

RECAPPING OUR
2024 RELEASE
SEASON

INSPIRING THE
NEXT GENERATION OF
OCEAN STEWARDS

LEOPARD SHARKS
RESURFACE IN
RAJA AMPAT

the ReSharker

INTERNAL COMMUNICATIONS · DECEMBER 2024



ReShark



An international, collective effort
to recover threatened sharks
and rays around the world

ACTIVE PROJECTS



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COVER

Accompanied by high school students from SMKN 3 Raja Ampat, Taran, Charlotte, and Dawn were released in South Misool, marking the start of the StAR Project Indonesia's 2024 release season. Photo by Pambajeng Putro.

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PHOTOGRAPHY

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FULL STEAM AHEAD:
HIGHLIGHTS
FROM OUR 2024
RELEASE SEASON

As part of the StAR Project Indonesia, 18 leopard sharks were released in Raja Ampat this year, bringing the total to 22



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2024 marked a significant milestone for the StAR Project in Raja Ampat. The number of leopard sharks released into the wild increased dramatically from four in 2023 to 18 in 2024. We are on track to meet our goal of releasing 50 or more pups into the wild by 2025. Post-release monitoring has confirmed that the pups are thriving, with individuals observed swimming successfully one month after release. This provides strong evidence that the pups are foraging naturally and adapting well to life on some of the world's most biodiverse reefs!

Dr. Mark Erdmann
Vice President of Asia-Pacific Marine Programs, Conservation International
ReShark Council & StAR Project Steering Committee StAR Project Steering Committee





Dr. Mark Erdmann trains the Misool Foundation aquarist team in acoustic tracking



Misool Foundation aquarist team shares a moment before releasing Taran, Charlotte, and Dawn



Team Misool after a busy day of releases: Pambajeng Putro, Agi Zalma, Revata Dharani Sofjan, Aisya Ramadhani Alpian, Virly Yuriken, Nesha Ichida, Dr. Mark Erdmann, Dr. Jaya Ratha, and Ayub Markus (left to right)



Team RARCC out in full force during a veterinary training visit by Dr. Paolo Martelli and nurse Chilli Chan from Ocean Park Hong Kong



RARCC aquarist Anggi Aenun feeds a pup in the sea pen

RELEASES

Since September, it has been all systems go for the StAR Project Indonesia in Raja Ampat, with an extended release season, a post-release monitoring program, back-to-back film crews, successive egg shipments, and new hatchings.

A total of 18 sharks were released this season, bringing our cumulative releases to 22. Of these 18, six raised at our Misool Foundation nursery were released in Misool, while the remaining 12, raised at our RARCC nursery, were released just outside the facility at Kri.

Compared to the sharks released last year, this year's sharks were intentionally grown out to over 1 meter in length at the time of release. This allowed them to be equipped with larger acoustic tags featuring stronger batteries, which are expected to last about five years. The tags also provided a high ping rate during the first week post-release, enabling active acoustic tracking.

The releases were conducted in batches and intentionally spread out to accommodate a diverse group of documentary film crews who came to capture each release and share the story of ReShark and the StAR Project. Eight documentary teams were on-site between September and November.



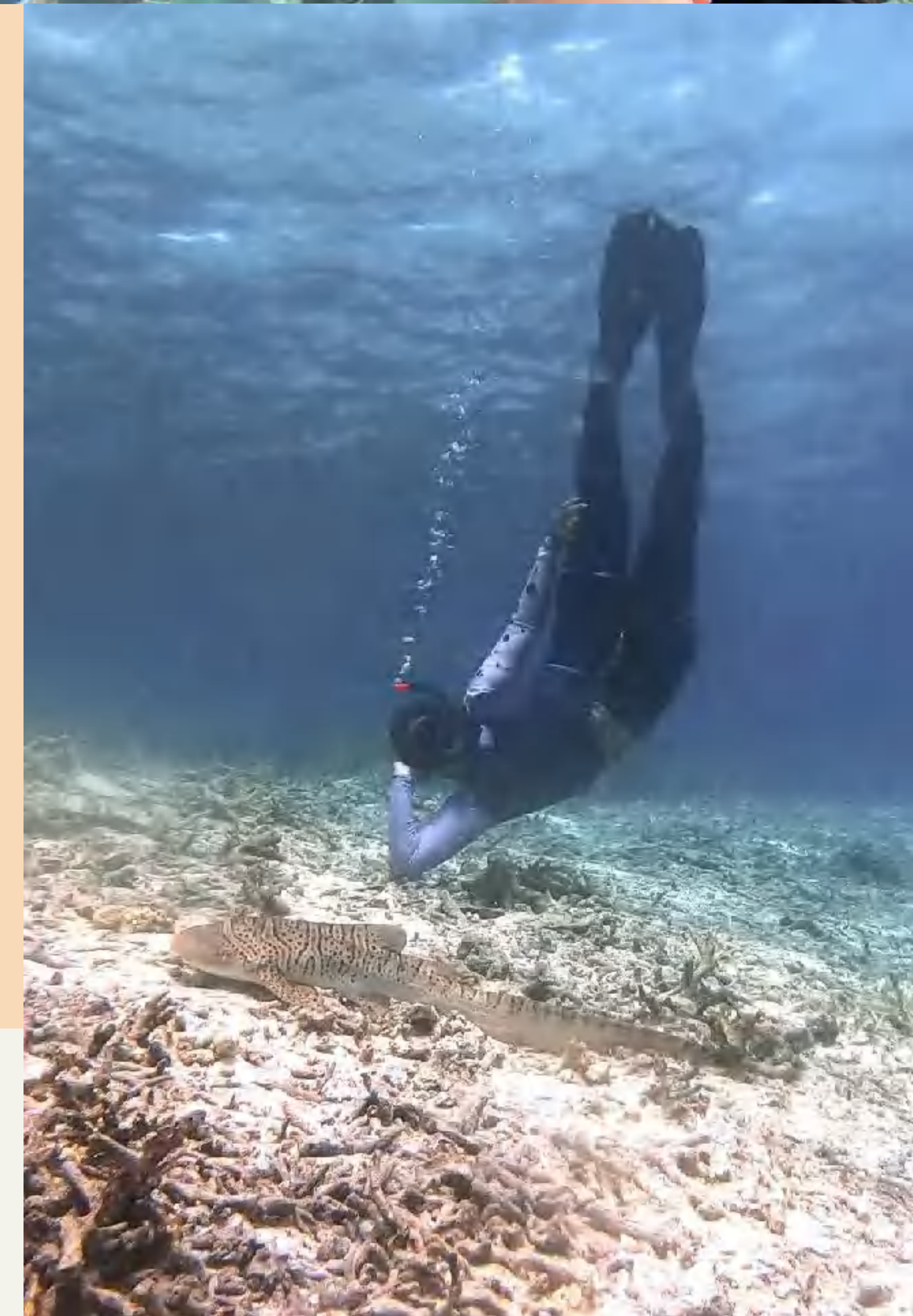
Accompanied by students and staff from SMK Negeri 3 Raja Ampat, Taran, Charlotte, and Dawn were released in South Misool, kickstarting the 2024 release season



ROUND 3

OCT. 1-4, 2024

Still at Kri, we moved on to releasing **Christina, Karen, and Anselm**. Members of the Raja Ampat Women Divers Association (MORA) celebrated the occasion with us. Villagers from the nearby Kurkapa village spotted Karen a little over a week after her release.



ROUND 1

SEPT. 15, 2024

Taran, Charlotte, and Dawn kicked off our season with their release in the shallow lagoon near Misool Resort. Students from SMK Negeri 3 Raja Ampat joined the event. The sharks fanned out in different directions, embarking on a marathon lap around the lagoon before venturing into deeper waters.



ROUND 2

SEPT. 18-20, 2024

Next up were **Buddy, Camille, and Seren** from our RARCC nursery, released on consecutive days at Kri Island, just beside the nursery. Local children from Child Aid Papua and Barefoot Conservation, both active contributors of food for our shark pups, were there to witness the releases.

ROUND 5

OCT. 28-30, 2024

We then returned to Misool, where **Kris, Lydia,** and **Claudio** were released, marking a milestone of 20 leopard sharks released to date. Guests from Misool Resort joined us for Lydia's release, making it an especially memorable occasion.



