"The Socorro Islands"

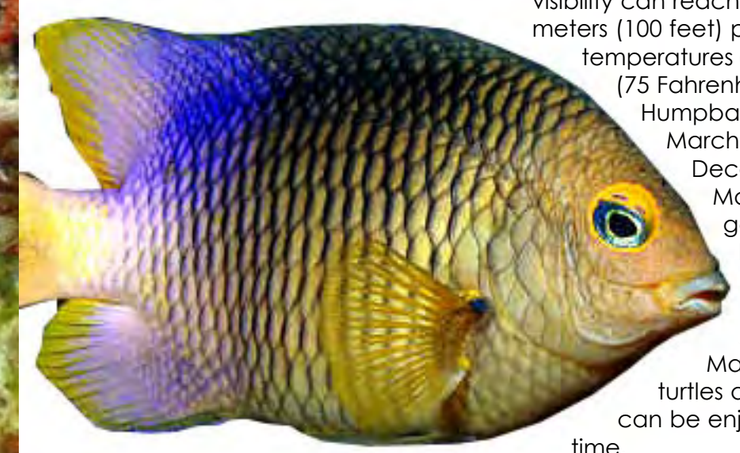
Mexico's Revillagigedos Archipelago

Text and photos by Barb Roy

Located 386km (250 miles) southwest of the tip of Baja California and over 720km (446 miles) west of Manzanillo, the Revillagigedos are one of three Mexican island groups in the Pacific Ocean. All four islands that make up the Revillagigedos Archipelago are remote, volcanic in origin and offer some of the most unpredictable, wild diving in the world. Isla Socorro is the largest of the Revillagigedos islands. Over the years, visitors have adopted the name—"The Socorro Islands"—when referring to this group. Depending on the time of year and which island you visit, a diver might encounter the graceful splendor of a humpback whale and her calf or be able to swim alongside a gargantuan whale shark. These wondrous creatures are all in addition to the archipelago's regular residents: giant Pacific mantas, hammerhead sharks, yellowfin tuna, sea turtles, over five other species of sharks and countless other large pelagics who utilize this offshore area.

CLOCKWISE FROM FAR LEFT: Brilliant coloured gargonians grace the reef at Socorro Island; Slipper lobster; Octopus; Neon coloured reef fish. PREVIOUS PAGE: *Nautilus Explorer* liveaboard heads toward a dive site at Roca Partida in the Revillagigedos Archipelago

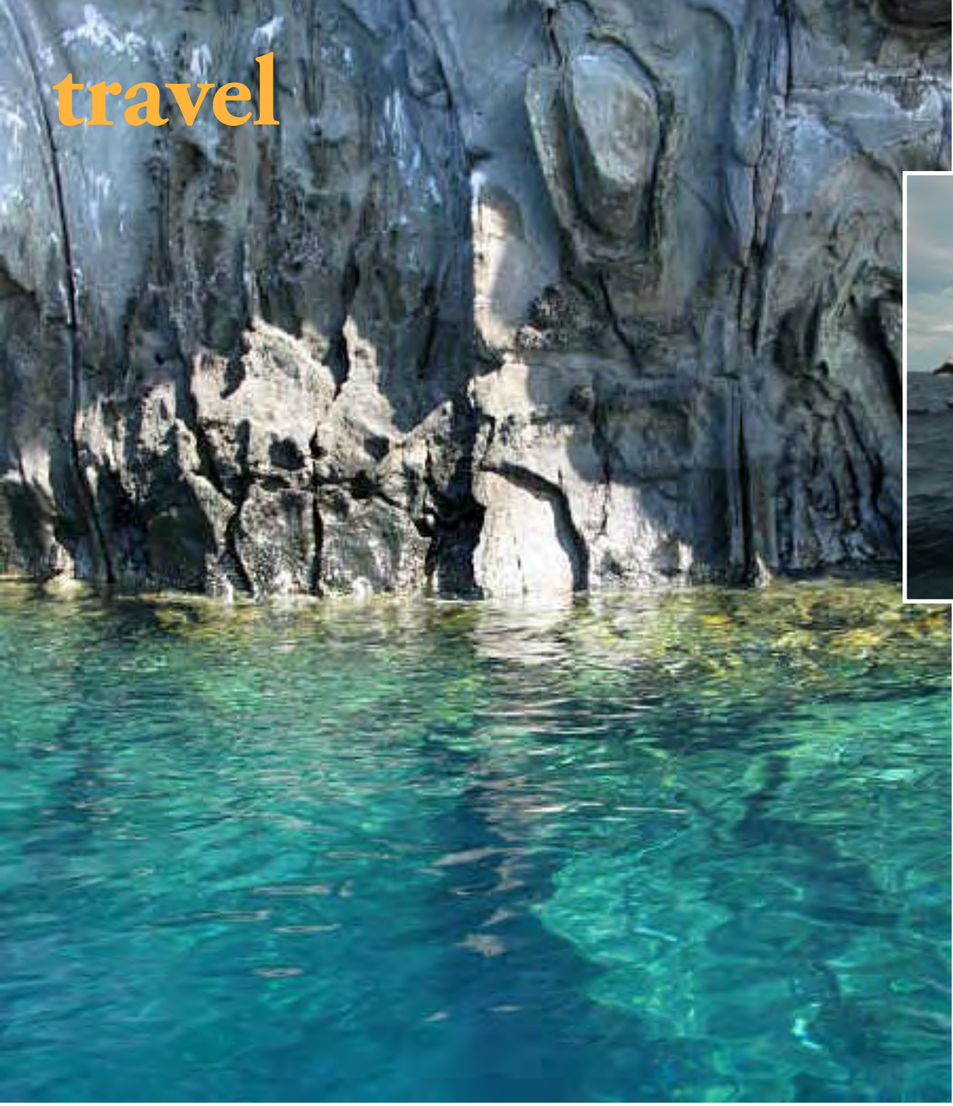
Topside, the islands are completely different in appearance and are home to many endemic plant and animal species. Overall, the area is recognized as a distinct terrestrial eco-region, which is part of the Neotropic ecozone (tropical and subtropical dry broadleaf forests). Below the azure blue coloured water, ancient volcanic activity has created a rugged terrain of reefs, overhangs, walls and unusual topography.



Diving at the Revillagigedos is done from November through early May when the water is generally calm and visibility can reach an impressive 30 meters (100 feet) plus! Cooler water temperatures of 23 degrees Celsius (75 Fahrenheit) seem to attract Humpbacks in February and March, while November, December and late April-May appear to be good for whale sharks. Pods of bottlenose dolphins are commonly seen from January through March. Mantas, sharks, turtles and schools of Jacks can be enjoyed almost anytime.

At one point, the region's natural marine resources were drastically depleted and some species completely wiped out, due to an over abundance of unregulated commercial fishing. Realizing the necessity for supervision and protection, the Mexican government established the Revillagigedos as a Protected Biosphere in 1994. No fishing of any kind is allowed within a 12 mile radius of each island. Although dive charter boats who frequent these islands have reported a steady increase in resident marine life populations, remoteness still hinders proper policing and monitoring efforts.

Today, the Revillagigedos welcomes adventurous divers from around the world for spectacular underwater photography opportunities and those who love to swim with big marine pelagics!



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ABOVE: Rock face of Socorro Island meets turquoise sea. THIS PAGE: Scenes from a dive with *Nautilus Explorer* at Roca Partida in the Revillagigedos Archipelago

Currently, there are two liveaboard dive charter operators who offer scheduled 8-11 night excursions—the Solmar V and the Nautilus Explorer. Both vessels are luxurious in every way, offering three gourmet meals per day, comfortable accommodations, 3-4 dives per day and a knowledgeable, professional crew. With the capability of making fresh water, their outdoor on-deck showers, rinse tanks and state-room showers are unlikely to ever run out. Both operations depart from Cabo San Lucas, taking approximately 24 hours to make the initial crossing to San Benedicto, the first island in a triangular journey. Only three of the four islands are visited, with the fourth, Clarion, being an additional 314km (195 miles) west of Socorro. The larger "mother-ship" is usually anchored in a protected area, with most of the diving taking place from two smaller boats, holding 8-10 divers each. Traveling from one island to the next is usually done at night.

