



Elkhorn Marine  
Conservancy



ANNUAL  
REPORT  
2022  
2023



# A message from our board

Dear Friends and Supporters of the EMC,

It is my pleasure to provide you with the Elkhorn Marine Conservancy's Annual Report for the fiscal year ending on June 30, 2023. The EMC's fiscal year concludes at the end of June consistent with the end of the spring season on Antigua.

Our mission is to enhance the resilience and local stewardship of Antigua's marine ecosystems through restoration, collaborative management, and conservation.

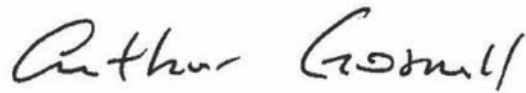
These restoration and conservation activities are critical for the future well-being of the island. Healthy coral reefs break up wave energy and protect the Antiguan coastline from erosion. Reefs are key to the Antiguan economy by impacting the tourism and fishing industries. And finally, healthy reefs are a legacy we want to leave for generations to come.

Led by our science team of Dr. Molly Wilson and Geneviève Renaud-Byrne, along with a terrific group of local staff and volunteers, the EMC has had a very successful year. We have planted over 4,600 corals, diversified into working with 12 different coral species, and built strong relationships with local stakeholders, including tour operators and fishermen, to foster sustainable behavior. These are just a few examples among a long list of achievements.

I would like to thank all of our EMC members and friends for the high level of financial support they have provided which has enabled us to operate at this pace. The EMC has a tremendous amount of work to do to restore the marine habitats surrounding Antigua, but with your support we hope to continue making meaningful progress. Please see the report from our science team which includes a list of goals and needs for the upcoming fiscal year.

Thank you again for your on-going support for the Elkhorn Marine Conservancy.

Best Regards,



Arthur Gosnell, Chair of the Board



## Our Board

Arthur Gosnell  
*Chair*

Stewart  
Dansby  
*Treasurer*

Barbara  
Chapman  
*Secretary*

Steven Hoch

Helena Jeffrey-  
Brown

Carla Knobloch

Fred Stelle

Martha  
Watkins-Gilkes





# A message from our staff

Antigua's coastal and marine ecosystems have suffered extensively in recent decades, with many now failing to provide habitat space and structure required to sustain healthy fish populations and protect coastlines. The demise of coral reefs, seagrass beds and mangroves has direct impacts on coastal communities and the Antiguan economy. Our work at the EMC is driven by our desire to restore these ecosystems so they can better support communities and businesses for generations to come.

With your support this year, we've planted thousands of endangered coral fragments onto degraded reefs, developed realistic strategies to protect our natural resources, collected scientific data to inform decisions and implemented innovative techniques to scale our restoration efforts. Most of all, your support has allowed us to provide employment opportunities in the field of marine restoration, helping us diversify livelihoods within the blue economy. Thank you for making our work possible.

Kindly,



Dr. Molly Wilson & Geneviève Renaud-Byrne



## Our Team

With double the number of staff we had one year ago, our talented team now includes a diverse group of individuals spanning multiple professional and cultural backgrounds.

Dr. Margaret 'Molly' Wilson  
*Marine Scientist & Project Manager*

Genevieve Renaud-Byrne  
*Marine Scientist & Project Manager*

Elderfield 'Tommy' George  
*Boat captain and Diver*

Shannon Costelloe  
*Communications Officer*

Monique Bigler  
*Research Assistant*

Samuel Cox  
*Diver*

Vincent Williams  
*Diver*

Kweesi Gyan  
*Diver*

Andre Philip  
*Social media manager,  
Photographer & Videographer*



"Working for the EMC gives me a great sense of satisfaction knowing that I'm playing a role in bringing the reefs back to life. The reefs protect the coastline, which is good for tourism, the local food industry, the economy, and overall health of the environment. It's rewarding seeing the increased number of fish since we started. I also work with a great team, we have a great time and still get a great deal of work done."  
Vincent Williams, Diver

