# MAR Fish

## Knowledge, Monitoring and Protection of Mesoamerican Reef's Fish Spawning Aggregations

# ACTION PLAN

## 2019-2021

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# CONTENT

# Acronyms

| | |
|---|---|
| **AGRRA** | *Atlantic and Gulf Rapid Reef Assessment* |
| **AMATELA** | *Asociación de Amigos de los Arrecifes de Tela* |
| **BICA** | *Bay Island Conservation Association* |
| **CCAD** | *Central American Commission on Environment and Development* |
| **COBI** | *Comunidad y Biodiversidad* |
| **CORAL** | *Coral Reef Alliance* |
| **EDF** | *The Environmental Defense Fund* |
| **FCG** | *Fundación para la Conservación de los Recursos Naturales y Ambiente en Guatemala (in Spanish)* |
| **FoN** | *Friends of Nature* |
| **FRZ** | *Fish Replenishment Zones* |
| **FUNDAECO** | *Fundación para el Eco-Desarrollo y la Conservación* |
| **HRI** | *Healthy Reefs for Healthy People Initiative* |
| **HCRF** | *Honduras Coral Reef Fund* |
| **MAR** | *Mesoamerican Reef* |
| **MAR Fund** | *Mesoamerican Reef Fund* |
| **MCPA** | *Marine and Coastal Protected Area* |
| **MPA** | *Marine Protected Area* |
| **MTES** | *Ministère de la Transition Écologique et Solidaire (in French)* |
| **NGO** | *Non-governmental organization* |
| **ROV** | *Remote Operated Vehicle* |
| **RMP** | *Roatan Marine Park* |
| **SCRFA** | *Society for the Conservation of Reef Fish Aggregations* |
| **SEA** | *Southern Environmental Association* |
| **SGP** | *Small Grants Program* |
| **FSA** | *Fish Spawning Aggregation* |
| ***TASTE*** | *Toledo Association for Sustainable Tourism and Empowerment* |
| **TIDE** | *Toledo Institute for Development and Environment* |

# MAR Fish ACTION PLAN

## Presentation

In the Caribbean waters of Mexico, Belize, Guatemala and Honduras, the Mesoamerican Reef (MAR) is found, a structure of interconnected and interacting marine ecosystems. The MAR is the largest reef system in the Atlantic Ocean which supports the Mesoamerican eco-region and the local communities that depend on it. In order to guarantee that the MAR keeps its natural richness, in 2004 a regional funding and coordination institution was launched with representatives from conservation funds of those four countries: the Mesoamerican Reef Fund (MAR Fund).

Coral reefs harbour the highest biodiversity of any ecosystem on planet Earth and directly support over 500 million people worldwide. These marine ecosystems are among the most threatened on earth due to unprecedented global warming events and climate changes; combined with growing local pressures, such as overfishing, which is critical to the ecological and economic health of the region.

The importance of coral reefs resides in the biodiversity that they help maintain, host and protect. Approximately 25% of known fish species spend some part of their life cycle in reefs, despite the fact that they cover less than 1% of the ocean floor. Losing such an essential part of the ocean environment could therefore have rippling effects that would cause much broader collapses, not just for marine species, but for fishing communities as well. The insufficient number of marine protected areas, as well as deficient management of the existing ones, along with inadequate monitoring and protection, is a huge challenge. In particular, Fish Spawning Aggregation (FSA) sites represent the near total annual reproductive output of the species that spawn there, and are extremely vulnerable to over-fishing. Jointly concerted efforts are needed to protect these important sites.

Considering the above, the MAR Fish Project was proposed and approved. This project has the overall objective of promoting the recovery of fisheries in the Mesoamerican Reef region, by strengthening the network of protected spawning aggregation sites of commercial fish, as critical areas in the life cycle of these species.

This four-country project will monitor the first regional spawning network in the Mesoamerican Reef region, contributing to the existing network of marine and coastal protected areas, as well as the network of fish replenishment zones (FRZ). Over a three-year period, from 2019 to 2021, there are two specific objectives: (i) Obtain legal recognition and management of Cayman Crown in Guatemala and Belize; and (ii) Promote participatory monitoring of a network of sentinel spawning areas in the four Mesoamerican reef countries.

The implementation of the MAR Fish Project will be guided through this MAR Fish Action Plan 2019-2021 which has four components with specific results and activities that, in general terms, will contribute to the conservation of FSA sites and to the general health of the MAR region.

# CHAPTER ONE: INTRODUCTION

## 1. Introduction and objective of the MAR Fish Action Plan 2019-2021

Fisheries in the Mesoamerican Reef (MAR) sustain the livelihoods of millions of people across Mexico, Belize, Guatemala and Honduras, a region where poverty is striking. But along this coastline, relentless pressure of fishing activities has contributed to a decrease of 23% of commercial fish biomass in sites surveyed by the Healthy Reefs Initiative (HRI), as registered in their 2018 Report Card. Fully-protected "fish replenishment zones" (FRZ), where no fishing is allowed, have proven extremely successful, doubling commercial fish numbers over the past decade in these zones. Unfortunately, while 57% of the territorial sea within the MAR is now within protected areas, only 3% is fully protected from fishing within FRZs. This is particularly detrimental within Fish Spawning Aggregation (FSA) sites, which are scattered along the MAR and are essential in maintaining healthy fish populations.

FSAs are temporary gatherings of fish that come together for reproduction, and in densities up to three times higher than those found during non-reproductive periods, which in turn makes them extremely vulnerable to over-fishing. FSAs generally represent the near total annual reproductive output of the species that spawn there. Periodic information on FSAs health, critical for their protection, is missing and there is no cohesive, multinational plan to monitor or manage them, nor widespread understanding of their importance.

Recently, a new coral reef overlapping the maritime borders between Guatemala and Belize was discovered, likely including Guatemala's first potential multi-species FSA. Being the south west extremity of the Cayman trench and due to its characteristic morphology, this area is called "Cayman Crown" (discovered in 2013, by Ana Giró, of HRI, and local Guatemalan fishers). Due to its recent discovery, vital information for its management and protection is missing and urgently needed.

Considering the above, the **MAR Fish Action Plan 2019-2021** will coordinate regional partners to successfully implement activities in order to guarantee the effective protection of Cayman Crown in both countries (Guatemala and Belize) and five other established neighboring FSAs (one more in Belize, two in Mexico and two in Honduras), aiming to become a four-country protected area network of FSA sites. This will play a pivotal role in the long-term protection of fisheries and livelihoods in the MAR.

The objective of the **MAR Fish Action Plan 2019-2021** is to coordinate activities required for the conservation and recovery of fish spawning aggregation sites (as critical areas of the life cycle of diverse fish species) with partners in the four-countries.

With this **MAR Fish Action Plan 2019-2021** partners of the four countries will establish the first regional spawning site monitoring network in the Mesoamerican Reef region, and focus on at least 7 existing FSA sites, including Cayman Crown, contributing to the existing network of marine and coastal protected areas and the network of fish replenishment sites.

# CHAPTER TWO: CHARACTERISTICS AND ENVIRONMENTAL IMPORTANCE OF THE MAR REGION

## 2. General context of the MAR Region

### 2.1. Geographical and environmental context

At over 1,000 km, the MAR is the largest reef system in the Atlantic Ocean. It runs along the Caribbean coasts of four countries: starting north of Quintana Roo, Mexico, it borders the coasts of Belize and Guatemala, and ending in the northern coast of Honduras, including the Bay Islands. The Mesoamerican Reef does not include high seas, only territorial waters.

The MAR and its surroundings are renowned for diverse natural wonders as well as its rich cultural and ethnic diversity. Its deep ocean trenches and coral reef systems provide food, shelter, breeding areas, migration routes and nursery grounds for a vast array of species. The MAR hosts over 500 fish species, 65 reef-building coral species, large populations of manatees, turtles and possibly the largest known annual aggregation of whale sharks. The coastal and marine resources include expanses of mangrove forests, sea grass meadows, and extensive reef systems that support the fisheries that in turn provide food security for residents and underpin both the tourism and fisheries industries (CZMAI, 2014).

Mexico, Belize and the Bay Islands of Honduras all have a strong tourist trade linked to the reef, with beach, scuba and snorkel opportunities via the promotion of vibrant coral reefs, apex predators such as bull sharks, and migratory species such as whale sharks and turtles. Marine tourism provides economic opportunities but has not replaced the importance of fishing for many families. In part, due to recognition of the importance of these resources, 57% of the territorial sea within the MAR is now within protected areas (Marine Protect Areas / MPAs), although only 3% of these are fully protected from fishing (McField et. al, 2018). Moreover, studies show that in fully protected areas there are up to 10 times more snapper and grouper biomass numbers than those with general designations (HRI, 2015). Within these MPAs and fish refuges, there are concerted efforts to conserve FSAs (Heyman, et.al, 2008).

### 2.2. Socio-economic and institutional context of the region

The region is characterized by uneven economic development, particularly in regards to tourism, which together with agriculture is the most important economic sector for employment and income in the MAR region. Fisheries and related activities are of relatively low importance when considered in terms of regional employment and economic contribution. However, the overall figures do not reflect the true value of the sector, as in many coastal communities fishing is the main source of employment and a traditional livelihood, even thou it's at small-scale and almost no industrial (HRI, 2015).

Tourism is the most important economic driver in terms of employment and income generation in the MAR region, particularly in areas where it is well established, such as the north of Quintana Roo (Mexico), Central Belize and the Bay Islands of Honduras. In Belize, for example, 38.1% of the GDP was directly or indirectly related to tourism activities in 2017, one of the highest rates in the Caribbean region.

This is also the case in the northern region of Quintana Roo, with 16 million tourists per year (World Travel and Tourism Council, 2017).

There are very few socio-economic data on small-scale fisheries and the existing data are not updated. According to reports by TNC (2006) and MAR Fund (2007), the MAR region has more than 6,000 fishers in island and coastal communities stretching from Holbox in Quintana Roo, to La Ceiba, Honduras. Illegal fishers can be found in the region, not obeying the laws and crossing borders between countries.

Nevertheless, the fishing sector represents a relatively small percentage of employment as stated below for each MAR country:

- **Mexico:** The State of Quintana Roo has about 2000 fishers and 29 cooperatives, which bring together the majority of fishers (about 750 in 2006, 790 in 2010) and are grouped in the Quintana Roo Federation of Cooperatives. Most fishers are located in the northern part of the region in the area from Holbox to Puerto Morelos. The southern part of the state, which embraces the area between Cozumel and Chetumal Bay, includes only about 30% of the state's fishers.

- **Belize:** has about 1800 to 2000 artisanal commercial fishers, and 650 registered vessels, mainly from northern region. Fishing and fish processing occupy 2.4% of the working population at the national level.

- **Guatemala:** there are approximately 1500 fishers in the Bay of Amatique region, in the Gulf of Honduras, mainly in a few communities (Livingston, Puerto Barrios). Most fishers are Garifuna and Mestizo craftsmen, but about 60 semi-industrial shrimp trawlers based in Livingston also operate in the area.

- **Honduras:** little information is available on the number of fishers. Heyman and Graham (2000) estimated that there were 647 fishers in the coastal area from the Motagua River (border with Guatemala) to Tela. But there are also a significant number of fishers in the Bay Islands and in the municipality of La Ceiba.

Regarding the institutional context, in 1997 the governments of Honduras, Guatemala, Mexico and Belize signed the **Tulum Agreement** to promote the conservation of the MAR through sustainable use of resources, for the welfare of present and future generations; particularly the approximately 2 million people that depend on the region's resources. Since the agreement was ratified, an impressive marine and coastal protected area (MCPA) network spanning approximately 8,192,526 hectares, made up of 73 proposed and declared MCPAs, has been established. Most of these MCPAs are managed with allotted annual funds, management plans and basic staff, although the style of management is different, as some have co-management schemes with local and national non-governmental organizations (NGOs), while others are more federally-managed. However, most MPAs do not have enough resources or personnel for proper management or enforcement.

Other effective regional solutions have evolved to face regional challenges. Given declining fish stocks, policies have strengthened across the region. In Belize, spawning aggregations are within protected areas that have varying degrees of financial support; reef-associated herbivorous fish are protected in Belize, Guatemala, and the Bay Islands of Honduras, while the protection for these in Mexico has been

drafted and approved, but not yet published; a region-wide ban on shark finning has been implemented; and no-take protected areas that serve as fish refuges are being created thanks to the joint efforts of civil society groups, fishing cooperatives, and government agencies.

Belize leads the region in fish spawning aggregation research and management. This country created a network of MPAs around 11 multi-species FSA sites in 2003 and continues to protect and monitor them. Honduras and Mexico have also decreed protection for important FSA sites.

A bilateral agreement was signed in Placencia, Belize in 2014. This agreement between Belize and the Republic of Guatemala is another legal framework that calls for technical coordination between these two countries. In addition to the agreement, and in spite of the current territorial dispute between them, strong relationships and history of joint work and exchanges between governmental and non-governmental organizations in these countries is a direct opportunity to advance the implementation of activities for the conservation and protection of shared natural resources and ecosystems.

