

Equilibrio

equilibrio.org.mx



Photo: Shawn Heinrichs

WINNER OF THE OCEAN TRIBUTE AWARD

This is the first time that a Mexican project has won this award, granted by the Prince Albert II Foundation of Monaco in collaboration with Boot Düsseldorf and the German Ocean Foundation. In addition to winning first place from the jury, *Equilibrio* achieved the highest public vote with 75.4%.

Since its creation in 2018, the Ocean Tribute Award has been given the task of recognizing and promoting worldwide marine conservation projects that meet one -or more- of the following characteristics: they are innovative, offer solutions to particular problems, and have a great impact on their places of origin.

Such has been the relevance of this award that each year it receives hundreds of applications from all over the world. In the last edition, one of these proposals was *Equilibrio* magazine, a Mexican publication that is part of a comprehensive environmental communication project led by Beta Diversidad A. C.

For almost 15 years, those of us who are part of *Equilibrio* have made an effort to offer a truthful, impartial and vanguardist media that serves as a support to spread among our readers all those issues related to the protection of nature that are little talked about, to raise awareness, and to inspire others to take action with the facts at hand and reliable information.

However, in addition to informing, we seek to call for action and promote changes that will result in a true conservation of marine and terrestrial biodiversity in our country: communication is also conservation.

At a time when print media faces the great challenge of surviving, a prize like the Ocean Tribute Award encourages us to continue, to maintain the quality that has always characterized us and to bet on digital platforms.

We are deeply grateful to those who throughout this time have made *Equilibrio* a reality: collaborators, donors, photographers, journalists, etcetera. This award is also a recognition of their work and effort.

We will continue to bet on a solid, reliable, and inclusive project.

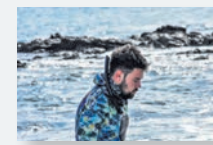


"Communication is also conservation".

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and check
other editions.



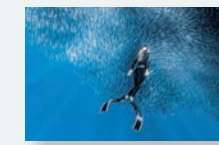
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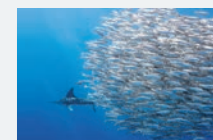
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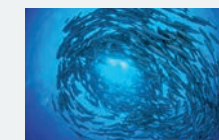
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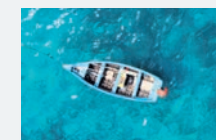
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WHY PROTECT THE WORLD'S SEAS?

Coastal fishermen know Mexico's seas like no one else; they are their best guardians and, unfortunately, the ones who suffer the most from their deterioration. For them, for the marine species that inhabit them, for those who come, for us: let's protect the oceans!



• WENDY HIGUERA

Nowadays, coastal fishing is less profitable and one of the main reasons is the overexploitation caused by industrial fishing, in addition to pollution, mining and illegal fishing. We are the most interested in the conservation and protection of the seas because we depend on fishing to bring sustenance to our homes, but we also want future generations to enjoy the benefits of the sea.

• ARMANDO NARANJO

The seas must be protected because they are borrowed from the future generations; we must make a good management of them through sustainable fishing of marine resources, using responsible fishing gear. We must work to create awareness with those of us who cohabit its coasts.



• JOSÉ FLORES

If we want to continue fishing, we have to take care of our seas! We need to be aware that we depend on the health of the seas and what we extract from them. Our future is based on the good management and care we give them.

We must develop the best fishing techniques that are environmentally friendly so that we do not impact the marine environment in a way that harms species and their reproduction. It is our obligation to make the existing conservation tools work to achieve better results; this motivates us to contribute our experience to create awareness in the new generations.



• FRANCISCO LUCERO

I am a son of the Sea of Cortez. I owe all my development and formation to my family, but also to the ocean. Depending directly on good fishing days taught me how important it is to keep our seas healthy; that is why sustainable actions that regenerate marine biodiversity are vital for the communities that depend directly on fishing.



• ABRAHAM OSUNA

We, as a fishing sector, depend on the seas for our livelihoods. They are also a source of food and oxygen for all mankind, and we must protect them. Future generations must enjoy their benefits.

• JOEL GONZÁLEZ

We must take care of the sea because all fishing families depend on it. We have to respect it because it gives us a living; if we don't do it now while there is still time, our future generations will not find fish where there is fish today. In addition, we must protect it from industrial ships and poaching.



• ALEJANDRO LUCERO

The livelihood of many, unique biodiversity, the lungs of the planet; whether you are from the coast or not, our seas give us more than we can imagine. Whether we are talking about food, health, or sustainability, we all depend on healthy seas. Our seas give us so much and we give so little, we must be responsible and take care of them for new generations, so that they can know the healthy seas and witness all their unique magic. Today we can work as a team for a common good.

• HUMBERTO ARIAS

The sea and its species are creators of life, wealth and food for humans and other animals. They also generate employment in the communities settled on the shores and ports that have sea. We must protect it.



• TOMÁS CAMACHO

We have to face the depletion of marine species populations, whether due to climate change, environmental issues or the detrimental effects of commercial fishing activities and also other economic activities such as underwater mining. If we are all well informed, better things can be achieved. No to the Don Diego mine in the Gulf of Ulloa!

A DEVOTEE OF THE OCEAN

By Adam Skolnick | @adamskolnick

It wasn't until I was 40 years old, with my marriage on life support and my back injured and weak, that I became a devotee of the ocean. Someone suggested that swimming might be my salvation, so I made my way to the coast where the ocean was cold and wild, and despite its proximity to a major metropolis, more filled with life than I'd expected. The water was crystal clear that day. I counted 50 bat rays on the sandy bottom and was hooked for life.

Since then, I have swum among playful harbor seals, curious sea lions, migrating whales, and surfing dolphins. I swim and dive to disappear into another world where even the smartest phones can't function. I swim to test myself, to learn important lessons about staying calm when forces greater than I have me in their grip. There is daring and problem solving and self-reliance, but also a profound love for the deep mystery that is the ocean, all oceans.

All of us are saltwater creatures. The ocean is roughly 3% salt, similar to the salinity in amniotic fluid. Like the earth itself, we are mostly saltwater, our every second breath is provided by the world's oceans. A seemingly infinite resource we have relied upon for transportation, trade, food, sport, fun, and a kind of emotional salve long since we crawled from the depths. The ocean is also the earth's largest carbon sink. All of life depends upon healthy marine ecosystems, and yet, too often, we take more than we need and treat them as a dumping ground.

And so I will fight for them, tell ocean stories whenever I can, and I will swim and I will dive as often as possible. 🌊



Photos: Frida Lara | @fridalara.

MEXICO'S REVILLAGIGEDO NATIONAL PARK

RECOGNIZED AS KEY COMPONENT OF THE EASTERN TROPICAL PACIFIC MARINE CORRIDOR

By Joaquín Labougle

A growing body of research shows that many of the ocean's commercially, culturally, and ecologically important species travel over far greater distances than previously realized, underscoring the danger that protection in one area can easily be undermined by vulnerability in another.

With this in mind, Beta Diversidad, a Mexican-based NGO in coordination with the network of marine protected areas of the Eastern Tropical Pacific Marine Corridor and the Mexican government successfully organized the Eastern Tropical Pacific Marine Corridor Summit and International Ocean Conservation Conference in La Paz, Baja California Sur in coordination with the Secretariat of the Environment and Natural Resources and the National Commission of Natural Protected Areas of Mexico.

The events brought people together from across the region, including scientists, experts, and park managers as well as representatives from the private sector, philanthropy, and government, to explore ways to strengthen technical and financial cooperation at the national and international levels, and learn more about existing initiatives in Latin America, including Mexico's commitment to strengthen the Eastern Tropical Pacific Marine Corridor.

The event was highlighted by the news that Revillagigedo National Park, Mexico's largest fully protected marine reserve that safeguards a chain of volcanic islands in the Pacific and the surrounding marine habitat, was formally incorporated as part

of the Eastern Tropical Pacific Marine Corridor (CMAR), a voluntary regional cooperative effort initiated by Ecuador, Costa Rica, Colombia, and Panama in 2004 to protect one of the ocean's most productive and biodiverse regions in the world.

Historically, the marine protected areas (MPAS) around the Galapagos, Cocos, Malpelo, Gorgona, and Coiba have been considered the core areas for the Eastern Tropical Pacific Marine Corridor. However, adding Revillagigedo adds to the growing evidence of greater regional leadership, ambition, vision, and cooperating on marine conservation. Ecuador, Colombia, Panama, and Costa Rica also recently announced plans for an interconnected transboundary network of MPAS.

Including the Revillagigedo National Park as part of the network of marine protected areas of the Eastern Tropical Pacific Marine Corridor recognizes and extends the geographical scope of management coordination further across the region. Such coordination and cooperation will better safeguard the underwater highways for key migratory and endangered species and help deliver the needed connectivity throughout the Eastern Tropical Pacific.

The Blue Nature Alliance is working alongside local partners in support of efforts to expand and implement marine protections in Costa Rica and to implement effective monitoring and enforcement of newly protected waters in Panama, and continues to explore opportunities to work throughout the region. 🌊

— ABOUT THE AUTHOR

Regional Programs Officer for Latin America and the Caribbean of the Blue Nature Alliance. Before joining the Alliance, Joaquín Labougle was in charge of the National Directorate of Marine Protected Areas of the Administration of National Parks of Argentina.



