



**MARINE
MEGAFUNA
FOUNDATION**

ANNUAL REPORT

2022



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This report, along with other information about MMF, is available online at www.marinemegafauna.org

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Centro de Investigação Científica Megafauna Marinha
Associação Megafauna Marinha
Praia do Tofo, Inhambane, Mozambique

MMF is a tax-exempt non-profit charitable organization under section 501(c)(3) of the US tax code (Tax ID #46-0645082).

All contributions are tax-deductible in accordance with US tax law.

The Associação Megafauna Marinha is also a registered not-for-profit association in Mozambique.

Graphic Design: Madeleine Pierce

OUR THREE PRIORITY REGIONS

North Pacific Ocean

North Atlantic Ocean

Arabian Sea

Indian Ocean

South Pacific Ocean

South Atlantic Ocean

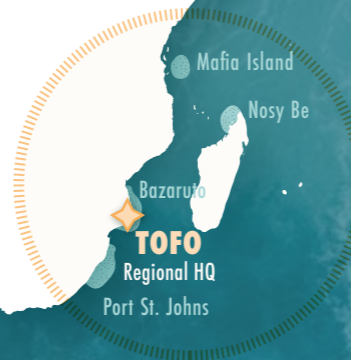
Americas • Western Indian Ocean • South East Asia