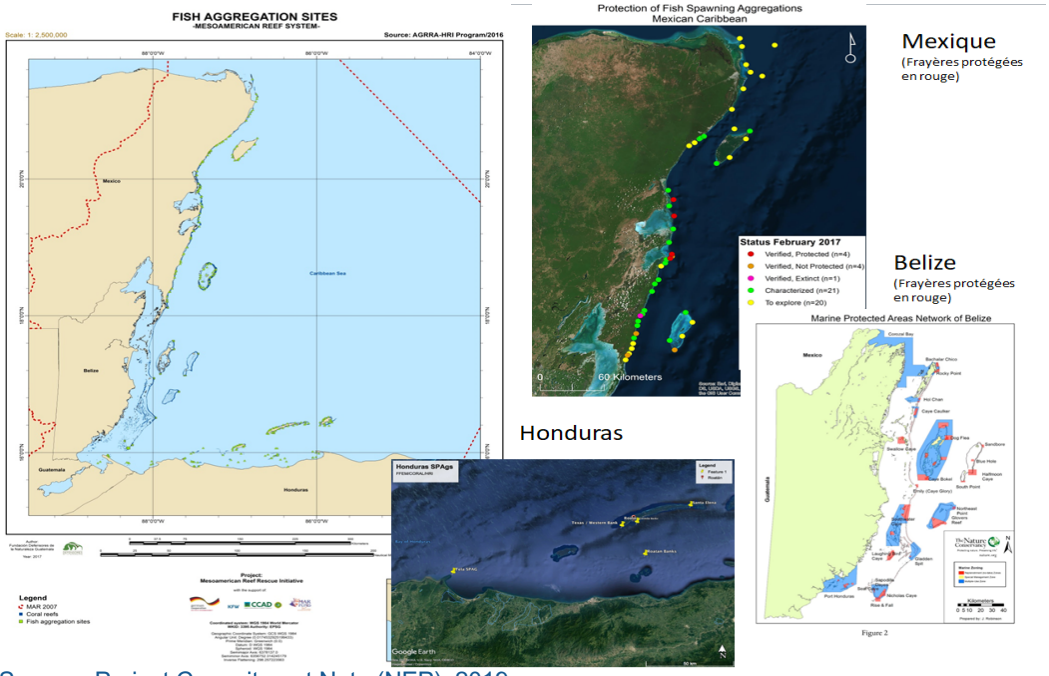
## 2.3. The importance of fish spawning aggregations

Fishing, particularly of snappers and groupers, is essential for the economy and food security of the Caribbean coastal communities in the four countries. Spawning is an essential and vulnerable step in the life cycle of several fish species, including those with significant commercial value (snappers, groupers, jacks). By definition, a fish spawning aggregation is a group of conspecific individuals grouped into densities three times higher than those found during non-procreation moments (Domeier and Colin, 1997). Spawning aggregations ensure the repopulation of specific areas and provide a source of larvae, which in turn replenish and enhance the resilience of populations along the MAR. During these aggregations, fish are more vulnerable and easier to capture. These sites have therefore been massively overexploited for some time without any type of control, resulting in the near extinction of some of these fish (Heyman et al., 2004). In particular, the Nassau grouper, which is largely overexploited in the region, is now listed as threatened on the IUCN Red List. The species is protected in Mexico and Belize; either its fishing is prohibited during the spawning period (December to February), and / or the spawning sites are protected, either directly ("replenishment zones" of Belize), or included within larger marine protected areas. Protecting breeding sites is therefore essential to ensure long-term fishing, and also because fish reproduces best when reaching larger sizes.

Although there are several multi-specie FSA sites, it is primarily the Nassau grouper breeding sites that have attracted research due to its threatened status. The following table, as well as figure 2-1, describe the identified sites in each country of the MAR Region.

| TABLE 2-1 FSAs IN THE MAR REGION | |
|---|---|
| **Country** | **Description** |
| Mexico (Quintana Roo) | 62 potential sites, including 29 characterized sites, 2 characterized and protected sites, 1 extinct site, 4 unprotected verified sites, 3 verified and protected sites |
| Belize | 11 sites proven to be protected, either within an MPA or within a replenishment zone |
| Guatemala | 1 Potential spawning aggregation site has been identified but still needs to be validated. |
| Honduras | 19 potential grouper aggregation sites have been identified, 4 of which have been validated: Roatan Banks and La Grupera in Cayos Cochinos, Banco Cordelia and Western Banks, on Roatan |

Source: Project Commitment Note (NEP), 2019.




Source: Project Commitment Note (NEP), 2019.

**Figure 2-1: FSA sites of the MAR region**

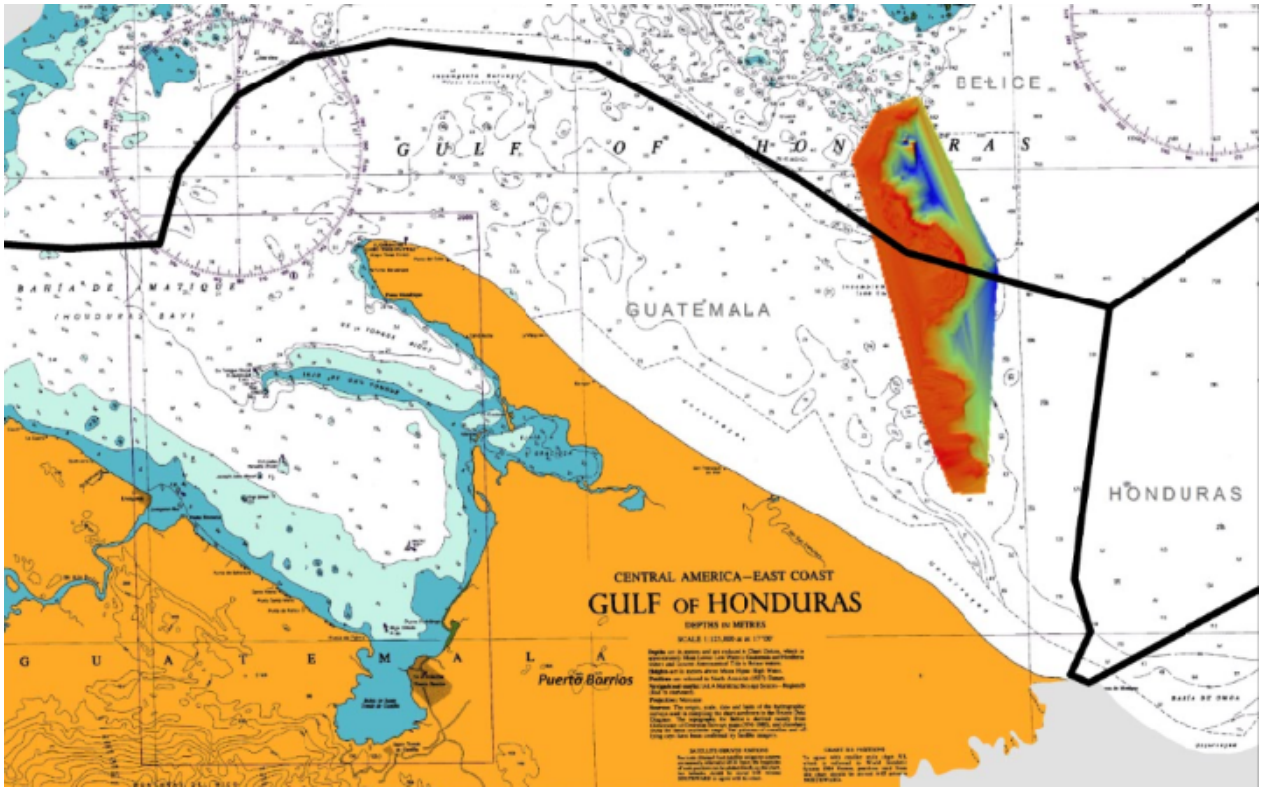
## 2.4. The recent discovery of Cayman Crown

The recent discovery of the southern Cayman Crown reef area, a potential multi-specie spawning aggregation site along the Belize-Guatemala maritime boundary, is a new challenge, and provides a unique opportunity to enhance conservation of reef ecosystems along the Mesoamerican reef. Cayman Crown was discovered in 2013, when Healthy Reefs Initiative (HRI) Coordinator for Guatemala, Ana Giró was working with local fishers of the community of Quetzalito in Guatemala. They mostly fish in the deep areas and had seen some 'rocks' (the local reference to coral reefs) nearby.

Ana visited the site with them and was surprised to find one of the most well-developed reefs with abundant coral cover in the MAR. The site has been called Cayman Crown because the shallow coral ridge wraps the western terminus of the deep Cayman trench.

The information gathered demonstrates the importance of the site and the need to urgently work on its management and conservation. The incorporation of Cayman Crown into the Belize and Guatemalan Protected Area Systems would:

- Conserve and protect important areas of multi-specie FSAs, high levels of coral diversity, and healthy populations of megafauna of endangered species.
- Strengthen the system of protected areas in the Guatemalan Caribbean coast. Guatemala has the smallest portion of the MAR and offers total protection to only 0.6% of its territorial sea, and 0% in reef areas. Cayman Crown is an opportunity to engage Guatemala to strengthen its conservation, MPA management and perhaps sustainable tourism efforts along its Caribbean coast, which has, so far, only limited tourism destinations.
- Increase the diversity of protected marine habitats in Belize and the percentage of its territorial seas under total protection, while strengthening its network of fish replenishment zones.
- Increase the resilience of the MAR by protecting a unique area, which is the subject to territorial dispute, and yet still currently in relatively good condition for corals, with a good opportunity to increase fish populations through regulations. Cayman Crown is relatively far from the coast, in the open ocean, which has discouraged the majority of artisanal fleets from fishing in this area, although some fishing does occur (figure 2-2 Cayman Crown Zone).




Source: HRI & LGL, 2017.

**Figure 2-2: Cayman Crown Zone**

# CHAPTER THREE: MAR Fish ACTION PLAN 2019-2021

## 3.1 Process for the development of the MAR Fish Action Plan 2019-2021

Thanks to the MARISLA Foundation, MAR Fund organized a workshop in Guatemala on April 11th and 12th, 2019. The general objective of the workshop was to bring together all the core partners within this project and develop the 3-year Action Plan, focusing specifically on the first 18 months. The specific objectives are:

- Plan all activities, draft a budget, identify all stakeholders involved, create a timeline, as well as project indicators, focused mainly on the first 18 months of the project.
- Discuss the Summit Foundation's proposal.
- Consider all fundraising prospects for the near future.

Annex 1 present the detailed agenda used during the development of the workshop.

## 3.2 Implementation and supervision of MAR Fish Action Plan 2019-2021

MAR Fund will oversee the management and implementation of **MAR Fish Action Plan 2019-2021**, both from an operational and financial point of view, and will provide reports as needed.

All project partners have vast experience in the Mesoamerican Reef, each in their own niche and area of expertise. Regardless of their specific role or activity within the project, they have all cultivated long-term relationships with stakeholders, including government authorities (protected areas and fisheries), fishers, local communities, civil society organizations and the academic world. This wealthy interrelationship one of the most important assets that the partners bring to the project and should accelerate conservation efforts in each zone.

All partners (as described in table 3-1) involved in the project have demonstrated outstanding technical capacities in their areas of expertise and ability to collaborate across borders, in partnership with government agencies and local fishing communities, in favor of the MAR. Civil society, communities and governments are also key stakeholders, and the project will work intensively with them to achieve its goals.

| TABLE 3-1 MAR Fish ACTION PLAN 2019-2021 IMPLEMENTATION PARTNERS | | |
|---|---|---|
| **Institution/ Country** | **Description of the institution** | **Summary of involvement in the project** |
| **The Meso-American Reef Fund (MAR Fund) REGIONAL** | MAR Fund is a privately managed fund with a Board of Directors comprised of international collaborators, experts, the Central American Commission on Environment and Development (CCAD), and the in-country funds from each of the Mesoamerican Reef countries – Protected Areas Conservation Trust (Belize), Fundación para la Conservación de los Recursos Naturales y Ambiente en Guatemala (FCG), Fundación Biósfera (Honduras), and Fondo Mexicano para la Conservación de la Naturaleza (Mexico). | • Will lead, through the Project Manager, the implementation of the MAR Fish Action Plan 2019-2021.<br>• Will follow-up day-to-day activities and establish close communication with all project partners, based on the activities they will be implementing.<br>• Will be project administrator and revise relevant documents, data and reports.<br>• Will receive proposals for activity execution.<br>• Will participate in regional meetings and training of the project partners.<br>• Will establish and manage a specific endowment fund for the two Cayman Crown's protected areas<br>• Will be in charge of purchasing relevant equipment of monitoring station<br>• Will be in charge of the volunteer who will made the diagnosis of the current use of Cayman Crown<br>• Will be in charge of contracting tenders for the Preliminary Business Planning for Cayman Crown MPAs, the implementation of short videos and a page on the website on FSAs in the AMR |
| **Healthy Reefs Initiative (HRI) REGIONAL** | HRI is a coalition of member organizations (74 partner organizations from SCO, academia, private sector and government agencies). HRI is specialized in the monitoring and assessment of the health of the reef ecosystem. | • Will lead the detailed mapping of the Cayman Crown area<br>• Will lead the ecological characterization of Cayman Crown's coral reef, (for potential MPA designation). Will focus primarily on the health and diversity of coral reef ecosystems.<br>• Will undertake technical studies that can be used for MPA declaration, expansion or zoning and management plans for the Cayman Crown reef, (in Guatemala and Belize)<br>• Will train and work closely with FUNDAECO in Guatemala, TIDE in Belize and CORAL in Honduras to implement monitoring protocols in the selected sentinel sites.<br>• Will participate in data analysis, the regional training on standard techniques and protocols for monitoring aggregations<br>• Will make regional fish spawning aggregation data from the seven sentinel sites available through their online platform and produce report cards, eco-audit and media outreach and communication to decision makers. |