ROUND 4


OCT. 23-25, 2024

Our releases at Kri continued with the next trio — **James, Jill,** and **Ethan**. Each spent time exploring the nearby shallow reef flats and seagrass beds before venturing out into the open blue. We were delighted to have the Raja Ampat MPA Management Authority join us for post-release monitoring.

ROUND 6

NOV. 12-30, 2024

Closing out this year's release season, the RARCC aquarist team bid a heartfelt farewell to **Wooly** and **Fijubeca**.

An underwater photograph showing a large school of small fish swimming in the upper half of the frame. In the lower right, a coral reef is visible, covered in various marine life and colorful corals. The water is a deep, clear blue.

TRACKING SUCCESS THROUGH POST-RELEASE MONITORING

According to IUCN conservation translocation guidelines, a critical part of any translocation is a robust post-release monitoring program to ensure released animals are surviving and contributing to species recovery. While tracking terrestrial animals is achievable with satellite tags, radio collars, and aerial surveys, monitoring wide-ranging marine species like leopard shark pups presents significant logistical challenges.

Passive acoustic telemetry offers a solution and is now being used in Raja Ampat. This method involves surgically implanting acoustic tags in each pup about a month before release. These tags transmit a unique frequency identifier, which is picked up by an array of underwater acoustic receivers. The receivers are strategically placed at reef sites within a roughly 10-kilometer radius around two release sites — one in the Dampier Strait and another in Southeast Misool. Each tag has a battery life of about five years, and when a tagged pup comes within 500 meters of a receiver, the tag's ID is recorded in the receiver's data log.

Nesha Ichida deploys an acoustic receiver in Misool as part of post-release monitoring efforts





Dr. Jaya Ratha and the RARCC aquarist team conducting an acoustic tag surgery



Reviewing initial post-release monitoring data from the Dampier Strait



Currently, 26 receivers are stationed around the RARCC nursery along the Dampier Strait, while 14 receivers monitor the area in Southeast Misool. In mid-November, data from all receivers in both locations was downloaded, yielding highly encouraging results.

Of the six pups released at Misool in 2024, all six were detected by the receiver array for periods of 1 to 4 days after release. The data suggests the pups later moved beyond the range of the receivers. Notably, four of the six pups last pinged on the westernmost receiver before disappearing from the array, indicating they ventured beyond the limits of the current coverage.

At the RARCC site, 10 pups were released before the November 2024 data download. Five of these pups were detected by the receiver array for periods ranging from 1 to 26 days. Two pups, in particular, provided fascinating movement data.

Jill pinged the receiver closest to the RARCC nursery upon release but then vanished from the array for two weeks. She reappeared around Cape Kri, pinged the receiver there for a day before disappearing again. A week later, she was detected across from the nursery, giving a total track of 24 days.

Karen provided the longest track, remaining within the receiver array for 26 days. Her movements revealed repeated trips along a 3- to 4-kilometer stretch of coastline between Cape Kri and the eastern tip of Mansuar Island.

These preliminary results provide strong evidence that the released pups are able to forage successfully in the wild. Leopard shark pups don't need to feed immediately after release, but tracking data showing movements up to 24 and 26 days post-release strongly suggests they have eaten multiple times and are adapting well to life in the wild.

The data also highlights the need to expand receiver coverage. With four pups at Misool and several pups at RARCC moving beyond the limits of the array, extending the listening range to 15 to 20 km from the release sites could allow for longer, more detailed tracks. Plans are already in place to add more receivers in early 2025, with the next data download scheduled for February 2025. Stay tuned for more updates as we continue to track the journeys of these remarkable pups and refine our monitoring efforts to support their survival in the wild.





INSPIRING THE
NEXT GENERATION OF
OCEAN STEWARDS

Discover how the StAR Project is creating opportunities through local partnerships, conservation outreach, and internship programs

Students from Child Aid Papua joined the RARCC aquarist team on Kri Island for Buddy's release



The StAR Project has emerged as one of the best tools to re-engage with the communities in Raja Ampat and reinvigorate the spirit of conservation, especially among younger generations. It's filled with hope, conservation optimism, and local pride, which is why we are implementing our outreach program from multiple angles.

Nesha Ichida
Program Director, Thrive Conservation
Program Manager, StAR Project Indonesia
Co-Chair, StAR Project Steering Committee



EXPANDING PARTNERSHIPS ALONG THE DAMPIER STRAIT

The Dampier Strait, nestled in the heart of Raja Ampat, serves as a vibrant marine corridor between the islands of Waigeo and Batanta. Renowned as a hotspot of marine biodiversity, it is also emerging as a gateway to conservation action. At its entrance lies Kri Island, home to the RARCC nursery.

Raja Ampat communities have long championed conservation, yet external pressures persist. Neshia Ichida, Program Manager for the StAR Project Indonesia, sees the StAR Project as a transformative initiative to reconnect local communities, especially younger generations, with their environment. “This project is filled with hope, conservation optimism, and local pride,” she explains. Outreach programs in schools, villages, and the tourism sector work to inspire a love for sharks and their habitats. Indeed, leopard sharks are emerging as a flagship species here, rallying community-driven conservation efforts.

A key element of this connection involves engaging children and villagers in practical conservation efforts, such as collecting snails and clams for the sharks — an activity that fosters participation and contributes to livelihoods. Future plans include offering nursery tours to local schools along the Dampier Strait and in South Misool, introducing shark- and ray-focused curricula, and partnering with homestays and resorts to bolster citizen science. Other initiatives include village movie screenings, informational boards, and more internship opportunities prioritizing local youth.



Facilitated by Barefoot Conservation, elementary school children from Arborek had the opportunity to visit the RARCC nursery and witness Seren's release



Conservation International's Dr. Mark Erdmann underscores the importance of involving communities, particularly children, in shark conservation. Recently, young participants from Child Aid Papua and Barefoot Conservation have helped to collect and deliver food for the juvenile sharks at the RARCC nursery and taken part in their releases. "Having local kids directly involved is vital," he explains.

"Such collaborations are invaluable for the local children," shares Maya Puspa Dewi, Indonesian Director of Child Aid Papua. "Hands-on experiences like these help them understand

the importance of sharks in the ocean and recognize that every species matters. These activities also inspire them to continue engaging with local conservation initiatives and take action to protect sharks."

By fostering connections between people and sharks, the StAR Project continues to create opportunities for villagers and children to witness the full life cycle of sharks – from birth to release – and even encounter them in the wild. This holistic approach strengthens community ties and paves the way for a sustainable conservation legacy.

Students from Child Aid Papua return to the RARCC nursery after collecting clams and snails from the mangroves around Gam Island to feed the shark pups





Where's the food coming from?: Map of communities and organizations along the Dampier Strait contributing feed for the juvenile sharks at the RARCC nursery



Facilitated by Barefoot Conservation, elementary school children from Arborek had the opportunity to visit the RARCC nursery and witness Seren's release

BRINGING SHARKS INTO CLASSROOMS IN MISOOL

In southern Raja Ampat, the Misool Marine Reserve, recognized for its high level of protection and biodiversity, has become a cornerstone of the StAR Project. Selected as one of two sites for the project's nurseries and releases, the reserve is managed by the Misool Foundation, a founding partner of ReShark.

Established in 2011 as the non-profit arm of Misool Resort, Misool Foundation employs over 50 staff, including rangers stationed at three dedicated outposts, to oversee the 300,000-acre privately funded marine reserve. Its mission focuses on safeguarding some of the world's most biodiverse reefs by empowering local communities. Through programs in marine governance, waste management, and species conservation, the foundation has created a robust conservation model. Its partnership with ReShark aligns with these goals, opening new doors for environmental education outreach.

Misool Foundation's outreach efforts include a strong focus on educating local youth. Collaborating with three high schools in nearby villages — SMAN 4 Raja Ampat in Lilinta, SMKN 3 Raja Ampat in Dabatan, and SMAS Guppi Raja Ampat in Fafanlap — the foundation conducts environmental education programs designed to inspire the next generation of conservationists.