Both operations supply aluminum 80 cu ft tanks which can accommodate DIN or yoke-style regulators. Nitrox is available to use for the entire trip as an option for an additional fee. Weights are also provided.

Isla San Benedicto

Isla San Benedicto is the third largest of the island group with two prominent peaks (Barcena and Herrera) and one very wide volcanic crater. The last recorded eruption was in 1952 leaving behind massive vertical ridges created by volcanic ash. As they solidified over the years, San Benedicto has

CLOCKWISE FROM LEFT: Whitetip sharks at Roca Partida; starfish; lobster at Socorro Island; goby at Roca Partida

taken on a gray-coloured glacial look. Very little life grows upon these ridges however, leaving scant quantities of green vegetation to be found on the northern half of the island. Both dive boats like to anchor on the more protected "ash" side of this island, using the smaller boats for quick access to trickier sites requiring maneuverability.

Stretching outward to the sea are the jagged remains of a lava flow—its violent epic forever frozen in time. Brown-footed boobies are one of the several sea birds utilizing the cliffs. From high above, they peer down with goofy expressions when the smaller boats motor over for closer looks. These noisy birds have even been known to land on visiting boats and be coaxed onto a human arm or head!

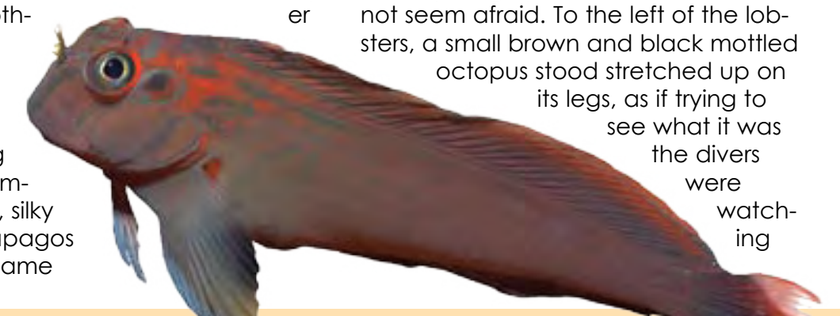
Underwater the lava flow continues to stretch out even more, offering a deep platform for divers to sit and wait for passing sharks and other large pelagics. Closer to shore, divers will find a multitude of colourful fish and hard corals on a stair-stepping terrain.

During a recent visit in January and February of 2007, I was able to dive this location at a place called the "Canyon". Like all of the other divers who jumped into the water for their first dive of the trip, I eagerly followed the dive guide over to a fingering reef and headed out towards open ocean.

As the depth increased, the water grew cooler. Sounds from the reef below and passing fish became more evident. At 27 meters (90 feet), I could clearly see the other divers and everything another 9 meters (30 feet) below me. Expecting to see hammerhead, silky and Galapagos sharks, I came equipped with a wide angle lens for my digital underwater camera system. For a while we all sat like spectators, patiently waiting for something to pass by. The blue abyss was the only thing I could see.

A large school of yellow fish with blue stripes formed a tight circle and hovered near the reef to one side of us. Thinking nothing of this I turned to see what I could find on the reef behind us. Several others also became curious and began exploring the reef.

Several small Socorro lobsters under a rocky ledge peered out, but did not seem afraid. To the left of the lobsters, a small brown and black mottled octopus stood stretched up on its legs, as if trying to see what it was the divers were watching



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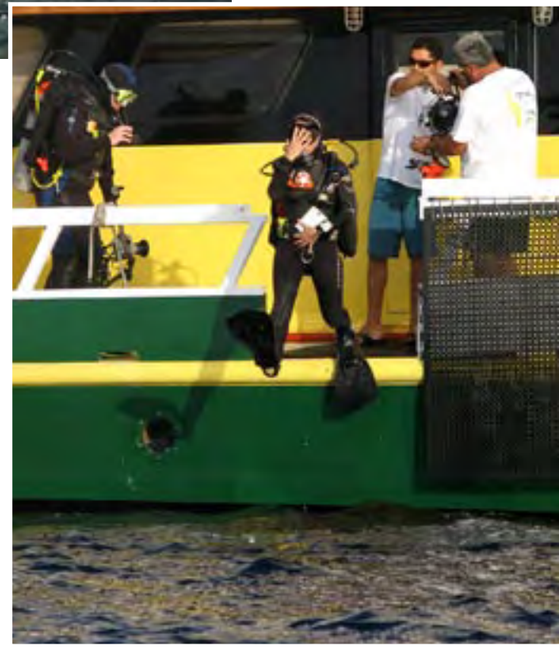
THIS PAGE: Scenes from a dive with *Solmar V* off the rocky islands of the Revillagigedos Archipelago

FAR LEFT INSET: Hammerhead shark



for. Behind these smaller critters I noticed several big silver-tip sharks and a huge manta! Realizing my wide angle lens was of little use for this octopus, I scurried off to join my companions who had already abandoned their posts. Within seconds, I was in the middle of the encounter photographing these sleek swimming machines.

About this time, the other divers, who stayed loyal to their watch, were rewarded by a large school of hammerheads in the distance! What an awesome experience it was, especially if this was one's first visit to the Revillagigedos.

On another dive to this same site, once again with my wide angle lens on, we saw more schooling hammerheads, but too far to photograph. A tiger shark however, came a bit too close, causing everyone to "hug" the reef, including the fish! Once the excitement was over, we swam with mantas and more sharks on our way back in.

Once the novelty of the big animals at the site wore off, I put my 50mm lens on and stayed in the 18 meter (60 foot) range photographing an array of smaller critters.

During the evening, when we all relaxed and showed our day's work, I was accused of teleporting to another reef! My fellow dive companions had no idea octopus, sea stars, sea cucumbers, sponge and smaller fish could be found on the reef. My presentation was also full of turtles, green morays, yellow guineafowl puffers, and aggressive pairs of damselfish.

Another site commonly visited, and well worth the wait if weather is uncooperative, is a place called "The Boiler". Coming within meters of the surface, a block-shaped pinnacle causes surface

water to boil in turmoil when conditions are rough. Similar actions beneath the surface occur, requiring caution to be heeded when swimming close to the rock. This harsh surge movement will also create a challenge for photographers attempting close-up shots.

In conditions like this, it is recommend that divers simply move away from the structure and redirect their focus to the mantas. For some unknown reason, this is one of the "hot-spots" where manta sightings are almost guaranteed! Huge mantabirostris, the largest of all the rays, seem to be attracted to the divers. With grace and poise they appear to fly through the water from one diver to the next, curiously looking each small bubble-blowing creature over carefully.

Mantas

Mantas can grow to a weight of 2000kg (4,400lbs) and have a wingspan of over 6.7 meters (22 feet). They are believed to give birth to just one pup, every 2-3 years. A manta's diet usually consists of small schooling fish and zooplankton. Their cephalic fins on each side of their mouth are rolled up when not guiding water and food into their mouth, giving them a "horned" appearance.

These pelagic giants are normally found all over the world in warm water near oceanic islands and submarine ridges with nutrient rich upwellings. Both charter operators have adopted a no touch and no

THIS PAGE: Wildlife abounds in the archipelago, above and below the surface of the sea

THIS PAGE: Scenes from a close encounter with a manta ray

riding policy so not to cause any stress in these magnificent animals, in hopes that they will continue to freely visit the sites.