| | | |
|---|---|---|
| **Fundación para el Eco-Desarrollo y la Conservación (FUNDAECO) GUATEMALA** | FUNDAECO is a local NGO engaged in the creation, management, protection and conservation of protected areas of Guatemala. Important activities have been implemented with communities. | • Will be in charge of promoting Cayman Crown to be declared either as a marine protected area, fish replenishment zone, MPA expansion or others in Guatemala.<br>• Will lead the policy development process with key decision makers in Guatemala, submit technical studies in support of the reserve declaration, and request co-management of the Cayman Crown area from Guatemala during its set up.<br>• Will participate in the collection of data necessary for the establishment of Cayman Crown and the management of the protected area.<br>• Will organize briefings with local fishing communities, tour operators and guides, municipalities, fisheries officers and protected areas managers to reach awareness on natural resources and its conservation. |
| **Toledo Institute for Development and Environment (TIDE) BELIZE** | TIDE is one of the leading conservation NGOs in Belize. It focuses on community participation in resource management and sustainable use of ecosystems.<br>It shares responsibility for co-management, in partnership with the Fisheries Department, of the Port Honduras Marine Reserve (PHMR).<br>It is also a founding and active member of the Belize Spawning Aggregations Working Group. | • Jointly with the Fisheries Department will lead the management of the recently declared replenishment zone Cayman Crown and the management of the protected area.<br>• Will organize briefings with local fishing communities, tour operators and guides, municipalities, fisheries officers and protected areas managers to reach awareness on natural resources and its conservation.<br>• Will lead the policy development process with key decision makers in Belize, submit technical studies, and negotiate co-management of the area.<br>• Will participate in the control and surveillance of the Cayman Crown Sentinel Site.<br>• Will participate in data analysis |
| **The Environmental Defense Fund (EDF) BELIZE** | EDF is a nonprofit organization committed to bipartisan environmentalism. Have played key roles in: (i) Driving the science and advocacy that led to federal action toward reducing climate-harming methane emissions; (ii) Introducing a management system that has dramatically reduced the amount of overfishing in the United States; (iii) Persuading companies, to adopt environmentally friendly business practices. | • Will participate in the proposal and development of technical and legal documents for the co-management of the recently declared replenishment zone Cayman Crown.<br>• Will participate in the characterization of fish spawning aggregation sites in Belize. |
| **Southern Environmental Association of Belize (SEA) BELIZE** | SEA is a non-governmental organization, created in 2008 when two longstanding conservation organizations, Friends of Nature (FoN) and the Toledo Association for | • Will monitor the Gladden Spit spawning aggregation site and share the information for the FSA database. |

| | | |
|---|---|---|
| | Sustainable Tourism and Empowerment (TASTE) merged to ensure improved community involvement in the conservation and co-management of the natural resources in Southern Belize. SEA co-manages Gladden Spit Silk Cayes Marine Reserve and is an active member of the Belize Spawning Aggregations Working Group. | • Will support the characterization and monitoring of fish spawning aggregation in Cayman Crown.<br>• Will organize the regional training on standard techniques and protocols for monitoring aggregations<br>• Will participate in data analysis. |
| **Community and Biodiversity (COBI) MEXICO** | COBI is a Mexican NGO that specializes in working with fishers to co-create solutions to recover marine ecosystems and develop sustainable fisheries. Founded in 1999, COBI operates projects in the Gulf of California, Pacific Ocean and the Mesoamerican Reef. | • Will share its expertise on research, assessment, monitoring and conservation of fish spawning aggregation sites in the Mexican Caribbean and on monitoring protocols for spawning aggregation sites (as per the guide already produced by them).<br>• Will be responsible of the monitoring of the two sentinel sites along the Mexican MAR, working closely with partners to ensure the use of standardized monitoring protocols for fish spawning aggregation sites, as well as share the information for the FSA database.<br>• Will make the status report of FSA research in the MAR region with revision of historical data<br>• Will lead the regional workshop on common monitoring protocol and strategy<br>• Will be involved in the regional training on standard techniques and protocols for monitoring aggregations<br>• Will be in charge of the regional data sharing workshop with all partners in the region and participate in data analysis. |
| **Coral Reef Alliance (CORAL) HONDURAS**[1] | CORAL is an NGO committed to saving coral reefs through collaborations with local actors in holistic conservation programs. CORAL's goal is to restore and protect a network of healthy worldwide reefs (known as Adaptive Reefscapes) that can adapt to climate change, because they are diverse, connected and large. To achieve this goal, CORAL works in four critically important | • Will characterize and monitor spawning aggregations sites in Honduras and share the information for the FSA database.<br>• Will work with local fishers throughout the North Coast of Honduras to create awareness on local FSAs, particularly in the Omoa region.<br>• Will participate in the mapping of the Cayman Crown area |

[1] Collaborators to monitor spawning sites (local partners, in addition to HRI: (i) **Tela**: Asociación Amigos de los Arrecifes de Tela (AMATELA), Tela Marine Research Center (ii) **Roatan:** Roatan Marine Park (RMP), Bay Islands Conservation Association (BICA) (iii) **Cayos Cochinos:** Fundación Cayos Cochinos / Honduras Coral Reef Fund (HCRF).

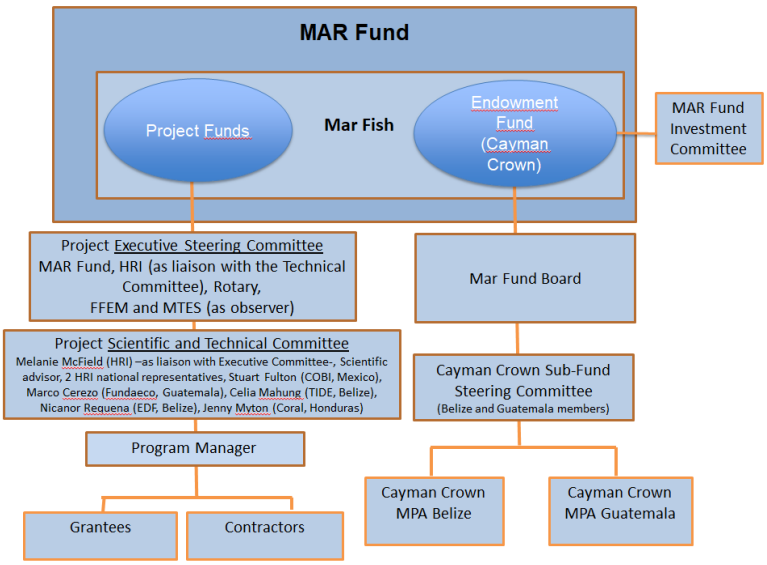
| | | |
|---|---|---|
| | reef regions of the world: Hawaii, Fijii, Indonesia and the MAR Region. | |
| **Rotary International** | Rotary is a worldwide network of 1,200,000 neighbors, friends, leaders and people dedicated to solving problems, who see a planet where people come together and take action to generate lasting change in the world, their communities and in themselves. | • In this project, the economic impact of fishing restrictions at Cayman Crown might affect fishing communities. Rotary International will support economical alternative initiatives to minimize negative economic impact in communities of Belize, Guatemala and Honduras. |

The implementation of the **MAR Fish Action Plan 2019-2021** will have a Steering Committee and a Scientific and Technical Committee that will oversee each activity. Figure 3-1 describes the Supervision Committees and Table 3-2 describes the participants in each committee.

The Steering Committee is integrated by MAR Fund, HRI as liaison with the Technical & Scientific Committee, Rotary and, as observers, FFEM and Ministère de la Transition Écologique et Solidaire (MTES). The Committee will contribute to project planning, approving annual work plans and budgets, reviewing and approving key project outputs and deliverables. Decisions taken during the Steering Committee meetings will be implemented by MAR Fund.

The Scientific and Technical Committee is integrated by at least one representative of each partner (Healthy Reef Initiative - HRI, Comunidad y Biodiversidad - COBI, Toledo Institute for Development and Environment - TIDE, Southern Environmental Association of Belize - SEA, Environmental Defense Fund - EDF, Foundation for Eco-development and Conservation - FUNDAECO and Coral Reef Alliance - CORAL). The Committee will provide support and advice for the effective implementation of the project to ensure its consistency from a technical point of view, and to ensure the scientific quality of the products.

Moreover, the Cayman Crown sub-fund (or “window”) will also have a Steering Committee which will consist of Belize and Guatemalan members.




Source: Project Commitment Note (NEP), 2019.

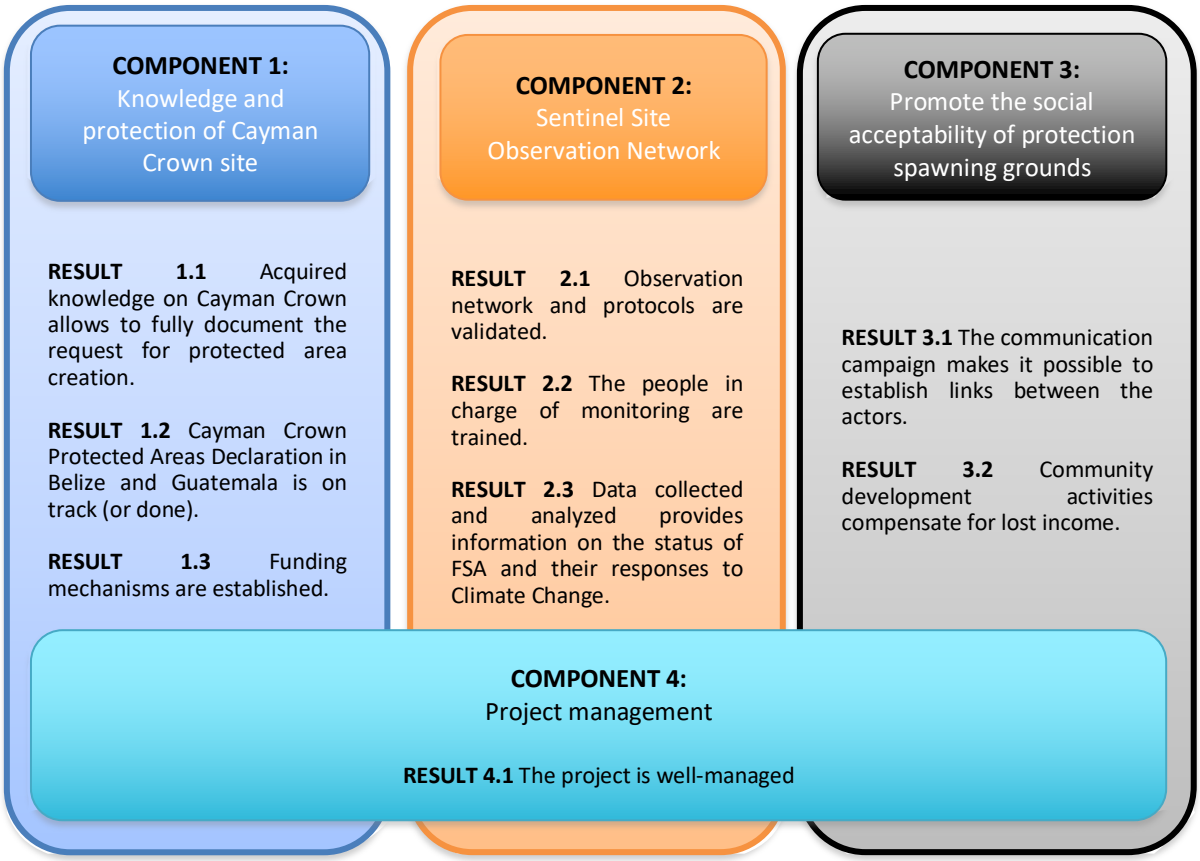
**Figure 3-1 MAR Fish Action Plan 2019-2021 supervision mechanisms**

| Table 3-2 Participants in each Project committee | |
|---|---|
| **PROJECT FUNDS** | |
| **STEERING COMMITTEE** | |
| **MAR Fund** | Maria José González |
| **HRI** | Melanie McField |
| **Rotary International** | - |
| **Observers:** | FFEM<br>MTES |
| **SCIENTIFIC AND TECHNICAL COMMITTEE** | |
| **HRI** | Melanie McField<br>Ana Giró<br>(As appropriate, Ian Drysdale will participate) |
| **COBI** | Stuart Fulton |
| **FUNDAECO** | Ingrid Arias |
| **TIDE** | Celia Mahung |
| **EDF** | Nicanor Requena |
| **SEA** | Denise Garcia |
| **CORAL** | Antonella Rivera |

## 3.3 Components of MAR Fish Action Plan 2019-2021

The **MAR Fish Action Plan 2019-2021** has been developed considering the main components of the MAR Fish Project. Figure 3-1 describes the diagram of MAR Fish components and its expected results.

