

PADI DISTINCTIVE SPECIALTY



MANTA RAY CONSERVATION

MANTA RAY CONSERVATION

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"You get the sense there's a lot more going on than in your average fish"
Josh Stewart, Manta Trust

WHAT ARE MANTA RAYS?

CLASSIFICATION

Both Oceanic Mantas (*Mobula birostris*) and Reef Mantas (*Mobula alfredi*) fall in the same family, Mobulidae and are part of the same class as sharks, Chondrichthyes, meaning they are a cartilaginous fish;

Animalia - Chordata - Chondrichthyes - Rajiformes - Mobulidae

MANTA RAY EVOLUTION

Mobulid rays are thought to have come into existence around 30 million years ago, coinciding with a period of global cooling combined with changes in ocean currents facilitated massive upwellings of nutrient-rich deep water allowing previously bottom dwelling rays to move up into the water column and develop filter-feeding strategies. Following periods of global warming is thought to have caused further divergence in the mobulid lineage as a result of fragmentation of populations with isolated population evolving into distinct species (Poortvliet, 2015)

As we know them today fossils of extant species date back only to the Early Pliocene around 5 million years ago (Bourdon, 1999) and it is thought that *M. alfredi* and *M. birostris* diverged within the last 1 million years (Kashiwagi et al., 2012)

One of the most significant discoveries with manta rays is the absolute brain to body mass ratio which has been shown to be the highest amongst all fish, as well as the more recent discovery that mantas have self-awareness (Ari and D'Agostino, 2016) proving these creatures are not only beautiful but also incredibly intelligent.

WHAT ARE MANTA RAYS?

MANTA RAYS VS OTHER MOBULID RAYS

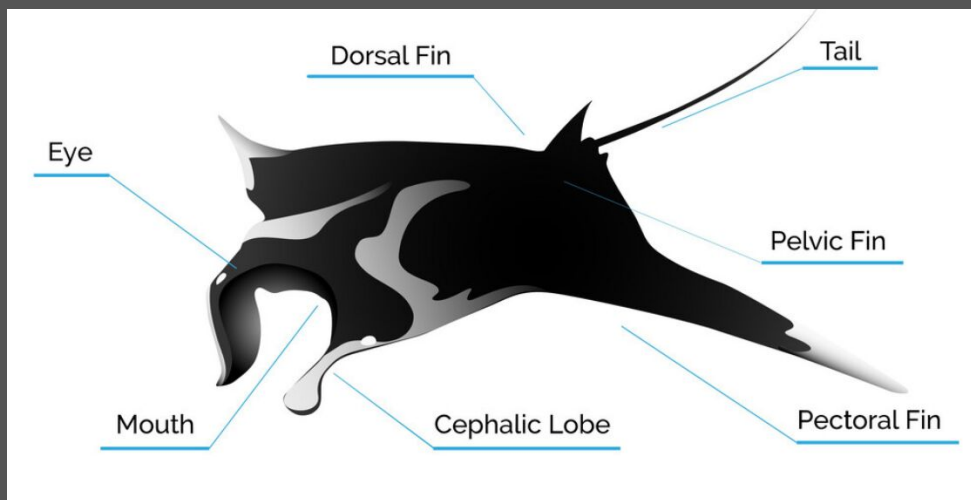


Morphologically manta rays are different from the other mobula ray species in the following ways;

- Terminal mouth
- Presence of spine
- Length of cephalic fins
- Broader head relative to max disc width
- Structure of the filter plates

(Compagno and Last, 1999; Paig-Tran et al., 2013; Marshall et al., 2009)

MANTA RAY ANATOMY



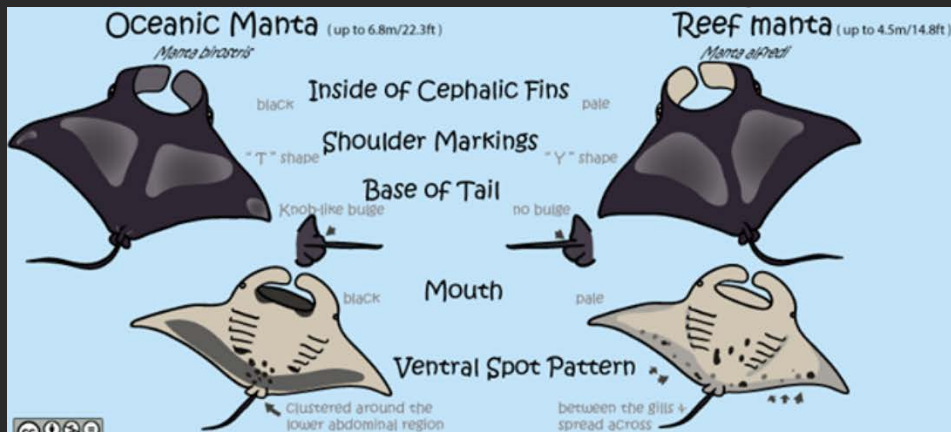
OCEANIC MANTAS VS REEF MANTAS

In 2009, Dr. Andrea Marshall (Queen of the Mantas) published a paper that resurrected the historically described *Manta alfredi* (Krefft, 1868), now *Mobula alfredi*, as a distinct species from *Manta birostris*, now *Mobula birostris*. The paper also hints at a third species resident in the Atlantic Ocean, *Manta sp. cf. birostris* however further study is needed for this to be conclusive.

