



the
ReSharker

INTERNAL COMMUNICATIONS · DECEMBER 2023

OUR LATEST HAPPENINGS

RELEASING MALI

Born and raised in the Misool Foundation nursery, she becomes the first zebra shark pup to be released in the waters of the Misool Marine Reserve.

On 9 July 2023, our StAR Project team, along with local partners, successfully released our fourth zebra shark pup Mali. Hailing from SEA LIFE Sydney Aquarium, she hatched in the Misool Foundation nursery on 17 January. Three months later, she graduated to her sea pen where she learnt how to hunt for her own food. Upon reaching 70cm in length, she was tagged and released shortly after.

Once Mali had been released, our team conducted a 20-hour continuous monitoring of the pup using active acoustic tracking techniques. This marked a new record for our post-release monitoring efforts. Mali's release was documented in our latest film, available for viewing on [YouTube](#).

We recently received great news of guests encountering Mali several times around the southern part of Misool.



“ Seeing how different stakeholders globally can band together for a single species recovery is so inspiring. I hope this will be an inspiration for everywhere else on the planet.

Nesha Ichida
Co-Chair, StAR Project Steering Committee
Thrive Conservation

Field veterinarian Dr. Jaya Ratha (Thrive Conservation) preparing Mali for her internal acoustic tag operation, with the assistance of Misool Foundation aquarists Agi Zalma and Kyra Wicaksono. Photo by Secret Sea Visions.



“ We’re very excited to receive new batches of eggs here at the RARCC nursery. Our shark nannies are working day and night to make sure everything goes well here!

Papua Diving Resorts

RECENT SHIPMENTS AND HATCHINGS

We have been keeping the wheels turning with more egg shipments and hatchings.

After a 6-month period navigating a revamped Indonesian import permit system and awaiting viable zebra shark eggs from our partner aquariums, we managed two shipments of three eggs in total between September and October 2023.



The eggs were donated from Shark Reef Aquarium at Mandalay Bay in Las Vegas, Nevada. Before reaching Jakarta Aquarium and Safari for their quarantine, they spent two weeks at Seattle Aquarium. Two eggs were assigned to the Raja Ampat Research and Conservation Centre (RARCC) nursery and one to the Misool Foundation nursery.





One-week old Marshal getting comfortable in the RARCC nursery in Raja Ampat. Photo by Mark Erdmann.

On 7 October, our sixth pup Marshal successfully hatched after receiving some assistance from our aquarist team, in consultation with experts from our Husbandry Working Group. Marshal's assisted hatching provided a valuable learning experience for our team. She was measured at 27.5cm in length and 76.0g in weight at birth. Since then, she has been feeding and growing extremely well.

We were treated to a behind-the-scenes look at our aquarists at work a week after Marshal's birth, when Dr. Mark Erdmann (Conservation International) paid the RARCC nursery a visit in October.

On 18 November, our seventh pup Buddy hatched in the RARCC nursery as well. She has also been feeding and growing healthily.



Misool Foundation aquarists candling a newly-arrived egg. Photo by Misool Foundation.