FLORIDA
MMF HQ

Yucatán

Galápagos
Islands



TOFO
Regional HQ

Mafia Island

Nosy Be

Bazaruto

Port St. Johns



NUSA
LEMBONGAN
Regional HQ

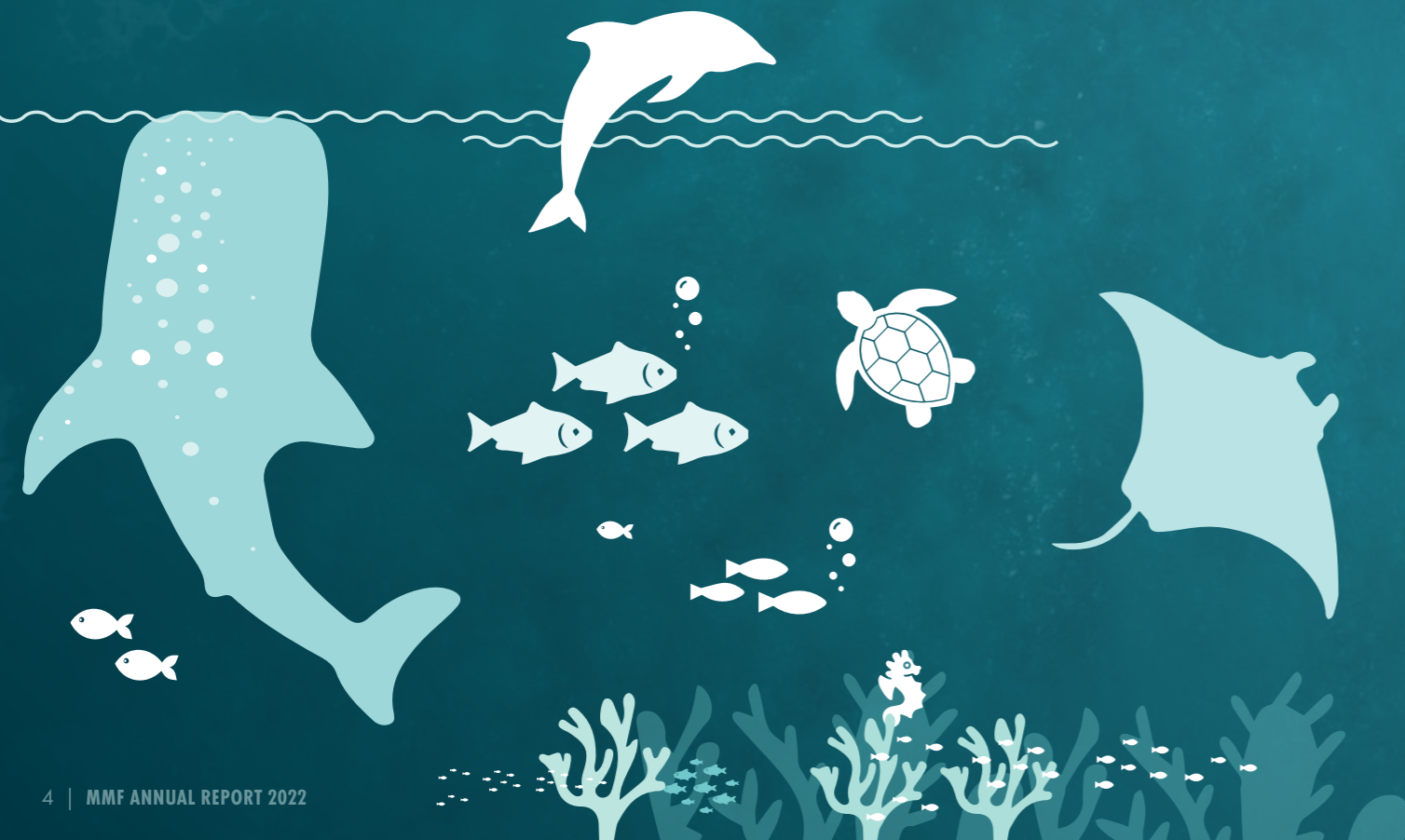
Sulu Sea

Sangkalaki

Raja Ampat

Komodo

Andaman Sea



MMF was founded in 2009 by renowned marine scientists Dr. Andrea Marshall and Dr. Simon Pierce to further their mission to save the world's ocean giants from extinction. Since then, many others have joined the team. The organization has expanded to worldwide research, education, and outreach on marine megafauna conservation.

Our team has conducted pioneering work on sharks and rays, particularly manta rays and whale sharks, which has helped these species move towards global protection. These iconic animals are also excellent flagships for the marine environment.

Our work has broad benefits for the other lesser-known endangered species that share their habitats and the creation and management of protected areas to ensure their survival.

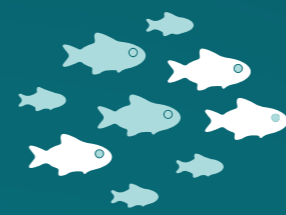
Our work focuses on strategic locations with large or otherwise important populations – such as breeding areas – of threatened marine species. We work to develop effective conservation solutions that minimize human threats to marine life, we work with communities to create sustainable livelihoods so they benefit from a healthy marine environment, and we build national science capacity to help ensure long-lasting monitoring and management.



MOZAMBIQUE CONSERVATION

CONSERVATION INITIATIVES EXPANDED

Two new locations added, including the new Dugong and Seagrass Conservation Project in Inhassoro.



OCEAN AMBASSADORS

38 new community leaders (now totaling 60) in three new villages have been trained to promote education and awareness of marine conservation solutions.

NEW PARTNERSHIPS

Six Local Fisheries Councils, including two new LFCs, have been established to facilitate collaboration between fishers, MMF, and government agencies to enhance the protection and management of marine resources.



IMPROVED LIVELIHOODS

129 households with improved livelihoods overall.



CONSERVATION MANAGEMENT

107 local leaders and fishers attended four workshops on Locally Managed Marine Areas and sustainability.



MMF RESEARCHERS, LED BY DR. ANDREA MARSHALL (SHOWN HERE), HAS DEVELOPED A MAJOR NEW RESEARCH PROJECT ON CRITICALLY ENDANGERED RHINO RAYS IN MOZAMBIQUE.



38 NEW COMMUNITY LEADERS
IN MOZAMBIQUE HAVE BEEN
TRAINED TO PROMOTE EDUCATION
AND AWARENESS OF MARINE
CONSERVATION SOLUTIONS.



MOZAMBIQUE RESEARCH

EXPANDING LOCAL CAPACITY

Five new Mozambican divers trained and qualified for megafauna scientific surveys, including one research technician from the Mozambican Institute of Oceanography.

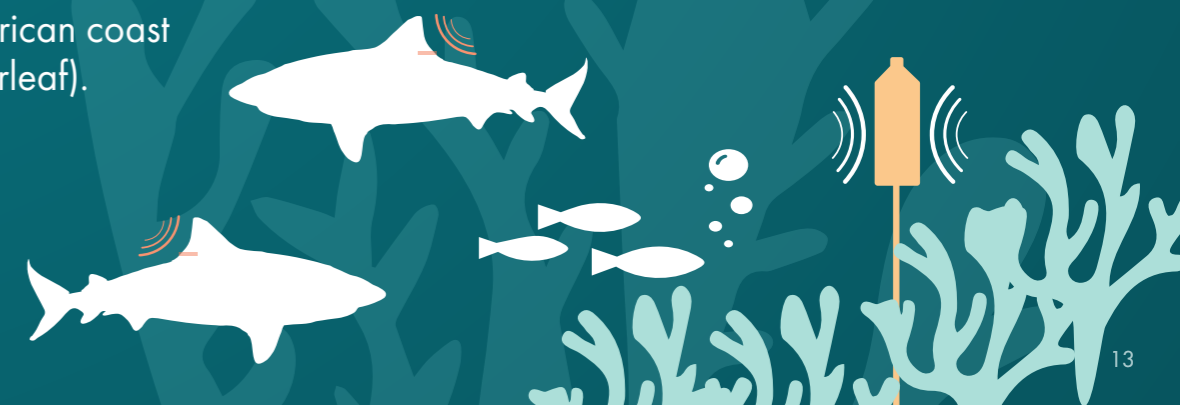


TRACKING MOVEMENTS

Satellite tags deployed on 11 reef manta rays, two black marlin, and one small eye stingray, with 25 acoustic tags deployed along the Inhambane and South African coast (see overleaf).

