Mozambique and South Africa
	12:15	Bruce Mann: Movement patterns of the flapnose houndshark <i>Scylliogaleus queckettii</i> in the Pondoland Marine Protected Area using both external dart tagging and acoustic telemetry
	12:30	Youri Ivann Mvomo Minko: Trophic ecology and nursery role of southern Gabonese waters for coastal sharks, critical data for marine spatial management
	12:45	Nick Clemo: Conservation genetics of scalloped hammerhead sharks in the Southwestern Indian Ocean
	13:00	Leigh de Necker: Safeguarding South Africa's Threatened Chondrichthyans
13:05 LUNCH		
Movement ecology	14:00	Ryan Daly: Breaking barriers: Transoceanic migration by a bull shark
	14:15	Stephanie Venables: Acoustic telemetry reveals spatial management priorities for bull sharks (<i>Carcharhinus leucas</i>) in Mozambique
	14:30	Alex Winkler: Crossing continental divides, habitat use of <i>Myliobatis aquila</i> in South Africa and Portugal, a comparative biogeographic movement analysis
	14:45	Alison Towner: Uncharted waters: An update on white shark movement in South Africa and a landmark dispersal event
	15:00	Chantel Elston: Blue stingrays in the Knysna Estuary: evidence for first ray pupping ground in South Africa
	15:15	Enrico Gennari: Use of passive acoustic telemetry on targeted and by-caught elasmobranch fishery species to inform future management strategies in South Africa
15:30 AFTERNOON TEA		
Movement ecology	16:00	Kevin Spiby: Insights into the movements of previously captive ragged-tooth sharks along the South African coastline
	16:15	Mia Hattingh: Habitat use by lesser guitarfish <i>Acroteriobatus annulatus</i> along the Kleinemonde coastline (Eastern Cape, South Africa)
	16:30	Stella Diamant: Understanding whale shark habitat use in Nosy Be, Madagascar: Insights from acoustic telemetry
	16:45	Ralph Watson: Site-fidelity and environmental patterns through observational data & photo-identification of <i>Bathytoshia brevicaudata</i> in Gansbaai
	17:00	Inge Adams: Release of a captive born short-tail stingray to the wild
17:05 END OF DAY 2		
18:30 INFORMAL DINNER AT MAJOR FRASERS (38 Somerset Street; for your own account)		

Protecting sharks and rays in Maputo National Park: Policy pathways for sustainable marine conservation

Miguel Gonçalves

Maputo National Park, Mozambique



Sharks and rays are globally recognized as priority species for marine conservation due to their ecological importance and high vulnerability to overexploitation. In Mozambique, unsustainable fishing, bycatch, and illegal trade pose major threats to their survival. Maputo National Park, a recently established marine and terrestrial conservation area in southern Mozambique, holds significant potential as a refuge for threatened elasmobranchs with its mosaic of coral reefs, seagrass beds, and mangroves, providing essential habitats for these species and offers a unique opportunity to establish a stronghold for their protection. Safeguarding sharks and rays in the park requires policy measures that integrate effective marine spatial planning, strict enforcement of fishing restrictions, and the establishment of no-take zones. Equally critical is the involvement of coastal communities through sustainable livelihood programs, capacity building, and benefit-sharing mechanisms linked to eco-tourism and conservation initiatives. Regional cooperation with neighbouring countries is also necessary to protect migratory species beyond park boundaries. Strengthening shark and ray protection in Maputo National Park will not only secure biodiversity but also contribute to sustainable development, climate resilience, and Mozambique's commitments under international conservation agreements.

Keywords: Mozambique, bycatch, illegal trade, elasmobranchs

Elasmobranch spatial ecology in a global biodiversity hotspot

Steve Gerber

Nelson Mandela University, Gqeberha, South Africa

The iSimangaliso Marine Protected Area (MPA), located at the interface of tropical and subtropical climatic zones, harbours Africa's southernmost coral reefs and is recognised as a global biodiversity hotspot. Despite their ecological significance and economic value through tourism, elasmobranchs remain largely overlooked in the area's Management Plan – except for a brief mention of ragged-tooth sharks during gestation periods. This study aims to investigate community compositions throughout the park and to assess the overall ecological importance of the area for sharks and rays.

This study uses Baited Remote Underwater Video systems (BRUVs) to assess elasmobranch communities across different management zones and habitat features, including sanctuary versus diving zones and sites located ON versus OFF the submarine canyon systems.

Findings indicate that submarine canyons host distinct elasmobranch assemblages, with a higher prevalence of large apex predators. In contrast, areas with intensive diving activity exhibit reduced shark abundance and a shift toward smaller, meso-predatory species. Evidence also strongly suggests that the MPA plays a critical role in the reproductive cycles of several species, including those listed as Critically Endangered.

These results highlight the urgent need to formally integrate elasmobranchs into the MPA's Management Plan. Such inclusion will be essential for guiding future conservation actions — particularly when species-specific reproductive hotspots or nursery areas are identified.

Keywords: Submarine canyons, pupping area, BRUVs, diving impact, MPA management

Take home message

iSimangaliso Park Authorities should prioritise the inclusion of elasmobranchs—particularly Critically Endangered and reproductively active species—into the MPA's Management Plan. Immediate attention should be given to safeguarding key habitats such as submarine canyons and sanctuary zones, laying the groundwork for adaptive, evidence-based conservation strategies moving forward

Advancing chondrichthyan conservation along the South African coastline: an eDNA metabarcoding approach

Kristina Loosen, Sara Andreotti, Conrad A. Matthee

Stellenbosch University, South Africa

South Africa is recognized as one of the top five global hotspots for chondrichthyan diversity, hosting ~191 species of sharks, rays, and chimaeras. Alarming, 29% of these species are currently listed as vulnerable or endangered on the IUCN Red List, emphasizing the urgent need for improved conservation strategies. Effective conservation depends on accurate monitoring of species presence and distribution; however, traditional survey methods for marine megafauna are often logistically challenging, time-consuming, and costly. Environmental DNA (eDNA) metabarcoding has emerged as a powerful, non-invasive tool for biodiversity assessments, offering a promising alternative for monitoring elusive marine species. Despite its success elsewhere, eDNA metabarcoding has yet to be widely applied for chondrichthyan monitoring in South Africa. We first conducted a controlled study using water samples from a local aquarium, successfully recovering all resident elasmobranch species with the primers Elaso2 (12S) and Sharkminibarcodes (COI). We then collected water samples from 14 coastal locations, at both surface and 10-meter depths, to investigate regional chondrichthyan diversity. To support species identification, we generated 12S rRNA reference barcodes for 43 South African chondrichthyan species and curated a national 12S reference library encompassing sharks, rays, and chimaeras. Using eDNA metabarcoding, we recovered 34 chondrichthyan species from field samples and detected significant differences between locations and across ecoregions. Additionally, we developed a qPCR assay specifically targeting South African white sharks (*Carcharodon carcharias*) to enhance the detection of this elusive species in environmental samples. By refining eDNA metabarcoding protocols for South African chondrichthyans, this study provides crucial baseline data to inform future marine monitoring efforts. Ultimately, our findings aim to support more effective, data-driven conservation initiatives and contribute to safeguarding South Africa's rich and vulnerable chondrichthyan fauna.

Keywords: eDNA metabarcoding, chondrichthyan, South Africa, qPCR, diversity

Take home message

We recommend that conservation managers and policymakers in South Africa integrate eDNA metabarcoding into routine marine monitoring programs to enhance the detection and tracking of chondrichthyan species, particularly within and around marine protected areas. Immediate adoption of these methods will provide cost-effective, non-invasive, and scalable biodiversity assessments, supporting more responsive and data-driven conservation efforts along the South African coastline.

Integrating long-term datasets to estimate regional abundance of white sharks in Southern Africa using continuous-time population models

Dylan Irion, Greg Distiller, Res Altwegg, Alison Kock

Statistics in Ecology, Environment and Conservation, Department of Statistical Sciences, University of Cape Town, Rondebosch, South Africa; Cape Research & Diver Development, Simon's Town, South Africa

Effective conservation of apex predators like the white shark *Carcharodon carcharias* depends on robust demographic estimates (abundance, survival) and trends over time. This study integrates multiple long-term datasets to produce the first comprehensive regional assessment of white shark abundance in southern Africa, explicitly accounting for movement dynamics and imperfect detection. The analysis draws on nearly two decades of photographic mark-recapture records across four study sites, as well as complementary satellite and acoustic telemetry data. A total of 38 individuals were fitted with SPOT transmitters, with 40 also carrying RCODE acoustic tags, enabling detailed inference on inter-site movement. Automated computer vision methods are being employed to identify individuals across over 1 terabyte of encounter records, standardizing individual detection histories. A novel continuous-time population model is under development to unify these diverse data sources, incorporating both the spatiotemporal structure of animal movement and the hierarchical processes underlying photographic detection. This integrative framework provides a foundation for estimating absolute abundance, identifying drivers of site fidelity and inter-site transitions, and evaluating long-term population trends. Insights gained will inform the development of regionally appropriate conservation strategies and enhance the ecological understanding of this elusive species.

Keywords: Mark-recapture, hierarchical modelling, state space model, telemetry, photo identification

Take home message

By integrating long-term photo-ID and telemetry data in a continuous-time modelling framework, we aim to produce the first robust, region-wide abundance estimates for white sharks in southern Africa — advancing both science and conservation.

Supporting sustainable fisheries management and shark and ray conservation at Zalala Beach, in Mozambique

Naseeba Sidat, Jorge Siteo, Dionísio Pires, Brian Smith, Rhett Bennett, Dave van Beuningen, Babu Ibrahim

Wildlife Conservation Society, Maputo, Mozambique

In Mozambique, sharks and rays play vital roles in coastal communities' food security and livelihoods, including at Zalala Beach. National fisheries legislation enables artisanal fishers to co-manage their fishing grounds via Community-Managed Fishing Areas (APGCs). The Wildlife Conservation Society (WCS) aims to support Zalala Beach fishing communities in strengthening their participation in decision-making processes and promoting sustainable use of fishery resources by establishing an APGC.

We identified and mapped fishing patterns across five fishing centres (Machimbue, Zalala, Malanha, Sopinho, and Idugo Island). Using the participatory mapping methodology developed in Tanzania (Rubens 2023), working groups from each centre mapped key fishing zones for six fishing gears, with a focus on longlines, surface gillnets, and bottom gillnets—those most associated with shark and ray catches.

Results showed significant overlap in fishing zones between centres, with Zalala fishers dominating several zones, especially those using longlines and gillnets. The Zalala fishing centre has the highest number of fishers, including users of the three main fishing gears. Across all gear types, summer was identified as the peak season for shark and ray catches.

Establishing an effective APGC at Zalala Beach requires active involvement of fishing communities, partners, and interested parties, and spatially accurate fishing data. While our participatory mapping provided valuable insights into fishing practices and pressures on shark and ray populations, challenges were experienced due to geographical variability between Zalala Beach and the original Tanzanian context of the method. To refine the understanding of spatial fishing patterns, we intend to complement current data with GPS-based tracking of fishing activity over a one-year period, enabling more accurate boundary delineation for the future APGC and better-informed management decisions. This will complement our initial study, which highlighted key shark and ray fishing zones and seasons and will be essential for sustainable management of these resources.

Keywords: Community-Managed Fishing Areas, sustainability, fishery landings data, coastal fishery mapping

Take home message

Establishing an effective community-managed fishing area that considers shark and ray conservation and management requires direct involvement with fishing communities, as well as a detailed understanding of the dynamics of the local fisheries, including spatially referenced information on fishing effort and species-level catch, by gear type, and seasonality in effort and catch, which can inform the participatory process for the area's establishment.

Making shark and ray monitoring matter for iSimangaliso Marine Protected Area management

Riaan Cedras, Mthandeni Mtembu, Siboniso Mbense

iSimangaliso Wetland Park Authority, St Lucia, South Africa

Sharks and rays are key ecological indicators within the iSimangaliso Marine Protected Area (MPA). Long-term monitoring programmes track their changes in abundance, distribution, and movement patterns. Much of the monitoring in iSimangaliso MPA is led by external researchers, often with limited alignment to park-level priorities and operational realities. Research outputs are frequently not actionable, as they often lack stakeholder engagement and do not adequately consider socio-ecological complexities. As a result, recommendations fail to adequately translate into management responses. Thus, management are faced with implementation challenges, including limited stakeholder engagement and a lack of structured communication pathways between researchers and managers. We encourage a co-design framework where MPA managers play a role in setting research questions and identifying data needs. This approach helps create pathways for the uptake of recommendations and findings that directly inform zoning, enforcement, and conservation strategies, i.e. inform effective and adaptive management of the MPA.

Keywords: iSimangaliso Marine Protected Area, elasmobranch monitoring, co-designed research, adaptive management, science-policy Interface, conservation planning.

Take home message

MPA managers should co-design research initiatives with researchers and local stakeholders.

