



MARINE
MEGAFUNA
FOUNDATION

ANNUAL REPORT 2023



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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

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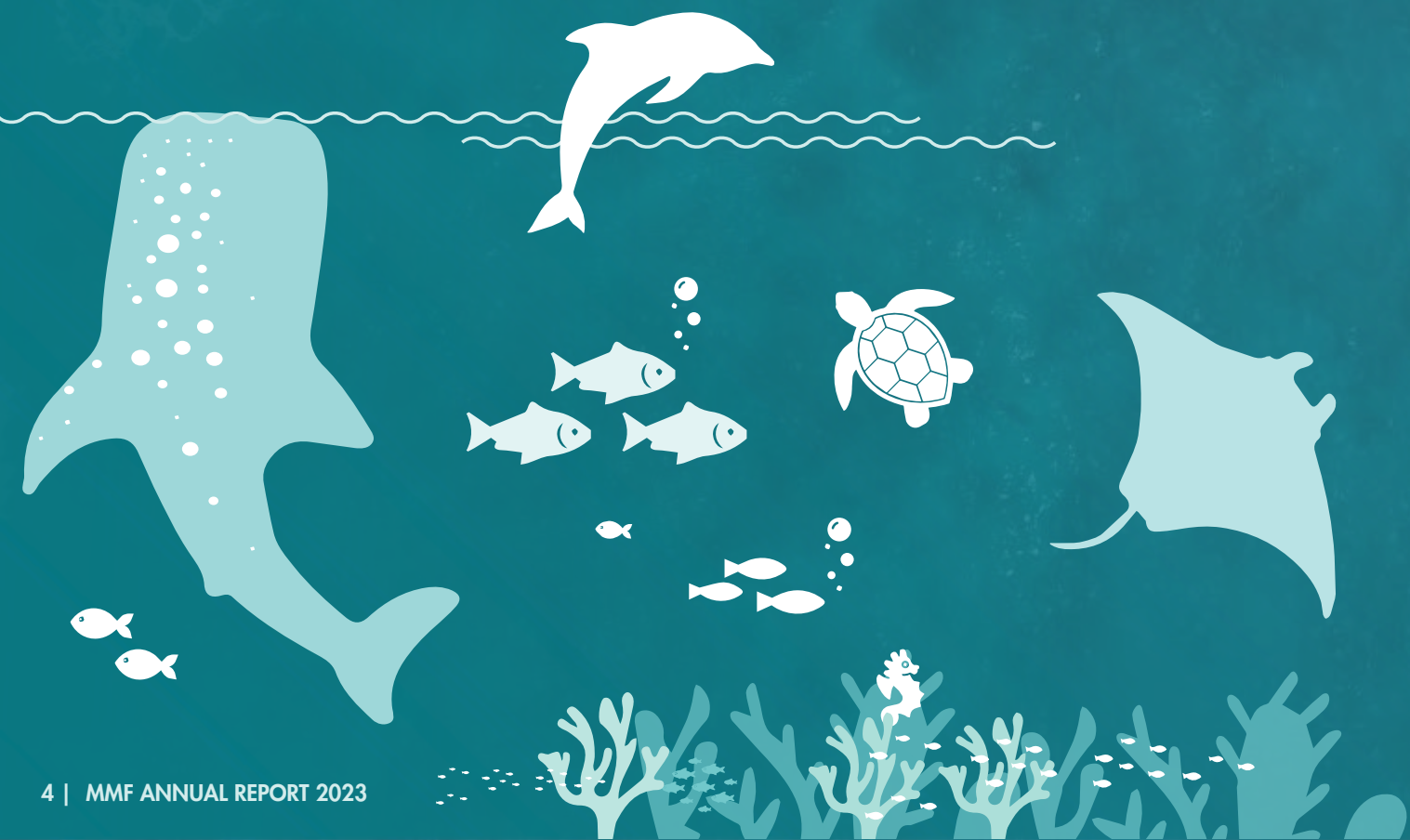
All contributions are tax-deductible in accordance with US tax law.

