The Mesoamerican Reef (MAR) region, which extends across the Caribbean coasts of Mexico, Belize, Guatemala, and Honduras is one of the richest and most diverse ecosystems in the world. It continues to face many threats to its health and that of the local communities and economies that depend on it. By effectively addressing these threats through a close alliance of government and civil society, it has the potential to set a global example of how societies can thrive sustainably alongside their environment.

There is a vital link between healthy ecosystems, stable healthy economies and the wellbeing of communities. National environmental authorities play a central role in the development of strategic and effective solutions to critical environmental issues. The 13th meeting of the Conference of the Parties to the Convention on Biological Diversity in 2016, as well as the upcoming 20th anniversary of the Tulum Agreement in 2017, represent an opportunity to showcase current achievements in conservation and key challenges for the future, as well as to demonstrate how decision-makers and regulators can contribute to the critical task of aligning the MAR region’s economies with its unique and precious marine resources.

When the heads of state of Belize, Guatemala, Honduras and Mexico signed the Tulum Agreement nearly 20 years ago, they agreed to promote the conservation of the Mesoamerican Reef (MAR) System through its sustainable use, thereby contributing to the welfare of present and future generations. Two decades on, it is now an appropriate time to take stock and plan for the continuing conservation of this globally important region. The Mesoamerican Reef region is world renowned for its diverse natural wonders as well as its rich cultural and ethnic diversity. The interconnected habitats stretching from high-peaked watersheds to deep ocean trenches provide food, shelter, breeding areas, migration routes and nursery grounds for a vast array of species. Our coastal and marine resources include large expanses
of mangrove forests and extensive shallow shelves that support important fisheries and some of the best remaining reefs in the Caribbean, which protect our shorelines, our coastal communities and underpin our tourism and fisheries industries.
The MAR is physically connected via a continuous marine corridor that stretches from northern Quintana Roo in Mexico to the Bay Islands of Honduras. It encompasses a complex coastal zone including mangroves, seagrass, the reef and the open sea. Connecting many of these sites are the currents that transport eggs and larvae of fish, invertebrates and other nekton. Spanning more than 1,000 kilometers, the MAR corridor is used as a migratory route by a host of marine megafauna including turtles, sharks, and large finfish. The whale shark calls the MAR home for a part of its lifecycle, connecting our region with several other ocean basins. These largest of fish move throughout the corridor to form predictable feeding aggregations during three seasonal pulses of food in Honduras, Belize and Mexico. The MAR also hosts the largest grouper in the Caribbean, the endangered Goliath grouper, throughout its entire life cycle. This car-sized fish not only links the coastal red mangroves to the coral reefs and deep mud flats but, through its movements, connects Southern Belize to Mexico and Honduras. Endangered Hawksbill and Green turtles also use the MAR corridor to move among all four countries in search of nesting and foraging grounds. The commercially valuable Caribbean spiny lobster also occurs in this marine corridor. Yet all species of large marine wildlife currently navigate a patchwork of legislation in the MAR, which only provides variable protection throughout their long lives. These species bring in millions of dollars in revenue and uncounted ecosystem benefits; for example, diving with bull sharks in Playa del Carmen generates approximately $400,000 in tourism revenue a year. A harmonized set of laws in the four countries would help rebuild populations of large marine species.

The importance of safeguarding the health of our marine and coastal resources is being increasingly recognized as a global priority due to their essential contribution towards climate stability, food security, peoples’ livelihoods and, critically, the four countries’ continued economic development.

These renewable natural resources underpin the coastal economy of the region, from small subsistence fishing villages, to international tourism industries. Indeed, according to a World Resources Institute analysis in Belize, coral reef- and mangrove-associated tourism contributed an estimated $150 million to $196 million to the national economy in 2007. Reef and mangrove dependent fisheries generated between $14 to $16 million in economic benefits. And by protecting coastal properties from erosion and
wave-induced damage, reefs and mangroves provide an estimated $231 to $347 million in avoided damages per year. Mangroves also sequester substantial carbon stocks. A single Mexican marine protected area – the Sian Ka’an Biosphere Reserve -- stores an amount of carbon equal to nearly half of Mexico’s annual CO2 emissions. Policymakers, coastal resource managers, local communities and businesses alike face a unique challenge: how can they maximize the economic benefits derived from these renewable resources to enhance the economic wellbeing of communities and the nation, whilst simultaneously preserving the long term biological and economic value of the region for future generations?
As the region continues to experience unprecedented changes along the coastlines and within the marine environment, including coastal pollution, fisheries decline, and increased vulnerability to climate change, we are looking to decisive leadership to help define a new path forward, away from “business as usual” and towards a sustainable “Blue Economy” that can help safeguard the natural capital that, in turn, sustains the people of the Mesoamerican Reef region. A blue economy, as an expansion of the green economy concept, reflects the growing recognition that robust economies and sustainable growth are dependent on a healthy resource base.