Dr. Marshall's work opened the door for so much research into manta rays and she is the co-founder of Marine Megafauna Foundation alongside whale shark expert Dr. Simon Pierce.

OCEANIC VS REEF MANTAS

THE DIFFERENCES



Mobula alfredi and *Mobula birostris* differ in the following ways, however these are not absolute (with the exception of the presence of the spine remnant);

- Maximum Size (DW) - Oceanic < 710cm. Reef < 500cm
- Shoulder Markings - Oceanic - T Shape. Reef - Y Shape
- Base of Tail - Oceanic- Remnants of spine. Reef - No remnants of spine
- Ventral Spot Pattern - Oceanic - Clustered. Reef - Spread across ventral side

WHERE ARE MANTAS FOUND?

DISTRIBUTION & CONSERVATION STATUS

Oceanic Manta Ray (*Mobula birostris*)

- Circumglobal in tropical and temperate waters (however often not crossing oceans)
- Sightings often seasonal
- More solitary, possibly migratory
- Depth Limit - 1000m
- Conservation Status - Vulnerable

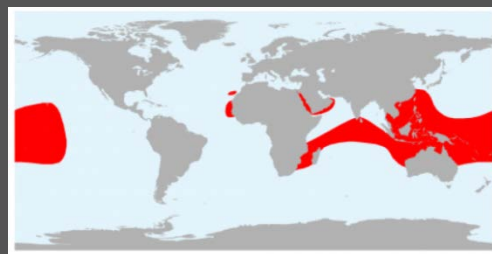
(IUCN Red List - *Mobula birostris*)



Reef Manta Ray (*Mobula alfredi*)

- Circumglobal in tropical and sub-tropical waters, not Atlantic
- Resident in or along productive near-shore environments
- Move between inshore cleaning and feeding stations
- Depth Limit - 300m
- Conservation Status - Vulnerable

(IUCN Red List - *Mobula alfredi*)





WHERE ARE MANTAS FOUND?

HABITAT & CONGREGATIONS

Oceanic Manta Ray (*Mobula birostris*)

Oceanic mantas (*Mobula birostris*) are commonly sighted along productive coastlines with regular upwelling, ocean island groups and offshore pinnacles and sea mounts (pictured above in Socorro, Revillagigedo Islands, Mexico). They are more oceanic and more migratory than reef manta rays with migrations across international borders and up to 1100km (Marshall et al., 2011) however recent research suggests that they do not cross oceans as often as was previously thought (Stewart et al., 2016) and if there is abundant food in an area they do not appear to travel far (Marshall et al., 2011). Additionally *Mobula birostris* inhabit shallow reefs during daylight hours and migrate vertically at night to deeper waters (Dewar et al. 2008)

Reef Manta Ray (*Mobula alfredi*)

Reef mantas (*Mobula alfredi*) are mainly found inshore and around coral reefs, rocky reefs and seamounts. They have smaller home ranges and shorter migrations than oceanic manta rays and are often 'resident' in areas of high primary productivity demonstrating a more sociable behaviour than their larger relatives (Homma et al. 1999, Dewar et al. 2008, Marshall et al. 2009). In some areas their habitats do coincide with that of Oceanic Mantas but this is not always the case. Reef mantas congregate in high numbers in feeding and cleaning areas and seem to work cooperatively when feeding in areas such as Hanifuru Bay, Maldives (Stevens, G., pers. comm). In other locations such as Australia seasonal migrations of up to 500km are regularly observed and they are known to have daily migrations of up to 70km (Couturier et al., 2011). Similarly to oceanic mantas, reef mantas have been shown to dive deep during night time (Braun et al., 2014)

MANTA RAY BEHAVIOUR

FEEDING

Manta rays are filter feeders that feed on zooplankton, including; euphasids, copepods, mysids, decapod larvae and shrimp

- They use their cephalic fins, once unfurled, to funnel in plankton-rich water
- The gill rakers are then used to strain and capture the food
- Large congregations of mantas can be found in feeding areas (eg. Hanifuru Bay,)
- Barrel Rolling - In areas of high food concentration when current is weak
- Cooperative Feeding - in high food concentration when current is strong (Stevens, G., pers. comm)
- Kona Night Dive - lights attract zooplankton, the most famous night dive in the world
- New research has suggested that with oceanic manta rays the majority of their diet actually comes from deep-sea sources between 200m and 1000m depth, unlike reef mantas who feed predominantly at the surface (Burgess et al., 2016, Stewart et. al, 2016)



