

**Assuring the long-term success of the network of fish refuges in the
Mexican MAR**



Project Number: RG-OAK-COBI-2017

Project Name: Assuring the long-term success of the network of fish refuges in the Mexican MAR

Grantee: Comunidad y Biodiversidad A.C. (COBI)

Author of the report: Stuart Fulton

Address: Isla del Peruano 215, Lomas de Miramar, Guaymas, Sonora, Mexico CP 85448

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Summary

During the 12 months from July 2017 to June 2018 we advanced greatly on the activities in the proposal. We have worked in collaboration with 200 fishers (from eight fishing cooperatives, and the federation), government (CONAPESCA, INAPESCA, CONANP), Academia (ECOSUR, UNAM, Smithsonian), civil society (TNC, the Kanan Kay Alliance) and the private sector (fish buyers, chefs, hotels) to move Quintana Roo’s fisheries towards sustainability. The Sian Ka’an and Banco Chinchorro lobster fishery continues to be the shining example of a sustainable well-managed fishery and fishers in other parts of the state (Yum Balam) are now learning from them and implementing their best practices. Positive steps have been made to bridge the divide between the cooperatives and markets for sustainable products and we have conducted four fisher exchanges to promote the exchange of information between different groups. The eight fish refuges (1,033 ha) of the Cozumel Cooperative have been renewed for five more years and the cooperative has committed to creating a saving fund to cover long-term monitoring costs. In Punta Herrero (four refuges, 1,025 ha) we are working with the cooperative to modify the original zones to provide increased fisheries benefits and protect spawning aggregations, and in Banco Chinchorro (one large refuge, 12,257 ha) we continue to negotiate with the cooperatives who have expressed concern over lack of enforcement. The 17th fish refuge in Quintana Roo (9 ha) was created in April through a multisectoral initiative involving COBI, CONANP, CONAPESCA and the fishers. Today there are 18,558 hectares of fish refuges that, along with CONANP zones cover 4.1 % of the territorial sea. Finally, we have begun innovative new projects, including the use of acoustic sensors for monitoring spawning fish, a national “*giants of the past*” project that looks at the disappearance of the large fish species, and a national gender equality at sea initiative that includes fishermen and women from Quintana Roo.

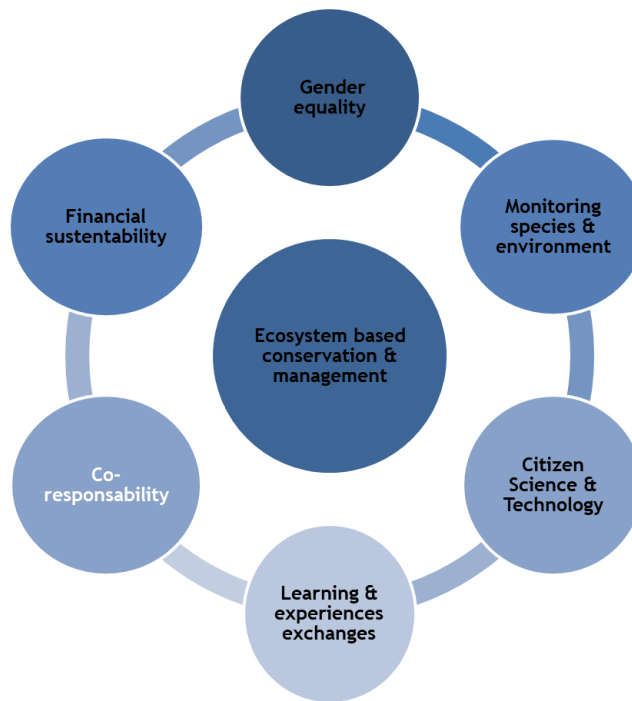


Figure 1 - Components of COBI’s model that contribute to ecosystem based conservation and management in the Mesoamerican Reef

Goals

General objective

Restore coral reef health and the main commercial fish species biomass in the Mexican MAR through the active participation of fishers, the protection of key habitats, the implementation of sustainable fishing practices, and the creation of replicable models that can influence both national and region fishing policy.

Specific objectives and expected results

Objective 1. Promote the implementation of sustainable fishing practices in the Mexican MAR:

1. The Sian Ka'an and Banco Chinchorro lobster fishery continues to be sustainable through its participation in a Fishery Improvement Project (FIP).
2. Sustainable practices are replicated in another fishery site in the Mexican MAR (Yum Balam).
3. Three new cooperatives in the Mexican MAR are identified to implement the next generation of fish refuges.

Objective 2. Support fishing cooperatives to be successful in financing initiatives of conservation and sustainable practices:

1. Mexican MAR lobster fishing cooperatives are aware of new options of sustainable markets.
2. The cost of implementing and maintaining fish refuges and sustainable fishing is known and shared among fishers.
3. At least one cooperative implements a strategy for the financial sustainability of their sustainable fisheries and fish refuges initiatives.

Objective 3. Protect fishing grounds, coral reefs, and Fish Spawning Aggregations (FSA) sites in the MAR from Tulum in the center to the Belize border in the south, through a network of fish refuges:

1. The 13 fish refuges established in 2012/13 are renewed for five more years.
2. Climate change monitoring (temperature and salinity) is incorporated in to the fish refuge monitoring program.
3. 50% (approx. 25 sites) of the grouper/snapper FSA sites in the Mexican MAR (from Tulum in the center to the Belize border in the south) are characterized and validated by fishers and COBI.

Objective 4. Scale up COBI's demonstrative models in public fishing policy in the Mexican MAR and at national scale:

1. The lobster fishery model developed in Sian Ka'an and Banco Chinchorro inspires other fishers in the MAR and decision makers to meet sustainability standards.
2. Design principles for fish refuges in the MAR are created through a collaborative process involving the four MAR countries.

Project progress

The project is progressing as expected. Some goals have been achieved early, whilst others present minor delays. We discuss progress by objective below.

