



Mobulid Identification

Guide



mantacatalogazores.wix.com/mobulaid



mantacatalogazores@gmail.com



Manta Catalog Azores



@MantaCatalog



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With the support of:



Oceanário de Lisboa



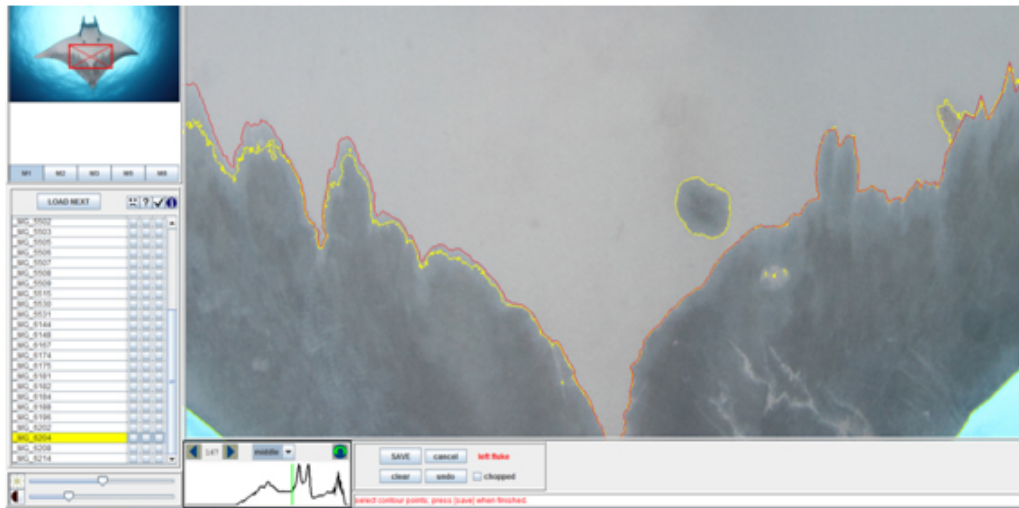
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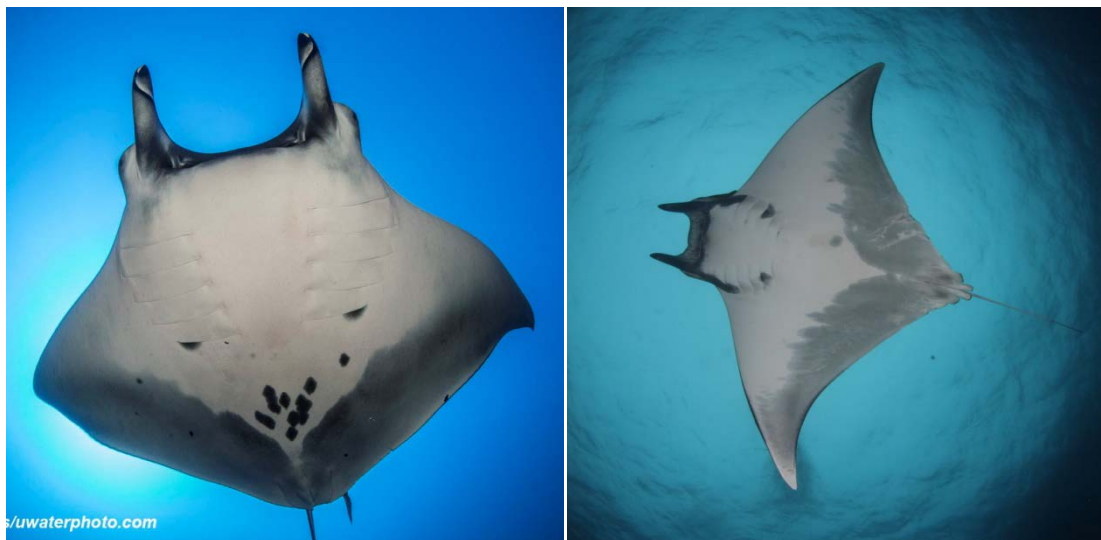
1. Manta Catalog Azores Project

This project aims to provide a better understanding of the spatial ecology of Mobulid rays and the threats they are facing. In particular, we want to learn where, when and why these animals aggregate at particular areas in the Atlantic Ocean, such as the seamounts in the Azores. For this we have developed a photo-ID catalog and a sightings database (number of animals seen on each dive), with the help of citizen scientists (divers that provide data) and of our collaborator dive centers.