# One year in review

## Restoring our oceans

4,610

corals  
planted

3,059

nursery  
corals

0.53

acres of reef  
restored

81

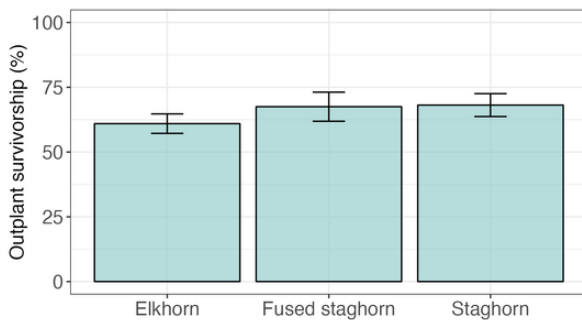
genotypes  
propagated

### CORAL OUTPLANTING

In July of 2022, our first nursery-raised corals were ready to be planted onto degraded reefs. Over the past eleven months, we've outplanted 4,610 fragments of coral from 42 different genotypes of elkhorn (*Acropora palmata*), staghorn (*A. cervicornis*), and fused staghorn (*A. prolifera*). Our outplanted corals currently cover an area of 0.53 acres across restoration sites at York Island, Ten Pound Bay, and Ricketts Reef.



*Geneviève and Tommy place staghorn fragments into a cement sphere.*



*Outplant survival varies by species, with a mean of 64.8%. While stressors such as disease and poor water quality can limit outplant survival, they also help select for resilient genotypes within our diverse restoration sites.*



*Geneviève conducts photomosaic surveys at restoration sites.*

### RESTORATION MONITORING

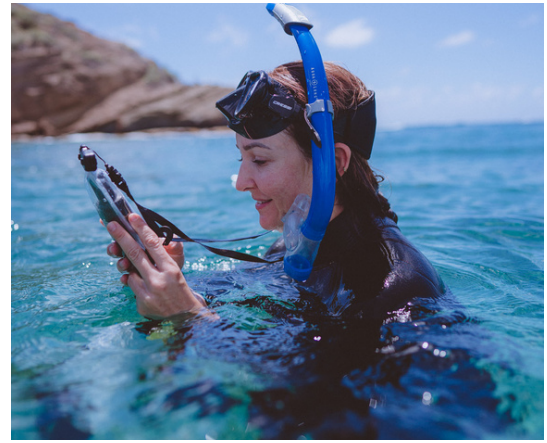
In order to assess the impacts of our coral restoration program, we collect extensive data at our restoration sites. In addition to monitoring the survival of all of our coral outplants, we track changes in reef structure and coral growth using photomosaics, or the stitching together of thousands of images to create 3D models of the seafloor. This past year we installed five photomosaic plots and have generated models from baseline plot imagery in collaboration with Dr. Art Gleason at University of Miami. We collected six month post-outplanting imagery in June 2023 and look forward to comparing the models once generated.

This past year we've also conducted ecological monitoring at each of our three restoration sites to compare fish, invertebrate, and benthic communities before and at different intervals after coral outplanting. While still early to detect long-term ecological change, our June 2023 monitoring results show increases in outplanted coral species as well as more abundant juvenile fish at some sites.