REEF MONITORING

Remote Underwater Video surveys were deployed, and 16 eDNA samples collected.



WE EXPANDED THE MOZAMBIQUE TRACKING NETWORK

NEW ACOUSTIC TAGS IN 2022



NEW ACOUSTIC RECEIVERS

Three new receivers deployed, including one deep water receiver, bringing the collaborative array to 25 receivers in the Inhambane Province.

1
BULL
SHARK

12
REEF
MANTAS

3
RHINO
RAYS

7
SMALLEYE
STINGRAYS

4
ZEBRA
SHARKS

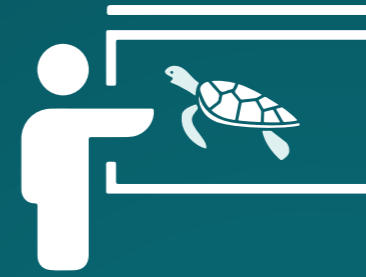


THE POORLY-KNOWN SMALLEYE STINGRAY IS NOW THE FOCUS OF A RESEARCH STUDY BY MMF IN MOZAMBIQUE, INCLUDING THE FIRST ACOUSTIC AND SATELLITE-LINKED TAGS TO EVER BE DEPLOYED ON THIS UNIQUE SEMI-PELAGIC SPECIES.





MOZAMBIQUE EDUCATION



11
SCHOOLS

in coastal Mozambique have been taught the wonders of their local marine habitats, and the importance of ocean conservation.

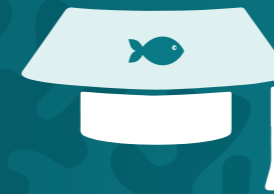


3,478
MINI MARINE
CONSERVATIONISTS

graduated MMF's curriculum between 2012–22.

38
ECOTOURISM
GRADUATES

from MMF's Coral Reef Club Vocational Program.



1,295
NEW SWIMMERS

trained by MMF's team to swim safely and confidently from 2012–22.



“

My child joined this program in 2016. In class, the children learn a lot about the marine ecosystem, anatomy of species, and how to protect those animals and our ocean. The swimming lessons are fun; our children learn to swim, and to be more careful when they go to the sea. Now, I feel safe, as a parent, when our children go to the pool, the river, lake, or in the sea, because I know that they will be able to take care of themselves and stay safe – they know how to swim very well.

I want to thank MMF for the existence of the program in our community. I would like this program to continue to exist, and to reach more communities, so that other children benefit.

Alex Joao Gove. Tofo, Mozambique.

THE CORAL REEF CLUB DECORATING MMF'S MARINE EDUCATION CENTER IN TOFO.

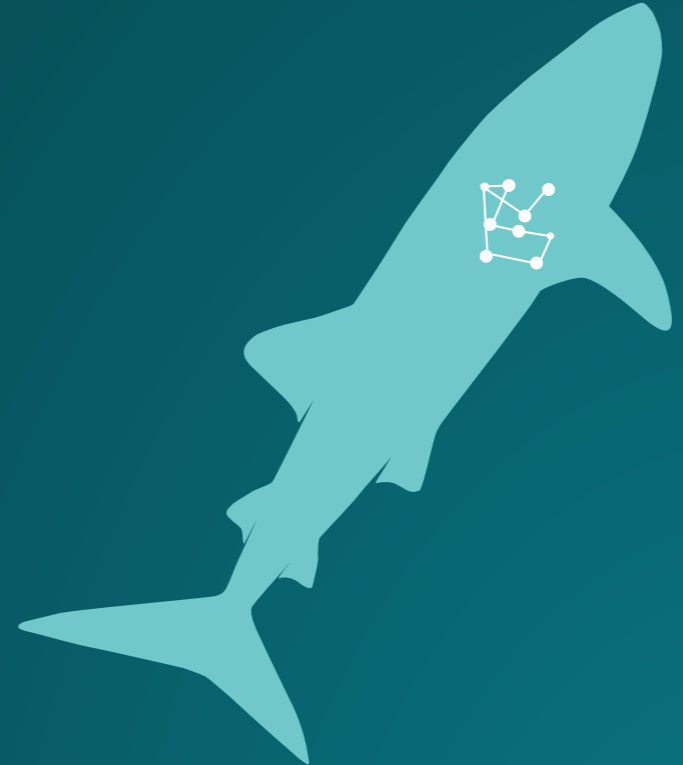


A GRADUATING CLASS OF SWIMMERS FROM
MMF'S PROGRAM IN TOFO, MOZAMBIQUE.





