

REEF RESCUE INITIATIVE

Post-Storm Reef Response Capacities in the Mesoamerican Reef Region (MAR)

he Mesoamerican Reef (MAR) is the largest coral reef system in the Atlantic Ocean, stretching more than 1,000 kilometers along the coastline of Mexico, Belize, Guatemala, and Honduras. The MAR contributes more than USD 4.5 billion in various ecosystem benefits, providing coastal protection, and providing livelihoods through tourism, and fisheries to the region (IDB, 2021; WTW, 2020)¹.



The Mesoamerican Reef Fund (MAR Fund) is a private regional environmental fund, which was created with the objective of contributing to the protection of the MAR Region. Its mission is to seek, secure and facilitate regional financing, foster partnerships and drive capacity building for the conservation, restoration, and sustainable use of marine and coastal ecosystems in the Mesoamerican Reef.

MAR Fund, through the Mesoamerican Reef Rescue Initiative (RRI), is working to protect and increase the resilience of the MAR and the environmental and cultural services it provides, through capacity building, better regulations, regional protocols, and funding for effective and timely reef restoration.

1 Economic Valuation of the Ecosystem Services of the Mesoamerican Reef, and the Allocation and Distribution of these Values



Strengthening post-storm reef response capacities in the MAR

very year, coral reefs are threatened by the impact of hurricanes, reducing their structural complexity and coral cover, putting at risk the ecosystem and ecological services they provide. For this reason, an immediate response drives the recovery of reefs, improving both the resilience of the ecosystem and the economy related to them, as well as the livelihoods and coastal protection of the millions of people who depend on this natural infrastructure.

This is why MAR Fund, through the RRI, and with the support of local partners, has formed post-storm response groups, with the aim of coordinating and carrying out immediate response actions on corals after the impact of a hurricane.

In the MAR, post-storm response groups have been trained and formalized following the guidelines described in the **Early Warning and Rapid Response Protocol - Actions to mitigate the impact of tropical cyclones on coral reefs**². This protocol aims to guide brigade members and response coordinators in the steps to follow before, during, and after a hurricane to effectively and promptly mitigate the impacts on coral reefs. The protocol was developed by The Nature Conservancy (TNC), with the support of Mexico's National Commission of Natural Protected Areas (CONANP), the National Institute of Fisheries and Aquaculture of Mexico (INAPESCA), and experts in reef response management.

MAR Fund, in coordination with TNC and with the support of local authorities and partners, has promoted the implementation of this protocol in the four countries of the MAR. The protocol is general in application, meaning it can be applied and scaled to other geographic areas.

² Early Warning and Rapid Response Protocol - Actions to mitigate the impact of tropical cyclones on coral reefs

Operational structure of the post-storm reef response

n accordance with the description in the Early Warning and Rapid Response Protocol, the following structure is suggested for the organization and operation of the Protocol and the implementation of the reef response:

- 1. Response Coordinating Committee
- 2. Operations Committee
- 3. Response Brigades, and
- 4. Network of allies.

This ensures the post-storm reef response is effective through a solid structure made up of the following components:

- Governance: This is key to effective coordination, decision-making and leadership in addressing reefs impacted by climate events in the MAR region.
 - In the Post-Storm Reef Response, governance consists of a leading entity, represented by a government institution, responsible for the management of reef sites and marine protected areas (MPAs) where they are located. The lead entity, among its functions, is responsible for supporting the Coordinating Committee in government efforts during the different stages of the response and immediate attention.
 - The **Response Coordinating Committee** is made up of a team of four to six people who will act as coordinator, secretary, brigade leader, and operations leader. Their duties include coordinating and leading the actions of the brigades and the operations committee, managing funds for the implementation of the response, training the brigades, developing and updating the Post-Storm Response Plan for the site, among others. This team is a primary decision-maker. It is in charge of coordinating with the leading entity, the operations committee, the network of allies, and other key institutions during the different stages of the response.

