

HRI / SI YEAR 1 TECHNICAL REPORT to MESOAMERICAN REEF FUND



1. Title page:

- Project Number HRI -1-2016
- Project name: Healthy Reefs for Healthy People: Strengthening the Scientific Foundation
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- Period covered in the report and date of presentation 10/01/2016 to 09/30/2017 (date of submission)

2. Executive summary to date: briefly describe activities and results to date.

Healthy Reefs for Healthy People (HRI) is a globally unique international collaboration among reef research, management and conservation institutions dedicated to safeguarding the MAR off Mexico, Belize, Guatemala and Honduras. HRI works very closely with partners to convene and coordinate the region's collaborative monitoring and communication about the overall health of the Mesoamerican Reef and our efforts to manage it. This is done by enhancing public awareness and support for marine conservation, through public dissemination of information via different media outlets, participation in national and international meetings. HRI also works with partners to improve on-going reef and MPA management and decision-making to restore the reef ecosystem's health and enhance its adaptive capacity/resilience to withstand stresses associated with global climate change and local threats.

HRI has maintained its leadership position in the conservation of the MAR and has become a global leader in science-based adaptive management that provides direct assistance to conservation practitioners and decision-makers.

HRI has advanced in targeting the four cornerstone strategies: healthy watersheds, healthy fisheries, healthy communities and healthy futures.

Healthy Watersheds – HRI’s Honduras coordinator continues his role with Polo’s Water Association, leveraging two \$50,000 projects with MAR Fund/KFW, a \$60,000 project with CORAL, and a \$10,000 project with Seacology, all directed at improving wastewater management in this important coastal tourism destination. The MAR Fund/KFW grant resulted in 31 more homes and businesses getting connected to sewage treatment, (representing treatment of approximately 3.1 million gallons of wastewater per year). When CORAL’s 47 additional sewage connections are also considered, this joint effort has resulted in over 8 million gallons of wastewater now being treated each year. Engineers without Borders (Penn State University Chapter) has agreed to carry out a solar energy project with Polo’s Water, to reduce the consumption of electricity at one of the wells that provides potable water to the community. The project is scheduled to begin in November 2017.

Healthy Communities – Our human communities in the Mesoamerican Region depend on productive coastal ecosystems. HRI is improving its understanding of the linkages between human and ecological health, and promote sustainable development alternatives. This strategy is closely linked with healthy watersheds and fisheries, we need healthy waters and sustainable fisheries in order to have healthy communities. HRI Belize collaborated with Columbia University researchers examining the human health impacts of fisheries management in the Toledo district.

Healthy Fisheries – Our strategy includes activities supporting ecosystem-based fisheries management, including the region-wide protection of parrotfish, important fish spawning sites, and the promotion of fisheries replenishment zones. In Mexico, two new fish refuges were established (30 km²) in Punta Allen, Sian Ka’an (September 2016) which protect Nassau grouper spawning aggregation sites. This work was done through the Kanan Kay Alliance, in which HRI is a partner. HRI’s efforts on parrotfish have finally succeeded at getting a request for information needed to create their protective regulation. HRI’s database on parrotfish population size structure is being used to modify the NOM 059 protecting wildlife to include all species of parrotfish in the Mexican Caribbean, with the help from the General Wildlife Direction. The aim is to get protection by the end of 2017 or early 2018, having all parrotfishes protected in the Mesoamerican region of Mexico.

HRI has worked closely with strategic partners within key organizations, and jointly developed a strategy for the conservation of the newly discovered reef in Guatemala: Cayman Crown. These partners are Will Heyman (LGL Ecological Research Associates), Celia Mahung (TIDE), Marco Cerezo (Fundaeo), María José Gonzalez (MAR Fund), and Ana Giró (HRI). The main conclusion of the strategy is to continue with site exploration, characterization, mapping and development of a technical report that may be used for the protection of the site. HRI, LGL and MAR Fund are working closely to get more funding to continue with site exploration.