SCALING UP OUR EGG SHIPMENTS

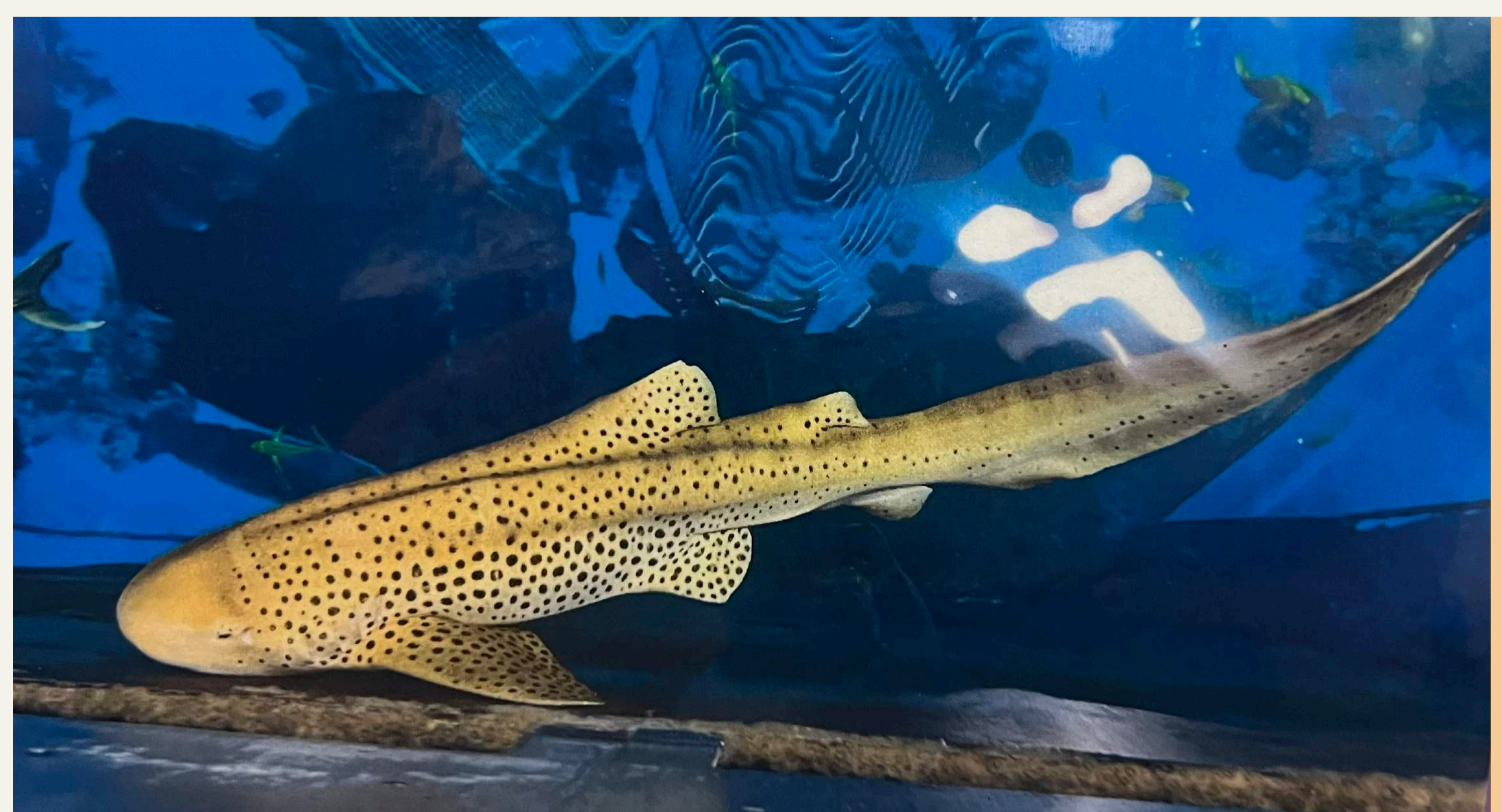
Having successfully demonstrated the StAR Project's proof of concept, our urgent focus now shifts to expanding our network of breeders and ramping up egg production and shipments.

We are expanding our breeders to 10 partner aquariums and zoos with both male and female adult zebra sharks. Several facilities (*) are actively tracking eggs to confirm viability prior to shipping, which is only apparent six weeks after the eggs are laid:

- Georgia Aquarium*
- Irukandji Shark & Ray Encounters*
- Loro Parque
- Minnesota Zoo
- Océanopolis Brest
- Omaha's Henry Doorly Zoo and Aquarium
- SEA LIFE Sydney Aquarium*
- Shark Reef Aquarium at Mandalay Bay*
- Sea World Marine Park Gold Coast*
- SeaWorld San Diego

We are especially excited about the good news from Georgia Aquarium. Oz, an adult male, has recently produced heterozygous eggs with three females. We are looking forward to receiving them early next year!

We strongly encourage more accredited aquariums to come onboard as breeding partners for the StAR Project. Find out how to do so on the next page.