MADAGASCAR HIGHLIGHTS



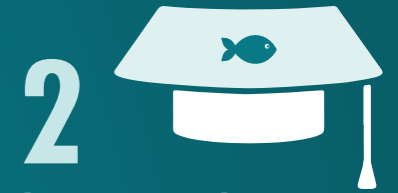
494 NEW SHARKS

identified from 2015 to 2022 near Nosy Be in NW Madagascar.



CODE OF CONDUCT

signed into law to guide responsible interactions within the tourism industry.



2 MASTERS STUDENTS

studying Nosy Be shark tourism.



TRACKING MOVEMENTS

Nine acoustic receivers deployed and 34 whale sharks tagged off Nosy Be.



THE MADAGASCAR WHALE SHARK
PROJECT TEAM WORKING WITH
CHILDREN ON NOSY BE.





TANZANIA HIGHLIGHTS

NO PLACE LIKE HOME

Two sharks have been seasonally visiting Mafia Island for at least 15 years.



CROSSING BORDERS

Three whale sharks have now been photo-identified in both Tanzania and Mozambique.

55 TISSUE SAMPLES

collected for genetics and feeding ecology studies



22 NEW SHARKS

identified in 2022 at Mafia Island, which is home to a small, highly-resident 200+ whale shark population.



WHALE SHARKS FEEDING ON
A BAITBALL OFF MAFIA ISLAND,
TANZANIA

INDONESIA HIGHLIGHTS

211
DIVE SURVEYS

for manta rays and marine turtles.

6
PLASTIC SURVEYS

in manta and turtle feeding areas around Nusa Penida, for the 7th consecutive year of monitoring.

3331
MANTA RAYS

now identified throughout Indonesia.

NEW
MASTERS STUDENTS

Janis Argeswara started her research at Florida International University, and Aulia Zeintrinanda started her degree at the University of Queensland.

OUTREACH

Two documentaries filmed, and 500+ people reached through our local school visits and industry workshops.

NEW INDONESIAN RESEARCHERS

Three students are being trained in research techniques from the Bina Nusantara, Diponegoro, and Udayana universities.

MMF RESEARCHERS ARE LEADING A NEW SEA
TURTLE PHOTO-IDENTIFICATION PROJECT
AT NUSA PENIDA, NEAR BALI.





MMF SENIOR SCIENTIST, DR. ELITZA GERMANOV,
LED THE 7TH CONSECUTIVE YEAR OF PLASTIC
POLLUTION MONITORING AT NUSA PENIDA .

Photo by Brooke Pyke



FLORIDA HIGHLIGHTS

30
AERIAL SURVEYS

to look for manta rays along the Florida coastline, and 500+ drone flights to locate mantas and observe behaviours.



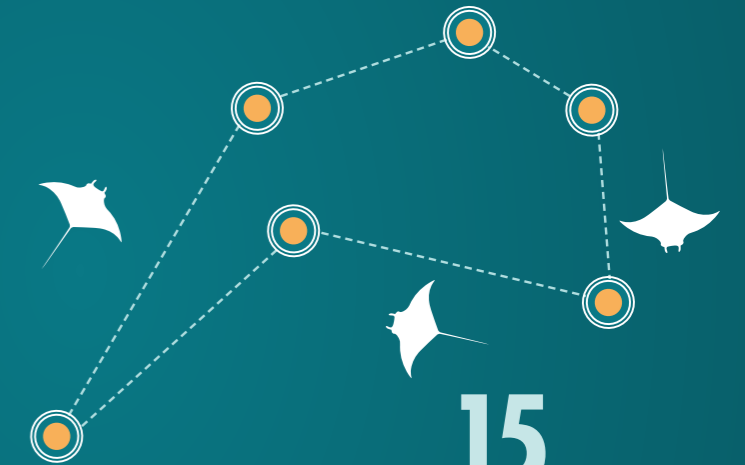
215
PLANKTON SAMPLES

to show us what mantas are consuming when feeding.



OUTREACH

2,000 children reached through our education curriculum.