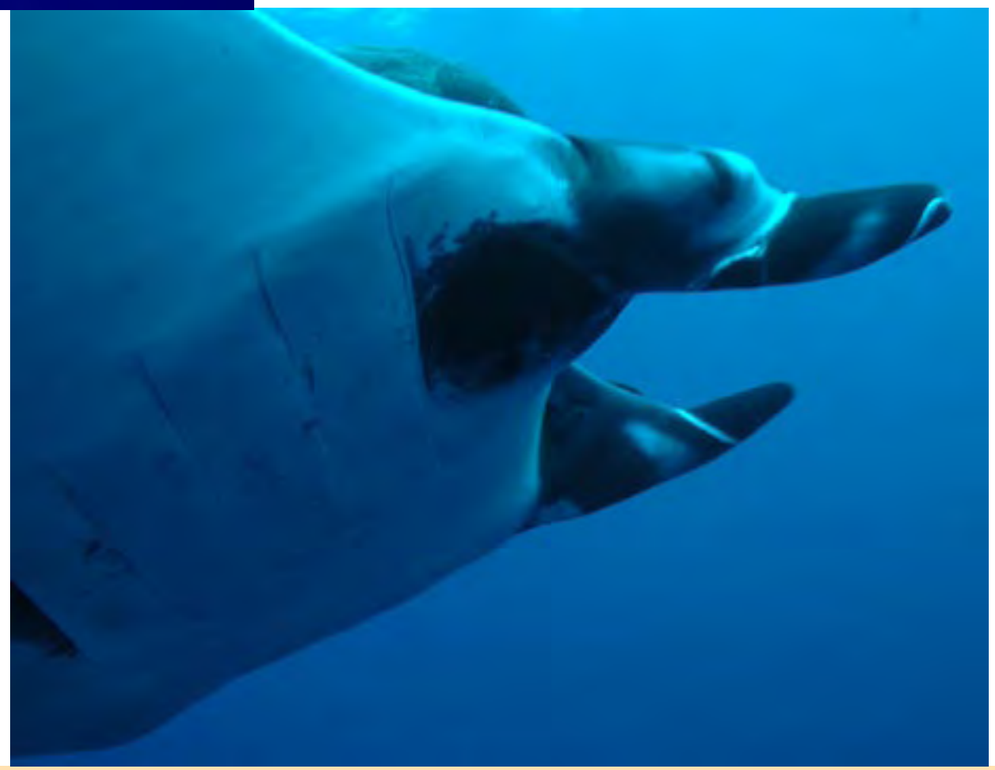
A manta photo identification system is supplied with regular images taken by the dive charter clients from both boats and crew in an effort to learn more about the individual mantas who frequent this and other island groups around the world.

The program was started and is maintained by Dr Bob Rubin and Karey Kumli of the Pacific Manta Research Group (manta-research.org), a division of the Department of Biology at the Santa Rosa Junior College in Santa Rosa California. This identification system has allowed the research group to catalog over 130 individuals over the past three years and record numerous re-sightings in the Revillagigedos alone. Information on population size, the health, behavior and travel habits will also provide important data for other scientific research groups.

Aside from the mantas, on the occasional calm day when surface action is minimal, a diver can easily swim around the "boiler" and several small deeper pinnacles. If water conditions permit, photographers will be delighted with intermittent clusters of yellow gorgonian sea fans, numerous species of moray eels and more colourful fish than you can keep track of. Lobsters huddling together under ledges, small family groups of longnose butterflyfish and several species of angelfish all make great photo subjects at this location.

Isla Socorro

The largest of the Revillagigedos islands, Isla Socorro, can be found 48 km (30 miles) south of San Benedicto. A rich vegetation of sage, grass and cactus cover most of the island, giving it a rich green appearance from the water. Brown, red and tan-coloured stone, highlighted by oval surface patterns,



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create a textured look on surrounding cliffs. In 1957, the Mexican Navy established a navel base on Socorro, today housing a population of 250 staff members and their families. Mount Evermann (1130 meters/3706 feet) is located at the island's center, with the last eruption recorded in 1993.

A recent push by conservation organizations has been to remove unwanted flocks of wild sheep, introduced in 1869. Several endemic plant and animal species are currently threatened or facing extinction due to the over-populated sheep.

Underwater the land is as diverse in its marine residents, with a nice blend of volcanic topography. There are several excellent sites around the island to explore, with "Aquarium" and "Cabo Pearce" being the most popular.

Before any diving is permitted, a dive boat must check in with the Navy base. Quite often the soldiers like to board the vessels, perhaps because there is little else to do and a few home-made cookies and freshly brewed coffee is always a treat!

At Cabo Pearce we began our dive near a wall and headed off the point to deeper water. In the middle of our path lay a large boulder where current visibly flowed around it. Tired of fighting the current, I headed for the lee side to rest and see what was giving the boulder a yellow stripe. There must have been over a hundred butterflyfish, all with the same idea as myself, to escape the current. I could have spent my whole dive here. The small invertebrates and fish were incredible!

Continuing on, we headed deeper in hopes of finding more sharks, whales or mantas. Instead, we found multitudes of redtail triggerfish, large Pacific burrfish, parrotfish and both male and female Mexican hogfish.

During the entire dive, I could hear the ghostly calls of humpback whales as they communicated with one another. The frequency and close proximity of their songs kept me constantly looking around, expecting one to show up. Although we did not see any on this dive, they have been known to just appear and allow divers to stay with them for hours, even when they are with calves.

On several additional shallower dives at Socorro, I wandered away from the group while exploring a sheltered cove, in pursuit of two octopuses! They paid little attention to me and probably didn't realize I was even following them. After acquiring numerous shots of them, I became distracted with an electric ray, moorish idols, spotted boxfish and more pairs of damselfish. The Clarion damselfish was exceptionally photogenic, as was the Clarion angelfish.

THIS PAGE: Landscapes and seascapes of Socorro Island; RIGHT: Manta ray soars over underwater photographer

When I finally found the two octopuses again, it seemed they were busily involved in a mating ritual.

In addition to diving at the "Aqua-rium" site, I was able to explore two other locations around Socorro. The first was next to a tiny lava-rock islet on the far side of the island. Both water and weather conditions must be just right to safely dive this site. Depth starts off about 12-15 meters (40-50 feet) and gradually gets deeper as we head away from the islet. Tall rock stacks are everywhere, resembling pieces of a stone wall left standing from an ancient

Manta ray and diver meet under the sea in the Revillagigedos Archipelago, Mexico

castle. My guess is that the stacks may have once been steam vents. Each stack housed a collection of tiny fish, coral heads and branches of small gorgonian fans at the top. Other invertebrates could also be found with a sharp eye. At about 27 meters (90 feet), the group was led to an underwater cave, leading in about 6 meters (20 feet), the size of a one-car garage. More invertebrates were found living on the ceiling of the cave.

On the way out, we spotted a half dozen small reef sharks passing by.

The other site was equally as interesting. We entered a calm sea in the late afternoon. As soon as we submerged, a large silky shark appeared and began circling us. The shark came so close I was able to tell it was a very healthy female! Her long sleek silvery grey body moved with ease as she slowly went to check out each diver. When one of the divers timidly reached out to touch her, she slightly changed her direction and was always out of range.

On the reef below, I found more Clarion angelfish, grunts and a few king angelfish. Probably the most interesting creature was a giant slipper lobster! If it were not for its orange-tan carapace, I might have missed it entirely as it climbed down a coral structure. Later, when I returned to the boat, I read that slipper lobsters are only reported to grow up to 46cm (18in). This one was clearly 61cm (24in), if not more!

Roca Partida

Located west of Socorro and San Benedicto, Roca Partida (meaning splintered rock) is perhaps the most spectacular, isolated site on this mesmerizing trip. Above water, you see a harsh weather-beaten rocky surface 34.5 meters (115 feet) high and about 90 meters (300 feet) from end to end, mostly covered in white bird guano. Frigatebirds, brown-footed boobies, masked boobies and gulls are just a few of the avian fauna creating the mess.

The length of time the dive boats will spend at Roca Partida strictly depends on the weather. If conditions are good, you can expect to anchor 2-3 days. Unlike some areas of the world, current direction, speed and duration are hard to predict here.