Students participate in activities such as field trips to the reef restoration area at Kalig, home to one of the foundation's ranger stations and the newly constructed sea pen. The sea pen provides hands-on learning opportunities where students can observe marine conservation in action. Presentations by Misool Foundation aquarists Agi Zalma and Aisya Ramadhani Alpian, alongside StAR Project interns, offer insights into ReShark and the day-to-day work involved in caring for juvenile sharks. These sessions include demonstrations of shark measurements and other essential tasks.





Students and staff from SMAN 4 Raja Ampat were treated to a special visit to the sea pen, where they had the opportunity to observe aquarists and sharks up close.

All smiles from the students and staff of SMKN 3 Raja Ampat after releasing Taran, Charlotte, and Dawn



Misool Foundation aquarist Agi Zalma delivers a talk



Dr. Mark Erdmann shares about ReShark with guests at Misool Resort



We hope these experiences inspire the students to see sharks as a vital part of the ecosystem. Such engagements can encourage them to learn more about conservation and consider careers in the field.

Virly Yuriken

Chairperson, Misool Foundation

Earlier this year, students from SMAN 4 Raja Ampat attended a special event shortly after the completion of the new sea pen. They were given a presentation by Agi and Aisyah and toured the sea pen to witness the sharks up close. Lince Kendi, Misool Foundation's outreach coordinator, reflected on the students' enthusiasm.

"They never expected to visit the sea pen. Their excitement skyrocketed when they saw the aquarists bring a shark to the surface to measure its length and weight," Kendi shared. "Some of the students even expressed interest in assisting. On the way back, they couldn't stop talking about the experience and kept asking when they could see the sharks swimming freely again."

Virly Yuriken, Chairperson of Misool Foundation, emphasized the significance of these interactions. "We hope these experiences inspire the students to see sharks as a vital part of the ecosystem," she said. "When populations decline, it takes hard work to restore balance.

Such engagements can encourage students to learn more about conservation and consider careers in the field."

This year's release season offered another unforgettable opportunity. High school students from SMKN 3 Raja Ampat and their teachers joined the release of Taran, Charlotte, and Dawn. Two students were even given the honor of holding and releasing the sharks themselves — a first-time experience they described as life-changing. One participating teacher expressed gratitude for the experience and shared it enthusiastically with colleagues, sparking widespread interest in future involvement.

Misool Foundation's efforts are creating a ripple effect, inspiring students and staff to share their experiences and fostering a growing curiosity about conservation within local communities. "We've seen an increase in excitement about conservation among the students, and that has left a lasting impression on our team," said Kendi.



1. Anggi Aenun (right) receives an orientation on her first day of internship, which she has since completed and been promoted to full-time aquarist
2. Emma Batty Sukerta (right) and Anggi Aenun (center) help measure the sharks
3. Eran Wehelmina Sauyai is our very first intern from Raja Ampat
4. Annisa Fathya assists with transporting the sharks into the sea pen at Misool
5. Revata Dharani Sofjan (left) joins in for post-release monitoring
6. Faccettarial Cylon Marchel Marlissa was the StAR Project's very first intern

IMMERSIVE INTERNSHIP OPPORTUNITIES FOR INDONESIAN YOUTH




N	SATURDAY	10	59	17.5	539
INE	TUESDAY	9	51	17.8	529
TO	WEDNESDAY	9	52	17.5	421
Y	WEDNESDAY	5	355	17.9	131
		3	35	115	

To provide hands-on experience and a stepping stone for Indonesian youth passionate about marine conservation, we launched the StAR Project internship program this year. Our first intern, Faccettarial Cylon Marchel Marlissa (Rial), joined the program in April and completed a three-month internship at the Misool Foundation nursery. He shares his detailed experience on our [blog](#). Since then, we've welcomed eight interns and counting, with representation from all five of Indonesia's main islands.


During the two- to three-month program, interns are based at one of our nurseries, assisting full-time aquarists with daily animal husbandry tasks such as feeding and measuring sharks, data entry, engaging with visitors, and participating in release and post-release monitoring efforts.

As the StAR Project Indonesia's repopulation efforts are based in Raja Ampat, we are focused on recruiting more local Papuans as interns, working closely with Universitas Papua and the Raja Ampat Women Divers Association (MORA) to achieve this. Recently, we were proud to welcome our first intern from Raja Ampat, Eran Wehelmina Sauyai, at the RARCC nursery.


After completing their internships, participants have gone on to finish university studies or take the next steps in their conservation careers. Notably, Anggi Aenun, a former intern, was promoted to a full-time aquarist at our RARCC nursery. Check out our [latest short film](#) to see what our interns accomplished during this past release season and hear about their experiences



Rial: ReShark provides a valuable opportunity for youths in Indonesia to learn more about sharks and get a hands-on conservation experience. I hope other young professionals like myself can similarly attain these meaningful experiences and make a positive impact in conservation.



Emma: I feel incredibly fortunate to have come onboard during such a busy and dynamic stage of the project. Contributing to every stage of the process in such a short time has been an incredible experience!



Annisa: This internship has been an unforgettable experience. Interacting directly with zebra sharks, caring for them, ensuring their health, and watching them grow week by week has been incredibly rewarding.

A leopard shark is captured in the middle of breaching the water's surface. The shark's body is arched, with its head and dorsal fin visible above the water. The water is dark blue with white foam from the shark's movement. In the background, a dark, rocky reef structure is visible. The overall scene is dynamic and captures a key moment in the shark's behavior.

**RESURFACING OF A SPECIES:
LEOPARD SHARK
SIGHTINGS IN
RAJA AMPAT**

A surge in leopard shark sightings in Raja Ampat since the StAR Project launched fuels hope for the species

Charlotte swims near the water surface after being released in Misool



“

The recent increase in leopard shark sightings in Raja Ampat is encouraging. It's still not entirely clear yet whether this trend is driven by the nurseries potentially attracting wild leopard sharks to the region or by heightened public awareness through the StAR Project. However, we will continue monitoring these sightings and evaluating their role in the recovery of the Raja Ampat population.

Dr. Christine Dudgeon

Senior Research Fellow, University of the Sunshine Coast & University of Queensland
Co-Chair, StAR Project Research Working Group
StAR Project Steering Committee



PRESENT STATE OF LEOPARD SHARKS IN RAJA AMPAT

Previously considered functionally extinct in Raja Ampat waters, the Indo-Pacific leopard shark (*Stegostoma tigrinum*) is showing promising signs of a comeback, thanks to the StAR Project. Before the project began, leopard sharks (or "stegs") were only occasionally seen, with surveys spanning over 15,000 hours across 20 years yielding just three individuals in the region's vast seven million hectares.

An initial [population viability analysis \(PVA\)](#) conducted prior to the StAR Project described Raja Ampat's leopard sharks as "a very small remnant population at low density."

Conservation assessments led by Dr. Mark Erdmann and Dr. Gerry Allen indicated sporadic sightings, primarily due to the area's high scuba diving activity. "There is no evidence of regular reproduction or detectable population growth," Erdmann observed, estimating fewer than 20 individuals across the archipelago.

Dive guides from Misool also reported isolated sightings, averaging only one individual per year, with no indications of a breeding population. This bleak outlook underscored the need for the StAR Project, which initiated its first reintroduction of young leopard sharks on January 13, 2023, in Wayag lagoon.

Since then, more than 20 leopard shark individuals have been successfully released into the waters of Raja Ampat.

Dr. Gerry Allen (bottom) and Dr. Mark Erdmann (top) during a biodiversity assessment in Raja Ampat





While no population estimates are available, these sightings are infrequent and suggest a very small remnant population [of Indo-Pacific leopard sharks] at low density. There is no evidence of regular reproduction or detectable population growth. A reasonable estimate by species experts involved in this project is about 20 individuals spread throughout the approximately six million hectares of the Raja Ampat archipelago.

Population Viability Analysis (PVA) Report
May 2021

INCREASE IN SIGHTINGS SINCE STAR PROJECT

Since the reintroductions began, sightings of stegs have risen substantially, boosted by a focused outreach campaign encouraging local fishers, divers, and visitors to report sightings of newly released sharks. Additionally, it is speculated that pheromones from the reintroduced juveniles may be attracting remaining adults, suggesting potential for natural reproduction in the future.

To date, fishers, villagers, divers from liveboards such as Solitude Adventurer and Coralia Liveboard, and NGO partners including Barefoot Conservation have documented several new leopard shark sightings across Raja Ampat, including in the northern and southern areas near release sites at Wayag and Kri (north) and Misool (south).