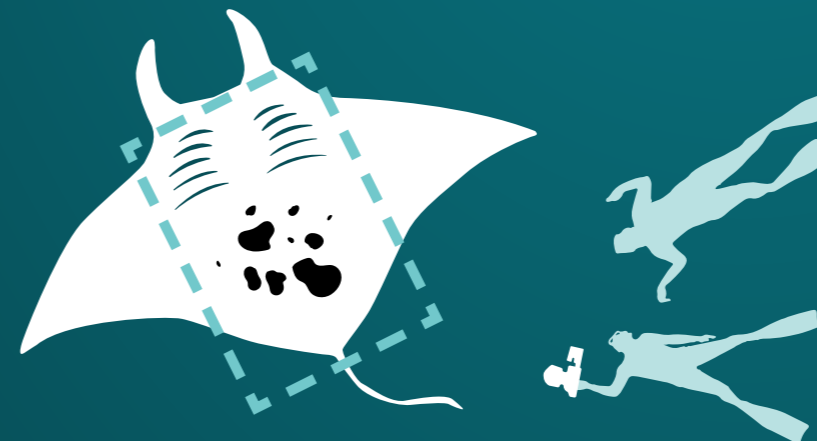


77
BOAT SURVEYS

for manta rays around the Florida coastline.

15
TAGGED MANTA RAYS

with acoustic and satellite tags, in collaboration with NOAA.



161
MANTA RAYS

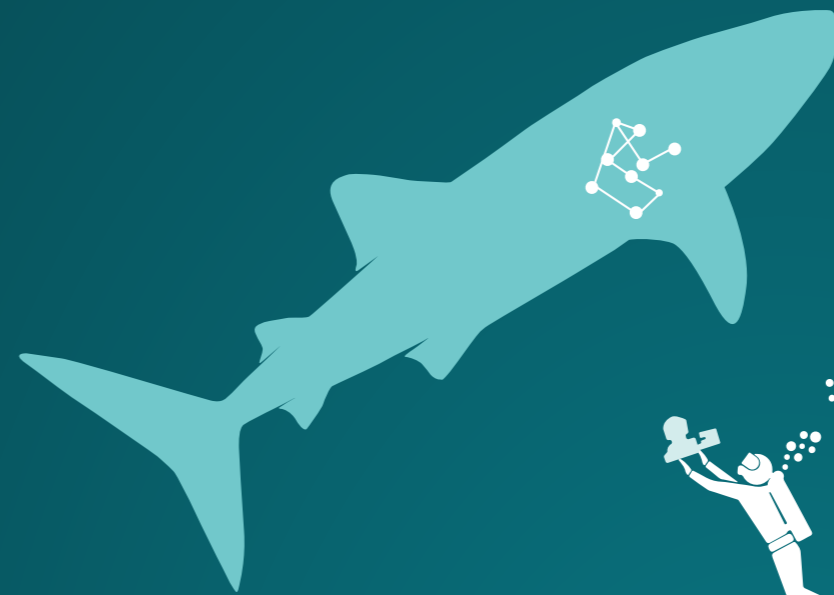
now identified by the MMF Florida team.



FOUNDER OF MMF'S FLORIDA MANTA PROJECT,
JESSICA PATE, HAS DISCOVERED THAT THE
FLORIDA COAST IS A NURSERY AREA FOR
YOUNG MANTA RAYS.



GALAPAGOS HIGHLIGHTS



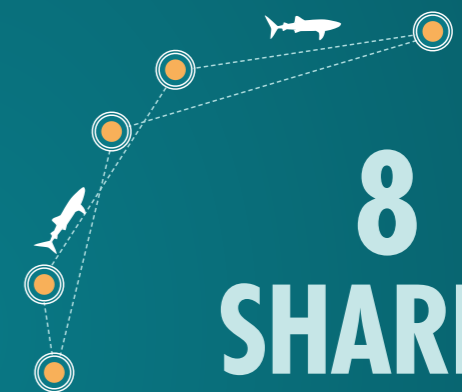
409 WHALE SHARKS

identified from the Galapagos Archipelago, with 15 new individuals identified during our July 2022 trip.



2 BLOOD SAMPLES

obtained from free-swimming whale sharks in 2022.



8 SHARKS TRACKED

with satellite-linked tags in July 2022.



DARWIN & WOLF ISLANDS

6

SEASONS

of collaborative research with the Galapagos Whale Shark Project team.

GALAPAGOS ISLANDS

ECUADOR



JENNY WAACK FROM THE GALAPAGOS
WHALE SHARK PROJECT COLLECTING
A BLOOD SAMPLE FROM AN ADULT
WHALE SHARK.