A New Vision

for Marine Protected Areas in Mexico

By Mario Gómez | @Mariogomez

When the figure of Natural Protected Areas (NPAs) first emerged in Mexico, they sought to conserve mainly forests that favored hydrological basins. Later, they focused on emblematic marine and terrestrial species, to later focus on representative tropical rainforests such as Monte Azules (Chiapas), Calakmul (Campeche) and Sian Ka'an (Quintana Roo).

It was not until the 1990s that areas in the sea inhabited by representative species such as whales, sharks or coral reefs began to be protected; all these areas were rather small.

By the 2000s, the Mesoamerican Barrier Reef System was established, a shared coral reef of 1000 kilometers that goes from Cabo Catoche, in Quintana Roo, to Roatan, in Honduras, passing through Guatemala and Belize. This was one of the first attempts to protect an international marine corridor.

At the same time that marine conservation efforts were growing, the fishing industry was on the rise, sophisticated industrial vessels with state-of-the-art technology that allowed them to increase their catches and travel greater distances. Environmental initiatives proved insufficient.

REVILLAGIGEDO MADE A DIFFERENCE

Over the years, the opposition between the fishing industry and the environmental authorities worsened; both actors with opposing positions operating in opposite directions, and far from dialogue. In this scenario, in 2017 a big step was taken when the Revillagigedo Archipelago Biosphere Reserve (created in 1994, and located in the Pacific Ocean) was decreed as a National Park, going from 384,000 hectares where fishing (industrial and sport fishing) was allowed to 14.8 million hectares, becoming the largest

Marine Protected Area (MPA) free of any type of fishing in North America, thus fulfilling two fundamental characteristics to achieve true protection: large-scale and strongly protected. More than four years after its creation, it has proven to be highly functional and productive. Contrary to popular belief, a large and highly restrictive area can be policed more efficiently.

Revillagigedo National Park (RNP) joins the growing list of MPAs that are betting on extensive polygons where any extractive activity is prohibited, such as Papahānaumokuākea National Monument (in Hawaii) and the recently expanded Cocos Island (Costa Rica), Galapagos National Park (Ecuador) and Coiba National Park (Panama).

As if that weren't enough, a few months ago the PNR joined the Marine Areas Network of the Eastern Tropical Pacific Marine Corridor (CMAR) and just last December received the Blue Park Award granted by the Marine Conservation Institute. We are on the right track, because once again it is confirmed that MPAs with a long-term vision are true savings banks for fisheries and guarantee food security in Mexico.

CONSERVATION AND PROMOTION AS ALLIES OF BIODIVERSITY

For years I have promoted the creation of MPAs in Mexico, and today I have no doubt that it is time to evolve and transform the way in which these tools emerge. The conservation of nature is an ally of responsible and orderly development; it can be protected and, at the same time, promote productive activities.

From now on, the birth and operation of MPAs in Mexico and the world must include intersectoral participation that involves environmental authorities, local governments, academic institutions, and science, as well

Nature conservation is an ally of responsible and orderly development; it can be protected and at the same time promote productive activities.

as agencies linked to fisheries and development, particularly tourism, which today is another subject that plays in favor of conservation. At the end of the day, we are all connected by the same ocean.

In the future, all those involved should have the opportunity to regulate and operate according to their faculties, under a co-management scheme. Even more so if we consider that MPAs are not opposed to other instruments such as fishing refuges or wildlife sanctuaries.

As is well known, MPAs have an Advisory Council in which CONAPESCA and INAPESCA hardly participate. Here there is a great opportunity for collaboration because it is the ideal space to discuss differences and plan joint long-term actions where the faculties and visions of each institution can achieve bet-

ter coordination. All actors with legitimate involvement in the subject should be represented there.

MPAs need sufficient and constant resources to operate efficiently. Fortunately, there are more and more international funds and businessmen willing to contribute resources for the creation and management of MPAs; this is how we set about the task of creating the Fund for the Conservation of the Seas (FOMARES), which seeks to support conservation, restoration, and promotion projects in Mexico's seas.

We have before us the perfect conditions to achieve this because there is will, there are projects in the pipeline, and the growing interest of society in general. I invite you to reflect; it is time to achieve what I have called the Blue Revolution. 🌊



Photo: Adrián Blanco.

— ABOUT THE AUTHOR

Explorer and naturalist. For three decades he has dedicated his efforts to designing and implementing public policies in Mexico, as well as promoting the declaration of new MPAs, including federal, state, and private ones. He was part of the team that created CONANP (National Commission of Natural Protected Areas). Specialist in ocean and marine conservation.

BAJA CALIFORNIA SUR

A TRUE WHALE SANCTUARY

By Michael Fishbach and Shawn Heinrichs

"How did you get so lucky to have Baja California Sur (Baja) as your base of fieldwork?" This is a question I have heard again and again at marine mammal conferences over the past 25 years.

Baja has a unique confluence of habitats, where the lush desert with the thickest stands of cacti on earth, meets the nutrient-rich, emerald Sea of Cortez to the east, and the mighty blue Pacific Ocean to the west. Here, there are islands that are home to strange plants and animals, hosting the greatest abundance of endemic species in North America. Towering jagged mountains rise abruptly from the ocean, and deep, complex canyons shaped by tectonic forces over millennia, carve their way through land and sea. The force of the Pacific crashes into the peninsula and up along these underwater canyons, stimulating robust upwellings that bring massive swarms of nutrients to the surface and support a dazzling array of life.

Baja is also blessed by a staggering abundance and diversity of cetacean species (whales, dolphins, and porpoises), on a level that is matched in very few other places on earth. And in the Northern Hemisphere, Baja is in a league of its own as far as whales are concerned. Commercial whaling annihilated global whale populations in the 19th and 20th centuries, and given commercial whaling was primarily based out of New England and Europe, this region was significantly farther away to reach by water than the rich whaling grounds of Antarctica. The whalers, then lacking a canal through Panama, had much further

to go to make it to Baja. However, despite this geographical advantage, the gray whales in particular, were still taken in vast numbers from the Pacific lagoons, and although their population was severely depleted, they have made a robust recovery in the past few decades. Today, they once again populate the lagoons of Ojo de Liebre, San Ignacio, and Magdalena Bay, much to the joy of throngs of winter whale watchers.

The riches of Baja have captured the attention of some leading ocean storytellers. In the words of my friend, Shawn Heinrichs, an ocean conservationist, filmmaker and photographer:

"My film and conservation work has taken me to the most remote corners of the ocean to document some of nature's most magnificent spectacles. Sadly, as a direct consequence of mass commercial whaling in the 19th and 20th centuries, the great whales have been notably absent throughout most of the ocean habitats I have filmed in. However, what I have experienced in Baja California Sur (BCS) has been truly mind blowing. The abundance and diversity of Great whales and cetaceans found here is second to none. The frequency in which I have encountered great whales of various species along the entire coastline is beyond anything I have experienced. In a single trip, I encountered blue, fin, brydes, humpback and gray whales, along with super pods of common dolphins and resident pods of bottlenose dolphins. The waters surrounding BCS are truly one of the last great sanctuaries for whales in the northern hemisphere, and we must do all we can to protect these majestic creatures".

Baja is home to all but four species of the world's 13 great whale species and is a critical habitat for the endangered and iconic blue whale, the largest animal ever to live on earth. Baja is home to the rarest cetacean still living, the Vaquita Porpoise, and also home to quite possibly the newest species of whale to be discovered (2019), that for now we call the Guadalupe Beaked Whale. Blue, humpback and gray whales migrate up and down the west coast of Baja every year, while fin whales have a resident population in the Sea of Cortez, and sperm whales can be found in great abundance when there is squid in the sea. Bryde's whales are also resident to the Sea of Cortez, while the less-common minke and sei whales can be found anywhere around Baja. With great luck, the extremely rare North Pacific Right Whale can also be found occasionally off Baja. In fact, anyone traveling the west coast of Baja will see whales at all times of the year, while the Sea of Cortez is a true whale watching paradise throughout the winter and into mid spring.

Marine Mammal biologist Dr. Jorge Urban has pointed out that resident fin whale populations are known to occur in just three places on earth with the Sea of Cortez being one of them.

With an estimated population of <700> individuals, it has been established that the coastal corridor between La Paz and Loreto as well as the more northerly Midriff Islands are the prime calving grounds for this unique population of fin whales.

My work over the past 27 years has primarily focused on identifying large whales photographically, by capturing the unique pigmentation pattern and dorsal fin shapes and sizes that distinguish one individual from another. Over these years I have made thousands of approaches to large whales and identified many hundreds of different individuals from numerous species.



Photo: Delphi Fishbach.



Photo: Shawn Heinrichs.