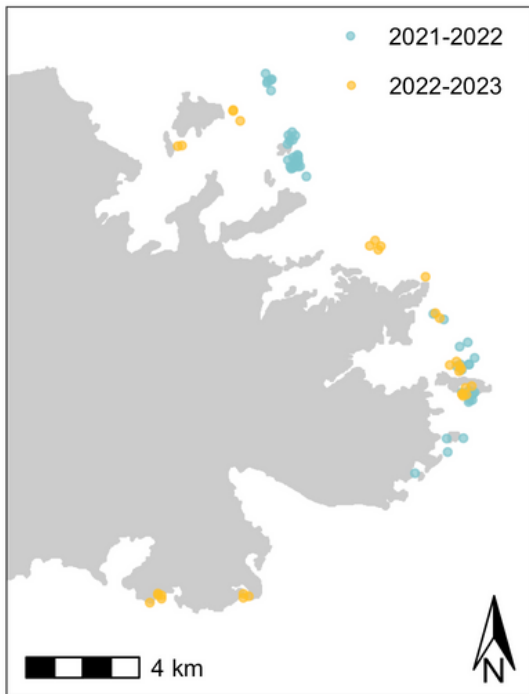


# MAXIMIZING DIVERSITY

**Why is genetic and species diversity so important to us?** In the last few decades, we've lost more than 80% of Caribbean corals due to various impacts such as coastal pollution and disease. The corals that remain on our reefs today hold genetic properties that have allowed them to persist and even thrive under difficult conditions. We're actively working to collect fragments from as many genetically distinct survivors (genotypes) as possible to increase the resilience of our restored reefs to ongoing threats including climate change and unsustainable resource use.



Shannon collects GPS data during coral collection.



Diversity is essential in building resilient reefs. This year we've increased the number of species in our coral restoration program from four to 12, and have collected fragments from 33 additional parent colonies, bringing the number of genotypes in our nurseries from 48 to 81. Nine of our new genotypes came from a genetic exchange with the Nelson's Dockyard National Park, during which both teams exchanged top performing genotypes from their respective nurseries and worked together to collect additional corals from the the south coast of Antigua for EMC to propagate along the east coast. To house these additional coral genotypes, we have expanded the capacity of our York Island nursery and installed an additional coral table at Ten Pound Bay.

# ENHANCING HERBIVORY

Herbivory is a critical process in coral reef ecosystems, where herbivorous fish and invertebrates graze down algae that would otherwise inhibit coral growth and recruitment. Unfortunately, increased fishing of herbivorous fish and the mass mortality of an important herbivorous sea urchin species in the late 1980s have led to herbivory levels that are insufficient to suppress algal populations. The EMC team has experimented with the in-situ rearing of the *Maguimithrax spinosissimus* crab, a voracious herbivore on Caribbean reefs. After various attempts and challenges, the EMC team facilitated the successful hatching of an egg-bearing female, but low abundances of juvenile *M. spinosissimus* in our hatching cage and the presence of other crustacean species suggest that predation may be a limiting factor. The trials of rearing *M. spinosissimus* - ranging from cultivating sufficient food to modifying cage designs - inspired EMC's research review on the current status and limitations of herbivore restoration, which will be submitted for journal publication in the coming year.





# Building our capacity

## MICROFRAGMENTATION

Bouldering corals such as brain and star corals are important reef builders, contributing to the reef's wave-breaking structure and ability to provide habitat space to fish and invertebrates. With guidance and training from Dr. David Vaughan (Plant a Million Corals) and Ken Nedimyer (Reef Renewal), we've launched a microfragmentation pilot to incorporate boulder coral species into our restoration program. Microfragmentation is the process of cutting coral into small pieces about the size of a dime. This technique stimulates growth rates of up to 50 times that of typical growth in the wild. Thus far, we have used microfragmentation to propagate over 500 fragments of seven different bouldering species including numerous endangered and critically endangered species.



*Captain 'Tommy' George cuts microfragments using a band saw (left). Scientist Molly Wilson installs microfragments on nursery tables (center). A pillar coral microfragment thrives in the nursery (right).*

## Informing management & reducing threats

Coral health can be affected by changes in water quality caused by nutrient inputs, pollution, sedimentation, and temperature fluctuations. Working alongside the government's Analytical Laboratory, we conducted seasonal water quality tests to monitor conditions within our coral nurseries and restoration sites, as well as adjoining ecosystems. Results revealed seasonal fluctuations in nutrient, dissolved oxygen and bacteria levels, likely a product of coastal resorts operations during the winter season, and higher influx of floating sargassum and algal blooms in the summer months. With this information, we can better inform behavioral change, policy recommendations and identify areas unfit for ecosystem conservation or restoration.