RESEARCH OUTPUT

2022 SCIENTIFIC PAPERS

Our scientific work focuses on the world's most endangered ocean species, and how we can protect them and their habitats.

Distribution of the reef manta ray *Mobula alfredi* and the oceanic manta ray *Mobula birostris* in the Philippines: A collaborative effort for conservation.

Rambahinarison J, Agustines A, Alexopoulos K, et al. *Journal of Fish Biology*.

Fatty acid profiles of more than 470 marine species from the Southern Hemisphere.

Nichols PD, Pethybridge HR, Zhang B, et al. *Ecology*.

Demographics and dynamics of the world's largest known population of oceanic manta rays *Mobula birostris* in coastal Ecuador.

Kanina Harty, Michel Guerrero, Anna M. Knochel, Guy M. W. Stevens, Andrea Marshall, Katherine Burgess, Joshua D. Stewart.

Diving into the vertical dimension of elasmobranch movement ecology.

Andrzejczek S, Lucas TCD, Goodman MC, et al. *Science Advances*.

Improving sightings-derived residency estimation for whale shark aggregations: A novel metric applied to a global data set.

Araujo G, Agustines A, Bach SS, et al. *Frontiers in Marine Science*.

Evidence of Závora Bay as a critical site for reef manta rays, *Mobula alfredi*, in southern Mozambique.

Carpenter M, Cullain N, Venables SK, Tibiriçá Y, Griffiths C, Marshall AD. *Journal of Fish Biology*.

Citizen science reveals the population structure and seasonal presence of whale sharks in the Gulf of Thailand.

Magson K, Monacella E, Scott C, et al. *Journal of Fish Biology*.

Vertical habitat use of black and striped marlin in the Western Indian Ocean.

Rohner CA, Bealey R, Fulanda BM, Prebble CEM, Williams SM, Pierce SJ. *Marine Ecology Progress Series*.

Using drones to assess volitional swimming kinematics of manta ray behaviors in the wild.

Fong V, Hoffmann SL, Pate JH. *Drones*.

Residency, movement patterns, behavior and demographics of reef manta rays in Komodo National Park.

Germanov ES, Pierce SJ, Marshall AD, et al. *PeerJ*.

Global collision-risk hotspots of marine traffic and the world's largest fish, the whale shark.

Womersley FC, Humphries NE, Queiroz N, et al. *Proceedings of the National Academy of Sciences*.

The distribution of manta rays in the western North Atlantic Ocean off the eastern United States.

Farmer NA, Garrison LP, Horn C, et al. *Scientific Reports*.

First records of the ornate eagle ray *Aetomylaeus vespertilio* from the Inhambane Province, Mozambique.

Venables SK, Conradie J, Marshall AD. *Journal of the Marine Biological Association of the United Kingdom*.

Citizen science as a key tool in whale shark conservation.

Araujo G, Kwong KO, Jones IG, Holmberg J, Pierce SJ, Manjaji-Matsumoto BM. *Aquatic Conservation: Marine and Freshwater Ecosystems*.

The need for long-term population monitoring of the world's largest fish.

Rohner CA, Venables S, Cochran J, et al. *Endangered Species Research*.

Pieces in a global puzzle: Population genetics at two whale shark aggregations in the western Indian Ocean.

Hardenstine RS, He S, Cochran JEM, et al. *Ecology and Evolution*.



HIGHLIGHTING OUTREACH

NETFLIX

We worked with **Wildspace Productions** to film sequences in Bazaruto for their upcoming Netflix documentary "Our Oceans" set for release in 2024.

OCEAN GIANTS MAGAZINE

Our second year of distributing our quarterly magazine to help showcase marine research, conservation, and education to over **6,000 subscribers.**



**3,000 +
MINI MARINE
CONSERVATIONISTS**

inspired through our global education programs.

GLOBAL MEDIA FEATURES

VIRTUAL REALITY

We worked with **IMMOTION** to film a virtual reality experience, which will be showcased in aquariums across the world, and via our Mozambique education programs.