| In the past decade, the concept of the Green Economy has been taking hold in many places around the globe and has expanded to include marine and oceans under the new banner of the “Blue Economy.” Countries are considering new development alternatives that take into account economic, social and environmental sustainability considerations. During the UN Conference on Sustainable Development of June 2012, the potential of a green economy for achieving sustainable development was reaffirmed. Several countries are adopting measures that build towards this vision, by adopting |  |

The region can now build on the successes and strong partnerships among civil society, local and national governments, and international institutions established since the Declaration of Tulum in 1997, in order to develop a truly cross-sectorial response to address the continuing threats and to capitalize on new opportunities in support of a blue economy in the MAR.

We can proudly say that many significant conservation results have been achieved in the region since 1997.

The MAR region now boasts a network of more than 65 coastal and marine protected areas, and almost all of them are now under active management. The countries have protected territorial seas within multiple use marine protected areas. Thirty-six percent of the territorial sea in the MAR is now within protected areas, although only 3% is fully protected from fishing. In Belize, spawning aggregations are protected; reef-associated herbivorous fish are protected in Belize, Guatemala, and the Bay Islands of Honduras; a region-wide ban on shark finning has been implemented, and no-take protected areas acting as fish refuges are being created to recover ecosystems and commercial fisheries. The region has become a global leader in adaptive management and the active implementation of recommended management actions that are now starting to show ecological results.

These conservation mechanisms now actively involve local participation. Fishers are at the forefront of designating and enforcing fish
refuges, in several cases participating in their design, management and monitoring. Local community groups are increasingly engaged in conservation and management activities, and protected area administrators collaborate with interested communities to develop sustainable alternate sources of income. Many protected areas and taxa benefit from advisory councils in which not only governmental authorities, but also local community groups, academia and NGOs participate.
To support the administration of protected areas and their resources, a number of long-term financing and management tools have been developed. The MAR Fund is now an established funding mechanism for the region. It supports a network of MPAs, reef restoration and the establishment of fish refuges, among other strategic conservation and sustainable use initiatives and is a convener for key conservation objectives. MAR Fund has been successful in mobilizing resources, including $23.5 million in endowment funds and $19.1 million in sinking funds. Its Small Grants Program is now a well-known mechanism for funding through a competitive process. In the past eight years, it has approved 52 projects and disbursed over $1.5 million in grants, leveraging over $2.4 million in matching funds. Throughout this process, the fund has supported the four protected areas authorities in the region, three academic institutions, 25 NGOs and 24 communities. Belize’s Protected Areas Conservation Trust –PACT– captures departure taxes that help to subsidize the operations of the country’s protected areas. The Mesoamerican Barrier Reef System Project generated manuals on MPA network design, MPA management and co-management, and monitoring methodologies – manuals that are still in use today. A set of standards and code of conduct for sustainable marine recreation activities was also developed in a process led by the tourism industry. These standards are being applied today across the region.

Since 2008 the Healthy Reefs for Healthy People Initiative (HRI) has produced four biennial report cards, making science-based information on the status of the reef’s health publicly available. In addition to measuring and analyzing a set of reef indicators, it also provides information on threats to the reef system, as well as important conservation and management results and recommendations. For example, the 2015 Report Card indicates that there is a slow but positive increasing trend in coral cover and fish biomass. Although these improvements may partly be related to natural fluctuations, the results are unusual in the global context and an encouraging sign that our efforts are producing positive results.