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

Graphic Design: Madeleine Pierce

OUR THREE PRIORITY REGIONS

Americas • Western Indian Ocean • Asia Pacific

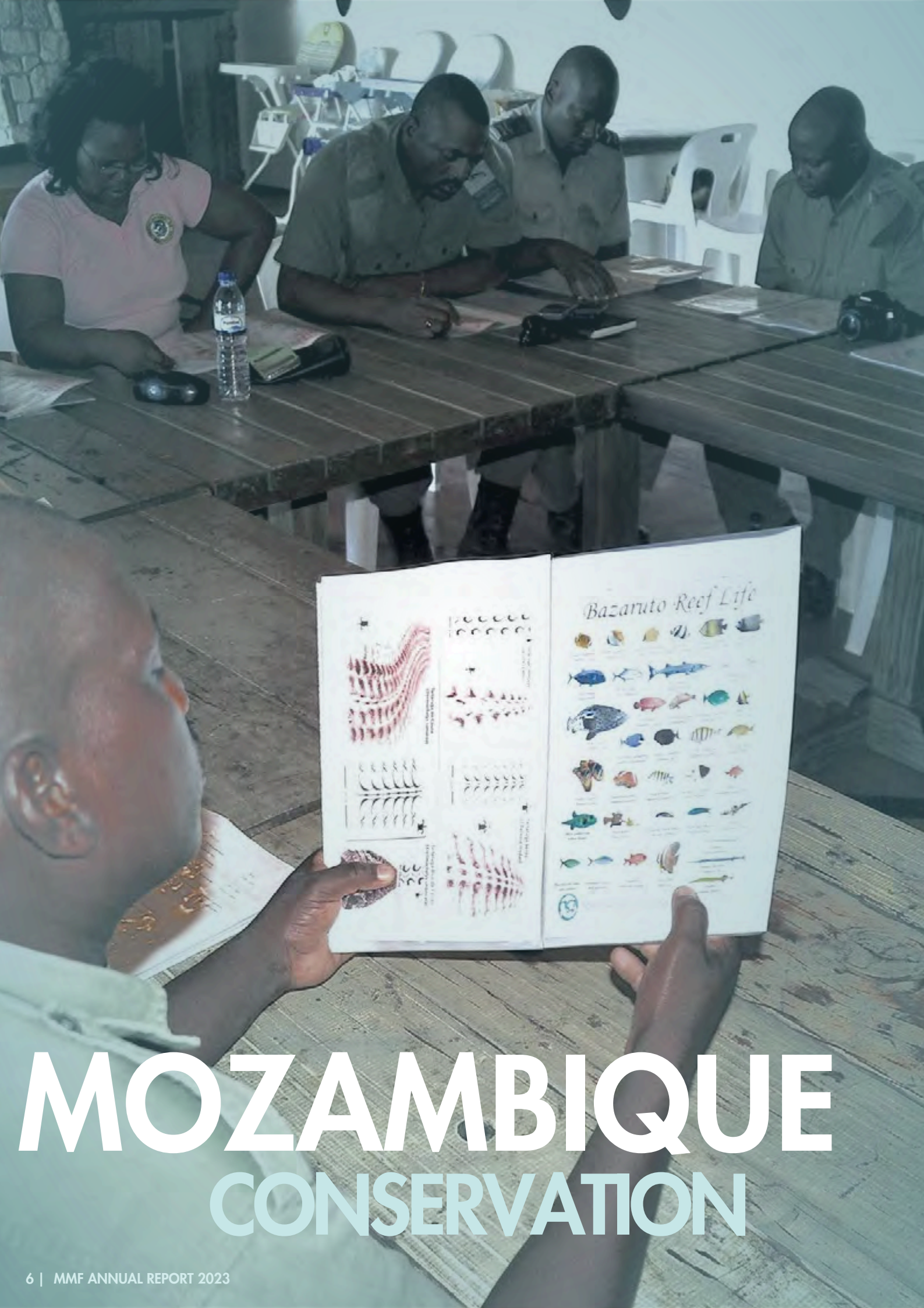


MMF was founded in 2009 by renowned marine scientists Dr. Andrea Marshall and Dr. Simon Pierce to further their mission to save the world's ocean giants from extinction. Since then, many others have joined the team. The organization has expanded to worldwide research, education, and outreach on marine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

Our team has conducted pioneering research 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.