Underwater sheer steep walls drop to hundreds of feet all the way around the island, making good buoyancy control a necessity. But buoyancy control isn't all the operators are worried about. Roca Partida is another manta "hot spot", creating a frenzy of interaction when several mantas show up at once!

Their enticing dance seems to draw divers away from the island causing them to "go blue", as the dive guides call it. Most divers forget that the mantas originally came to them, and if they just keep the island in sight, the mantas will always return, sooner or later.

When not dancing with the mantas, I joined the sharks next to the island at 21 meters (70 feet). About 15 sharks, all bigger than me, were enthralled in a swimming game using different current flows to move really fast in one direction, change depth in another and circle back around for another go at it. I simply perched myself next to a rocky ledge to photograph this unusual behavior.

At times, I would move directly into their path for better angles. They came straight at me or from behind and simply went around me at the last second! It was a thrilling experience to be among these large predators. I guess it hit me later how dangerous it could have been, especially watching the feeding sharks at night swarm off the back deck. Then, on the other hand, during their game, I was not afraid and

COUNTER-CLOCKWISE FROM LEFT: Divers prepare for a leap into the sea in the archipelago; Sea life under San Benedicto; Whitetip shark at Socorro Island; Sunset from the deck of *Nautilus Explorer* at Socorro Island;

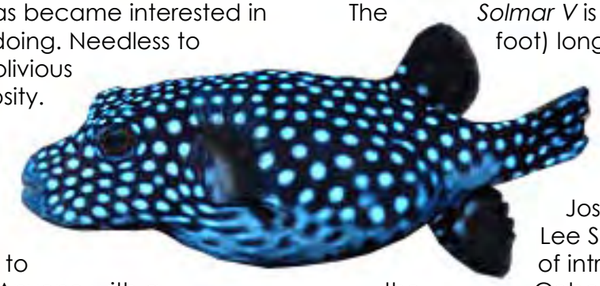
showed no fear, therefore, that might have eased my acceptance into their activity. My dive buddy tells me it's the aggressive photographic nature photographers possess that the sharks are sensing.

Macro and close-up life on Roca Partida was perhaps the most spectacular and plentiful of all the islands. Visibility was better and healthy large schools of different fish species flourished. With my 50mm lens, I was able to photograph giant hawkfish, adult and juvenile leather bass (juveniles found hiding in sea urchins) and Panamic fanged blennies.

With my wide angle lens, I captured groups of young white-tipped reef sharks resting in soft groves around the island and colourful groups of orange Clarion soldierfish.

Away from the island, opportunities were endless to film and photograph the pelagics. Huge silver bigeye jacks, barracuda, bait-balls and so many different kinds of sharks were everywhere!

At one point, when I was trying to get a good portrayal of the dramatic scenery, I turned to discover a loan hammerhead shark swimming back and forth behind me! With each pass it came closer and closer until it had enough of my flashing strobes and swam away. Several of my dive companions commented later that they had observed similar scenes with me on two occasions when mantas became interested in what I was doing. Needless to say, I was oblivious to their curiosity.



Once again, the mantas were interactive and fun to be around. Anyone with a camera or video came away happy with full memory cards and personal experiences to cherish throughout the year! This is the type of dive trip a diver can easily return to year after year and expect to see something different on every dive. Since the mantas are the only identified creature with regular sightings, some moving from island to island, it is safe to say they will be waiting for you upon your return journey to this underwater realm of these enchanted islands.

Isla Clarion

The last of the island group is Isla Clarion, the second largest and outer-most island at 314km (195 miles) west of Socorro. Although mostly uninhabited, a small Navel garrison of about nine men resides there. Of the three prominent peaks on Clarion, Mount Gallegos is the highest at 335 meters (208 feet). Due to the island's remoteness, little is know about the diving here. Those I have talked with who have been diving here, say it is pristine!

Dive operators

As previously stated, both dive operations are professional in every way. Their crews are very skilled in the art of providing dive service and keeping everyone safe and happy. In observance of both crews, I have seen them go out of their way to make sure the dive and accommodation experience is unforgettable.

Solmar V

The *Solmar V* is a 33.6 meter (112 foot) long vessel who has offered dive trips to the Revillagigedos since 1992. The vessel is owner by Jose Luis and Leslie Lee Sanchez, pioneers of introducing diving in the Cabo area and the Sea of Cortez.

The dive crew (all speak fluent English) is supplied by Amigos del Mar, a dive shop in Cabo San Lucas who also pro-

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vides local dive charters.

The boat will accommodate 20-22 guests. Transfers are provided from the airport by Cape Travel to a hospitality room at Solmar Suites. Onboard voltage is 110AC (used in the US). Port fees, fuel surcharges, park fees, beer and wine are all included with the trip. The Solmar V operation believes that wilderness is the ultimate luxury.

Nautilus Explorer

The *Nautilus Explorer* is a 35-meter (116-foot) long vessel which has provided trips to the Revillagigedos since 2004. Mike Lever is the captain of the *Nautilus Explorer* and a pioneer in liveaboard diving in British Columbia, Canada, and to Alaska. The dive crew is hand picked by Mike himself.

Two executive suites and nine staterooms will accommodate 20-24 guests. Transfers can be arranged from the airport, with a hospitality suite located at the Posada Real Hotel. Onboard voltage is 120V / 60Hz. Port fees are extra ($65 US cash, payable at the end of your trip). The *Nautilus* offers 30 different microbrews and an extensive wine list.

In an effort to help prevent illegal fishing around the Revillagigedos and other protected sanctuaries, Mike Lever is planning on supplying a Twin-engine Piper Aerostar for an estimated 80-90 patrol flights per year. Locations of illegal fishing boats will be reported to the Mexican Navy for enforcement action. The plane will be based in Cabo San Lucas with the capability of handling a pilot and three passengers for speeds of up to (378 kilometers (235mph), and a range of 1610 kilometers (1000 miles). Mike will also provide the administration and operation of the new program. Optional use of the plane will be available to conservation groups for a nominal fee to cover operational costs.

Both charter boats have been actively involved with the sport fishing industry, the local rotary club and Pronatura to protect the natural beauty and splendor of these islands.

Travel Information

When visiting the Revillagigedos, one must fly into the Los Cabos Airport (SJD airport code). Airlines who fly into SJD include: American, Continental, Delta, America West, Mexicana, Alaska, United and US Airways. There is no departure tax. As of January 2007, all US citizens are required to have a passport for travel in and out of Mexico. Upon landing in Mexico, visitors will be issued a temporary visa for entry into Mexico and collected upon leaving. Additional items to bring include: sun block, a refillable water bottle, sun glasses, swim suit, sun hat, a light coat or sweater and casual clothing.

Diving Information

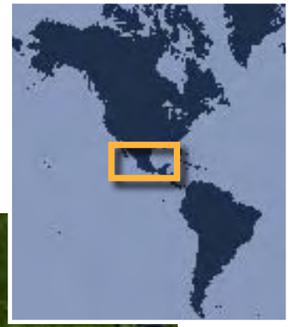
Divers are required to show a dive certification card upon arrival at the boat. Dive medical insurance is recommend anytime you travel. Water temperature ranges from 22-26 degrees Celsius (72-80 degrees Fahrenheit). A full one or two-piece 3-5mm wetsuit is advised. Although no gloves are needed, a thin neoprene skull cap, additional vest and boots will keep you extra warm. Additional gear to bring would be a camera, video or camcorder, small light, spare-parts kit, basic dive gear. Gratuities should depend on the level of service you receive, generally ranging US$200-$350 or more if exceptional. ■

CLOCKWSIE FROM FAR LEFT: Octopus in purple drag; Dive master outlines the dive; *Solmar V* anchoured off Socorro Island; Fanged Blenny at Roca Partida; *Nautilus Explorer*; Dive guide provides thorough information and diagrams for a dive in the archipelago

fact file

Mexico

RIGHT: Western Hemisphere map showing Mexico. BELOW: Satellite map of Mexico showing the location of Mexico's Revillagigedos Archipelago