“The waters surrounding BCS are truly one of the last great sanctuaries for whales in the northern hemisphere, and we must do all we can to protect these majestic creatures”;

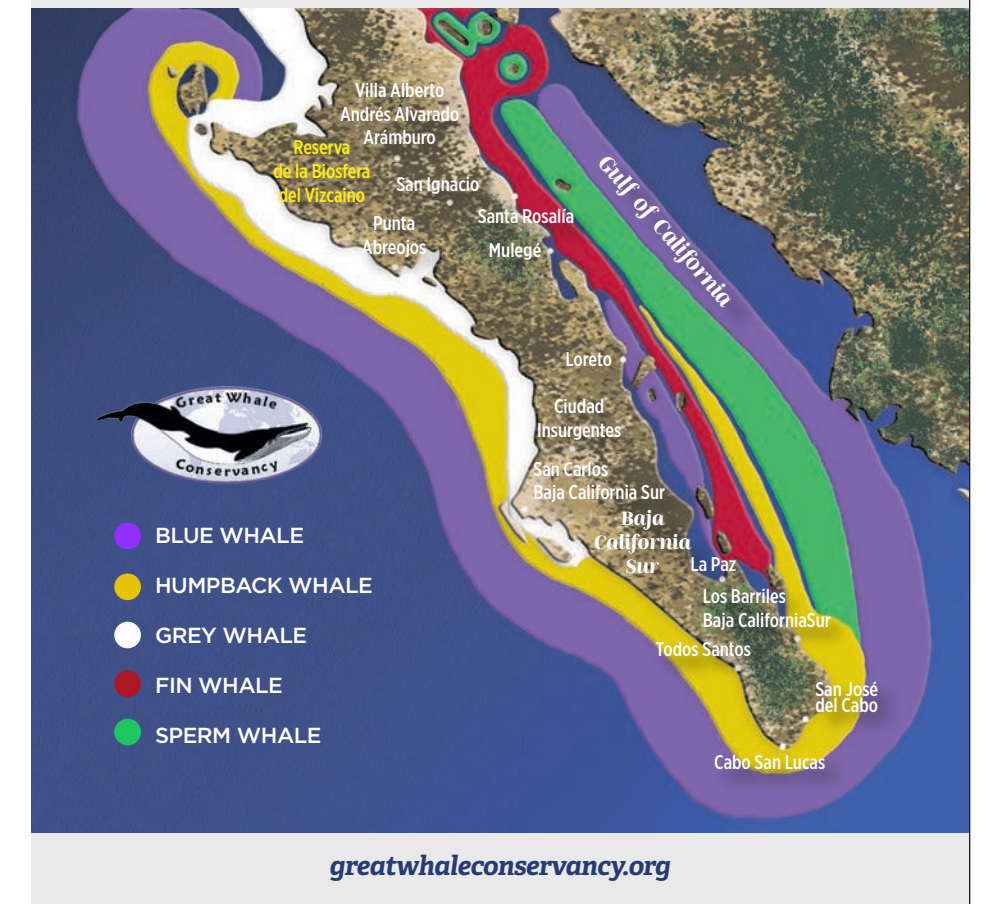
Shawn Heinrichs.

However, the primary focus of my work has been on the iconic and endangered blue whale. Some blue whale individuals exhibit strong habitat preference, and we have observed some of these “regulars” ten, fifteen or in very unique cases, as many as eighteen of the twenty-seven years I’ve worked in Baja. Nubbin, White Eyes, Hook, Slice, and many others, are blue whales I instantly recognize, and when they are seen in yet another year, it feels like a reunion with an old friend who has mysteriously disappeared for most of the year, only to faithfully return to their favored winter area, just as I do.

Though my working area has been primarily in a nutrient rich and rather small portion of the Sea of Cortez, in an around the Loreto Bay National Marine Park, which is without question a major blue whale “hot spot”, I recognize the critical need to expand our focus to include the waters surrounding all of Baja California Sur (BCS). If we are to truly protect the whales, we must protect the waters throughout their migratory route in this region, and there is no better mechanism to achieve than through the creation of a Marine Biosphere Reserve and further, through it’s inclusion in the Eastern Tropical Pacific Marine Corridor.

These magnificent ocean giants bring both pride and significant tourism income to people all around Baja California Sur. From the gray whales of Baja’s three Pacific Lagoons, to the orcas and humpbacks in the southern Sea of Cortez, to the blue whales of Loreto, the fascination with these awe inspiring whales is remarkable, and many fishermen are now switching their work in winter to whale watching tourism, an industry that is far more sustainable in the long run than the diminishing extractive fishing activities they have long practiced.

The Great Whales of BCS



We must also not lose sight of the fact that these whales enrich the marine ecosystem in a significant way by stimulating vast phytoplankton blooms via their mineral rich enormous fecal plumes (poops). These planktonic blooms are both vast photosynthesis mechanisms and the base of the entire oceanic food chain. So more whales mean more fish, and without question, an enriched ecosystem that is not only good for nature but also for the communities who depend on it. So it is beholden upon us to clearly identify all

critical habitats for the Great whales in the waters surrounding Baja, and to enact protective measures to effectively address primary threats, such as the depletion of food sources, strikes by large ships and entanglement in fishing nets and other fishing gear.

The establishment of a Marine Biosphere Reserve around Baja California Sur would be one of the greatest steps in our time for the conservation of great whales in the northern hemisphere, and establish Mexico as a global leader in great whale conservation. 🌐

— ABOUT THE AUTHORS

- **Michael Fishbach** conducts annual field research on the blue whale in the Sea of Cortez of Baja California Sur, where for the past 26 seasons he has tracked the oldest and the best known blue whales on earth. Michael is the Executive Director of the Great Whale Conservancy.

- **Shawn Heinrichs** is an artist and Emmy-award winning cinematographer, photographer and marine conservationist. Co-founder of Sea Legacy.



HIGH SEAS PROTECTION

CRUCIAL PIECE OF OCEAN CONSERVATION

By Sebastian Nicholls

Photo: Mauricio Zavala.

The more than 50,000 kilometers of coastline throughout Latin America give the ocean a crucial role in livelihoods and food security in the region. In fact, the ocean is so important to our communities that Latin America has created or expanded Marine Protected Areas (MPAS) within national waters, and Ecuador, Colombia, Costa Rica, and Panama recently committed to creating an interconnected, transboundary migration corridor to protect marine wildlife in the Eastern Tropical Pacific.

The timing could not be more crucial, because the ocean's health is in decline. The cumulative impacts of a changing climate—compounded by pollution, shipping, and noise from oil, gas, and mineral exploration—are now affecting every part of the ocean, including the areas beyond the national jurisdiction of any single country, also known as the high seas. To ensure that the ocean continues to provide benefits and maintain resilience, the world's governments must take bold action to protect the high seas.

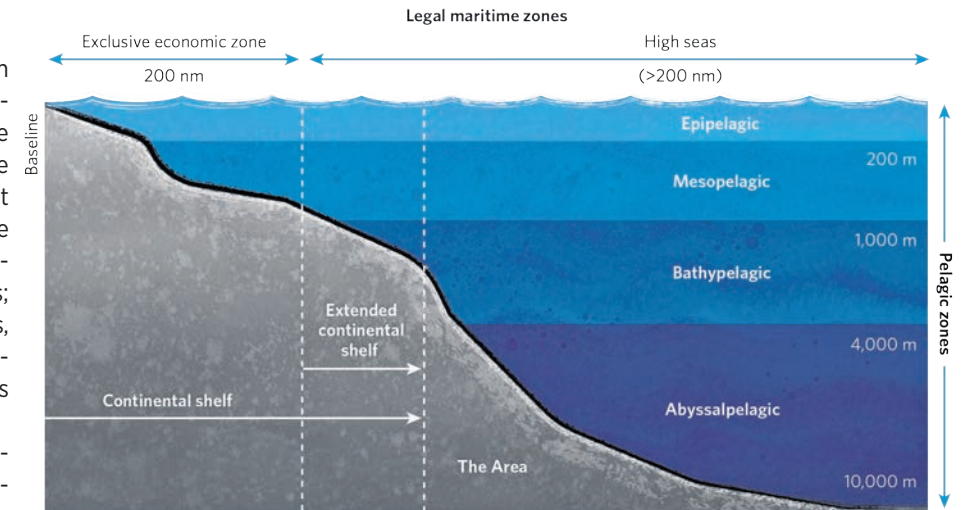
The high seas begin 200 nautical miles from shore and cover nearly half of the planet's surface. Much is still to be learned about how the ecological integrity of these areas connects to the health of coastal zones, but scientists know that the high seas teem with life and are among the largest reservoirs of ocean biodiversity. Additionally, the high seas support abundant fisheries; provide habitat and migratory routes for whales, sharks, sea turtles, and seabirds; and harbor remarkable ecosystems, such as deep-water corals and other majestic marine life.

Further, the high seas help to regulate global air temperatures and slow the impact of climate change on land by absorbing and storing excess carbon dioxide from the atmosphere. In 2014, the Global Ocean Commission estimated the economic value of removing this carbon from the atmosphere at us\$74 billion to us\$222 billion per year. At the same time, higher levels of carbon dioxide in the atmosphere have contributed to rising ocean temperatures and increased acidity—threatening ecosystems and habitats that marine species depend on and adding to problems such as coral bleaching and reduced oxygen concentrations (the process known as deoxygenation).