We focus on strategic locations with large or otherwise important populations – such as key feeding breeding areas – of threatened marine species. MMF works to develop effective conservation solutions that minimize human threats to marine life, while working with communities to create sustainable livelihoods so they benefit from a healthy marine environment. We also emphasise the development of national science capacity in the developing world to ensure long-lasting monitoring and management.



FOUR NEW IUCN IMPORTANT SHARK & RAY AREAS



MMF has been instrumental in the designation of the Greater Bazaruto area, Pomene, Southern Inhambane Province (Tofo and Zavora), and a substantial southern Mozambique movement corridor as globally-important shark and ray habitats

OCEAN AMBASSADORS

MMF trains community leaders who advocate for education and awareness of marine conservation solutions within their community. This year, the OA's reached 3,440 individuals: 866 children, 1,689 women, and 885 men

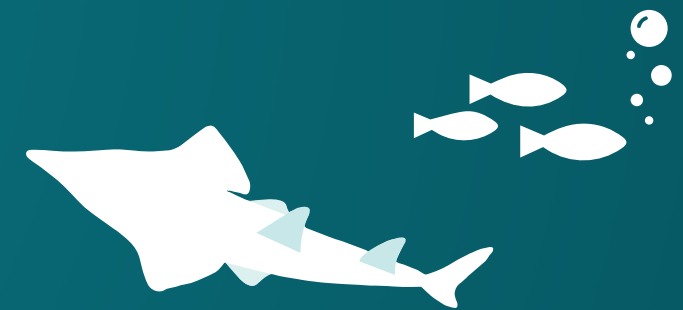
NEW FISHING CLOSURE

Tofo Fisheries Council established a temporary fishing closure of 3 months



10 VILLAGE SAVINGS LOAN GROUPS

There are now 207 active members, with women comprising 63% and men 37%



CONSERVATION MANAGEMENT

85 local leaders, fishers and community members participated in a workshop to discuss "catch monitoring and sustainable fisheries in Inhambane province"

MOZAMBIQUE CONSERVATION

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





MMF TRAINS COMMUNITY LEADERS
IN MOZAMBIQUE TO PROMOTE
EDUCATION AND AWARENESS
OF MARINE CONSERVATION
SOLUTIONS.

MOZAMBIQUE RESEARCH

EXPANDING LOCAL CAPACITY

One new Mozambican diver trained for megafauna scientific surveys, and another qualified for whale shark surveys



582
MEGAFAUNA SURVEYS

18 TISSUE SAMPLES

Collected from 5 shark and ray species for genetic and feeding ecology studies

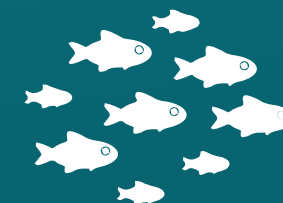
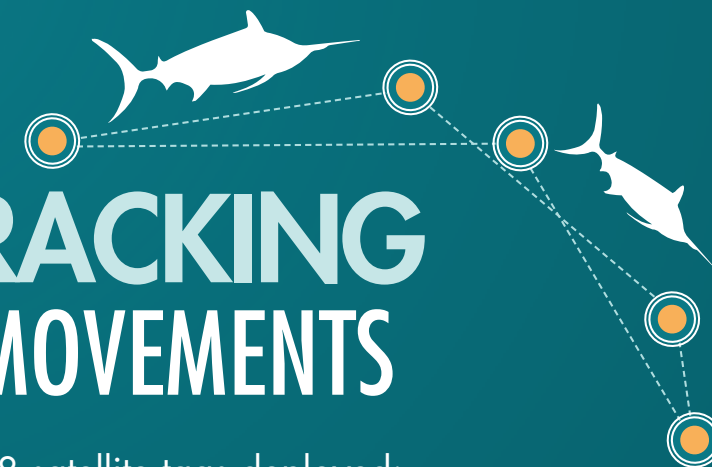