Beyond data: Building conservation impact through local community-led BRUV surveys

Charles Lucas Makio, Rosalia Neema Kahindi, Justin Beswick, Mangi Samuel

Department of Life sciences, Atlantic Technological University, Donegal – Ireland; Anti-poaching team, Bahari Hai Conservation, Watamu - Kenya

Sharks and rays play a vital role in maintaining healthy marine ecosystems by acting as apex and mesopredators, helping regulate food webs and preserve ecological balance. However, these species are experiencing alarming global and regional population declines. Along the Kenyan coast, artisanal fishery significantly influences these trends, either positively or negatively. Conventional monitoring efforts are often limited by financial constraints, gaps in local knowledge, and poor integration between research institutions and coastal communities. As a result, many conservation efforts have had limited practical impact, remaining largely academic. To bridge this gap, Bahari Hai Conservation, a local NGO, partnered with the Wildlife Conservation Society (WCS) to develop a community-led Baited Remote Underwater Video (BRUV) monitoring program. This initiative combined Bahari Hai's strong community ties with WCS's technical expertise and funding support, creating a collaborative and effective marine biodiversity monitoring model. Between 2022 and 2025, the project conducted 262 BRUV deployments in Watamu–Malindi (North Coast Kenya) and 70 more in 2025, along with 50 comparative deployments in Shimoni (South Coast Kenya) under the Shark Conservation Fund and Global FinPrint Project respectively. Each BRUV unit comprising five baited frames with dual cameras captured one-hour video sessions per deployment. Community members, including fishers, conservation students, and Beach Management Unit (BMU) representatives, were involved in planning, fieldwork, and video analysis. This hands-on participation helped them understand the ecological importance of sharks and provided employment and technical training opportunities. They contributed to both deployment and preliminary video analysis, gaining transferable skills for future research roles. By involving the fisher community in early video review, the burden on university researchers was reduced, enabling them to focus on deeper analysis. This collaborative approach proved both effective and empowering, highlighting the potential of local communities to play a key role in marine conservation.

Keywords: Artisanal fisheries, community engagement, marine biodiversity monitoring, capacity building, collaborative conservation

Take home message

Integrating local communities, especially artisanal fishers into scientific monitoring improves ecological data quality, reduces costs, and builds local capacity and stewardship. This project shows that community-led BRUV programs can meaningfully complement conventional research and support more effective conservation. The key management implication is that fisheries managers and conservation agencies should formally adopt community-led monitoring within national frameworks. This requires dedicated support for local training, equipment, and co-management structures that recognize local ecological knowledge. Doing so fosters trust, enhances adaptive capacity, and leads to more grounded and sustainable marine resource management. This approach is scalable and offers a practical model for other coastal regions.

The effectiveness of BRUVS in detecting and monitoring inshore elasmobranch communities within Marine Protected Areas

Aseeqah Davids, Rushdi Ariefdien, Russell Dixon, Kyle Smith, Alison Kock

South African National Parks, Scientific Services, Cape Town, South Africa

Marine ecosystems are sensitive to human-induced pressures, which may result in biodiversity loss and potential ecosystem collapse. Marine Protected Areas (MPAs) are designated ocean areas designed to manage these pressures and conserve species and habitats. To ensure their effectiveness, it is crucial to implement standardised and rigorous monitoring methods aligned with management objectives. Inshore elasmobranch species are crucial to coastal ecosystems, but they face growing threats from human activities like overfishing. Monitoring these species is essential for effective conservation, however, traditional survey methods can be invasive, destructive, expensive, and/or difficult to implement in complex habitats. Baited Remote Underwater Video Surveys (BRUVS) offer a standardised approach to assess inshore elasmobranch communities' diversity, abundance, and size structure in a non-destructive and non-invasive manner. This study employed BRUVS to assess the effectiveness of detecting inshore elasmobranchs within four MPAs managed by South African National Parks, representing the west, south and east coasts, namely, West Coast National Park MPA, Robben Island MPA, Table Mountain National Park MPA, and Tsitsikamma National Park MPA. Data were collected over six years, however, not all MPAs have data coverage for the entire period. Preliminary findings suggest that BRUVS are effective in detecting benthic elasmobranchs, with at least 10 species from six families identified to date, and endemic, threatened catsharks emerging as the most frequently observed across the surveyed MPAs. Additionally, there was an observed increase in both the diversity and abundance of elasmobranch species from the west to the east coast. The effectiveness of BRUVS in detecting benthic elasmobranchs varies among MPAs, likely reflecting differences in environmental conditions or levels of protection.

Keywords: Non-invasive sampling, video analysis, biodiversity, sharks, batoids

Take home message

To strengthen ecological monitoring and adaptive management, the use of BRUVS should be adopted as a standard, non-destructive survey method for inshore elasmobranchs in selected South African MPAs, with consistent, long-term deployment coordinated by management authorities in collaboration with research partners. This research shows that BRUVS are a valuable, non-invasive tool for monitoring inshore elasmobranchs and can help improve the adaptive management of South Africa's MPAs for their conservation.

Assessing shark and ray diversity and abundance: Long-term stereo-BRUV monitoring in Maputo National Park, Mozambique – Implications for Marine Protected Area (MPA) management

Jorge Sitoe, Dave van Beuningen, Rhett Bennett, Naseeba Sidat, Stela Fernando, Rosalina Cossa, Hugo Costa

Wildlife Conservation Society, Maputo, Mozambique

Southern Mozambique is recognized as a global hotspot for shark and ray species richness, endemism and evolutionary distinctiveness, with at least 136 different shark and ray species documented to date in Mozambique. Marine protected areas (MPAs) are an important form of management tool for shark and ray protection and Maputo National Park (MNAP) falls within this hotspot and likely plays an important role in affording sharks and rays in this region some degree of protection from fisheries and other threats. The present study conducted stereo baited remote underwater video (stereo-BRUV) surveys in the MNAP to assess shark and ray distribution, seasonality, species richness, relative abundance, size ranges and associated habitat types from Inhaca Island in the north of the Park to Ponta do Ouro in the south. From 2019 to 2023, 391 samples were collected (equating to 391 hours of stereo-BRUV footage). Overall, 56 sharks (comprising 13 species) and 169 rays (comprising 11 species) were recorded, representing 0.58 sharks and/or rays recorded per hour of video footage (or an average of 1.72 hours needed to record each individual shark or ray). Most sharks (77%) and rays (82%) recorded in the MNAP are from species classified as Threatened on the IUCN Red List of Threatened Species. Furthermore, the whitespotted wedgfish *Rhynchobatus djiddensis* and honeycomb stingray *Himantura uarnak* were both recorded in all the BRUV surveys, while the grey reef shark *Carcharhinus amblyrhynchos* was recorded in all surveys except the May 2023 survey, suggesting that these species use the MNAP year-round, providing further support for the importance of the MNAP as a refuge for these threatened species. The fact that much higher numbers of sharks and rays per survey were recorded during this study relative to similar studies in northern Mozambique and most of the southwest Indian Ocean supports the fact that southern Mozambique is considered a global shark and ray hotspot and MNAP is well positioned to offer a safe refuge for these threatened species, as although the populations of these species are declining globally, they appear to be present in the MNAP in relatively high numbers.

Keywords: MPA, MNAP, stereo-BRUV, sharks, rays

Take home message

The MNAP already incorporates several no-take zones, and that sharks and rays can be caught in the MNAP but cannot be retained or killed, but must immediately be released alive (under Annex II of Ministerial Diploma n.º 8/2023), the importance of the MNAP in conserving sharks and rays should be further explored, as it is likely that additional shark- and ray-specific, or gear-specific, management measures can be incorporated into the Park's management plan with minimal negative implications, which will help to facilitate the conservation of this imperilled group of species.

Tracking transboundary movements of manta rays to inform marine spatial planning in Mozambique and South Africa

Nakia Cullain, Ryan Daly, Toby Rogers, Stephanie Venables, Michelle Carpenter, Derek Tittensor, Heike Lotze

Marine Megafauna Foundation, Závora, Mozambique; Dalhousie University, Department of Biology, Halifax, Canada

Effective marine spatial planning and conservation of highly mobile marine species requires a detailed understanding of their movement patterns across political boundaries and into areas beyond national jurisdiction. The reef manta ray (*Mobula alfredi*) is a long-lived, slow-reproducing elasmobranch known to undertake large-scale movements between Mozambique and South Africa. Despite growing research efforts and increased species-level protections, spatial management has been challenging due to their highly mobile nature, with current measures often too limited in scale to encompass their movements. As a result, reef manta rays remain vulnerable to overexploitation from both targeted and incidental fisheries. Between 2022 and 2024, we tracked 67 reef manta rays in southern Mozambique and South Africa using a combination of satellite ($n = 19$) and acoustic ($n = 48$) telemetry. Our findings reveal high site fidelity to key coastal habitats, including the iSimangaliso Wetland Park in South Africa, as well as frequent transboundary movements, with some individuals moving offshore beyond national jurisdictions. Spatial analyses also show overlap between manta ray movements and areas of intensive fishing effort, increasing the risk of bycatch and highlighting the need for dynamic, coordinated management approaches. By integrating ocean observation tools with spatial analyses, we identify key habitats and movement corridors that could inform adaptive management and regional collaboration for conservation planning.

Keywords: *Mobula alfredi*, acoustic telemetry, satellite telemetry, conservation, management

Take home message

Our findings highlight the urgent need for strengthened cooperation between Mozambique and South Africa—particularly at the level of marine governance and management—and for improved implementation and enforcement of MPAs and protective legislation. Integrating critical habitats and movement corridors into regional planning processes is essential to improving protection and ensuring the long-term conservation of mobile marine species in southern Africa.

Movement patterns of the flapnose houndshark *Scylliogaleus queckettii* in the Pondoland Marine Protected Area using both external dart tagging and acoustic telemetry

Bruce Mann, Ryan Daly, Gareth Jordaan

Oceanographic Research Institute, Durban, South Africa; Department of Ichthyology and Fisheries Science, Rhodes University, Makhanda, South Africa

The flapnose houndshark is an endemic, range-restricted species found between East London and Richards Bay on the east coast of South Africa. Little is known about the biology and ecology of this species, and it is listed as Vulnerable on the IUCN Red List. This species was the most common elasmobranch caught in a long-term monitoring project conducted in the Pondoland MPA from 2006 to 2022. To obtain an understanding of their movement behaviour, individuals were externally dart tagged ($n = 168$) and a small sample of sub-adult and adult individuals ($n = 13$) were internally tagged with acoustic transmitters (Innovasea V13-1L). A total of 32 (19%) dart tag recaptures were made with an average distance moved of 213 m (± 170 SD). Based on these data, linear home range length was calculated at between 503-574 m. Movements of acoustically tagged males and females were localised with all detections only recorded on receivers (Innovasea VR2W) in proximity to the tagging site, thus confirming high residency and site fidelity over multiple years. These findings highlight the value of spatial protection for this vulnerable range-restricted species. While not specifically targeted in any fishery, high numbers of juveniles are sometimes caught in the competitive shore angling fishery, particularly along the Wild Coast. Ongoing efforts are required to highlight the careful handling and release of these individuals, as well as ongoing enforcement of no-take MPAs within their distribution. Furthermore, consideration should be given to decommercializing this species as has been done for some other recreationally important elasmobranch species.

Keywords: Residency, site fidelity, home range, catch-and-release

Take home message

Flapnose houndsharks are a highly resident, range-restricted species that require careful management. Encouraging their careful handling and release in both shore- and boat-based recreational fisheries is recommended. Similarly, ongoing efforts are required to ensure enforcement of no-take MPAs within the distribution of this species. Decommmercialization of this species should be considered.

Trophic ecology and nursery role of southern Gabonese waters for coastal sharks: Critical data for marine spatial management

Youri Mvomo Minko

Wildlife Conservation Society, Libreville, Gabon

Understanding both trophic interactions and habitat use is essential for the conservation of threatened sharks, particularly during vulnerable life stages. This study explores the ecological role of southern Gabon's coastal waters for juvenile *Sphyrna lewini* (scalloped hammerhead) and *Carcharhinus limbatus* (blacktip shark), two species frequently caught in artisanal fisheries and classified as globally threatened. Fieldwork conducted in the Mayumba region between March 2022 and April 2023 involved fishery-dependent sampling, stomach content analysis (SCA), and stable isotope analysis ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$). SCA revealed a predominance of teleost prey, especially *Pteroscion peli* (boe drum), with strong dietary overlap between species, while isotopic results showed low interspecific variation, suggesting reduced resource partitioning and limited competition, possibly due to high prey availability linked to seasonal upwelling. In parallel, nursery criteria defined by Heupel et al. (2007) were tested. Results indicate a predominance of juveniles (including young of the year) and newborns in Mayumba, minimal adult presence, and seasonal trends in size distribution. Crucially, juveniles from *S. lewini* and *C. limbatus* were more abundant in Mayumba compared to other regions along the Gabonese coast. Stable isotope compositions further supported prolonged juvenile residency, suggesting that individuals remain in the area for extended periods. Although long-term tracking data are not yet available, historical catch records provide evidence of recurrent use of this coastal zone by juveniles over time. These combined lines of evidence support the identification of Mayumba as a critical nursery habitat. These findings collectively highlight the ecological importance of Mayumba as both a nursery and foraging ground, reinforcing the need for spatially explicit conservation actions along the Gabonese coast. Protecting such habitats is vital for sustaining regional shark populations and ensuring the long-term viability of threatened coastal elasmobranchs.