Photo-ID consists in the use of photographs of marks or patterns that are unique to each individual and that remain without change throughout its lifetime. We can use these marks and patterns as fingerprints to ID different animals. This is a non-invasive method that allows us to study these animals with minimal impact. The larger the photo-ID database, the higher the chances of tracking a returning animal.



What does a photo-ID look like?



How to get involved:

You can help study these animals by sending us your photos/videos and information on your dives. We are looking for underside photos of the ventral pattern (see images below). These photos/videos will help us identify species and track individual animals when they visit these aggregations. The photos will be used for scientific purposes only and you can add your watermark as long as it doesn't cover the ventral area of the individuals. It is very important that you tell us the place and date were each photo was taken.

Send us your photos/videos to: **mantacatalogazores@gmail.com**

Thank you in advance! If you have any questions visit our website and don't hesitate to contact us!

A message from the researcher



I first arrived in the Azores in 2011 to start my MSc degree. Once here, I realized that this was one of the few places in the world where mobula rays gather in large groups. One species in particular, the Chilean devil ray *Mobula tarapacana*, which is barely known to science, yet it is one of the species caught by target fisheries around the world to satisfy the demand for mobula and manta gill rakers used in Chinese medicine. Having large groups of these rays 'in our own backyard' makes this the perfect place to study them, and that is what I have been doing.

I have now moved onto my PhD degree and 2017 will be the 6th year I will be collecting data on the occurrence of Mobulids in the Azores, with the precious help of dive operators and citizen scientists, through the project **Manta Catalog Azores**, which represents the first photo-ID database for a *Mobula* species worldwide.

The fact that these rays are present here only during the summer months (between June and October) gives us a short timeframe to study them. Moreover, the offshore location of their aggregations makes it difficult to carry out intensive field work. However, the help of citizen scientists and local dive centers has been crucial to gather data on these animals and to contribute to a better understanding of these unique aggregations that occur in the seamounts.

I would like to thank everyone that has contributed to this project so far. Thanks to their support and also the support of organizations like **Oceanário de Lisboa**, **Save Our Seas Foundation** and **Manta Trust** this project has been able to grow and to help increase our knowledge of these species.

Sincerely,

Ana Filipa Lourenço Sobral

Ana Filipa Sobral (aflsobral@gmail.com)

2. What's a Mobulid Ray?

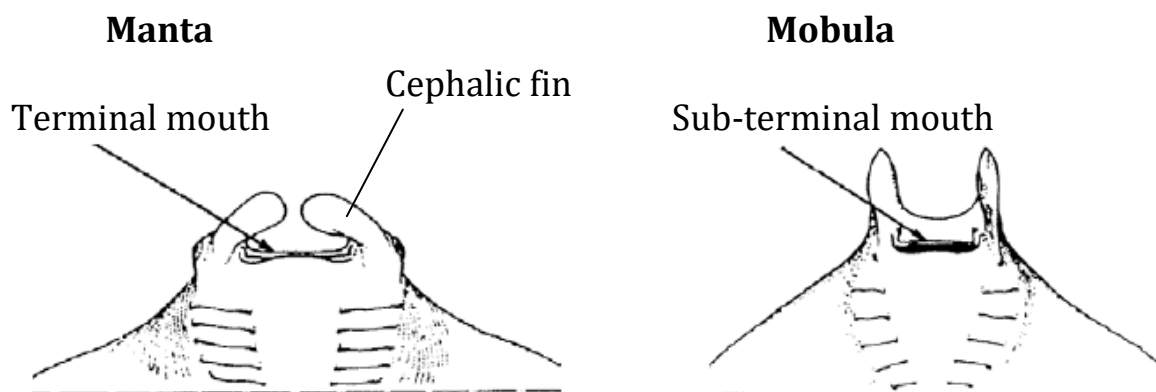
Mobulid rays belong to the family Mobulidae, which has eleven recognized species and comprises two genera: *Mobula* (nine species) and *Manta* (two species).