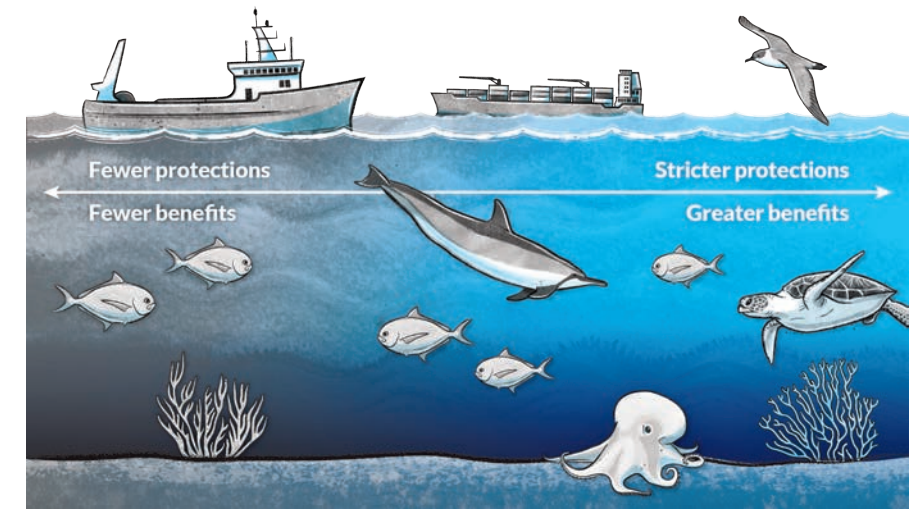
By contrast, the gross value of the catch in high seas fisheries is estimated at us\$7 billion to us\$16 billion a year. Industrial fishing fleets work in more than half of these ocean areas, and over one-third of these fish stocks are overexploited. The 2020 State of World Fisheries and Aquaculture report from the United Nations Food and Agriculture Organization (FAO) highlighted the declining status of high seas fish stocks and recognized the need for more effective management measures. According to the report, the percentage of stocks fished at biologically unsustainable levels increased from 10% in 1974 to 34.2% in 2017.

Marine protected areas have demonstrated benefits to fisheries. A 2018 analysis found that the average biomass of fish within fully protected, well-managed marine reserves is over 600% greater than in adjacent unprotected areas and more than three times greater than in partially protected MPAS. But there's currently no legal mechanism for establishing comprehensive MPAS on the high seas; only 1% of the high seas is protected globally.

Scientific evidence suggests that protecting at least 30% of the ocean is needed to help secure the long-term health of our planet. And, to date,



Scientific evidence suggests that protecting at least 30% of the ocean is needed to help secure the long-term health of our planet.



more than 110 countries have united in support of a global target to protect at least 30% of the ocean by 2030. But because the high seas constitute roughly two-thirds of the global ocean, protections are needed there to help leaders achieve the 30% goal. In the first half of 2022, countries have an opportunity to do just that by finalizing a high seas treaty that would allow nations

to establish highly protected, cross-sector MPAS on the high seas. Latin America has displayed incredible leadership on marine conservation within country borders, but the ocean is an interconnected system—and harmful activities in international waters can negatively impact domestic conservation efforts. It's time to go further and protect the high seas. 🌊

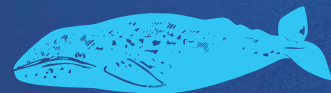
— ABOUT THE AUTHOR
 Sebastian Nicholls works on The Pew Charitable Trusts' protecting ocean life on the high seas project.

WORTH MORE ALIVE



SWIMMING AND DIVING WITH BULL SHARKS in *Playa del Carmen* (Quintana Roo) alone generates up to \$8 million USD a year. In contrast, shark fishing in the state of *Quintana Roo* produces profits of only

\$ 1.8 MILLION USD



DURING THE JANUARY TO APRIL SEASON, the *El Vizcaino Biosphere Reserve*, in BCS, receives up to **20,000 TOURISTS** who visit the region to see the arrival of the emblematic **GRAY WHALES**. They generate estimated earnings of

\$ 10 MILLION USD

In *BCS*, a live **HAMMERHEAD SHARK** can generate up to

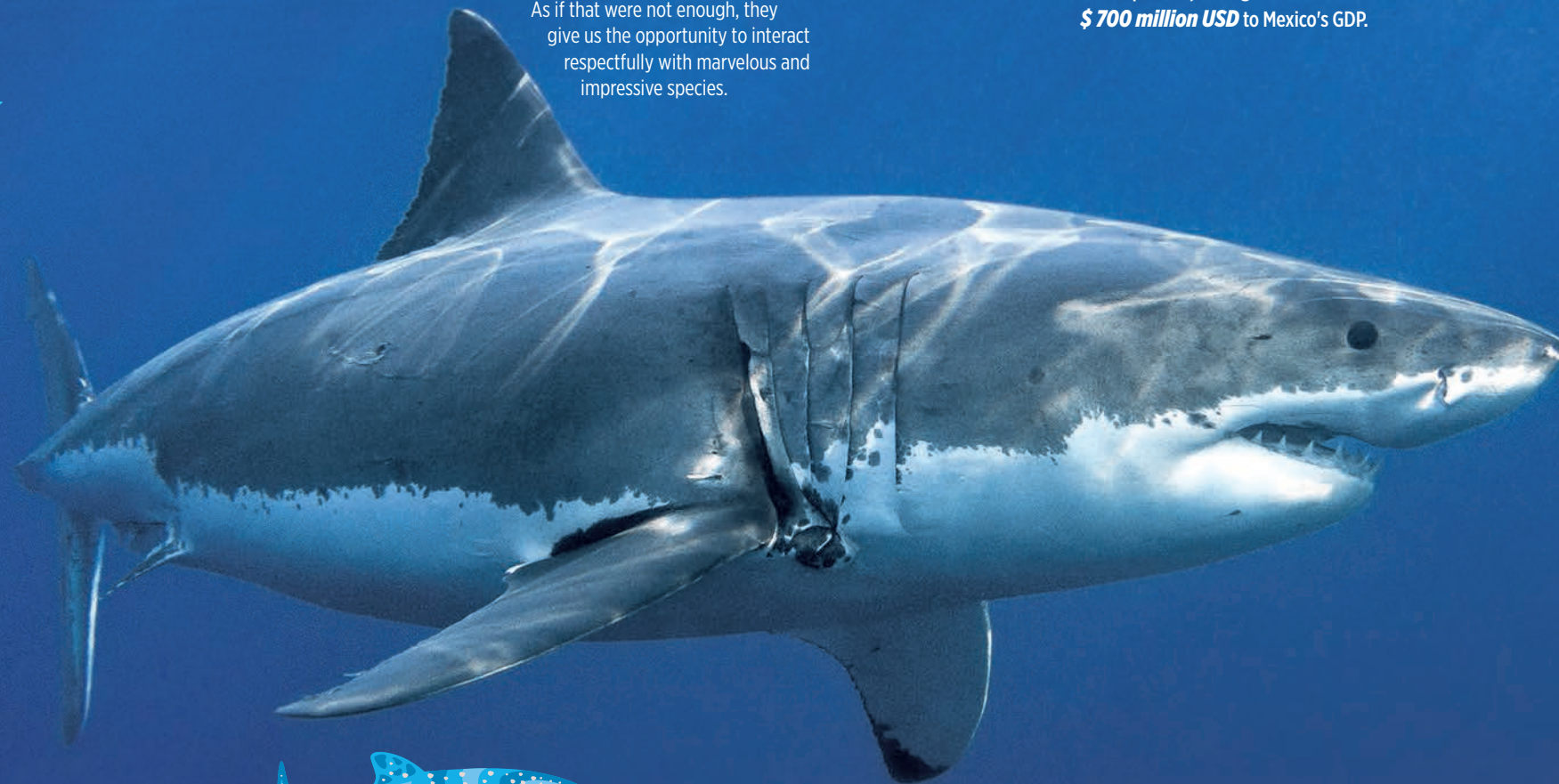
\$ 1,600 USD

per month from tourism. On the other hand, the meat of a dead shark sells for only **\$ 100 USD**.



Conservation tourism based on responsible and non-extractive activities is the best alternative to address the impact of overfishing in the oceans. Diving, snorkeling, and swimming in the world's oceans produce an important economic benefit, generate sources of employment, give relief to marine ecosystems, and allow their recovery.

As if that were not enough, they give us the opportunity to interact respectfully with marvelous and impressive species.



On average, a tourist is willing to pay a little more than

\$ 75 USD

to snorkel near the **WHALE SHARKS** in the *La Paz Bay* in BCS.

This same activity generates an economic income of **\$ 950,000 USD** in *Holbox and Isla Mujeres* (Quintana Roo) per season; that is,

30% of the total income of the *Yucatán Peninsula*.

UNDERWATER TOURISM IN MEXICO contributes some

\$ 725 MILLION USD

to the national economy per year (not including transportation, lodging and food).

In comparison, fishing contributes about **\$ 700 million USD** to Mexico's GDP.



The appreciation -inside a special cage- of a **WHITE SHARK** in *Guadalupe Island* (Baja California) generates

\$ 220,000 USD

while the sale of a dead one is **\$ 300 USD**.