HRI, CORAL and CINVESTAV are jointly creating the baseline for a new no-take zone in the French Cay area of Roatán, through participating in monitoring 2 sites that shed the needed information to establish this new NTZ. The needed technical report has been created with zoning maps. There have been several community meetings to

discuss all these ideas, and the local members continue to push for the successful creation of this new fish-replenishment zone (see HN folder: HON Ficha técnica Lobster City and HON Informe Final Linea biologica French Cay).

Honduras recently published the new Fishing Law, which replaces the former one, published in 1959 (see HN folder: HON Ley de Pesca 2017). Despite the fact that HRI participated in meetings where the inclusion of herbivorous fish was discussed, these were not included in the new law. HRI has now reached out to all Honduras partners in order to request active participation in the creation of the regulations (“Reglamento de la Ley de Pesca”) in order to continue pushing for the protection of key herbivorous species and to make certain that MPA’s and their management entities have a say in how these regulations will be created.

Healthy Futures – HRI lead the MAR’s BleachWatch Program and mobilized a coordinated network of trained surveyor teams to evaluate the extent of bleaching throughout the Mesoamerican reef region during the 2016 bleaching event (October/November). The complete coral bleaching database is available for 2015 and 2016, reviewed and standardized for the entire region, including information per site and species (see folder: Bleaching Report).

HRI will carry out a third season of BleachWatch monitoring, if emergency funding can be obtained, focusing on the same sites in order to have temporal data that can be compared over time. Reports of severe bleaching began in late September and efforts will be made to get assessments in by mid October.

New Smithsonian regulations about contracting foreign individuals over the long-term have led us to have the Guatemala, Honduras and Mexico Coordinators contracted directly through MAR fund for years 2-4 of this grant, along with their travel and associated expenses. Thus, approximately half the annual budget will be expended directly on these contracts, with the remainder going to Smithsonian for other program expenses.

3. Objectives: The objectives of the project, as established in the approved proposal.

- A. Convene and Coordinate the region’s collaborative monitoring and communication about the overall health of the Mesoamerican Reef and our efforts to manage it.
- B. Healthy Watersheds: Working alongside existing local and national water entities, HRI will promote the adoption and replication of effective management schemes that will allow better management of potable and waste water in coastal communities improving reef health (and community health).
- C. Healthy Fisheries: HRI aims to advance the network of scientifically justified replenishment zones or no-take fish refuges, protecting at least 10% of territorial sea by 2020, including 75% of the known fish spawning sites. Increase herbivory and reef health by protecting parrotfish region wide by 2018.
- D. Healthy Communities: Convey consistent, scientific information and recommendations to policymakers, decision-makers and the public, such that the connections between reef health, human health and socioeconomic sustainability, result in effective conservation action at an unprecedented scale.
- E. Healthy Futures: Expand HRI science to address main impediments to reef health by exploring management interventions and monitoring specific

responses including emergency bleach watch monitoring if needed to improve our understanding of reef resiliency.

4. Project progress

The originally planned methodology for each of the objectives still applies. Each of the objectives and accomplishments is explained in the following paragraphs.

A. Convene and Coordinate the region's collaborative monitoring and communication about the overall health of the Mesoamerican Reef and our efforts to manage it.

o Collaborative training and reef monitoring with partners

AGRRA monitoring was conducted from June to October 2016, where 26 sites were surveyed in Mexico, 36 sites in Belize, 10 sites in Guatemala and 81 sites in Honduras. Two additional sites later monitored, by CORAL, HRI and CINVESTAV, to create the baseline for a new Replenishment Zone (RZ) in the French Cay area of Roatán. Each HRI country coordinator organized most, if not all, logistics to carry out the monitoring activities. All monitoring data has been entered into the HRI database and we are actively working on the data analysis to be reported in the upcoming 2017 Report Card to be launched in November 2017.

In September, HRI participated in the MAR Reef Restoration Network workshop at Akumal, Q. Roo, where the 4 Mesoamerican countries participated to reactivate this network which started in 2012. HRI's Guatemalan and Honduran Coordinators are now part of the steering committee, elected by their countries members to represent them in this network (see MAR Coral Restoration Committee.jpg).

o Enhance partner capacity and participation with HRI

Through HRI's leadership on the Global Coral Reef Monitoring Network - Caribbean Steering Committee, we participated in the approval of Socioeconomic monitoring guidelines to accompany the biophysical guidelines approved in summer 2016. Guidance for the collection of these social data can be found in the Socio-economic Monitoring Guidelines. (<http://www.socmon.org/download.ashx?docid=58172>). In addition, the main "Socio-Economic Manual for Coral Reef Management" manual provides more detailed information on field methods see link here: (<http://www.socmon.org/download.ashx?docid=58170>).