Even though Mantas and Mobulas are amongst the most charismatic of marine species we still know very little about their biology and ecology. These rays are currently facing serious threats caused by numerous human activities including directed fisheries, incidental capture as by-catch, habitat destruction, marine debris, boat strikes, entanglement and unregulated tourism.

Mobulids mature late, have long life spans, and give birth to a single pup every 2 to 5 years, which limits the capacity of populations to recover from depletion caused by human activities or other impacts. It is therefore increasingly important to raise awareness about the importance of the conservation of these animals.

How to tell them apart?

Due to external appearance similarities, *Manta* and *Mobula* rays are often confused. Mobulas are smaller than mantas and can be distinguished by morphological differences in their mouths and cephalic fins: Mantas have paddle-like cephalic fins and terminal mouths located at the front of the head; Mobulas have shorter pointed fins and sub-terminal mouths located underneath the head.



3. Mobulids in the Azores

Located in the middle of the Atlantic Ocean, the volcanic islands of the Azores are the most isolated islands in the North-eastern Atlantic. The extremely unique environment that results from this being the only landmass between two continents makes the archipelago an important point for many species that every year undertake Atlantic migrations and here find perfect conditions to breed, feed and grow.

Here we can find three different species of Mobulid rays (image below): *Manta birostris* (Giant Manta Ray), *Mobula tarapacana* (Sicklefin Devil Ray) and *Mobula mobular* (Giant Devil Ray). These species are present in the region during the summer, warmer, months. *Mobula tarapacana* is encountered frequently while *Manta birostris* is seen occasionally and *Mobula mobular* is rarely seen.



Identification characters

Each species as specific morphological characters that allow their identification:

Mobula tarapacana



1. Short and thick tail with no caudal spine
2. Spiracle in an slit above and behind the margin of pectoral fin
3. Pronounced ridge along dorsal midline, Color: Brown to olivaceous green dorsally
4. Ventral side white anteriorly, grey posteriorly, with an irregular but definite demarcation line
5. Short cephalic fins
6. Gill covers often with grey shading/flaring