History An ancient land of advanced Amerindian civilizations, Mexico succombed to Spanish rule for 3000 years before gaining independence in the early part of the 19th century. Mexico was thrown into economic turmoil after a devaluation of the peso hit the country in late 1994. It triggered the worst recession in over 50 years. But the country continues to make leaps in its recovery while economic and social concerns continue to challenge the nation, including underemployment for large numbers of citizens, low real wages, unequal income distribution, and few opportunites for advancement for Amerindian indivituals in the poor southern states. In 2000, election results marked the first time since the Mexican Revolution in 1910 that the opposing party defeated the incumbant party in government, the Institutional Revolutionary Party (PRI). In December of that year, Vicente FOX of the National Action Party (PAN) became the first chief executive elected in free and fair elections. Government: federal republic. Capital: Mexico (Distrito Federal)

Geography Mexico is located in central or middle America, bordering the Caribbean Sea and the Gulf of Mexico, between the US and Belize and bordering the North Pacific Ocean, between Guatemala and the US. The country's terrain is filled with high, rugged mountains and plateaus, low coastal plains and desert. Lowest point: Laguna Salada -10 m; Highest point: Volcan Pico de Orizaba 5,700 m. Coastline: 9,330 km.

Climate varies from desert to tropical. Natural hazards: hurricanes on the Pacific, Gulf of Mexico, and Caribbean coasts, tsunamis along the Pacific coast, volcanoes and destructive earthquakes in the center and south.

Environmental issues include a lack of proper hazardous waste disposal facilities and natural fresh water resources with pollution marring the northern reservoirs, poor quality or inaccessible sources in the rest of the nation; industrial pollution and raw sewage affect rivers in urban areas; rural populations are moving to urban areas, widespread erosion; desertification; deforestation; deteriorating agricultural lands; serious water and air pollution in the nation's capital and urban centers along US-Mexico border; groundwater depletion causing subsidence in Valley of Mexico. Note: Lack of clean water and deforestation are now considered national security issues by the government. Mexico has entered some international agreements including Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Wetlands, Whaling.

Economic Mexico's free market economy has recently entered the trillion dollar class. A blend of modern and outmoded industry and agriculture is increasingly dominated by the private sector. The government has expanded competition in seaports, railroads, telecommunications, electricity generation, natural gas distribution and airports. Per capita income is one-fourth that of the US. NAFTA has tripled trade with the US and Canada since 1994. Ninety percent of Mexican trade is under free trade agreements with over 40 countries including, Guatemala, Honduras, El Salvador, the European Free Trade Area, and Japan. Current administration is mired by congressional opposition against measures to improve infrastructure, modernization of the tax system and labor laws, and allowing private investment in the energy sector. Challenges also inclue boosting economic growth, improving Mexico's international competitiveness, and reducing poverty. Natural resources: petroleum, silver, copper, gold, lead, zinc, natural gas, timber. Agriculture: corn, wheat, soybeans, rice, beans, cotton, coffee, fruit, tomatoes; beef, poultry, dairy products; wood products. Industry: food and beverages, tobacco, chemicals, iron and steel, petroleum, mining, textiles, clothing, motor vehicles, consumer durables, tourism. Note: Corn (maize) is thought to have originated in Mexico. It is one of the world's major grain crops.

Currency Mexican peso (MXN). Exchange rates: 1EUR=14.14 MXN, 1USD=10.95 MXN, 1GBP=21.47 MXN

Population 107,449,525 (July 2006 est.) Ethnic groups: mestizo (Amerindian-Spanish) 60%, Amerindian or predominantly Amerindian 30%, white 9%, other 1%. Religions: nominally Roman Catholic 89%, Protestant 6%, other groups 5%.

Languages Spanish, various Mayan, Nahuatl and other regional indigenous languages.

Deco Chambers

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CONSERVATION ORGANIZATIONS
The Manta Network
www.save-the-mantas.org

"Save the manatee? Save the stingray? Save the what?"

Save the Manta Rays

Text by Robert Aston
Photos by Donald Tipton, Mark Harding, Guy Stevens, Felipe Vallejo

The shark fin trade affects the rays too

world. In the Pacific Ocean, they have been documented as far south as New Zealand and as far north as Hawaii.

Even though they can be observed far from shore, they are mainly seen in small groups around the islands of Micronesia, French Polynesia and Indonesia. In the Indian Ocean, the population around a single atoll in the Maldives may number in the thousands. Off the coast of eastern Africa there is anecdotal evidence of the world's largest manta rays. We do not know why they live only in certain areas. We suspect their habitat preferences may be tied to certain periods of their lifecycle with open water migration only occurring for the more mature individuals within a given population.

Manta rays are slow to reproduce with one or two pups per year, slow growth rates and late age of first reproduction. Information on maturity and their

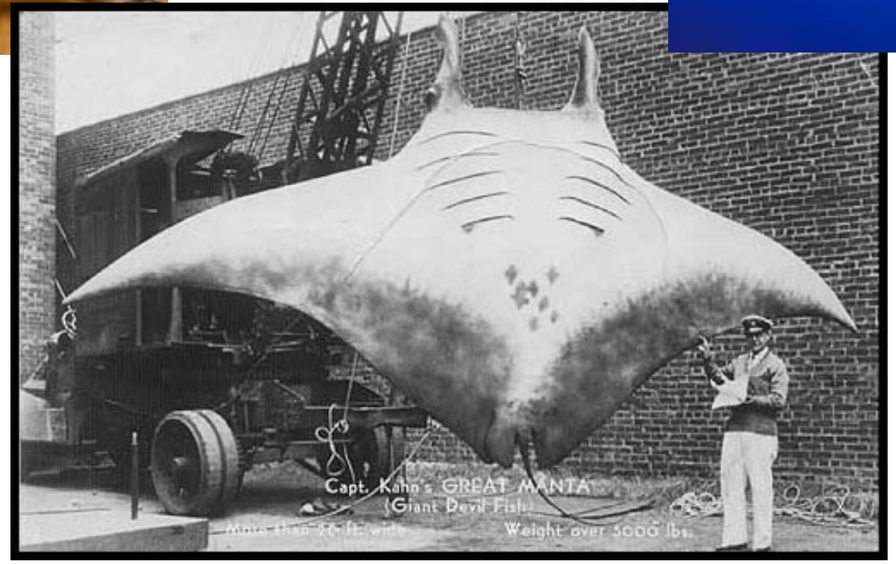
DONALD TIPTON

The name "manta" comes from the Portuguese word for blanket.

"Save the manatee? Save the stingray? Save the what?"

If you ask a group of people what is a manta, nine out of ten will think of stingrays or those large things that swim in the rivers of Florida. Even through the manta ray is the largest winged creature on the planet and has a wingspan wider than a condor, few people even know they exist.

The width of a manta ray can exceed 22 feet. They are part of the shark family but hold no danger to humans as they eat only tiny zooplankton. They are found throughout tropical and subtropical regions of the



Public domain, ca.1933. Caption states the ray weighed over 5000 lbs.

presumed long generation time of more than fifty years has not been fully documented. A recorded instance of small population size with minimal exchange between areas indicates an enhanced risk for local extinction.

Manta rays are not well-known for several reasons. Being solitary animals, humans have had little contact with them. Until recently, not much was known about them so they were feared and called "devil rays" due to the two fins on their heads that resemble horns. The name "manta" comes from the Portuguese word for blanket. They were thought to have attacked and capsized small fishing boats. Many fishermen and islanders considered them monsters from the sea.

Featured in the 1945 movie "Fish From Hell", fishermen in the Sea of Cortez feared that the giant manta would eat all their fish. This could not be further from the truth as mantas and mobula rays are plankton eaters and hold no threat to fish, let alone humans.