HRIs collaborated with researchers from Columbia University, Toledo Institute for Development and Environment (TIDE), the Belize Fisheries Department and Harvard University. This study focuses on studying the human health impacts of seafood consumption in the Toledo district. Toledo was chosen based on data showing occurrences of anemia and child stunting over the years.

Preliminary results indicate that 44% of surveyed participants have noticed a change in the fish markets, and of these individuals, 44% have noticed that the fish sold is getting smaller over the years, 27% have noticed the price of fish increasing over the years, and 29% say that there has been less fish being sold. Preliminary results were published in Amandala Newspaper in Belize:

<http://amandala.com.bz/news/fish-plate-smaller/>

HRI Mexico and Guatemala has also provided useful partnership information to Asociación Interamericana para la Defensa del Ambiente (AIDA) from other parts of the country and even from other Latin American countries, so they can continue and enforce the efforts of protecting parrotfishes in states as Baja California Sur or countries like Colombia, learning from our experiences in the Mesoamerican countries.

Our Mexico Coordinator, Marisol Rueda, will continue collaborating with the Land2Coast project led by British organizations such as the Cardiff University, to finish the project early 2018. The aim is to outline the threats inland, which are affecting the marine and land environment as well as setting into risk the availability of resources for the society in Q. Roo. The final result will be a governance strategy that could help the state to improve in their management actions by 2018.

There have been many changes in HRI's governmental partner's positions, with Alfredo Arellano, the new director of SEMA, now serving as our main contact person to continue the collaboration with HRI.

HRI's Honduras coordinator continues to push for the decreeing of Tela Marine Wildlife Refuge, which is still under discussion in the National Congress. There are many doubts if this will be achieved, as Honduras will hold general elections in November of 2017, and the National Congress is (almost) at a stand-still.

HRIs Guatemalan coordinator participated as one of the instructors in the AGRRA Coral Reef Monitoring Training Course held in Turks and Caicos Islands (TCI). The main objective of the course was to enhance monitoring as well as reef health reporting in TCI. The organizations that participated were: Department of Environment and Coastal Resources, Turks and Caicos Reef Fund and Wolfs Company. HRIs collaboration with TCI will broaden AGRRA data collection in the Caribbean as well as improve reef health reporting (see attached file: TCI AGRRA Agenda).

- **Enhance public awareness and support for marine conservation**

While our primary efforts are focused on effectively communicating what we learn with partners in the Mesoamerican Region, our ability to protect coral reefs also extends outside of our MAR borders, so international outreach is important. We continue to share information and trainings through our Regional Partner Meetings, Report Cards, Eco-Audits, Survey Trainings, open access data portal and social media. New this year is the collaboration with Smithsonian's Communication Division on the Earth Optimism Summit in April in Washington DC and on our Report Card launch planned for November 2017. We are exploring new digital interactive video and graphical means of integrating data and communications for this 2017 Report Card.

The HRI Country Coordinators are seen as key marine conservation leaders in their respective countries, with capacity and ability to disseminate information clearly on key marine issues, reef health and conservation. We have continued to work with media and having news being publicized regularly in Mexico and Guatemala. All the public dissemination of information is essential to build an informed electorate that will support stronger regulations.