Manta birostris

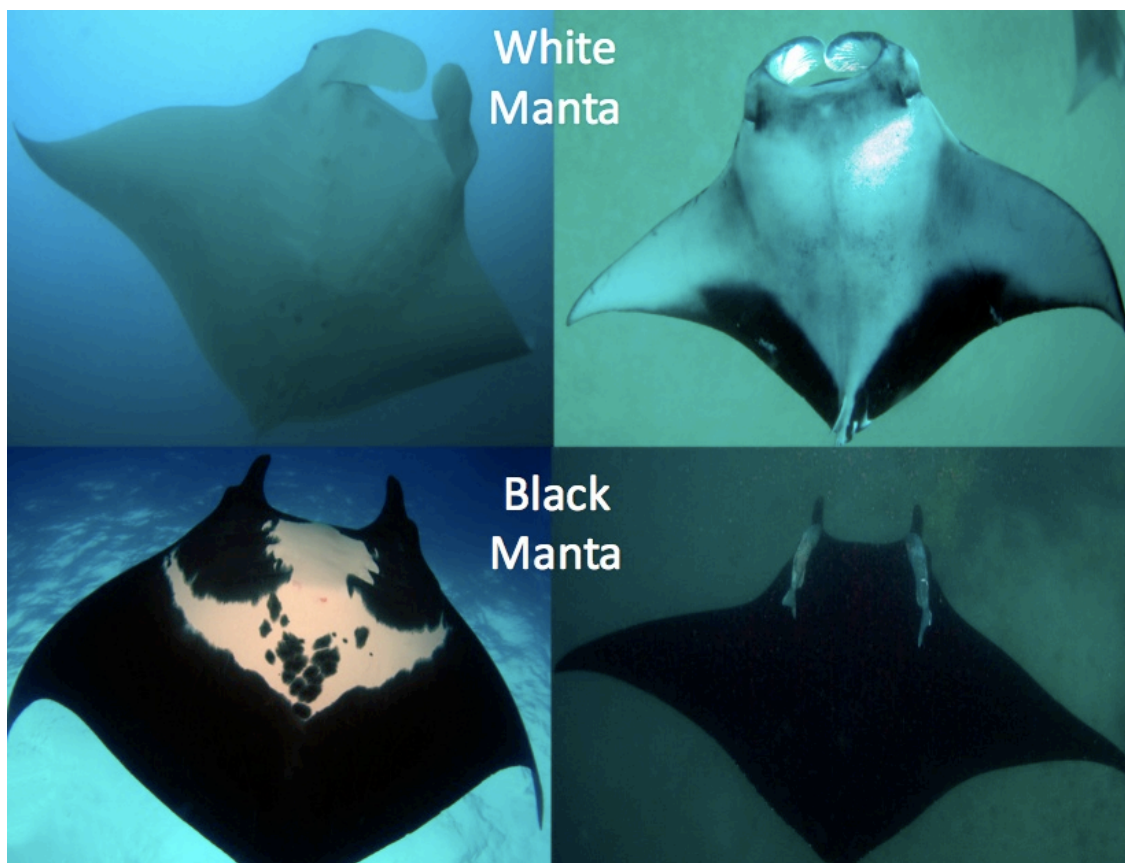


1. Slender whip-like tail, vestigial caudal spine
2. Pale to white chevron shaped patch, blazes of white color on the dorsal tips of the pectoral fins
3. Coloration around mouth extends from the base of the cephalic fins to the first gill slits, ventral surface largely cream to white with dark grey to black spots and patches occurring between the gills and the opening of the cloaca, black semi-circular spots posterior to the fifth gills
4. Dorsal surface black, with large white shoulder patches on either side of a dark midline, mouth black to charcoal grey in coloration.