Fifty years later, I found myself heading south of Cabo San Lucas, Mexico bound for a remote area of the Eastern Pacific and home to a rich assortment of marine pelagic life. I was on an assignment for a popular dive magazine but little did I know what would be in store for me as I covered the diving surrounding Socorro and San Benedicto Islands. (see preceeding article in this issue).

The manta ray is such a magnificient and highly intelligent creature that every encounter leaves you affected

From my first encounter with a 16-foot wide manta ray, I was entranced. Day after day we played, often with several rays at arm's reach. At times they passed overhead blanketing the sun's rays. On our last day we were treated to a full day of frolic in the mantas' playground.

Dive after dive I was joined by four large mantas that circled in the warm, clear waters just off the seamount. As I recounted in my 1995 article, Socorro Islands--The Manta Playground, "I waited motionless, two mantas glided

above and two below. Without fear, one large manta with two white spots on its back circled ever closer. As she came to rest four inches from my face, our eyes met again. We were both motionless as we each contemplated the other's being. None of us that played with the mantas that day will ever be the same again." At that time I had no idea that for the rest of my life I would be on a quest to save the world's mantas.

While on that trip, I learned that in early 1994 two Mexican fishing boats had violated the marine sanctuary, killing two large manta rays as part of their normal netting operation. This deadly deed was recorded on video by passing sport divers. The fishermen even allowed the videographer on board to record the full impact of the event. The fishermen had not realized that the videotape would quickly be conveyed to the Mexican officials in Cabo San Lucas where it would get immediate media attention. Fortunately, this led to even stricter government permits, regulations and a step up in the monitoring and inspections.

A year later, I formed an alliance with Dr. Bob Rubin, a foremost authority on Manta birostris. After my second trip to research the Socorro mantas, we decided that a global manta conservation organization was needed. It took a while to organize and The Manta Network was granted non-profit status in the fall of 2004.

save the mantas.org

Why are more people not trying to save mantas?

The first answer to that question is that little, none or bad press exists surrounding mantas. The second reason is the lack of data from fisheries, scientific and international trade sources.

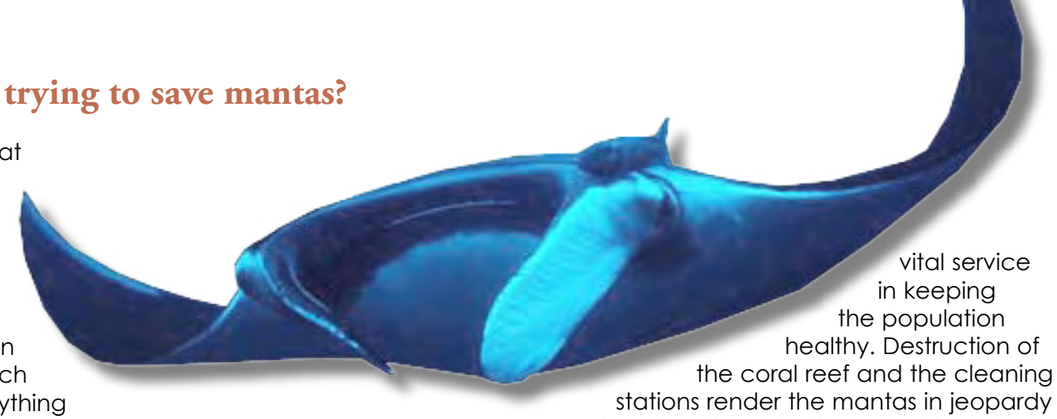
Occasionally, mantas are included in some sensational press coverage such as the 1997 newspaper article "Everything Killed in the Trap Net Fishery". Highly illegal fishing practices known as "Trap Nets" were installed in 1996 by a Taiwanese fishing fleet in a pelagic migratory channel at Manado, Indonesia.

This article states: "Between 27 March 1996 and 12 February 1997 the catches included some 1,424 manta rays, 18 whale sharks, 312 other sharks, 4 minke whales, 326 dolphins, 577 pilot whales, 789 marlin, 84 turtles, and 9 dugong." The fishermen reported all of these as "by-catch" (non-intended species) but most of the animals were frozen and sent to market.

Consumption

Little is known about the world consumption of mantas due to inaccurate or non-existent reporting. Manta ray catches are generally grouped with other rays in by-catch reports making them of little conservation value. CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international organization that was formed by a treaty with 172 member states to monitor and regulate international trade. Mantas and mobula rays have yet to be added to the list requiring fishery monitoring.

An obscure record of exit declarations by Chilean micro exporters to South Korea in 2005 reported that manta rays yielded nearly three times more revenue than corrugated paper exports, some US $106,000. This was slightly up from the previous year and nearly twice that of eel exports.



In May of 2002, while doing work with WWF in the remote Alor region of eastern Indonesia, Dr. Heidi Dewar found that a single village had converted its previous local consumption of mantas into a commercial venture. Mantas were hunted and their skin sent to Jakarta where it is used in the production of shoes and wallets. The dried manta gill plates are sent to Hong Kong where they are used in traditional medicines. Dr. Dewar estimated that the total take over an average season was in excess of 1,500 mantas. She feared that this number could not be sustained and with villagers now buying motorboats with longer ranges, other areas would be affected, especially the nearby Komodo Marine Sanctuary.

In another part of the world off the coast of Tanzania, local fishermen are dynamiting the reef as this makes it easier to catch a diminishing fish supply. Manta rays, as well as most marine animals, rely on smaller fish to perform parasite removal from their skin. Manta cleaning stations perform a vital service in keeping the population healthy. Destruction of the coral reef and the cleaning stations render the mantas in jeopardy of contracting skin diseases which compromises their health.

It is difficult enough to obtain data on legal fishing and almost impossible to find out about illegal activities. This problem has thwarted our efforts to submit a petition to CITES for the protection of manta rays. It will be another three years before they will convene and by then it may be too late to begin the data collection, so we must act now.

Since the late 1990s, efforts to protect manta rays have begun in several locations where manta frequent. One of the earliest efforts began in Kona, Hawaii with Manta Pacific, a non-profit volunteer group. Over several years, the local population was photographed and recorded in attempts to provide data for their pro-

Finned manta ray. The fins are cut of and the rest of the body just discarded

DONALD TIPTON

The Manta Network is involved in:

Research
Manta Field Research Affiliates
Global Manta Database
Manta Migration Study
Continous Monitoring Program
Manta Research Expeditions

Education
On-Line Manta Community
Manta Resource Guide
Mantas-in-the-Classroom
Community Outreach

Conservation
Adopt-A-Manta
Tens Rules of Encounters
Eco-Tourism Programs
Telepresence Network

Protection
Manta Documentary
In-Country Partnerships
CITES Endangered Species

tection. Studies have indicated that protection of mantas are not only good for the mantas but also for manta tourism which has contributed more than $2.5 million a year to the local economy.

In the last two years, several more organizations have been formed, some for research and others for conservation. (See "Mantas From Around the World") Most of these have small budgets, are staffed by volunteers and focus only on local populations and issues. As part of the shark family, mantas have been included in some of the programs headed by global conservation organizations.

The Manta Network is the only global organization dedicated solely on manta and mobula rays. It is working to create programs to protect and conserve mantas. Its mission is to create a knowledge base to educate fishing and tourism industries, government organizations, conservation groups and the public on the importance of protecting and conserving these magnificent creatures.

The Manta Network's efforts are focused into scientific research, education, conservation and protection. Studies are conducted in conjunction with leading manta researchers. It strives to make available accurate information about areas where manta populations are threatened that helps to increase industry, government and public awareness about the critical issues.

The Manta Network combines scientific research with education and community to foster conservation and protection. The organization serves as a central repository for manta information and a resource for any organization or individual seeking to further their work.