Publications for Guatemala in Noticias Green:

- <https://noticiasgreenpress.com/2017/03/22/el-agua-un-recurso-natural-indispensable/>

- <https://noticiasgreenpress.com/2017/02/21/arrecife-mesoamericano-avances-y-retos-ambientales/>
- <https://noticiasgreenpress.com/2016/11/10/los-arrecifes-coralinos-ecosistemas-fragiles/https://noticiasgreenpress.com/tag/oceano/>
- <https://noticiasgreenpress.com/2017/03/22/el-agua-un-recurso-natural-indispensable/>
- <https://noticiasgreenpress.com/2017/06/07/nuestros-oceanos-nuestro-futuro/>
- <https://noticiasgreenpress.com/2016/12/08/los-oceanos-y-su-importancia-para-el-planeta/>
- <https://noticiasgreenpress.com/2017/04/22/el-impacto-del-plastico-en-las-profundidades-oceanicas/>

Publications for Mexico:

- <https://www.youtube.com/watch?v=ftZmQp1HEUE>
- https://issuu.com/www.jccreativetechnology.com/docs/playacar_magazine_51_-_issue
- http://issuu.com/www.jccreativetechnology.com/docs/playacar_magazine_50_issue
- <http://sustentur.com.mx/ven-progreso-en-la-proteccion-del-arrecife-mesoamericano/>

In Mexico, the bleach watch project results were shared under the specialized meetings of climate change under the Watershed Council of the Yucatan Peninsula, giving emphasis on improving or diminishing other stressors such as: inadequate wastewater treatment, coastal development and beach erosion (see attached files in Healthy Waters folder: 03 PROGRAMA JORNADA DE GET QROO Final, CONAGUA 10 mar, Fotos).

In Honduras, HRI was invited to give a presentation on the Report Card and Eco Audit at the first annual National MPA Meeting, held in Tela on October 2016 and lead by Proyecto Marino Costero. HRI was 1 of 2 NGOs invited to talk at this important event (see attached files in Healthy Fisheries folder: I Foro Areas Protegidas Marinas Oct 2016, Agenda del Foro Areas Marino Costeras, Fotografías).

HRI gave a presentation on the economic importance of coral reefs in two separate forums: National Biodiversity Day (May) and at the First National Biodiversity Congress (August) (see attached files in HN folder: HON Evaluación Economica de Arrecifes). HRI also collaborated with FAO in presenting the impacts of climate change to coastal and marine ecosystems in 2 workshops (La Ceiba and Roatán), which are related to the Green Climate Change Fund call for proposals (see attached file in HN Folder: HON Taller FVC).

HRI Honduras coordinator, was asked by UNDP to help create Voluntary Commitments for different partners in the country in support of Sustainable Development Goal #14 which focuses on oceans and marine life. A series of 3 workshops were held, in Tegucigalpa, La Ceiba and Roatán, that led to the creation of 84 commitments. These were uploaded to the UN's Ocean Conference website, which were then presented at the UN's General Assembly on World Ocean's Day (June 8th). Honduras was able to present all these commitments as proof that the country is working towards sustainable use of oceans (see attached files in HN Folder: HON Informe Final DRYSDALE ODS14 Océanos).

In Guatemala, HRI continues to be the leader in coral reef ecosystems and sharing the status of the health of the MAR. HRI has enhanced public awareness by participating in national conferences and partner's meetings, where our work has been portrayed (see attached files in GT Folder: Dia Océanos, Entrevista Ana Giro TGW).

The Regional HRI Partners Meeting was held in Playa del Carmen, México on Dec 1-3, 2016. Over 41 partners from the 4 countries attended the meeting. Partners jointly reviewed preliminary results, data and/or indexes, while prioritizing recommendations and success stories to be included in the 2017 Report Card (see folder: COP and HRI meeting). Results from the bleach watch monitoring were discussed as well as the identification of priorities for the next two years on focused on marine conservation.

The special 10 years of data Anniversary Report Card is underway with launches planned for November 2017. In Belize the Report Card launch is planned to coincide with the historic signing of national legislation making a moratorium on offshore oil exploration, the culmination of a seven year effort of analysis and outreach effort of HRI and partners in Belize.

Internationally, HRI was presented at two special events during the COP in Cancun in December 2016 (see folder: COP and HRI meeting). HRI's Director was also a featured speaker in the Smithsonian's first "Earth Optimism" Symposium in DC in April. A HRI presentation focused mainly on the 2015-15 coral bleach watch results was presented in May at the Association of Marine Labs of the Caribbean Symposium in Merida, Mexico. HRI's Mexico Coordinator also presented our work at the International Society for Conservation Biology meeting in July in Cartagena, Columbia where we captured a lot of attention and international press with this article in the Business Standard:

http://www.business-standard.com/article/news-ians/mesoamerican-reef-gets-global-attention-117072800880_1.html.