REEF MONITORING

Remote Underwater Video surveys were deployed in 5 locations

TRACKING MOVEMENTS

18 satellite tags deployed:
1 small eye stingray, 3 giant manta rays, 2 bottlenose wedgefish, 3 black marlin, and 11 reef manta rays (4 in Mozambique, 7 in South Africa)



WE EXPANDED THE MOZAMBIQUE TRACKING NETWORK

NEW ACOUSTIC TAGS IN 2023:

**15 NEW
ACOUSTIC RECEIVERS
DEPLOYED**

bringing the collaborative
array to 38 receivers in the
Inhambane Province

**3
SMALLEYE
STINGRAYS**

**1
GIANT
MANTA RAY**

**12
REEF
MANTA RAYS**

**4
ZEBRA
SHARKS**

**2
ORNATE
EAGLE RAYS**

**5
BOTTLENOSE
WEDGEFISH**



THE POORLY-KNOWN SMALLEYE STINGRAY IS 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.

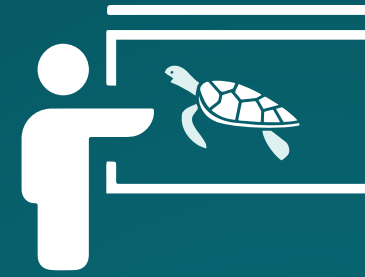




MOZAMBIQUE EDUCATION

12
SCHOOLS

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

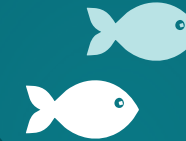
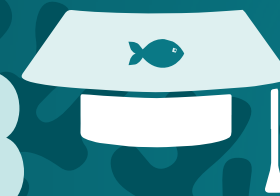


3,764
MINI MARINE
CONSERVATIONISTS

graduated from MMF's ocean awareness curriculum between 2012-24

193
ECOTOURISM
GRADUATES

from MMF's Coral Reef Club Vocational Program from 2012-24



1,505

NEW SWIMMERS

trained by MMF's team to swim safely and confidently from 2012-24



“

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.





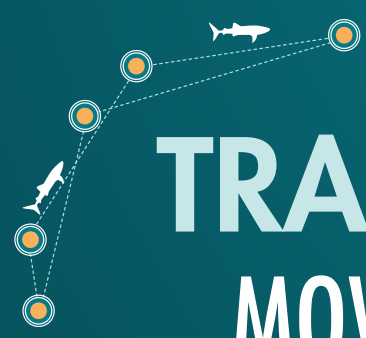
MADAGASCAR HIGHLIGHTS

CODE OF CONDUCT

law has been adopted, obliging tourism operators to follow international best practice

TOURISM TRAINING

114 local skippers and guides trained on our Code of Conduct, and established a whale shark tourism management committee



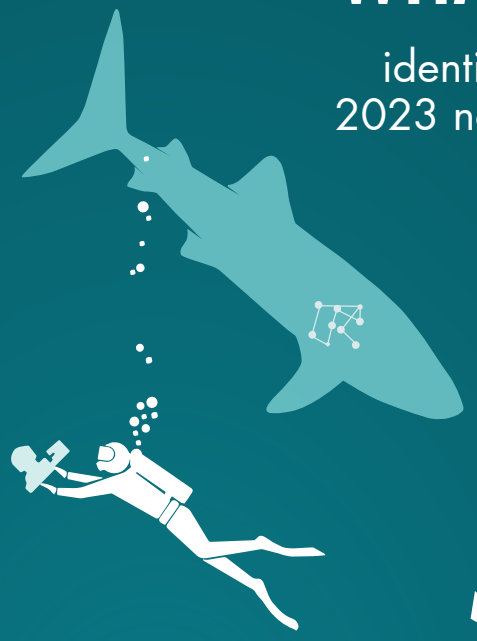
TRACKING MOVEMENTS

13 whale sharks acoustically-tagged, and 1 satellite tag deployed off Nosy Be



525 WHALE SHARKS

identified from 2015 to 2023 near Nosy Be in NW Madagascar



50 BIOPSIES

collected and sent to CSIRO for analysis

MASTERS STUDENT

studying whale shark prey



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





TANZANIA HIGHLIGHTS

NO PLACE LIKE HOME

Four whale sharks have been seasonally visiting Mafia Island for at least 15 years