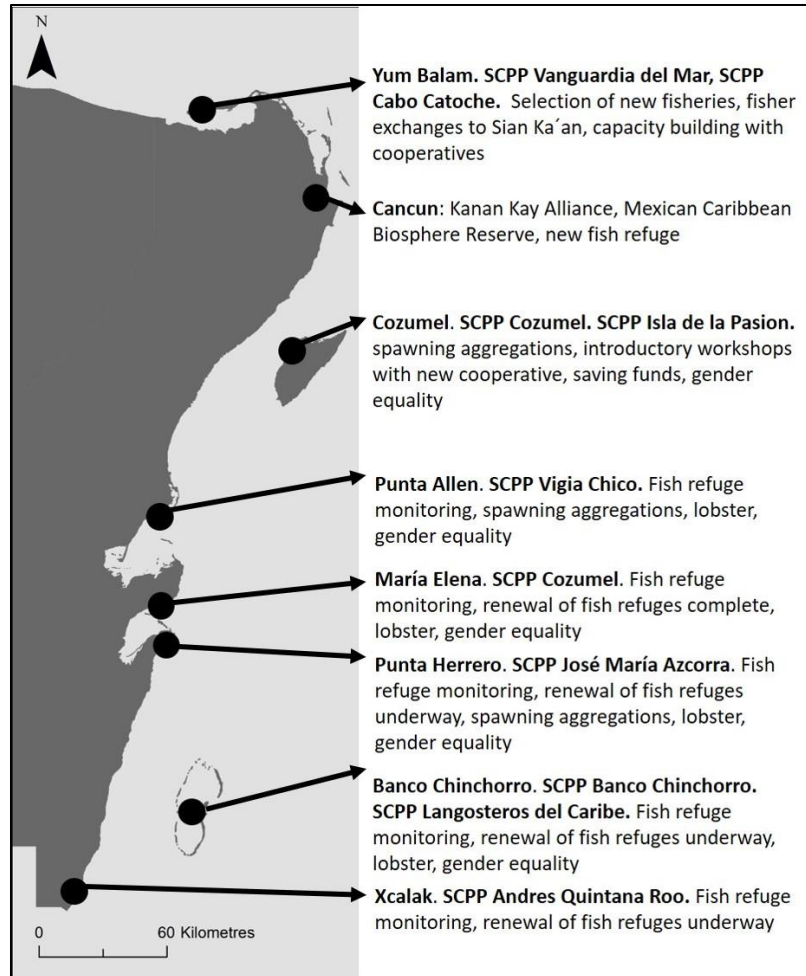


Figure 2 Map and summary of fishing communities, cooperatives and activities during the grant period

O1 Promote the implementation of sustainable fishing practices of the cooperatives in the Mexican MAR.

We held a workshop in March 2018 (O1/A1,A2,A3) to follow up on the 2017 activities (O1/A4) for the lobster fishery¹. The participants had completed 90 % of the activities proposed in the 2017 work plan; fishery monitoring, validation of reference points, design of an app for fishing logbooks, a monitoring protocol to assess the effect of the fishery on the ecosystem, and connecting fishermen to new markets. The activities that were not completed include a report on the ecosystem impact of the fishery (led by Razonatura) and the cooperatives' savings funds, which although not complete are advancing well and will continue to be

¹ We originally managed this activity as a Fishery Improvement Project (FIP). As the six fishing cooperatives were previously part of the Marine Stewardship Project (MSC) certification which only certifies sustainable fisheries (they withdrew due to high costs, the five year audit would have cost US\$80,000, too much for a small-scale fishery) a FIP does not really apply. However, the work plan includes work with the value chain and fishery monitoring, and as such it is important to continue. The fishery is also certified as "Best Choice" by the Monterrey Bay Aquarium (<http://www.seafoodwatch.org/seafood-recommendations/groups/lobster?q=Lobster&t=lobs&o=427>) and continues to be recognized as very sustainable.

worked on during 2018. The workshop was attended by 29 people, representing organizations and partners involved with the lobster fishery of Quintana Roo, such as civil society organizations, fishing cooperatives, government agencies, academics, consultants, and representatives from the private sector. In addition, the work plan for 2018 was prepared considering four principles of sustainability: stock health, ecosystem health, functional management and fair trade.

We conducted a workshop with 35 fishers from two cooperatives from Holbox in September 2017 to collect the information necessary for the analysis and selection of the most suitable fishery. We analysed seven fisheries with grouper, lobster and permit fisheries scoring highest for suitability (O1/A5,A6,A7) and, based on this and the market possibilities identified by the fishers, we selected the lobster fishery (O1/A8). The information collected during this process will be invaluable to the implementation of sustainability standards in Objective 4. Components of the analysis include fisheries indicators (for example total catch, seasons and markets), biological indicators (susceptibility of the fishery to overfishing) and social indicators (conflicts and governance).

The first of two fisher exchanges involving Yum Balam fishers was held in February 2018. Eight fishers from two cooperatives visited Punta Allen and then Maria Elena in Sian Ka'an to see how those cooperatives operated (O1/A9). A second exchange is planned for late summer 2018 in which cooperative leaders from Yum Balam will visit Cozumel to see the installations of the Cozumel cooperative and learn how to manage live lobsters for sale.

Through the actions of COBI and other members of the Kanan Kay Alliance (KKA) we have reached out to 21 of the 25 registered fishing cooperatives in the State of Quintana Roo. The Federation of Cooperatives helped provide an overview of the current situation of each of its cooperative members (O1/A10). Of particular importance is the fact that all the new cooperatives are based in the north of the state, an area of great importance for the next generation of fish refuges. Seven cooperatives have already committed to creating marine reserves, and the SCPP Pescadores de Puerto Morelos completed the process by creating a nine-hectare fish refuge in Cancun, with support from CONANP, in April 2018 (O1/A11). In Cozumel the SCPP Isla de la Pasión, COBI, the KKA and CONANP have met on four occasions with cooperative leaders to discuss the approximate location of the reserves, and also bring together key stakeholders (the cooperative, the SCPP Cozumel and CONANP). Results of these meetings have been twofold. Firstly, we have helped CONANP and the SCPP Cozumel formalize discussions with the SCPP Isla de la Pasión, a cooperative that was previously forgotten about and had a reputation for not respecting the MPA and closed seasons. Second the SCPP Isla de la Pasión welcomed this approach, has shared information about the location of potential fish spawning aggregation sites and has already begun discussing potential areas of new fish refuges. We will follow up on their interest through our actions with the Kanan Kay Alliance.