Keywords: Artisanal fisheries, resource partitioning, stable isotopes, juvenile sharks, Gabon

Take home message

Mayumba, Gabon functions as a critical nursery and foraging habitat for juvenile scalloped hammerheads *S. lewini* and blacktip sharks *C. limbatus*, supporting their conservation through informed habitat protection.

Conservation genetics of scalloped hammerhead sharks in the Southwestern Indian Ocean

Nick Clemo, Aletta Bester-van der Merwe, Juliana Klein, Rhett Bennett, Matt Dicken, Sébastien Jaquemet

Shark & Ray Lab, Department of Genetics, Stellenbosch University, South Africa

Coastal communities in the Southwestern Indian Ocean (SWIO) rely heavily on fisheries for both income and sustenance, including the catch of sharks for local consumption and export. A key species caught in these fisheries is the scalloped hammerhead shark (*Sphyrna lewini*), valued for its fins and listed as Critically Endangered by the International Union for the Conservation of Nature. Very little is known about the genetic diversity and connectivity of this species within the SWIO: information that is important for the implementation of conservation measures. Using a 514bp fragment of the mitochondrial control region amplified for 1540 *S. lewini* specimens, we aimed to assess the phylogeographic connectivity of the species within the SWIO region as well as globally. Additionally, we aimed to create a regional ‘DNA zip-coding’ database to identify source populations of samples collected from the shark fin trade. ‘DNA zip-coding’ uses genetic markers to assign individuals to their most probable source population. Within the SWIO, genetic diversity was found to be high, while low to moderate levels were seen in the Caribbean, East Atlantic, Central Pacific and East Pacific populations. The inclusion of newly generated SWIO reference sequences increased the regional representation and coverage of the ‘DNA zip-coding’ database. This could improve the geographical resolution at which illegally sourced fins can be traced back to their population of origin, thereby identifying geographic areas where increased regulation and conservation efforts are needed.

Keywords: Conservation genetics, population assignment, phylogeography, *Sphyrna lewini*, stock management

Take home message

Sphyrna lewini exhibits significant population connectivity in the SWIO, harbouring unique genetic diversity compared to other regional populations. This highlights the region as a potentially important conservation area for the species. Expanding the global DNA zip-coding database enables the identification of the populations most impacted by the shark fin trade, highlighting regions where improved trade regulations are most urgently needed.

Safeguarding South Africa's Threatened chondrichthyans

SPEED TALK

Jennifer Olbers, Nikki Chapman, **Leigh de Necker**, Lauren van Nijkerk, Jean Harris

WILDTRUST

South Africa is a top five global biodiversity hotspot for chondrichthyans, hosting around 194 species with relatively high levels of endemism. Effective legal protection and management are crucial to safeguarding these species, especially amid global and regional threats. While many chondrichthyan species in South African waters maintain relatively healthy populations, over 100 species are adversely affected by illegal and legal fishing activities, habitat disturbance and other human-induced pressures. To address these challenges and secure protection for threatened species, WILDTRUST, together with the Shark Conservation Fund, launched the *Shark and Ray Protection Project*. This six-year project focuses on enhancing scientific knowledge about threatened species, advocating for stronger legal protections, improving enforcement capabilities, and raising public awareness. Despite progress, gaps have been exposed, highlighting the need to prioritise improvements in legal frameworks, enforcement capacity, prosecution success rates, and public engagement. The *Sharks Under Attack* campaign supports these efforts by changing negative perceptions and promoting positive actions through various media platforms. This presentation aims to highlight the objectives and progress of this collaborative project, which seeks to implement better conservation measures for South Africa's chondrichthyans.

Keywords: Biodiversity, endemism, conservation, management, enforcement

Take home message

South Africa, a global biodiversity hotspot for chondrichthyans, faces significant threats to over 100 species from fishing, habitat disturbance, and other human activities. The Shark and Ray Protection Project aims to advance scientific knowledge, advocate for stronger legal protections, improve enforcement, and raise public awareness. Despite progress, urgent improvements in legal frameworks, enforcement, prosecution and public engagement are critical to ensure effective conservation measures for these vital marine species.

Breaking barriers: Transoceanic migration by a bull shark

Ryan Daly, Taryn Murray, Michael Roberts, David Schoeman, Nicolas Lubitz, Adam Barnett, Riaan Cedras, John Filmlalter, Dunsin Bolaji, Grant Brokensha, Pamela Le Noury, Fabien Forget

Oceanographic Research Institute, Durban, South Africa & South African Institute for Aquatic Biodiversity, Makhanda, South Africa

Bull sharks (*Carcharhinus leucas*) are a large mobile shark species that play an important ecological role within and between disparate marine ecosystems. The scale of their migratory behaviour has only recently been described in Southern Africa revealing complex intra-specific movement patterns. However, as the southern African coastline is increasingly influenced by habitat loss and climate change, it is important to understand how bull sharks may respond and or adapt their movements and habitat use to survive. To investigate this, we fitted 55 and 40 adult bull sharks with acoustic and satellite tags, respectively, and tracked them for up to ten years. We describe how climate change may drive extreme temperature events that could alter long-established migratory patterns. We also describe the first trans-oceanic record of a bull shark movement and report on the longest migration of the species on record. The results are discussed in the context of climate change impacting the migration patterns of large and mobile marine species. Finally, we discuss the challenges for conservation management when considering threatened species undertaking large transboundary migrations and the need to improve collaboration and adapt management strategies.

Keywords: Shark movement ecology, climate change, marine conservation management

Take home message

Climate change is increasingly influencing the movements and habitat use of migratory bull sharks that undertake complex, wide ranging and transboundary movement patterns. The implications for cooperative management in the Western Indian Ocean are discussed and recommendations regarding transboundary conservation management between South Africa and Mozambique are highlighted.

Acoustic telemetry reveals spatial management priorities for bull sharks (*Carcharhinus leucas*) in Mozambique

Stephanie Venables, Lukas Müller, Chris Rohner, Andrea Marshall, JD Filmlalter, Ryan Daly

Marine Megafauna Foundation, Praia do Tofo, Inhambane, Mozambique; Akashinga Mozambique

Bull sharks (*Carcharhinus leucas*) are wide-ranging coastal sharks capable of large-scale movements yet often display seasonal site fidelity. While telemetry studies have provided insight into their movement ecology along the South African coast and into Mozambique's Maputo Province, little is known about habitat use further north. The Bazaruto Seascape in the Inhambane Province encompasses two adjacent marine protected areas (MPAs), the Bazaruto Archipelago National Park (BANP) and the Vilanculos Coastal Wildlife Sanctuary (VCWS). To better understand site use and visitation patterns within this region, we acoustically tagged 17 bull sharks (16 females, 1 male) and monitored their activity from 2019 to 2024 using 42 receivers deployed throughout the Inhambane Province, and the broader ATAP network extending into South Africa. Tagged sharks were detected year-round and exhibited periods of residency (mean $R_{max} = 0.47 \pm 0.26$), with individuals spending up to 84% of their monitored time within the array. Core activity spaces were within BANP boundaries but extended beyond the seaward boundary of VCWS. Movements varied considerably among individuals—ten sharks were only detected within the Bazaruto array, while one sub-adult female undertook a return migration to Toliara, Madagascar (minimum distance = 1730 km). Additionally, 22 bull sharks (11 female, 11 male) tagged in Ponta do Ouro, KwaZulu-Natal, and the Breede River were detected in the Bazaruto Seascape, confirming large-scale regional connectivity. These transient sharks visited for 1–31 days (mean = 4.80 ± 6.40 d), with up to 7 visits per individual, and some were detected annually across the study period, indicating the area may be an important stop on coastal migration routes. Our findings highlight that the Bazaruto Seascape serves as critical habitat for both resident and transient bull sharks and support the expansion of MPA boundaries to better protect these habitats and enhance spatial management of coastal elasmobranchs.

Keywords: Bazaruto Seascape, Marine Protected Areas, movement ecology, telemetry

Take home message

We recommend the extension of the seaward boundary of the Vilanculos Coastal Wildlife Sanctuary (VCWS) to encompass identified core habitats as a step towards improved protection of bull sharks and other coastal elasmobranchs. Additionally, we recommend the establishment of strategically located no-take zones within both VCWS and the Bazaruto Archipelago National Park (BANP), with implementation ideally occurring during upcoming MPA zoning reviews or marine spatial planning processes.

Crossing continental divides, habitat use of *Myliobatis aquila* in South Africa and Portugal, a comparative biogeographic movement analysis

Alexander Winkler, Amber Childs, Rhett Bennett, Edward Butler, Taryn Murray, Michelle Soekoe, Matthew Parkinson, Kyle Smith, Sebastian Kraft, David Abecasis, Warren Potts

South African Institute for Aquatic Biodiversity, Makhanda, South Africa; Department of Ichthyology and Fisheries Science, Rhodes University, Makhanda, South Africa

Myliobatis aquila, a Critically Endangered batoid, exhibits a wide distribution from the North Eastern Atlantic to the East Coast of Africa and the Mediterranean Sea. Its taxonomic status, however, remains uncertain, potentially constituting a species complex. Its recent classification as Critically Endangered, highlights the urgency for conservation action before it is too late. While the species has declined rapidly in the NE Atlantic, the population in Southern Africa is considered to be one of the species' last strongholds. Spatial management, such as marine protected areas (MPAs), is crucial for the sustainable management of these populations, necessitating an understanding of their movement ecology. This study aims to enhance our understanding of *M. aquila*'s movement ecology and evaluate MPA efficacy in areas where the populations are in dire straits (Portugal) and in areas where populations are stable (South Africa). To this end we deployed acoustic telemetry arrays along the South African coast and collaborated with European partners in Portugal where similarly designed acoustic telemetry arrays were deployed resulting in the opportunity for comparative analysis. Thirteen individuals in South Africa and two in Europe (two in Portugal) were tagged with Innovasea V13-1I acoustic tags. All individuals displayed high site fidelity to their tagging areas. Exploratory movements were, however, observed, emphasizing the potential value of even small MPA networks. Findings suggest high residency levels with occasional exploratory movements, underscoring the importance of spatial management for *M. aquila* conservation.

Keywords: Common eagle ray, acoustic telemetry, Southern Africa, NE Atlantic, Critically Endangered

Take-home message

Myliobatis aquila showed similar movement patterns in both Portugal and South Africa, exhibiting high site fidelity with certain individuals displaying exploratory behaviour. Emphasising the potential value of small MPA networks in conserving these critically endangered populations.

Uncharted waters: An update on white shark movement in South Africa and a landmark dispersal event

Alison Towner, Dylan T. Irion, Oliver J. D. Jewell, G. Fahmi, Christopher Fischer, Enrico Gennari, Madison Stewart, John P. Tyminski, Alison A. Kock

South African International Maritime Institute

Historically, South Africa's Western Cape supported consistent seasonal aggregations of white sharks (*Carcharodon carcharias*), particularly in False Bay and Gansbaai. However, since 2015, sightings have declined significantly, coinciding with the emergence of a shark-specialist killer whale (*Orcinus orca*) ecotype, although additional environmental and anthropogenic factors may also be contributing. More recent declines observed in Mossel Bay and Plettenberg Bay have sparked scientific debate regarding whether these patterns represent a population decline or an eastward cohort shift. In response, a coordinated tagging initiative was launched in early 2025. Satellite transmitters were deployed on white sharks in the Eastern Cape by Oceans Research, the South African Institute for Aquatic Biodiversity (SAIAB), and collaborators. Concurrently, during a brief re-aggregation in Mossel Bay, sharks were also tagged by South African National Parks, the Department of Forestry, Fisheries and the Environment (DFFE), and partners. This presentation outlines preliminary findings from these efforts and explores the potential emergence of new aggregation areas beyond traditional monitoring zones. The presentation concludes with a landmark discovery: a white shark originally tagged off Dyer Island, Gansbaai, in 2012 was recently recaptured in Southeast Asia—representing an unprecedented long-distance dispersal event.

Keywords: Dispersal, predator, movement ecology, cross-boundary management, tracking, trade enforcement

Take home message

This case underscores the importance of long-term tracking and cross-sector collaboration in understanding the spatial ecology of wide-ranging apex predators. Moreover, it reveals ongoing issues with species misidentification in trade and highlights the urgent need for improved enforcement and regulatory oversight.