Another promising trend is the recovery of parrotfish and other herbivorous fish. These species are effective at grazing and keeping macro algae in check, thereby allowing coral growth. Management measures to protect parrotfish in the region are included in the last Report Card: Belize banned fishing of parrotfish and surgeon fish in 2009; Honduras has banned the use of fish traps and spear guns (the fishing techniques typically used to catch parrotfish) since 2004 followed by full protection in 2010 in the Bay Islands National Marine Park, and Guatemala also banned fishing of parrotfish in April 2015. Following suit, Mexico has now started a campaign to protect its parrotfish. The HRI, using its standardized methodology, has been able to measure the positive trends resulting from these regulations.

The HRI also produces an Eco-Audit, which evaluates efforts to protect and sustainably manage the region’s coral reefs and documents the extent to which recommended management actions have been implemented in each country. Results are comparable across the region and allow stakeholders in the four MAR countries to see where the biggest gaps in management are and where management actions
are required.

Another regional initiative assesses the status of large marine species that are not captured by current reef monitoring methods. MarAlliance is leading a multi-partner effort to provide clear indices of abundance, diversity, density and distributional hotspots for threatened species such as sharks, rays, the Goliath grouper, and Hawksbill turtles – large, marine wildlife which often exert strong ecological effects on their habitats or other species. The first regional report card on sharks and other large marine wildlife, identifying shark and turtle hotspots, key nursery areas, and areas in need of elasmobranchs (sharks and rays) repopulation, will be issued in the coming months.
Advances have been made on the marine pollution front as well, demonstrating that agricultural production can be done with substantially reduced fertilizer, pesticide and sediment run off into the MAR. Over the past decade the World Wildlife Fund has deployed precision agriculture techniques with the agricultural sector – with encouraging results. For example, between 2004 and 2016, the Belize Sugar Cane Farmers Association reduced phosphorus applications by 82%; the Banana Growers Association reduced fungicides by 24%, and a palm oil company in Honduras reduced herbicides by 70% and fertilizer by 30% while increasing productivity by 25%.

A key ingredient in successful endeavors of any kind - not least conservation of natural resources and environmental goods and services - is the creation and strengthening of human capital. The Mesoamerican Reef Leadership Program (MAR-L) does precisely that: it accelerates conservation in the MAR by strengthening the capacities and leadership skills of young conservationists in Mexico, Belize, Guatemala, and Honduras to help them launch innovative conservation projects. To date, this world class program has trained 171 leaders from the four countries, has 44 conservation projects underway focusing on high-priority conservation issues, and has developed a successful network of committed conservation practitioners, forming a critical mass of change agents in the region.

What is truly exciting about all these advances is that they are taking place across the four MAR countries and stakeholders across the region are communicating and exchanging better practices. Formal and informal networks are being created and are growing. The fact that these changes are occurring at the regional level is a crucial accomplishment as it reflects the ecological reality that the MAR is a single, shared, resource.

Although the advances over the past 20 years are substantial, more needs to be done to protect the MAR from continuing threats to the natural capital it embodies. Four threats stand out as the most critical impediments to the long-term ecological and economic viability of the Mesoamerican Reef.

