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FEATURE

# A Bold Approach to Zebra Shark Conservation

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BY DR. LISA HOOPES AND DR. ERIN MEYER (/CONNECT-STORIES? AUTHOR=DR.-LISA-HOOPES-AND-DR.-ERIN-MEYER)

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**T**he  
endearing spots  
of the zebra  
shark  
(*Stegostoma  
tigrinum*)—  
commonly  
known as  
leopard shark  
throughout the  
Indo-Pacific—  
make it a  
recognizable  
and popular  
shark for  
visitors to  
Association of  
Zoos and  
Aquariums-  
accredited  
facilities.

Populations of zebra sharks in the wild, however, have undergone dramatic declines in the past 30 years, partly as a result of habitat degradation, but especially from targeted hunting for the shark fin trade.

In 2016, global population declines of this charismatic species resulted in elevating the listing of zebra sharks to Endangered on the International Union for Conservation of Nature Red List of Threatened Species.

“Despite increased protections, populations of zebra sharks within Southeast Asia have not shown signs of recovery. They are considered to be functionally extinct within some regions of their historic range, particularly in Indonesia,” said Dr. Mark Erdmann, vice president of the Marine Asia-Pacific Field Division at Conservation International. “In over 25 years of working, living, and diving in Indonesia, I

have seen only a handful of animals.”

To date, population reinforcement and reintroduction programs have focused on terrestrial and freshwater species rather than marine species.

Examples of reinforcement and reintroduction programs for elasmobranchs are noticeably absent.

“This is largely due to the lack of information on basic life history and ecology of sharks and rays, the complex and

demanding nature of their husbandry, and an unfounded cultural bias against these species,” said Julie Levans, senior curator and AZA zebra shark studbook keeper at the Virginia Aquarium and Marine Science Center in Virginia Beach, Va. “The care and breeding success of zebra sharks within AZA institutions provides a unique opportunity for aquariums to put their expertise to work to restore zebra shark populations throughout

their historic population range.”

This bold idea was first proposed by Conservation International over five years ago, when their Asia-Pacific team developed a concept plan for recovering zebra sharks in Indonesia.

Inspired by Association of Zoos and Aquariums-assisted conservation successes like the reintroduction of the scimitar-horned oryx and the California condor, Georgia Aquarium in

Atlanta, Ga., hosted a workshop in December 2019 to bring together representatives from AZA-accredited facilities, Conservation International, the IUCN Species Survival Commission's Conservation Planning Specialist Group, South-East Zoo Alliance for Reproduction and Conservation, and academic researchers to discuss the feasibility of a world-first recovery program for an endangered elasmobranch population.



With a clear conservation need for zebra shark recovery in Indonesia and an established network of well-enforced marine protected areas (MPAs), Raja Ampat was proposed as the top choice for initial release and monitoring sites for the reinforcement program.

This conservation effort proposes to take advantage of the oviparous reproductive strategy of zebra sharks and the hardy nature of their egg cases, which are able to tolerate trans-

Pacific shipping. Egg cases produced by genetically-appropriate broodstock at AZA-accredited facilities will be coordinated for shipment to Raja Ampat, reared and monitored in grow-out pens, and finally tagged before being released within designated MPAs to closely monitor post-release survival and behavior.

“Workshop participants enthusiastically endorsed the concept,” said Levans. “The group is energized and

ready to begin developing this initiative.”

Since that workshop, the initiative has rapidly developed momentum and the *Stegostoma tigrinum* Augmentation and Recovery (StAR) project was named and includes advising members from the Raja Ampat MPA Authority, Conservation International, Georgia Aquarium, Misool Foundation, Raja Ampat Research and Conservation Centre, Seattle Aquarium in Seattle, Wash., Thrive

Conservation,  
University of  
Queensland,  
Virginia  
Aquarium, and  
the West Papua  
Research and  
Development  
Agency, and will  
soon add key  
representatives  
from the  
Indonesian and  
West Papua  
governments.

The StAR  
project seeks to  
re-establish  
healthy, self-  
sustaining, and  
resilient  
populations of  
zebra sharks  
throughout its  
range through  
the introduction  
of juveniles bred  
in managed care  
and hatched  
from eggs  
supplied by  
participating  
AZA-accredited

facilities. The project will start by focusing on recovery of two populations in the Raja Ampat archipelago, West Papua Province, Indonesia, and has already secured a critically important funding partnership with Fondation Segré to launch this novel initiative.

This multi-national collaborative initiative on zebra sharks will serve as a foundation for AZA accredited facilities to lead *ex-situ* elasmobranch conservation in support of *in-*

*situ* population recovery, similar to successful conservation programs already underway with numerous terrestrial and freshwater species. The StAR project leverages existing AZA Species Survival Plan and studbook records to identify broodstock, and aligns with AZA SAFE shark and ray program goals. AZA partners will be instrumental in shaping *ex-situ* and *in-situ* husbandry protocols and training programs, and collaborating on long-term

scientific studies  
with scientists,  
local experts,  
and community  
members in  
Indonesia.

There is also  
great capacity  
for the AZA  
community to  
partner with the  
project team  
and local  
community  
members to  
develop  
outreach and  
education  
programs to  
engage with  
guests through  
aquarium  
exhibits and  
EcoResorts in  
Indonesia, and  
with local  
community  
schools.  
Anecdotal  
evidence  
suggests that  
knowledge of  
zebra sharks

may be  
diminishing  
among  
Indonesian  
youth.

“Leopard  
[zebra] sharks  
are virtually  
unknown  
among the  
younger  
generations of  
the local  
communities  
here, and this  
multi-  
stakeholder  
effort is an  
incredible  
opportunity to  
restore the  
diversity of Raja  
Ampat’s reefs,”  
said Marit  
Miners, co-  
founder of  
Misool  
EcoResort and  
Misool  
Foundation.



While there is a long road of planning ahead until the release of the first juvenile zebra sharks, the StAR project hopes to inspire the AZA community to think about elasmobranch conservation in new and exciting ways, harnessing the untapped potential of extraordinary species in aquariums and the collective professional knowledge of animal care, welfare, and breeding. Ultimately, the StAR project could provide a blueprint for enacting conservation

initiatives with other critically endangered elasmobranchs held within AZA-accredited facilities.

Even as AZA members face dire economic challenges, the commitment to advancing innovative, impactful conservation projects remains. While human communities battle a global pandemic, the ocean needs help, perhaps even more than before. A healthy ocean provides food security, coastal protection, climate buffering, and so much more.

And the StAR project team is rising to that challenge. If you're interested in reaching for the StARs, please reach out the authors for further details.

*Photo Credit:*

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*Shawn*

*Heinrichs*

*Third: © Grant Abel*

**DR. LISA HOOPES IS THE DIRECTOR OF RESEARCH, CONSERVATION AND NUTRITION AT GEORGIA AQUARIUM.**

**DR. ERIN MEYER IS THE DIRECTOR OF CONSERVATION PROGRAMS AND PARTNERSHIPS AT THE SEATTLE AQUARIUM.**

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