The SCPPs Por la Justicia Social, Caribe, Isla Blanca, Pescadores de Makax, and Patria y Progreso continue to work in partnership with the NGO Seacology and created a 1,367 ha community marine reserve for lobster near Isla Contoy². The Kanan Kay Alliance will provide technical support where necessary but COBI is not directly involved in the operation of the zone.

Finally, current COBI partner, SCPP Andrés Quintana Roo, from Xcalak, had previously

² <https://www.seacology.org/project/contoy-island/>

expressed interest in creating a fish refuge in its fishing grounds. The cooperative already participates with the fish refuge in Banco Chinchorro, but would like to implement a fish refuge in Xcalak. Preliminary discussions with the cooperative at the start of this trimester highlighted the fact that the main goal of the cooperative was to create a fish refuge as a tool to control illegal fishing. However, as creating a fish refuge does not guarantee that CONAPESCA will implement surveillance, and as Xcalak already has several no take zones as part of the MPA we have not prioritized fish refuge creation in this area. We are, however, training fishers of the cooperative to investigate fish spawning aggregation sites in the area.

List of Deliverables:

- A1 FIP Work Plan 2018
- A2 Progress Report FIP Lobster 2017
- A3 FIP Workshop Report 2018
- A4 Lobster Work Plan 2017
- A5 COBI Multicriteria Analysis Yum Balam
- A6 Participants Cabo Catoche Holbox Sept2017
- A7 Participants Vanguardia Holbox Sept2017
- A8 Presentation Results of Fishery Selection
- A9 Areas of Opportunity for the Implementation of Fish Refuges in Quintana Roo 2017-2018
- A10 Fisher Exchange Holbox Sian Ka´an
- A11 ZRP Canal Nizuc

O2 Support fishing cooperatives to be successful in financing initiatives of conservation and sustainable practices.

In March, in Cancun, the "2nd Workshop for the co-creation and commercialization of sustainable fishing: Lobster" was held (O2/A1,A2,A3). The aim was to open potential new marketing channels for lobster, and establish new methods to follow up on the challenges posed by the commercialization of sustainable fishing products. A total of 58 people participated in the workshop, representing hotels, chefs, producers, fishers, funders, and CSOs with knowledge of the fishery and commerce. The information generated during the first workshop "Co-creation of sustainable fishing: solving market access challenges" (O2/A4,A5,A6), held in phase one of this project was used as input for the design of the workshop; and a new search was also carried out for stakeholders interested in sustainable lobster. The four objectives set for the workshop were met successfully:

- 1) Connecting the work of the cooperatives with the current needs and challenges of the market.
- 2) Providing tools to cooperatives that allow them to improve their marketing skills.
- 3) Generate a connection between different stakeholders in the lobster value chain.
- 4) Encourage the possibilities of new commercial relationships between producers and future buyers.

As part of the process of connecting markets with the six cooperatives, a special workshop for cooperatives was held in Chetumal in March 2018 previous to the above workshop, in order to prepare the fishers on issues related to cost dynamics, negotiation, and agenda feedback.

In collaboration with Juan Carlos Villaseñor (Bren School, UC Santa Barbara) we have developed a draft tool for quantifying the necessary investment to create and operate a fish refuge using COBI's model. The tool can be found at <https://turfeffect.shinyapps.io/CosteoDeReservas> but modifications are still being made to make the platform more user-friendly (O2/A7). We will roll out the tool in the next trimester

and train stakeholders to use it. From analysing COBI's investments from 2009 to date, we can see that approximately US\$54 was invested per hectare to create the current network of fish refuges. We are also trying to calculate the benefits to the fishers using market prices of seafood that the fishers have provided. For example, in the Gallineros fish refuge of Maria Elena, abundance data from biological surveys conducted with the fishers suggest that there is over US\$100,000 worth of lobster (of capture size). We are currently working on how best to present this information to the cooperative, as we do not want such high values to be misinterpreted.

The Cozumel cooperative will pilot the saving fund for covering the operating costs of marine reserves and sustainable fisheries and signed an agreement during the first trimester of the grant (O2/A8,A9). In July 2017 we held a workshop with the cooperative to review the costs and develop the rules for the operation of the fund. We estimate that the cooperative would need about US\$5,000 annually to cover the fish refuge monitoring and US\$3,000 to cover the lobster fishery monitoring. The roll out of the fund next year will take this in to consideration. Along the same lines, we have had discussions with Fondo Mexicano para la Conservación de la Naturaleza to discuss the possibility of establishing a national fund for marine reserves that can help contribute to the operating costs of marine reserves.

List of Deliverables:

- A1 Commercialization Workshop Report
- A2 Commercialization Workshop Survey
- A3 Commercialization Workshop Main results
- A4 Lobster commercialization options
- A5 Fact Sheet Coop Info
- A6 Coop Fact Sheets website view
- A7 MR Cost Calculator
- A8 Saving Fund Workshop Report
- A9 Saving Fund Agreement

O3 Protect fishing grounds, coral reefs, and Fish Spawning Aggregations (FSA) sites in the MAR (from Tulum in the center to the Belize border in the south) through a network of fish refuges.

The eight fish refuges of the SPCP Cozumel were renewed in the Federal Register on the 30th of November 2017³ (O3/A1,A2,A3). The agreements for the five Punta Herrero and Banco Chinchorro fish refuge expire in September 2018. We began preliminary meetings with the presidents of the cooperatives of Banco Chinchorro in September 2017 but progress has been slow due to poor weather that has prevented us from crossing to Banco Chinchorro three times and limited responses from one of the three cooperatives. In April we met with the fishers again and, in principle, they are in favour of renewing their fish refuge. However they have major concerns exist on two issues: 1) the lack of surveillance and enforcement in Banco Chinchorro⁴, and 2) the lack of visible economic benefits for fishers who are not in the core biological monitoring team. The cooperatives continue to discuss the renovation however due to the two points above, particularly the first point, and we are unsure if they will decide to renew the fish refuge.

