

# Mangrove Ecosystem in the Mesoamerican Reef Ecoregion (MAR): its conservation, restoration, and monitoring

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**W**ithin the framework of the Cartagena Convention and the UN Decade of Restoration, as well as the Declaration of the Council of Ministers of Environment of the Central American Commission on Environment and Development (CCAD) on restoration commitments regarding the Bonn Challenge, the mangrove ecological restoration (ER) is considered a nature-based solution (NBS) that allows for a common response to the effects of climate change.

Mangroves are a vitally important ecosystem, and the ecosystem services they provide benefit both the health and integrity of the reef and coasts, as well as the safety of their inhabitants. This ecosystem is threatened in the Mesoamerican Reef ecoregion, hence the importance of having mechanisms that contribute to its management, conservation, and restoration.

In this context, the CCAD, through the "Integrated Ridge to Reef Management of the Mesoamerican Reef Ecoregion" (MAR2R) Project, in coordination with MAR Fund, developed the project "Engaging local communities in the conservation and restoration of mangroves and coral reefs and promoting good practices in sustainable fisheries in the MAR." This was possible with funding from the Global Environment Facility (GEF), through the World Wildlife Fund (WWF) as the implementing agency for the MAR2R Project.

## RESULTS

### 1. "Regional Strategy for Mangrove Management, Conservation, Restoration, and Monitoring in the Mesoamerican Reef 2020-2025<sup>1</sup>."

This regional instrument was developed under an alliance comprised of MAR Fund, the Smithsonian Institute, the MAR2R Project, and key stakeholders from Mexico, Belize, Guatemala, and Honduras. The strategy is a reference platform for shared actions in the four countries that make up the Mesoamerican Reef ecoregion (MAR). Its specific objectives are focused on:

- 1) Managing, conserving, restoring, and monitoring the mangrove ecosystem.
- 2) Promoting sustainable livelihoods.
- 3) Promoting effective implementation of legal frameworks and strengthening the governance and effective participation.
- 4) Developing knowledge management, monitoring, and surveillance system.
- 5) Secure financial resources for implementation.



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<sup>1</sup> <https://repository.si.edu/handle/10088/107481>

The strategy was shared with and validated by 72 key stakeholders (35 women and 37 men) of the ecoregion and distributed through different virtual platforms of the partners.

## 2. Manual for the Mangrove Ecological Restoration of the Mesoamerican Reef System and the Wider Caribbean<sup>2</sup>.

To strengthen local, national, and regional capacities regarding the restoration of mangrove ecology and the ecosystem services it provides in the MAR region and the Wider Caribbean, MAR2R Project, UNEP - Cartagena Convention, and MAR Fund joined forces, approached scientific experts in the field, and worked on the design of this manual. The manual is being implemented to strengthen local, national, and regional capacities for effective restoration in the MAR region and the Wider Caribbean.

MAR Fund is currently negotiating to implement a mangrove restoration project in the MAR region using the manual as a guide. This project involves the Center for Research and Advanced Studies of the National Polytechnic Institute (CINVESTAV, for its initials in Spanish), the Foundation for Eco-development and Conservation (FUNDAECO, for its initials in Spanish), and the Center for Marine Studies (CEM, for its initials in Spanish) so far.

## 3. Conservation, Restoration, and Monitoring of the Mangrove Ecosystem with Community Leadership in the AUMRS.

Community participation is important for successful ecosystem management and restoration actions. In the Sarstún River Multiple Use Area (AUMRS, for its initials in Spanish), a protected area located in the Guatemalan Caribbean, the communities of San Juan and Barra Sarstún implemented a project that promoted mangrove protection in that region, with the support of EcoLogic Development Fund and APROSARSTUN



(a community organization). Five hectares of mangrove were restored in the community of San Juan and 2.09 in the community of Barra Sarstún. Also, 248 participants (147 women and 101 men) signed up for 16 training workshops on mangrove conservation, mangrove ecosystem, and forest nurseries.

One of the sustainability tasks supported by this project consisted of arranging the leasing of the areas to be conserved and restored at the Office for the Control of State Reserve Areas (OCRET, for its initials in Spanish) to register these plantations into the PROBOSQUE Forestry Incentives Program of the National Forest Institute (INAB). On August 9, 2022, EcoLogic received a favorable resolution from the National Council of Protected Areas (CONAP, for its initials in Spanish) for the three files. On August 11, 2022, they were submitted to INAB for enrollment in the PROBOSQUE program. As a result, 49.2 ha of forest were registered, representing an income of US\$350/ha/year for the community for 10 years.

<sup>2</sup> <https://marfund.org/es/manglares/#Manual>

#### 4. Mangrove mapping (regional-national)<sup>3</sup> in the MAR ecoregion.

With a spatial resolution of 10 meters and using the Google Earth Engine platform, scientists Jordan R. Cissell of Samford University's Department of Geography and Steven W.J. Canty of the Smithsonian Institution's National Museum of Natural History, Working Land and Seascapes, mapped mangroves in the MAR ecoregion.

The report<sup>4</sup> indicates a total cover of 3,143.04 km<sup>2</sup> for all the MAR, distributed as follows: 2,454.70 km<sup>2</sup> in Mexico, 578.54 km<sup>2</sup> in Belize, 101.42 km<sup>2</sup> in Honduras, and 8.38 km<sup>2</sup> in Guatemala. This is the first time the mangrove ecosystems of the four MAR countries have been mapped using a standardized methodology with high spatial resolution. It also provides a detailed and accurate description of the MAR mangrove ecosystems for 2020 and a baseline consistent enough to monitor future changes in mangrove ecosystems in the region.

These maps are a tool for monitoring and evaluation of the mangrove ecosystem to identify the sites where coverage should be increased with restoration activities. Due to their importance, MAR2R Project will share these maps with the environmental authorities of the four countries of the ecoregion so that they can decide what the best use of the data provided is.

## LESSONS LEARNED

- ▶ The participation of the communities in project planning is essential in order to have their support during the implementation and to empower community members for follow-up actions.
- ▶ It is necessary to promote effective mangrove restoration projects in the MAR ecoregion because of the goods and services that the ecosystem provides.
- ▶ The coordinated work of experts at the regional level provides tools for conservation.



## IMPACT

- ▶ Key stakeholders in the MAR ecoregion have information and management tools to promote marine resource management, specifically to address mangrove restoration.
- ▶ Regional projects, such as the MAR2R Project, produce and strengthen partnerships, and encourage other donors to continue supporting these successful initiatives. As an example of sustainability and to give continuity to the projects promoted by the MAR2R Project, MAR Fund will continue to support the project "Communities of the Sarstún River Basin strengthen their resilience and adapt to climate change," implemented by EcoLogic. In addition, key partners in mangrove restoration, such as CINVESTAV and the National Autonomous University of Mexico (UNAM), use and promote the manual in their restoration projects and through the 2nd Congress of Mangroves in the Americas.

<sup>3</sup> <https://marfund.org/es/manglares/#ArchivosKMZ>

<sup>4</sup> <https://marfund.org/es/manglares/#ReporteFinal>