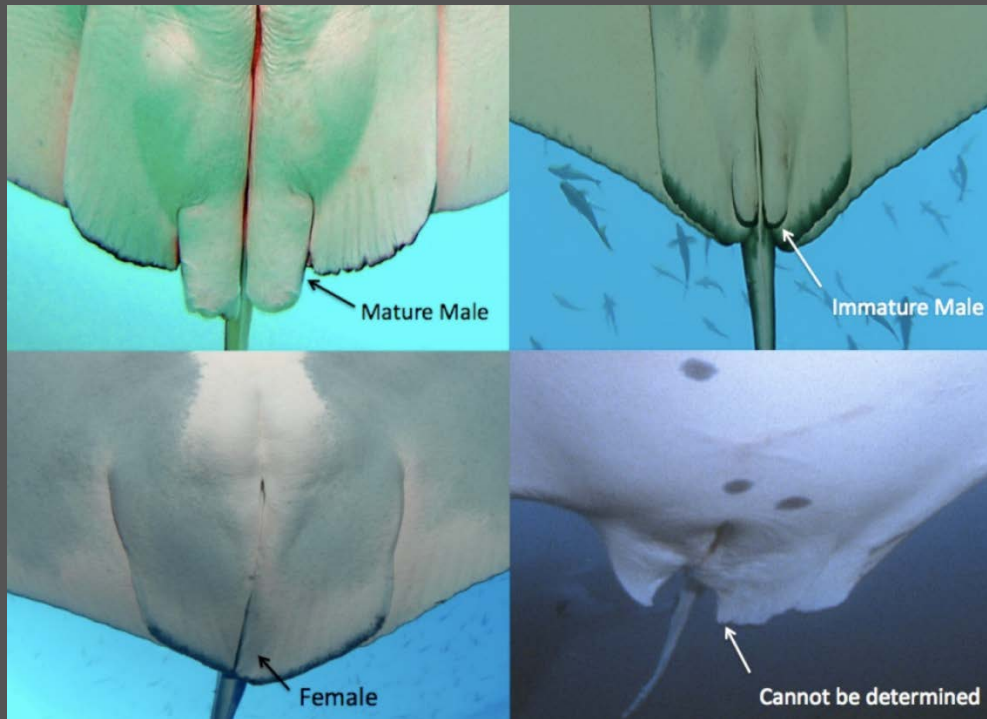
CLEANING STATIONS

- Cleaning Symbiosis - Cleaner fish remove parasites externally and internally
- Help with fighting infection of bites and aiding healing by cleaning wounds
- Different species of cleaner fish at one site may do different jobs, or focus on different areas
- Mantas actively seek out these areas and will 'queue' to be cleaned
- Species of cleaner fish dependent on region: Angelfish - Socorro (Giant Mantas). Cleaner Wrasse - Hawaii. Butterflyfish & Sergeant Majors - Mozambique



MANTA RAY BEHAVIOUR

SEX IDENTIFICATION



REPRODUCTION

The slow life history of manta rays is cited as a key reason why such species have little capacity to withstand directed fisheries (Dulvy et al., 2014)

Life Expectancy	40 years + (although largely unknown)
Sexual Maturity	Reef - 8 years (female) Reef - 6 years (male) Oceanic - Unknown
Type	Ovoviparous
Gestation	1 year
Offspring	1 pup (1.5m)
Frequency	2-5 years

Data from IUCN Red List for *Mobula birostris* and *Mobula alfredi*

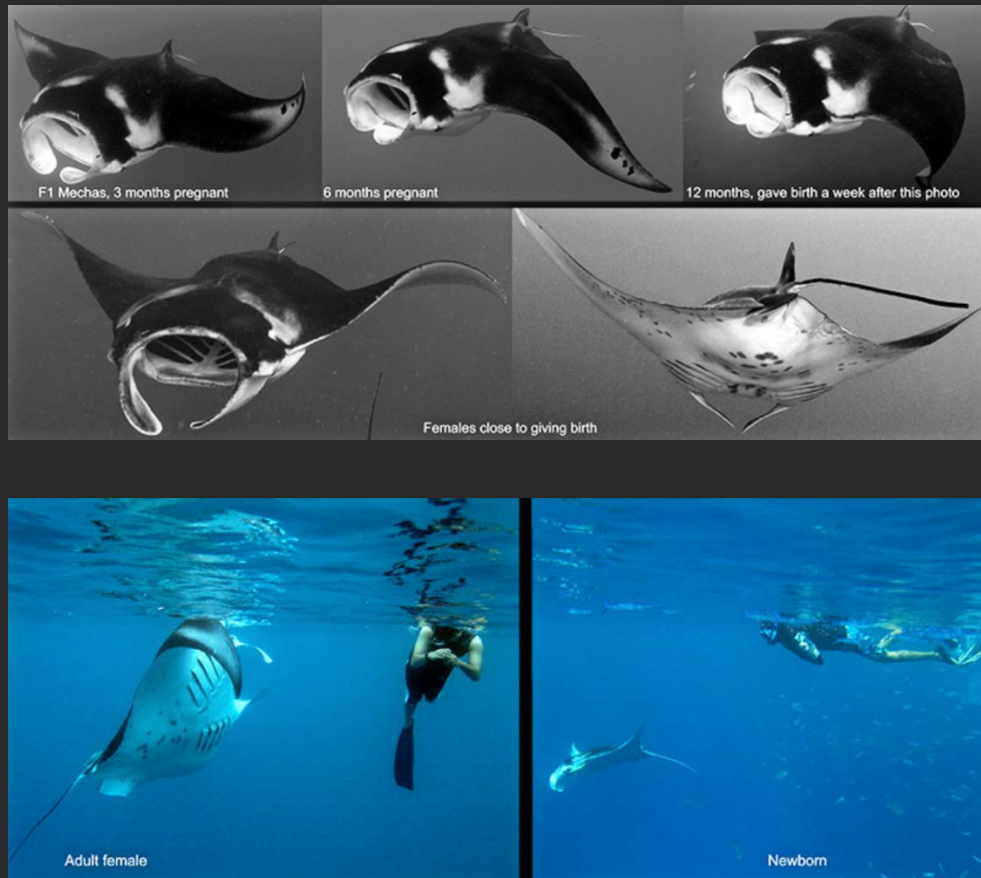
MANTA RAY BEHAVIOUR

REPRODUCTION



Mating in manta rays is far more graceful and less violent than mating in sharks. A female ready to mate will be followed by many males in what is known as a 'Mating Train' where the males compete by trying to match the females moves (Yano et al., 1999; Marshall and Bennett, 2010). This has been shown to last for up to several days, not always ending with the female selecting a mate. Mating itself has rarely been observed however mating scars are seen on the left pectoral fins of females and the claspers of males. After a pup is born there is no parental guidance and offspring fend for themselves (Deakos, 2010)