1. **The discharge of effluents and contaminants from human activities in the watersheds and marine areas.** Effluents from human activity, from agriculture to beachfront resorts to coastal cities, directly impact the MAR’s coastal and marine habitats, affecting their capacity to provide important environmental goods and services such as fisheries and tourism-related activities, and to recover from other sources of stress such as climate change. Sewage is a critical threat: it reaches the sea through porous limestone in Mexico, down the Motagua River in Guatemala and from coastal cities all along the MAR’s coastline. Inadequate water treatment as well as untreated sewage are fueling algal blooms and threatening reefs. Also, according to the Healthy Reefs Report Card, in Mexico toxins and trash are reaching the reef as a result of poor solid waste disposal: in Belize, elevated nutrients and chemicals from agricultural runoff are decreasing water quality and fueling algal blooms; and in Guatemala, the Motagua River carries agrochemicals and trash directly into the sea, risking human health as well as wildlife habitat.
The Healthy Reefs Initiative conducts an Eco-Audit every other year, measuring progress on addressing each threat. For Sanitation and Sewage Treatment, the 2016 score was “average to poor”. This is a key issue for protecting both reef health and human health. It is also the lowest scoring theme in the 2016 Eco-Audit (46%) with no improvement this period. Inadequately treated sewage is commonplace in the region and deleterious to both reef and human health. However, solid efforts are underway to address these issues, particularly in Honduras and Mexico. Additional efforts are needed for new or improved infrastructure to treat and reduce wastewater (including sewage, agricultural and industrial effluents) in order to reduce the nutrients and toxins that reach coral reefs.
2. Unsustainable coastal development. Unsustainable coastal development is impacting on marine and coastal habitats, particularly mangroves, which provide shoreline protection, water filtration and nursery habitat for many economically and ecologically important marine species. When mangroves are cleared for coastal development, and fill material is deposited, the resulting increase in suspended sediments increases turbidity and smothers seagrass and corals. According to the Healthy Reefs Initiative Report Card, the growing tourism industry along the Quintana Roo coast is increasing demand for development, and illegal and improper building design is destroying mangroves, wetlands and beach dunes. Likewise, in Belize, unregulated development is destroying coastal habitat. In Guatemala, industrial ports generate pollution and navigational hazards, and coastal development is fueling deforestation and decreasing water quality. In Honduras, the rapid growth in tourism is depleting resources and destroying important habitats. While coastal development has generated many employment opportunities, if it continues without more care for the environment, the appeal of the MAR’s coast and marine resources will dwindle and along with it, the associated jobs. Environmentally sound coastal zone management plans (including appropriate building codes) and their effective implementation is essential in the four countries of the MAR.

The HRI 2016 Eco Audit rated Coastal Zone Management (CZM) efforts as “average to poor”. CZM is considered one of the most critical management needs within the region, balancing the need for economic development, sustainable livelihoods and long-term ecological sustainability. The 2016 CZM score improved to 60%, with some progress in all four countries with their coastal zone and watershed management plans. Further actions are now needed to further implement and enforce these management plans, especially to address direct physical damage through dredging or land filling, or indirect damage through increased runoff of sediment, pollution, and sewage, all of which can greatly impact the health of a reef. Additional effort is also needed to track the extent of mangroves affected by these plans.

HRI rated efforts on Sustainability in the Private Sector as “poor”. This rating seeks to evaluate how much the private sector, which benefits from the region’s coral reefs, are contributing to their management and conservation. It had a very slight improvement and ranks at 50%. The most progress has been of indicators for the level of governmental incentives given to sustainable businesses, adoption of seafood eco-labeling
programs and voluntary eco-standard programs for marine recreation providers. Additional efforts are needed to increase the participation of hotels in eco-certification schemes and support of MPAs by the private sector. Partnerships between the private sector and governments or NGOs can facilitate information exchange, training in best environmental practices, and collaborative efforts to find solutions to issues of shared concern.
3. Chronic fishing pressure endangers ecosystem function in many places across the MAR. Important steps have been taken to improve the sustainability of fishing activities including the creation of fish replenishment zones, better enforcement capacity, and harmonization of selected fisheries regulations across the region through the Central America Fisheries and Aquaculture Organization (OSPESCA). However, years of overfishing have resulted in reductions or collapses of some fish, lobster and conch stocks. Illegal fishing and poor enforcement continues to be a problem. We need to build on the achievements in recent years such as the Chakay/MSC ecolabeling initiative for sustainably managed lobster stocks in Sian Ka’an and Banco Chinchorro in Mexico, which were spearheaded by Razonatura, an NGO devoted to empowering local communities in the sustainable use of their natural resources. In a harmonized way across the MAR, we need to phase out unsustainable fishing gear, and promote good fishing and marketing practices, and continue to build the network of scientifically justified replenishment zones or no-take fish refuges in and around MPAs. These should focus on source or nursery habitats that provide ecological connectivity for commercially important species and provide measurable benefits to local fisheries to ensure economic prosperity for the fishers themselves.

