

The Coral Chronicles

2022 ■ 2023



Photo: Dan Mele



Corals in Crisis

The Lovango Resort and Beach Club has partnered with Reef Response to help corals in crisis. Learn how our partnership is helping save corals and, support coral research.



Lovango Island Map



Dr. Marilyn Brandt, Project Director

Never before has there been such an urgent need for public and private groups to work together to combat the decline of coral reef ecosystems. Corals are the foundational organisms of coral reefs – they are the trees in the rainforests of the seas – and they are quickly disappearing. Climate change, coastal development, and overfishing have combined to cause a “death by a thousand cuts” for corals, and the sharp decline in coral abundances has meant the loss of the ecosystem services they provide. These services include providing homes for fish, lobster, and other commercially important reef creatures as well as growing structures that protect shorelines from battering waves and storm-induced flooding. Corals even provide water filtration by eating the tiny creatures that can be parasites. Coral reefs across the world also create a large proportion of the oxygen that the world breathes every day – you could therefore call them the lungs of our planet! The loss of coral reefs will be a devastating loss for everyone, and even more so for coastal communities like the U.S. Virgin Islands. Scientists, managers, and other local coral reef stakeholders are working hard to understand and mitigate the loss of corals and attempt to combat it through active coral restoration. I am

Corals are the foundational organisms of coral reefs – they are the trees in the rainforests of the seas – and they are quickly disappearing.

proud to be the Director of Reef Response, one such group leading efforts to restore corals to U.S. Virgin Islands reefs in order to jump start the process of healing for these critical habitats. The scale of the problem is intimidating, and collaboration will be essential to surmounting the challenges facing coral reefs today and in the future.

For these reasons, I am thrilled to introduce Reef Response’s partnership with the Lovango Resort and Beach Club. I believe our partnership can serve as a successful model of a public-private collaboration that will propel the field of coral restoration forward. At Lovango Cay, Reef Response is actively working to remedy the effects of climate change, including treating coral disease, while also testing cutting edge strategies for coral restoration. The Lovango Resort and Beach Club is supporting our work by providing essential funding for the establishment and maintenance of a new coral nursery (the Rescue Zone) and also supporting our work in a research area where we are testing techniques to improve the effectiveness of restoration (the Research Zone). They are also backing our targeted and intensive restoration of corals to the coral reef on the north side of Lovango Cay (the Restored



Photo: Dan Mele

I believe our partnership [with Lovango Beach Resort] can serve as a successful model of public-private collaboration.

Zone). Part of the Lovango Resort and Beach Club’s support includes paid internships for graduate and undergraduate students at the University of the Virgin Islands. These students have gone on to use their training to assist in our work, but they are also participating in restoration operations elsewhere in the U.S. Virgin Islands and wider Caribbean. Finally, the environmentally friendly development and operation practices of the Lovango Resort and Beach Club ensure that Reef Response’s work to grow, research, and restore coral around the island of Lovango Cay is not in vain or in jeopardy. Our work together to provide educational and outreach opportunities, both in the territory and online, ensures that the results of our work and

our partnership will be recognized and understood locally and globally.

I hope you enjoy learning more about corals, our work, and our successful collaboration. And most of all, I hope you enjoy your time visiting the beautiful coral reefs of the U.S. Virgin Islands.

An Interview with Matt Snider

Matt is the Director of Operations for Little Gem Resorts and Project Manager for Lovango Resort & Beach Club.

– Interviewed by Elisa Bryan

How did the Lovango Resort and Beach Club project come about for you and your family?

We are a 4th generation family business which, as you can imagine, results in a lot of family bonding and interesting dinner conversation! Our business has evolved with each generation and when my parents took over the business we built a resort on Martha’s Vineyard where our love for hotels and small island communities grew. This love of island communities led to the development of a second resort in Nantucket and eventually in 2019, the Lovango Resort and Beach Club came into our awareness. At the time, we were faced with a need to create year-round employment for our staff and we really fell in love with the Virgin Islands. Lovango made a lot of sense so we dove head first into what has become a really fun and adventurous project.

Working with our team at UVI is pretty unique. Are you involved in similar partnerships at your other resorts?

We are a company very involved in our local communities but this type of partnership is unique to Lovango. Lovango's unique location really forced us to think differently and more environmentally across our company. We are entirely off the grid, we make our own water and electricity, but there are processes we were naive about initially and have since educated ourselves. If you asked me four years ago I would have said our companies were environmentally conscious but, we have grown tremendously since then!