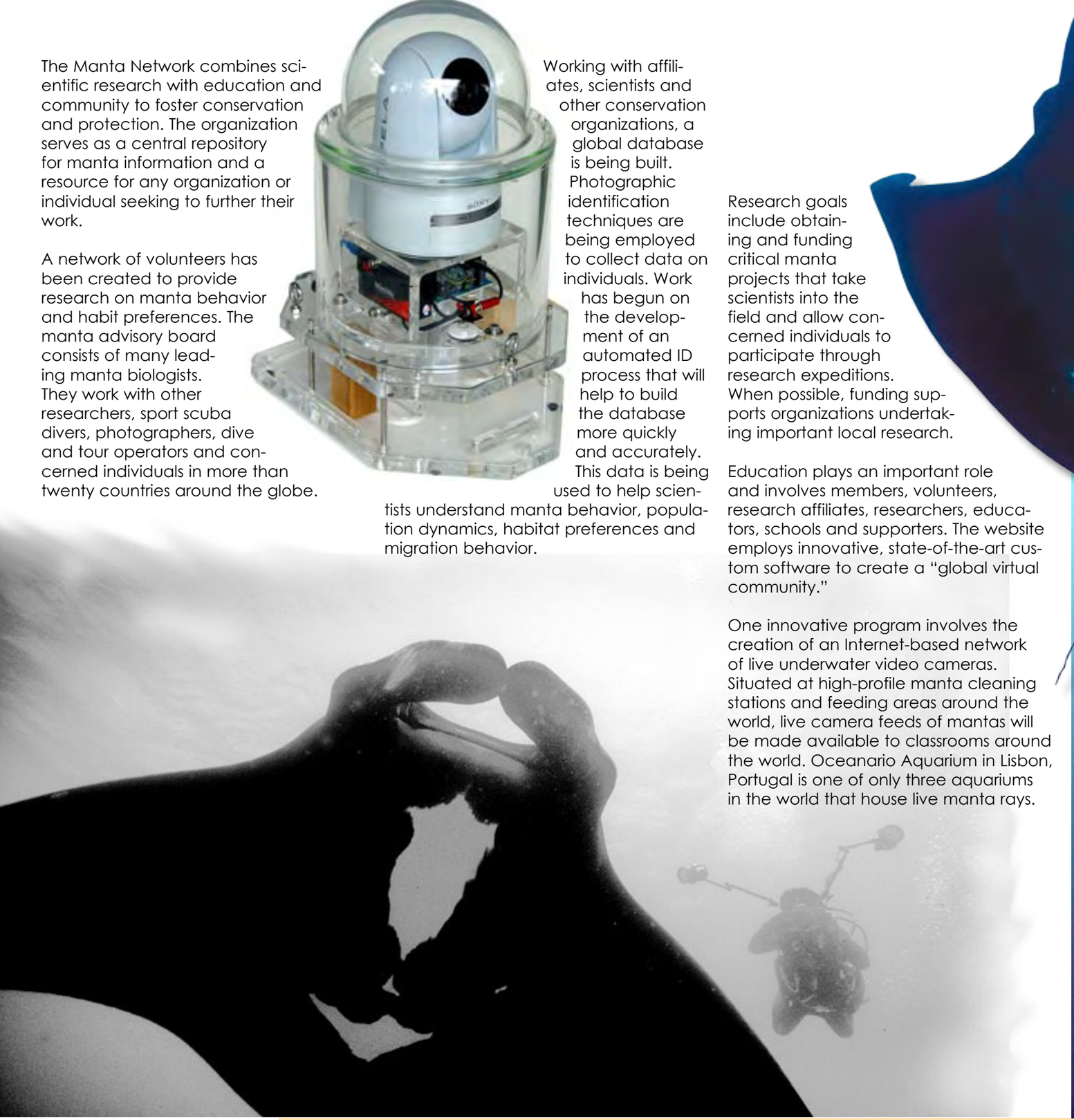
A network of volunteers has been created to provide research on manta behavior and habit preferences. The manta advisory board consists of many leading manta biologists. They work with other researchers, sport scuba divers, photographers, dive and tour operators and concerned individuals in more than twenty countries around the globe.

Working with affiliates, scientists and other conservation organizations, a global database is being built. Photographic identification techniques are being employed to collect data on individuals. Work has begun on the development of an automated ID process that will help to build the database more quickly and accurately. This data is being used to help scientists understand manta behavior, population dynamics, habitat preferences and migration behavior.

Research goals include obtaining and funding critical manta projects that take scientists into the field and allow concerned individuals to participate through research expeditions. When possible, funding supports organizations undertaking important local research.

Education plays an important role and involves members, volunteers, research affiliates, researchers, educators, schools and supporters. The website employs innovative, state-of-the-art custom software to create a "global virtual community."

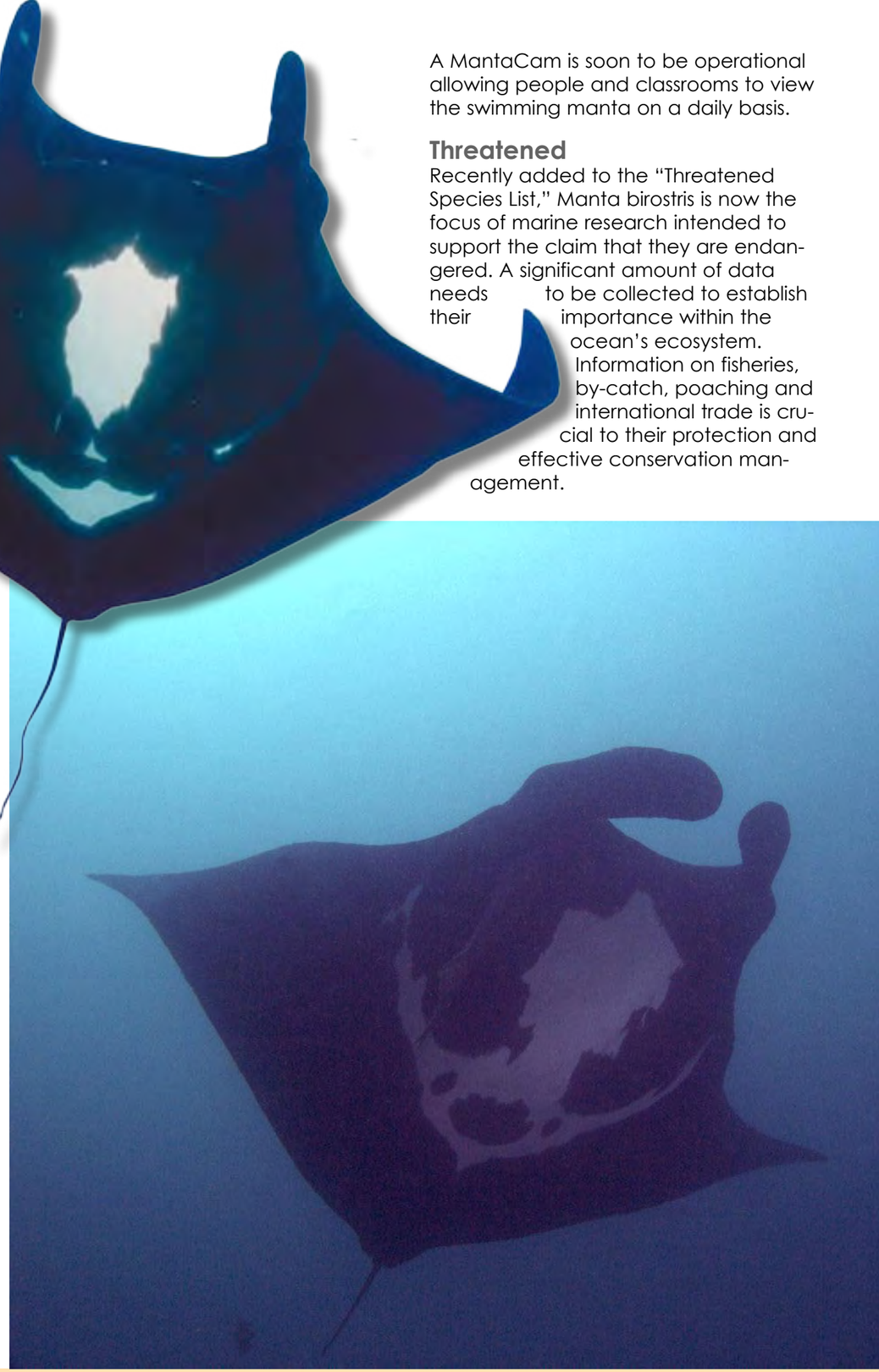
One innovative program involves the creation of an Internet-based network of live underwater video cameras. Situated at high-profile manta cleaning stations and feeding areas around the world, live camera feeds of mantas will be made available to classrooms around the world. Oceanario Aquarium in Lisbon, Portugal is one of only three aquariums in the world that house live manta rays.