The HRI team also published a case study of Collaborative Adaptive Management in the Mesoamerican reef, in a UNEP book entitled "Handbook on the Economics and Management of the Sustainable Oceans (see: Handbook on the Economics and management of sustainable oceans):

<http://www.ebooks.com/95723506/handbook-on-the-economics-and-management-of-sustainable-oceans/nunes-paulo-a-l-d-svensson-lisa-e-markandya-anil/>

https://play.google.com/store/search?q=9781786430724&c=books&hl=en_GB

The Guardian, one of the UK's leading newspapers, also published a feature on the Mesoamerican Reef, with assistance of HRI. It focuses on several challenging reef conservation issues in Belize and includes a preview of the upcoming HRI Report Card (see: The Guardian).

<https://www.theguardian.com/environment/2017/aug/22/belize-coral-reefs-improving-grassroots-restoration#img-1>

B. Healthy Watersheds

- **Effective management of wastewater in the West End community improves local water quality and reef health.**

HRI's Honduras Coordinator is also the Secretary of the Board of Directors within Polo's Water Association, West End's local water board in charge of potable water and sanitation. His direct involvement has allowed the Board to leverage two \$50,000 projects with MAR Fund/KFW, one \$60,000 project with CORAL, and one \$10,000 project with Seacology, all directed at improving wastewater management in this important coastal tourism destination. The CORAL grant connected a total of 47

homes to sewage treatment (see HN folder: HON Sewage Treatment Calculations OCT 2017). The second MAR Fund/KFW grant allowed for the connection of 31 homes and businesses to the sewage treatment, bringing the combined total to 78 homes resulting in a staggering 8 million gallons of sewage treated per year (see in Healthy Waters folder file: Informe Tecnico Conexiones).

Penn State's Engineers Without Borders (EWB) chapter has leveraged funds to carry out a solar power project in West End. This project is scheduled to begin in November 2017 and will provide a solar panel array and all needed electrical components, to power one of the wells that supply potable water to the community.

The original idea presented to EWB was to install this solar array at the waste water treatment plant, in order to reduce operational costs, which are around \$7,000 per month. The idea was changed to potable water when the fact that the savings would benefit the Municipality of Roatán (who pays this bill) and would not represent a direct benefit for the community, which is one requisite to carry out EWB projects.

- **Replicate successful Water Board management scheme two more areas by 2020**

In Honduras, West End, as of February 2017, was divided into 2 water districts: the north end, serviced by Half Moon Bay (HMB) Water; while the south was serviced by Polo's Water Association. This led to an imbalance in the quality and type of service, as Polo's has been more transparent and reliable over the past 12 years. Due to poor management and overwhelming debt with the company that operates the wastewater treatment plant, the local Community Council, recently dissolved HMB and asked Polo's to service the entire community.

Polo's has also been approached by two other water management entities- Patronato de la Colonia Los Maestros (near Coxen Hole) and Junta de Agua de Los Fuertes (near French Harbour). These two entities heard of the success of Polo's Water through television and radio interviews, and requested meetings to explain ways to better perform their water management activities. Thus, our successful management of West End water and wastewater system is quickly spreading across the island of Roatán and serving as a model for the country.

- **Identify new water-treatment technologies to improve wastewater treatment in the MAR**

HRI has begun conversations with OMEGA Global Initiative, who have a project designed by former NASA scientists to treat wastewater in coastal communities, while producing energy and food (mariculture) ([www. http://omegaglobal.org](http://omegaglobal.org)). HRI is looking for collaborative funding opportunities to enable a pilot program in the MAR.

C. Healthy Fisheries

- **Enhance commercial fish biomass and reef health by protecting spawning aggregation sites.**

Thirteen grouper SPAG sites have been identified in Belize, with 11 fully protected since 2003. Most are now included within MPAs and are being regularly monitored, as reported on in the 2017 Report Card success stories for Belize.

In Mexico, two new Fish Replenishment Zones were established (30km²) in Punta Allen, Sian Ka'an (September, 2016) which protect Nassau grouper spawning aggregation sites. This work was done through the Kanan Kay Alliance, in which HRI is an actively participating member.