**Figure 3-1. Diagram of MAR Fish Component**




***Component 1: Knowledge and protection of Cayman Crown site.***

The site will be subject to scientific explorations, in order to validate the existence of FSAs, characterize them, and study the coral reefs of the area, whose first explorations revealed its good health. These elements will serve to advocate for the protection of the new replenishment zone declared in Belize and the expansion of Punta de Manabique Wildlife Refuge in Guatemala. High-level political discussions will be held with key decision-makers to protect and manage Cayman Crown sites in Belize and Guatemala, by bringing together the two countries whose NGOs are already working together for coherent management. A financial mechanism - an endowment fund in the form of a specific window hosted within MAR Fund - will be established to ensure the long-term management and protection of the Cayman Crown site.

***Component 2: Sentinel Sites Observation Network.***

Several spawning sites are already protected and monitored in the region, mainly sites for the Nassau grouper, a critically endangered species found in the IUCN Red List.

The aim of the project is to set up a network of 7 sentinel multi-specie spawning sites, so as to ensure a homogeneous monitoring that allows a coherent regional vision of their evolution, with special focus on climate change's effects.
A regional workshop will gather all actors in order to agree on common protocols, data collection and data analysis. Training sessions will allow various actors to learn and commit to following the monitoring process: fisheries administrators, NGO members, fishers and other members of coastal communities. The regional workshop will include the participation of women. The process will allow the creation of a database and the production of a MAR regional inventory, which will be reported at the Caribbean level and internationally (Society for the Conservation of Reef Fish Aggregations - SCRFA).

***Component 3: Promote general acceptance of protecting spawning grounds.***
A detailed communication plan will allow close relationships between scientists, fishers, environmentalists, policy makers and citizens, in favor of a regional movement to strengthen the understanding of the role of fish spawning aggregations in the management of fisheries, the importance of protecting them and fostering collaborative management. This plan will contribute to build a "citizen science" movement that promotes a better understanding of environmental issues by local communities.

With the support of the regional Rotary network, as well as support from at least two NGOs already involved in the field, community development activities will be implemented for the communities most affected by the establishment of a no-take zone around the Gulf of Honduras (Belize, Guatemala and Honduras), taking into account that the current fishing effort seems to be low.

***Component 4: Project Management.***
A full-time Project Manager will be hired by MAR Fund for the duration of the project. The main activities of the Project Manager will be: day-to-day follow up of the project, promote a close and effective communication between project partners, prepare annual reports and review relevant technical and financial documentation, as well as prepare the necessary documentation for the audits. As a mechanism to guarantee the effective implementation of the project, a Steering Committee and a Scientific and Technical Committee will oversee each activity to ensure the consistency of the project from a technical point of view, and review and validate project reports to ensure the scientific quality of the products. Moreover, the committees will have a say on the tools that needs to be bought and the tenders to be contracted for specific activities.

## 3.4 MAR Fish Action Plan 2019-2021

The implementation of **MAR Fish Action Plan 2019-2021** should help partners of the Project identify their activities according to established dates. Table 3-3 identifies the activities and results for each component, the type of execution and responsible actor. It also presents the minimum scope for each activity as guidance for the development of the contract and the budget according to the phase of implementation. Table 3-4 presents a more detailed budget; table 3-5 present all relevant indicators and; table 3-6 shows the chronological calendar for the implementation of activities and highlights the first 18 months (Phase 1) of the MAR Fish Action Plan. Moreover, table 3-7 describes the prioritization of monitoring stations for each country and their equipment requirement, while table 3-8 shows the equipment to be purchased with the first disbursement from FFEM.

Finally, Table 3-9 present the summarized budget according to activities of the three years of the project.

| TABLE 3-3 MAR Fish ACTION PLAN 2019-2021 ACCORDING TO ESTABLISHED ACTIVITIES | | | | | | | |
|---|---|---|---|---|---|---|---|
| **COMPONENT 1:** | **KNOWLEDGE AND PROTECTION OF THE AREA OF CAYMAN CROWN SITE** | | | | | | |
| **Result 1.1** | *Acquired knowledge on Cayman Crown allows to fully document the request for protected area creation* | | | | | | |
| **N.** | **Activity** | **Dates** | **Form of execution/Responsible** | **Scope/Specific Activities** | **Funds required Phase 1 (18 months) in US $** | **Available funds in US $** | **Partners that contribute** |
| 1.1.1 | Detailed mapping of the Cayman Crown area, based on existing and new field data | Start in September | **EXPRESSION OF INTEREST**<br>**/**<br>**HRI** | - Analysis of single beam/multi beam data from literature/previous studies if available<br>- Clean & interpolate data into a preliminary/contour/base map<br>- Collect new bathymetric data<br>-Interpolate data into a model to create a bathymetric map. | 182,500.00 | 182,500.00 | FFEM<br>MAR Fund<br>HRI |
| 1.1.2 | Ecological characterization of coral reefs and megafauna | August –October 2019 and continue through the life of the project. | **SINGLE SOURCE CONTRACTOR**<br>**/**<br>**RESPONSIBLE:**<br>HRI will partner with TIDE and SMITHSONIAN. | - Monitoring of groups of megafauna that could include: turtles, whales, sharks, billfish, other mammals.<br>- Detailed ecological studies will be conducted at some stations to describe the area and assess its condition. -<br>Evaluation of coral recruitment, size structure of the coral population, the status of corals and the rugosity of the reefs. | | | |
| `1.1.3 | Characterization of fish spawning aggregation | December 2019, January and February 2020 (Groupers).<br>April, May, June 2020 (Snappers) and continue | **EXPRESSION OF INTEREST** | - Field expeditions are organized to characterize aggregations in potential sites in Cayman Crown using a protocol validated by the team.<br>- Fish tagging/in situ loggers | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | through the life of the project. | **/**<br><br>**RESPONSIBLE:**<br>____ | - Collection of data by subsea and video visual counts (species present, size, density, breeding behavior, color change, gonad status), specifying moon phase, time, depth, and weather conditions.<br>-Monitoring of physical data: point-specific data, temperature profiles.<br>-Analysis of aggregation characterization data to account for their importance, location, duration, species present and size. | | | |
| 1.1.4 | Compilation and analysis of site characterization data to guide management | February-June 2020 | **EXPRESSION OF INTEREST**<br><br>**/**<br><br>**RESPONSIBLE:**<br>HRI | - Analysis of reef characterization data using the AGRRA methodology. | | | |
| 1.1.5 | Management and zoning recommendations | By December 2020 | **EXPRESSION OF INTEREST**<br><br>**/**<br><br>**RESPONSIBLE:**<br>FUNDAECO and TIDE with support of HRI | - Make the first management proposals, in partnership with local communities and eventual zoning of the Cayman Crown sector. | 5,000 | 5,000 | FFEM |
| **Result 1.2** | *Cayman Crown Protected Area declaration in Belize and Guatemala is on track (or done)* | | | | | | |
| **N.** | **Activity** | **Dates** | **Form of execution/Responsible** | **Scope** | **Funds required Phase 1 in US $** | **Available funds in US $** | **Partners that contribute** |
| 1.2.1 | Drafting of documents for the legal declarations (technical document depending on the MPA status) | By December 2019 | **RESPONSIBLE:** | -FUNDAECO AND TIDE sign an agreement to work together- Placentia Agreement<br>-Develop advocacy and technical documents and proposals for legal | 70,000 | 70,000 | MAR Fund<br>HRI<br>TIDE<br>FUNDAECO<br>EDF |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | FUNDAECO and HRI, TIDE and EDF (Placencia Agreement between FUNDAECO and TIDE) | documents for the official declaration of Cayman Crown as a protected area (Marine protected areas, no take zone, MPA expansion or others).<br>-Draft of a Technical document for legal declaration | | | |
| 1.2.2 | Follow up high-level political discussions with decision makers to advance in the declaration and management of the Cayman Crown Site | by December 2020 | **RESPONSIBLE:** FUNDAECO, HRI, TIDE, EDF | -Present results and recommend actions in support of the declaration of the protection of the Cayman Crown site.<br>-Lead political process and present the technical studies documenting the decrees creating marine protected areas.<br>-TIDE and FUNDAECO will strengthen their presence in the communities to dialogue, inform, give awareness and discuss the management system of Cayman Crown,<br>-Conduct regular patrols to monitor activities taking place in the area. | 67,500 | 67,500 | HRI<br>TIDE<br>FUNDAECO<br>EDF |
| 1.2.3 | Protection is gazetted and management plans are developed (Regional meeting for regional policy coordination and harmonization) | by December 2020 | **TENDER** for Belize's Management Plan<br><br>Apply for **SMALL GRANTS PROGRAM**<br><br>/<br><br>**RESPONSIBLE:** TIDE | - Co-management arrangements and management plans are developed<br>- Polices will be put in place, and laws will be applied in parallel with Patrols / monitoring<br>-Community meetings will be established to educate and train locals so local fishers will adhere to non-fishing guidelines | 94,500 | 94,500 | FFEM<br>MAR Fund<br>HRI<br>Oceans 5<br>TIDE<br>FUNDAECO<br>EDF |

| **Result 1.3** | *Funding mechanisms are established* | | | | | | |
|---|---|---|---|---|---|---|---|
| **N.** | **Activity** | **Dates** | **Form of execution/Responsible** | **Scope** | **Funds required Phase 1 in US $** | **Available funds in US $** | **Partners that contribute** |
| 1.3.1 | Provide initial management funding for Cayman Crown MPAs in Belize and Guatemala | by December 2019 | **EXPRESSION OF INTEREST:** Tide and FUNDAECO (30K each)<br><br>Apply for **SMALL GRANTS PROGRAM (2019-2020)**<br><br>**/**<br><br>**RESPONSIBLE:** TIDE and FUNDAECO | -TIDE and FUNDAECO **will provide matching funds** to ensure protection and management of Cayman Crown, Sinking funds<br>-TIDE and FUNDAECO, for Belize and Guatemala, respectively, will begin to implement core management activities early in the project to reduce pressure on resources and generate community support for the future declaration of areas:<br>1.Monitoring/Patrolling<br>2.Establish a field base and a field team<br>3. Environmental education<br>4. Community participation | 330,000 | 312,000 | FFEM<br>MAR Fund<br>Oceans 5<br>TIDE<br>FUNDAECO<br>EDF |
| 1.3.2 | Preliminary Business planning for Cayman Crown MPAs | by December 2020 | **OPEN INVITATION FOR BIDS**<br>**/**<br>**RESPONSIBLE:** MARFUND | -Develop business plans, to determine the financial needs for good management of the MPAs in the long term. | 12,500 | 12,500 | Oceans 5 |
| 1.3.3 | Establish and manage a specific endowment fund for the two Cayman Crown's Protected Areas | by December 2020 | **RESPONSIBLE:** MARFUND | Endowment fund established and managed:<br>1. Maintain the real value of long-term assets (10-year horizon)<br>2. Maximize annual cash flows to contribute to operating costs and channel funding to field projects | 875,000 | 875,000 | FFEM<br>MAR Fund |