Here is a confirmed list of sightings (most with photographic evidence):

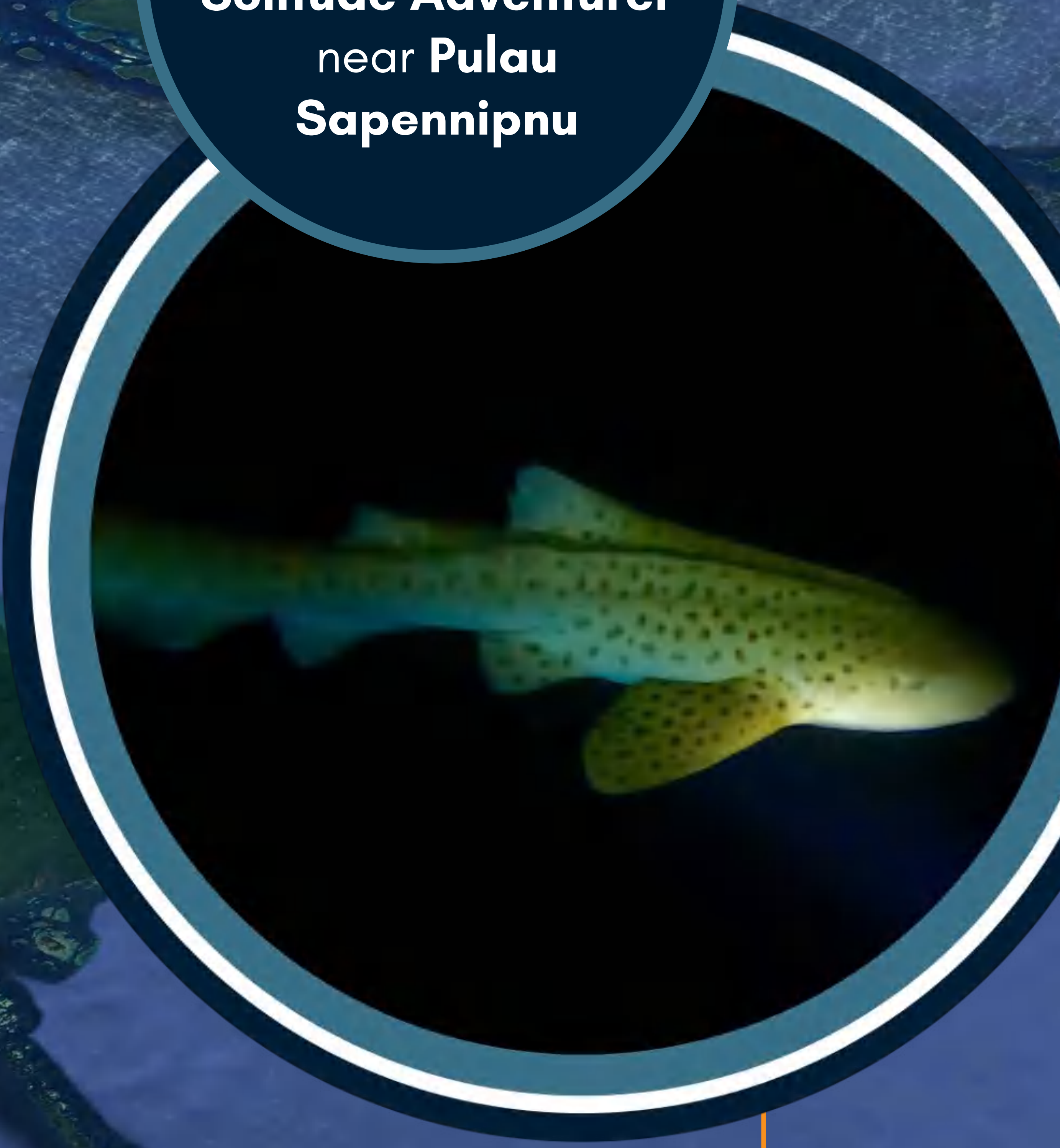
- Apr 12, 2015: Eagle Nest
- Nov 8, 2019: Magic Mountain
- Nov 21, 2019: Ayau Besar
- Oct 16, 2019: Magic Mountain
- Apr 22, 2023: Eagle Nest
- Nov 23, 2023: South Misool
(Likely Mali)
- Jan 11, 2024: Wayag Lagoon
(Likely Charlie, Audrey, or Kathlyn)
- Mar 11, 2024: Wara Ridge
- Mar 24, 2024: Pulau Sapennipnu
(Likely Mali; reported by Solitude Adventurer)
- Apr 3, 2024: Cafe D'Break
- Oct 8, 2024: Cape Kri
(Confirmed Karen; verified by receiver data)
- Oct 9, 2024: Mios Kon
(Likely Marshal, Audrey, or Kathlyn)
- Oct 12, 2024: Kurkapa
(Confirmed Karen; reported by villagers)
- Oct 30, 2024: Manta Ridge
(Reported by Barefoot Conservation)
- Nov 2, 2024: Pulau Yefnabi
(Reported by Coralia Liveboard)



A rare albino leopard shark was spotted at a depth of 70 meters at **Eagle Nest**



A likely sighting of **Mali** was reported by guests aboard **Solitude Adventurer** near **Pulau Sapennipnu**



CAFE D'BREAK

PULAU SAPENNIPNU

WARA RIDGE

EAGLE NEST

MAGIC MOUNTAIN

MISOOL FOUNDATION NURSERY

Citizen science contributions from **Coralia Liveaboard** and **Barefoot Conservation**