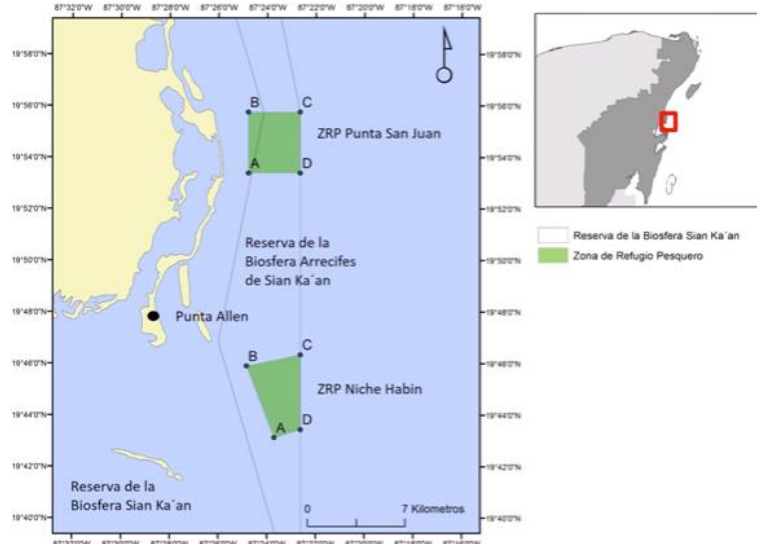


Figura 1. Delimitación y descripción de las Zonas de Refugio Pesquero en la Bahía de la Ascensión, ubicada en el Estado de Quintana Roo (El plano de ubicación contenido en el presente Acuerdo es con fines específicamente de referencia geográfica y sin valor cartográfico).

The Cayman Crown (potential SPAG site) conservation strategy has been developed. The meeting for the development of the strategy was held on March 27th in Guatemala City. HRI worked closely with strategic people within key organizations; jointly they developed a strategy for the conservation of the newly discovered reef Cayman Crown. The partners are Will Heyman - LGL Ecological Research Associates, Celia Mahung – TIDE, Marco Cerezo – Fundaeco, María José Gonzalez – MAR Fund, Ana Giró – HRI. The main conclusion of the strategy is to continue with site exploration, characterization, mapping and development of a technical report that may be used for the protection of the site. HRI, LGL and MAR Fund are working closely to get more funding to continue with site exploration.

- **Increase the percent of sea within fully protected zones to 10% by 2020**

New RZ in the French Cay area of Roatán: The needed technical report has been created with zoning maps. There have been several community meetings to discuss all these ideas, and the local members continue to push for the successful creation of this new fish-replenishment zone.

HRI collaborated with AGRRA, led by CORAL and CINVESTAV, to create the baseline for a new RZ in the French Cay area of Roatán, participating in the AGRRA monitoring 2 sites to establish this new RZ.

In Mexico, two new RZs were established in Punta Allen (30km²), Sian Ka'an which protect Nassau grouper spawning aggregation sites. This work was done through the Kanan Kay Alliance, in which HRI is a partner.

Guatemala's HRI Coordinator is part of the core team for establishing a network of replenishment zones in the MAR, an initiative led by The Nature Conservancy (TNC). She and HRI's director are providing scientific input and collaborating as a co-author in the document: Biophysical Principles for Designing a Network of Replenishment Zones for the Mesoamerican Reef System (see Healthy Fisheries folder: Biophysical Principles for Designing a Network of NTAs in the MAR_Ana Giro).