³ http://www.dof.gob.mx/nota_detalle.php?codigo=5506189&fecha=30/11/2017

⁴ This was confirmed through our study of perception and published in Marine Policy in January "Halfway to Sustainability: management lessons from community-based, marine no-take zones in the Mexican Caribbean" (see Applied and Citizen Science folder)

In October 2017 we held a very positive workshop with the cooperative members in Punta Herrero however in December the cooperative expressed similar concerns to the Banco Chinchorro groups and the renewal process halted. We met with the cooperative leaders again in March 2018 and discussed many of the issues, before a final meeting in May when a new design for the fish refuge network was created. Three fish refuges will be removed⁵ and the fourth and largest fish refuge will be expanded to protect five more spawning sites⁶. Whilst this represents a decrease in the overall area closed to fishing, we are satisfied that it is biologically optimal as the expansion to protect spawning area will provide additional benefits whilst the sites being removed have not shown increases in biodiversity during the last five years.

Biological monitoring for the eight SCPP Cozumel fish refuges was completed in March. We took advantage of the visit to coordinate an exchange with fishers from Baja California (who also have fish refuges) and the NGO Niparaja. Previously (2016) fishers from the SCPP Cozumel had visited Baja California. The three Baja California fishers were joined by seven fishermen and one fisherwomen to complete the monitoring in Sian Ka'an. The Banco Chinchorro fish refuge was monitored by 10 fishers during the week 14-20 May and we are currently preparing the data report (O3/A4), and the Punta Herrero fish refuges will be monitored in June before the lobster season opens in July.

Working with Bren School of Environmental Science & Management we created an application called MAREA⁷ that can be used to evaluate no take marine reserves. A webinar was conducted online⁸ in September (watched by 130 people) and a scientific paper has been published in PLOSONe journal (O3/A5). We hope this tool will be used nationally for evaluating fish refuges, and people from Honduras (CEM) have been in touch to see if it can be applied there.

We have installed six oceanographic sensors⁹ in six fish refuges that measure temperature and one sensor that measure sea level height. Twenty-two fishers took part in the installation and we are collaborating with ECOSUR and UNAM to calibrate and maintain the sensors. In November we installed an acoustic sensor in a FSA site in Punta Allen to collect continuous data on a grouper spawning site (O3/A6). We removed the sensor in March 2018 to download the data and reinstalled a new sensor. We have detected some fish but we are working with scientists to identify the species (O3/A7 turn volume up). In April 2018, due to our work in Quintana Roo, we were invited to represent Mexico in the 2nd Meeting Of The Spawning Aggregations Working Group in Miami, Florida. We shared our experiences with leading spawning aggregation researchers and managers and made some excellent contacts to further our work (O3/A8). Previously, in May 2017, we conducted a fisher exchange to Belize, in collaboration with Dr. Will Heyman and Southern Environmental Association (SEA) to share experiences between three Mexican fishers and Belizean counterparts. The fishers saw how long term monitoring has occurred, how tourism can operate at FSA sites and the benefits and problems associated with both.

Finally, we have characterized 30 FSA sites in the centre-south of Quintana Roo in collaboration with 35 fishers from five cooperatives. In the entire state, 40 sites have been

⁵ Anegado de Chal, El Faro, and Canche Balam

⁶ The fish refuge Faro Profundo currently protects a Nassau Grouper spawning site, but will be expanded to cover five more spawning sites for grouper, snapper and triggerfish.

⁷ <https://turfeffect.shinyapps.io/marea/>

⁸ <http://www.natureserve.org/general-approach-and-tool-evaluate-effectiveness-no-take-marine-reserves-juan-carlos-villasenor>

⁹ The sensors measure temperature and sea height.

characterized. Of these eight have been verified¹⁰ as spawning aggregations and four of these are protected. We also trained 19 fishers from Punta Allen, Xcalak, and Cozumel, including five women, to join the monitoring teams between July 2017 and June 2018. We have now effectively characterized all of the FSA in the southern region (with the exception of Banco Chinchorro, see *obstacles*) and with support from MARFund/FMCN¹¹ we have recently completed the characterization of the potential FSA sites in Cozumel creating bathymetric maps and including all the sites in a priority conservation index (O3/A9,A10,A11). In Puerto Aventuras we have characterized five sites and completed preliminary SCUBA dives, however we have not been able to increase our efforts in this area as it is a high-end tourist destination with no local fishing cooperative with whom we can work. This elevates costs and is not directly aligned to COBI's goals of working with local fishers.

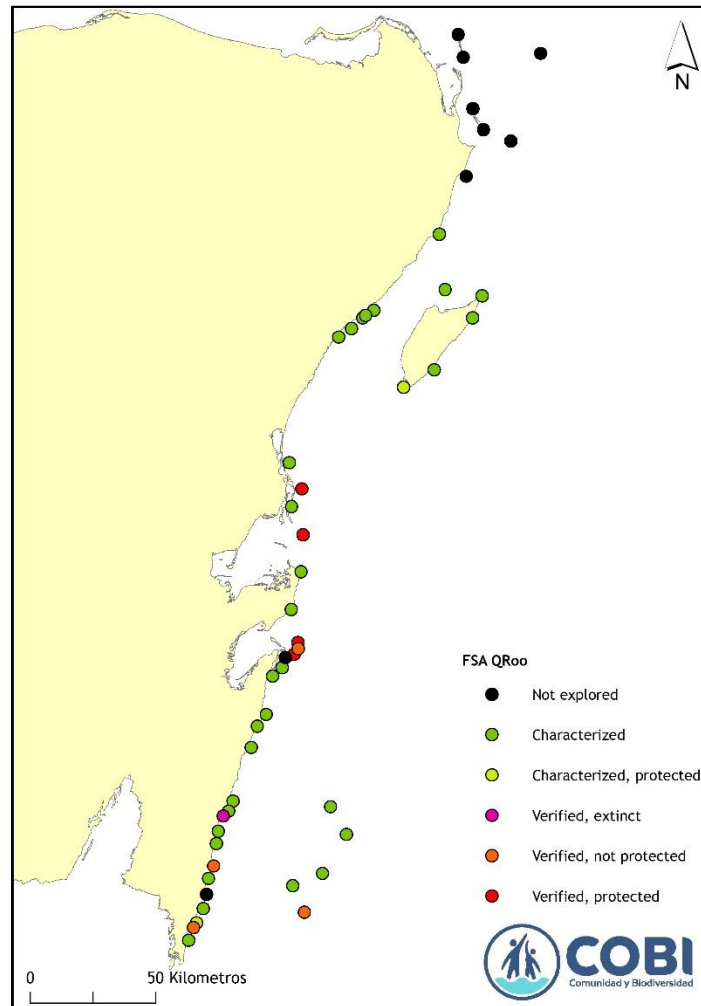


Figure 3 Location of FSA sites in Quintana Roo, and the characterization status

List of Deliverables:

- A1 Fish Refuge renewal workshop Sian Ka'an

¹⁰ It is possible that there are more than eight spawning sites, but COBI's team have not been on site at the right time to verify the presence of spawning fish. At certain sites (six sites), identified by our prioritization index we will increase diving effort during spawning season.

