

# CARIBBEAN ECO-NEWS



## Coral Reef Restoration: Is It Worth It?

by Genevieve Renaud-Byrne

Caribbean islands and their inhabitants have evolved side by side with coral reefs, depending on them as a vital source of food, coastal protection, and later, tourism. Nonetheless, coral reefs and adjoining coastal ecosystems have been undervalued and mismanaged for decades. It is estimated that climate change, overfishing, habitat destruction and pollution have destroyed half of the world's coral reefs since 1950. A further 90 percent of remaining corals will be threatened by 2030 unless drastic actions are taken to reduce threats.

In the Caribbean, branching and bouldering stony corals form the foundation of near-shore reefs, creating wave-breaking reef systems which protect lagoons and beaches, while providing a complex habitat for thousands of reef organisms. Reef-building species responsible for



Once thriving coral reefs are now fields of dead coral skeleton covered in algae.

creating this habitat and thus supporting vital ecological services include the elkhorn coral (*Acropora palmata*), which currently faces an extremely high risk of extinction.

The island of Antigua in the lesser Antilles has long been protected from the wrath of the Atlantic Ocean by an intricate fringing reef system dominated by elkhorn coral which, like most reefs within the region, has been heavily degraded. Vast underwater fields of crumbling coral skeletons covered in algae now dominate the seascape. Marine ecologist Ruleo Camacho and his colleagues found that live coral covered only 9 percent of Antigua's reefs in 2020, compared to the 40



A few surviving elkhorn corals stand tall among skeletons.

percent observed in healthy reef systems. Fortunately, small patches of living coral colonies still exist, many containing genetic properties that have allowed them to persist through difficult conditions. While their survival sheds light onto the resilience of the ecosystem, they are unfortunately too few and far between to support ecosystem recovery without intervention.

The Elkhorn Marine Conservancy (EMC) was established in 2021. Since its inception, the EMC has successfully grown and planted thousands of endangered corals back onto the reef, while striving to increase public awareness, advocating for policy change, implementing educational programs and developing science-based strategies to protect Antigua's waters.

ELKHORN MARINE CONSERVANCY



Planting corals involves using cement or epoxy to "glue" healthy coral fragments onto degraded reefs. Here, the EMC team is planting elkhorn coral onto a patch reef adjacent to Green Island, on the east coast of Antigua.

This year, just as the EMC's coral reef restoration program entered its third year, an El Nino event caused sea surface temperatures to rise across the globe. By mid-summer, the impacts of this climate event had exacerbated the impacts of global warming, driving unprecedented heat stress in many Caribbean and Meso-American reefs. Mass coral mortality was reported in Florida after reefs were exposed to temperature highs exceeding 31C (88F) for several weeks. This crisis comes at a time when Caribbean reefs are

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Healthy coral reefs grow in the shallow surf zone, breaking waves and providing habitat for fish, an important source of protein for Antiguan and Barbudans.

already exposed to a deadly stony coral tissue loss disease (SCTLD) epidemic, depleted fish populations and reduced water quality. At the time of writing this article (late August 2023), water temperatures in Antigua were hovering just below the Caribbean's mean bleaching threshold, sparing the EMC's coral nurseries and adjoining reefs for the time being.

This year's unfortunate events and future climate projections call into question the feasibility of large-scale coral reef restoration. Why should we invest time and resources into restoring a habitat that will struggle to thrive under current or future conditions?

There is of course the argument for saving species from extinction. Stony corals such as elkhorn help define the entire ecosystem.

Without these keystone species coral reefs would cease to exist altogether. By allowing human activities to wipe out corals,

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we are accepting the narrative that Caribbean reefs and the small islands that depend on them are less important than the economic and political drivers that have led to their demise.