Onboarding Procedure for StAR Project Breeding Partners



Phase I StAR Project charter signature

- Outlines roles and commitments of partners, including governance structure, Working Groups, and communications expectations
- To be signed by CEO or Director of partner institution

Phase II Genetic testing

- Determines if animals are from eastern or western population, parentage, and relatedness
- Blood sample or fin clip required
- Directions will come from Dr. Kady Lyons



Phase III



Egg assessment:

- Allows Veterinary Working Group to evaluate disease risk of your collection
- To be filled out by those closest to breeding efforts with input from Veterinarian

Breeder agreement:

- Reflects results of genetic testing
- Sent by Dr. Christine Dudgeon and signed by Dr. Erin Meyer

Vet fit for export letter:

- Indicates no known history of specific diseases
- Sent by Veterinarian at partner institution to Riley Pollom

Phase IV

Egg tracking:

- All discovered eggs are tracked internally

Parthenote testing:

- Eggs are tested for parthenogenesis (lethal sampling for eggs; can also be done with blood or fin clips from live pups)
- To help ensure genetic diversity is maintained

Egg shipment:

- Viable eggs shipped at 10-15 weeks to appointed collation institution (Seattle Aquarium for US eggs; SEA LIFE Sydney Aquarium for Australian eggs; other countries currently under discussion), with partner institutions funding the shipments to collation facility





Georgia Aquarium's resident zebra sharks, Oz and Dalmatian. Photo by Georgia Aquarium.

Leah Neal is a curator at Georgia Aquarium and the co-chair of our Husbandry Working Group. She also serves as the Association of Zoos and Aquariums (AZA) studbook keeper for *Stegostoma tigrinum*. She shares more about her responsibilities in our Q&A:

What does your role involve?

My role is to maintain a database that includes information about all zebra shark individuals at AZA institutions. To accomplish this, I must reach out to institutional representatives for specimen reports and make sure all updates provided are reflected in the studbook. These include collection sites, dates, parentage, birthdates and genetic information.

How does this contribute to the zebra shark Species Survival Plan® (SSP) program?

This helps the SSP determine relatedness of the animals and provides the necessary information to try to make pairings to aid in the sustainability of the population in aquaria. Every three years, a breeding and transfer plan is published to achieve the sustainability goal. The most recent plan was just published in October 2023.



How does your work relate to the StAR Project's objectives?

Unique to this most recent plan was the need to make matching pairs of the distinct genetic populations found from working with the StAR Project.

Our challenge was to ensure that not only was relatedness considered but also matching eastern population animals amongst themselves and likewise western population animals amongst themselves. I actively log the genetics received in the studbook so we can easily filter to make recommendations.

Moving adult animals is in no way an easy nor inexpensive task and, in some cases, can pose a hindrance to the recommendations made.

The commitment our partner institutions have made on behalf of the StAR Project and the SSP is remarkable. AZA facilities believe in the StAR Project and are eager to execute recommendations to further the project.



Leah at the RARCC nursery, during an in-person visit to provide further training with the local aquarist team. Photo by Georgia Aquarium.

RESHARK LODGE

Our up-and-coming accommodation facility at Kri Island in Raja Ampat will house our ReShark aquarists, future interns and visiting researchers.

To house our team of aquarists, interns and researchers, we have built an accommodation facility just a stone's throw away from the RARCC nursery. It is scheduled for completion by end 2023.

We will soon be launching our inaugural StAR Project internship program once a larger number of eggs arrives in Raja Ampat. The internship will provide Indonesian university students hands-on experience in shark husbandry and post-release monitoring at the RARCC and Misool Foundation nurseries. Prospective applicants should keep a lookout for the launch of the program soon.

Researchers who are interested in the StAR Project may also reach out to our Steering Committee co-chairs [Dr. Erin Meyer](#) (Seattle Aquarium) and [Nesha Ichida](#) (Thrive Conservation). The facility will be able to accommodate two visiting researchers at any given time.





Construction of the up-and-coming RARCC accommodation facility, located a short walk away from the nursery. Photo by Max Ammer.