The first important juvenile manta ray (*Mobula birostris*) habitat was identified in 2018 in Flower Garden Banks National Marine Sanctuary in the northwestern Gulf of Mexico (Stewart et al., 2018)



THREATS & VALUES



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"Better to light one candle than curse the darkness"
Rev. Seizan Kawakami

THREATS & VALUES

NATURAL PREDATION

Due to their size manta rays do not have many natural predators

Known to attack;

- Killer Whale (*Orcinus orca*)
- False Killer Whale (*Pseudorca crassidens*)
- Tiger Shark (*Galeocerdo cuvier*)
- Great Hammerhead (*Sphyrna mokarran*)
- Bull Shark (*Carcharhinus leucas*)
- Grey Reef Shark (*Carcharhinus amblyrinchos*)

(Marshall & Bennett, 2010)



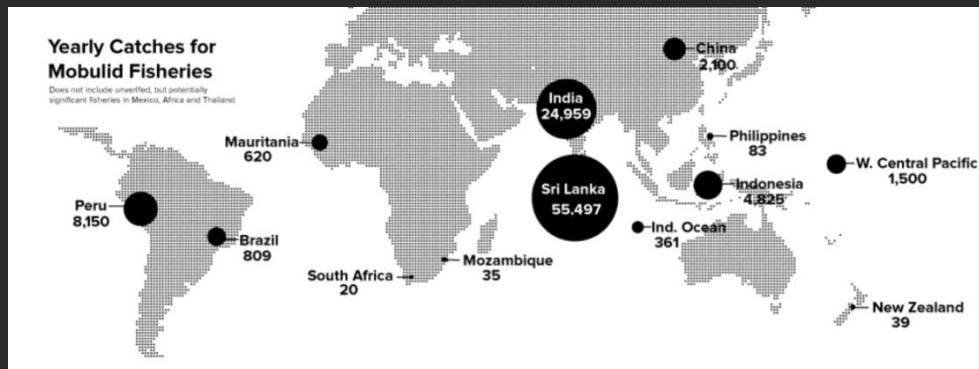
Mantas are able to regenerate tissue quickly and recover from significant bites as shown in the photos below.

Frequency of attacks appears to be regional, due to the number of predators in the area.
e.g. Mozambique - High / Maldives - Low (Marshall & Bennett, 2010)



THREATS & VALUES

TARGETED FISHERIES



Between 1998 and 2009, mobulid landings increased more than an order of magnitude (from 200 to 5000 metric tons year (Ward-Paige et al., 2013). Targeted fisheries have been reported in Indonesia (previously), Philippines, India, Sri Lanka, Mexico, Taiwan, Mozambique, Gaza, Palestinian Territories and Egypt (Croll et al., 2016)

Manta rays are targeted by fisheries using harpooning, netting and trawling. They are easy prey due to their large, often slow moving at the surface with aggregating behaviours and predictable habitat use and lack of human avoidance. They have high value in the increasing international Gill Raker Trade and artisanal fisheries target them for food and local products. (WildAid, 2014)

THE GILL RAKER TRADE

The shark fin trade has received a lot of media attention in recent years however there is also a less publicised growing demand for manta ray gill rakers that has only recently begun to be researched and discussed,

- *Peng Yu Sai* - Local name for the health tonic / soup made from gill rakers
- Promoted as a way of removing toxins from the body, curing and aiding in recovery from a range of ailments including cancer, acne, fever, chicken pox
- Also claimed that it boosts the immune system in general
- High levels of Arsenic, Cadmium, Mercury and Lead in all samples (WildAid, 2014)
- Not officially recognised as Traditional Chinese Medicine (WildAid, 2014)
- Some believe the demand for gill rakers has increased since the demand for shark fin has started to fall, often using same trade routes and traders (O'Malley et al, 2016)



THREATS & VALUES

BYCATCH

Mobulids have been reported as bycatch in 30 small- and large-scale fisheries globally (Croll et al., 2016), although the unreported figure is likely to be much higher

- Gillnet, purse seine fisheries and netting programs throughout distribution as non-target species, often retaining catch to sell to the gill raker trade.
- Drift nets regularly catch mantas in the Phillipines (Acebes & Tull, 2016)
- Protective shark netting also responsible for catching mantas in South Africa and Australia



POLLUTION

The effects of pollution such as plastics and microplastic ingestion in manta rays is widely unknown but is being researched currently

- Microplastic pollution is a major threat to filter-feeding animals such as manta rays. Filtering of indigestible plastic particles can block nutrient absorption and cause damage to the digestive tract of animals. Additionally, plastic-associated chemicals and pollutants can accumulate over decades and alter biological processes, leading to altered growth, development and reproduction, including reduced fertility. (Germanov et al., 2018)
- Ghost Netting also poses a threat to manta rays that become entangled
- Additionally pollutants in the water may result in changes to the zooplankton distribution that manta rays feed on and the result of this is also currently widely unknown.



