



# FISH REFUGES

To recover fisheries and marine ecosystems in the Mesoamerican Reef (MAR), the creation of fish refuges also known as fish replenishment zones is being promoted.

## Mesoamerican Reef

The MAR is the largest cross-border coral reef in the Atlantic. Its 1,000-kilometer coastline stretches from the tip of the Yucatan Peninsula in Mexico to the Bay Islands in Honduras, passing through Belize and Guatemala.



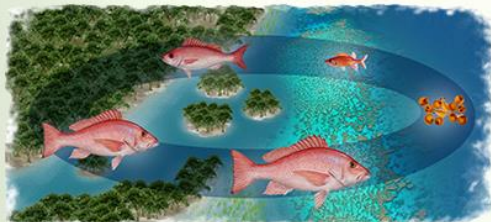
## MAR Biodiversity

MAR ecosystems include life refuges—mangroves, sea grasses and coral reefs—that are habitats for at least 500 species of fish, 66 species of spiny corals a large population of manatees, dolphins, stingrays, sharks and marine turtles, some of which are endangered.



## Cascade effect

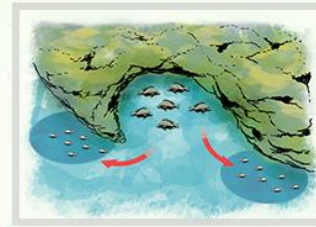
In fish refuges the entire ecosystem recovers when there is no fishing. There is spillover, for example with lobsters leaving areas protected by fishers and moving into fishing areas, benefits fishers and supports the recovery of species.



## Life cycles

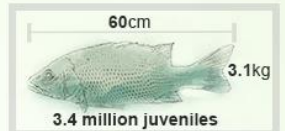
Many species in the MAR use different ecosystems during the various stages of their lives. Therefore a comprehensive protection of ecosystems is essential to maintain and ensure healthy and abundant species. These ecosystems include mangroves, sea grasses and coral reefs.

- (1) Mangroves
- (2) Sea grasses
- (3) Coral reefs
- (4) Open sea



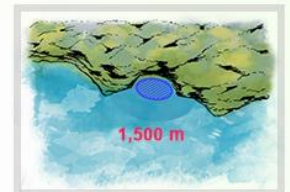
## Overspill benefits

Larvae and juveniles seek protection in mangroves, coral reefs and sea grasses, which are key ecosystems in fish refuges. With the increasing number of organisms, species spill outside the reserve and thus benefit fishers. The spillover of fish more than compensates the loss of income due to no fishing.



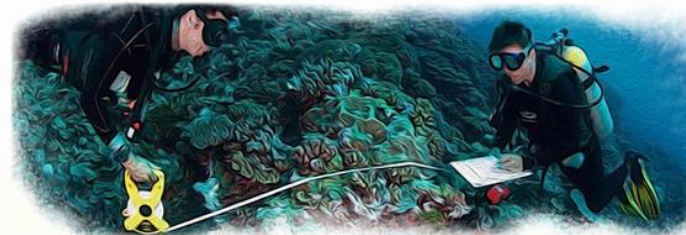
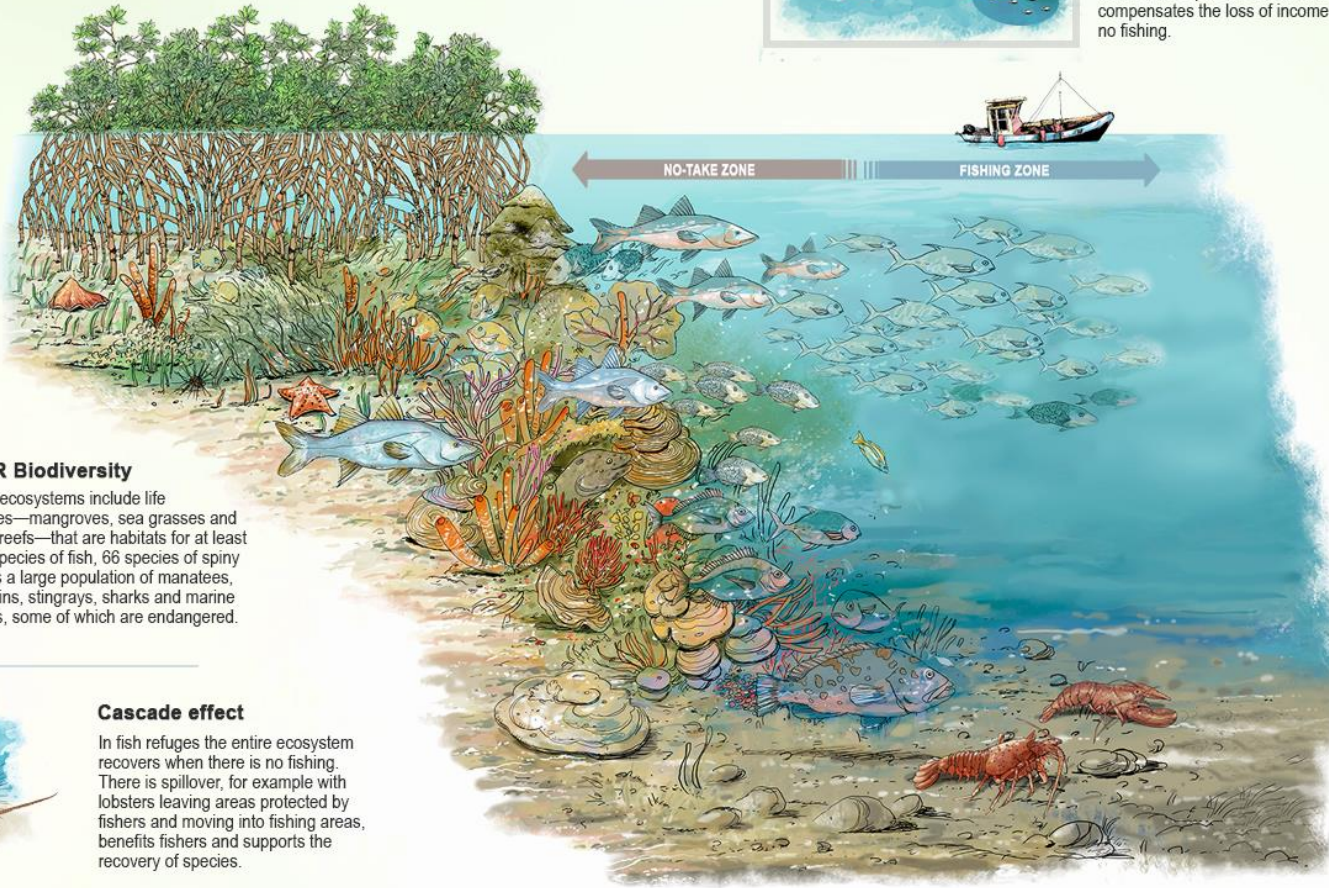
## Descendants and maximum size

It is important to allow species to reach their maximum size. Larger fish are able to produce more young. Upon reaching maturity, juveniles will spread within and outside the fish refuge.



## Spillover zones

Overspill zones are next to fish refuges. After recovering and growing within fish refuges, species spread outside and can be fished according to allowed fishing regulations. Spillover areas are mostly outside marine biodiversity nurseries and include mangroves, sea grass beds and coral reefs of the MAR.



## Monitoring

Underwater monitoring allows determining which species are present, as well as their number and size. Monitoring must be done regularly and always using the same methodology. It is important to monitor within and outside fish replenishment zones to compare differences and assess whether their purpose is being fulfilled.