SPOTLIGHTING OUR SCIENCE

CONFERENCE PRESENTATIONS

11th Indo-Pacific Fish Conference

Auckland, New Zealand • November 2023

ReSharking leopards in Raja Ampat: A behind-the-scenes look at the StAR (*Stegostoma tigrinum* Augmentation and Recovery) project

Presenter: Neshia Ichida (Thrive Conservation)

78th Annual Conference of the World Association of Zoos and Aquariums

San Diego, CA, USA • October 2023

ReShark: Building a multicultural, interdisciplinary coalition for global shark and ray conservation

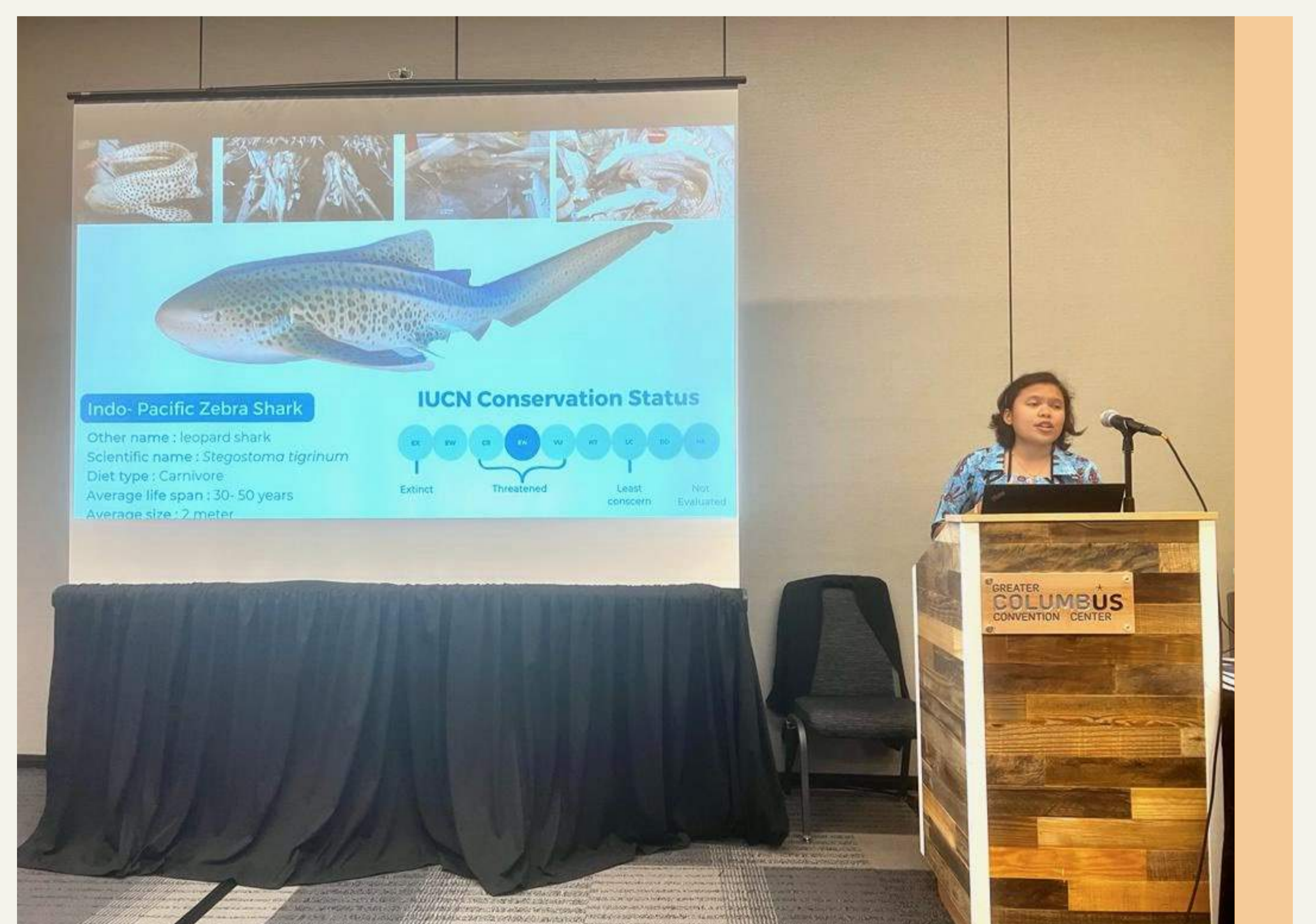
Poster presentation: Riley Pollom (Seattle Aquarium)