To alleviate local human stressors and promote the resilience of critical ecosystem within Antigua's east coast, management is essential. Natural resource management promotes sustainable economic development, protects habitats and the ecosystem services they provide to communities, all while balancing conflicting interests through spatial planning. This year we developed a comprehensive Integrated Marine Management Strategy for the Nonsuch Bay Region, which complimented the Environmental Awareness Group's (EAG) Offshore Island Nature Reserve Feasibility Study. With these studies, we now understand the values and services offered by the terrestrial and marine environment, and have the necessary information to take next steps towards effective natural resource management.





# Promoting environmental stewardship

## LIONFISH DERBY

In November of 2022, EMC helped host Antigua's biggest ever lionfish derby, which included hunting, training, cookoffs, jewelry making workshops, and educational speakers. The event was a big success with a total of 864 lionfish removed from Antigua's reefs by 36 different divers. The grand prize was claimed by a team of fishermen from Urlings fishing village led by Barry Prince (right).



*On set with videographer Roddy Grimes-Grame and the EAG.*

## VIRTUAL CLASSROOMS

The EMC has collaborated with the EAG to develop a coral reef series as part of their "Into the Wild with the EAG" virtual learning program. Over the past year, the teams have scripted, filmed, and edited three educational episodes and developed accompanying student workbooks and teachers' guides. The materials are currently undergoing final edits and the "Into the Wild: the Coral Code" series will be launched across Antiguan schools at the start of the 2023 school year.

## REEF-SAFE SUNSCREEN

Over the past six months, EMC volunteer Julie Esty has led a bold campaign to reduce the use of toxic sunscreens in Antigua. "I can't thank EMC enough for sponsoring our safe-sunscreen project," Julie remarks "During Phase One of this project, we have made a great deal of progress in educating the local community to the dangers of toxic sunscreens and in encouraging the government to implement bans on a number of these chemicals. We are also working on spreading the message to as many visitors as possible and we anticipate that the new legislation will be passed within the year."

# Building our community

The EMC's accomplishments are supported by a strong community of scientists, practitioners, educators and stakeholders. This past year we expanded our network through numerous conferences and engagement initiatives. Our scientific team was thrilled to attend the 2022 Reef Futures conference in Florida and present at the 2023 EAG Environmental Conference (EECO) in Antigua.

We've strengthened relationships with local stakeholders through numerous events including our 2022 community boat tour, which provided 49 community members, staff and volunteer families with the opportunity to explore our nursery at Green Island. Through meetings and events, we've also built a growing local and international membership of 133 individuals that compliments the larger supporters within our Reef Keepers circle.





# Our supporters

## Our Reef Keepers

Our reef keepers pledge to give USD \$10,000 or more every year for five years. They are truly the life-line for our organization, ensuring we have the funds to accomplish our mission. We'd like to express our sincere gratitude to our EMC Reef Keepers for their generous donations and ongoing support:



Robin and Ted Ashford

Sana and Andy Brooks

Shelly and Michael Carr

Barbara and Duncan Chapman

Mally and Stewart Dansby

Barbara and Steve Glascock

Page and Arthur Gosnell

Janie and Steven Hoch

Ala and Ralph Isham

Carla Knobloch

Ingrid and Ward Marsh

Elizabeth and Richard Miller

Bettina and Fred Stelle

Sigrid and Ladd Thorne

## Our EMC Members

We are humbled and privileged to be supported by a diverse community of donors who, as stewards of the marine environment, have joined us in our mission to restore and protect Antigua's critical marine ecosystems. We sincerely thank our membership for their support so far:

### \$100,000 USD and above

Anonymous

### \$50,000 - \$99,999 USD

Robin and Ted Ashford

Barbara van Beuren and Stephen L. Glascock

Shelly and Michael Carr

Page and Arthur Gosnell

Mill Reef 75th Anniversary Gala

Bettina and Frederick Stelle

### \$25,000 - \$49,999 USD

Helene and Archie van Beuren

Barbara and Duncan Chapman

Mallie and Stewart Dansby

Estate of Edna Fortscue

Janie and Steven Hoch

Ala and Ralph Isham

Elizabeth and Richard Miller

Tri-Fork RORC 600 Racing Team

### \$20,000 - \$24,999 USD

Beth and Michele Colocci

Ingrid Henrichsen and Howard Marsh

Yeager Family Charitable Fund

### \$15,000 - \$19,999 USD

Sana and Andy Brooks

Catherine and William Ebert

Jumby Bay Island Company

### \$10,000 - \$14,999 USD

Curt Greer and Pamela Kohlberg

Helen and Ed Healy

Amy Leeds and Anders Brag

Wendy and Benjamin Griswold IV

Kenny and Gordon Nelson

Eleanor and Tom Ratchford

Sloan and Wick Simmons

Station 6 LLC

Sigrid and Ladd Thorne

### \$5,000 - \$9,999 USD

Sophie and Franz Alabers-Schoenberg

Elizabeth Ballantine and Paul Leavitt

Emily and Harold Bogle

Suki and Miguel de Braganca

Tory Burch and Pierre Yves Roussel

Caribbean Alliance Insurance

Betsy and James Lewis

*[list continues on next page]*



# Our supporters

## **\$5,000 - \$9,999 USD cont'd**

Cayre and Alexis Michas  
Mary Jane and Joseph P. Platt Jr.  
Frances and John Portelli  
Christa and Paul Schenker  
Catherine and Andrew Sidamon-Eristoff  
Anonymous

## **\$2,500 - \$4,999 USD**

Ala Isham, LLC  
Christina and Weston Hoard  
Catherine C. Degarve Parker  
Jeannie and Rick Witmer

## **\$1,000 - \$2,499 USD**

John H. J. Acker  
David Astor  
Leigh and John Bartlett  
Nancy and Pete Buck  
Catharine and John Cathey  
Sarah and Bryan Colley  
Carrie and Chip Emery  
Julie and Brad Esty  
Benedicte Hallowell  
Pen Hallowell  
Victoria Hampton  
Kimberlea and Stephen Jeffries  
Wendy and Stephen S. Lash  
Connee Mayeron and Fuller Cowles  
*[list continues in next column]*

## **1,000 - \$2,499 USD cont'd**

Brigitte Moufflet  
National Parks Authority Calendar Fundraiser  
Tara and Michael Rockefeller  
Dee and John Shane  
Andrew Sidamon-Eristoff  
Martha Watkins-Gilkes and Tony Gilkes  
Anonymous

## **\$10 - \$999 USD**

Carol Ackerman  
Margot Anderson  
Dorothy Baker  
Marco Bava  
Blackbaud Giving Fund  
Caroline Melly Crovatto  
Lillian Ann Dalby  
Susan deGrave  
Richard Demayo  
Meredith and Jonathan Flom  
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Ana Maria and Placido Arango Garcia-Urtiaga  
Elizabeth Gilbert-Bono and Mark Bono  
Lee Henderson  
Lisa Hills  
Emily and Charlie Kilvert  
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Paula McLeod and Jamie Pfaff  
Missy and Banks Meyer  
Cheryl and John Mowinckel  
Jennifer and Erik Oken  
Christine Scoggin  
Gabrielle Thomas  
Jennifer Trant  
Dorothy Walker  
Hope Walker  
Anonymous  
Anonymous  
Anonymous  
Anonymous