TRACKING MOVEMENTS

9 satellite tags deployed to track whale shark movements, in collaboration with the Reef Ecology Lab at KAUST



69 TISSUE SAMPLES

collected for genetics, feeding ecology and pollution studies




27 NEW SHARKS

identified in 2023 at Mafia Island, which is home to a small, highly resident population of 250+ whale sharks



WHALE SHARKS FEEDING ON
A BAITBALL OFF MAFIA ISLAND,
TANZANIA

INDONESIA HIGHLIGHTS

90 
DIVE SURVEYS
for manta rays and marine turtles

3,180
MANTA RAYS
now identified
throughout Indonesia

21
MANTAS
STEREO-MEASURED

**NEW
MASTERS
STUDENT**

Project leader, Janis Argeswara, is currently a Fulbright Scholar at Florida International University

OUTREACH
Presented to government agency for marine resources, plus 570+ people reached through our local school visits and industry workshops

**NEW INDONESIAN
RESEARCHERS**

Four students are being trained in research techniques from the Bina Nusantara, Diponegoro, and Bandung IT Universities

AULIA ZEINTRINANDA, MMF TURTLE PROJECT LEADER,
GRADUATED FROM THE UNIVERSITY OF QUEENSLAND IN
DECEMBER 2023 WITH A MASTERS IN CONSERVATION BIOLOGY





MANTA SWIMS THROUGH PLASTIC POLLUTION AT NUSA PENIDA

Photo by Brooke Pyke



FLORIDA HIGHLIGHTS

30 AERIAL SURVEYS

looking for manta rays along the Florida coastline, and 500+ drone flights to locate mantas and observe behaviors



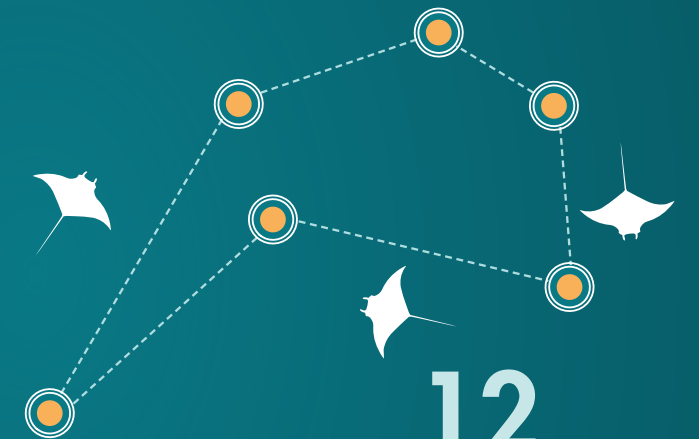
215 PLANKTON SAMPLES

analyzed to show us what mantas are consuming when feeding



OUTREACH

2,500 children reached through our education curriculum

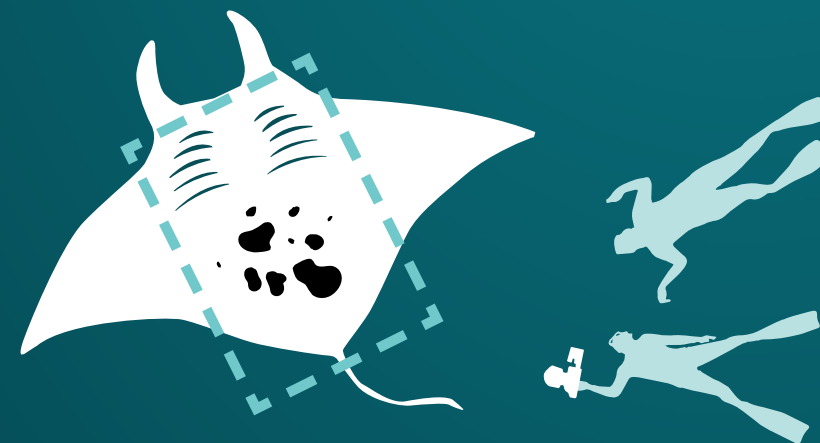


12 TAGGED MANTA RAYS

with acoustic and satellite tags, including two tagged at the mouth of the Mississippi River

