

Participation and patrols promote sustainable fisheries in the Mesoamerican Reef Region.

Caribbean reef fisheries are highly diverse ecologically, socially and economically. However, management and conservation efforts often rely on a conventional top-down approach, which fails to incorporate a fishery's diversity into its framework. Here we present a case study of Los Micos Lagoon, a coastal lagoon responsible for seeding fish biomass in sites with some of the highest live coral cover in the Mesoamerican Region, the Tela Bay (Honduras) reefs. Through an adaptive co-management approach, local stakeholders sequentially implemented different strategies to improve fish biomass: (1) Temporal fishing bans, (2) Increased enforcement and (3) Locally-adapted Territorial Use Rights for Fishing (TURFs). We used both fishery-dependent (dockside landings monitoring) and independent (scientific fishing surveys) sampling to test the impact of the different management strategies from 2017 to 2019. Fish biomass increased only 10% after the implementation of the temporal ban, but biomass increased 171% when the temporal bans were paired with enforcement patrols. Furthermore, when the TURFs were added, fish biomass increased by 689%. This increase in fish biomass was also reflected in a doubling of profits when TURFs were incorporated into the management system. The Los Micos Lagoon case study demonstrates that in complex socioecological systems, such as coral reef fisheries, it is important to include local stakeholders in the management process to tailor management strategies to their needs; complex problems require participatory solutions.