**473,300 +
REACHED
VIA SOCIAL MEDIA**

**GREW OUR
SOCIAL MEDIA**

29,500+ 23,000+

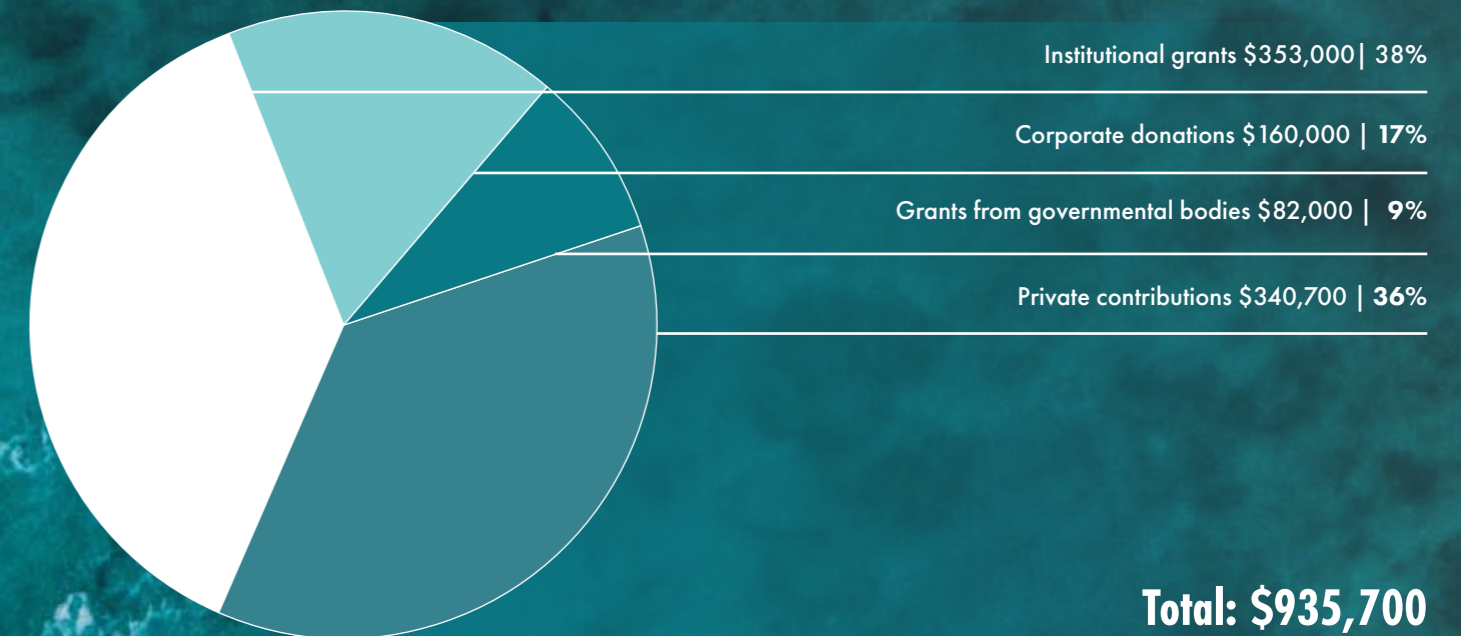


DR STEPHANIE VENABLES CONDUCTING AN
ELASMOBRANCH SURVEY IN MOZAMBIQUE

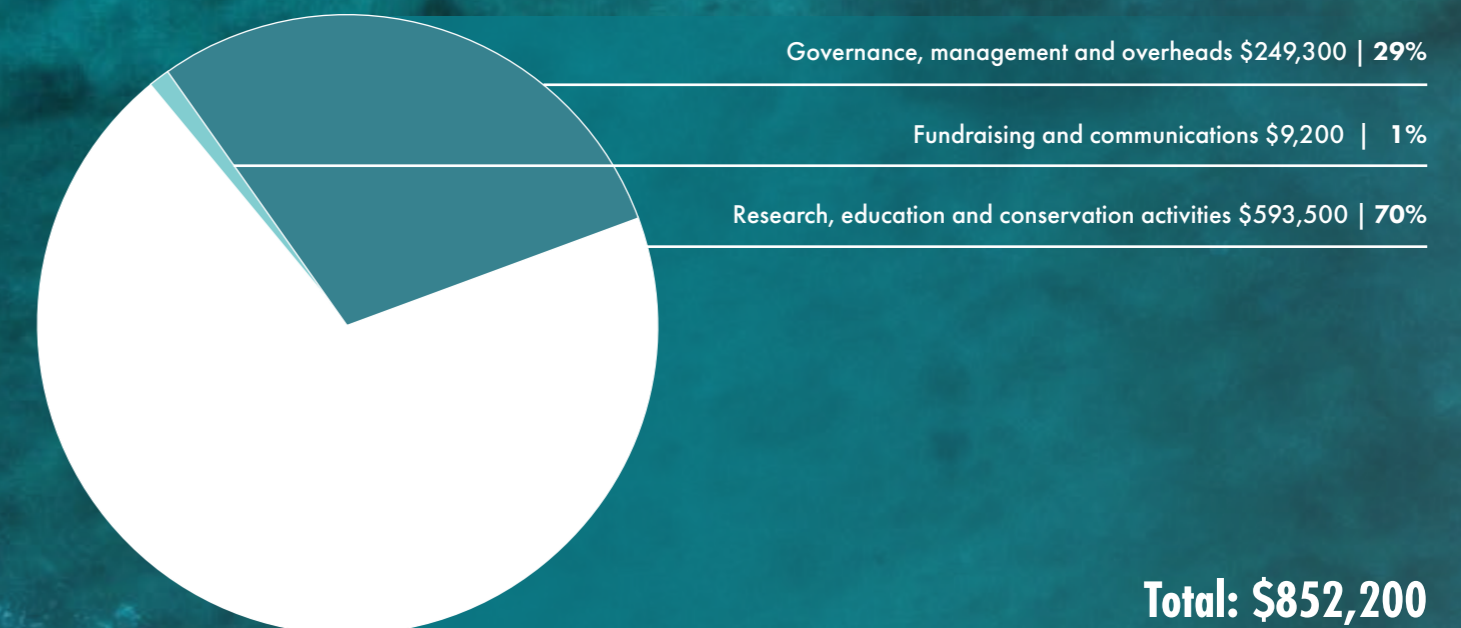


FINANCIAL SUMMARY 2022

REVENUE



EXPENDITURE



SPECIAL THANKS TO OUR MAJOR PROJECT FUNDERS

“

Your help and support enables us to protect the world's most endangered ocean wildlife, train the next generation of conservationists, and conserve marine ecosystems. These discoveries and successes would not be possible without you.

Thank you, so much.



DR. SIMON PIERCE



DR. ANDREA MARSHALL

Alan Parker	Help For Mozambique	Prince Albert II of Monaco Foundation
Angel Protocol	Jim Artindale & Ann Rooney	ScubaPro
Art Blocks	John Marshall	Shark Conservation Fund
Aqua-Firma	Kansas City Zoo	Shark Foundation
Blue Action Fund	Mantahari Oceancare	Stichting Kalverboer Silsby Foundation
Blue Corner Dive	Margo Marshall	Sundive Byron Bay
Big Fish Diving	Mark & Caroline Hackney	Sustainable Ocean Alliance
Boris Worm	Mario Klingemann	Stanford University
David & Carol Myers Foundation	Milkywire	Swiss Friends Of Galapagos
Disney Conservation Fund	MMF Canada	The Barlow Family
DSZ - International Giving Foundation For Mozambique	Mohamed Bin Zayed Species Conservation Fund	The Rufford Foundation
Alina Riensema	NACORA	The Wondrous Trust
Eco Field Trips	Ocean Mata	Turing Foundation
Elnora Cameron	Ocean Tracking Network	Ultralight Control Systems
ExxonMobil Mozambique	Ocean Wildlife Project	US Ambassador's Special Self-Help Fund
Fondation Ensemble	Our Children's Earth Foundation	Waterlust