| **COMPONENT 2:** | **SENTINEL SITE OBSERVATION NETWORK** | | | | | | |
|---|---|---|---|---|---|---|---|
| **Result 2.1** | ***Observation network and protocols are validated*** | | | | | | |
| **N.** | **Activity** | **Dates** | **Form of execution/Responsible** | **Scope** | **Funds required Phase 1 in US $** | **Available funds in US $** | **Partners that contribute** |
| 2.1.1 | Status report of FSA research in the MAR region with revision of historical data | By June 2020 | **EXPRESSION OF INTEREST**<br>**/**<br>**RESPONSIBLE:** COBI Leads | - Develop a preliminary report for the meeting in October and then a final one by June 2020<br>-Develop a regional assessment of the current state of surveillance and protection of all FSA sites (including metadata illustrating the state of knowledge, management and monitoring). | 22,000 | 22,000 | FFEM<br>SUMMIT |
| 2.1.2 | Validate a common monitoring protocol and strategy through a regional workshop | by last week of October 2019 Workshop in Mexico (Quintana-Roo) October 24th-25th | **EXPRESSION OF INTEREST**<br>**/**<br>**RESPONSIBLE:** COBI Leads | Regional workshop's objectives:<br>- Prioritization and agreement of sites<br>- Develop a standardized monitoring and management strategy<br>- Validation of Protocols and partners, data sharing agreements<br>- Database management will also be discussed<br>FFEM participation | 45,000 | 45,000 | FFEM<br>HRI<br>SUMMIT |
| ***Result 2.2*** | ***The people in charge of monitoring are trained*** | | | | | | |
| **N.** | **Activity** | **Dates** | **Form of execution/Responsible** | **Scope** | **Funds required Phase 1 in US $** | **Available funds in US $** | **Partners that contribute** |
| 2.2.1 | Provide regional training on standard techniques and protocols for monitoring aggregations | In May 2020 | **EXPRESSION OF INTEREST**<br>**/**<br>**RESPONSIBLE:** | - 30 Participants (for staff of governmental and non-governmental organizations, university students and fishers) from the four MAR countries will be trained.<br>- Training will include the collection of aggregation data, installation and | 117,000 | 86,000 | FFEM<br>HRI<br>COBI<br>FUNDAECO |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Organized by SEA and the Belize Fisheries Department, with support from COBI for the training (MEXICO). | maintenance of equipment in situ, fish tagging.<br>- Logistics and funding for operations including participant travel will be handled by SEA | | | |
| 2.2.2 | Training for coral reef monitoring | April- June 2020 | **EXPRESSION OF INTEREST**<br>**/**<br>**RESPONSIBLE:** HRI | - Regional training (ej. patrolling)<br>- Coaching and peer-peer exchanges<br>- Develop a science monitoring program (fish and corals)<br>- Community participation in the protection and conservation of areas through conservation agreements that will be signed with key communities | 24,000 | 24,000 | MAR Fund<br>HRI |
| **Result 2.3** | ***Data collected and analyzed provides information on the status of FSAs and their responses to Climate Change*** | | | | | | |
| **N.** | **Activity** | **Dates** | **Form of execution/Responsible** | **Scope** | **Funds required Phase 1 in US $** | **Available funds in US $** | **Partners that contribute** |
| 2.3.1 | Equipment of monitoring stations ** | by June 2020 | **EXPRESSION OF INTEREST / RESPONSIBLE:** MARFUND with COBI support | - Equipment for monitoring station is needed and it will be purchased according to the budget<br>- At least a HOBO Temperature logger one for each site, fish tagging and acoustic recording. | 164,000 | 135,000 | FFEM<br>MAR Fund<br>Oceans 5 |
| 2.3.2 | Support and maintain a coordinated monitoring program for FSA on sentinel sites in the MAR | Start in May-June (snappers) 2019, December 2019 - February 2020 (groupers) and continue through the life of the project. | **EXPRESSION OF INTEREST/SGP**<br>**/**<br>**RESPONSIBLE:** SEA, COBI, CORAL, HRI, FUNDAECO, EDF | -**In Belize**, SEA will continue to collect FSA monitoring data from Gladden Spit and possible FSAs in Cayman Crown will be monitored. If the partners so wish and at no additional cost, other sites in Belize with long-term monitoring data may be added such as Turneffe, Lighthouse and Key Glory depending on the budget.<br>**-In Mexico**, COBI will continue monitoring the two sentinel sites, Punta Herrero and Punta Allen to collect grouper and snapper UVC data. Xcalak is suggested as a third site if money allows. | 416,136 | 416,136 | FFEM<br>MAR Fund<br>HRI<br>COBI<br>SEA<br>EDF<br>CORAL<br>Oceans 5<br>SUMMIT |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | -**In Honduras,** Cordelia and Texas will be monitored with dives by HRI and CORAL. A third site, Sandy Bay, can be also monitored if money allows, while the site of Tela will be monitored with ROV. Roatan Banks and Caldera del Diablo will be monitored with acoustics.<br>-**In Guatemala** possible FSA in Cayman Crown will be monitored by HRI, FUNDAECO, EDF, and SEA. | | | |
| 2.3.3 | Upgrade the database and improve data entry | Start in October 2019 | **EXPRESSION OF INTEREST**<br>**/**<br>**Pending for quote and will be discussed at the meeting in October** | -Template to provide information needs to be developed.<br>-Development of the database and upgrade of the existing one.<br>-FSA regional monitoring network will be supported by a shared and regionally adopted database, available directly on the HRI website.<br>-The database will host at least all new monitoring data collected from the sentinel sites | 37,000 | 37,000 | FFEM<br>MAR Fund<br>HRI |
| 2.3.4 | 2.3.4.1 Sentinel sites analysis | By December 2021 | **RESPONSIBLE:**<br>Each sentinel site partner and consolidation by HRI | -Work with COBI and SEA partners to compile, clean, capture and analyze existing/historical FSAs monitoring data (baseline data from Gladden and COBI).<br>-Upgrade and enhance FSAs database and share operational system with all project partners to input and store their own data.<br>-Available as graphical results as well as downloadable .csv files for further analysis by others<br>-Analyze water parameters for Climate Change<br>-Annually submit a report for each site.<br>-HRI/AGRRA final report | 7,500 | 0 | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2.3.4.2 Regional Data sharing workshop with all partners in the region | By September 2021 | **EXPRESSION OF INTEREST**<br><br>**/**<br><br>**RESPONSIBLE:** COBI | -Presentation of the database and the interface of HRI to promote the extension of the observation network at all sites monitored in the region.<br>-A regional status report (MAR region) will be produced, which will be shared throughout the Caribbean and internationally. | - | - | - |
| **COMPONENT 3:** | **PROMOTING THE SOCIAL ACCEPTABILITY OF PROTECTING SPAWNING GROUNDS** | | | | | | |
| **Result 3.1:** | ***The communication campaign makes it possible to establish links between the actors*** | | | | | | |
| **N.** | **Activity** | **Dates** | **Form of execution/Responsible** | **Scope** | **Funds required Phase 1 in US $** | **Available funds in US $** | **Partners that contribute** |
| 3.1.1 | Development and implementation of short videos | Start in March 2020 | **TENDER** (for the development of the Communication Strategy)<br><br>**SGP:** for the implementation of the Communication Strategy<br><br>/<br><br>**RESPONSIBLE:** MARFUND | - Communication strategy and implementation campaign<br>-Short film to show how participants in the four countries of the project are working together to monitor, study and protect FSAs. | 20,000 | 5,000 | FFEM |
| 3.1.2 | Development of a page on the website on spawning aggregation information in the MAR (tab linked to partner's website) | | | -Communication campaign<br>-Website hosted within HRI or MAR Fund website.<br>-The website will include communication products, interactive maps, videos, animated graphics, reports on latest scientific discoveries with links to documents, | 7,500 | 7,500 | FFEM<br>HRI |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | fish songs, and natural history resources (homepage) | | | |
| 3.1.3 | Radio spots developed and aired at a local level (air time included) | | | -Communication campaign<br>In order to reach the fishers in Cayman Crown, TIDE and FUNDAECO will work with radio producers and journalists in Belize and Guatemala to brief them on the project, providing them with stories, and links with spokespersons and interviewees who will be able to get the message across.<br>A similar work will be done for the other FSA areas. | 3,000 | 0 | - |
| 3.1.4 | Hold information meetings for local fishing communities through regular visits to buffer zone communities (Cayman Crown) | By December 2021 | **SGP FUNDRAISE / RESPONSIBLE:** TIDE AND FUNDAECO CORAL, HRI | -At least 3 Meeting per country (coordination between partners: OMOA, Puerto Cortes (Honduras) and Cayman Crown (BZ and GT)<br>-Promote educational activities for fishing communities | 10,000 | 1,500 | HRI |
| 3.1.5 | Report cards, eco-audits & media outreach and communication to decision makers | One by September 4th 2019 and one more in 2021 /eco audit 2020 | **EXPRESSION OF INTEREST / RESPONSIBLE:** HRI | HRI will use its extensive network of partners and logistical experience to help publicize the project to national stakeholders and media with report cards. | 32,500 | 32,500 | FFEM<br>MAR Fund<br>HRI<br>SUMMIT |

| **Result 3.2** | ***Community development activities compensate for lost income*** | | | | | | |
|---|---|---|---|---|---|---|---|
| **N.** | **Activity** | **Dates** | **Form of execution/Responsible** | **Scope** | **Funds required Phase 1 in US $** | **Available funds in US $** | **Partners that contribute** |
| 3.2.1 | Diagnostic of the current use of Cayman Crown | By December 2019 | **Terms of Reference: VOLUNTEER / RESPONSIBLE:** MARFUND | - Could be a thesis of a student, but it needs funding at least for travel (contact Carlos Perez-Volunteer- Ian will contact him) | 10,000 | 5,000 | HRI |
| 3.2.2 | Design and execution of local initiatives to compensate and create alternatives | Start December 2019 | **SINGLE SOURCE CONTRACT**<br><br>**RESPONSIBLE:** Belize, Guatemala and Honduras with the support of **Rotary International District** with the support from NGO staff of FUNDAECO, HRI and TIDE | Community development project/activities<br>Design of local initiatives<br>Create economic alternatives to reduce pressure over fishing resources<br><br>These remote fishing villages have limited sanitation infrastructure, precarious health services and limited alternatives to fishing: opt for the installation of clean water mechanisms and / or alternative economic activities, as has been defined for several communities in the region (tourism initiatives, fishing guides, cocoa plantations, among others | 60,000 | 14,000 | FFEM<br>HRI |

| COMPONENT 4: | PROJECT MANAGEMENT | | | | | | |
|---|---|---|---|---|---|---|---|
| **Result 4.1** | ***The project is well managed*** | | | | | | |
| **N.** | **Activity** | **Dates** | **Form of execution/Responsible** | **Scope** | **Funds required Phase 1 in US $** | **Available funds in US $** | **Partners that contribute** |
| 4.1 | Initial planning workshop | April 2019 | MAR Fund | -Effectively implement the MAR Fish Action Plan 2019-2021. | 20,000 | 20,000 | MARISLA |
| 4.2 | Program manager (MAR Fund Staff) | 2019-2021 | **EXPRESSION OF INTEREST**<br><br>**RESPONSIBLE:** MAR Fund | -Cooperate with the logistics for the regional meetings and training of the MAR partners<br>-Receive and approve the proposals for the execution of activities<br>-Establish a close communication with all MAR partners and get involved with the activities' partners will be implementing. | 48,000 | 41,000 | FFEM<br>Oceans 5 |
| 4.3 | External Annual Auditing and Final Evaluation of the Project | 2020-2021 | MAR Fund | -Annual monitoring will be implemented<br>-External audit will be held at the end of the project. | 7,500 | 7,500 | FFEM |
| 4.4 | Management and admin costs | 2019-2021 | MAR Fund | | 81,164 | 81,164 | FFEM<br>Oceans 5 |
| **TOTAL** | | | | | **2 769,300** | **2 599,300** | **GAP -170,000** |

## TABLE 3-4 BUDGET ACCORDING TO ACTIVITIES FOR THE FIRST 18 MONTHS (IN US $)

### COMPONENT 1: KNOWLEDGE AND PROTECTION OF THE AREA OF CAYMAN CROWN

**COMPONENT RESULT 1***: The Cayman Crown Reef is legally recognized and managed in Belize and Guatemala*

**RESULT 1.1:** ***Acquired knowledge on Cayman Crown allows to fully documented the request for protected area creation***

| Activity | Activity | Dates | Form of execution /Implementer | PHASE 1 (18 months) | FFEM contribution | MAR Fund contribution | Partners Matching funds | GAP |
|---|---|---|---|---|---|---|---|---|
| 1.1.1 | Detailed mapping of the Cayman Crown area, based on existing and new field data | Start in September 2019 | **EXPRESSION OF INTEREST / HRI** | 182,500 | 128,536.50 | 46,463.50 | 7,500 | 0 |
| 1.1.2 | Ecological Characterization of coral reefs and megafauna (oxygen kits) | August –October 2019 and continue through the life of the project. | **SINGLE SOURCE CONTRACTOR / RESPONSIBLE:** HRI will partner with TIDE and SMITHSONIAN. | | | | | |
| 1.1.3 | Characterization of fish spawning aggregation | December 2019, January and February 2020 (Groupers). April, May, June 2020 (Snappers) and continue through the life of the project. | **EXPRESSION OF INTEREST / RESPONSIBLE:** _____ | | | | | |
| 1.1.4 | Compilation and analysis of site characterization data to guide management | February-June 2020 | **EXPRESSION OF INTEREST / RESPONSIBLE:** HRI | | | | | |
| 1.1.5 | Management and zoning recommendations | By December 2020 | **EXPRESSION OF INTEREST / RESPONSIBLE:** FUNDAECO and TIDE with support of HRI | 5,000 | 5,000 | 0 | 0 | 0 |

**RESULT 1.2***: Cayman Crown Protected Area declaration in Belize and Guatemala is on track (or done)*

| Activity | Activity | Dates | Form of execution | PHASE 1 (18 months) | FFEM contribution | MAR Fund Amount | TOTAL OTHERs | GAP |
|---|---|---|---|---|---|---|---|---|
| 1.2.1 | Drafting of documents for the legal declarations | By December 2019 | **RESPONSIBLE:** FUNDAECO and HRI, TIDE and EDF | 70,000 | 0 | 10,000 | 60,000 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1.2.2 | Follow up high-level political discussions with decision makers to advance in the declaration and management of the Cayman Crown Site | by December 2020 | Proposals are needed for fundraising<br>/<br>**RESPONSIBLE:**<br>FUNDAECO and HRI, TIDE and EDF | 67,500 | 0 | 0 | 67,500 | 0 |
| 1.2.3 | Protection is gazetted and management plans are developed (Regional meeting for regional policy coordination and harmonization) | by December 2020 | **TENDER** for Belize's Management Plan<br>Apply for **SMALL GRANTS PROJECT**<br>/<br>**RESPONSIBLE:** TIDE | 94,500 | 5,000 | 6,500 | 83,000 | 0 |