Annual Conference of the European Association of Zoos and Aquariums

Helsinki, Finland • September 2023

ReShark initiative: An international, collective effort to recover threatened shark and rays around the world

Presenter: Núria Baylina (Oceanário de Lisboa)



99th Annual Conference of the Association of Zoos and Aquariums

Columbus, OH, USA • September 2023

SAFE Shark and Ray | ReShark: An update on our impact and evolution

Presenters: Hap Fatzinger (AZA SAFE & North Carolina Aquarium at Fort Fisher) and Dr. Erin Meyer (Seattle Aquarium)

Zebra sharks in Raja Ampat: The StAR Project
Presenters: Julia Tapilatu (Texas A&M University) and Dr. Erin Meyer (Seattle Aquarium);
Moderator: Riley Pollom (Seattle Aquarium)



I hope to use the knowledge I'll be uncovering about zebra shark growth and development to support and improve the StAR Project in years to come.

Julia Tapilatu

Texas A&M University Master's Candidate
Former RARCC Aquarist

INTRODUCING OUR FIRST RESEARCH FELLOWSHIPS

ReShark's groundbreaking work opens up a universe of scientific questions left unanswered and with them tremendous opportunities for international research collaboration.

We envision creating multiple pathways to empower outstanding researchers to come onboard to help answer these questions. If you have a specific idea in mind, do reach out to our Research Working Group co-chairs [Dr. Lisa Hoopes](#) (Georgia Aquarium) and [Dr. Christine Dudgeon](#) (University of the Sunshine Coast).

Introducing our first two scientists – Julia Tapilatu and Dr. Hugo Lassauce, who are both currently working on ReShark-related projects:

Julia Tapilatu is a former aquarist at the RARCC nursery. She recently commenced her master's program at Texas A&M University. Her work, which focuses on the effect of water parameters on the growth of zebra shark pups in aquariums, in comparison with our nurseries, will inform the husbandry and care of these young sharks moving forward.

Stay up to date with Julia's work:



Dr. Hugo Lassauce is currently a postdoctoral researcher at Aquarium des Lagons Nouvelle Calédonie, one of our partner aquariums. He spearheads the Zebra Shark Project New Caledonia, a local initiative by the aquarium's Laboratory of Marine Biology and Ecology, which has inspired and will continue to inform the StAR Project. He talks about the inception of the project and his postdoctoral work in New Caledonia:

How did Aquarium des Lagons' initial work with the local zebra shark population help formalize the thinking behind the StAR Project?

The origin story is pretty interesting. Way back in 2017, Dr. Mark Erdmann started floating the idea of an *ex situ* shark conservation initiative with Indo-Pacific leopard shark researcher Dr. Christine Dudgeon. At the time, Aquarium des Lagons had already been working with citizen scientists to collect zebra shark eggs from the wild which we hatch and rear for our public display.



We have a lot of locals swimming in Lemon Bay, which is just next to our aquarium. They began showing interest in the bay's biodiversity and started taking photos of what they saw and sending them to us. These photos included consistent sightings of zebra shark eggs.

Our team saw this as an amazing opportunity to not only include the species in our aquarium but to properly study it. We devised a protocol to conduct yearly surveys in the bay, collect the eggs we found, grow the pups in our aquarium and subsequently release the sharks once they had matured - it was basically StAR before StAR, but all happening right here in Noumea!

We tend to collect around 30 eggs each year between October and December. We suspect the laying of eggs tends to correspond with the warmer season. Slightly less than half of those eggs will be viable and eventually hatch.



Hugo and his colleague Hugues Gossuin releasing the newly-tagged zebra shark pups in Lemon Bay. Photo by Bluegreen Production.