Blue stingrays in the Knysna Estuary: Evidence for first ray pupping ground in South Africa

Chantel Elston, Taryn Murray, Kyle Smith, Amber Childs, Matthew Parkinson

Oceanographic Research Institute, Durban, South Africa

Many species of rays are threatened with extinction, but effective conservation measures rely on protecting vulnerable life stages of animals. Pupping grounds in particular are places where pregnant females and neonates occur, making them critical habitats that should be considered in spatial conservation planning. While ray nursery areas have been identified globally and in South Africa through the reliance of juveniles on certain areas, the location and nature of pupping grounds remains elusive. Blue stingrays *Dasyatis chrysonota* aggregate annually in the Knysna Estuary, and direct observations and acoustic telemetry were used to determine whether this aggregation may occur for reproductive purposes. Direct observations across three years (2022 – 2024) confirmed the presence of visibly pregnant females (with distended abdomens) at the aggregation site over the period of a few weeks. Seven pregnant females were tagged with acoustic transmitters in 2022 and their movements monitored using an array of 15 acoustic receivers in the Knysna Estuary. High residency indices for three months post-tagging (mean 0.65, range 0.53 – 0.79) indicate females remained in the estuary, where it was highly likely that parturition occurred. Finally, a neonate was also sighted at the aggregation site in 2024. All lines of evidence highlight that the Knysna Estuary is a pupping ground for blue stingrays, the first identified in South Africa, and one of only a handful suggested globally. Short-term spatial closures during spring months when these individuals aggregate (October to December) would provide significant conservation benefits to this declining Near Threatened endemic species.

Keywords: Acoustic telemetry, *Dasyatis chrysonota*, aggregation, critical habitat

Take home message

Endemic blue stingrays aggregate in the Knysna Estuary every spring, with evidence showing that this aggregation is for reproductive purposes and that the estuary functions as a pupping ground for this threatened species. We recommend an amendment to the MLRA to include a closed season for the species between October and December each year within the Knysna Estuary, and for SANParks in collaboration with stakeholders to further investigate means to reduce disturbance during the aggregation.

Use of passive acoustic telemetry on targeted and by-caught elasmobranch fishery species to inform future management strategies in South Africa

Enrico Gennari, Neil Hammerschlag, Taryn Murray, Patricia Albano, Chris Fallows, M. Fallows, Lacey Williams, O. Sedgwick, Eugin Bornman, Ben D'Antonio, Paul Cowley

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Many targeted and non-targeted fishery species in South Africa are collapsed or overexploited. In addition, many fall under the threatened categories of the IUCN's Red List of Threatened Species. In general, the failure of traditional management approaches can also be attributed to a lack of information on the movement patterns of the species of interest. The use of acoustic telemetry can provide paramount information about spatio-temporal patterns, including the identification of critical areas (e.g. feeding, mating, birthing, nursery etc.), but also provide insights into where and when management decisions can be more effective. Therefore, movement ecology using passive acoustic telemetry should be considered a research priority for many of these species. The movement patterns of commercially fished smoothhound sharks *Mustelus mustelus* (assessed as Endangered in South Africa), and commercially by-caught smooth hammerhead sharks, *Sphyrna zygaena* (assessed as Vulnerable globally), were investigated along the South African coastline using a combined effort of 11 years of passive acoustic telemetry data from 33 smoothhound sharks (23 females and 10 males) and 15 smooth hammerhead sharks (nine females and six males). Three studies have been looking at biological and ecological factors affecting their movements, within and outside Marine Protected Areas (MPAs), as well as the spatio-temporal overlap with fisheries. Furthermore, the use of predation transmitters to discriminate between natural and fishery induced mortalities was investigated. This type of study provides data which, if used correctly, have the potential to improve management decisions related to shark fisheries in South Africa.

Keywords: *Sphyrna zygaena*, *Mustelus mustelus*, acoustic telemetry, fishery management, MPAs, effectiveness

Take home messages

- 1) Smooth hammerhead sharks display distinct sex-based variations of distribution already during their early life stages; 2) the effectiveness of MPAs for protecting and restocking shark populations may be severely impaired if surrounding buffer zones were not implemented; 3) both species are equally susceptible of being caught by the demersal shark longline fishery.

Insights into the movements of previously captive ragged-tooth sharks along the South African coastline

Kevin Spiby, Koebraa Peters, Taryn Murray

Two Oceans Aquarium, Cape Town, South Africa; Cape Peninsula University of Technology, Cape Town, South Africa

Ragged-tooth sharks, *Carcharias taurus*, are found globally in coastal waters. These large slow-growing predators have historically been commercially fished and are also a popular recreational fish species. Consequently *C. taurus* is now listed as Critically Endangered on the IUCN Red List of Threatened Species. Due to their slow swimming nature, and desired ‘dangerous’ look, they have become a popular species to house in public aquaria. The Two Oceans Aquarium in Cape Town, South Africa, have displayed ragged-tooth sharks since 1995 as an ambassador species for various education and conservation programmes. Since 2004, sharks that have become too large for the exhibit have been released back into the wild. Between 2012 and 2021, 37 sharks (10 male and 27 female) were acoustically tagged and released providing the opportunity to learn more about their coastal movements after spending time in captivity. Since then, the South African coastal acoustic receiver network (Acoustic Tracking Array Platform) has recorded over 177 000 individual detections. Overall, 81% of the sharks were detected, with males (1075 days) and females (1172 days) being detected for a similar number of days. While the length of coastline used was similar between both sexes, females were detected further west (Pringle Bay) than males, while males were detected further east (Sodwana Bay). Both species displayed high levels of connectivity along the coastline, and interestingly, tagged sharks were recorded spending a significant amount of time in both the Knysna (females) and Breede (males) estuaries. The results of this study can provide useful insights into determining the feasibility of releasing ragged-tooth sharks after spending extended periods of time in public aquaria and could be extended to other species.

Keywords: Acoustic telemetry, South Africa, Acoustic Tracking Array Platform, *Carcharias taurus*

Take home message

Ragged-tooth sharks have shown that they can return to the wild and survive after spending time in a captive environment. This could allow for other ambassador species to be returned to the wild after being in an aquarium environment and their reintegration back into the wild monitored.

Habitat use by lesser guitarfish *Acroteriobatus annulatus* along the Kleinemonde coastline (Eastern Cape, South Africa)

Mia X.A. Hattingh, Taryn S. Murray, Ryan J. Wasserman

Department of Zoology and Entomology, Rhodes University

The lesser guitarfish *Acroteriobatus annulatus*, an endemic species found along the coast of southern Africa, is a targeted species of both economic and ecological value. The lesser guitarfish also holds intrinsic value as a contributor to i) southern African biodiversity due to its endemism, and ii) community structure as mesopredators in their associated systems. In 2020, the International Union for Conservation of Nature (IUCN) Red List of Threatened Species classified the species as Vulnerable; however, in spite of this, and in spite of their present exploitation as a fishery target, very little data are available informing their life history and spatial ecology, particularly in South Africa, hindering the establishment of species-specific conservation measures. To address the knowledge gap, 15 lesser guitarfish (12 males, 3 female; average ($\pm$ SD) of 862 mm total length [TL]) were acoustically tagged and their movements monitored by a shallow inshore array of acoustic receivers between the Kowie and Great Fish rivers from October 2024 to July 2025 to assess residency to the area, home range size and their use of the longshore, inshore and offshore environments. Despite the species' capability for larger coastal movements of up to 726 km, preliminary acoustic telemetry results (based on > 6000 individual detections) suggest high residency to or near tagging areas, with relatively small home ranges. These findings support those gleaned from dart tagging. Further, no inshore/offshore movements were observed. Results from this study will contribute to a greater project assessing area use and movement behaviour of multiple recreationally important fishery species within and along this stretch of coastline. This information will contribute towards the development of an Other Effective Area-based Conservation Measure (OECM), potentially turning this stretch of coastline into a catch-and-release only fishing zone.

Keywords: Spatial ecology, endemic conservation, fisheries management, OECM

Take home message

Preliminary acoustic telemetry results suggest that lesser guitarfish are highly resident, holding small home ranges along the coastline between the Kowie and Great Fish rivers. This information, which adds to the limited body of knowledge on the movement ecology of lesser guitarfish, can be used in targeted conservation efforts for this Vulnerable endemic species in South Africa.

Additionally, the data can also contribute to multispecies assessments of residency and movement behaviour along this stretch of coastline, which in turn, can be used towards the development of an OECM.

Understanding whale shark habitat use in Nosy Be, Madagascar: Insights from acoustic telemetry

Stella Diamant, Chris Rohner, Rhett Bennett, Jeremy Kiszka, Simon Pierce

Madagascar Whale Shark Project Foundation, Madagascar

The coastal waters of Nosy Be, northwest Madagascar, are an ISRA, a biodiversity hotspot and critical habitat for threatened marine megafauna, including whale sharks (*Rhincodon typus*), mobulid rays, and wedgefishes. These species support local economies through ecotourism but face increasing threats from unregulated fishing, boat collisions and potential climate-related changes in prey availability.

Nosy Be is the only known feeding ground for juvenile whale sharks in Madagascar, with over 500 individuals identified since 2015 through citizen science and research photo-ID efforts. Yet whale shark sightings in the region have declined in recent years, raising concerns about their long-term presence. In 2022, a collaborative effort launched Madagascar's first acoustic telemetry array to investigate whale shark movements and habitat use, supporting the implementation of a proposed marine protected area (MPA) corridor.

With 50 tagged whale sharks, a clear seasonal spatio-temporal signal was observed, confirming that the previously identified 'whale shark season' from September to December is when most sharks are present. However, some individuals were detected frequently or intermittently throughout the year, and ventured further offshore regionally, indicative of higher residency in some individuals and intra-specific variability in behaviour. This ongoing study suggests that whale shark space use around Nosy Be is focused within a specific area, which is also a hotspot for sympatric megafauna species such as mobulid rays and cetaceans. These results provide critical insights for spatial management planning and reinforce the urgency of protecting Nosy Be's unique marine ecosystem.

Keywords: Acoustic telemetry, *Rhincodon typus*, spatial planning, Madagascar

Take home message

Endangered species have temporal patterns which need to be considered for their protection. In this case, telemetry showed that despite seasonal observations, some animals do use the area year-round, and that the MPA corridor doesn't include the whole core use area used by whale sharks. Such information can be used to inform management plans. Updating the national protected species list and both management plans and limits of the MPA corridor, as well as reinforcing capacity-building and enforcement efforts, in particular, should be promoted as utmost priority, for the conservation of threatened shark and ray species in northwest Madagascar.

Site-fidelity and environmental patterns through observational data & photo-identification of *Bathytoshia brevicaudata* in Gansbaai

Ralph Watson, Amy Webber

Department of Biological Sciences, University of Cape Town, Rondebosch, Cape Town

Short-tail stingrays (*Bathytoshia brevicaudata*) are large benthic elasmobranchs, with a maximum disk width of 2.1 m, found in the coastal waters of South Africa, Australia, New Zealand, and the Sea of Japan. Despite their wide distribution, local ecological knowledge, including residency patterns, remains limited. Opportunistic sightings data collected from a local shark-cage diving vessel operating in the Gansbaai area were used to track the presence of short-tail stingrays between 2014 and 2024. Generalized Additive Models (GAM) were employed to link sightings to sea surface temperature (SST), depth, month, and year. The year-round presence of the species suggests high site fidelity to the area, with a greater affinity for the region during the spring and autumn months, correlating with SST ranging from 15 to 19 °C. Historical trip photos taken over the same period were used to track individual stingrays over time, utilising unique spot patterns behind the spiracles, enabling long-term identification of individuals. The ten identified stingrays displayed considerable variation in residency time, suggesting a more complex pattern of habitat use and movement within South African populations than previously recognised. These findings provide valuable insight into the species' ecological behaviour and movement patterns, enhancing the understanding of how short-tail stingrays interact with their associated environment.

Keywords: Short-tail stingray, residency, seasonal distribution, ecology, South Africa

Take home message

Short-tail stingrays, whose local ecological knowledge is not well known, show high variation in site-fidelity within a local South African embayment. While sightings are influenced by temperature and seasonality, photographic ID of individuals shows a combination of high resident and transient individuals, suggesting any species management recommendations rely on species-specific methods rather than spatial planning.

Release of a captive born short-tail stingray to the wild

SPEED TALK

Inge Adams

Two Oceans Aquarium, Cape Town, South Africa

A male short-tail stingray (*Bathytoshia brevicaudata*) was born at the Two Oceans Aquarium in 2012 from a wild caught adult female. He grew well and was housed in various exhibits before moving to our large 1.6 million litre Ocean Exhibit in 2016. In 2023, aquarists noticed him displaying seemingly repetitive swimming behaviour. He would be seen swimming clockwise around the exhibit at speed, and was noted swimming into the main viewing panel with force by staff and members of the public. Research was done into the possible causes of this behaviour, and ultimately the decision was made to release him into the wild. He underwent a health check by the in-house veterinarian, and then was fitted internally with an acoustic tag before his release in Muizenberg, False Bay on 14 March 2024. His tag pinged on the receivers in Macassar on 18 March 2024, but we have yet to receive further data from his tag. By tagging and releasing this stingray, we hope to gain information on the success of the release of captive-born rays, as well as movements post-release.