Fortuna Foundation	Padma	Windrush Trust
Foundation Bertarelli	Paul T. Jones, II and Sonia M. Jones	WWF Tanzania
Foundation Segre	Peri-Peri Divers	Zoomarine
Georgia Aquarium	Pure Ocean Fund	



“

If you want to help our oceans, now is the time. Join us in saving Earth's most iconic marine wildlife.

DR. ANDREA MARSHALL

Co-founder, MMF



BECOME AN MMF MEMBER

When you join our community, you'll be making a transformational contribution to our organization's conservation efforts. Your steady, incremental donations provide a reliable stream of funding. This creates a strong financial foundation for us to build out our capacity for conservation, plan for the long term, and ensure that we have the resources we need to achieve our goals.

JOIN TODAY

MMF FOUNDING MEMBERS

Suzanne Pierce
Mark Hackney
Josh Axford
Peter Rohner
Sandra Venables
Laura Weiland
Pam Flam
Mo Flam
Claudia Haas
Vessela Brakalova
Stanislav Germanov
Tom & Mary Longfellow
Ivy Yin
Gabriela Beutler
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Michael Ernestus
Godknows Hwata
Christopher Bie
Elizabeth Stanko
Elizabeth Blackford
Julia Cano
Julie Corbin
Jesse Robbins



Healthy ecosystems are more resilient to climate change.

We promote marine megafauna species as conservation flagships to preserve and rebuild healthy marine ecosystems.



EXPLORE MMF's PIONEERING MARINE CONSERVATION WORK

Get our **FREE** Quarterly Magazine
delivered straight to your inbox.

[LEARN MORE](#)





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FOUNDATION**

ANNUAL REPORT 2022

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