A MantaCam is soon to be operational allowing people and classrooms to view the swimming manta on a daily basis.

Threatened

Recently added to the "Threatened Species List," Manta birostris is now the focus of marine research intended to support the claim that they are endangered. A significant amount of data needs to be collected to establish their importance within the ocean's ecosystem. Information on fisheries, by-catch, poaching and international trade is crucial to their protection and effective conservation management.



A testimony

working in the ocean daily provides me with the opportunity to have many manta encounters. These encounters do not just allow me to be in the presence of majestic creatures, but also permit me to assist in the identification of newly sighted individuals. New individuals are identified by photographing mantas from several different angles, especially the ventral and dorsal sides. These photographs are then compared with previous photographs on file to discover if the manta is a new individual, or an individual that has already been identified. If the manta is unidentified, I send the pictures to the Manta Pacific Research Foundation. The MPRC contributes to the Manta Network, which is an organization that works towards, "advancing knowledge of mantas." Their goal is to accomplish this through population studies, environmental education, environmental assessment studies, and public awareness initiatives. It is an exuberant feeling to contribute towards educating people about mantas. I have personally identified 7 new individuals that I have been following for the past 3 years. They usually appear at the same dive site during the summer months. All of the mantas are still alive, which keeps me happy. Most commonly they are about 10 to 12 feet in wing span and are very white ventrally and greyish dorsally. However, the mantas that I have spotted lately are quite large with an estimated wing span of 12 to 15 feet. These mantas have been located at Reef's End inside Moluccana Crater off the coast of Maui, Hawai'i. The largest we have seen was estimated to have a 17 foot wing span. Although we do not yet know where the mantas from Maui go during the winter months. The Manta Network is researching their migratory habits. For me, contributing towards manta education is not just through the organization, but also by sharing what I know about mantas with fellow divers, as well as teaching them how to respect these noble ocean gliders. Happy diving to all.

Aloha,
Benja Iglesis
www.benjaiglesis.com

Susceptibility to increased predation, loss of habitat and accidental by-catch is increasing the risk of extinction. This vulnerability is affecting several documented local populations. Some scientists conclude that the pressure on the local populations will lead to local extinction and may result in long-term reduction or extinction of the global population.

Several reports conclude that more than 90% of the world's pelagic fish have disappeared due to excessive harvesting and illegal fishing practices. These include shark finning for shark fin soup which is a Chinese delicacy, even through the fins have no taste. Scientific circles fear that global warming will dramatically affect coral reefs and along with them the manta cleaning stations, destroying in a few years what took millions of years to create.

Loss of manta cleaning stations along with the fish that service them will have a significant impact on the world's manta rays. It is a threatened species that could very well be in danger of extinction.

We need to act quickly to raise awareness of the plight of the global population of manta rays and the urgent need to protect them. If we hesitate, the world's largest winged and most majestic creature will be gone before most people ever knew they even existed.

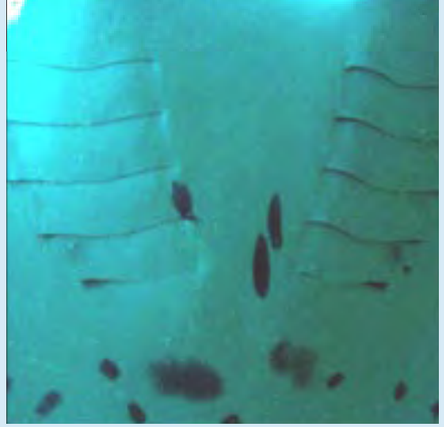
Manta Ray Studies in Brazil

Dr. Otto Bismarck Fazzano Gadig
SÃO PAULO STATE UNIVERSITY, UNESP – SÃO VICENTE, BRAZIL

Manta rays are reported off the entire Brazilian coast, but there are no studies on its biology, distribution and other important biological aspects. The only study, ate presente, was carried out in Southern Brazil in a Marine Protected Area named Laje de Santos Marine State Park, located about 21 nautical miles off São Paulo, Brazil comprising 5 square km sea portion adjacent to a 500 m long and 100 m high rock (24º 00'S- 43º 23'W). This area is massively utilized for recreational diving operation, and the any fishery is prohibited.

In this research it was made 34 sightings of manta rays, during 244 diving operations, totalizing 40 individuals. Most rays were recorded during the southern hemisphere winter (July to August), corresponding to 90,2% of total sighted rays. During this season, several giant mantas are caught and killed accidentally by artisanal gillnets in Southern Brazil (Figure Attached, by F. S. Motta, Projeto Cação). Females comprised 32,1% and males 67,8% of sexed individuals. All specimens were adults, judging by its size, which varied from 3 to 5,5 m wide and by the characteristic stuffed pelvic in males area, suggesting that the seminal vesicle was filled with semen. The presence of adults of both sexes during the winter period at the Park may be related to a reproductive behaviour.

The Laje de Santos State Marine Park is a highly visited place by divers, most of them touching the mantas, what can affect the natural behaviour of this species. Therefore, future directions include more detailed behavioural studies to know about the intraspecific interaction between mantas, as well as, between mantas and man. Such data is necessary to allow recreational and eco-diving regulatory measures in marine protected areas around the world.



Manta rays unique identification pattern

The liveaboard adventure dive boat **Undersea Explorer** has teamed up with James Cook University's Honours student Owen O'Shea for our latest manta research project. His research is centred at a manta cleaning station on Osprey Reef, a pinnacle in the Coral Sea, 69 nautical miles east of the Australian continent. Mantas are commonly seen there during our regularly scheduled dives, but Owen wanted more data. He used a remote underwater video camera to record action at the cleaning station from dawn until dusk, each day Undersea visited Osprey Reef (usually 2-3 days per week). He is now analysing the data to investigate the interactions between the cleaner fish and their clients, which typically include not only mantas, but also a broad spectrum of sharks, including grey reef whalers, hammerhead sharks, and the occasional oceanic black tip. Owen has identified at least 25 different individual manta rays that have visited the site, with several repeat guests!

Undersea Explorer marine biologists also continue to gather information for our nature diary on the exciting creatures (including mantas) that we see at our sites. We have kept a record of environmental variables and biological sightings for the past decade, which allows us to better understand the behaviour and distribution of key indicator and charismatic species.

Maldivian Manta Ray Project

The Maldivian Manta Ray Project is a non-profit research and conservation organization based at the Four Seasons Resorts in the Maldives.

Manta rays are listed as 'near threatened' by the World Conservation Union (IUCN) and much scientific research is still needed to properly assess their status worldwide. Almost nothing is known about their population ecology, use of critical habitat, movements or reproduction, all of which are important if we are to accurately assess the state of the species.

One of the best ways to begin understanding the population of manta rays in the Maldives is to establish a method of recognising and recording individuals. Using photographic and video identification we are building a comprehensive database of the individual mantas throughout the Atolls. This highlights trends in their behaviour, allow for an estimation of the population size and their movements both spatially and temporally.

We are also using satellite and acoustic tagging programs to identify the migration routes and daily activities of these amazing animals. For more information on the projects work please visit our website at **www.maldivianmantas.com**