¹¹ Agreement: A1705006 MEX 9-018

- A2 Fish Refuge Renovation 2017-2022 Federal Register Decree
- A3 Technical Report Fish refuges Sian Ka´an 2012-2017
- A4 Draft data report Banco Chinchorro Monitoring
- A5 MAREA publication
- A6 Acoustic Sensor Training Report
- A7 Acoustic Sensor sample
- A8 Presentation Spawning Aggregation Conference
- A9 Viability Index for FSA protection 2018
- A10 Bathymetry Cozumel
- A11 FSA Video English version

O4 Scale up COBI’s demonstrative models in public fishing policy in the Mexican MAR and at national scale.

Our preliminary talks with the fishers from Yum Balam to discuss the best way of replicating the success of the Sian Ka´an and Banco Chinchorro lobster fishery has (O4/A1) led us to develop a program based on the experiences from the two sites with a sustainable lobster fishery. We will accompany the fishers from Yum Balam (two cooperatives, Cabo Catoche, Vanguardia del Mar, representing 80 fishers) over the next 12 months in the implementation of a business plan, improved competitiveness and good practices, with input provided by the Sian Ka´an fishing cooperatives. The fisher exchanges that we have conducted to date (O1/A8) have given us the necessary information to develop a thorough program to guide the cooperatives through COBI’s capacity building model and set solid institutional foundations for future conservation initiatives. In August 2018, we will hold a workshop in the north of Quintana Roo to launch the process.

The biophysical design principles for marine reserves are complete and have been published in English and Spanish (O4/A2,A3). In October 2017, a core team of COBI, TNC, CINVESTAV and Fundación Haciendas del Mundo Maya met in Mérida to begin adapting socioeconomic and governance design principles to the Mesoamerican Reef region. The core team has continued to meet in person and virtually to plan the activities and the final workshop to design the principles will be held between 18 and 21 June (O4/A4).

Finally, we have been working on creating products that use our experience from the Mesoamerican Reefs that we can apply throughout Mexico. These include national protocols for marine reserve monitoring (O4/A5), spawning aggregation monitoring (O4/A6), oceanographic monitoring (O4/A7) and a national website focused on the protection of top predators called *Giants of the Past* (draft website O4/A8). This final product will aim to be the central hub for information, in Spanish, on large marine predators (such as groupers and snappers and others listed on the IUCN Red List) for Latin America. Similarly, we are beginning a project with CONABIO to provide technical support to review and improve the information on the conservation and fishing status of more than 600 fish species¹².

List of Deliverables:

- A1 Lobster sustainability standards workshop
- A2 Biophysical principles for RZs in the MAR
- A3 Principios biofísicos en el SAM
- A4 Summary socioeconomic and governance principles SAM
- A5 Protocolo Monitoreo Reservas Marinas

¹² <http://www.biodiversidad.gob.mx/usuarios/alimentacion/peces/>

- A6 Protocolo Monitoreo Agregaciones
- A7 Protocolo Monitoreo Oceanográfico
- A8 Gigantes del Pasado mockup

Obstacles

With all the information and experience collected from the initial phase of the project (related to commercialization of sustainable fishing), we were forced to develop a new strategy after buyers at the national level showed lower than expected levels of interest in sustainable lobster. To confront this reality, we found a greater interest from markets at the local level (Quintana Roo State), so we adapted our plans to take advantage of this new scenario. At the beginning, it was a challenge to adapt, because our allies from NUUP, based in Mexico City, had a national view, and not enough state contacts to help us create a new strategy at the local level. We needed to find new ally from the Caribbean region, with experience in business models and commercialization, who could give a new shape to the second phase of the project. Fortunately, we find an organization called K'iin Impacto, based in Merida. K'iin Impacto did a great job, but this adaptation to a new ally and new strategy, took additional time. Once in the process, we found some key points that showed us the actual obstacles that could delay the beginning of a new commercial relationship between sustainable lobster cooperatives, and new buyers:

- 1) An important demand for sustainable lobster at the local level does exist and market access is not the main problem. The main problem is the lack of internal structure, capital, and business capacity in the cooperatives.
- 2) The cooperatives show great differences in terms of business and structure capacities, so each cooperative need an individual focus, not a fishery focus, to analyse this, and strengthen their individual weaknesses.
- 3) In July and August, it is difficult to enter these new markets because the volume of lobster for sale is greater than the market demand. It would force cooperatives to distribute to many different buyers to sell the entire catch, and that would require complex logistics for the fishers, and greater risks.
- 4) The hotels industry is used to paying several days after the delivery of the product, and this can represent a problem for the cooperatives, as they do not have the capital to operate in the meantime. Besides, delivering the product in advance of the payment represents a limitation in terms of trust, and traditionally the cooperatives have only built trust through long-term business relationships. This topic was discussed in the latest workshop, and we believe this could be solved by an adapted factoring scheme.

The main obstacles to fieldwork have occurred in Banco Chinchorro. Firstly, our fish spawning aggregation work in Banco Chinchorro has been heavily affected by poor weather conditions and we have not been able to reach some sites. Secondly, two fish refuge renovation workshops planned for Banco Chinchorro have had to be cancelled as we could not cross the 40 km to the atoll, again due to bad weather.

Regarding the renewal of the fish refuges, two problems come to light:

1. Lack of enforcement. The presence of CONAPESCA (responsible for enforcing fishing regulations) is effectively null. Freedom of information requests by the KKA have shown that they perform on average three inspections *per year* in Quintana Roo, and rarely act on tip offs. CONANP has often performed surveillance duties in the MPAs but lacks legal authority to detain illegal fishers and has had severe budget cuts during the last three years. This is more of an issue in Banco Chinchorro than Punta Herrero.