**RESULT 1.*3 Funding mechanisms are established***

| Activity | Activity | Dates | Form of execution | PHASE 1 (18 months) | FFEM contribution | MAR Fund Amount | TOTAL OTHERs | GAP |
|---|---|---|---|---|---|---|---|---|
| 1.3.1 | Provide initial management funding for Cayman Crown MPAs in Belize and Guatemala | by December 2019 | **EXPRESSION OF INTEREST**<br>DIRECT SOURCE to TIDE and FUNDAECO (30K each)<br>**SGP 2019-2020**<br>**/**<br>**RESPONSIBLE:**<br>TIDE and FUNDAECO | 330,000 | 60,000 | 102,000 | 150,000 | -18,000 |
| 1.3.2 | Preliminary Business planning for Cayman Crown MPAs | By December 2020 | **OPEN INVITATION FOR BIDS**<br>**/**<br>**RESPONSIBLE:**<br>MARFUND | 12,500 | 0 | 0 | 12,500 | 0 |
| 1.3.3 | Establish and manage a specific endowment fund for the two Cayman Crown's Protected Areas | By December 2020 | **RESPONSIBLE:**<br>MARFUND | 875,000 | 525,000 | 350,000 | 0 | 0 |

**COMPONENT 2: SENTINEL SITE OBSERVATION NETWORK**

**COMPONENT RESULT 2** ***: Observation network and protocols are validated.***

| Activity | Activity | Dates | Form of execution | PHASE 1 (18 months) | FFEM contribution | MAR Fund Amount | TOTAL OTHERs | GAP |
|---|---|---|---|---|---|---|---|---|
| 2.1.1 | Status report of FSA research in the MAR region with revision of historical data | By June 2020 | **EXPRESSION OF INTEREST / RESPONSIBLE:** COBI Leads | 22,000 | 20,000 | 0 | 2,000 | 0 |
| 2.1.2. | Validate a common monitoring protocol and strategy through a regional workshop | October 24th-25th 2019<br>Mexico (Quintana-Roo) | **EXPRESSION OF INTEREST / RESPONSIBLE:** COBI Leads | 45,000 | 21,000 | 0 | 24,000 | 0 |

**RESULT 2.2** ***The people in charge of monitoring are trained***

| Activity | Activity | Dates | Form of execution | PHASE 1 (18 months) | FFEM contribution | MAR Fund Amount | TOTAL OTHERs | GAP |
|---|---|---|---|---|---|---|---|---|
| 2.2.1 | Provide regional training on standard techniques and protocols for monitoring aggregations | In May 2020 | **EXPRESSION OF INTEREST / RESPONSIBLE:** Organized by SEA and the Belize Fisheries Department, with support from COBI for the training. | 117,000 | 55,000 | 0 | 31,000 | -31,000 |
| 2.2.2. | Training for coral reef monitoring | April- June 2020 | **EXPRESSION OF INTEREST / RESPONSIBLE:** HRI | 24,000 | 0 | 18,000 | 6,000 | 0 |

**RESULT 2.3** ***Data collected and analyzed provides information on the status of FSAs and their responses to Climate Change***

| Activity | Activity | Dates | Form of execution | PHASE 1 (18 months) | FFEM contribution | MAR Fund Amount | TOTAL OTHERs | GAP |
|---|---|---|---|---|---|---|---|---|
| 2.3.1. | Equipment of monitoring stations ** | By June 2020 | **EXPRESSION OF INTEREST / RESPONSIBLE:** MARFUND | 164,000 | 40,000 | 70,000 | 25,000 | -29,000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.3.2 | Support and maintain a coordinated monitoring program for FSA sentinel sites in the MAR | May-June (snappers) 2019, December-February 2019-20 (groupers) and continue through the life of the project. | **EXPRESSION OF INTEREST/SGP / RESPONSIBLE:** HRI, FUNDAECO, COBI, CORAL, EDF and SEA | 416,136 | 28,500 | 78,000 | 309,636 | 0 |
| 2.3.3. | Upgrade the database and improve data entry | Start in October 2019 | **EXPRESSION OF INTEREST / RESPONSIBLE:** Pending, will be discussed at the meeting in October | 37,000 | 10,000 | 7,000 | 20,000 | 0 |
| 2.3.4 | 2.3.4.1 Sentinel sites analysis | By December 2021 | **RESPONSIBLE:** Each sentinel site partner and consolidation of analyzed data by HRI | 7,500 | 0 | 0 | 0 | -7,500 |
| | 2.3.4.2 Regional Data sharing workshop with all partners in the region | By September 2021 | **EXPRESSION OF INTEREST / RESPONSIBLE:** COBI | 0 | 0 | 0 | 0 | 0 |

**COMPONENT 3: PROMOTING THE SOCIAL ACCEPTABILITY OF PROTECTING SPAWNING GROUNDS**

***COMPONENT RESULT 3: Fostering the social acceptability and support for protecting spawning aggregation***

***RESULT 3.1 The communication campaign makes it possible to establish links between the actors***

| Activity | Activity | Dates | Form of execution | PHASE 1 (18 months) | FFEM contribution | MAR Fund Amount | TOTAL OTHERs | GAP |
|---|---|---|---|---|---|---|---|---|
| 3.1.1. | Development and implementation of short video clips | Start in March 2020 | **TENDER** (for the development of the Communication Strategy) **SGP:** for the implementation of the Communication Strategy / **RESPONSIBLE:** MAR Fund | 20,000 | 5,000 | 0 | 0 | -15,000 |
| 3.1.2 | Development of a page on the website on spawning aggregation information in the MAR (tab linked to partner's website) | Start in March 2020 | | 7,500 | 5,000 | 0 | 2,500 | 0 |
| 3.1.3 | Radio spots developed and aired at a local level (air time included) | Start in March 2020 | | 3,000 | 0 | 0 | 0 | -3,000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3.1.4. | Hold information meetings for local fishing communities through regular visits to buffer zone communities (Cayman Crown) | By December 2021 | **SGP FUNDRAISE / RESPONSIBLE:** TIDE, FUNDAECO, CORAL, HRI | 10,000 | 0 | 0 | 1,500 | -8,500 |
| 3.1.5 | Report cards, eco-audits & media outreach and communication to decision makers/policy brieaf | One by September 4th 2019 and one more in 2021 /eco audit 2020 | **EXPRESSION OF INTEREST / RESPONSIBLE:** HRI | 32,500 | 5,000 | 5,000 | 22,500 | 0 |

***RESULT 3.2 Community development activities compensate for lost income***

| Activity | Activity | Dates | Form of execution | PHASE 1 (18 months) | FFEM contribution | MAR Fund Amount | TOTAL OTHERs | GAP |
|---|---|---|---|---|---|---|---|---|
| 3.2.1 | Diagnostic of the current use of Cayman Crown | By December 2019 | **Terms of Reference:** VOLUNTEER / **RESPONSIBLE:** MARFUND | 10,000 | 0 | 0 | 5,000 | -5,000 |
| 3.2.2. | Design and execution of local initiatives to compensate and create alternatives | Start December 2019 | **SINGLE SOURCE CONTRACT / RESPONSIBLE:** Belize, Guatemala and Honduras with the support of **Rotary International District** with the support from NGO staff of FUNDAECO, HRI and TIDE | 60,000 | 10,000 | 0 | 4,000 | -46,000 |

**COMPONENT 4: PROJECT MANAGEMENT**

***RESULT 4: The project is well managed***

| Activity | Activity | Dates | Form of execution | PHASE 1 (18 months) | FFEM contribution | MAR Fund Amount | TOTAL OTHERs | GAP |
|---|---|---|---|---|---|---|---|---|
| 4.1 | Initial planning workshop | April 2019 | MARFUND | 20,000 | 0 | 0 | 20,000 | 0 |
| 4.2 | Program manager (MAR Fund Staff) | 2019-2021 | **EXPRESSION OF INTEREST / RESPONSIBLE:** MARFUND | 48,000 | 26,000 | 0 | 15,000 | -7,000 |
| 4.3 | External Annual Auditing and Final Evaluation of the Project | 2020-2021 | MARFUND | 7,500 | 7,500 | 0 | 0 | 0 |
| 4.4 | Management and admin costs | 2019-2021 | MAR Fund | 81,164 | 62,000 | 0 | 19,164 | 0 |
| | | | | | | | | |
| **TOTAL** | | | | **2 769,300.00** | **1 018,536.50** | **692,963.50** | **887,800** | **-170,000** |

| TABLE 3.9 BUDGET ACCORDING TO ACTIVITIES FOR THE 3 YEARS (IN US $) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **ACTIVITES** | | **FFEM contribution** | **MAR Fund contribution** | **Partners Matching funds** | **SUMMIT contribution** | **Total Financial Needs** | **Total Available** | **GAP** |
| **Component 1: The Cayman Crown Reef is legally recognized and managed in Belize and Guatemala** | | | | | | | | |
| 1.1.1 | Detailed mapping of the Cayman Crown area, based on existing and new field data | $140,000 | $70,000 | $10,000 | | $220,000 | $220,000 | $0 |
| 1.1.2 | Ecological Characterization of coral reefs and megafauna (oxygen kits) | | | | | | | |
| 1.1.3 | Characterization of fish spawning aggregation | | | | | | | |
| 1.1.4 | Compilation and analysis of site characterization data to guide management | | | | | | | |
| 1.1.5 | Management and zoning recommendations | $10,000 | $0 | $0 | | $10,000 | $10,000 | $0 |
| 1.2.1 | Drafting of documents for the legal declarations | $0 | $10,000 | $60,000 | | $70,000 | $70,000 | $0 |
| 1.2.2 | Follow up high-level political discussions with decision makers to advance in the declaration and management of the Cayman Crown Site | $0 | $0 | $70,000 | | $70,000 | $70,000 | $0 |
| 1.2.3 | Protection is gazetted and management plans are developed (Regional meeting for regional policy coordination and harmonization) | $10,000 | $13,000 | $103,000 | | $126,000 | $126,000 | $0 |
| 1.3.1 | Provide initial management funding for Cayman Crown MPAs in Belize and Guatemala | $60,000 | $175,000 | $317,000 | | $570,000 | $552,000 | -$18,000 |
| 1.3.2 | Preliminary Business planning for Cayman Crown MPAs | $0 | $0 | $25,000 | | $25,000 | $25,000 | $0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1.3.3 | Establish and manage a specific endowment fund for the two Cayman Crown's Protected Areas | $525,000 | $350,000 | $0 | | $875,000 | $875,000 | $0 |
| **Total Component 1** | | $745,000 | $618,000 | $585,000 | $0 | $1,966,000 | $1,948,000 | -$18,000 |
| **Component 2: Sentinel Site Observation Network** | | | | | | | | |
| 2.1.1 | Status report of FSA research in the MAR region with revision of historical data | $20,000 | $0 | $0 | $2,000 | $22,000 | $22,000 | $0 |
| 2.1.2 | Validate a common monitoring protocol and strategy through a regional workshop | $21,000 | $0 | $5,000 | $19,000 | $45,000 | $45,000 | $0 |
| 2.2.1 | Provide regional training on standard techniques and protocols for monitoring aggregations | $55,000 | $0 | $42,000 | | $164,000 | $97,000 | -$67,000 |
| 2.2.2 | Training for coral reef monitoring | $0 | $30,000 | $6,000 | | $36,000 | $36,000 | $0 |
| 2.3.1 | Equipment of monitoring stations | $40,000 | $120,530 | $25,000 | | $283,000 | $185,530 | -$97,470 |
| 2.3.2 | Support and maintain a coordinated monitoring program for FSA sentinel sites in the MAR | $199,000 | $96,000 | $427,000 | $23,136 | $807,000 | $745,136 | -$61,864 |
| 2.3.3 | Upgrade the database and improve data entry | $10,000 | $7,000 | $30,000 | | $47,000 | $47,000 | $0 |
| 2.3.4 | 2.3.4.1 Sentinel sites analysis | $0 | $0 | $0 | | $30,000 | $0 | -$30,000 |
| | 2.3.4.2 Regional Data sharing workshop with all partners in the region | $15,000 | $0 | $0 | | $45,000 | $15,000 | -$30,000 |
| **Total Component 2** | | $360,000 | $253,530 | $535,000 | $44,136 | $1,479,000 | $1,192,666 | -$286,334 |
| **Component 3: Fostering the social acceptability and support for protecting spawning aggregations** | | | | | | | | |
| 3.1.1 | Development and implementation of short video clips | $10,000 | $0 | $0 | | $75,000 | $10,000 | -$65,000 |
| 3.1.2 | Development of a page on the website on spawning aggregation information in the MAR (tab linked to partner's website) | $10,000 | $0 | $5,000 | | $15,000 | $15,000 | $0 |
| 3.1.3 | Radio spots developed and aired at a local level (air time included) | $0 | $0 | $0 | | $12,000 | $0 | -$12,000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3.1.4 | Hold information meetings for local fishing communities through regular visits to buffer zone communities (Cayman Crown) | $0 | $0 | $3,000 | | $40,000 | $3,000 | -$37,000 |
| 3.1.5 | Report cards, eco-audits & media outreach and communication to decision makers | $5,000 | $5,000 | $30,000 | $7,500 | $47,500 | $47,500 | $0 |
| 3.2.1 | Diagnostic of the current use of Cayman Crown | $0 | $0 | $5,000 | | $10,000 | $5,000 | -$5,000 |
| 3.2.2 | Design and execution of local initiatives to compensate and create alternatives | $10,000 | $0 | $6,000 | | $90,000 | $16,000 | -$74,000 |
| **Total Component 3** | | $35,000 | $5,000 | $49,000 | $7,500 | $289,500 | $96,500 | -$193,000 |
| **Component 4: Project management and evaluation** | | | | | | | | |
| 4.1 | Initial planning workshop | $0 | $0 | $20,000 | | $20,000 | $20,000 | $0 |
| 4.2 | Program manager (Mar Fund Staff) | $30,000 | $0 | $20,000 | | $96,000 | $50,000 | -$46,000 |
| 4.3 | Audit | $30,000 | $0 | $0 | | $60,000 | $30,000 | -$30,000 |
| 4.4. | Management and admin costs (overhead @ 6%)+OH Summit | $72,000 | $0 | $17,000 | $5,164 | $94,164 | $94,164 | $0 |
| **Total Component 4** | | $132,000 | $0 | $57,000 | $5,164 | $270,164 | $194,164 | -$76,000 |
| | | | | | | | | |
| **TOTAL US $** | | $1,272,000 | $876,530 | $1,226,000 | $56,800 | $4,004,664 | $3,431,330 | -$573,334 |
| **Total Euros** | | 1,115,789 € | 768,886 € | 1,075,439 € | 49,825 € | 3,512,863 € | 3,009,939 € | -502,925 € |

