

## HOW IMAGES ARE USED:

The photos used in this research have been generously contributed by interested divers who are passionate about these magnificent creatures, their habitat, and their future. Our project would not be possible without the selfless goodwill and efforts of scores of concerned divers and photographers. The use of underside images of mantas enables us to identify individual animals, and follow their movements and fate over time. We now recognize over 590 individuals, over 200 of which have been seen more than once over time. Ten have been sighted multiple times over periods in excess of 20 years. A single manta known for 28 years represents the longevity record for this species.

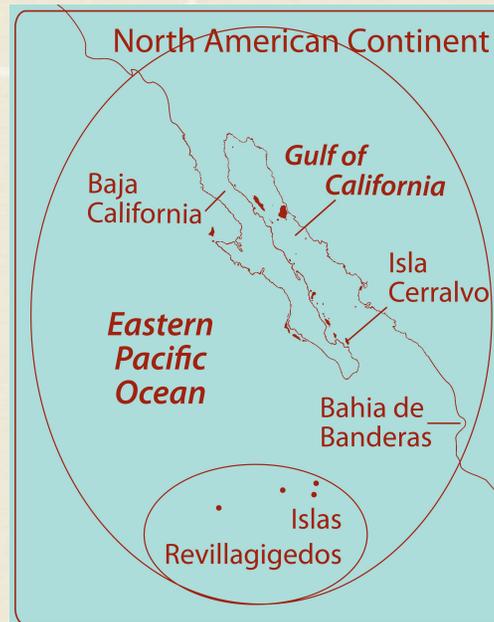


*Image of manta Ladyface & photographer, © Terry Maas*

Our photographic library contains over 30,000 images that are used to match individuals in time and space, these photographs have demonstrated that mantas travel between the Revillagigedos and Cerralvo island in the Sea of Cortez. These observations are of both scientific and conservation value because they indicate that, via migration, the depleted population of the Gulf of California can recover. Our primary goal is to conduct research that will provide a scientific basis for protection of this species and the critical habitat in which it lives. With your help, we believe it is possible. Please join us in this effort to make a difference.

## WHO WE ARE:

The Pacific Manta Research Group has conducted field research on the Oceanic Manta Ray for over three decades in the Gulf of California, the Revillagigedo Archipelago and Banderas Bay in the Mexican Pacific. Our findings have been chronicled in several educational documentaries and viewed widely by international audiences. In addition, the results of our work have been presented to the broad scientific community and to the Government of Mexico. These studies have contributed to efforts to expand and establish habitat and species protection for manta rays and other members of the larger pelagic community of marine animals, including sharks and whales. Presently, the outcomes are being included in an application to UNESCO to establish the Revillagigedo Archipelago as a World Heritage site.



# PACIFIC MANTA RESEARCH GROUP



PLEASE JOIN US IN AN INTERNATIONAL EFFORT TO STUDY, CONSERVE AND PROTECT THESE CHARISMATIC ANIMALS AND THEIR HABITAT

PACIFIC MANTA RESEARCH GROUP

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WE UNDERSTAND FAR LESS ABOUT THE NATURE OF MARINE HABITATS THAN ABOUT THOSE ON LAND.

WE UNDERSTAND INFINITELY LESS ABOUT THE WORLD'S OCEANS THAN WE DO ABOUT STELLAR SPACE.

WE UNDERSTAND THAT IN THE SEA WE LEARN THE LANGUAGE OF ANOTHER WORLD. ONE THAT MAY ALLOW US TO SURVIVE IN THIS ONE.

*- Robert Rubin*



## BECOMING INVOLVED IN MANTA RESEARCH

We welcome you to become a contributor to our project! Your help is invaluable, and your images will be used exclusively for scientific purposes. When used, we will credit your authorship and inform you about our scientific and conservation progress. Please see our photographer's agreement, <http://tinyurl.com/photogreement>, to specify our uses of your images. Thank you for joining ourselves and others in efforts to understand, protect and conserve these "flying carpets of ebony silk".

Robert Rubin, Ph.D. - Director PMRG

Karey Kumli, B.A. - Project Manager PMRG

We are grateful for your donations:  
<https://santarosajc.ejoinme.org/?tabid=507553>

# PACIFIC MANTA RESEARCH GROUP

## MANTA AND MOBULA:

The family to which manta rays belong, contains two species of manta and nine different mobula rays, also known as "devil rays" for the horn-like head appendages they use in foraging on small zooplankton and for sensory perception. The oceanic manta ray (*Manta birostris*) is considered to be among the most recently appearing cartilaginous fish (five million years) in the world's oceans and the most highly advanced members of the approximately 1100 species of elasmobranch fish, including the sharks, skates, rays and the little-known chimaeras.



*Manta ray - Mouth terminal.  
Photographer unknown.*



*Mobula ray - Mouth ventral.  
Photographer unknown.*

## MANTA MORPHS / FORMS:

Unlike most populations elsewhere in the world, these animals display two color forms. Unrelated to either sex or size, the chevron and black forms occur in a 3:1 ratio respectively. Similar to human fingerprints, both forms exhibit unique ventral markings specific to individuals. Quality photographic images/videos of the ventral surface patterns are used to identify, track and catalogue animals.



*Chevron form - Ventral view  
As used for photo identification.  
Image © Roberto Chavez Arce*



*Black form - Ventral view  
As used for photo identification.  
Image © Kaia Thomson*

## CONTRIBUTORS & COLLEAGUES:

"It takes a village" to conduct field research of this magnitude. The Pacific Manta Research Group owes its success to the collaborative efforts and goodwill we have received from scores of divers, Roberto Chavez, Alfonso Trujillo, Mike McGettigan, Sherry Shaffer, the crews and owners of the Nautilus Explorer and the Solmar V, Drs. Mauricio Hoyos, James Ketchum, Gavin Chilcott, and Felipe Galvan, and many others, to whom we are forever grateful.



*Kathy and I sent in our images and video and were told there were 4 new IDs made. We were honored that could name one of them after my late father "Marinus" and to be able to take part in the research.  
- Peter Mieras & Kathy Johnson [www.rendezvousdiving.com](http://www.rendezvousdiving.com)*

*"Everyone traveling to Revillagigedo should submit their images to the Pacific Manta Research Group. One photograph may not seem like much to offer to such a large project, but the ripples that image can send out could be massive. Citizen scientists/photographers offer a huge help to researchers studying the giant mantas. The more images that can be catalogued the better. Don't let your photographs sit stagnant on your computers at home - give them to the great group of people at PMRG and help them do some good for the animals of Revillagigedo."* - contributing photographer Bryce Groark - [LivingOceanProductions.com](http://LivingOceanProductions.com)