YEFNABI

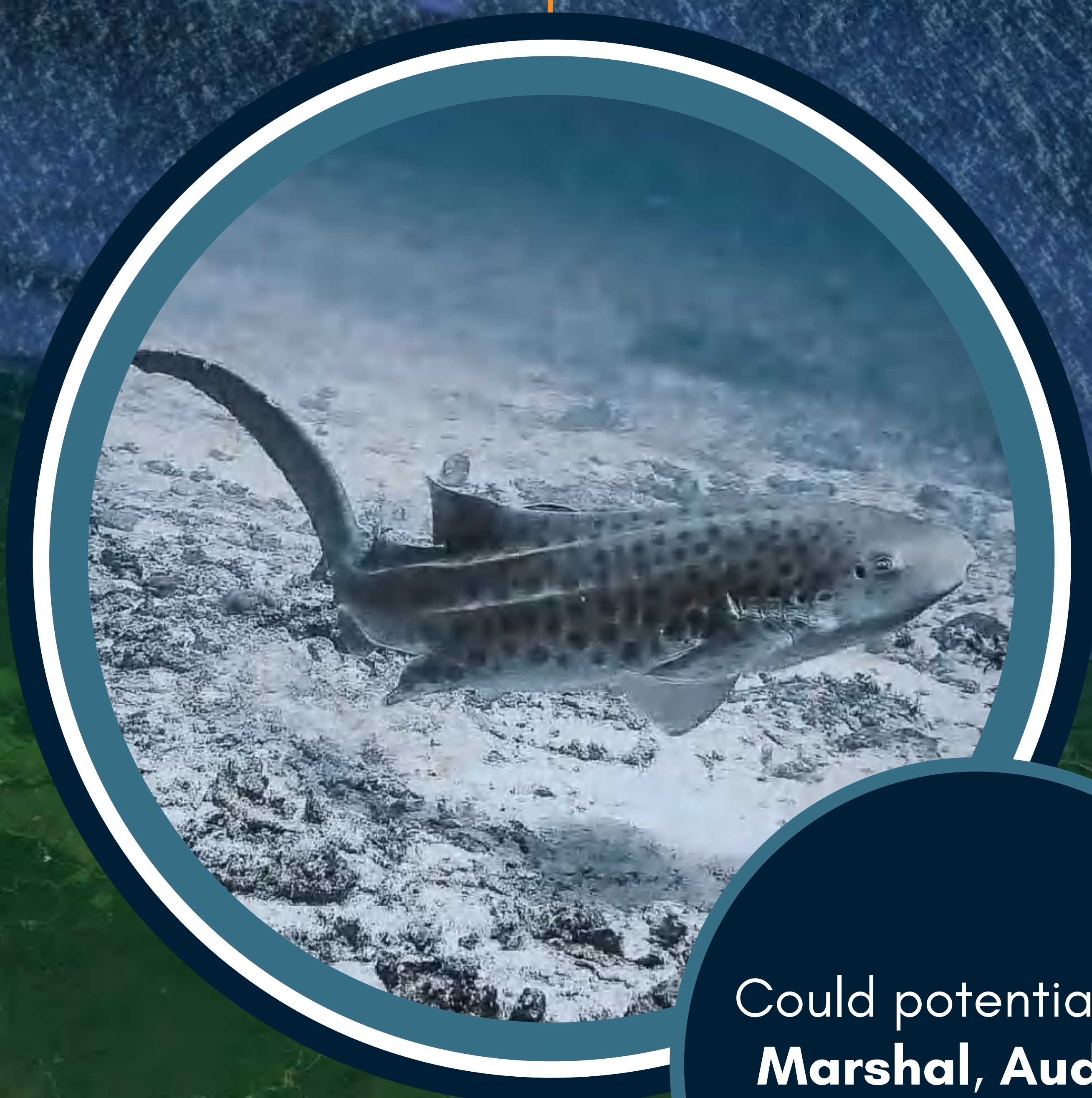
MANTA RIDGE

KURKAPA

MIOS KHON

AYAU BESAR

RARCC NURSERY



Could potentially be **Marshal, Audrey, or Kathlyn**

Karen was spotted by villagers from **Kurkapa** on Mansuar Island just over a week after her release



MAPPING SPECIES RECOVERY WITH CITIZEN SCIENCE

With leopard shark sightings increasing in Raja Ampat, the StAR Project is leveraging data from [Spot the Leopard Shark \(STLS\)](#), a citizen science program launched in Thailand in 2013, to study the recovery of local leopard shark populations.

Now integrated with the global Wildbook Photo-ID database, STLS allows citizen scientists to submit sightings, enabling individual identification and observation. Founded by Dr. Christine Dudgeon, Co-Chair of the StAR Project Research Working Group, STLS uses automated matching technology to help scientists analyze data on wild and reintroduced leopard sharks.

Each reported sighting through STLS in Raja Ampat (and worldwide) contributes valuable data on movement patterns, population health, and potential breeding behaviors, strengthening the conservation framework that the StAR Project is building to ensure long-term success.

The resurgence of leopard shark sightings in Raja Ampat marks a hopeful turn for a species once nearly lost in the region. As the StAR Project continues ramping up its work, these early successes could pave the way for a full return of the species, enriching the vibrant biodiversity that makes Raja Ampat one of the world's most celebrated marine environments.





CONTRIBUTE TO

LEOPARD SHARK RESEARCH

SUBMIT YOUR PHOTO



 PHOTO TIP:

Most useful areas for ID are the left side and dorsal fin. Ensure these are captured clearly.

SCAN HERE:



Spot the Leopard Shark is a citizen science program that uses photo-ID of leopard sharks (*Stegostoma tigrinum*), also known as zebra sharks, to assist scientists in investigating their populations, behaviour and longevity.

Submitting your leopard shark photos will help scientists understand more about this endangered species. The data collected over time will also contribute directly to its conservation. Scan the QR code on the left for more information on how to take your photos and upload them to Sharkbook.



FROM AQUARIUM TO NURSERY:

THE TRANSLOCATION JOURNEY OF EACH EGG

*Behind the scenes of an all-hands-on-deck effort to
deliver shark eggs from around the world to Indonesia*

Sea World Gold Coast staff perform an ultrasound examination on Indie, an adult leopard shark

“

It takes a village to successfully ship eggs to Indonesia. From the teams tracking eggs at aquariums and securing permits, to those packing shipments for Seattle or Indonesia, and finally to the dedicated team ensuring their safe arrival at the nurseries, everyone works tirelessly, often beyond their regular duties. We're thrilled to welcome Sea World Gold Coast to the StAR Project as their animals contribute viable eggs, boosting the genetic diversity of the sharks being reared and released.

Leah Neal
Curator of Fishes and Invertebrates, Georgia Aquarium
Chair, StAR Project Husbandry Working Group
StAR Project Steering Committee



A diver from Georgia Aquarium retrieves a freshly laid leopard shark egg from the exhibit



A newly laid egg at SEA LIFE Sydney Aquarium is regularly candled by staff to monitor the developing embryo.



PIONEERING CONSERVATION TRANSLOCATION

The StAR Project is breaking new ground in conservation with its innovative use of *ex-situ* breeding and translocation to restore threatened shark and ray populations. While similar strategies have been used for species like the [California condor](#) (*Gymnogyps californianus*) and [black-footed ferret](#) (*Mustela nigripes*), nothing of this scale has ever been attempted for elasmobranch rewilding.

What began as a bold idea faced a critical question: Could shark eggs survive long-distance travel? In 2017, New Caledonia's Aquarium des Lagons provided the answer, successfully shipping Indo-Pacific leopard shark (*Stegostoma tigrinum*) eggs to Chicago's Shedd Aquarium.

This groundbreaking achievement became the blueprint for today's global egg shipments to Indonesia, where the hatchlings are raised in *in-situ* nurseries before returning to the wild.

ADDRESSING GENETIC CONCERNS

Not all leopard sharks in aquariums make the cut as breeders. Ensuring the genetic integrity of the program is paramount. Before an aquarium joins as an accredited breeding institution, extensive genetic testing is conducted to address concerns about outbreeding and inbreeding.

Outbreeding concerns focus on population genetics. Released sharks must originate from the appropriate genetic stock. For leopard sharks, global populations are divided into [two main sub-populations](#) by the Indonesian Throughflow Current, aligning with the Wallace Line.

As Raja Ampat lies east of this divide, breeding animals must have eastern lineage. Genetic analyses using mitochondrial DNA (ND4) and microsatellite markers verify this provenance. All genetic samples are screened at the Feldheim Laboratory at the Field Museum.

The team at Seattle Aquarium packs and prepares eggs for shipment from the United States to Indonesia



To avoid inbreeding, only breeding pairs with low genetic relatedness are approved. Microsatellite markers are used to identify and exclude pairs that are parent-offspring, siblings, or half-siblings. **Parthenogenesis** — a form of asexual reproduction documented in leopard sharks and other elasmobranchs — is also screened for. Although the mechanism behind parthenogenesis remains unclear, its genetic signal is unmistakable. Because parthenotes have high mortality, eggs from each potential breeding pair are tested, and only pairs with heterozygous offspring — evidence of sexual reproduction — are approved for the StAR Project.

THE CLOCK STARTS TICKING

Each egg embarks on a meticulously timed journey, where every step counts. Once an egg is laid by an approved breeding pair within the exhibit of a partner institution, divers retrieve it within a day and transfer it to holding tanks. With an incubation period of approximately 20 weeks — dependent on water temperature — timing is critical. Warmer conditions can accelerate development, thus the StAR Project

Staff at Jakarta Aquarium and Safari receive a new shipment of eggs from the United States



Husbandry Working Group has determined that eggs must arrive in Indonesia no later than 15 weeks into incubation.

Aquarium staff handle the eggs with precision, measuring and candling them to check for viable embryos. Typically, embryos can first be detected with the naked eye around four weeks into incubation, though monitoring begins earlier. Weekly candling continues until about 10 weeks. As soon as a viable embryo is detected, coordination of shipment plans begins.

Seattle Aquarium serves as a central hub, collecting eggs from breeders across the United States. Upon arrival, eggs undergo a short acclimation period, followed by candling and ultrasound exams to ensure embryo health. Three weeks before their scheduled departure to Indonesia, final preparations — ranging from paperwork to inspections and logistics — are completed. Australian institutions follow similar export procedures, ensuring all eggs are ready for their journey to Indonesia.



Dr. Christine Dudgeon, Dr. Erin Meyer, and Siobhan Houlihan (left to right) at Sea World Gold Coast, the StAR Project's newest breeder



Meet Romeo, the sire of eggs that originated at Sea World Gold Coast

FROM AROUND THE WORLD TO INDONESIA

All eggs arriving in Indonesia first stop at Jakarta Aquarium and Safari for a vital quarantine process. Aquarium staff, along with representatives from five Indonesian partner NGOs – Elasmobranch Institute Indonesia, Konservasi Indonesia, Misool Foundation, Raja Ampat Research and Conservation Centre, and Thrive Conservation – work tirelessly to ensure the eggs' safe handling. This includes unpacking, monitoring water parameters, and preparing for the rest of their journey.