In *Revillagigedo National Park*, located in Mexico's Pacific Ocean, diving with **GIANT MANTA RAYS** brings in

\$ 14 MILLION USD ANNUALLY.

The **WHALE WATCHING INDUSTRY**

is estimated at more than

\$ 2 BILLION USD WORLDWIDE.



The annual earnings of the countries that share the **MESOAMERICAN BARRIER REEF** from the *live reef diving industry* amount to

\$ 2 BILLION USD



In *Costa Rica*, the annual tourism value of a **LIVE SHARK** amounts to **\$ 80,000 USD**;

\$ 1.6 MILLION USD

IF IT LIVES FOR **20 YEARS.**

During its lifetime, a **SHARK** inhabiting the waters of the *Island of Fiji* generates

\$ 1.9 MILLION USD



SOURCES

AIDA, CIBNOR, CONANP, dataMares, International Monetary Fund, Mauricio Hoyos, Migravía Coco-Galápagos, Pelagic Life, Pelagios Kakunjá, Saving Our Sharks, UNAM.

ORGCAS

AND THE SHARK PROJECT

By Frida Lara, Porfiria Gomez, Elena Herran and Sofia Martinez



Photo: Alexa Adem.

A NEW PERSPECTIVE ON SHARK CONSERVATION IN THE SEA OF CORTEZ

Before our culture became aware of the indispensable role that sharks play in marine ecosystems, Peter Benchley's novel *Jaws*, later made into a film by Steven Spielberg, produced great terror around the world, exposing sharks to indiscriminate hunting.

The rapid and immeasurable growth of industrial fishing worldwide, as well as the great demand for their fins in the Asian market, led

"There are still ten percent of the top predators left. There are still some blue whales. There is still some krill in Antarctica. There's still time but not much time, to turn things around",

Sylvia Earle.

local fishing communities to concentrate their activity on catching sharks. In recent years, we have learned that sharks have late maturity, slow growth and low fecundity, characteristics that make them highly vulnerable to fishing and compromise their population recovery.

This year, an analysis published in the journal *Current Biology* concludes that one-third of the world's sharks, rays and chimaeras are now threatened with extinction according to the International Union for Conservation of Nature (IUCN) Red List criteria. The Gulf of California is no exception; in these waters we have witnessed the heavy fishing exploitation of the 1990s, which depleted shark populations to the point of driving the great hammerhead shark (*Sphyrna mokarran*) to local extinction and putting other species such as the scalloped hammerhead shark (*Sphyrna lewini*) in critical danger of extinction. We are far from the times when Jacques-Yves Cousteau called this area "the aquarium of the world".

Today, the coastal fishermen in the Gulf of California sustain themselves from shark fishing. However, their work has become every day more complicated because to find the resource they sometimes need to go out beyond mile 30, spending annually more than \$750 USD in fishing equipment, \$13,000 USD in the purchase of an engine to start the season and up to \$700 USD a month in gas.

Fishing is no longer the activity it was years ago. Before, in a good day, people could earn up to \$1000 USD. Today, in an average day, they catch seven to 10 sharks; considering that each one has an average value of \$100 USD, subtracting expenses and dividing the profit between the work team (two or three fishermen), each fisherman has an average profit of \$30 USD a day.


In the midst of uncertainty about the future of the population, there is growing interest in the economic benefits that live sharks provide for ecotourism, both locally and globally. In response to these current issues, an unprecedented approach is being proposed:

The ORGCAS are a group of women with different professions and profiles, united by the conservation of the seas throughout four main pillars: science, education, sustainable tourism, and communication. We seek to create evidence through research and gather information to provide solutions for conservation, as well as to communicate the importance of marine ecosystems, promoting the care and protection of marine areas starting with the Gulf of California, we promote a healthy coexistence between humans and nature.

For this reason, at ORGCAS, we started The Shark Project; its objective is to generate more sustainable productive activities for coastal shark fishermen in the community of Agua Amarga, in Baja California Sur. The first phase consists of training the fishermen so that they can provide services to tourists visiting the region; we will support them with planning, material, equipment, and follow-up so that this can be carried out.

Worldwide, coastal communities are proving that sharks are worth more alive than dead in ecotourism. An estimated 590,000 shark watchers spend \$314 million USD a year, directly supporting 10,000 jobs. The value of landings from shark fisheries worldwide is about \$630 million USD. Based on current trends, the number of shark observers could double in the next 20 years, generating \$780 million USD in tourism expenditures worldwide.

Sustainable or conservation tourism is not the miracle solution; we have examples such as Indonesia, where mass tourism killed the value of interaction with the whale shark (*Richodon typus*). Therefore, it is necessary to work on codes of conduct and good practices, give value to the activity and consider the capacity of the ecosystem, without affecting the species we want to conserve.

In addition, The Shark Project plans that in its next stage the community's economic activities will be diversified, making them more independent of the tourism seasons and have an integral development mindful of the conservation of their natural resources. 

— MORE INFO:  @Orgcas

WE ARE ALL CONNECTED

By Dona Bertarelli | @DonaBertarelli

Photo: Andy Mann.

From the bottom of the sea to the top of the mountains, we need the ocean for life on earth as we know it.

Looking out at the ocean from onboard our maxi-trimaran, *Sails of Change*, I feel a sincere respect and deep connection to the ocean. And this connection isn't just sentimental, it's real and I believe true for all of humanity. From the bottom of the sea to the top of the mountains, we need the ocean for life on earth as we know it.

I've been learning about the ocean all my life, inspired by mentors like Her Deepness, the esteemed Dr. Sylvia Earle, environmental advocates and marine scientists around the world. And the science shows us that a healthy ocean relies on us not only safeguarding vast areas of the ocean, and achieving the goal to protect at least 30% of the ocean by 2030, but also making sure this protection is meaningful.

It feels like both a long and a short time since I last sailed around the world in the winter of 2015 to 2016. A long time, because it has taken years to raise awareness globally. That a healthy ocean gives us oxygen and food, and livelihoods, while at the same time, helping us to mitigate climate change. That we need to create huge, fully or highly protected areas of the ocean to keep it healthy. That we need to choose the right ecosystems to protect, to conserve biodiversity hotspots teeming with life. That we need to be rigorous with monitoring and enforcement of those reserves, while at the same time, respecting the essential rights and roles of indigenous people and local communities in conservation. And it feels like a short time, because in conservation terms, it is urgent that we reconnect with the ocean and act now to protect its health and our future.

The COVID-19 pandemic made many of us think about what we could do better, how we could make our planet somewhere that our children and grandchildren and future generations can live in, be healthy, and enjoy. It is time to build back better. I believe it is also time for us to re-connect. With ourselves, with nature.

And perhaps thoughts of the future are what inspired Ecuador, Colombia, Costa Rica and Panama, four Latin American countries who have recently shown leadership to others around the world. They have dared to make connections between their governments, between science and policy, and above all, between their marine protected areas. At the COP 26 in Glasgow, they announced their intention to create a large Eastern Tropical Pacific Marine Ocean Highway, connecting their national Marine Protected Areas (MPAS) and increasing the area

of the ocean protected, making a safe haven for some of the world's richest ocean biodiversity and the migratory routes of key marine species.

In October 2021, Mexico's Revillagigedo National Park joined the Eastern Tropical Pacific Marine Corridor (cMAR), a non-binding initiative for the conservation and sustainable use of marine biodiversity in the region, which was established in 2004. In recent years, with Pew Bertarelli Ocean Legacy I have had the honor to engage with and support local partners in the region to encourage their work for the creation, management and connectivity of MPAS, such as Beta Diversidad, MigraMar and Coalition for the Defense of the Seas of Mexico (CODEMAR) amongst others, as well as members of the governments of Ecuador, Colombia, Costa Rica, and Mexico. Mexico created the Revillagigedo National Park in 2017, its largest marine reserve, which protects a huge variety of marine life and is another critical waypoint for migratory species in the Pacific Ocean. At COP 26, the President of Ecuador also announced an expansion of the Galapagos marine reserve, and the President of Colombia announced the country would more than double the marine zones protected.

These initiatives and others around the world give me hope that governments indeed have the political will to act not only unilaterally but also regionally to make ocean protection a reality.

On my visits to this region, as elsewhere, I am awestruck by the incredible beauty of nature, and motivated all the more to work to protect nature and biodiversity in all its forms, on land and in the ocean.

Just as I hope I will never lose this sense of wonder at the beauty of nature, I feel it is incredibly important that we continue to advance the science we need to better understand the ocean, and deliver on our responsibility towards young people and schoolchildren, to keep the ocean and our planet healthy.

As I write this, I am preparing to attempt another circumnavigation of the world, and throughout our journey, I hope to shine a light on why we need to ensure nature is protected and re-connected, in order to restore balance in humanity's, in our, relationship with nature. 🌊

— ABOUT THE AUTHOR

Dona Bertarelli is an ocean advocate, and the fastest woman to sail around the world. She is also the Special Adviser for the Blue Economy to UNCTAD and a Patron of Nature of the IUCN. Through the Bertarelli Foundation, she partnered with The Pew Charitable Trusts to create Pew Bertarelli Ocean Legacy in 2017. She founded *Sails of Change* with her children, and husband, Yann Guichard in 2021, and in the same year, launched Global Fishing Watch Marine Manager to help with management, monitoring and enforcement of existing reserves, and support efforts to create new reserves and expand existing ones.