2. **Paternalism.** The fishing sector in Mexico has become very accustomed to receiving subsidies and hand-outs from the government in return for actions. This has become apparent in the fish refuge renewal workshops where the cooperatives have asked COBI for trucks (to move catches) or payments to renew the fish refuges. We explained to the fishers that COBI does not operate like this and the marine reserves we establish with fishers are collaborative processes with a co-investment from both parties to ensure long term resource sustainability. Fishers have permits to access a federal resource that is patrimony of the nation and as such have a responsibility (and legal obligation) to care for it with input from civil society. We will however work with them to explore sustainable financing options (as we are doing through this project) and to change attitudes and perceptions.

Links with other organizations

We continue to work closely with all members of the Kanan Kay Alliance. During this grant period, two general assemblies have been held (June 2017: 57 participants and March 2018: 32 participants). The KKA is currently going through a restructuring with Stuart Fulton leaving the voluntary Executive Coordinator post and Ines Lopez leaving the Technical coordinator post. A paid Executive Coordinator will be hired in the coming months (financed by the Claudia and Roberto Hernandez Foundation). Ines Lopez will join the coordinating group for socioeconomic development and Jacobo Caamal will lead the fish refuge group.

During late 2017 we also received funding through CONAPESCA for fish refuge monitoring and to buy SCUBA equipment in Punta Herrero. This stemmed from a proposal submitted by COBI and the cooperative to CONAPESCA in mid-2017 and is the first time that a cooperative has received funding from CONAPESCA for fish refuge monitoring¹³. This year (2018) we have submitted two more proposals to CONAPESCA with two different cooperatives. The projects have been pre-approved and hope to receive the money to begin activities soon. Additionally, during the World Ocean Summit, held in Quintana Roo in March, we took part in a side event with FMCN and the Packard Foundation to share information on the Quintana Roo fish refuges¹⁴. During this event, the Fisheries Commissioner Mario Aguilar Sanchez stated his intent to increase the amount of federal funding for fish refuge activities by 50%.

Applied & Citizen Science

Articles published during grant period:

1. Ayer et al. 2018. Halfway to sustainability Management lessons from community-based, marine no-take zones in the Mexican Caribbean
2. Chollett et al. 2017. A case for redefining the boundaries of the Mesoamerican Reef Ecoregion
3. Marcos-Camacho et al. 2016. Caracterización de la pesquería de tiburón en el norte de Quintana Roo, México
4. Espinosa-Romero et al. 2017. Civil Society Contributions to the Implementation of the Small-Scale Fisheries Guidelines in Mexico
5. Villaseñor-Derbez et al. 2018. A user-friendly tool to evaluate the effectiveness of no-take marine reserves
6. Fulton et al. Submitted. Marine Conservation Outcomes Are More Likely When Fishers Participate as Citizen Scientists.

¹³ On this occasion CONAPESCA asked COBI to manage the money as they had not managed a project of this type with a cooperative before. However we hope they can fund the cooperatives directly in the future.

¹⁴ <https://www.debate.com.mx/mexico/conapesca-refugios-pesqueros-mexico-zonas-de-produccion-reproduccion-de-especies-20180310-0003.html>

7. Fulton et al. Submitted. From Fishing Fish to Fishing Data The Role of Artisanal Fishers in Conservation and Resource Management

Description of activities for next period

Below we discuss the activities planned for the next grant period, by objective.

O1 Promote the implementation of sustainable fishing practices of the cooperatives in the Mexican MAR.

The 2018 lobster work plan will be carried out once the lobster season opens on 1st July. COBI will continue fisheries monitoring with ECOSUR generating data from the fish refuges with fishermen, and generating spaces for dialogue to achieve compliance with the activities in the work plan. In August we will conduct the second fishers' exchange between Yum Balam and the Sian Ka'an cooperatives. The next exchange will be conducted in Cozumel where the SCPP Cozumel has their infrastructure for handling live lobster. Leaders from the SCPP Vanguardia del Mar and SCPP Cabo Catoche will visit Cozumel to see the installations, tanks where the live lobster is sold, and the management process from catch to export. After the exchange, we will create a formal work plan with the SCPP Cabo Catoche for the design and implementation of a fishery improvement project.

O2 Support fishing cooperatives to be successful in financing initiatives of conservation and sustainable practices.

After the "2nd Workshop of Co-Creation and commercialization of sustainable fishing: Lobster", many organizations were interested in taking the lead to continue the efforts made in this area. The three main challenges addressed in the workshop where: 1) How to awaken greater consumer interest in sustainable fishing products? 2) How to introduce sustainable lobster into new national and international markets? 3) How to facilitate the process of buying/selling sustainable lobster? Considering this, COBI will help the newly interested stakeholders to build connections and follow up on these three main topics.

We will launch the fish refuge costing tool online application in the summer. We will pilot the tool with fishers to ensure that it is user-friendly and works on both computers and hand-held devices. We will then host the tool on the COBI website and scale up the roll out to create a useful tool for third parties in the MAR and Mexico.

O3 Protect fishing grounds, coral reefs, and Fish Spawning Aggregations (FSA) sites in the MAR (from Tulum in the center to the Belize border in the south) through a network of fish refuges.

The summer months (once the lobster season opens in July) will be used for data analysis and report writing. FSA monitoring will begin again in November, and the fish refuges will be monitored during the period March-May 2019. During July and August we will work with CONANP Cancun to devise a strategy for managing the new Nizuc fish refuge (created 24th April 2018). We will also provide follow up with CONAPESCA to the renewal process for the fish refuges in Banco Chinchorro and Punta Herrero (as long as the renewal process goes ahead as planned - if, as is possible in Banco Chinchorro, the renewal does not advance satisfactorily, we will create a case study that documents the complex web of interactions that include a conch fishing ban, Marine Stewardship Council certification and de-certification, a fish refuge, and cuts to CONANP budget, as an example of how, despite good intentions from fishers, NGOs and government, conservation actions do not always concluded as planned, and use it as a call to attention for CONAPESCA).