The stopover is essential to ensure the survivability of this precious cargo. After quarantine, the eggs are transported from Jakarta to Sorong by air. From Sorong, they embark on their final leg to *in-situ* nursery facilities in Raja Ampat. Each shipment is typically divided between the RARCC

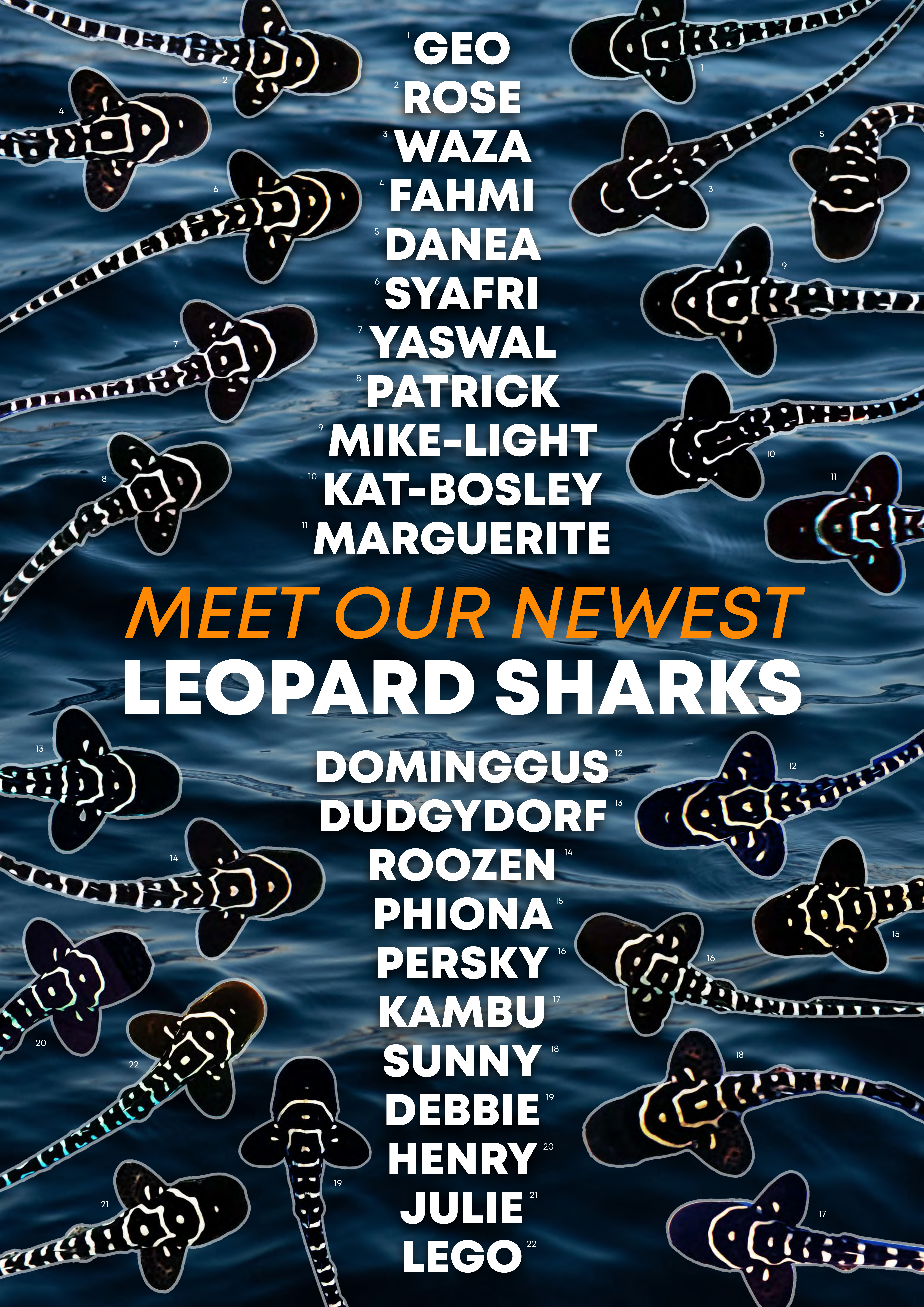
nursery on Kri Island and the Misool Foundation nursery in South Misool. Once there, dedicated aquarist teams take over.

Since our last update, two new shipments of shark eggs have arrived at our nurseries:

- **Shipment #8:** The largest so far, comprising 25 eggs, arrived in September – 23 from Shark Reef Aquarium at Mandalay Bay and 2 from Georgia Aquarium
- **Shipment #9:** 6 eggs followed in December – 2 from Sea World Gold Coast (newest breeder for the StAR Project), 2 from Georgia Aquarium, and 2 from Shark Reef Aquarium at Mandalay Bay

Excitingly, all sharks from the earlier shipment have also hatched and are growing well in the nurseries.





1 **GEO**
 2 **ROSE**
 3 **WAZA**
 4 **FAHMI**
 5 **DANEA**
 6 **SYAFRI**
 7 **YASWAL**
 8 **PATRICK**
 9 **MIKE-LIGHT**
 10 **KAT-BOSLEY**
 11 **MARGUERITE**

**MEET OUR NEWEST
 LEOPARD SHARKS**

12 **DOMINGGUS**
 13 **DUDGYDORF**
 14 **ROOZEN**
 15 **PHIONA**
 16 **PERSKY**
 17 **KAMBU**
 18 **SUNNY**
 19 **DEBBIE**
 20 **HENRY**
 21 **JULIE**
 22 **LEGO**



VIABLE EGGS SHIPPED:

69



7



30



2



21



9

41



28



SNAPSHOT

RAJA AMPAT • CAA DEC 2024



TOTAL SHARKS RELEASED:

22

CURRENTLY IN SEA PEN:

0

CURRENTLY IN JUVENILE STAGE (PUP TANK):

22

CURRENTLY IN EMBRYONIC STAGE:

5

UNHATCHED EGGS:

8

MORTALITIES:

12

Check out the **Population Viability Analysis** report for the StAR Project:



OTHER HAPPENINGS

Two new films
— “Scaling Up the StAR Project” and “The 2024 Release Season” — produced by Indo-Pacific Films, are now available to watch on YouTube.



StAR Project Thailand:
Program Manager May Chuangcharoendee visited the RARCC nursery to learn about the project's infrastructure. Significant progress has been made in securing government MOUs and community outreach. Sea pen construction and genetic sampling of leopard sharks at Aquaria Phuket are set to begin soon.

Help us ReShark our oceans

ReShark is pioneering rewilding efforts for sharks and rays. Your generous donation of work on the ground and allows us to continue innovative species recovery programs — join and donate today!

Is my donation secure?

In New Caledonia, Dr. Hugo Lassauce and his team **tagged and released 17 juvenile zebra sharks**, deploying 80 receivers across various habitats to study their first-year behavior in the wild.



Our **public donation link** has been live since Giving Tuesday! Members of the public can now support our work by donating here:



The "Great Australian Steg Semen Expedition" (**GASSE**) is currently underway. Stay tuned for updates in the next issue!