70 BOAT SURVEYS

for manta rays around the Florida coastline



210 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.

GREAT BARRIER REEF HIGHLIGHTS



Great Barrier Reef Marine Park

2 SEASONS
of collaborative research in far north QLD with Biopixel Oceans Foundation

32 WHALE SHARKS
identified from the Wreck Bay area

15 SHARKS TRACKED
with satellite tags

20+ AERIAL SURVEYS
by plane and helicopter to help locate whale sharks, with 100+ drone flights

The infographic features a map of Australia with a location pin for the Great Barrier Reef Marine Park. It includes icons for satellite tags, a shark's movement path, a shark with a tag, a diver, a helicopter, and an airplane. A large whale shark is also depicted at the bottom right.

2023 SCIENTIFIC PAPERS

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

Persistent transboundary movements of threatened sharks highlight the importance of cooperative management for effective conservation.

Daly R, Venables SK, Rogers TD, et al. Marine Ecology Progress Series.

Annual recurrence of the critically endangered bowmouth guitarfish (*Rhina ancylostoma*) in Djibouti waters.

Boldrocchi G, Robinson D, Caprodossi S, Mancuso E, Omar M, Schmidt JV. Biology.

Movement and vertical habitat use of yellowfin tuna *Thunnus albacares* in a vertically compressed habitat: the Galápagos Marine Reserve.

Rohner CA, Garabato ACN, Hearn AR. Journal of Fish Biology.

Emergent community architecture despite distinct diversity in the global whale shark (*Rhincodon typus*) epidermal microbiome.

Doane MP, Reed MB, McKerral J, et al. Scientific Reports.

Widespread diversity deficits of coral reef sharks and rays.

Simpfendorfer CA, Heithaus MR, Heupel MR, et al. Science.

Multiple datasets confirm range extension of the sicklefin devil ray *Mobula tarapacana* in the western North Atlantic Ocean off the eastern USA.

Pate JH, Wilmott JR, Jones C, Horn C, and Farmer NA. Journal of the Marine Biological Association of the United Kingdom.

Underwater ultrasonography and blood sampling provide the first observations of reproductive biology in free-swimming whale sharks.

Matsumoto R, Murakumo K, Nozu R, et al. Endangered Species Research.

Interactions between marine megafauna and plastic pollution in Southeast Asia.

Omeyer LCM, Duncan EM, Abreo NAS, et al. Science of the Total Environment.

Plastic pollution and marine megafauna: recent advances and future directions.

Nelms SE, Clark BL, Duncan EM, et al. In: Plastic Pollution in the Global Ocean.

Southward range extension and transboundary movements of reef manta rays *Mobula alfredi* along the east African coastline.

Marshall AD, Flam AL, Cullain N, Carpenter M, Conradie J, Venables SK. Journal of Fish Biology.



RESEARCH OUTPUT



HIGHLIGHTING OUTREACH



Our Mozambique teams filmed for **Inside Africa** who featured MMF to a global audience through August



Our Virtual Reality experience is currently being played in 54 zoo and aquaria over 7 continents. Since it's April release, over 130,000 people have experienced the content

OCEAN GIANTS MAGAZINE

Our third year of distributing our quarterly magazine to help showcase marine research, conservation, and education to over **9,000 subscribers.**