D. Healthy Futures

- **HRI leads the incorporation of the latest reef science into reef management testing out new theories to improve reef management**

MAR Bleach Watch: HRI mobilized a coordinated network of trained teams of surveyors to evaluate the extent of bleaching throughout the Mesoamerican reef region. This second assessment (following the first assessment done in 2015) of the 2016 bleaching event (October/November) mobilized a total of 48 surveyors in the entire MAR region (24 in Mexico, 8 in Belize, 14 in Honduras and 2 in Guatemala). These teams surveyed a total of 107 sites, all of which had full species-level identification (29 sites in Mexico, 32 sites in Belize, 5 sites in Guatemala and 41 sites in Honduras). The field operations involved 23 sub-grants organized by the four HRI country coordinators. Preliminary data from 2016 were presented at the HRI Partner meeting and COP 13 in Cancun in December (see folder: COP and HRI meeting). The complete coral bleaching database is available for 2015 and 2016, reviewed and standardized for the entire region, including information per site and species, this information is being used for the report on coral bleaching in the MAR. The paper documents the 2015-2016 bleaching event in the Mesoamerican Reef (MAR). A Bleaching Severity Index (BSI) was used to assess its relation to thermal, human stressors and environmental variables through a general additive model (see folder Bleaching Report).

HRI recently received notification of a grant from Oak Hill Fund (OHF) that will match this grant for core staffing and expenses, which also supporting the development pilot studies exploring innovative new reef restoration and management interventions. HRI's Director presented these ideas at the MAR Reef Restoration network meeting in Akumal in September, with much interest being generated among the partners. Our main focus will be on testing interventions designed to reduce macroalgal proliferation. These include increasing herbivory, by enhancing the populations of natural herbivores (parrotfish, *Diadema* urchins and King Crab). In addition we will test methods of increasing the reefs natural water filtration function by fragmenting and replanting sponges that naturally filter and clean the water. Finally, we will test the benefit and cost of further enhancing or jump-starting these natural restoration techniques by manually removing or weeding macroalgae with volunteer divers.

5. Indicate the advance of the project in relation to the original timetable and explain the reason for any delays there may have been.

- **8 coastal municipalities are improving sanitation**

There are delays in acquiring ratification by the Honduran Govt. of the Cartagena Convention and its 3 protocols. HRI continues to work closely with Dirección General de Biodiversidad (DiBIO) and Merchant Marine (MM) in pushing this important

legislation forward. The latest news from partners at MM in late September is that it is on the President's desk, waiting to be signed, which might take more time due to the fact that campaigning has begun for the upcoming elections.

At the latest meeting with IDB, they expressed that sewage and sanitation did not become a priority for 2017 for the Government in conjunction with the IDB. Due to this delay, which will now be presented again to be included in the 2018 agenda, IDB, CORAL and HRI are now focusing their efforts on establishing a close working relationship with the 20/20 National Plan. This plan looks to foster the creation of 5,000 new hotel rooms on Roatán, but no waste water infrastructure has been included in the plan. We will present a united front to make sure that all investments include treatment in some form. This will be achieved by meeting with the Board of Plan 20/20, which will be called by IDB. At this meeting we will present the water quality analysis results, the achievements up to date with Polo's Water management and the data on macro-algae included in the 2015 Report Card; as well as IDB's water and sanitation investment plan.

- **Increase herbivory and reef health by protecting parrotfish region wide by 2018**

Honduras recently published the new Fishing Law, which replaces the former one, published in 1959 (see HN folder: HON Ley de Pesca 2017). Despite the fact that HRI participated in meetings where the inclusion of herbivorous fish was discussed, these were not included in the new law. HRI has now reached out to all Honduras partners in order to request active participation in the creation of the regulations ("Reglamento de la Ley de Pesca") in order to continue pushing for the protection of key herbivorous species and to make certain that MPA's and their management entities have a say in how these regulations will be created.

HRI Mexico has submitted a draft to modify the NOM 059 protecting wildlife to include all species of parrotfish in the Mexican Caribbean, with the help from the General Wildlife Direction. The aim is to get protection by the end of 2017 or early 2018, having all parrotfishes protected in the Mesoamerican region.

6. Obstacles: Indicate if there have been any obstacles to the development of the project that have prevented achieving the planned goals or complying with the timetable, and how you have solved or plan to solve the situation.

In Mexico, the Quintana Roo government changed political parties at the state level, so all previous political relationships had to be reestablished in order to continue working closely with government. The positive outcome is that the new State Ministry of Ecology and Environment is headed by a well-respected biologist who is very familiar and supportive of HRI's work. We now have open access and good potential to continue and strengthen the ongoing collaboration. Regarding data for Mexico it took a long time to get CONANP's data for 2017 Report Card, and evaluated, since they used a different methodology that doesn't meet our stated minimum sample size for adequacy. Also in Mexico, the planned "success story" of Othón P. Blanco municipality requiring tertiary waste water treatment had to be removed, because we found out that the official decree no longer contains that requirement - after being mysteriously removed.