HABITAT DESTRUCTION / CLIMATE CHANGE

Coastal Development in many areas may interfere with local population of manta rays, especially reef mantas who live along productive coastlines. Coastal development can impact marine populations through loss of critical habitats, acoustic disturbance, increased pollution, increased anthropogenic activities related to tourism and physical disturbance. With manta rays increased turbidity as a result of dredging can decrease productivity and reduce the food resources available in an area (Kessel et al., 2017)

Climate change has also shown trends in decreasing both phytoplankton and zooplankton abundance in areas of the oceans in the last few decades (Chust et al., 2014). These changes potentially could put populations at risk if zooplankton levels fall low enough to not support the food demands of local manta populations.



THREATS & VALUES

UNREGULATED TOURISM

Manta rays have been known to have collisions with watercraft due when they spend time on the surface in congregations.

- The pictured reef manta was photographed by the Maldivian Manta Trust in Nov, 2018 and shows a boat propeller injury.
- In Hawaii, 2018 a reef manta from the Kona night dive was shown with a propeller injury which prompted policy change at the famous night dive



Additionally, excessive tourism in one site at Bora Bora was thought to have driven away a local population of mantas (de Rosemont, 2008). A precautionary approach to managing manta ray tourism must be taken in order to prevent tourism causing disturbance and potentially affecting the long term health of the manta ray population, with a need for improved tourist education and perhaps a regulated diver numbers at key sites (Anderson et al., 2011)

CAPTIVITY - AQUARIUMS

Animals in captivity has long been a topic of discussion, especially when it comes to larger creatures, such as the widely publicised Blackfish documentary released in 2013. With manta rays it is a controversial topic, however it is worth noting that the few places that manta rays are held in captivity are also research centres such as the Georgia Aquarium in the USA. The USA and Japan currently have mantas in display tanks with no plans for release. South Africa and Bahamas have previously held mantas.



HOW VALUABLE ARE MANTAS?

BIODIVERSITY

"Species are like a house of cards. You can't just take one card out of the deck, and not expect the deck to crumble."

Dr. Stewart Pimm - Duke University

The loss of any animal is devastating, we are here to try and preserve these majestic giants. Manta rays have an important role to play in maintaining a healthy balance in the ocean alongside all other marine animals.

THE ECONOMIC BENEFITS OF MANTA TOURISM

Research into the value of manta ray tourism alongside migration studies have been directly responsible for helping persuade governments to protect manta rays.

- Worldwide, more than one million people scuba dive or snorkel with manta rays each year
- Globally manta ray tourism generates US \$73 million directly for tour operators, with over US \$140 million direct economic impact, including associated tourism expenditures (O'Malley et al., 2013)
- Ten countries account for almost 93% of the global revenue estimate including; Japan, Indonesia, the Maldives, Mozambique, Thailand, Australia, Mexico, USA, Micronesia and Palau (O'Malley et al., 2013)
- The Maldives is estimated to bring in US \$8.1 million a year directly from manta tourism (Anderson et al., 2011)
- In Indonesia alone the industry is worth over US \$15 million (O'Malley et al., 2013)
- Unfortunately often manta fishing grounds and tourism overlap.
- One manta is worth US \$1 million over it's lifetime vs. \$500 dead in the fish market (O'Malley et al., 2013)



SAVING MANTAS



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*"I will never stop trying to inspire people or urging them to get involved in this fight"
Dr. Andrea Marshall, Queen of Mantas.*

SAVING MANTA RAYS

RESEARCH QUESTIONS

There are still so many unanswered questions about manta rays. Hard numbers are needed to back up circumstantial evidence to help effect policy change.

Here are just a few questions that scientists are currently working on:

- Are they declining worldwide as a whole or concentrated declines in certain areas? How fast are they declining?
- Migrations - Where do they go? Is it annual? Can we predict it?
- Populations - Are they connected populations? Are they isolated subpopulations? Is there regional connectivity? Are there difference between the populations?
- Plastics & Megafauna - Are they ingesting plastic? How much? Is it damaging? What can be done?

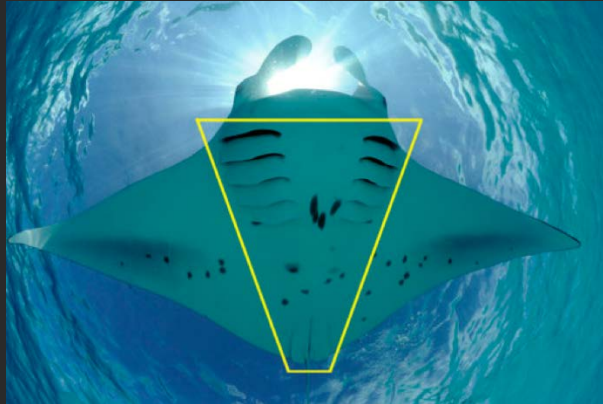
FURTHER READING IN CURRENT MANTA RESEARCH