# Donations & Expenses

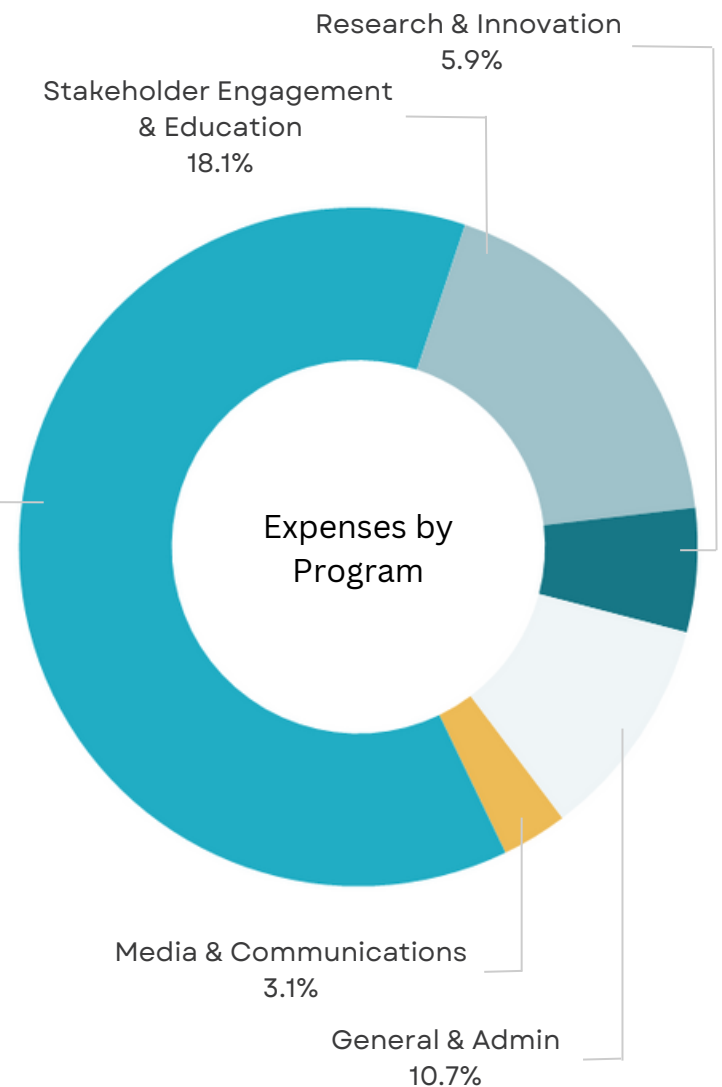
## Donations

Donations (USD)	\$344,978
Interest income (USD)	\$2,174
<b>Total income (USD)</b>	<b>\$347,152</b>

## Expenses

Program	Total expenses (USD)	Percent allocation
Media & Communications	\$ 7,948	3.1%
Ecosystem Restoration	157,710	62.2%
Stakeholder Engagement & Education	45,769	18.1%
Research & Innovation	14,955	5.9%
General & Admin	27,023	10.7%
<b>2022/23 Total</b>	<b>\$ 253,406</b>	<b>100.0%</b>

	Total (USD)	Percent surplus
<b>2022/23 Net Surplus</b>	<b>\$93,746</b>	<b>27%</b>



The EMC capital budget for the 2023-2024 fiscal year includes the purchase of a 28 ft boat to support our operations. We would like to extend our sincere gratitude to Daniel Way for his assistance with financial administration and reporting.





# Our volunteers, collaborators and partners

We are extremely grateful for all the volunteers that have dedicated time and effort to helping us achieve our goals:

Ishy Andrews  
Richard Boivin  
Richard Boltar  
Mike Byrne  
Ruby Coates  
Emma Crane  
Paul David  
Sara Eldridge  
Chip Emery

Weber Emery  
Julie Esty  
Tanner Etsy  
Chloe Farwell  
Jim Forni  
Joe Heidel  
Ralph Heise  
Josh Huntington-Rainey  
Julie Louwrens

Tristan Louwrens  
Sammy Martin  
Zoe McBride  
Lindsey McIntosh  
Leslie Nunns  
Roxane Oreja  
Elliot Pau  
James Platt  
Nico Psihoyos

Marie-Claude Renaud  
Michael Robertson  
Melanie Sauer  
Leon Swann  
Gabrielle Thomas  
Joshua Tubbs  
Jim Wilson  
Judy Wilson  
Hazel Woodward  
Tim Woodward



As a volunteer, I love those days when I am called to go out to the nursery to take care of our baby corals. Seeing these little creatures grow and develop is such a great way to give back to Mother Earth what we have taken from it. I hope to keep supporting the EMC Team in other projects and to continue learning the secrets of the amazing, rich and colorful marine life we have in Antigua.