How have the releases been like and what's the potential for post-release monitoring?

We recently deployed a large number of receivers in the lagoon here in Noumea, which cover a wide array of marine habitats - from the coastline right out to the deep channels, comprising coral reefs, mangroves and seagrass meadows.

In a way, we're casting our net as wide as possible as we really have no idea what kinds of habitats zebra shark juveniles tend to spend time in.

Since 2019, we've been tagging our sharks. Just recently, we successfully released our largest cohort of 8 zebra sharks - all tagged, and ready to go.

We released them in Lemon Bay itself, the same area their eggs came from. With the receivers in place, we're looking forward to learning about the species' life history, social behaviors, movement patterns and much more!

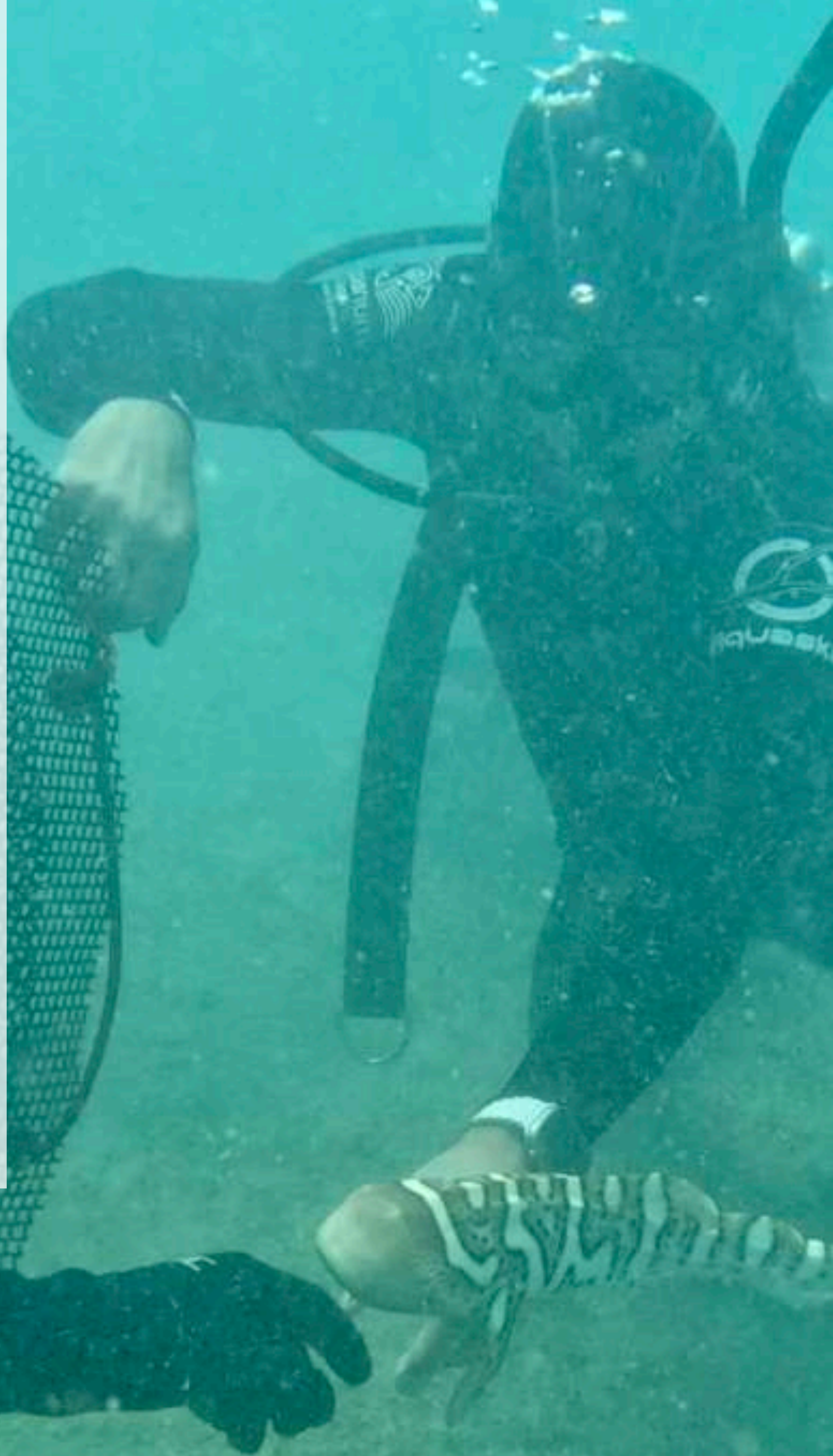
That's exciting! What else will you be up to in the coming years?