- The **Operations Committee** is made up of a team of two to four people. Its objective is to coordinate the logistical and operational actions of the response, as well as communication, team mobilization and the supply of inputs and materials, the toolbox and other resources necessary for the brigades to carry out the different stages of the response.
- The Network of Allies is made up of governmental and non-governmental organizations, as well as independent collaborators who want to support and complement post-storm response efforts. The committees and the network of allies can be made up of representatives from government institutions, non-governmental organizations (NGOs), scientists, community members and the private sector.
- The Brigades. A group of people trained to carry out post-storm rescue and restoration activities on coral reefs. Each brigade can include ten certified brigade members, six divers and four snorkelers. A brigade is led by the brigade leader. The number of brigade members in a brigade to respond to an event depends on the magnitude of the event and the resources available for response.
- The Post-Storm Response Plan is a management tool developed based on the Early Warning and Immediate Response Protocol. The Response Plan is a site-specific document and details the activities to be followed before, during and after the impact of a hurricane. Its objective is to ensure a timely and effective response to coral reefs. The Response Coordinating Committee is responsible for developing and updating its own response plan annually.

Supporting the post-storm reef response capacities in the MAR

n 2021, MAR Fund initiated building the governance and response capacities for the rapid response to reefs in the face of hurricanes. These capacities have been installed in collaboration with TNC and with the support of environmental, biodiversity and natural resources authorities in charge of managing protected areas and reef sites in the four MAR countries. The support of our donors has also been key to these achievements. Currently, seven Post-Storm Response Coordinating Committees for reefs have been created, trained and formalized. One in Mexico³, two in Belize, three in Honduras and one in Guatemala (Figure 1). Each Committee has developed its Post-Storm Response Plans, specific to each site. In addition, 17 brigades have been formed, for a total of 168 brigade members, of which 19 have been trained and certified as brigade trainers.







³ The National Commission of Protected Natural Areas (CONANP) has installed more capacities in Mexico. The number reported in this document reflects installed capacities only by MAR Fund.

TABLE 1. Reef response capacities formed from 2021 to 2024.

Country	Reef sites	Coordinating Committee	Post-Storm Response Plans	Brigades	Brigade members	Certified trainers
Mexico*	Banco Chinchorro e Xcalak, Puerto Morelos	1	1	3	30	7
Belize	Turneffe Atoll, Hol Chan, Glover´s Reef, South Water Caye	2	2	5	55	4
Guatemala	Cabo Tres Puntas, Motaguilla	1	1	2	19	3
Honduras	Tela Bay, Bay Islands, Cayos Cochinos	3	3	7	64	5
Total		7	7	17	168	19

*The numbers for Mexico reflect the capacities formed by MAR Fund and partners from 2021 to 2024.

Exchange of experiences

n November 2023, MAR Fund coordinated the first Regional Workshop for the Exchange of Experiences in Post-Storm Response Capacity to Mitigate the Impact of Hurricanes on Coral Reefs"⁴. More than 100 people from different sectors participated in the workshop, including brigade members, members of the Coordinating Committees, representatives of NGOs and authorities from the four MAR countries. Representatives of the Coordinating Committees from the four MAR countries presented their experiences, challenges and success stories with response capacities in their country. At the workshop, participants agreed to implement a continuous monitoring system to understand the health of the reef, strengthen collaborations between authorities and response capacities, strengthen national and regional collaborations and seek more funding to create more capacities in attention to coral reefs in the region.



4 Virtual Regional Workshop for the Exchange of Experiences in Post-Storm Response Capacity to Mitigate the Impact of Hurricanes on Coral Reefs

Strengthening Post-Storm Response Governance for reefs in the MAR

n 2024, MAR Fund trained 64 people, representatives of various governmental and non-governmental organizations in the MAR. Through this training, the capacities of national and local authorities, as well as experts in different areas, were strengthened, providing them with key knowledge on planning, management and coordination for the post-storm response for reefs. It also promoted local participation and the exchange of experiences among participants, which enriched collective learning; thus contributing to true collaboration for the benefit of all.