O4 Scale up COBI's demonstrative models in public fishing policy in the Mexican MAR and at national scale.

After the June socioeconomic and governance design principles workshop we will work with the information generated by the participants to finalize the redaction of the principles. This will be completed by the core team before being shared with the participants and managers in a final report. We are also working with a consultant (Noemi Espinosa, UNAM) to create a policy brief for decision makers that includes an evaluation of Quintana Roo's no take zones based on the design principles. This will be complete in October and will include a tool that can be used in other parts of Mexico and the MAR.

Finally, as a new component of our work, COBI has begun working to promoting gender equality in fisheries. To date, we have organized two workshops to: 1) co-design the training curricula with more than 15 experts from NGOs, researchers and Human Rights institutions; and 2) train 17 community leaders to understand what is gender equality, how to integrate the approach with human development goals, how decision making is positively impacted when gender equality exists in the process and how to use cinematographic language to communicate. In parallel we developed a coaching program for community leaders to help them design a local action plan to incorporate gender equality to improve livelihoods; and we have designed a website¹⁵ to share information about gender equality at sea. For the last semester of 2018 and through 2019, we will: 1) organize another gender training workshop in June 2018 in Cozumel; 2) continue supporting human development of community leaders through coaching; 3) host a Think Tank to develop a critical route to foster implementation of gender equality in different sectors; 4) develop indicators; 5) assess the impact of this project, and; 6) submit a scientific paper describing our experience and share widely.

¹⁵ <http://igualdadanelmar.org/>

Project development table

Objective	Output / Expected Result	Activity	Trimester								Performance indicator	Sources and means of verification	Impact Indicator	Assumptions & risks	% of Completion	
			1	2	3	4	5	6	7	8						
O1 Promote the implementation of sustainable fishing practices of the cooperatives in the Mexican MAR.	The Sian Ka'an and Banco Chinchorro lobster fishery continues to be sustainable through its participation in a Fishery Improvement Project (FIP).	1. Update, validate and implement the FIP through multi-sectoral collaboration (cooperatives, federation, local and federal government and OSCs).	X	X	X	X	X	X				(3) Meetings with the fishers, technical working group (COBI, ECOSUR, INAPESCA, CONANP) and fish buyers from Sian Ka'an.	Updated FIP document uploaded to https://fisheryimprovementprojects.org/ Minutes and presentations (ppt) from meetings with fishers, technical working group and buyers to develop FIP, List of participants and photos.	By 2018, two fisheries (lobster and newly selected fishery) will participate in Fishery Improvement Projects (sustainable fishing practices). By 2025 the 25 fishing cooperatives that form the Federation of Cooperatives of Quintana Roo (2,000 fishers) have committed to and are implementing sustainable fishing practices that are reflected in fishery stock and ecosystem health.	Assumptions rely on continued ecosystem health/minimal impacts of climate change on the fisheries. Contact has been made with the Federation to measure interest, however individual cooperatives may not show sufficient interest in implementing new practices if the goals are unclear.	60% The 2017 workplan has been updated, and 2018 workplan has been developed and will be implemented during the coming 12 months.
	Sustainable practices are replicated in another fishery site in the Mexican MAR (Yum Balam)	1. To collect data of lobster, grouper and octopus' fisheries to run a multicriteria analysis using Delphos program 2. Run the multicriteria analysis using Delphos to select another fishery based on standards for sustainable fishing in the Mexican MAR to start in a FIP.				X	X	X	X			(2) Visits are held in Yum Balam with the fishing cooperatives to collect data. (1) Meeting to run the Delphos analysis with the fishers to select the most appropriate fishery in Yum Balam.	A final report including a description of the analysis, selection process for the fishery, and the involvement of the fishing cooperatives. Minute, photos from meeting and list of participants			100% We have conducted two visits to Holbox the Delphos analysis to select the fishery.
	Three new cooperatives in the Mexican MAR are identified to implement the next generation of fish refuges.	1. To identify with the federation three cooperatives to implement the new generation of fish refuges. 2. To disseminate the ecological and economic benefits of the fish refuge.			X	X	X	X				(1) Meeting with the federation to identify the three new cooperatives (2) Fishers exchanges (8 fishers from Maria Elena community, where they have fish refuges and at least two fishers of the three new cooperatives identified).	Minute, photos from meeting, fisher exchange and list of participants.			50% We have met with the federation and produced the first report. We conducted the first of two exchanges.