Apart from the catch-and-release program, I'm hoping to find out as much as possible about zebra sharks over the next three years.

My work will span everything, from engaging citizen scientists to monitor local populations through photo-ID to collecting biopsy samples. We hope to gain baseline data and knowledge about the species, which is only possible because of our local undisturbed marine environment.

Ultimately, we're hoping that all these can go on to support the development of the StAR Project in Raja Ampat and beyond, as well as inform wider conservation measures.

Stay up to date with Hugo's work:



Hugo and his colleague Hugues Gossuin releasing the newly-tagged zebra shark pups in Lemon Bay. Photo by Bluegreen Production.

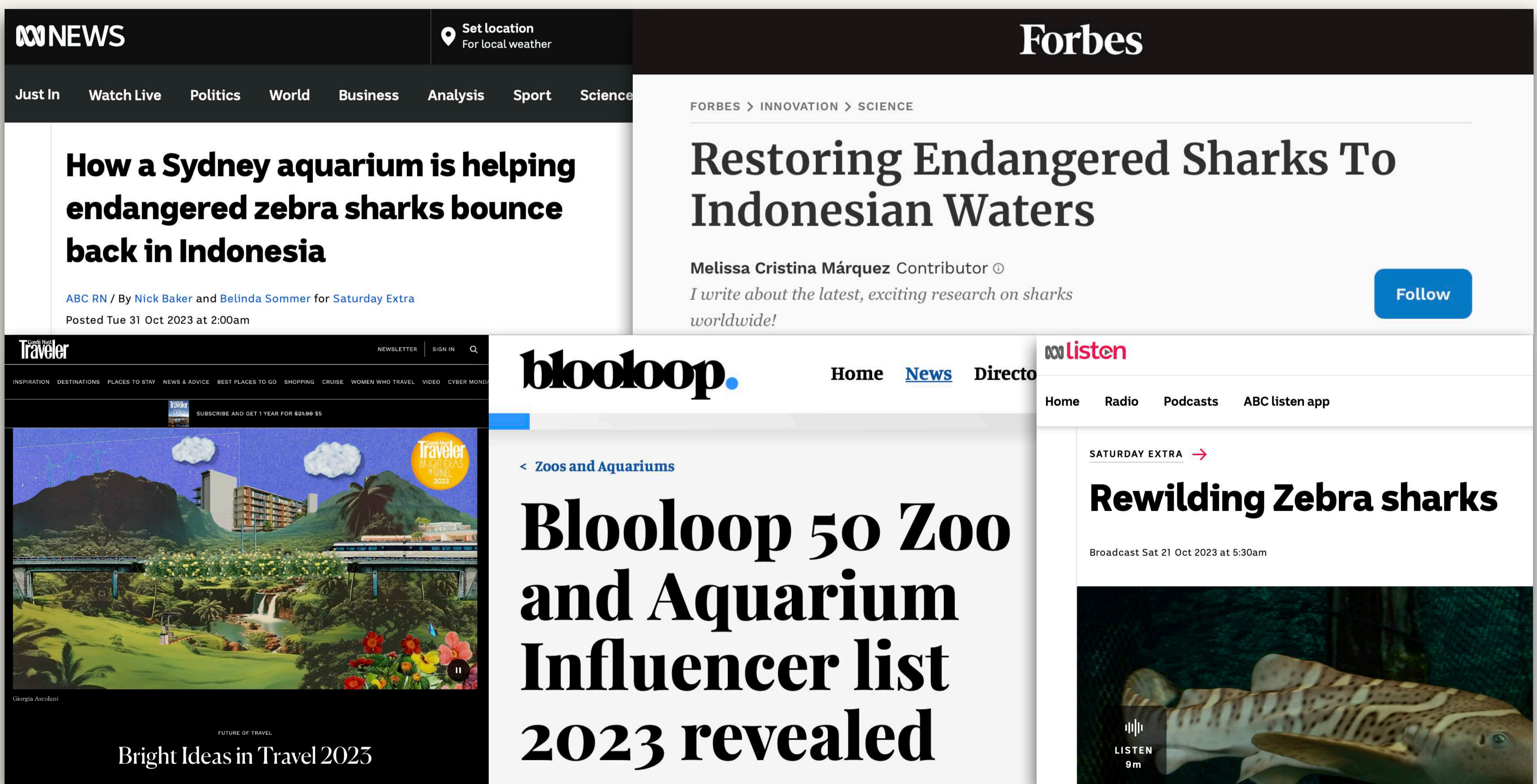
OUR MEDIA HIGHLIGHTS

LATEST COVERAGE



These stories are valuable because they allow us to share hard truths about loss, provide solutions, and document conservation successes that may inspire others to innovate.

Jennifer Hayes
National Geographic Photographer



CELEBRATING OUR COMMUNITY

RESHARK FOUNDERS



STAR PROJECT FOUNDERS



MINISTRY OF
MARITIME AFFAIRS AND FISHERIES
REPUBLIC OF INDONESIA



Representatives from ReShark's partner organizations gather for our inaugural retreat in Seattle, hosted by Seattle Aquarium. Photo by Djordje Zlatanovic.



- Acquario di Genova
- Aquarium de Lyon
- Fondation Segré
- Loro Parque
- Nausicaá Centre National de la Mer
- Oceanário de Lisboa
- Oceanogràfic València
- Océanopolis Brest
- Poema del Mar Aquarium
- Royal Burgers' Zoo

Okinawa Churaumi Aquarium

Atlantis Dubai
IUCN SSC Shark Specialist Group