Ralph Heise - *Volunteer since 2021*

Whether it be through collaboration on joint project, sharing of information and best practices, research assistance, discounts, or in-kind donations, our collaborators and local partners have increased the quality of our work and have help us achieve our goals:





# The year ahead

"The past year has been an incredible period of growth and accomplishment for the EMC team. With no shortage of exciting initiatives on the horizon, we look to the coming year with great anticipation for what we can accomplish and sincere gratitude for those who have made our work possible."

- Dr. Molly Wilson, Marine Scientist & Project Manager

## OUR TARGETS

1

acre of reef  
restored

8,000

coral fragments  
planted

## SCIENCE & RESTORATION

This year we expect to exceed the number of corals that we outplanted in 2022-23 and aim to plant 8,000 coral fragments onto degraded reefs. Among these outplants will be our microfragments of bouldering coral species, bringing the total number of outplanted species in our restoration sites from three to twelve. With a new EMC workboat anticipated by early 2024, the ease and adaptability of our restoration work will improve immensely. We also look forward to incorporating innovations to increase restoration efficiency, including the use of biodegradable ropes to outplant corals "in bulk" and custom mesh crates to facilitate sorting and transporting numerous coral genotypes to restoration sites. Alongside research on enhancing herbivory at restoration sites, we anticipate submitting a manuscript for academic publication in 2024. This coming year also marks the addition of our own water quality testing equipment, which, along with the EMC workboat, will remarkably expand the scope of our water quality monitoring and research program.





## OUR TARGETS

100

new EMC  
members

2,000

students  
reached

“Coral reefs sustain Antigua and Barbuda in countless ways. They protect our coastlines and beaches, sustain our economy by increasing tourism value and supply us with local seafood. I have personally witnessed the degradation of our local marine environment and fully support the EMC in their efforts to enhance the health of these critical ecosystems.”

- Hon. Charles Fernandez  
Minister of Tourism and Investment

## EDUCATION, OUTREACH & ADVOCACY

A diversity of engagement initiatives fill EMC's 2023-2024 calendar. This summer, we will be coordinating and subsidizing field trips to our coral nursery for local summer camps, as well as snorkel tours and ocean-based swim lessons for adults. At the start of the 2023 school year, the Into the Wild: Coral Code episode will be launched in Antiguan schools after months of collaborative development, filming, and editing among the EMC and EAG teams. We will continue to spread awareness about toxic chemical sunscreens via our ongoing reef-safe sunscreen campaign, which gathered substantial community and government support this year. As the tourist season resumes this fall, we look forward to developing educational tours of our coral restoration work in collaboration with local tour operators. Alongside local partners, we will also be assessing the financial feasibility of a pilot Marine and Terrestrial Management Area within Nonsuch Bay. This study will further inform our long-term strategy to reduce local impacts, diversify the blue economy and protect areas of high ecological importance. We are also thrilled to be hosting our first annual EMC member event in December of 2023 and working to build our membership community throughout the year.



# BECOME A MEMBER

Join our growing community of supporters by donating or volunteering with us. All members receive our quarterly newsletter, annual updates, and an invitation to an EMC community event.

## DONATE

### General Membership

\$10 USD minimum

### Reef Keepers Circle

Pledge to donate a minimum of \$10,000 USD annually for 5 years

## VOLUNTEER

Apply to be a dive volunteer and help us collect, raise and plant coral. See our website to fill out an application form.

# GET IN TOUCH



[www.emcantigua.org](http://www.emcantigua.org)



@emcantigua



@antiguaemc



**Elkhorn Marine  
Conservancy**

Special thanks to Andre Philip for the images captured and displayed in this report.