O2 Support fishing cooperatives to be successful in financing initiatives of conservation and sustainable practices.	Mexican MAR lobster fishing cooperatives are aware of new options of sustainable markets.	<p>1. To establish connections and relationships between fishers and buyers</p> <p>2. To include the fishers in the NUUP platform of sustainable producers and buyers.</p>	X	X	X	X							(1) Workshop held in Mexico City with fishers (>20) and buyers (>3).	<p>Minutes from workshop and meeting.</p> <p>List of participants and photos.</p> <p>(6) Fact sheets of the cooperatives with information of the lobster fishery for buyers.</p> <p>List of fishers and buyers included in NUUP database.</p>	By 2025, six fishing cooperatives (24%) of the 25 of the federation are self-financing their sustainable fishing and fish refuges.	Fishers could potentially be demotivated if added-value commercialization is not achieved for their sustainable products.	75% We have held two workshops (1 st in Mexico City, 2 nd in Chetumal) to include the fishers' information in the NUUP platform, and discuss Q Roo markets.	
	The cost of implementing and maintaining fish refuges and sustainable fishing is known and shared among fishers.	1. Develop a tool (Excel sheet) to quantify the costs of implementing and maintaining fish refuges and sustainable fishing in the MAR.				X	X	X	X					<p>(1) Meeting with COBI's fish refuges team and accountant.</p> <p>(6) Interviews with six fishing cooperatives to review the costs of implementing fish refuges and sustainable fishing in the MAR.</p> <p>(3) Interviews with members of the Kanan Kay Alliance to review the costs of implementing fish refuges and sustainable fishing in the MAR.</p>	Tool in Excel spreadsheet format.			70% The information for the tool is now in a draft user-friendly platform. Modifications are still being made.
	At least one cooperative implements a strategy for the financial sustainability of their sustainable fisheries and fish refuges initiatives.	<p>1. Develop a work plan for financing the implementation of fish refuges and sustainable fishing.</p> <p>2. To develop an agreement for the implementation of the work plan.</p>					X	X	X	X				<p>(7) meetings, (1) for each cooperative, then (1) for the 6 cooperatives in Chetumal, Quintana Roo.</p> <p>(1) meeting to sign an Agreement detailing work plan.</p>	<p>Cooperatives data base.</p> <p>Work plan</p> <p>Signed Agreement</p> <p>Photos and minute from the meetings.</p> <p>List of participants.</p> <p>Account balance of monitoring fund.</p>			50% A cooperative has committed to the fund. The next step is to begin implementation. No progress has been made since the first trimester report.
O3 Protect fishing grounds, coral reefs, and Fish Spawning Aggregations (FSA) sites in the MAR (from Tulum in the center to the Belize border in the south) through a network of fish refuges.	The 13 fish refuges established in 2012/13 are renewed for five more years.	1. Renew the 13 current fish refuges (14,400 hectares) established for five more years.			X	X	X		X	X			<p>(50) Fishers complete the annual biological evaluations of the fish refuges.</p> <p>(2) Renewal proposals that included the 13 fish refuges submitted to CONAPESCA.</p>	<p>(2) Annual biological monitoring report.</p> <p>(2) Submitted proposal for renewing the 13 fish refuges</p> <p>Publication of renovation in the Mexican Federal Register.</p>	By 2018, biological changes in the fish refuges will be: <ul style="list-style-type: none"> Lobster abundance. 2016: 527 ind ha⁻¹. 2018 target: 580 ind ha⁻¹. Fish biomass (commercial species). 2016: 	The cooperatives have already communicated their desire to continue with the fish refuges however a convincing case for renewing the fish refuges must be presented, using monitoring data collected by the	50% (one of two decrees renewed – in María Elena, Sian Ka'an, eight fish refuges). Monitoring completed for 9/13 fish refuges.	

	<p>Climate change monitoring (temperature and salinity) is incorporated in to the fish refuge monitoring program</p>	<ol style="list-style-type: none"> 1. Train 10 fishers to install and maintain oceanographic sensors. 2. Install and maintain oceanographic sensors in four fish refuges. 3. Share with all sectors the data obtained with the sensors. 			X	X	X	X		<p>(10) Fishers trained to install and provide maintenance to the oceanographic sensors.</p> <p>(5) Sensors installed to measure temperature and salinity in four fish refuges (one in Banco Chinchorro, one in Punta Allen, one in Punta Herrero and two in Maria Elena).</p> <p>(4) workshops, one in each community (Punta Herrero, Banco Chinchorro, Punta Allen, and Maria Elena), to share data.</p> <p>(1) Presentation of the results to Kanan Kay Alliance.</p>	<p>Minutes from workshops.</p> <p>List of participants and photos.</p> <p>Oceanographic sensors installed.</p> <p>Data from sensors included in technical report and shared.</p>	<p>159.5 g m⁻². 2018 target: 175 g m⁻².</p> <ul style="list-style-type: none"> • Coral Cover. 2016: 14.4% hard coral cover. 2018 target: coral cover remains at the same level as 2016. <p>By 2018, sixty fishers from six cooperatives participate in the search for fish aggregation sites.</p> <p>By 2025, the network of fish refuges in the Mexican MAR has increased in area from the current 14,400 ha to 20,000 ha, that protect FSA sites.</p>	<p>fishers themselves.</p>	<p>50% Five sensors have been installed (in Punta Allen, Maria Elena, and Punta Herrero), and workshops completed in two communities (Punta Allen and Punta Herrero).</p>
	<p>50% (approx. 25 sites) of the grouper/snapper FSA sites in the Mexican MAR are characterized and validated by fishers and COBI.</p>	<ol style="list-style-type: none"> 1. To characterize FSA in the center and south of the Mexican MAR (from Tulum in the center to the Belize border in the south). 2. To monitor previously explored FSAs 	X	X	X		X	X		<p>(10) site visits covering a total of 25 sites.</p> <p>(19) fishers participating in the characterization of 15 new FSA.</p> <p>10 FSA sites monitored once a year by 41 fishers.</p>	<p>Characterization report and priority index for conservation for each FSA site.</p> <p>Bathymetric maps. Video and Photo.</p>			<p>75% 30 sites have been characterized and monitored. Ongoing work during spawning season (Nov-Mar)</p>
<p>O4 Scale up COBI's demonstrative models in public fishing policy in the Mexican MAR and at national scale.</p>	<p>The lobster fishery model developed in Sian Ka'an and Banco Chinchorro inspires other fishers in the MAR and decision makers to meet sustainability standards.</p>	<ol style="list-style-type: none"> 1. Promote the implementation of standards for sustainable fishing in other fisheries with fishers and decision makers, using the lobster fishery as case study. 			X	X	X	X	X	<p>(1) Workshop (two days) held in the north of Quintana Roo with four fishing cooperatives (>30 fishers) and decision makers (CONAPESCA, INAPESCA, CONANP).</p>	<p>Minute from workshop. List of participants and photos.</p>	<p>By 2025, the results from the participatory models in the MAR are replicated and/or incorporated in to regional and national fish policies in Mexico led by CONAPESCA, INAPESCA and CONANP.</p>	<p>Not applicable.</p>	<p>50% The workshop is planned for August and the standards will be implemented over the coming year. Government agencies have been involved in the process to see how the model can be replicated in other areas</p>

	Design principles for fish refuges in the MAR are created through a collaborative process involving the four MAR countries.	2. Develop design principles (biophysical, socioeconomic and governance) for fish refuges network that include fisheries, biodiversity and climate change objectives for Mexican coral reefs	X	X	X	X					(2) Workshops conducted with key stakeholders from the MAR region (Mexico, Belize, Guatemala, Honduras) with approx. 30 participants in each workshop. The first workshop will be held in Cancun, the second will be confirmed during the first workshop.	Publication of design principals for marine reserves in the MAR. Workshop minutes, photos and list of participation with researchers, government officials and key stakeholders in the MAR.		60% Biophysical principles are complete. Socioeconomic principles will be completed in June.
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