Keywords: Acoustic telemetry, *Bathytoshia brevicaudata*, South Africa

Take home message:

Determining the feasibility and success of releasing captive born stingrays.

PROGRAMME: Day 3, Thursday 18th September

08:50 KEYNOTE: Elisabeth Fahrni Mansur – Connecting minds, hearts, and hands through scientifically grounded, strategically planned educational outreach to create and sustain effective marine conservation solutions		
Education, science engagement & comms	09:30	Judy Mann: Using communication to inspire care for the ocean – and sharks
	09:45	Ghofrane Labyedh: Coasts of care: Fishing community-led conservation efforts to conserve sharks and rays in Cameroon
	10:00	Isaah Seidu: Local Ecological Knowledge and socio-economic drivers of migration of artisanal shark fishers in West Africa
	10:15	Nico Booyens: Justice4Jaws: Youth-led advocacy and outreach for shark conservation
	10:30	Justin Blake: Meet a real-life shark scientist – Lessons from 1,000+ online talks
	10:45	Wade Naude: Decolonising the terminology and language in marine conservation
	11:00	Charles Lucas Makio: Enhancing elasmobranch conservation awareness through education: Knowledge gains and attitude shifts among fishers and students in coastal Kenya
11:05 MORNING TEA		
Sharks & humans	11:30	Sarah Waries: Unpacking multi-stakeholder roles in managing the risk and repercussions of unprovoked shark bites
	11:45	Matt Dicken: The South African shark risk management strategy of KwaZulu-Natal
	12:00	Sébastien Jaquetmet: Global shark risk management: where are we coming from and where do we go?
	12:15	Michaël Hoarau: Innovative tools for shark detection and risk mitigation in Reunion: Insights from the Centre Sécurité Requin
	12:30	Cicely Nagel: A comparative study of colour and contrast discrimination in oceanic blacktip and bronze whaler sharks
	12:45	Nadeem Nazurally: Sharks, cages and concerns: Disentangling myths from evidence in aquaculture settings
	13:00	Matt Dicken: Political dimension of shark risk management in South Africa
13:05 LUNCH		
Fisheries & trade	14:00	Bernadine Everett: Collateral damage in the KwaZulu-Natal crustacean trawl fishery
	14:15	Nina Faure-Beaulieu: Shark and ray catches across South Africa's hake bottom trawl fishery: comparing observer and logbook catch records
	14:30	Abdalla Abdulla: Status of shark and ray landings in Tanzania and implications for management
	14:45	Elvinah Nyale: Interactions between the artisanal fishery and the Critically Endangered scalloped hammerhead shark in Kenya
	15:00	Oliver Wright: An interactive, data-driven platform for monitoring shark fin trade and detecting shark fin trafficking
	15:15	Simone Louw: South African shark and ray trade dynamics
15:30 AFTERNOON TEA		
Fisheries & trade	16:00	Warren Potts: Pro-environmental behavioural intervention improves angler catch and release practices and the health of released elasmobranchs
	16:15	Shanan Atkins: Quo vadis shark nets?
	16:30	Matt Farthing: Global meta-analysis for predicting post-release mortality in marine recreational fisheries
	16:45	Thembelihle Ndlovu: Long-term catch trends of the bull ray <i>Aetomylaeus bovinus</i> along the KwaZulu-Natal coast, South Africa
16:50 END OF DAY 3		
18:30 CLOSING DINNER AT HIGH CORNER (122 High Street)		

Connecting minds, hearts, and hands through scientifically grounded, strategically planned educational outreach to create and sustain effective marine conservation solutions

Elisabeth Fahrni Mansur

Marine Conservation Practitioner and Environmental Educator



Conservation management aims to safeguard a healthy ocean that continues to benefit us. It is part of our responsibilities as conservation practitioners to facilitate the collaborative development, implementation, and monitoring of conservation solutions. The active engagement of the communities, government agencies, businesses or enterprises and institutions impacting marine wildlife and the spaces they occupy is essential.

Educational outreach aims to empower people to be a part of conservation solutions by effectively communicating conservation science findings and resulting management recommendations. Building informed conservation constituencies and institutionalizing platforms that enable learning from each other, should be prioritized in conservation management, not just added as an afterthought. Meaningful connections need to be nurtured between all stakeholders and the ecosystems they depend on, for ensuring that sharks, rays, and other marine wildlife can continue to fulfil their respective roles throughout their lifecycles.

Informed by her experiences as a teacher, nature guide, CEO of a tour company, and manager of educational outreach and marine conservation programs, Elisabeth promotes strategically designed and locally tailored educational outreach interventions that go beyond conveying information. Her innovative traveling exhibitions brought about measurable changes in the knowledge and attitudes of remote coastal fishing communities as well as among national policy makers towards globally threatened dolphins, sharks, rays, and protected area regulations. The 'Ocean Guardians' radio programs reached as many as 1.8 million people across the coastal belt of Bangladesh, with training workshops and tools enabling hundreds of government officers to enforce laws and rules on shark and ray exploitation and trade by identifying and monitoring protected species.

By showcasing educational outreach strategies that incorporate multidisciplinary approaches, Elisabeth hopes to inspire the creation of innovative and effective educational outreach programs that connect the minds, hearts, and hands of ocean stakeholders and instill pride about their role in safeguarding a healthy ocean.

Using communication to inspire care for the ocean – and sharks

Judy Mann

Two Oceans Aquarium Foundation, Cape Town, South Africa; Department of Ichthyology and Fisheries Science, Rhodes University, Makhanda, South Africa

People are at the heart of marine conservation – they are our biggest challenge and our most powerful solution. Protecting the ocean is one of the most serious challenges facing humanity today. We have much of the science, and we know many of the solutions, what we need is a deeper understanding of people's connections to the ocean, how this influences the decisions that they make, and how to communicate more effectively to inspire action. This presentation will share some of the lessons that we have learnt about effective communication to inspire ocean care in an African context.

Keywords: Communication, marine education, behaviour change

Take home message

Strategic communication has the power to change perceptions, attitudes and behaviours.
Helping shark scientists to communicate more effectively will help sharks and people.

Coasts of care: Fishing community-led conservation efforts to conserve sharks and rays in Cameroon

Ghofrane Labyedh, Betty Laglbauer, Guido Leurs, Fetra Metiegoum, Cedrick Fogwan, Cedric Biankeu, Rima W. Jabado, Aristide Takoukam Kamla

African Marine Mammal Conservation Organization (AMMCO), Dizangue, Cameroon; The Manta Trust, Catemwood House, Norwood Lane, Corscombe, Dorset, DT2 0NT, UK

Unsustainable exploitation of sharks and rays (elasmobranchs) in Cameroon's coastal waters poses a critical threat to aquatic biodiversity. Thirty-seven of the 45 documented species are threatened on the IUCN Red List of Threatened Species. Since 2015, the African Marine Mammal Conservation Organisation (AMMCO) has been collecting data on sharks and rays fisheries through fish market surveys and the SIREN App—a citizen science tool enabling fishers to report species observations. High numbers of juveniles, including Critically Endangered species like the blackchin guitarfish (*Glaucostegus cemiculus*) and scalloped hammerhead (*Sphyrna lewini*), indicate potential reproductive areas or nursery grounds that require urgent protection. In response, a community-led conservation initiative was launched along the southern coastline of Cameroon (Kribi) to reduce shark and ray mortality in small-scale fisheries through elasmobranch catch documentation, socio-economic surveys, capacity building, and fisher engagement in scientific monitoring.

Between October 2023 and February 2025, 200 days of fish market surveys were conducted across two fish markets (Mboa Manga and Londji) to document elasmobranch landings. A total of 2163 individuals were recorded, representing 16 elasmobranch species. In parallel, eight local fishers across the three fishing communities – Mboa Manga (n = 2), Londji (n = 4), and Lobe Waterfall (n = 2) – were trained to identify and safely release threatened elasmobranch species, and to use GPS devices to map shark and ray catch hotspots. Over eight sea trips, fishers successfully released two daisy whiplays (*Fontitrygon margarita*) and 20 catch locations were mapped. Finally, socio-economic interviews with 75 fishers and 10 government fisheries officers provided valuable insights into fishing practices, trade, and attitudes toward conservation.

By building local capacity and strengthening collaboration between fishers and researchers, the project has created a foundation for sustainable fisheries management. These findings underscore the importance of integrating participatory approaches into marine conservation strategies, particularly in data-poor regions.

Keywords: Participatory research, live-release, nursery habitat identification, small-scale fisheries, elasmobranch monitoring

Take home message

A high occurrence of neonates and juveniles elasmobranchs, especially blackchin guitarfish, scalloped hammerhead, and daisy whiplay, suggests the presence of nursery grounds for Critically Endangered and endemic species along Cameroon's southern coastline, underscoring the importance of these areas. To enhance management and conservation, we recommend collaborative efforts to conduct acoustic telemetry studies for the delineation of critical habitats, expanding the genetic analyses to improve data accuracy and species identification, and supporting the designation of Important Shark and Ray Areas (ISRAs) to inform protected area design.

Local Ecological Knowledge and socio-economic drivers of migration of artisanal shark fishers in West Africa

Issah Seidu

Department of Wildlife and Range Management, Kwame Nkrumah University of Science and Technology, Ghana

The general perspective of migrant fishers targeting sharks, rays, and guitarfish, particularly regarding their movement patterns across local and international jurisdictions, remains unexplored. This study investigates guitarfish fisher's migration patterns both national and international, catch composition, and the drivers for the target of the species. The study used a mixed-method approach to gather both qualitative and quantitative information about the fisher's migration patterns. Guitarfish species were lumped together as “small” and “large” and many fishers (68%, $n = 34$) were unable to identify the sawfish. Fishers stated that they normally catch large-sized guitarfishes in Gambia, Benin, and Nigeria but relatively smaller individuals in Ghana and Ivory Coast. Many fishers perceived the reductions in the abundance and sizes of guitarfishes and wedgefishes were caused mostly by the Trawling fishery (32%, $n = 16$) and Overfishing (24%, $n = 12$). We identified five different types of migration based on the responses from fishers: West Coast, Central Coast, East Coast, Intra-regional migration, and International Seasonal movement. The West Coast Migration fishers are larger in volume and many fishers in the study communities are categorized under this migration pattern, where they spent two to four months in West Coast communities. Migrant fishers undertake international movement, to skip the impact of lean fishing seasons in the country and further take advantage of seasonal marine resources. The international migration for guitarfish in Liberia, Ivory Coast, Togo, Benin, Nigeria, and The Gambia began in the mid-2000s. Depletion of target species and high market demand are the main drivers of fishers' migration. Many fishers noted that they do not have any fallback livelihood options to depend on if there should be a regional ban on the exploitation of elasmobranch fishery.

Keywords: Migrant fishers, guitarfish, sharks, West Africa, international migration

Take home message

Given these results, it is prudent to recognize the socio-economic contributions of migrant fishers and integrate their activities with those of indigenous fishers in any fisheries policy development.

It is also recommended that any conservation or policy efforts that aim to promote the sustainable management of shark and guitarfish fishery must consider both the ecological and socio-economic well-being of fishers to ensure long-term benefits for marine ecosystems and coastal communities.

Justice4Jaws: Youth-Led Advocacy and Outreach for Shark Conservation

Nicolaas Gerrit Booyens

Justice4Jaws, Cape Town, Durban, and Gqeberha (Port Elizabeth), South Africa

Justice4Jaws is a grassroots level, youth-led initiative based in Cape Town, Durban, and Gqeberha (formerly Port Elizabeth), South Africa. We are dedicated to reshaping public perception of sharks and advocating for the protection of their spaces through culturally relevant education, creative outreach, and community engagement.

Our work includes running school-based youth outreach programs, hosting public awareness events, and developing accessible educational tools such as the uShaka SA card game. In 2024, we facilitated a shark-focused workshop at the Plett Ocean Festival and collaborated with organizations such as the Ocean Investment Trust, Surfer Kids, and the Plett Hope Spot. We have presented to university students at both the University of Cape Town and Nelson Mandela University, fostering dialogue between youth advocates and the academic community. Justice4Jaws also presented at the 7th International Marine Conservation Congress (IMCC7) in Cape Town, highlighting our youth-driven model of science communication.

We are currently assisting with the development of a permanent display at uShaka Marine World Aquarium that aims to tackle persistent myths about sharks and broaden public engagement. Online, we manage active social media channels on LinkedIn, Facebook, and Instagram, as well as WhatsApp groups that share shark and ray-related content with a wide audience including university students, conservationists, and school learners.

Our work shows that creative, youth-led outreach, rooted in local culture and identity, can play a significant role in shifting attitudes and building inclusive marine stewardship.

Keywords: Youth outreach, marine literacy, shark education, digital advocacy, inclusive conservation

Take home message

Marine educators, scientists, aquaria, and conservation organizations should collaborate with youth-led initiatives to co-create inclusive shark and ray education and awareness campaigns. These efforts should be rolled out across South Africa's coastal communities using both digital and physical engagement strategies.