- Dr. Andrea Marshall - Research - <http://www.queenofmantas.com/research/>
- Dr. Guy Stevens - Research - https://www.researchgate.net/profile/Guy_Stevens
- Joshua Stewart - Research - https://www.researchgate.net/profile/Joshua_Stewart5
- Elitza Germanov - Research - https://www.researchgate.net/profile/Elitza_Germanov
- Marine Megafauna Foundation - <https://marinemegafaunafoundation.org>
- Manta Trust - <https://www.mantatrust.org/>

CITIZEN SCIENCE

"By photographing a manta ray you can **directly** contribute to a global effort to better understand and protect these amazing animals" - Mantamatcher

TAKING GOOD ID PHOTOS



The above image is a great example of a good identification photo of a manta ray

- You need a clear in focus shot of the ventral surface (belly) of the manta ray
- It is best to crop the image and rotate it so the manta ray is centred
- Record the date, time seen and location the manta ray was sighted

The below databases use computer software to map, identify and recognise individual manta rays with a high level of accuracy as the spot patterns on a manta is similar to a human's individual fingerprint and do not vary greatly over time.

WHERE TO UPLOAD YOUR IMAGES

Manta Matcher - Marine Megafauna Foundation

- 9,433 individual manta rays identified since the launch in 2012
- Developed by Dr Andrea Marshall ("Queen of the Mantas")
- Headquarters in Tofo, Mozambique with additional offices across Indonesia and the USA



**MARINE
MEGAFUNA
FOUNDATION**

Website - www.mantamatcher.org

ID The Manta - The Manta Trust

- Over 10,000 individual manta rays identified since the launch in 2012
- The Manta Trust is based in the UK but has a global presence with affiliate partners researching in many locations across the Indian Ocean, SE Asia, Western Pacific and Central and South America.



Website - www.mantatrust.org/idthemanta

HOW CAN MANTAS BE SAVED?

MARINE DEBRIS MANAGEMENT

The global population is awakening to the problem of marine debris and it is easy to get involved in helping this problem, no matter where you are in the world. It can also be a great way of engaging local communities and educating people..

- **Underwater Cleanups** - Organised events such as Dive Against Debris or Adopt a Dive Site and submitting data to global databases
- **Land / Beach Cleanups** - Stopping debris making it to the ocean with organisations such as Trash Hero, Save The Plastic or 4Ocean, or just following the Take Three For The Sea mentality
- **Engaging in Scientific Research** - The impact of marine debris such as Microplastic Manta Trawls with Save The Plastic and 5 Gyres
- **Following REFUSE - REUSE - REDUCE - REPURPOSE - RECYCLE** in terms of what you use in your everyday life
- **Campaigning Governments** - The banning of single-use plastics and develop better waste management strategies



MARINE DEBRIS ORGANISATIONS

Project AWARE - Dive Against Debris / Adopt a Dive Site

Website - <https://www.projectaware.org/diveagainstdebris>

Trash Hero

Website - <https://trashhero.org>

Save The Plastic

Website - <http://savetheplastic.org>

4Ocean

Website - <https://4ocean.com/>

5 Gyres

Website - <https://www.5gyres.org/>

The Plastic Bank

Website - <https://www.plasticbank.com/>

MORE OCEAN
LESS PLASTIC
THE 5 GYRES INSTITUTE

4Ocean



HOW CAN MANTAS BE SAVED?

LOCAL MANAGEMENT & COMMUNITY ENGAGEMENT

- Getting people in the water so they can see the wonder of mantas
- Working with locals to educate and aid them with declining fisheries, teaching them the value of mantas alive vs. dead
- Helping provide alternative incomes to manta fishing. e.g. Misool
- Making local people ambassadors for conservation by teaching them the methods for data collection and conservation
- Educating people in China to toxins and conservations issues e.g. WildAid



REGIONAL PROTECTION

Since February 2014 Indonesia has fully protected manta rays within its exclusive economic zone (EEZ) covering nearly 6 million square kilometres making it the largest sanctuary for manta rays in the world! Possibly due to the US\$15 million estimated annual value of its manta ray tourism (O'Malley et al., 2013)

GLOBAL PROTECTION

In recent years there has been growing momentum for the global protection of manta and mobula Rays, due to the campaigning of organisations such as Marine Megafauna Foundation, The Manta Trust and scientists working on the conservation of these majestic species.

The Convention on the Conservation of Migratory Species of Wild Animals (CMS)



As an environmental treaty under the aegis of the United Nations Environment Programme, CMS provides a global platform for the conservation and sustainable use of migratory animals and their habitats.

- Manta Rays (2 species) included from 2011
- Mobulid Rays (9 species) included from 2017

The Convention on International Trade in Endangered Species (CITES)



CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

- Manta Rays (2 species) added to Appendix II in 2014
- Mobulid Rays (9 species) added to Appendix II in 2017



HOW CAN MANTAS BE SAVED?