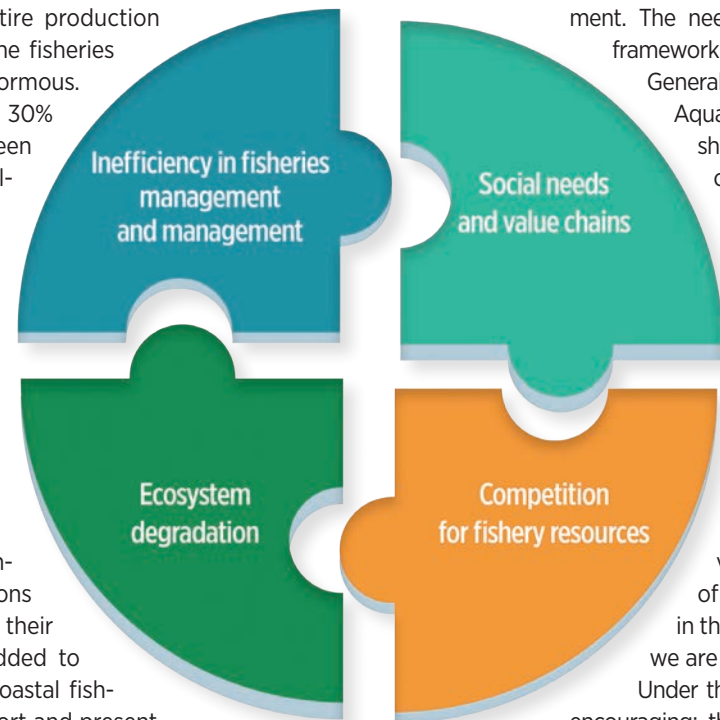
FISHING IN MEXICO

By Gustavo Alanis | @CEMDA

Fishing is one of the main and oldest subsistence activities at a global level. Currently, the capture and cultivation of marine organisms provides enough protein for human consumption, equivalent to 20.5 kilos per capita per year. However, they have had a strong impact on the environment, affecting ecosystems, species and, consequently, the population that depends on them. Considering the entire production chain, the challenges facing the fisheries and aquaculture sectors are enormous.

For the last decade, nearly 30% of national fisheries have been considered overfished and almost 20% have collapsed. The challenges are evident: open access policies, regulations with little consultation and social participation, non-compliance with regulations, inappropriate incentives, and an incompatibility of scales between which resources are to be managed and in which socio-ecological systems are distributed without considering the interactions between marine species and their effect on ecosystems. This added to the inequity experienced by coastal fishermen, who have limited support and present some degree of marginalization due to their precarious living conditions that impose an additional barrier to competitiveness.

To understand the problems surrounding fishing in our country, it is necessary to address the components in each of its dimensions: social and economic governance. The interaction of these components translates into a "vicious circle" where the social



needs, the lack of clarity in access rights, bureaucracy, and the low capacity to address problems result in inefficient management and administration of fishery resources, which is reflected in the degradation of marine and coastal ecosystems.

This situation is incubated in part by the lack of public policies and capacities of the institutions responsible for implementing an efficient management. The need to strengthen the regulatory framework in this area is reflected in the General Law on Sustainable Fishing and Aquaculture, which, although published in 2007, has not only been criticized for its lack of updates but also for the absence of its regulations, which intensifies the legal gaps and compromises the sustainable management of fisheries.

However, the fishing situation becomes even more complex if we consider that we are facing environmental variations related to climate change that condition the survival and population dynamics of species and result in alterations in the functioning of ecosystems that we are just beginning to understand.

Under this scenario, the forecasts are not encouraging; the capacity to adapt to adverse situations for fishing will be determined to a great extent by the public policies that are defined considering the needs of the sector under an integral and sustainable approach. Therefore, it is a priority to promote support for artisanal fishing, updating the law and the issuance of its respective regulations, together with the strengthening of capacities to adapt to the effects of climate change in the fishing sector. 🌊

Note: Text derived from the document *Análisis del marco político y legal en materia pesquera: oportunidades y retos*.



"The ocean has given us **EVERYTHING**.

It feeds us, gives us the air we breathe and even gives us life itself.
The ocean lives in each of us.

It is time to give back to the ocean the abundance it gives us".

GÁDOR MUNTA

Oceanologist specializing in sharks,
diving instructor and conservationist.

@gadormunta



Photo: Jorge Cervera Hauser.

PUTTING A HALT TO HARMFUL SUBSIDIES TO FISHERIES

By Andrés M. Cisneros-Montemayor | @AndresMCisneros

This coming February, in Geneva, Switzerland, at the 21st Ministerial Conference of the World Trade Organization (WTO), an important step could be taken towards changing the trajectory of overexploitation of the seas that we have followed for almost a century.

A dive or tour of Mexico's seas quickly attests to the immense dimension of space and life in the oceans. Most of us will have heard that the oceans cover three-quarters of the Earth's surface; perhaps fewer know that they comprise 99% of the habitable space on our planet.

Many of us have grown up entwined with the sea and many more will have fallen in love after their first visit. There is something difficult to describe about the sea, about the schools of fish or the solitary and silent sharks, the whales or dolphins, or the birds that envelop it. Fishing and, more properly said, the men and women who fish and live off the sea, hold a special place in our collective consciousness as Mexicans, in our literature, cinema, culture and cuisine. Ceviche, "A la talla" style fish, lobster with beans or Gobernador tacos are part of our family ties and at the same time, key pieces in national and international tourism campaigns.

It should be shocking, then, that a large part of the more than 300,000 people who depend on fishing in Mexico are

in conditions of poverty. Even where local management -sometimes with, sometimes without governmental or civil association support- has managed to achieve best practices, similar stories are heard. Big fish have not been seen for a long time. Fishing no longer yields as it used to. There are many illegals who do not respect. The big boats come in and there is no one to stop them. Everything is polluted. Nobody listens to us.

Broadly speaking, these fishing problems in Mexico and in many other countries can be traced back to two main causes. First, the continued marginalization of fishing communities and the inequity between fishermen, processors and intermediaries in terms of decision-making power and full participation in the benefits of fishing. Second, the historical mismanagement of fisheries and its fundamental assumption: marine resources are inexhaustible, then, the bigger the boat, the more fish are caught.

It is especially this last issue that the WTO pledged to address through an agreement that limits governments from subsidizing illegal, unreported (fishing that is not reported to anyone) and unregulated (fishing with unsustainable methods, even though there are no specific laws prohibiting them) fishing, overfishing and overcapacity (using public money to buy bigger boats or nets when there is no longer enough fish in the water). These types of subsidies are also known as "harmful" and include, for example, the government paying for the cost of gasoline and diesel, new boats or boat repairs. They also include any type of financial support to vessels that have been sanctioned for illegal fishing; this includes

Worldwide, 60% of fisheries are fishing at the maximum sustainable level and 33% have already collapsed. Even so, more than \$22 billion USD a year are granted in subsidies to allow fleets to grow and continue fishing.

the capture of endangered species or during times of the year when they are reproducing.

Of course, using everyone's money to support illegal fishing or overfishing sounds illogical and even absurd. That is why legally affirming that we must support fisheries in a way that makes them profitable and sustainable is precisely what is important about the WTO agreement.

Today, it is estimated that almost half of all fish caught in the world are not officially reported, including some 10 million tons a year that are thrown overboard because they are too small or of little commercial value. Of all the world's fisheries, 60% are fishing at maximum sustainable levels and 33% have already collapsed. However, worldwide, more than \$22 billion USD a year continue to be granted so that fleets can grow and continue fishing. Instead of being a focused support or a long-term investment, many of these fisheries already depend on subsidies to continue operating, sometimes in very distant waters. As fish are depleted in their home waters, some fleets now fish in the waters of other countries, including many in Latin America and Africa; it is estimated that half of these foreign fleets would not be profitable without subsidies.

A hundred years ago it may have seemed that the only limit to our fishing catch was the size of the fleet, but today it is indisputable that this is not true. Once we exceed the capacity of the environment to recover, the more we increase fishing effort to try to catch as much as before, the less we will catch and the worse it is for the ecosystem, a true vicious circle.

The agreement at the WTO to limit harmful subsidies is precisely an attempt to break that cycle, to recognize that the oceans can no longer support more nets and to look for new ways to support fishing communities that are sustainable and equitable.

Mexico has been one of the driving forces behind the agreement to limit harmful subsidies in the WTO, which continues to be negotiated on the eve of the 2022 Ministerial Conference where consensus may finally be reached. This is a reflection of the growing linkage of governance in the country with international sustainable development goals and discussions, which also includes Mexico's membership, along with 13 other countries, in the recent High-Level Panel for a Sustainable Ocean Economy. However, there is still a long way to go.

According to the latest available figures, our country spends some \$273 million USD a year on the fisheries and aquaculture sector; \$190 million USD from this, the 70%, are harmful subsidies.