**3,500 +
MINI MARINE
CONSERVATIONISTS**

inspired through our global education programs

**1M+
REACHED
VIA OUR WEBSITE
& SOCIAL MEDIA**

**GREW OUR
SOCIAL MEDIA**
f 30,100+ @ 25,600+

GLOBAL MEDIA FEATURES

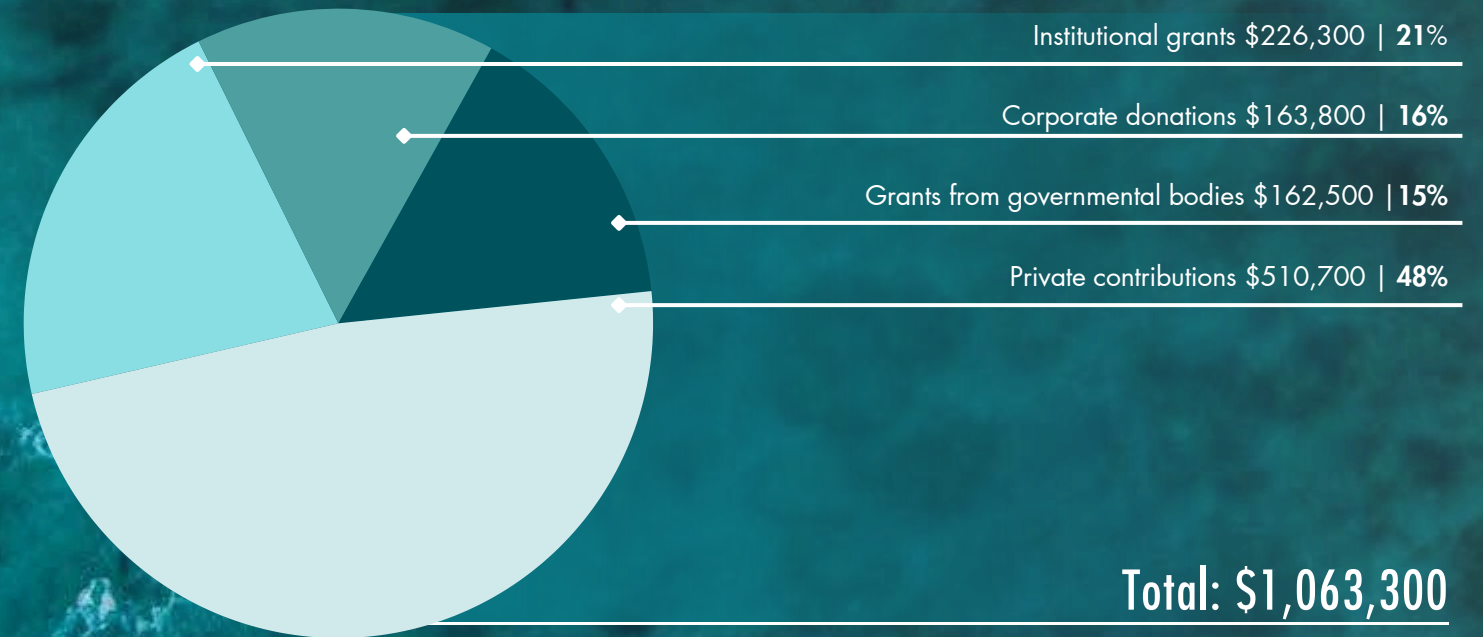


DR STEPHANIE VENABLES CONDUCTING AN
ELASMOBRANCH SURVEY IN MOZAMBIQUE

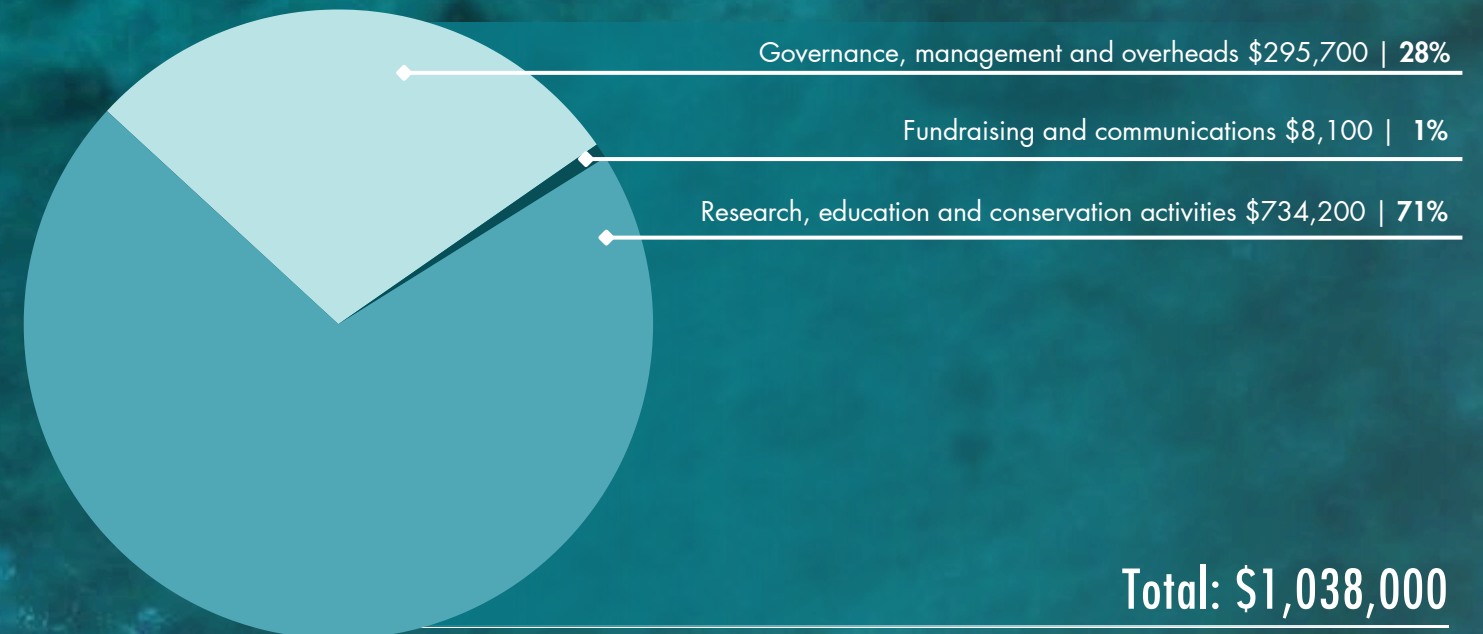


FINANCIAL SUMMARY 2023

REVENUE



EXPENDITURE



Thank you



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
- A Stuart Holdings
- Aqua-Firma
- Better Giving
- Blue Action Fund
- Big Fish Diving
- Boris Worm
- Casa JVC
- David & Carol Myers Foundation
- Disney Conservation Fund
- Alina Riensema
- Elasmocean
- Elnora Cameron
- Fondation Ensemble
- Fortuna Foundation
- Foundation Segre
- Georgia Aquarium
- Government of Ireland – International Development Program
- Help For Mozambique
- Jim Artindale & Ann Rooney
- John Marshall
- Kansas City Zoo
- Mantahari Oceancare
- Margo Marshall
- Mark & Caroline Hackney
- Milkywire
- Mission blue
- MMF Canada
- Mohamed Bin Zayed Species Conservation Fund
- Morin Resort
- NACORA
- Ocean Mata
- Ocean Wildlife Project
- Our Children's Earth Foundation
- Paul T. Jones, II and Sonia M. Jones
- Peri-Peri Divers
- Potenza Family Charitable Fund
- Pure Ocean Fund
- Prince Albert II of Monaco Foundation
- Queensland Government
- Ray of Hope Expeditions
- ScubaPro
- Shark Conservation Fund
- Shark Foundation
- Stichting Kalverboer Silsby Foundation
- Sundive Byron Bay
- Thanda Island (Thanda Tanzania Ltd)
- The Irish Embassy
- The Rufford Foundation
- Turing Foundation
- Ultralight Control Systems
- Waterlust
- Windrush Trust
- WWF Tanzania
- Zoomarine



**Healthy ecosystems
are more resilient
to climate change.**

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



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