RESPONSIBLE OPERATIONS

Case Study - Misool Eco Resort / Misool Foundation, Raja Ampat, Indonesia

Misool Private Marine Reserve protects 30,000 acres of the world's richest reefs. Since 2005 a powerful partnership between local communities and private enterprise resulted in the creation of the region's First No Take Zone. With a permanent staff of 15 local rangers the reserve is patrolled 365 days a year at a cost of \$250,000 with a plethora of community initiatives and the research to prove that it is working (biomass has increased by over 250% in 6 years) it is one of the most successful marine reserves in the world. (Globoceanrefuge.org, 2018)

Find Out More Here - <https://www.misoolfoundation.org>

Case Study - Hanifaru Bay (UNESCO Marine Protected Area), Baa Atoll, Maldives

Hanifaru was declared protected on 5 June, 2009 and the protected area of coverage includes the uninhabited island of Hanifaru and the reef of Hanifaru extending to 200m. It is one of the World's most iconic dive sites for the amazing interactions that can be had with annual congregations of literally hundreds of manta rays as well as other megafauna such as whale sharks and nesting green and hawksbill turtles. (Broffice.gov.mv, 2019)

- Operators required to follow strict rules including access times, routes, mooring locations, maximum vessel numbers (5) and maximum tourist numbers (80)
- Tourists are required to follow strict animal-interaction guidelines, and are guided by certified Hanifaru guides.
- Each tourist pays a fee of US\$20 to the Baa Atoll Conservation Fund (BACF).

Find Out More Here - <http://broffice.gov.mv/en/index.php/protected-areas/18-hanifaru>

INTERACTING WITH MANTAS

CODE OF CONDUCT - DIVING WITH MANTAS

CODE OF CONDUCT FOR MANTA RAY INTERACTIONS

PHOTOGRAPHS

Please abide by these guidelines and avoid excess flash photography when photographing mantas, do not point your flash directly into their eyes.

If you happen to photograph the spot pattern on the underside of a manta ray, please submit it to MantaMatcher.org to help us learn more about these incredible creatures.

PLEASE LOOK, BUT DO NOT TOUCH

Touching a manta ray invades their personal space and can disturb their behavior and lead to shorter interaction times.

KEEP YOUR DISTANCE

Try to stay at least 3m/10ft away from a manta. If a manta ray comes close to you, simply remain calm and still, maintain good buoyancy and let the manta control the interaction.

APPROACH SLOWLY

Do not chase or harass manta rays or block their path while they are swimming.

Remain low and close to the bottom giving the mantas space to swim above you. It is important not to restrict their natural behavior and movements.

DO NOT ENTER CLEANING STATIONS

Even when mantas are not there - they can arrive at any time and we do not want to scare them away. Maintain a good distance from cleaning stations during your descent and ascent.

Cleaning stations are important in maintaining the health of manta rays as cleaner fish remove parasites and clean any wounds or infections. Disturbance at cleaning stations can cause mantas to stop cleaning or clean elsewhere.

BE CAREFUL NOT TO TOUCH OR DAMAGE MARINE LIFE

This includes hard and soft corals - these are critical habitats for the cleaner fish that clean the mantas and other fish. If you need to hook into the reef, ensure you are hooking into rock or dead coral.

SCUBA DIVING



MARINE MEGAFaUNA FOUNDATION
SAVING OCEAN GIANTS FROM EXTINCTION

INTERACTING WITH MANTAS

CODE OF CONDUCT - SNORKELING WITH MANTAS

CODE OF CONDUCT FOR MANTA RAY INTERACTIONS



KEEP NOISE TO A MINIMUM

Enter the water by sliding in slowly from the boat - do not jump in. Keep your fins under the surface of the water while you are kicking to reduce splash.

SNORKEL CALMLY AND SLOWLY

If the manta rays are feeding close to the surface of the water, try to stay still and let the mantas swim around you.



PLEASE LOOK, BUT DO NOT TOUCH

Touching a manta ray invades their personal space and can disturb their behavior and lead to shorter interaction times.



KEEP YOUR DISTANCE

Try to stay at least 3m/10ft away. If a manta ray comes close to you, simply remain calm and still and let the manta control the interaction.



APPROACH SLOWLY

Do not chase or harass manta rays or block their path. Avoid duck-diving in front of a manta ray as it may startle them and cause them to stop cleaning or feeding. It is important not to restrict their natural behavior and movements.



SNORKELING



MARINE MEGAFUNA FOUNDATION
SAVING OCEAN GIANTS FROM EXTINCTION

INTERACTING WITH MANTAS

10 Tips for Divers to Protect the Ocean Planet

Divers share a deep connection with the ocean. You can make a difference for ocean protection every time you dive, travel and more.

Be a Buoyancy Expert

Underwater plants and animals are more fragile than they appear. The swipe of a fin, bump of your camera or even a touch can destroy decades of coral growth, damage a plant or harm an animal. Streamline your scuba and photo gear, keep your dive skills sharp, perfect your underwater photo techniques and continue your dive training to fine-tune your skills.

Always be aware of your body, dive gear and photo equipment to avoid contact with the natural environment.



Be a Role Model

New scuba divers are being trained and certified every day. Regardless of your experience level, be sure to set a good example for others when interacting with the environment—while underwater and on land.



Take Only Photos – Leave Only Bubbles

Nearly everything natural found underwater is alive or will be used by a living creature. If you take a coral, shell or animal, you can disturb the delicate balance and add to the depletion of dive sites for future generations.



Protect Underwater Life

Choose not to touch, feed, handle, chase or ride anything underwater. Your actions may stress the animal, interrupt feeding and mating behavior or provoke aggressive behavior. Understand and respect underwater life and follow all local laws and regulations.



Become a Debris Activist

An astonishing amount of waste makes its way underwater, reaching even the most remote ocean areas. Once there, it kills wildlife, destroys habitats and threatens our health and economy. Don't let your dives go to waste. Remove and report what doesn't belong underwater every time you dive. Make a conscious effort to buy green, buy local and, when possible, buy less.