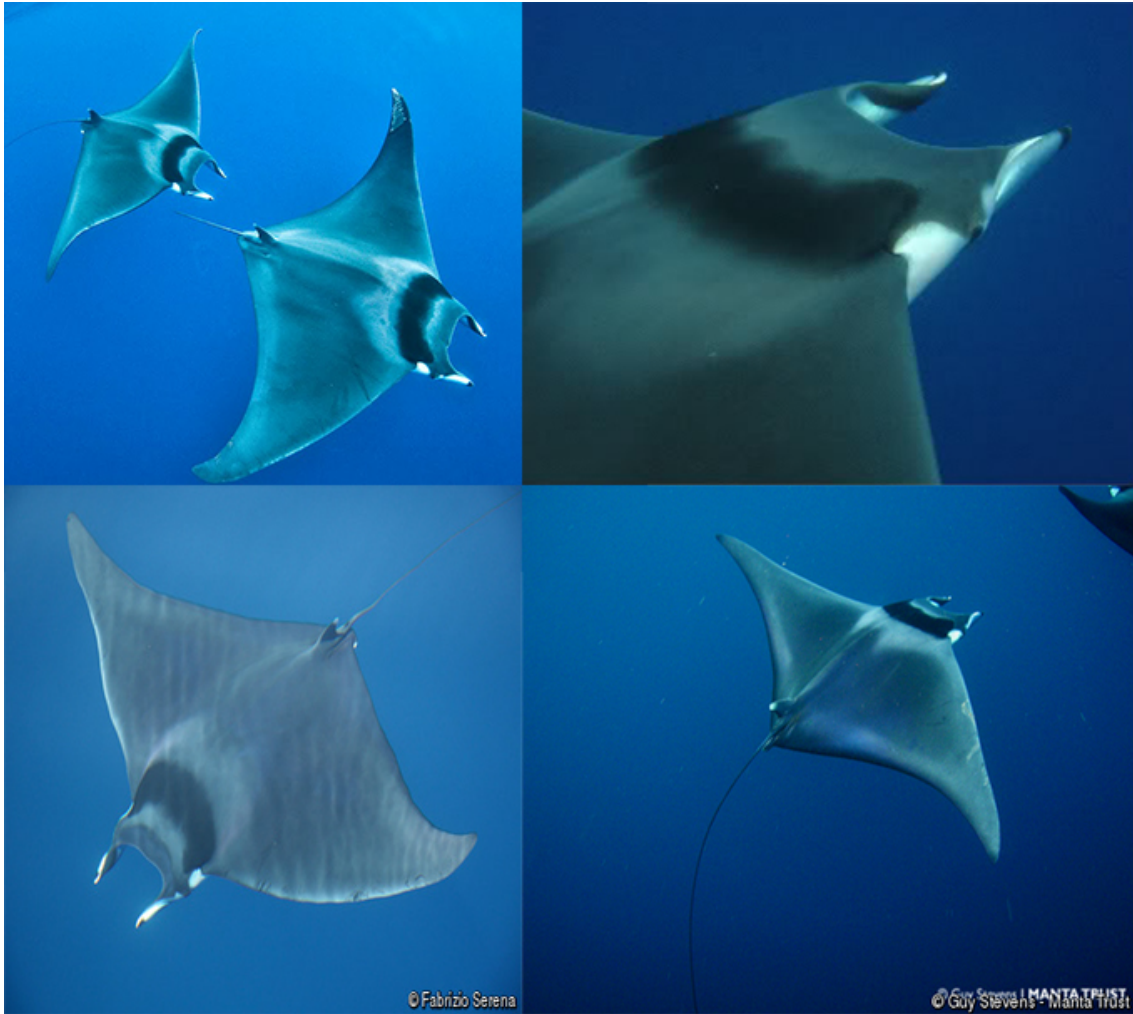
Manta birostris: color morphs

To make matters slightly more confusing, two distinct color morphs have been identified in manta rays, black mantas and white mantas. A genetic disorder causes these different colour variants and both conditions are rare.

Black mantas, or melanistic mantas, have an entirely black topside, and a predominately black underside except for a variably sized white blaze along its mid-line. White mantas, or leucistic mantas, have a reduction pigment making their skin appear lighter, even white.