Secure donation

Give once Monthly

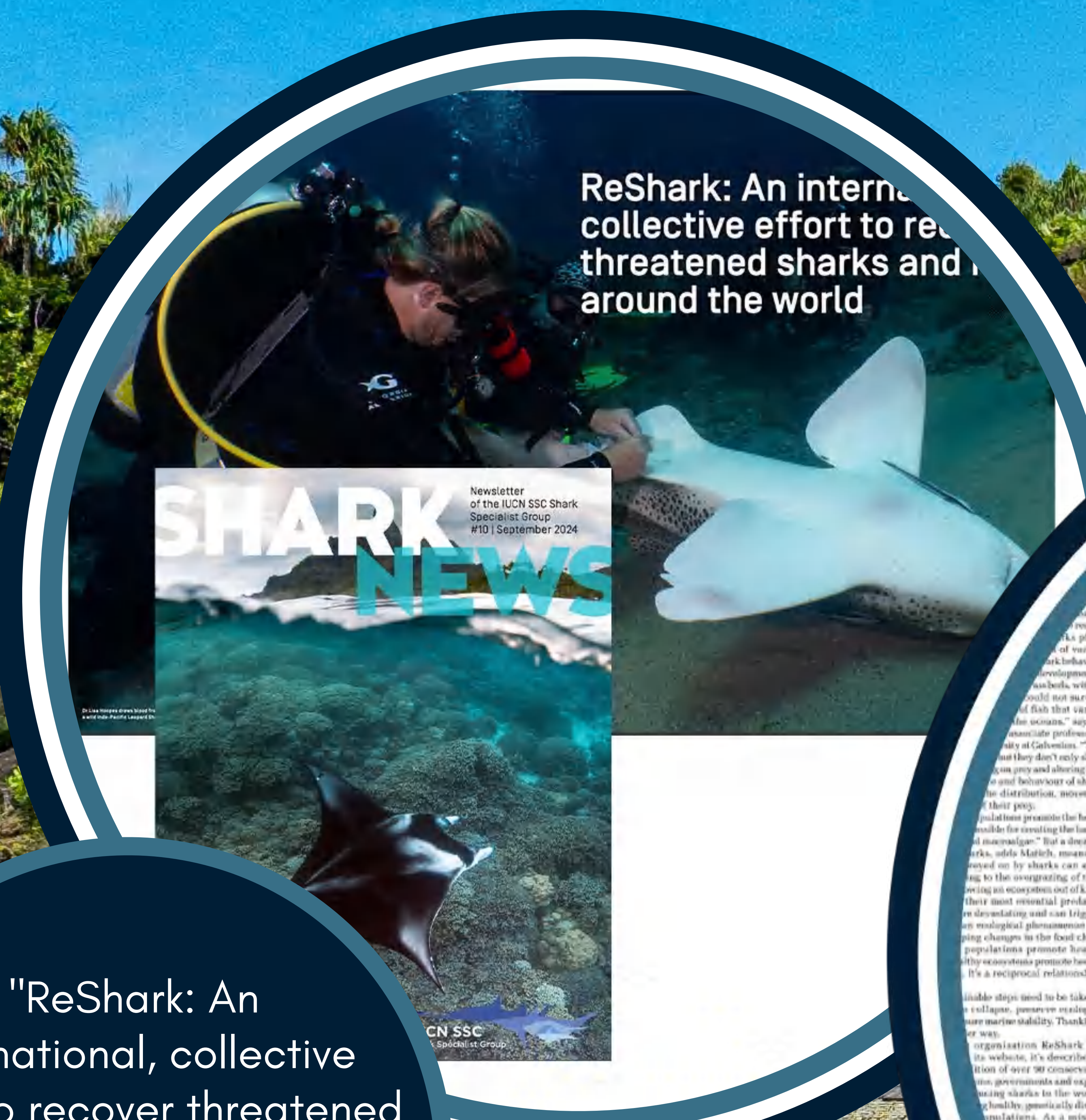
\$1,000 \$500 \$300

\$100 \$55 \$25

\$100 USD

Donate

MEDIA HIGHLIGHTS



ReShark: An international collective effort to recover threatened sharks and rays around the world



"ReShark: An international, collective effort to recover threatened sharks and rays around the world" featured in **Shark News**

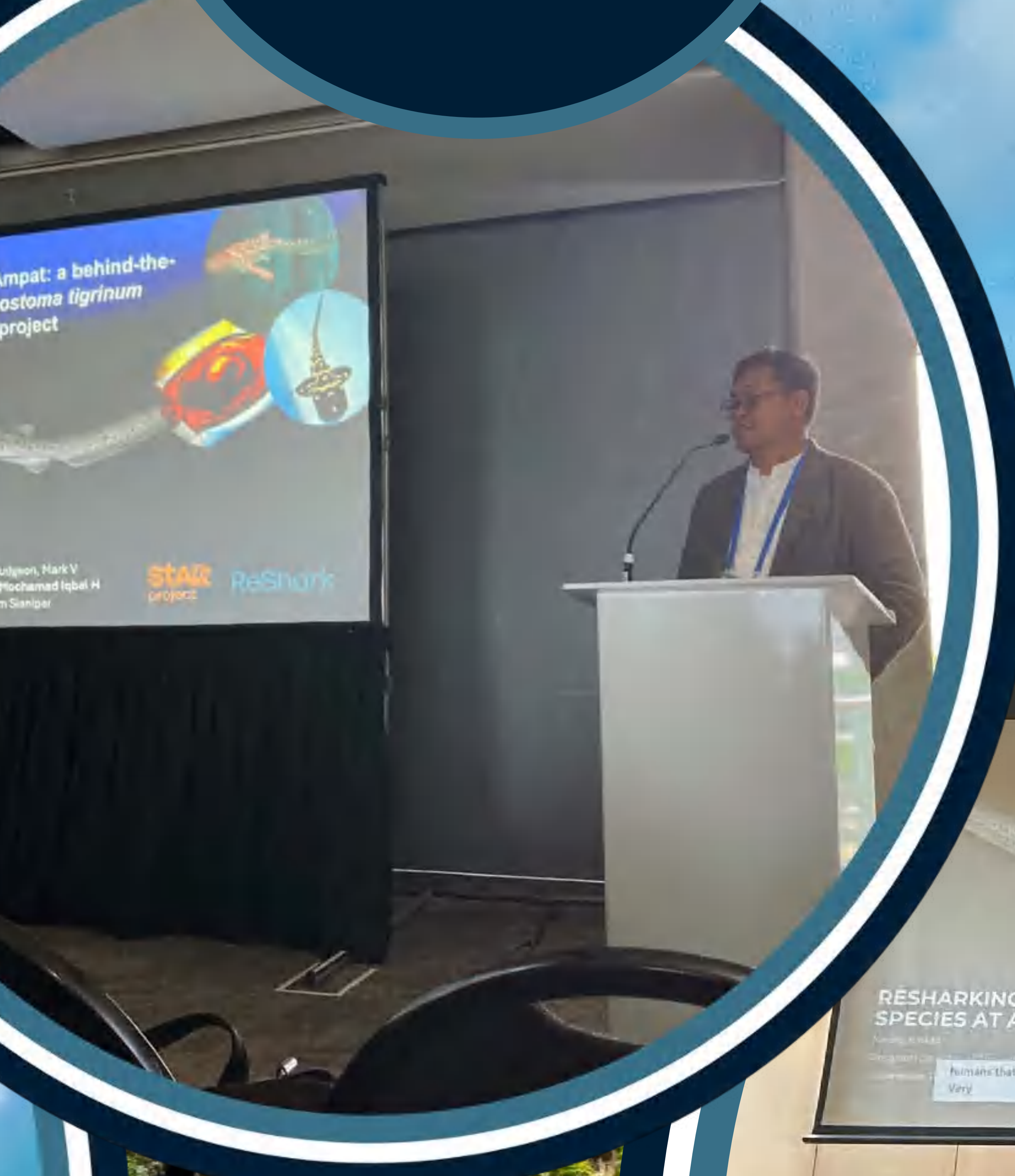


"Save the sharks...Save the oceans," featured in **BBC Science Focus Magazine**



Iqbal Herwata presents at the **7th International Marine Conservation Congress** in Cape Town, South Africa

Julia Tapilatu wins runner-up honors at the **2024 Texas A&M University Three Minute Thesis Competition**



Nesha Ichida delivers the keynote address at the **79th WAZA Annual Conference** in Sydney, Australia

SCIENCE HIGHLIGHTS

OUR PARTNERS



Canadian Parks and Wilderness Society
IUCN SSC Conservation Translocation Specialist Group
Ripley's Aquarium of Canada