**TABLE 3-5 MAR Fish Indicators**

| COMPONENT 1: KNOWLEDGE AND PROTECTION OF THE AREA OF CAYMAN CROWN | |
|---|---|
| **COMPONENT RESULT 1:** The Cayman Crown reef is legally recognized and managed in Belize and Guatemala | |
| **INDICATORS** | **MEANS OF VERIFICATION** |
| • Official declaration in Guatemala | • 1 publication of its official declaration |
| • Official declaration in Belize | • 1 publication of its official declaration |
| • 1 management plan developed in Guatemala | • 1 document of Management Plan for Guatemala |
| • 1 management plan in Belize (Submitted to authorities) | • 1 document of Management Plan for Belize |
| • Systematic monitoring and evaluation of the state of the reef | • 1 annual report of the ecological and biophysical state |

***RESULT 1.1: Acquired knowledge on Cayman Crown allows to fully document the request for protected area creation***

| Activity | Activity | INDICATOR | MEANS OF VERIFICATION |
|---|---|---|---|
| 1.1.1 | Detailed mapping of the Cayman Crown area, based on existing and new field data | • Map of Cayman Crown is developed | • Printed and digital map |
| 1.1.2 | Ecological Characterization of coral reefs and megafauna | • % Representative sample of the total coral reef area that has been characterized.<br>• List of certain groups of species of megafauna,<br>• Portfolio of more than 100 photos<br>• 5 video clips (20-60 secs) are developed | • Report of % coral reef area<br>• List of species<br>• Portfolio file<br>• Video clips |
| 1.1.3 | Characterization of fish spawning aggregation | • Hours diving reported (Human and ROV)<br>• Maps routes of diving (entrance and exit points)<br>• Number of fish spawning aggregation and/or spawning behavior<br>• Portfolio of more than 100 photos<br>• 5 video clips (20-60 secs) are developed | • Document/reports of hours diving<br>• Maps of routes<br>• Portfolio file<br>• Video clips |
| 1.1.4 | Compilation and analysis of site characterization data to guide management | • 100% of the environment and specificities of Cayman Crown is described in a report | • Document/Report |
| 1.1.5 | Management and zoning recommendations | • Report explaining the management plan and zoning recommendations | • Document/Report |

***RESULT 1.2: Cayman Crown Protected Area declaration in Belize and Guatemala is on track (or done)***

| Activity | Activity | INDICATOR | MEANS OF VERIFICATION |
|---|---|---|---|
| 1.2.1 | Drafting of documents for the legal declarations (technical document depending on the MPA status). | • Technical document that supports the legal declaration of the area<br>• Legal texts are developed<br>• Report describing the management plan and zoning recommendations | • Two technical documents (Belize-Guatemala)<br>• Two legal documents (Belize-Guatemala)<br>• Report of the management plan |
| 1.2.2 | Follow up high-level political discussions with decision makers to advance in the declaration and management of the Cayman Crown Site | • At least 8 meetings with high-level officials to advance in the declaration and management of Cayman Crown site | • 8 Reports/Minutes of the meetings |
| 1.2.3 | Protection is gazetted and management plans are developed (Regional meeting for regional policy coordination and harmonization) | • Management plan<br>• Regional meeting | • Report of the regional meeting<br>• 1 document with policy coordination harmonization<br>• 1 document with the management plan of the site |

***RESULT 1.3 Funding mechanisms are established***

| Activity | Activity | INDICATOR | MEANS OF VERIFICATION |
|---|---|---|---|
| 1.3.1 | Provide initial management funding for Cayman Crown MPAs in Belize and Guatemala | • 2 grants applications | • Application grant forms<br>• Accounting document<br>• Documents for funding requests |
| 1.3.2 | Preliminary Business planning for Cayman Crown MPAs | • 3 Businesses plans are developed | • 3 documents |
| 1.3.3 | Establish and manage a specific endowment fund for the two Cayman Crown's Protected Areas | • % Capitalization of the endowment fund<br>• 5 new opportunities for new capitalization<br>• More than 4% of the average annual return on investments is obtained. | • Activity reports<br>• Accounting documents |

**COMPONENT 2: SENTINEL SITE OBSERVATION NETWORK**

**COMPONENT RESULT 2:** A monitoring network of 7 sentinel spawning sites is operational and supports the protection of a regional network of multi-species spawning aggregations.

| INDICATORS | MEANS OF VERIFICATION |
|---|---|

| | |
|---|---|
| • The commercial fish biomass at monitoring sites stays stable or increases | • Annual report (HRI) |

***Result 2.1: Observation network and protocols are validated.***

| Activity | Activity | INDICATOR | MEANS OF VERIFICATION |
|---|---|---|---|
| 2.1.1 | Status report of FSAs research in the MAR region with revision of historical data | • Analysis of the existing information | • Document |
| • 2.1.2. | • Validate a common monitoring protocol and strategy through a regional workshop | • Regional workshop successfully convened<br>• Methodology approved | • List of participants<br>• Minutes of the workshop<br>• Documents of agreement during workshop<br>• monitoring protocol established |

- Result 2.2 The people in charge of monitoring are trained

| Activity | Activity | INDICATOR | MEANS OF VERIFICATION |
|---|---|---|---|
| 2.2.1 | Provide regional training on standard techniques and protocols for monitoring aggregations | • 25 people participate in the training<br>• At least 80% of the people complete the training and becomes certified | • Field mission reports<br>• List of participants<br>• List of certifications |
| 2.2.2. | Training for coral reef monitoring | • 20 people participate in the training<br>• At least 80% of the people complete the training and becomes certified | • Field mission reports<br>• List of participants<br>• List of certifications |

***Result 2.3: Data collected and analyzed provides information on the status of FSAs and their responses to Climate Change***

| Activity | Activity | INDICATOR | MEANS OF VERIFICATION |
|---|---|---|---|
| 2.3.1. | Equipment of monitoring stations ** | • 100% of the monitoring equipment (planned) is installed<br>• all sites have temperature loggers<br>• at least one site has fish tagging monitoring | • Quotes of equipment<br>• Report of equipment bought<br>• Reports of process of installation<br>• Maps of installation sites<br>• Report of number of fishes tagged |
| 2.3.2 | Support and maintain a coordinated monitoring program for FSA sentinel sites in the MAR | • 3 monitoring per site are developed annually | • Reports of monitoring |
| 2.3.3. | Upgrade the database and improve data entry | • Database upgraded (new software) | • Report of upgrade process |
| 2.3.4 | 2.3.4.1 Sentinel sites analysis | • 7 documents of FSA sites analysis | • Documents/Reports |
| | 2.3.4.2 Regional Data sharing workshop with all partners in the region | • Regional workshop developed | • List of participants<br>• Minutes of the workshop<br>• Documents of agreement during workshop |

**COMPONENT 3: PROMOTING THE SOCIAL ACCEPTABILITY OF PROTECTING SPAWNING GROUNDS**

**COMPONENT RESULT 3**: Fostering the social acceptability and support for protecting spawning aggregations

| INDICATORS | MEANS OF VERIFICATION |
|---|---|
| • Negative trend in the number of infractions | • List of infractions<br>• Fines emitted<br>• Final report |

***Result 3.1 The communication campaign makes it possible to establish links between the actors***

| Activity | Activity | INDICATOR | MEANS OF VERIFICATION |
|---|---|---|---|
| 3.1.1. | Development and implementation of short video clips | • Short videos developed for social media, tv, written media | • Quotes<br>• Videos presented |

| | | | |
|---|---|---|---|
| 3.1.2 | Development of a page on the website on spawning aggregation information in the MAR | • Website page on spawning aggregations | • Website page developed |
| 3.1.3 | Radio spots developed and aired at a local level | • 10 radio spots developed for each FAS areas | • Quotes<br>• Radio spots presented |
| 3.1.4. | Hold information meetings for local fishing communities through regular visits to buffer zone communities (Cayman Crown) | • Nine meetings per year with fishing communities | • List of participants<br>• Minutes of the meetings<br>• Reports of meetings |
| 3.1.5 | Report cards, eco-audits & media outreach and communication to decision makers | • Two report cards that includes FSAs information<br>• eco-audit spawning aggregation indicator | • Report cards<br>• Final report |

***Result 3.2 Community development activities compensate for lost income***

| Activity | Activity | INDICATOR | MEANS OF VERIFICATION |
|---|---|---|---|
| 3.2.1 | Diagnostic of the current use of Cayman Crown | • 1 diagnosis completed | • Final report |
| 3.2.2. | Design and execution of local initiatives to compensate and create alternatives | • at least one regional project | • Report of the project |

**COMPONENT 4: PROJECT MANAGEMENT**

| INDICATORS | MEANS OF VERIFICATION |
|---|---|
| • Annual meeting of the Steering Committee and their reports | • Activity reports (document) |
| • Logical framework and financial audits report developed | • Evaluation report (document) |
| • Final project developed | • Final project report (document) |

***Result 4 The project is well managed***

| Activity | Activity | INDICATOR | MEANS OF VERIFICATION |
|---|---|---|---|
| 4.1 | Initial planning workshop | • Number of NGOs participating in the workshop | • List of participants<br>• Minutes of the meeting<br>• Action Plan of the project |
| 4.2 | Program manager (MAR Fund Staff) | • Number of months worked | • Documents/Reports |
| 4.3 | External Annual Auditing and Final Evaluation of the Project | • Auditing reports<br>• Final Evaluation Report | • Reports |

**TABLE 3-6 CHRONOLOGICAL IMPLEMENTATION OF MAR Fish ACTION PLAN 2019-2021**

***** some activities funded by partners and MAR Fund started before the first disbursement from FFEM**

| N | Activity | Partner | Period of time | PHASE I - 2019 ***April 2019 – December 2020 | | | | | | | | | PHASE I - 2020 January 2020 – December 2020 | | | | | | | | | | | PHASE II 2021-2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | |
| 4.1 | Initial planning workshop | MAR Fund | April 11-12, 2019 | X | | | | | | | | | | | | | | | | | | | | | |
| 2.3.2 | Support and maintain a coordinated monitoring program for FSA sentinel sites in the MAR | HRI,FUNDAECO, COBI, SEA, EDF | April-June Dec-Feb Through the life of the project | | X | X | | | | | | X | X | X | | X | X | X | | | | | | X | X |
| 4.2 | Program manager | MAR Fund | Start August 2019 | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1.2.1 | Drafting of documents for the legal declarations (technical document depending on the MPA status) | FUNDAECO, HRI, TIDE and EDF | By December 2019 | | | X | X | X | X | X | X | X | | | | | | | | | | | | | |
| 3.1.5 | Report cards, eco-audits & media outreach and communication to decision makers | HRI | Report cards in 2019 and 2021 eco-audit by 2020 | | | X | X | X | X | X | X | X | | | | | | | | | | | | | X |
| | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | |
| 1.3.1 | Provide initial management funding for Cayman Crown MPAs in Belize and Guatemala | TIDE and FUNDAECO | By Dec 2019 | | | X | X | X | X | X | X | X | | | | | | | | | | | | | |
| 2.1.1 | Status report of FSAs research in the MAR region with revision of historical data | COBI Leads | By June 2020 | | | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 2.3.1 | Equipment of monitoring stations ** | MARFUND Quotes from COBI | By June 2020 | | | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | |
| 1.1.5 | Management and zoning recommendations | FUNDAECO and TIDE with support from HRI | By Dec 2020 | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| 1.2.2 | Follow up high-level political discussions with decision makers to advance in the declaration and management of the Cayman Crown Site | FUNDAECO, HRI, TIDE, EDF | By Dec 2020 | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |

| N | Activity | Partner | Period of time | PHASE I- 2019 | | | | | | | | | PHASE I- 2020 | | | | | | | | | | | PHASE 2 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | |
| 3.2.1 | Diagnostic of the current use of Cayman Crown | Volunteer MARFUND | By Dec 2019 | | | | | X | X | X | X | X | | | | | | | | | | | | | |
| 1.1.1 | Detailed mapping of the Cayman Crown area, based on existing and new field data. | HRI | Start September 2019 | | | | | | X | X | X | X | | | | | | | | | | | | | |
| 1.1.2 | Ecological characterization of coral reefs and megafauna | HRI (assistance from TIDE and possibly other researchers) | August – October 2019 and continue through the life of the project | | | | | X | X | X | | | | X | X | X | | | | X | X | X | | | X |
| 2.1.2 | Validate a common monitoring protocol and strategy through a regional workshop | COBI Leads | Oct 2019 (24th-25th) | | | | | | | X | | | | | | | | | | | | | | | |
| 2.3.3 | Upgrade the database and improve data entry | Contractor Pending | Start in October 2019 | | | | | | | X | X | X | X | X | X | X | X | X | X | | | | | | |
| 1.2.3 | Protection is gazetted and management plans are developed (Regional meeting for regional policy coordination and harmonization) | TIDE | By Dec 2020 | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| 1.1.3 | Characterization of fish spawning aggregation | | Dec 2019 -Jan 2020 (groupers) and May-Jun 2020 (snappers) and continue through the life of the project. | | | | | | | | | X | X | X | | | X | X | | | | | | X | X |

| N | Activity | Partner | Period of time | PHASE I- 2019 | | | | | | | | | PHASE I- 2020 | | | | | | | | | | | PHASE 2 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | |
| 3.2.2 | Design and execution of local initiatives to compensate and create alternatives | ROTARY INTERNATIONAL FUNDAECO, HRI and TIDE | Start Dec 2019 | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1.3.2 | Preliminary Business planning for Cayman Crown MPAs | MARFUND | By Dec 2020 | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | |
| 1.3.3 | Establish and manage a specific endowment fund for the two Cayman Crown's Protected Areas | MARFUND | By Dec 2020 | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | |
| 2.3.4 | 2.3.4.1 Sentinel sites analysis | Each sentinel site partner and consolidation by HRI | By Dec 2021 | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X |
| 1.1.4 | Compilation and analysis of site characterization data to guide management | HRI | February – June 2020 | | | | | | | | | | | X | X | X | X | X | | | | | | | |
| 3.1.1 | Development and implementation of short videos | TENDER / SGP | Start March 2020 | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X |
| 3.1.2 | Development of a page on the website on spawning aggregation information in the MAR | TENDER / SGP | Start March 2020 | | | | | | | | | | | | X | X | X | X | | | | | | | |
| 3.1.3 | Radio spots developed and aired at a local level | TENDER / SGP | Start March 2020 | | | | | | | | | | | | X | X | X | X | X | X | X | X | X | X | X |
| 2.2.2 | Training for coral reef monitoring | HRI | Apr- Jun 2020 | | | | | | | | | | | | | X | X | X | | | | | | | |
| 2.2.1 | Provide regional training on standard techniques and protocols for monitoring aggregations | Organized by SEA with support from COBI | Start in May 2020 | | | | | | | | | | | | | | X | X | | | | | | | |
| 3.1.4 | Hold information meetings for local fishing communities through regular visits to buffer zone communities (Cayman Crown) | TIDE, FUNDAECO, CORAL, HRI | By Dec 2021 | | | | | | | | | | | | | | X | X | X | X | X | X | X | X | X |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.3.4 | 2.3.4.2 Regional Data sharing workshop with all partners in the region | COBI | By Sep 2021 | | | | | | | | | | | | | | | | | | | | | X | X |

**** MONITORING STATIONS**

Although there are several multi-specie FSA sites in the MAR region, the project partners prioritized sites in each country to monitor. As a minimum, seven sites will be equipped with a HOBO temperature logger and acoustic sensors, and one with receivers for fish-tagging. For the latest, it will be necessary to buy tags for fish and possibly consider a small budget for training (tags installation and data analyses). Moreover, equipment for Remote Operated Vehicle (ROV) will be necessary. The following table describes the prioritization of monitoring stations for each country (Table 3-7) and their equipment requirement. Table 3-8 shows the equipment to be purchased with the first disbursement from FFEM. More sites will be equipped and more parameters will be measured, with matching funds, during the project.

**TABLE 3-7 PRIORITIZES MONITORING STATIONS FOR EACH COUNTRY**

| Country | Information |
|---|---|
| Mexico | 1. Punta Allen: The site already has an acoustic and temperature logger.<br>2. Punta Herrero: The site already has a temperature logger. An acoustic sensor was acquired by COBI and will be put in site when the opportunity comes.<br>3. Xcalak: It currently has nothing. It is suggested to buy one temperature logger for this site and if possible, an acoustic sensor as well. |
| Belize | 1. Gladden Spit: It currently has nothing. It is suggested to buy one temperature logger for this site and an acoustic sensor as well<br>2. Cayman Crown: It currently has nothing. It is suggested to buy one temperature logger for this site and if possible, an acoustic sensor as well.<br>3. Turneffe or Key Glory: It currently has nothing. If money allows it is suggested to buy one temperature logger for this site and if possible, an acoustic sensor as well |
| Guatemala | 1. Cayman Crown: It currently has nothing. It is suggested to buy one temperature logger for this site and an acoustic sensor as well. |
| Honduras | 1. Texas: It currently has nothing. It is suggested to buy one temperature logger for this site and an acoustic sensor as well<br>2. Sandy Bay: It currently has nothing. It is suggested to buy one temperature logger for this site and if possible, an acoustic sensor as well.<br>3. Cordelia Banks: It currently has nothing. If money allows it is suggested to buy one temperature logger for this site and if possible, an acoustic sensor as well. |

**TABLE 3-8 PRIORITIZED EQUIPMENT**

| Equipment | # of Units | Unit Cost | Total Cost |
|---|---|---|---|
| Hobo temperature logger | 7 | $ 129,00 | $ 903,00 |
| Acoustic sensor | 7 | $ 3.000,00 | $ 21.000,00 |
| Installation/Acoustic Sensor Base | 7 | $ 250,00 | $ 1.750,00 |
| Training for fish tagging | 1 | $ 1.647,00 | $ 1.650,00 |
| Fish tags | 40 | $ 350,00 | $ 14.000,00 |
| Tether 100m (for ROV) | 1 | $ 300,00 | $ 300,00 |
| Controller (for ROV) | 1 | $ 400,00 | $ 400,00 |
| TOTAL | | | $ 40.000,00 |

# CHAPTER FOUR: REFERENCES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# CHAPTER FIVE: ANNEX

**PROGRAM**
**Regional Planning meeting for the "MAR Fish" project: Knowledge, monitoring and protection of Mesoamerican Reef spawning areas.**
**Hilton Garden Inn Hotel, Guatemala City**
**April 11 and 12, 2019**

**Objectives of the Project:**

1) Obtain legal recognition and management of Cayman Crown in Guatemala and Belize, a newly discovered aggregation area.

2) Promote participatory monitoring of a network of sentinel spawning areas in the four Mesoamerican reef countries.

**General Objective of the workshop**:

**Develop the Action Plan for the MAR Fish project for the total period (3 years)** of the project, with focus on the first 18 months.

**Specific Objectives of the workshop**:

1) Plan all **activities, budget, stakeholders involved, timeline and indicators** for the project, with a specific focus on the first 18 months.
2) Discuss the summit proposal.
3) Consider all fundraising prospects for the future.

**Day 0, Wednesday, April 10, 2019**

| Time | Activities | Facilitator |
|---|---|---|
| 12:00 – 20:00 | Arrival of participants to Guatemala City. | Hotel |

**Day 1, Thursday, April 11, 2019**

| Time | Activities | Facilitator/Presenter |
|---|---|---|
| 09:00 – 9:15 | Welcome | MAR Fund<br>**María José González** |
| 09:15 – 9:45 | Presentation of participants<br>Review of the workshop program | MAR Fund<br>**Facilitator** |
| 09:45 – 10:30 | Project Presentation | MAR Fund<br>**María José González** |
| 10:30 – 11:00 | Presentation of the procurement processes of the Project<br>Operating Rules | MAR Fund<br>**Patty Cabrera** |
| 11:00 – 11:15 | Coffee Break | |

| Time | Activities | Facilitator/Presenter |
|---|---|---|
| 11:15 – 13:00 | **COMPONENT 1: KNOWLEDGE AND PROTECTION OF CAYMAN CROWN SITE**<br>***RESULT 1.1: Acquired knowledge on Cayman Crown allows to fully documented the request for protected area creation***<br>Activities 1.1:<br>1) Preliminary mapping for Cayman Crown – (compilation of data)<br>2) Detailed mapping of the Cayman Crown area (based on new field data)<br>3) Ecological Characterization of coral reefs and megafauna<br>4) Characterization of fish spawning aggregation<br>5) Compilation and analysis of site characterization data to guide management. Compile and analyse characterization data into site description to support management<br>6) Management and zoning recommendations | MAR Fund Facilitator |
| 13:00 – 14:00 | Lunch | |
| 14:00 - 15:00 | ***RESULT 1.2 Cayman Crown Protected Area declaration in Belize and Guatemala is on track***<br>Activities 1.2:<br>1) Drafting of documents for the legal declarations (technical document depending on the MPA status)<br>2) Follow up high-level political discussions with decision makers to advance in the declaration and management of the Cayman Crown Site<br>3) Protection is gazetted and management plans are developed (Regional meeting for regional policy coordination and harmonization) | MAR Fund Facilitator<br>**FUNDAECO**<br>**TIDE** |
| 15:00 - 15:30 | ***RESULT 1.3 Funding mechanisms are established***<br>Activities 1.3:<br>1) Provide initial management funding for Cayman Crown MPAs in Belize and Guatemala<br>2) Preliminary Business planning for Cayman Crown MPAs<br>3) Establish and manage a specific endowment fund for the two Cayman Crown's Protected Areas | MAR Fund Facilitator<br>**María José González** |
| 15:30 – 16:00 | **COMPONENT 2: SENTINEL SITE OBSERVATION NETWORK**<br>***RESULT 2.1 Observation network and protocols are validated***<br>Activities 2.1:<br>1) Status report of FSAs research in the MAR region with revision of historical data<br>2) Validate a common monitoring strategy through a regional workshop: prioritization and validation of sites, protocol and partners, data sharing agreements | MAR Fund Facilitator |
| 16:00 – 16:15 | Coffee break | |
| 16:15 – 17:00 | ***Result 2.2 The people in charge of monitoring are trained***<br>Activities 2.2:<br>1) Provide regional training on standard techniques and protocols for monitoring aggregations<br>2) Training for coral reef monitoring | MAR Fund Facilitator |
| 17:00 – 18:00 | ***Result 2.3 Data collected and analyzed provides information on the status of FSAs and their responses to Climate Change***<br>Activities 2.3:<br>1) Equipment of monitoring stations<br>2) Support and maintain a coordinated surveillance program for FSA sentinel sites in the MAR<br>3) Upgrade the database and improve data entry<br>4) 2.3.4.1 Sentinel sites analysis<br>5) 2.3.4.2 Regional Data sharing workshop with all partners in the region | MAR Fund Facilitator |
| 19:00 | Dinner | |

**Day 2, Friday the 12th of April, 2019**

| Time Schedule | Activities | Facilitator |
|---|---|---|
| 09:00 – 09:30 | **Welcome**<br>**Recap Day 1** | MAR Fund Facilitator |
| 09:30 – 10:30 | **COMPONENT 3: PROMOTING THE SOCIAL ACCEPTABILITY OF PROTECTING SPAWNING GROUNDS**<br>***Result 3.1 The community develops activities for lost income***<br>Activities 3.1:<br>1) Development and implementation of short videos<br>2) Development of a website on spawning aggregation information in the MAR<br>3) Radio spots developed and aired at a local level<br>4) Report cards, eco-audits & media outreach and communication to decision makers<br>• Ana Salceda and MAR PBS Films | MAR Fund Facilitator<br>**Melanie McField** |
| 10:30 – 11:15 | ***Result 3.2 The communication campaign makes it possible to establish links between the actors***<br>Activities 3.2:<br>1) Diagnostic of the current use of Cayman Crown<br>2) Design and execution of local initiatives to compensate and create alternatives | MAR Fund Facilitator<br>**Rotary** |
| 11:15 – 11:30 | Coffee Break | |
| 11:30 – 12:15 | **COMPONENT 4: PROJECT MANAGEMENT**<br>Component 4:<br>• Project management<br>• Administrative plan and costs<br>• Define the roles of the members of the scientific and technical committee | MAR Fund Facilitator |
| 12:15 – 13:00 | Conversation<br>• Final discussion on budget | MAR Fund Facilitator |
| 13:00 -- 14:00 | Lunch | |
| 14:00 – 14:45 | Summit Proposal<br>• Presentation of The Proposal<br>• Discussion of policy plan for each country | MAR Fund **María José González** |
| 14:45– 16:00 | More details on the operation:<br>• Advice all areas<br>• Field visits to all areas<br>• Progress reports of the project<br>• Facilitate interactions<br>Communication tools to follow up within stakeholders (App., Online community like Linkedin) | MAR Fund Facilitator |
| 16:00 -- 16:15 | Coffee Break | |
| 16:15 – 16:30 | Conversation<br>• Miscellaneous | MAR Fund Facilitator |
| 16:30 – 17:30 | Overview<br>Next steps<br>Conclusions | MAR Fund Facilitator |
| 19:00 | Dinner | |

**Day 3, Saturday, April 13, 2019**

| Time | Activities | Facilitator |
|---|---|---|
| 04:30 - | Participants leave Guatemala City | Hotel |