Mobula mobular

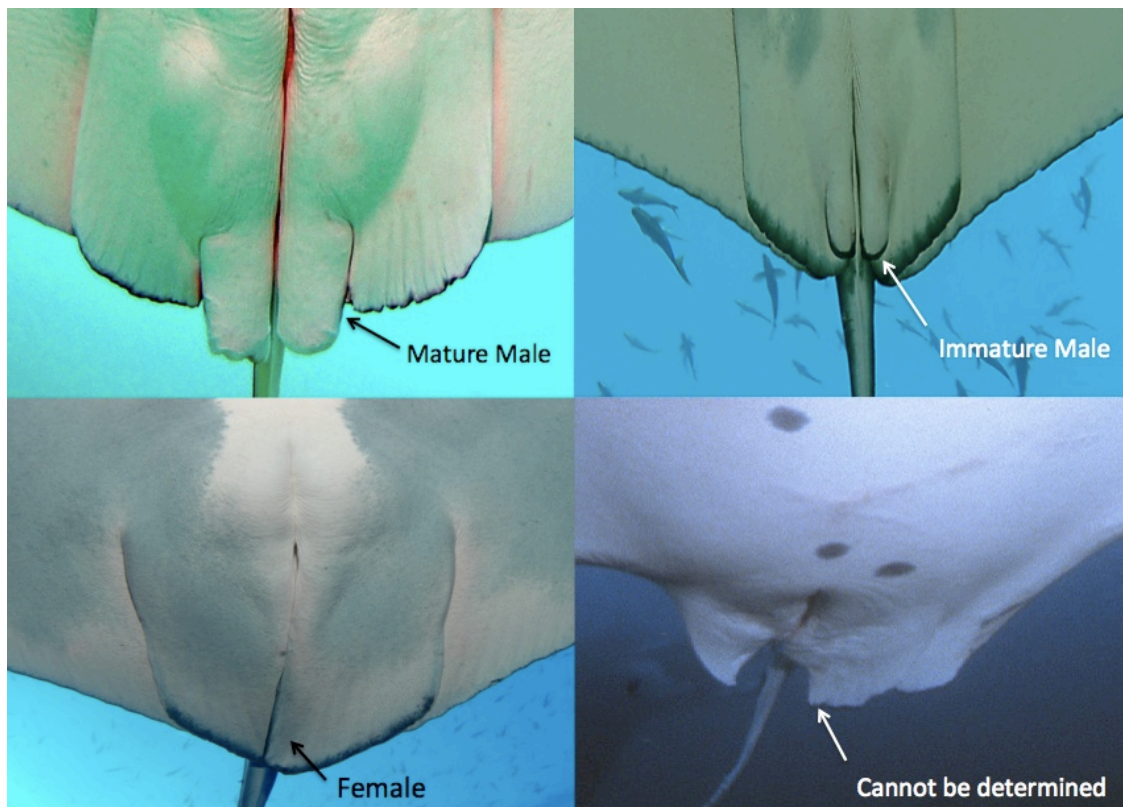


1. Dark blue dorsal surface, with crescent-shaped light area on each "shoulder"
2. Top of the head with thick dark black band stretching from eye to eye, short cephalic fins
3. Very long wire-like tail, white tip of the dorsal fin
4. White ventral surface