The fact that the new Fisheries Law in Honduras did not create any kind of protection for parrotfish and that the Honduran government did not include sewage and sanitation in their 2017 IDB-Govt priorities, are two set-backs for our work that also indicate a lack of political will for conservation. We will continue to build public appreciation for reef values as a means of addressing this.

The territorial dispute between Guatemala and Belize adds a layer of complication and has been an issue to advance in the protection of the recently discovered Cayman Crown reef. However, we are working closely with LGL Ecological Research Associates and the MAR Fund to strategize and move forward an effective long-term protection of the site. HRI is carefully navigating the fluctuating political tensions and opportunities with regards to how we begin to socialize the existence and need to protect this amazing reef.

7. Links with other organizations: Describe any alliances established as a result of the project development.

In Mexico, alliances with the new government officials at SEMA, Alfredo Arellano as Director, Silvia Lavalle as Director of Biodiversity and Graciela Saldaña as Subdirector of Environmental Politics were established.

The alliances with the 8 fishermen cooperatives in Mexico, with whom we work under the Kanan Kay Alliance, has been strengthened, and the Chiquilá fishermen have integrated and got more involved expressing their interest to start RZs in Holbox area, as the others have expressed an interest on renewing the existing ones (Banco Chinchorro, Sian Ka'an) and some of them creating new fish refuges in Cozumel.

HRI has begun conversations with OMEGA Global Initiative, who have a project that they have designed with NASA to treat wastewater in coastal communities around the world, HRI will work towards collaborating in order to take this treatment technology to the north coast of Honduras, to begin with, and then expand to the rest of the MAR countries where HRI has partners that work in sewage and sanitation. In order to showcase the effectiveness of this innovative technology, a pilot project will be first carried out in Honduras, most probably in the Bay of Tela. Once the technology has been proven effective, we will begin conversations with other possible partners in sites within the rest of the MAR. Only the first pilot research program in California has been completed to date.

HRI recently signed a partnership agreement with the Presidential Office on Climate Change. This elevates the playing field on which HRI can further push for mitigation and adaptation projects related to coastal and marine ecosystems (see HN folder: HON Version Final Convenio HRI Clima+).

HRI has recently partnered with Fundación Mundo Azul in Guatemala, to help implement the Jane Goodall's Roots and Shoots Program for the Mesoamerican Reef. HRI Guatemala, has recently partnered with Semillas del Oceano a newly created NGO working in education.

HRI has been contacted by AIDA to learn from our experience in protecting parrotfishes in the Mesoamerican countries and help to expand protection to other Mexican regions and also in other countries in Latin America.

Through contacts with Smithsonian we are in early discussions about potentially assisting HRI collaborative reporting efforts in Cayman and Guyana in 2018, as well as the Turks and Caicos as previously mentioned under training.

8. Description of activities for next period: Briefly describe the activities that will be undertaken in the next period.

- Enhance public awareness and support for marine conservation with the 2017 Report Card launch. Followed by a strong outreach through communications and media. This will be followed by local, regional and international outreach efforts.
- Coral Bleach Watch monitoring for late 2017.
- Seek additional funding which will support some additional research on *Diadema* populations and coral restoration efforts in the region. Characterize sites with high abundance of *Diadema*.
- In Playa del Carmen, Q. Roo, Mexico, HRI is partnering with the planetarium, to organize the Reef Month in November, projecting the documentary Flows where HRI participated, and bringing the “Mares Mexicanos” documental series to be projected creating a cinema debate where people will have the opportunity to get answers and perspectives from the experts.
- Collaborative reef monitoring with partners to assess reef condition.
- improve effluent water quality through sanitation projects in Roatán Honduras.
- Demonstrate the linkages between human, economic and reef health through different assessments like coastal poverty and impacts to human health due to changes in Reef health.

9. Project development table

Please see attached Project Development Table with updates.