Implementing response actions to coral reefs

Puerto Morelos Reefs National Park, Quintana Roo, Mexico

In October 2020, Hurricane Delta, a category 2 event, and Tropical Storm Zeta impacted the reefs in Puerto Morelos. Post-storm response activities, led by CONANP, were carried out by the Puerto Morelos brigades in collaboration with personnel from the Puerto Morelos National Reef Park (PNAPM) and the National Fisheries Institute. A total of seven reef sites, covering an area of 1.25 hectares, were intervened in the PNAPM, stabilizing 1,192 coral colonies and cementing 7,766 fragments of Acropora palmata, Acropora prolifera, and Agaricia sp., as well as stabilizing 14 colonies of soft corals. A total of 23 brigade members from governmental institutions, NGOs, and the private sector supported the post-storm assessment and restoration actions. The post-storm response activities were funded through RRI's Emergency Fund⁵.

Solution Turneffe Atoll Marine Reserve, Belize

In November 2022, parametric reef insurance was triggered when Category 1 Hurricane Lisa impacted the Turneffe Atoll Marine Reserve in Belize. This event resulted in a USD 175,000 insurance payout for Turneffe. MAR Fund received the payout through the Emergency Fund and transferred it to the Turneffe Atoll Sustainability Association (TASA), the organization tasked with managing the insurance funds for the Post Storm Response Coordinating Committee and leading response activities at the affected site.

Following the event, TASA led the response, managing to intervene at two sites on the atoll, stabilizing 107 fragments of *Acropora* sp., three branches of *Acropora palmata*, 65 colonies of soft and hard corals, one fragment of *Dendrogyra cylindrus* and two of *Porites porites*. Additionally, 68 fragments of *Acropora cervicornis* were transferred to an on-site nursery. A brigade made up of 18 representatives from NGOs and government institutions participated in the post-storm response activities.

⁵ Operation Guidelines for the Emergency Fund for the Mesoamerican Reef



Banco Chinchorro Biosphere Reserve, Quintana Roo, Mexico

In April 2023, Stony Coral Tissue Loss Disease (SCTLD) was reported for the first time in the Banco Chinchorro Biosphere Reserve, Mexico. In August 2023, with the aim of rescuing and relocating coral fragments of the species highly susceptible to SCTLD, *Dendrogyra cylindrus* and *Meandrina meandrites*, the CONANP carried out rescue actions with the support of MAR Fund, which provided financing from the Emergency Fund. A total of 76 fragments were rescued and relocated to on-site nurseries with the help of 12 brigade representatives from government institutions, NGOs and the tourism sector.

Puerto Morelos Reefs National Park, Quintana Roo, Mexico

In July 2024, Hurricane Beryl, a Category 2 storm, impacted the coasts of Puerto Morelos, causing significant damage to the already vulnerable coral colonies. In response, CONANP led the post-storm response

activities, which included the rescue of coral fragments and colonies, the inspection and monitoring of nurseries, and the mobilization of a team consisting of 32 brigade members, 6 volunteers, and several boats. Following the Early Warning and Rapid Response Protocol, the brigade members carried out actions at five sites within PNAPM: Ojo de Agua, Unidad Arrecifal (UA) Limones, Unidad Arrecifal Jardines Somero, Sitio Fish Market, and Unidad Arrecifal "La Pared." Efforts focused on the recovery of key species such as Acropora palmata, Orbicella faveolata, Pseudodiploria strigosa, and Porites porites, as well as some soft corals. As a result, 193 coral colonies and 1,038 coral fragments were successfully stabilized. During the subsequent monitoring phase, 166 corals were evaluated, of which 161 remained alive, reflecting a high survival rate. These actions were made possible thanks to funding from MAR Fund's Emergency Fund, through the Reef Rescue Initiative.



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You can visit our website to find out more about the initiative: www.marfund.org • https://marfund.org/en/reef-rescue-initiative/



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