Meet a real-life shark scientist – Lessons from 1,000+ online talks

Justin Blake

RockHopper, Cape Town, South Africa

Online communication has become a critical, yet underutilized, tool for (shark) scientists—especially those seeking to connect their work with conservation impact, public awareness, or funding. During the COVID-19 pandemic, I developed *Meet a Real-Life Shark Scientist*, an online experience that now has over 1,000 five-star reviews from global teams at companies like Google, Apple, GitHub, and Meta.

What began as a basic screen share evolved into a dynamic, high-impact storytelling and science outreach session using free software, simple lighting, and intentional engagement strategies. Through thousands of hours presenting shark science live to diverse audiences, I uncovered key lessons in what works—and what doesn't—when sharing our work with non-specialists.

This workshop-style talk will take you behind the scenes to explore how to:

- Translate complex science into compelling, values-based stories;
- Choose low-cost tools;
- Adapt content without compromising scientific integrity;
- Apply practical tips and tricks for engagement;
- Build supportive online communities beyond the call.

With challenges in securing travel funding, growing pressure to demonstrate impact, and the need to counteract misinformation, online science engagement offers shark researchers a vital, accessible strategy to scale their influence—if done well.

Keywords: Science communication, outreach, online, Zoom/Meet

Take home message

Shark scientists should invest in live, online public engagement as a core part of their communication and conservation strategy. Training in storytelling, software use, and audience management should be prioritized by academic institutions, NGOs, and research bodies – especially in low-resource settings. Start now using free tools, and scale with impact over time.

Decolonising the terminology and language in Marine Conservation

Wade Naude

Save Our Seas Foundation Shark Education Centre (SOSFSEC)

For shark conservation measures to be effective and sustainable, local communities must be included in the process. When science is communicated through an accessible, relatable and inclusive lens, awareness is more likely to lead to action. There is often a disconnect between communities (that are most impacted by conservation issues) and scientists; in some cases, this is due to the jargon-filled language used by scientists. In South Africa, a country with 11 official languages, English remains the dominant language in scientific discourse. This poses a significant barrier in post-apartheid educational contexts, particularly for Afrikaans, Afrikaaps (a colloquial blend of Afrikaans and English spoken across Cape Town), and isiXhosa-speaking learners from under-resourced communities. At the Save Our Seas Foundation Shark Education Centre (SOSFSEC), this language barrier has led to noticeably limited engagement from learners during education programmes conducted solely in English. Students frequently struggled to respond to interactive questions or grasp complex terminology, especially when their home language was not English. To address this, the SOSFSEC team adopted multilingual and culturally responsive approaches. Lessons were adapted to include translations into Afrikaans, Afrikaaps, and isiXhosa, not only through direct language translation but by incorporating local idioms and culturally familiar references. This approach also addresses the spatial and psychological challenges that learners face when visiting historically white-dominated coastal institutions. Feelings of alienation in unfamiliar, privileged environments can erode learners' confidence and reduce their willingness to participate. The SOSFSEC's inclusive approach is thus not only a communication tool but also a method for building emotional safety and disrupting spatial exclusion in marine education. This approach can be adopted by conservationists, scientists and marine educators looking to foster deeper engagement with diverse linguistic communities. It emphasises the role of language as a conduit for empowerment, understanding, and meaningful collaboration in marine conservation efforts.

Keywords: Marine education, language equity, multilingual learning, Afrikaaps, isiXhosa,

Take-home message

Language inclusivity is critical to equitable marine education, especially in multilingual and post-apartheid contexts. Learners engage more confidently when taught in their home languages, including informal or hybrid dialects like Afrikaaps. Alienation in educational settings can stem not only from language but also from spatial and cultural dynamics; inclusive communication helps bridge this gap. Marine science outreach must be reimagined to centre local language, cultural references, and identity to foster genuine conservation awareness.

Enhancing elasmobranch conservation awareness through education: Knowledge gains and attitude shifts among fishers and students in coastal Kenya

SPEED TALK

Charles Lucas Makio, Jenni Choma, Rolf Voorhuis

Bahari Hai Conservation, Jacaranda Road, Watamu, Kenya

The declining global trend of elasmobranch populations is reflected in the Western Indian Ocean (WIO) making them of significant interest among conservation groups. Most elasmobranchs are top predators playing important ecological functions but face significant threats from overfishing, habitat degradation, and weak regulatory enforcement. Commercial fisheries and targeting of elasmobranch species are top threats to elasmobranchs but the contribution of artisanal fishers cannot be overlooked, as well as their potential as key conservation allies. In Kenya, elasmobranchs are considered to be rarely targeted but caught incidentally or as bycatch in artisanal fisheries. This study provides a baseline assessment to ascertain this but also to inform on the effectiveness of an elasmobranch education program implemented in November 2024 and December 2024. Thirty-four fisher groups (BMUs) along the Kenyan coast were engaged through interactive materials and participatory sessions. The goal of the education and awareness program was to address knowledge gaps, myths, and socio-economic constraints, perception and awareness on elasmobranchs. The project included 2 sessions with fishers, 2 hours each. Pre- and post- program questionnaires were administered whereby it was revealed that a significant increase ($df = 868$, $p < 0.05$) in knowledge and awareness on; 1. elasmobranch identification (from 37 – 78%), understanding of elasmobranch ecology (from 45 – 82%) and protection/conservation of elasmobranch (44 – 72%) among fishers over the project period. However, 56% of the fishers were largely unaware of elasmobranch species-specific protection laws (both national and international). Findings of this pilot project highlight the importance of integrating education with conservation and sustainable livelihood strategies/projects to promote long-term elasmobranch conservation dedication.

Keywords: Elasmobranchs, threats, conservation, education and awareness, artisanal fishery

Take home message

Artisanal fishers have significant impacts on shark and ray mortality; however, through communication, education, and sustainable livelihood alternatives, artisanal fishers could become part of the conservation solution for sharks and rays.

Ripples of Responsibility: Unpacking multi-stakeholder roles in managing the risk and repercussions of unprovoked shark bites

Sarah K. Waries

Shark Spotters

Shark bites are low-frequency, high-impact events that have far reaching consequences, disproportionate to their level of risk. Managing shark bites and their impacts therefore presents a complex challenge for authorities where social, economic and ecological factors converge, often with competing priorities. During periods of high shark activity, or following an unprovoked shark bite incident, public expectations often centre on government interventions to “manage the situation” to reduce further risk. This focus on authorities overlooks the significant role that individual water users, conservation NGOs, the media and other key stakeholders can play in reducing the risk and repercussions of these incidents.

Emphasising the importance of personal responsibility in understanding and reducing risk is vital for effective shark risk management. This requires dedicated public education efforts to provide accurate, non-sensational information with clear behavioural guidance to empower water users to make informed decision to adapt their actions and reduce personal risk. Furthermore, the actions of various stakeholders after a shark bite can directly influence the severity of the negative repercussions arising from the incident. The growing exploitation of shark related fears for financial gain, from media outlets profiting off sensationalist narratives, to companies selling untested or ineffective technologies marketed as “solutions”, can intensify public anxiety, distort perceptions and drive political decisions for interventions that may lack scientific grounding and could have significant environmental consequences.

Taking a shared responsibility approach, based on collaboration, transparency, stakeholder integrity, scientific evidence, and ethical decision making is essential for effective shark risk management that safeguards both sharks and people, while fostering realistic public expectations of ocean risk.

Keywords: Shark-human interactions, shark incidents, shark risk management

Take home message

Shark bite risk management requires a shift from solely government-led interventions toward a shared responsibility approach involving authorities, individuals, NGOs, media, and other stakeholders. Public education that provides accurate, non-sensational information and empowers water users to make informed decisions is essential. Transparent, evidence-based, and ethical collaboration can prevent fear-driven reactions, reduce negative impacts, and balance human safety with shark conservation.

The South African shark risk management strategy of KwaZulu-Natal

SPEED TALK

Matt Dicken

KwaZulu-Natal Sharks Board, Durban, South Africa

The KwaZulu-Natal Sharks Boards bather protection programme originated at Durban in 1952 to mitigate the risk of shark attack. The programme comprises the deployment of shark nets, and more recently baited drumlines, to catch and kill potentially dangerous species of sharks. The programme works by reducing the population of resident sharks in the vicinity of beaches, and the probability of a water user encountering a shark and being attacked. As part of the programme the KZNSB monitors the environmental impact of catches to assess any potentially negative impacts on biodiversity. It also contributes to research projects aimed at improving the knowledge of sharks and promoting biodiversity and tourism, as well as investigating shark attacks and its prevention. Since its inception, the KZNSB programme has reduced the incidence of fatal sharks at protected beaches by 100%. This is in marked contrast to shark attacks in the other coastal provinces of both the Eastern and Western Cape, which have continued to increase. Although the program has enhanced bathing safety, reducing environmental impacts and the associated by-catch of non-target species remains a priority. Over the past four decades, several interventions have been initiated, which have successfully reduced the total catch of both sharks and harmless animals by 84%. These include, among others; the release of all live sharks, a reduction in the number of netted beaches from 44 to 37, an 80% reduction in the length of nets and their replacement with baited drumlines, and the strategic removal of nets during the austral winter and spring to mitigate both the capture of sharks associated with the sardine run and the entanglement of migrating whales. Maintaining its public safety mandate, while reducing environmental impacts demonstrates the programme's ability to achieve a workable balance between impact and safety in shark-control programmes.

Keywords: Shark attack, strategy, KwaZulu-Natal Sharks Board

Take home message

The introduction of bather protection gear has reduced the incidence of unprovoked shark attack at protected beaches in KwaZulu-Natal by 100% and directly supports the province's R10bn tourism industry. Continued reductions in catches demonstrates the programme's ability to achieve a workable balance between impact and safety in shark-control programmes.

Global shark risk management: where are we coming from and where do we go?

Sébastien Jaquemet, André Afonso, Paul Butcher, Jeremy Cliff, Emmanuel Coutures, Matt Dicken, Nathan Hart, Michaël Hoarau, Charlie Huveneers, Christopher G. Lowe, Gavin Naylor, Vic Peddemors, Tatiana Tchong-Fat, Sarah Waries

Réunion Island University, UMR Entropie; Réunion Island Shark Security Centre

Shark bites on humans are generally sporadic but clusters of such incidents are increasingly more frequent and can have severe socio-economic consequences. When such clusters occur, local authorities often respond by designing and implementing shark control programs that aim to reduce the risk of shark bites whilst minimizing any impacts of coastal activities and local economy. Historically, lethal methods have been used across several countries and continues to be implemented to reduce local populations of potentially dangerous sharks. However, this approach has raised ethical and ecological concerns because of the negative impacts on non-targeted species, but also because of the increasing recognition of the conservation status of sharks and public interest in shark conservation. As a result, many novel shark-bite mitigation strategies have evolved to minimize lethal measures and the potential negative environmental impact of these programs. This presentation reviews historical and current approaches of shark risk management in coastal areas and discusses future strategies that could be implemented to limit shark-bite risk and impacts on marine ecosystems. In March 2025, these issues were discussed by 15 international experts with experiences from South Africa, Australia, United States, Brazil, Réunion Island, and New Caledonia at a week-long symposium on shark risk management in Reunion Island. Although shark fishing remains pivotal in shark risk management, fishing gears and practices can be adapted to reduce catch per unit of effort of non-target species and to maximize survival of released animals. Complementary and alternative practices should be tested robustly and independently based on new technologies to detect sharks, alert water users, and reduce environmental impact on threatened or protected species. The inclusion of shark risk management in broader strategies of sustainable development of coastal areas is highly recommended to find a balance between economic, social, and ecological considerations.

Keywords: Shark risk, fishing, beach netting, underwater and aerial detection, tagging

Take home message

Shark risk management is at a turning point. In the context of the erosion of the marine biodiversity, historical programs aimed at reducing local shark populations is no longer acceptable because of its impacts on other non-targeted species including charismatic megafauna. Shark risk management must be considered in a broader scheme of sustainable development of coastal areas, that includes all potential risks to sea users. New technologies that can detect sharks and alert water users should be encouraged.

Innovative tools for shark detection and risk mitigation in Réunion: Insights from the Centre Sécurité Requin

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GIP Centre Sécurité Requin / GIP Shark Security Centre, Saint-Leu, Réunion Island

To address the increasing challenges posed by human shark interactions in coastal waters of Réunion Island, the Centre Sécurité Requin (CSR) has implemented and tested a range of innovative monitoring and detection tools. The objective is to enhance real-time detection capabilities, understand shark behaviour, and inform effective risk management strategies for ocean users.

The CSR's approach combines aerial surveillance using drones, underwater visual monitoring through Baited Remote Underwater Video Systems (BRUVs), real-time shark detection powered by artificial intelligence (AI), and a comprehensive tag-and-release program. Drones equipped with high-resolution cameras enable rapid, broad-area observation of nearshore waters, especially in high-use recreational zones. BRUVs provide systematic data on species presence, behaviour, and habitat use. Concurrently, an AI-based image recognition system has been developed to automate shark identification from video feeds, aiming for deployment in real-time detection networks. Additionally, acoustic tagging has been used to monitor individual movements and migration patterns of key shark species.