But, to put it constructively, this means that we have in Mexico almost \$200 million USD a year that could be used for investments in equitable and sustainable fisheries throughout the country-while complying with the WTO agreement that the country has helped to build. These investments include, for example, strengthening the fishing cooperatives that have long been one of the best bets for good management. Many of these associations of fishermen and processors have been able to organize themselves to decide how much, when, and how to fish in order to increase the value of their catches, better distribute income among the cooperative and ensure that they fish sustainably. Likewise, investments must be made in actions that fishing communities should not have to lead, such as the prevention of illegal fishing; the strengthening of the fisheries research and co-management system; the effective protection of areas and species; the development of new methods for processing and value-added; or support for new communication networks for more transparent and inclusive management, among other possibilities.

Reaching an agreement at the WTO to limit harmful subsidies would be an affirmation that we need a new relationship with the oceans and a new commitment to address the real needs of the people who make their living from fishing. For Mexico, this will be only the first step and it is up to all of us to listen, voice our opinions and work to ensure that fishing continues to be part of our culture, traditions, and economy for the next hundred years. Seventy years ago, we marched to the sea and the sea treated us well; now it is our turn to return the favor. 🌊

THE RECONVERSION OF SUBSIDIES



NO

- ✗ ILLEGAL, UNREPORTED AND UNREGULATED FISHING
- ✗ PREDATORY FISHING METHODS
- ✗ SUPPORT FOR SANCTIONED VESSELS
- ✗ OVERFISHING
- ✗ ACQUISITION OF LARGER BOATS AND NETS



YES

- ✓ EQUITABLE AND SUSTAINABLE FISHERIES
- ✓ STRENGTHENING OF FISHING COOPERATIVES
- ✓ PREVENTION OF ILLEGAL FISHING
- ✓ RESEARCH
- ✓ SPECIES PROTECTION

— ABOUT THE AUTHOR

He is an Assistant Professor at Simon Fraser University in Canada and Associate Director of the Nippon Foundation Ocean Nexus Center at the University of Washington. He is a native of Guaymas (Sonora), a resource economist and world expert in sustainable development policies and blue economy.

HEROES OF THE SEA

By Alberto Tinoco Guadarrama | @albertotino

This story does not begin at sea. It emerges in the hardest moments of the pandemic, when this virus forcibly enclosed us and snatched us by force from acquaintances and strangers. Thus, with fear as a shadow and the desperation of the current Government recommendation of "staying at home", I started a radio project and met -via Zoom- Dora Sierra, a charming woman who initiated the first citizen science projects through *Quino El Guardián*, an old fishing boat, which seems to go aching everywhere, but it is still there, sailing the Sea of Cortez. As the radio talk progressed, Dora told me about a program that sought to give a group of children from fishing communities in Baja California Sur an experience that would open new horizons for them: Heroes of the Sea.

I didn't have to insist much, she is a generous woman. I suggested to document a trip on that boat, of course, along with the Heroes of the Sea. The days went by, and we were finally able to go out to meet our families, to recognize each other among our friends and to feel the freedom of being outside.

From La Paz we flew to Hermosillo; many of the children we accompanied had barely left their communities, some had never even imagined getting on a plane. On board, shy laughter, nerves, children half suspicious of the strangers that were this reporter and Ramón Castellanos, conservationist, great photographer and good friend. After all, they are still children -well, almost young- and as they say: we began to "break the ice". From Hermosillo we took the road to Puerto Peñasco, piled into two vans for a 455 kilometer trip. Dora and the crew were waiting for us at the dock. This would be the second trip of the Heroes of the Sea, but it would be the first time they would know "the blue room" from the deep, which is where that other world is revealed to you.

I have to tell you the story of the Heroes of the Sea.
I still don't know how it ends, but it's clear to me how it begins.

"The sea is at the origin of life on earth,
the sea is in the forgotten history of our cells.
We are sea before we are land.

Diving is a way of getting to know the sea and the creatures that inhabit it,
diving is like flying, but without the sensation that you are going to fall,
diving is finding ourselves and facing our own fears.

Down there we can find paradise,
but every paradise also has its hell.

We are the Heroes of the Sea,
we travel in Quino El Guardián and this is our story".

Photo: María Lizárraga | Archivo CONANP.

ON BOARD THE QUINO EL GUARDIÁN

After the crew's introductions, the ship's safety protocols, the accommodation in the cabins, already wearing shorts, a T-shirt and no sandals, we began to meet, one by one, the Heroes of the Sea during an en-dearing voyage.

Itzel is from the community of Santiago, with a penetrating look, always analytical, sometimes calculating. She is the most intelligent.

Ángel and **Roberto** are from Agua Verde; I don't know why they won't separate from their cell phones if there is no reception. Of course, when the call to dive is made, they are the first to prepare their equipment.

Esme is from the community of Los Barriales, her father is a sport fisherman. She is the most cheerful, cute, and the best dancer.

Bryan is from Agua Verde; he has accompanied his father to fish since he was a child and knows how difficult it is to go out on the sea. He doesn't know it yet, but it is possible that this trip will change his life.

Mareli is from Ensenada Blanca; she is the shyest, the most withdrawn, so thin that it seems like the wind is going to break her. She is the smallest. In the first days of the voyage, she was always quiet, but by the end of the trip, she would not stop talking.

Manuel is from El Campamento. He is the oldest, always serious, always sleepy, but always ready to get to know the sea.

René is from Agua Verde, his father is a fisherman and his mother is a teacher. At 17 years old, he has a huge nine-month challenge ahead of him. He is the best diver.

Dámaris is from the Ligú community. When she dives, maintaining buoyancy is still a struggle, but there she goes.

Manuel, who is nicknamed "Palmita", is from Loreto. He appears to be very tough, but he is sensitive, with a lot of empathy. An ear problem has prevented him from diving; eventually he will make it. In the meantime, he helps the crew. He is already 18, but since he was a child, practically on his own, he managed to get ahead. I just

found out that he has already enrolled in university.

Esaid is from La Ribera. He is a young man who knows that this opportunity will help him in the future.

Desiré is from Agua Verde, her parents work in a hotel. She is very respectful, very mature, and likes to learn languages. For this girl, being at sea has been a real challenge because her fisherman grandfather died while hookah diving.

Gabriel is from Ensenada Blanca, his parents live from fishing. He is the tallest and strongest and when he went into the water for the first time with the diving equipment, he saw a huge snapper at the bottom and instinctively wanted to catch it. He dives so well that I told him he is my greatest shot.

Dámaris is from Agua Verde. Her father is also a fisherman, sometimes she and her sister go with him on the boat to cast the line and earn some money. She is always telling jokes. During the trip she is the one who encourages "Palomilla" to tease me around.

THE BIG ISLANDS

We started sailing towards the big islands in the Gulf of California. After a busy night, we arrive at Angel de la Guarda. We are in the navel of the Baja peninsula; the water is cold, and the visibility is not the best. The Heroes of the Sea dive for the first time with their diving equipment. Down below they look like buoys, rising and falling; it's a matter of time before they learn to control their buoyancy. However, their eyes already show the joy that always comes from seeing life underwater in the front row. Until now, they only knew about coastal fishing. Many are perfectly familiar with commercial species and their exploitation, but they are barely aware of the importance of conserving biodiversity, not only for their sustainable exploitation, but also for the protection of marine ecosystems.

At *Quino El Guardián*, instructors, naturalists and researchers explain how to take a sample from the sea to recognize the DNA of the species. They learn how to monitor fish and invertebrates, count them, and identify

"These 14 children are going to be the ambassadors of the seas of Baja California Sur, and they are going to have enough tools to translate the theme of conservation to the elders who still go out to sea fishing",

Ramón Castellanos.

them. They learn about sea lion populations and reinforce their technical diving skills.

We arrive at Bahía de Los Ángeles. The Heroes of the Sea dive the Clavera and Don Juan sites. At the bottom they practice how to make a transect and monitor fish and invertebrates with a quadrant, the sea lions approach them and play with the measuring tape. There is laughter underwater.

Finally, we reach San Pedro Mártir, a spectacular island position, where the water clarity is amazing, and the marine life is abundant. At a site known as Punta Norte they are ready for their first deep dive, to see a wall of black coral. As they come out of the water, they say what they saw there, and can't stop joking around, which reflects that they are enjoying it. In the afternoons, Dora Sierra gathers on the deck to talk with her children. And the chats are getting louder and louder, more passionate. Without realizing it, perhaps, they have understood why it is important to conserve these natural spaces. Itzel recognizes that things must change in the Gulf of California: "How is it possible that we allow people from other states to come and take away what we have been taking care of for years. We need to establish rules and organize ourselves to protect what is ours, what we have tried so hard to conserve". Esmeralda has understood that if we do not take care of marine biodiversity today, there will be no tomorrow: "There are many towns nearby that are dedicated to work in the sea, so if we do not take care of it, what will become of those people? What will they eat? What will

they live on if there is nothing else to do?" Dámaris assures that in her community there is an intention to protect, even a vigilance committee has the fishermen's cooperative, but she assures that it is impossible to do anything against the industrial ships: "It doesn't seem fair to me, because with so much effort we have managed to create a fishing refuge and people who are not from the community arrive and take everything that we have managed to conserve".