Make Responsible Seafood Choices

Overfishing leads to species declines while harmful fishing practices damage and pollute underwater ecosystems. You play a critical role as a consumer. If seafood is part of your meal selection, ensure you're choosing sustainably sourced species and encourage others, including restaurants and shop owners, to do the same.



Take Action

Scuba divers are some of the strongest ocean advocates on the planet. Now, more than ever, divers like you are taking a stand. Speak out for conservation, share your underwater images, report environmental damage to authorities and campaign for change.



Be an Eco-tourist

Make informed decisions when choosing and visiting a destination. Choose facilities dedicated to responsible social and environmental business practices that include water conservation, energy reduction, proper waste disposal, use of mooring buoys and respect for local cultures, laws and regulations.



Shrink Your Carbon Footprint

Global warming and ocean acidification are putting your favorite animals and the whole ocean planet at risk. Do your part by understanding and reducing your carbon footprint and look for ways to offset what you can't reduce.



Give Back

Ocean protection depends on all of our actions, large and small. Investing in the ocean protects our planet and lets the dive adventure live on. Donate or fundraise for ocean protection to fuel the grassroots action and policy change necessary to ensure a clean, healthy ocean planet.



Thank you for giving the ocean planet the protections it deserves!
Take action with us at

PROJECTAWARE.ORG



KNOWLEDGE REVIEW

Answer the following questions. Your instructor will review your answers with you.

1. What are the main differences between manta rays and the other members of the mobulid ray family?
2. What are the main differences between oceanic manta rays (*Mobula birostris*) and reef manta rays (*Mobula alfredi*)?
3. What are the three colour morphs that manta rays can exhibit and describe the differences?
4. How do manta rays feed? Describe two variations of this behaviour.
5. What are cleaning stations and what kind of relationship exists at them?
6. Name three of the threats facing manta ray populations.
7. How do manta rays provide value to the world?
8. What protections are already in place to help conserve manta rays on both a regional and global level?
9. How can you contribute to scientific research into manta rays?
10. Describe how to have a positive, safe, environmentally friendly interactions with manta rays.

DIVE OBJECTIVES

As part of this course you will complete two Open Water dives at sites often frequented by manta rays. Before each dive your instructor will give you a thorough briefing, including environmental orientation, safety considerations and dive profile information.

Here are the main objectives of each dive:

DIVE 1 OBJECTIVES

- Practice Environmentally Responsible Diving Practices
- Follow The Code of Conduct for Manta Ray Interactions
- Identify The Type of Site (Feeding or Cleaning Station)
- Count The Number of Individual Manta Rays You See During Your Dive and Identify The Species Seen

DIVE 2 OBJECTIVES

- Dive 1 Objectives, plus the following for the sighted Manta Rays...
- Identify the Sex of any encountered Mantas
- Identify any Pregnancies, Mating Scars or Wounds present on the Mantas
- Identify Cleaner Fish Species if at a Cleaning Station
- Take ID Shots and Upload Them to Citizen Science Databases following your Dive

But, most importantly, have a WONDERFUL time viewing these charismatic gentle giants of the ocean and tell everyone you know about what you have experienced and learned about these magnificent creatures.

MANTA RAY RESOURCES

DOCUMENTARIES

Film - Racing Extinction (2016)

Not just about Mantas, but featuring the story of how manta rays came to be listed on CITES and featuring the work of The Manta Trust and Shawn Heinrichs being instrumental in making it happen



Film - The Patterns of The Ocean (2018)

The story of Marine Megafauna Foundation's fight to get manta rays protected throughout the whole of the Indonesian Exclusive Economic Zone



Natural World (2009) - Andrea, Queen of Mantas

The Story of Dr Andrea Marshall revealing the second species of Manta Ray in Mozambique

BOOKS

MANTA - Secret Life of Devil Rays (2016)

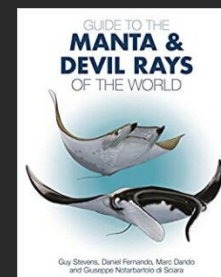
Guy Stevens, Thomas P. Peschak

For the past decade, marine biologist and leading manta expert Guy Stevens has devoted his life to answering the important questions about manta rays. Now he has joined forces with award-winning National Geographic photographer Thomas P. Peschak to produce this book. It combines groundbreaking photography, personal experiences and the latest scientific research to create the definitive publication about these charismatic animals.



Guide To The Manta And Devil Rays of The World (2018)

Guy Stevens, Daniel Fernando, Marc Dando and Guiseppa Notarbartolo Di Sciarra
Guide to the Manta and Devil Rays of the World includes detailed information on the identification, characteristics, threats, and distribution for each species in this family. Illustrated with more than 200 color photos, drawings, and plates, this guide also contains an expansive introduction to the general taxonomy, biology, and behavior of these iconic animals.



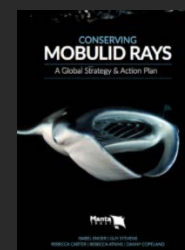
REPORTS

The Manta Trust - Conserving Mobula Rays - A Global Strategy and Action Plan (2018)

- <https://bit.ly/2Jhwo10>

WWF Report - Global Priorities for Conserving Sharks & Rays - A 2015-2025

Strategy - <https://bit.ly/2ub1qhs>



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