The integration of these tools has led to several key findings: drone surveillance proves not effective in detecting sharks in Reunion except in clear and shallow water conditions for bull shark (*Carcharhinus leucas*), while BRUVs provide invaluable ecological data on species diversity and site fidelity. Preliminary AI models demonstrate promising accuracy in shark recognition compared to other fish species. Tagging data has revealed distinct seasonal and spatial patterns in shark activity, correlating with environmental conditions and human use areas.

These findings underscore the importance of a multi-tool approach to shark risk management. Combining real-time detection with ecological insight enables better-informed, adaptive management decisions. The CSR's work contributes not only to local public safety but also serves as a scalable model for other regions facing similar challenges in balancing marine conservation with recreational and economic use of coastal ecosystems.

Keywords: Shark detection, drone surveillance, BRUVs, artificial intelligence, tag-and-release program, acoustic telemetry

Take home message

Integrating multiple innovative tools as drones, BRUVs, AI, and tagging enhances the detection and understanding of shark presence nearshore. This multifaceted approach supports more responsive and informed coastal risk management strategies, improving safety while respecting marine biodiversity.

A comparative study of colour and contrast discrimination in oceanic blacktip and bronze whaler sharks

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Despite the extremely low global incidence of human fatalities caused by sharks, negative shark-human interactions remain a significant concern. By increasing our understanding of sharks' behaviour, the chance of negative interactions between humans and sharks could be reduced. This project aimed to collect behavioural data from two species of large carcharhinid sharks, to determine whether some colours might play a role in attracting sharks' attention and ultimately, provide guidelines on sharks' colour preferences. Utilising a novel in-field behavioural approach, oceanic blacktip sharks (*Carcharhinus limbatus*) and bronze whaler sharks (*Carcharhinus brachyurus*) were exposed to five differently coloured bait tubes (white, yellow, silver, red, and black). Results revealed that both *C. limbatus* and *C. brachyurus* were able to discriminate between the five coloured tubes, demonstrating a significant preference for the brighter colours (white, yellow, and silver) over the darker colours (*C. limbatus*, $F(4, 100) = 9.10$, $p < 0.01$; *C. brachyurus*, $F(4, 160) = 21.26$, $p < 0.01$). These preferences are likely to be associated with the luminance contrast between bait tubes and the background, which will be detected by the sharks, even if colour-blind. This study is the first behavioural study on *C. limbatus* and *C. brachyurus* focusing on visual cues and empirical evidence on which colours are best avoided when engaging in activities in shark-inhabited areas in South Africa. To reduce the chances of negative interactions, dive gear, wetsuits, and bathing suits should avoid high-contrast colours such as white, yellow, and silver.

Keywords: South Africa, shark vision, *Carcharhinus limbatus*, *Carcharhinus brachyurus*

Take home message

To minimise the chances of negative shark-human interactions in South Africa, it is recommended that ocean-goers should avoid wearing high-contrast colours such as white, yellow and silver . These guidelines should be implemented by individuals, dive gear manufacturers and authorities, especially in areas known to be inhabited by shark species.

Sharks, cages and concerns: Disentangling myths from evidence in aquaculture settings

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Marine aquaculture continues to expand globally, surpassing wild-caught fisheries for several commercially important species. However, its integration into coastal ecosystems raises ecological and public concerns, particularly regarding potential shark attraction and increased human-shark encounters near aquaculture facilities. The Southwestern Indian Ocean islands of Mauritius and Réunion have been central to this debate. While Réunion has experienced multiple shark incidents, Mauritius has remained free of unprovoked shark attacks, prompting interest in localized factors influencing shark behaviour. This study assessed shark-aquaculture interactions at a privately operated lagoonal fish farm in Mauritius, located in a 20–25 m deep channel. Using a combination of three Baited Remote Underwater Video systems (BRUVs) and an Unbaited Stationary Video (USV) system, we monitored shark presence and behaviour around the cages. The BRUVs were deployed 50 m from the cages, while the USV was placed directly beneath the cages during both normal and feeding conditions. Observations were conducted daily over a month and then monthly from April 2018 to January 2019, and again from December 2022 to December 2024, covering dusk (17:00) and night (19:00) periods. Across all monitoring periods and video hours, no sharks were recorded near the cages or in response to baiting and feeding stimulus. A total of 32 sightings of *Sphyræna* spp. (barracudas) were observed near the farm infrastructure, showing no predatory behaviour towards caged fish. These results suggest that lagoonal aquaculture in Mauritius does not inherently attract sharks, and generalized assumptions linking fish farms to shark presence may be context-specific and influenced by geographic, ecological, and operational factors. Contrary to widespread public perception, the data strongly indicate that lagoonal aquaculture in Mauritius does not contribute to shark attraction. This highlights the need for localized scientific assessments before drawing broad conclusions on aquaculture-shark dynamics. Evidence-based communication is essential to reduce public apprehension and support the sustainable growth of the aquaculture sector.

Keywords: Shark behaviour, aquaculture, BRUVs, predator interactions, public perception

Take home message

A scientific evidence base is essential for public communication, relating to the potential impacts of anthropogenic alterations to the marine environment, such as aquaculture facilities, particularly surrounding the sensitive topic of shark-human interactions.

Political dimension of shark risk management in South Africa

SPEED TALK

Matt Dicken

KwaZulu-Natal Sharks Board, Durban, South Africa

Unprovoked shark bites have consistently increased in South Africa as well as globally over the last four decades, largely in response to increases in human population and water-based recreational activities. In the province of KwaZulu-Natal (KZN) this presents the KZN Sharks Board (KZNSB) with a “wicked problem” in how to maintain its public safety mandate, while ensuring the protection of endangered marine species and reducing environmental impact. This problem is compounded by the low probability, yet in some cases the fatal consequences of an attack, the high degree of media attention and public emotion it elicits, as well as the concern and fear of sharks expressed by a large component of the public. Strategies to mitigate shark attack broadly comprise fishing (shark removal) and non-fishing (no shark removal) methods. The high incidence of shark attacks along the KZN coastline in the 1940’s and 1950’s, resulted in the first deployment of shark nets (fishing) off Durban in 1952. Since its inception, the KZNSB programme has reduced the incidence of fatal sharks at protected beaches by 100%. The rest of the South African coastline does not use lethal shark mitigation strategies. However, in response to increasing rates of shark attack in the Western Cape a shark spotting program was initiated in 2004 and the deployment of a non-lethal exclusion net at Fish Hoek in 2013. In 2024, the shark spotting programme was extended to Plettenberg Bay, in the Western Cape, following two fatal shark bites within a 3-month period in 2022. This presentation examines some of the underlying issues, which shape the political dimension of shark risk management in South Africa, including, among others; financial, morality, environmental, perception, and effectiveness...it’s complicated!

Keywords: Politics, wicked problem, shark attack

Take home message

The prevention of shark attacks is complicated, presenting government and policy makers with a “wicked problem” in how to balance the public safety mandate, while ensuring the protection of endangered marine species and reducing environmental impact.

Collateral damage in the KwaZulu-Natal crustacean trawl fishery

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An observer programme for the KwaZulu-Natal Crustacean Trawl Fishery, funded by the Department of Forestry, Fisheries and the Environment, was in place from 2003 until 2012. At the time, the fishery consisted of an inshore and offshore component. The observers recorded the bycatch of the fishery, including all elasmobranchs. A total of 950 trawls was observed, with an uneven split of 113 trawls on the inshore grounds and 837 on the offshore grounds. In the inshore area, 94% of trawls caught at least one shark taxon, and 93% caught at least one batoid taxon. The taxa caught included 10 shark and 21 batoid taxa. The most frequently encountered shark species were *Sphyrna lewini* (98 trawls), *Mustelus mosi* (20 trawls), and *Rhizoprionodon acutus* (17 trawls) while the most encountered batoid species were *Gymnura natalensis* (77 trawls), *Maculabatis gerrardi* (40 trawls), and *Acroteriobatus annulatus* (32 trawls). In the offshore area, 65% and 48% of trawls caught shark and batoid taxa, respectively. The most occurrences of sharks were *Squalus* spp (380 trawls), *Dalatias licha* (119 trawls), and *Pliotrema warreni* (118 trawls), while batoids were *Cruriraja parcomaculata* (213 trawls), *Dipturus springeri* (123 trawls), and *Leucoraja wallacei* (46 trawls). Of the 64 elasmobranch taxa caught, only 17 were egg layers and only one of these (*Raja miraletus*) was caught inshore. All other species were either ovoviviparous or viviparous. Some taxa were caught on both the inshore and the offshore grounds (12 batoids and 5 sharks) but the majority were only caught on one of the trawl grounds despite their wide depth preferences. The proclamation of the uThukela MPA has provided protection from trawling to the species that occur on inshore grounds and, to some extent, to those that move between inshore and offshore, but there are still many species that are exposed to the fishery.

Keywords: Elasmobranchs, sharks, batoids, catch statistics, life history

Take home message

The uThukela Marine Protected Area has provided a haven from trawling for several elasmobranch taxa that live in shallow-water or that move between the inshore and offshore trawl grounds. There is, however, considerable fishing pressure on the offshore grounds and mitigation measures should be investigated to afford these species similar protection.

Shark and ray catches across South Africa's hake bottom trawl fishery: comparing observer and logbook catch records

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Two-thirds of sharks and rays are threatened globally, mainly from overfishing. This threat is exacerbated by poor documentation of catches at spatial and species level which hinders the ability to build even simple risk assessments and in turn delays the development of targeted and effective management measures. South Africa is a globally important hotspot harbouring a fifth of global shark and ray species. There are several commercially important fisheries, many of which catch sharks and rays as retained or discarded bycatch. The hake bottom trawl fishery is MSC certified and is the most valuable fishery in South Africa. The fishery comprises an inshore (< 110 m) and deep-sea sector (> 110 m), operating on the Agulhas bank and west coast of South Africa at depths down to 700 m. Data from the fishery's observer programme were used to assess shark and ray catch trends from 2008 to present. Observers documented 52 shark and ray species caught by the fishery, whereas logbooks records will record shark catches into one of 5 broad categories, whilst skates and rays are recorded in a single category. We estimated catch per unit effort (CPUE) in kg/h across the fishery, standardized based on observer data catches. These highlighted significant differences in CPUE for sharks in the offshore trawl, with estimates of > 5 kg/h for observer data and < 1 kg/h for logbook data. This difference can in part be attributed to the non-reporting of sharks at the trawl level across the fishery. Observer coverage across the inshore sector was considered too limited to develop appropriate estimates. Standardised CPUE was then used to estimate total annual shark and ray catches across the fishery. This study highlights the need for improved logbook reporting, especially for sharks in deep-sea trawls as well as improved observer coverage across inshore trawls.

Keywords: Bycatch, Hake, Demersal, CPUE

Take home message

Improved species-level logbook reporting of shark and ray catches at the drag level, particularly in the deep-sea sector of the hake trawl fishery, is recommended. This should be accompanied by an increase in observer coverage across the inshore trawl. Improved logbook reporting will enable more accurate catch assessments and support the development of targeted, species-specific conservation and management measures for vulnerable shark and ray populations.

Status of shark and ray landings in Tanzania and implications for management

Abdallah S. Abdulla, Jean A. Mensa, Baraka Kuguru, Zahor el Kharousy, Dave van Beuningen, Rhett Bennett

Wildlife Conservation Society Marine Program Tanzania

A three-year study (2019-2021) by the Wildlife Conservation Society in Tanzania, monitored artisanal shark and ray landings to address data gaps hindering effective management. Using a mobile phone application at 12 sites, researchers recorded biological (species, sex, size, weight) and fishery (gear type, targeted/bycatch) data, along with photographic and tissue samples. The surveys identified at least 61 chondrichthyan species, representing 62% of confirmed species in Tanzania, with Zanzibar showing a significantly higher diversity than previously reported. Worryingly, a high percentage of individuals caught were classified as threatened (44-53% across sites), including species listed under the Appendices of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES), and those with retention bans under Resolutions of the Indian Ocean Tuna Commission (IOTC). Catch composition varied geographically, with Pemba showing more sharks and fewer batoids compared to Unguja and the mainland, likely due to habitat differences. Fishing gear also influenced catches, with sharks mainly caught by hook-and-line and longlines, while batoids were primarily caught in gill nets and ring nets. Notably, a significant proportion of both groups were reported as targeted catches, presenting management opportunities. The study emphasizes the necessity of long-term, species-specific monitoring and highlights potential management strategies, including seasonal measures based on fishing patterns and geographical zonation informed by distribution and juvenile presence. This work aims to provide a monitoring model and contribute knowledge for improved and sustainable shark and ray fisheries in Tanzania and the Western Indian Ocean.

Keywords: Artisanal fishery, catch monitoring, Zanzibar

Take home message

These findings demonstrate the importance of species-level, long-term catch monitoring. There is an opportunity and need for improved fishery management and conservation of sharks and rays in Tanzania, in order to limit or avoid catches of, and impacts on, threatened species. The findings indicate the possibility of several management opportunities to be done.