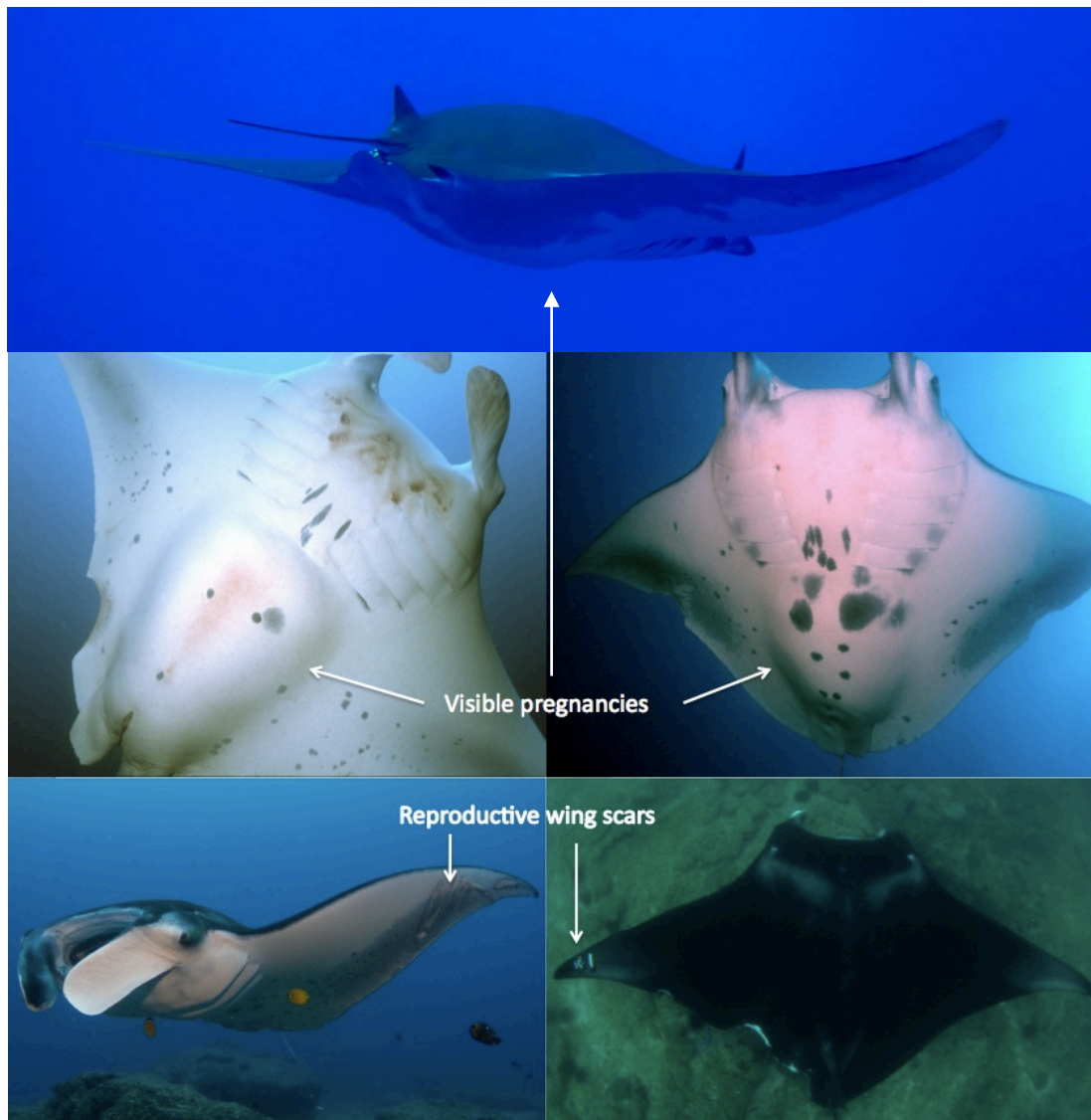
4. Determining sex and maturity

Determining the sex of mobulids is usually quick and easy. If you have taken a good ID shot of the standardized area, you will be able to ID the animal's sex from this photo. If not, check your other photos to see if you can see the pelvic fins. Pelvic fins are the two small fins located at the rear of the animal by the tail.

Male rays have external reproductive organs, called claspers, that protrude off of these pelvic fins. Immature males will have small claspers and mature males will have large claspers that protrude past the edge of the pelvic fins.



Female manta rays do not have any external reproductive organs so all that you will see in the image will be fins. Because there are no organs to judge by, determining the maturity status of a female ray can be difficult. If the individual was visibly pregnant or possessed reproductive scars (bite marks obtained during mating) on either of their wing tips then they can be classified as mature (see following page).



5. Identifying different behaviours



Feeding: Mobulids with cephalic fins unrolled and the mouth and gills open is a sign of feeding activity (images above).

Interaction between different species: Mantas and Mobulas are often seen interacting between them, either swimming around each other or following each other (images above).

Mating: usually when several males are seen chasing a female and mimicking her movements (mating train) or when one male chases a female very closely, almost touching, performing synchronized movements at an increasing speed (images above).

Interaction with divers: Mobulid rays are very curious towards divers, often approaching and swimming in circles around them.

6. Threats

Mobulids face different human related impacts and often do we encounter individuals that are visibly affected. Some examples are rays entangled in fishing gear or animals that suffered boat strikes (images below). It is also fairly common to see animals that suffered bites from natural predators.