The HRI 2016 Eco Audit rated Ecosystem-based Fisheries Management efforts as “fair”. These efforts promote long-term ecological integrity and fisheries sustainability benefiting reefs and people. It has a fair score (60%) due partially to previous improvements in 2014 such as (a) Harmonizing fisheries regulations among countries, and (b) Grouper fishery regulations. New improvements in 2016 are based on the increased protection of parrotfish and grazers with full protection in Guatemala (5-year harvest ban) and new efforts in Mexico. Efforts to protect parrotfish are important especially as parrotfish are being targeted for food as other fish stocks decline. Previous efforts in Belize to protect herbivorous fish resulted in an increase in biomass over the years with larger parrotfish found in MPAs or areas with catch restrictions, suggesting protection allows parrotfish to grow large. Additional progress is needed to secure protection of parrotfish in Mexico and coastal Honduras and to address rights-based sustainable fisheries management. Recovery of fisheries requires the appropriate management of fishing areas and practices, as well as efforts to identify and address underlying social and economic factors leading to overexploitation rates and lack of traceability in the commercial chain.

The HRI 2016 Eco Audit gave Marine Protected Areas a “good” rating. MPAs are one of the main tools for protecting reef resources in the MAR. This theme had the second highest score (70%), based partially on the amount of area under protection. Improvements were seen in the amount of areas fully protected and the generation of alternatives for fishers within the network of MPAs. These replenishment zones are important to allow fish to mature and produce more fish for the future. Based on HRI data of 43 long-term survey sites,
fully protected areas had 10 times more snapper and grouper biomass than those within general use areas of designated MPAs or reefs with no protection. More large groupers were found in long-established MPAs or MPAs with additional protection measures. Progress is still needed to reach a minimum 10% territorial sea under full protection; and in the level of “MPAs with good enforcement”; highlighting the importance of fully funding MPAs, providing staff and training, and increasing enforcement of regulations within the MPAs.
4. **Climate change impacts on the reef.** Climate change is taking its toll on coral reefs in multiple ways: ocean acidification (which occurs when oceans absorb CO2 from the atmosphere) is hindering corals from absorbing the calcium carbonate they need to maintain their skeletons, elevated sea temperatures from global warming are bleaching corals and changing oceanographic dynamics as well as species behavior and larval settlement and juvenile movements. If the Mesoamerican reefs are going to endure, we need to take whatever actions we can to protect them, as well as to build their resilience to a changing climate. Some reefs may have survived bleaching events and other impacts of climate change better than others. Research to identify and map reefs most likely to be resilient to warming seas / coral bleaching is still needed for the MAR, especially since climate change is one of the biggest stressors for our reefs. Those reefs should be identified, and special efforts should be undertaken to protect them from the other threats identified above, thereby ensuring that healthy populations of herbivores keep algae at bay, that coastal development is not smothering them in sediments and that they are not being fouled with sewage or agricultural contaminants.

The HRI 2016 Eco Audit rated Global Issues for the MAR as “fair”. These issues include evaluation of efforts to develop regionally accepted criteria and maps of potentially resilient reefs, as well as the percentage of mangrove forests managed under carbon sequestration schemes. As human populations grow, so do the resource demands imposed on ecosystems. The environmental impacts of anthropogenic actions, which are processes or materials derived from human activities, are becoming more apparent. This indicator measures the application and progress of an incentive program of ecosystem services for carbon sequestration. This theme includes evaluation of efforts to adopt and expand a reward system for carbon sequestration and encourage a reduction in hydrocarbon extraction and dependency while promoting the use of alternative renewable energy sources. **Future efforts need to build on this terrestrial experience and help develop the blue economy in the MAR, potentially providing economic incentives for mangrove and seagrass conservation through their carbon sequestering services.**

**Our aim** is to build personal, corporate and societal responsibility towards our blue resources and to guarantee their effective protection and sustainable use as pillars of rural and urban development, and through this approach enable businesses and communities, large and small, to see sustainable returns on their investments. To the extent that this effort is undertaken in a participatory way, in which people living in small coastal communities and large coastal cities alike embrace the connection between a healthy reef and their own wellbeing, it will have a much greater chance of enduring over the long-term.

The MAR Fund, Healthy Reefs Initiative and MAR Leadership Program and their diverse partners in conservation have proven track records of designing and successfully implementing innovative solutions to marine resource management challenges, including science-based, decision making tools, collaborative marine resource monitoring, innovative solutions for marine spatial planning, and novel finance mechanisms to facilitate the restructuring of fisheries. We see a clear opportunity for Belize,
Guatemala, Honduras and Mexico to collectively enhance their global leadership in resolving complex marine conservation problems and forging a pathway for businesses and communities to thrive under the emerging Blue Economy.

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