Interactions between the artisanal fishery and the Critically Endangered Scalloped Hammerhead Shark in Kenya

Remy Oddenyo, Rhett Bennett, Dave van Beuningen, **Elvinah Nyale**

Wildlife Conservation Society, Kenya Marine Program

Scalloped hammerhead sharks *Sphyrna lewini* have been fished heavily globally resulting in population declines exceeding 80%. These declines of *S. lewini* populations are exacerbated by its slow growth and reproductive rates, which limit its resilience to fishing pressure and rates of recovery. Measures have been set in place to restrict trade globally, such as inclusion of *S. lewini* under Appendix II of CITES, although this has limited impact on localised trade and exploitation of this species. In the Western Indian Ocean and developing nations such as Kenya, steps have been taken to develop National Plans of Action (NPOA) for the Conservation and Management of Sharks, with measures proposed to reverse the trend but which are yet to take effect. To shed light on the status of exploitation of this species in Kenya, we summarise artisanal fishery landings of *S. lewini*. Surveys were conducted two days per week, at selected sites, over a six-year period (2018-2024), during which 116 *S. lewini* were recorded. Males ($n = 70$) outnumbered females ($n = 46$) at a sex ratio of 1:0.7 (M:F). All sharks recorded were juveniles ranging from 47 cm – 97 cm total length (TL) for males and 34 cm – 65 cm TL for females. The majority of specimens ($n = 107$, 92%) were caught using gillnets with the remainder caught using hook and line. Landings were concentrated in Malindi-Ungwana Bay ($n = 100$, 86%), an area recently classified as an Important Shark and Ray Area (ISRA). The outlook for this Critically Endangered species is dire with this evaluation suggesting possible growth overfishing and limited enforcement of measures pending implementation of the draft NPOA. A precautionary approach is recommended where communities are engaged on pragmatic solutions such as voluntary small-scale fishery closures and spatial protections, especially for critical habitats of *S. lewini*, including pupping and nursery grounds, such as Malindi-Ungwana Bay.

Keywords: *Sphyrna lewini*, juveniles, artisanal fisheries, Kenya, critical habitats

Take home message

Scalloped hammerhead sharks caught by artisanal fishers in Kenya are all below length at maturity. Gillnets are the main gear used by fishers to catch scalloped hammerhead sharks in Malindi-Ungwana Bay, an area recognised as an Important Shark and Ray Area (ISRA). The draft National Plan of Action for Sharks in Kenya contains recommendations for management but is pending final government approval and yet to come into effect. There is a need for spatial protection of critical nursery and pupping habitats of this Critically Endangered species as a precautionary measure.

An interactive, data-driven platform for monitoring shark fin trade and detecting shark fin trafficking

Oli Wright, Mike Mole, Markus Burgener

TRAFFIC Southern Africa, Pretoria, South Africa

Illegal, Unregulated and Unreported (IUU) shark fishing undermines legal and sustainable fisheries and compromises the ability of the legal fishing sector to support economies and livelihoods in developing countries. IUU shark fishing is driven by illicit international trade in shark products, and curbing illegal trade is critical in the broader fight against unsustainable exploitation of shark populations.

To help address this illicit international trade, TRAFFIC, with support from Map Scientific Services (MAPSS), have developed FishTradeStats: an online dashboard for the analysis of United Nations (UN) Comtrade trade data for shark fins and other high value marine products. The intended outcome of this data visualisation and analysis tool is increased capacity of law enforcement to analyse legal trade data for fisheries commodities, and to identify discrepancies in this data that may indicate illicit international trade.

FishTradeStats comprises two data visualisation and analysis dashboards:

A dashboard for general trade statistics, for the purpose of providing an overview of trade flows and trends.

A dashboard for comparison of import and export statistics for the purpose of identifying discrepancies in trade data which may point to the occurrence of illicit trade.

Customs and Fisheries law enforcement officials have limited capacity to monitor and investigate shark fin trade and can benefit from tools that show them where to allocate scarce resources. Although potentially useful to law enforcement officials, trade data analysis is time consuming, and may require specialist training. With the user-friendly FishTradeStats data analysis dashboard, law enforcement officials can quickly and easily analyse fisheries trade data to identify priority areas for targeted law enforcement interventions.

Keywords: Fisheries, trade, trafficking, fins, data, intelligence, enforcement

Take home message

Data for legal trade in shark fins can provide critical intelligence to law enforcement agencies tasked with detecting and interdicting trafficked shark fins. The FishTradeStats data visualisation tool makes this data more accessible to southern African customs and fisheries officials. FishTradeStats has the potential to protect threatened shark species from IUU fishing by improving counter trafficking efforts and disrupting the balance of risk vs reward for transnational wildlife trafficking networks.

South African shark and ray trade dynamics

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Globally, there is a concern over the impact that the catch and subsequent trade in shark and ray products can have on shark and ray populations. As an important region for sharks, there is a need to understand South Africa's role in the international shark and ray trade and to monitor any changes. TRAFFIC published a report in 2022 on South Africa's shark and ray trade dynamics (https://sharksunderattackcampaign.co.za/wp-content/uploads/2022/08/SharkAttack_SharkTradeReport.pdf), where we looked at Customs data, CITES data, FAO and DFFE catch data, and seizure records. TRAFFIC has just updated this analysis and a new report reflecting these results will be published in mid-2025. The new report covers the period 2011-2023 and describes changes over time for shark and ray product (fins and meat) imports and exports, trade partners, the volumes and values of the trade, CITES records for international trade in shark products linked to South Africa, and seizure records of shark and ray products that have been traded illegally and where there is a link to South Africa. The analysis shows a decline in imports by all countries of both shark meat and fins, and changes in the key importing countries for shark meat. The report also highlights discrepancies between South Africa reported exports of shark and ray products compared with World reported imports from South Africa, and World reported exports of shark meat to South Africa when compared with South African imports.

Keywords: Trade, CITES, fins, meat

Take home message

South Africa (DFFE and SARS) is encouraged to engage with key trading countries where there are significant discrepancies in trade data to determine the correct traded mass and value, and identify the reasons for the discrepancies. SARS is encouraged to develop a Customs trade code for dried shark fins in international trade.

Pro-environmental behavioural intervention improves angler catch and release practices and the health of released elasmobranchs

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Many of South Africa's endemic coastal shark species are under threat, with exploitation and specifically recreational fishing recognised as one of the main impacts on their populations. The marine shore-based fishery (MSBF) is the largest marine fisheries sector by participation and has a considerable impact on the coastal shark populations. Although only a small proportion of recreational fishers kill sharks for food, bait or illegal sale, and some fishers simply leave captured sharks to die on the shore, the majority are released. However, the post-release survival is highly dependent on the catch and release (C&R) practices employed by the angler. This presentation highlights the progress on a decade-long behaviour project aimed at improving the C&R behaviour of competitive recreational anglers. We followed a pro-environmental behaviour framework, which included the collection of baseline C&R behaviour and shark health indices during the national competition in 2014, the design of interventions (structural, incentives, education, and feedback), and continued assessment of progress. We found that shark health was impaired after the catch and release events before the intervention in 2014. However, by 2017, the significant improvements in angler C&R behaviour resulted in improved physiological and motor performance by the two dominant species. We ceased direct engagements with anglers after 2017 but resumed monitoring in 2021 following the COVID pandemic. We found that both the catch and release behaviour and shark health had continued to improve up until 2025. We conducted semi-structured interviews with the managers of each of the seven franchises to gain an understanding of why the C&R behaviour improved despite our limited engagements. We found that our Conservation Trophy, which is awarded to the team with the best handling practices at the end of each national competition, was the primary driver for the sustained pro-environmental practices.

Keywords: C&R angling, marine shore-based fishery, competitive recreational anglers

Take home message

Understanding the context and drivers of behaviour, in this case, the competitive nature of competitive recreational anglers, is critical to designing and promoting sustainable pro-environmental interventions.

Quo vadis shark nets?

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A great variety of methods are now available to reduce the risk of shark bites. In hotspots around the world we noted four types of lethal methods to reduce the chance of shark bites: gillnets, baited hooks (drumlines), longlines, and SMART drumlines, which alert fishers who launch quickly to release bycatch but euthanise target sharks. We identified six types of non-lethal methods: SMART drumlines with target shark translocation; Shark Spotters, both land-based and water-based; drones; underwater video surveillance; exclusion nets; and tagged target sharks with listening stations. Reunion uses two lethal and five non-lethal methods. New South Wales, Australia uses one lethal and three non-lethal methods. Queensland, Australia uses two lethal and two non-lethal methods and are testing one non-lethal method. Cape Town, South Africa uses two non-lethal methods. KwaZulu-Natal (KZN), South Africa uses two lethal methods. This paper discusses recent processes to explore opportunities to change perceptions of the current lethal methods to reduce the risk of shark bites in KZN.

Keywords: Bather protection, lethal shark control, drumlines, bather-shark conflict, perceptions

Take home message

As the world moves towards less lethal ways to protect bathers, we explore ways to support this change in KwaZulu-Natal, South Africa.

Global meta-analysis for predicting post-release mortality in marine recreational fisheries

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Rhodes University

Marine recreational fisheries represent a significant portion of global fisheries. Managers are increasingly acknowledging the significant impact these fisheries can have on fish populations (Post et al. 2002). Most recreational fisheries are also largely open-access, managed through output controls (bag limits and size limits) rather than traditional input controls which are often used to regulate commercial effort. A growing conservation-orientated sentiment amongst recreational anglers has also led to many anglers voluntarily releasing their catch. Due to the use of output management controls and voluntary catch-and-release (C&R) release behaviour, many recreationally captured fish are caught and released if not of legal size or the angler has gone over their daily bag limit. Most reviews of catch-and-release in recreational fisheries to date have focussed primarily on identifying key drivers of post-release mortality and other sub-lethal impacts to develop best practices (e.g. Bartholomew and Bohnsack 2005, Brownscombe et al. 2017). There has been little effort to develop a basis for actually predicting post-release mortality (PRM) of sharks and rays at a scale useful for fisheries managers seeking to incorporate discrete PRM estimates in stock assessments and other decision-making. Consequently managers and decision makers are left using existing estimates for similar/related species, or estimates from dissimilar species in similar fisheries, or simply to subjectively interpret the likelihood of PRM being higher or lower than that of other taxa. To this end, this study aimed to systematically review the existing academic literature for PRM estimates from marine recreational fisheries alongside other important information also reported. The objective of the study was to then use a meta-analytical approach to model these estimates using a Bayesian framework. The resulting model was used to create a user-friendly tool for estimating PRM at various levels.

Keywords: Catch-and-release, sport fishing, discard mortality, post-capture mortality

Take home message

This tool provides an important decision support tool to assist in understanding the post-release mortality rate of sharks and rays in marine recreational fisheries.

Long-term catch trends of the bull ray *Aetomylaeus bovinus* along the KwaZulu-Natal coast, South Africa

SPEED TALK

Thembelihle Ndlovu, Nomfundo Nkabi

KwaZulu-Natal Sharks Board, Umhlanga, Durban, South Africa

The bull ray *Aetomylaeus bovinus* is a Critically Endangered batoid species. Its full distribution range is still uncertain, but it is known to inhabit the coastal and warm waters of Europe, South Africa and Mozambique, as well as in Zanzibar and Kenya. Recently, this species was found along the south coast of South Africa and in estuaries with females displaying seasonal philopatry. However, the bull ray distributional range and annual migrations along the east South African coast remain unknown. Therefore, a 43-year dataset from the KwaZulu-Natal (KZN) Sharks Board bather protection program was used to determine catch trends, geographical and seasonal trends, and size distribution of bull rays for the first time from the east coast of South Africa between 1981 and 2023. A total of 1411 bull rays with a Field Length (FLEN) ranging from 44 to 350 cm were caught as by-catch from the KZN shark nets. These included 726 (51.5%) females and 685 (48.5%) males. Generalised Additive Models (GAMs) were employed to identify whether the year, month, and area had an influence on the presence of bull ray. The GAMs revealed the KZN North area had a significant influence on the presence of bull ray, specifically the Durban beach in this area had relatively greater juvenile catches which could suggest this area likely forms a nursery ground for this species. Therefore, further research is required to determine the movement ecology and nursery areas of bull rays along the KZN coast and whether the KZN estuaries also forms part of their nursery. Identification and subsequent management of nursery habitats may be important in the conservation of this Critically Endangered species.

Keywords: Bull rays, catch trends, shark nets, KZN coast

Take home message

The Durban beach captured the highest number of juveniles, with a larger proportion being caught in net number one. In addition, five juveniles were caught at the Durban beach on the same day which further suggest bull rays are likely to be encountered at this beach moving in pairs and in groups. This indicates that net installation at Durban should be closely monitored by the KZN Sharks Board to reduce bull ray bycatch mortalities as Durban beach could be a potential nursery area for Critically Endangered bull rays.



SOUTHERN AFRICAN
SHARK & RAY SYMPOSIUM