Second, we must not underestimate nature's capacity for adaptation, and instead provide it with a helping hand. The rate of change in ecosystem conditions (e.g., water temperatures) has been incredibly rapid relative to the world's natural history. Natural selection cannot keep up, especially in the case of slow-growing species such as coral. By helping corals reproduce asexually through the process of fragmentation, coral reef practitioners at EMC and around the region can help. A piece of coral can be cut into dozens of fragments, which will grow and provide hundreds of fragments to be replanted on the reef. To date, the EMC has planted 4,610 corals from 81 genetically distinct species onto degraded reefs around the east coast of Antigua, equivalent to 23,000 square feet (0.53 acres) of restored reef, and aims to plant an additional 8,000 corals in the coming year. By planting these corals within close proximity, they can also start to sexually reproduce on the reef, creating potentially stronger genetics.

Finally, the capacity of coral reefs, seagrass beds and mangrove forests in mitigating the impacts of climate change and pollution should not be overlooked. Reefs are the stronghold of this coastal trio, breaking and dissipating wave energy and supplying fish and invertebrate larvae to the adjacent ecosystems which support their health and productivity. Together these ecosystems are reducing the amount of carbon in our atmosphere and working tirelessly to filter pollutants and absorb nutrients, all while supplying coastal communities with an essential source of food and protection. Restoring and conserving our environment continues to be our greatest solution in addressing the climate crisis.

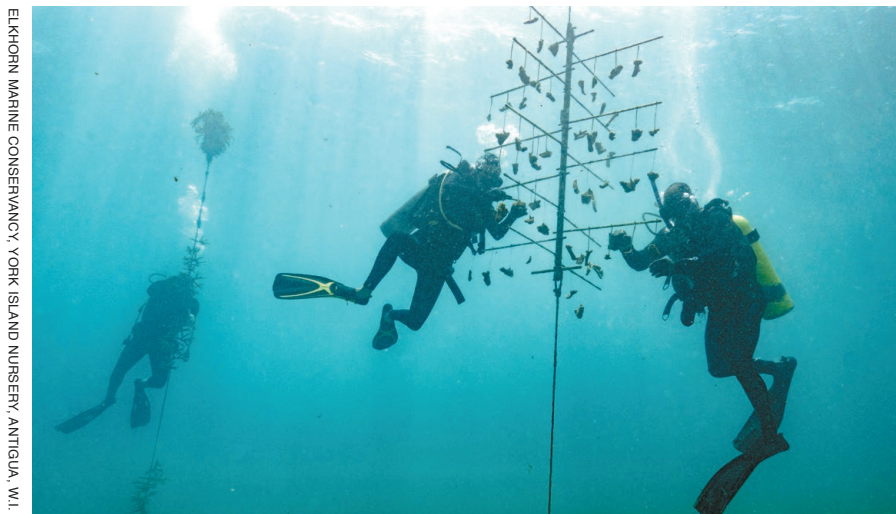
While projections for future warming are alarming even in the short term, we still have time to slow and reverse the impacts of climate change. Immediate action needs to take place both within communities and at the international scale to reduce greenhouse gas emissions,

regulate fisheries, minimize pollution and enforce protected areas. Coupling these actions with active restoration to ensure coastal ecosystems are abundant and resilient enough to continue supplying invaluable services to small island states is imperative. Furthermore, decreasing community vulnerability by creating new employment opportunities within the field of restoration, conservation, sustainable tourism and mariculture ensures coastal communities are both sustaining their economies while putting carbon back in the ground.


To take part in the solution, consider how your personal actions, investments and influence can help reduce emissions. To support the Elkhorn Marine Conservancy, please visit the website: [www.emcantigua.org](http://www.emcantigua.org)

*Genevieve Renaud-Byrne is a marine scientist and project manager with the Elkhorn Marine Conservancy.*

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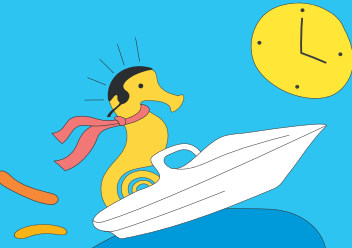
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