Ocean Park Hong Kong

- Badan Layanan Umum Daerah Unit Pelaksana Teknis Daerah Kawasan Konservasi Perairan Daerah
- Badan Penelitian dan Pengembangan Daerah (Balitbangda) Provinsi Papua Barat
- Badan Riset dan Inovasi Nasional (BRIN)
- Child Aid Papua
- Indo-Pacific Films
- Indonesian Ocean Pride
- Jakarta Aquarium and Safari
- Kementerian Kelautan dan Perikanan (KKP)
- Konservasi Indonesia
- Misool Foundation
- Misool Resort
- Ocean Blue Tree
- Papua Diving Resorts
- Pemerintah Daerah Kabupaten Raja Ampat (Raja Ampat Regency Government)
- Pemerintah Provinsi Papua Barat (West Papua Provincial Government)
- Pemerintah Provinsi Papua Barat Daya (Southwest Papua Provincial Government)
- Raja Ampat Research and Conservation Centre
- Thrive Conservation
- Universitas Papua

Kwame Nkrumah University Science and Technology

S.E.A. Aquarium,
Resorts World Sentosa

uShaka Sea World

- Aquarium des Lagons Nouvelle Calédonie
- Cairns Marine
- Irukandji Shark and Ray Encounters
- James Cook University
- SEA LIFE Sydney Aquarium
- SEA LIFE Trust Australia and New Zealand
- Sea World Marine Park Gold Coast
- Sundive Byron Bay
- University of Queensland
- University of the Sunshine Coast



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AZA SAFE Shark and Ray Program
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Port of Seattle
Rumah Foundation
Samantha and Seren Bass
Save The Blue Foundation
Seattle Aquarium
Shannon and Audrey Wong
Silolona Sojourns
The Plum Foundation
Tropical Marine Centre
Virginia Aquarium & Marine Science Center

Sunset over Kri Island. Photo by Indo-Pacific Films.

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