Ramón Castellanos, who in recent years has been involved in the creation of a Biosphere Reserve in the Sea of Cortez and the Pacific of Southern California, is surprised by the clarity of the arguments of these young people, most of whom are the children of fishermen: "You can't tell them about fishing, they know perfectly well the problems that their parents suffer. Here they have been planted the seed of conservation, instilling them with this scientific knowledge makes them appreciate marine life more. These 14 children are going to be the ambassadors of the seas of Baja California Sur, and they will have enough tools to translate the theme of conservation to the adults who still go out to sea to fish".

On our way back to Angel de la Guarda Island we stop at San Esteban. The current is strong, and it is the first time these young divers will experience the power of nature. Down below the bottom is rough and the tide is strong. The exercise consists of everyone holding on to each other's arms and forming a circle to maintain their buoyancy, helping the buddy next to them. To our surprise, they manage to stay in the current, helping each other, working as a team, facing the challenge together. These kids don't know it yet, but the instructors have just certified them as open water divers.

WHAT THEY LEFT ON THE BOAT

Luis Jiménez, one of Quino El Guardián's instructors, has become that teacher we looked up to as kids. He knows it and seems

to break down; with glassy eyes that can barely contain the tears when he recapitulates what Heroes of the Sea has meant: "You come to this project, very proud, because you are changing someone's life. But suddenly you discover that the one who is changing is you, when you discover that the one who is learning is also you".

Amy Hudson is a woman who has made her way into the fishing communities. Many fishermen know and respect her. She is a tough woman who always speaks her mind. She knows well the needs of the men and women of the sea. I talk to her as we head back to the mainland and she knows that for these children diving is only an excuse to achieve something beyond the horizon marked by their impoverished communities: "The program is a complement to other conservation efforts, it is an investment in the next generation where changes are really going to be made, it also seeks to train young people capable of facing any challenge".

Dora Sierra has plans for the future. The first generation of Heroes of the Sea is about to graduate. She has been able to walk one step at a time, always looking for allies, always looking for support from here and there. For a long time, her world revolved around real estate, but she is stubborn and has dreams and a deep love for the Sea of Cortez and her ships: Rocío del Mar and Quino El Guardián. She is convinced that the seed of conservation she planted in these children, who have now grown into young adults, will sooner or later germinate: "I look at their little faces as children and they are already teenagers, six of my Heroes of the Sea have already graduated from high school, they are already going to college and I know that this trip will have an impact on them".

I may never see Quino El Guardián's Heroes of the Sea again; they may become part of my memories of the Gulf of California. Now that some of these kids I knew have turned 18, they may not even remember me. Life is like that. The only demand is that they give me back something they took from me. They took a little bit of my heart. I only wish that in their present and future lives, as the sailors say, there will be "good seas and better winds".

THE OTHER HEROES OF THE SEA

Far to the south, Michael Fishbach of the Great Whale Conservancy and Mario Gómez of Beta Diversidad search for whales in Loreto to monitor their behavior and photo-ID them.

In Bahía de La Paz, Lenin Oviedo, a researcher at UABCS, is developing the first monitoring program for the resident populations of common dolphins. He studies their behavior and how to take advantage of this natural resource for marine wildlife watching tourism. In the coastal communities of the state, Nora Torres conducts interviews with fishermen, who complain about how the industrial fleet enters their fishing zones and takes in one day what they, with great effort, manage to fish during the whole season. In the Southern California Pacific, Jay Clue of Dive Ninja takes photographers Shawn Heinrichs and Levi Chandler of Sea Legacy in search of a bait ball, where billfish and sea lions try to catch sardines in Magdalena Bay. Meanwhile, CICIMAR researcher Marta Palacios studies the formation of large schools of mobulas in the Gulf of California, where pregnant females may be giving birth to their young. It all happens at about the same time in this natural laboratory of marine life. Researcher James Ketchum, from Pelagios Kakunjá, is clear: "The Gulf of California and the Southern Californian Pacific are strategic places for the observation of megafauna, we have everything here. Many species have declined in the last decades. If we don't make an effort to recover them, everything will change for the rest of our lives. This is an opportunity to create great Marine Protected Areas".

Underwater photographers, activists, researchers who do science for conservation, tourism service providers and coastal fishermen who promote fishing refuges, are also Heroes of the Sea without intending to be so.

— ABOUT THE AUTHOR

Journalist and associate producer of the television project Por el Planeta.



MARINE PROTECTED AREAS

By Matt Rand | @mattfishrand

CAN SAFEGUARD BIODIVERSITY, BOLSTER FISHERIES, AND PROTECT OCEAN ECOSYSTEMS

Ocean health is critical to all life on the planet. Yet the ocean is in decline, largely due to human activities that have driven the collapse of some fisheries, biodiversity loss, and acidification of the ocean water itself. Evidence suggests that halting this downward slide requires protecting more of the world's ocean, with Marine Protected Areas (MPAs) providing a proven way to effectively conserve marine life and habitats, improve ocean health, and provide multiple benefits to the communities whose lives and traditions are linked to these waters.

An MPA is a defined geographical area in which industrial fishing and other human activity is restricted, which allows depleted populations to recover while protecting key species and vulnerable habitats. Science indicates that MPAs that are fully protected, well-managed and large in scale provide the most biodiversity and ecosystem benefits, improve long-term food security, allow resilience against the effects of climate change, and protect ocean-based livelihoods.

Over time, fully protected areas result in more and bigger fish and greater biodiversity, with the greatest benefits seen in MPAs that have been in place and well-managed longer than 10 years. And thriving populations of fish within fully or highly protected areas are more likely to supply adult and larval fish to outside areas, with the spillover of animal life from the MPA sustaining or increasing the catch of nearby fisheries. A study in Ecuador's Galapagos Marine Reserve found that waters surrounding an MPA supported higher catches and greater fishing effort; similarly, a recent study showed benefits for Hawaiian fisheries as a result of the 2016 expansion of the Papahānaumokuākea Marine National Monument. And preliminary information indicates that the fishing industry has benefited from the spillover effect around Mexico's Revillagigedo National Park.


Creation of MPAs as a fisheries management tool is garnering support, specifically because of how much MPAs contribute to ecosystem-based management approaches. New evidence indicates that fisheries regulations on their own may be insufficient in creating sustainability, and a combination of management steps and fully protected areas may be necessary.

Protecting habitats, such as coral reefs, can also generate considerable financial benefits for communities. For example, experts estimate that Hawaii's net economic benefit from coral reefs—related to fisheries, tourism, increased property values, coastal protection, and other ecosystem services such as carbon storage—is US\$360 million a year.

Yet despite the significant benefits when MPAs are implemented effectively, there are limits to how much an individual MPA can achieve. Natural systems are not bound by national jurisdictions; hab-

itats extend through multiple countries, and highly migratory species can travel thousands of miles across ocean basins. And the sustainability of marine life can depend on how well populations and critical ocean ecosystems are connected.

Large MPAs that encompass multiple habitats, or networks of MPAs that protect migratory pathways and key habitats, can better ensure the connectivity of populations, which can then help build resilience in a changing environment. That means that a more effective approach for management takes into account how policies and protections interconnect within the complex interactions between biological and human activities. In short, the many benefits of MPAs can be boosted through a connected network of protected areas.

Countries in the Eastern Tropical Pacific are working together to achieve that outcome and are well on the path toward expanding protected networks through collaborative conservation and management. But those governments still could do more through marine protections to maximize socioeconomic benefits, strengthen local communities and culture, and ensure the preservation of the region's unique species and ecosystems for future generations. Only through continued collaboration and cooperation can the threats facing the ocean be adequately addressed to restore ocean health for the benefit of all. 

— ABOUT THE AUTHOR

Matt Rand oversees The Pew Charitable Trusts' large-scale marine habitat conservation work.



We want to give children a chance to become more aware of the important role oceans play in keeping our global environment healthy. We asked children in different countries to draw a picture under the theme: How can oceans stay healthy and what can we do to support them?

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2021 EDITION



LEONARDO GARCÍA

MEXICO, AGE: 7

"Sharks keep our oceans in balance, they aren't scary at all. It's important we learn to love and respect them".



NICK CAR

UNITED STATES, AGE: 9

"It's important to protect orcas and other big ocean mammals because they are very good at sinking carbon from the air we breath".



THEO PARKER

UK, AGE: 7

"We all need to act, the time to protect our oceans is now".



ANA DELGADO

COSTA RICA, AGE: 6

"We need safe places away from big fishing nets to protect our oceans".

PARQUE NACIONAL REVILLAGIGEDO



Foto: Archivo INI Revillagigedo, el Castillo en Isla Clarión

El Parque Nacional Revillagigedo de 14,808,780.12 hectáreas, forma parte del Corredor Marino del Pacífico Este Tropical (CMAR), conformado por Áreas Marinas Protegidas de Ecuador, Costa Rica, Colombia y Panamá. Una iniciativa regional para fortalecer la gestión de la biodiversidad marina y costera.

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Parque Nacional Revillagigedo



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