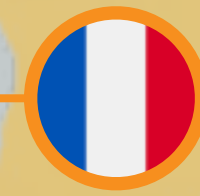


Albuquerque BioPark Aquarium
Andrew Wicklund Design
Aquarium of the Pacific
Association of Zoos and Aquariums (AZA)
AZA Saving Animals from Extinction
Columbus Zoo and Aquarium
Conservation International
Discovery Cove
Field Museum
Georgia Aquarium
Golden Nugget
IUCN Conservation Planning Specialist Group
Jenkinson's Aquarium
Johnny Morris' Wonders of Wildlife National Museum and Aquarium
Kansas City Zoo & Aquarium
Landry's Downtown Aquarium
Loveland Living Planet Aquarium
Loyola University
Minnesota Zoo
Mote Marine Laboratory
Museum of Science & History
Mystic Aquarium
National Aquarium
New England Aquarium
North Carolina Aquarium at Fort Fisher
OdySea Aquarium
Omaha's Henry Doorly Zoo and Aquarium
Point Defiance Zoo and Aquarium
Re:wild
Ripley's Aquarium of Myrtle Beach
SEA LIFE Aquarium at LEGOLAND California
SEA LIFE North America
Seattle Aquarium
SeaWorld Orlando
SeaWorld San Antonio
SeaWorld San Diego
Shark Advocates International
Shark Reef Aquarium at Mandalay Bay
Shedd Aquarium
South-East Zoo Alliance for Reproduction and Conservation
The Dallas World Aquarium
TJP Inc.
Toledo Zoo and Aquarium
University of Delaware
Virginia Aquarium & Marine Science Center
Wildlife Conservation Society's New York Aquarium

European Association of Zoos and Partners (EAZA)
Royal Burgers' Zoo



Aquarium de Lyon
Nausicaá Centre National de la Mer
Océanopolis Brest



Fondation Segré



Acquario di Genova

Oceanário de Lisboa



Loro Parque
Oceanogràfic València
Poema del Mar Aquarium



MarAlliance

Kwame Nkrumah University Science and Technology

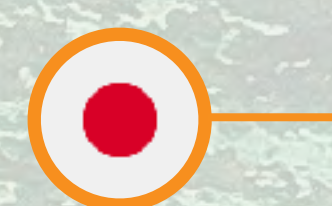


uShaka Sea World





Atlantis Dubai
IUCN SSC Shark Specialist Group

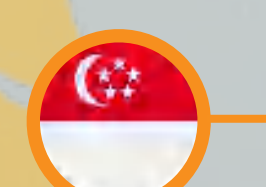


Okinawa Churaumi Aquarium

Ocean Park Hong Kong



Ocean Blue Tree
Thai Sharks and Rays
WildAid



S.E.A. Aquarium



Badan Riset dan Inovasi Nasional (BRIN)
Kementerian Kelautan dan Perikanan (KKP)
Pemerintah Provinsi Papua Barat
Pemerintah Provinsi Papua Barat Daya
Badan Riset dan Inovasi Daerah (BRIDA) Provinsi Papua Barat
Pemerintah Daerah Kabupaten Raja Ampat
BLUD UPTD KKP Kepulauan Raja Ampat
Child Aid Papua
Elasmobranch Institute Indonesia
Indo-Pacific Films
Indonesian Ocean Pride
Jakarta Aquarium and Safari
Konservasi Indonesia
Misool Foundation
Misool Resort
Papua Diving Resorts
Pelagos Marine Nusantara
Raja Ampat Research and Conservation Centre
Thrive Conservation
Universitas Papua

Aquarium des Lagons Nouvelle Calédonie

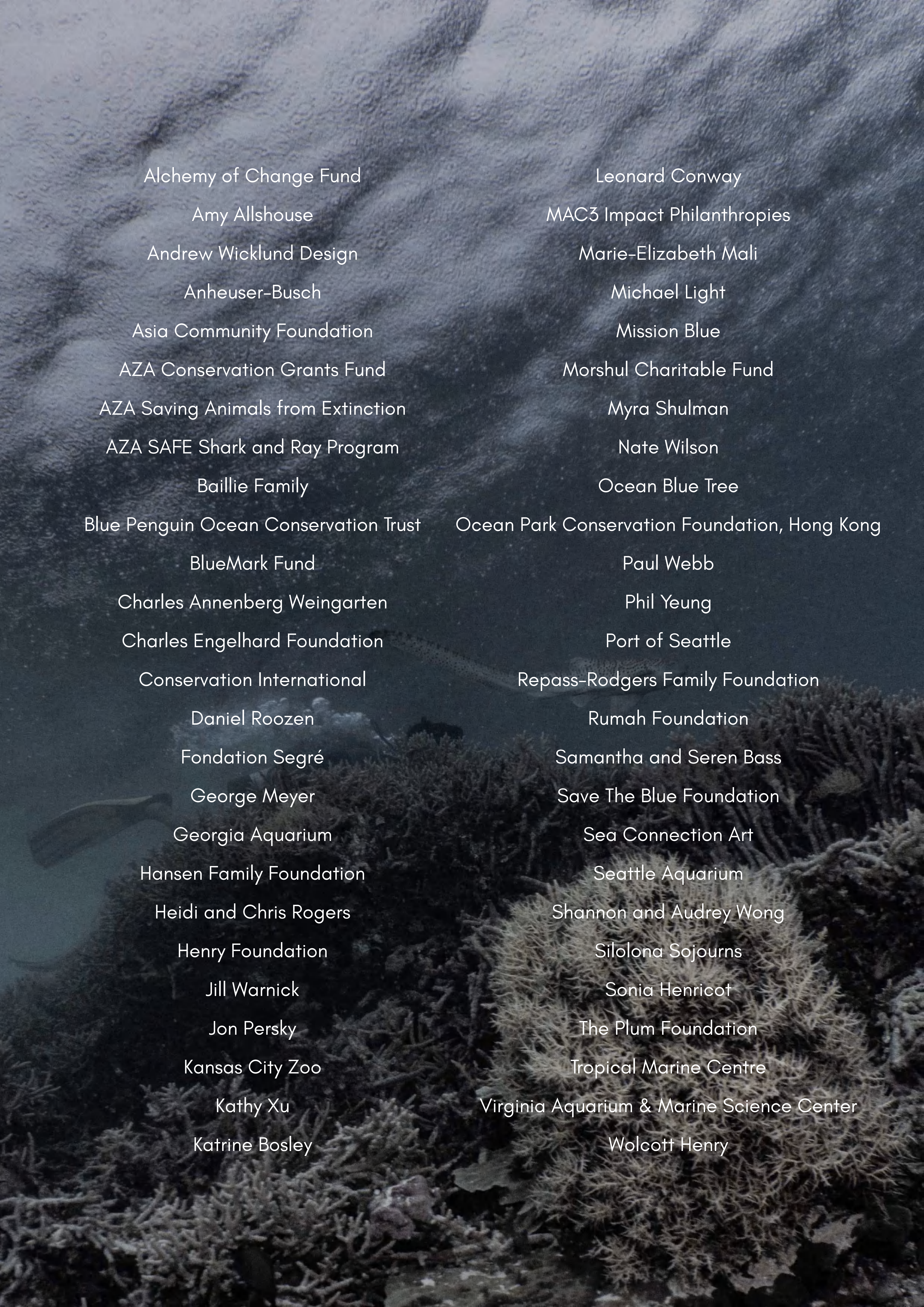


Biopixel Oceans Foundation
Cairns Marine
Irukandji Shark and Ray Encounters
James Cook University
SEA LIFE Sydney Aquarium
SEA LIFE Trust Australia and New Zealand
Sea World Gold Coast
Sundive Byron Bay
University of Queensland
University of the Sunshine Coast





SPECIAL THANKS TO
OUR SUPPORTERS



Alchemy of Change Fund
Amy Allshouse
Andrew Wicklund Design
Anheuser-Busch
Asia Community Foundation
AZA Conservation Grants Fund
AZA Saving Animals from Extinction
AZA SAFE Shark and Ray Program
Baillie Family
Blue Penguin Ocean Conservation Trust
BlueMark Fund
Charles Annenberg Weingarten
Charles Engelhard Foundation
Conservation International
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Nate Wilson
Ocean Blue Tree
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Paul Webb
Phil Yeung
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Repass-Rodgers Family Foundation
Rumah Foundation
Samantha and Seren Bass
Save The Blue Foundation
Sea Connection Art
Seattle Aquarium
Shannon and Audrey Wong
Silolona Sojourns
Sonia Henricot
The Plum Foundation
Tropical Marine Centre
Virginia Aquarium & Marine Science Center
Wolcott Henry

ReShark