How did your connection with Reef Response come about?

Do you know that expression "seven degrees of separation"? You’re separated seven degrees from somebody in the Islands! An employee knew about Reef Response and suggested we have a conversation. It was a no brainer for us to work with this team and restore the reefs around Lovango. Marilyn and the team are extremely entrepreneurial, thoughtful and caring. It’s hard not to want to work with a group like that when your goals are so aligned. Plus, our guests are unique...

this is a high-end glamorous camping experience, "glamping", and we have the opportunity to engage our guests and even our employees in a different way. Our guests have an adventurous mindset and when here, they want to learn about what we’re doing in the community. They’re excited to hear about the coral reef restoration program. We encourage them to snorkel and explore the reef thoughtfully. Almost all our guests take the opportunity to snorkel the reef and comment on it. It’s a very special part of their stay.

What do you know about coral restoration and, what have you learned?

Interesting question. I knew shockingly little before this project. You always want to protect the reefs but the next step of actually understanding what that means well, it's an ongoing process. I do know that this is a very long-term project and while it can take a minute to destroy a reef it takes decades to grow it. This doesn't happen overnight and there are lots of steps ahead. From using the right sunscreen to the actual science of growing a reef...I have to say I’m still naive.

Can you tell me more about your vision for this project?

Lovango existed long before the resort came into being. People have lived on this island for some time, their memories are here and now we are part of its history. We approach this development thoughtfully, as part of the community, and we are open to the community and respect what came before us. We care for what will come after us by safeguarding the environment and our shorelines. With these goals, our partnership with the Reef Response team at UVI was a no-brainer. This

This is definitely a long-term commitment...It boggles the mind to think a dropped anchor could destroy all the progress.

team has been so wonderful to work with its been such a positive learning experience. I don’t think we fully understood just how long it would take to grow the reef! This is definitely a long term commitment...I didn’t know what to expect but we’ve had so much success already. It boggles the mind to think a dropped anchor could destroy all the progress.

So....what has it been like working with a team of “coral nerds”?

Hah! They have so much passion and they are so committed to their goal that it's hard not to get swept up in that energy. The team is so knowledgeable and dedicated you want to be a part of it. It's pretty exciting! This partnership has been fantastic and we just love it.



Photo: Dan Mele

We are Reef Responders

Dr. Marilyn Brandt

Reef Response Director

Dr. Brandt joined the faculty of the University of the Virgin Islands in 2010 and her research has focused on coral disease ecology. She led the formation of Reef Response in reaction to the drastic declines in living coral she has personally observed in the Caribbean over the last two decades.

Kathryn Cobleigh

Reef Response Coordinator

Kathryn began with Reef Response as a graduate intern before transitioning to the role of Coordinator in 2020. Since then, she has organized field operations, nursery maintenance, and personnel management for the Reef Response team and interns. Her skills and passion are vital to our restoration goals.

Sonora Meiling

Marine Disease Specialist

Sonora completed her Masters at UVI tracking lesion progression rates of disease corals with 3D models. Now, she manages the coral disease research for the territory, including monitoring programs, collaborative projects with other universities, and identifying ways to restore disease-susceptible species of coral.

Nicholas Durgadeen

Coral Restoration Specialist

Nicholas combines two key aspects of his life: using science and research to support marine life as a conservationist and educating the local community. He has a background in educational outreach, coral restoration, and coral disease treatment.

Dr. Larry Dew

Coral Restoration Specialist

Dr. Dew's 25-year career in tropical conservation led him to UVI in 2018. He has worked to secure funding for our land-based coral nursery and our other coral propagation and research facilities. Underwater he has been fighting coral disease and trying to get as many live corals as possible back out onto our reefs.

Dan Mele

Coral Aquarist Specialist/
Research Photographer

Dan has been working to restore coral reefs for the last seven years, specializing in propagating corals in a land-based nursery. Additionally, Dan uses photography and film to communicate the exciting research happening at Reef Response.

Jason Quetel

Marine Life Restoration Specialist

Born and raised in St. Thomas, Jason has been diving professionally since 2003 and with the University of the Virgin Islands since 2014 focusing on coral and fish monitoring. In 2021 he joined Dr. Brandt's Lab as the Marine Life Restoration Specialist focusing on coral restoration.

Brad Arrington

Coral Restoration Specialist

Brad has used his creativity and innovation to propel the impact of Reef Response's work, notably, through the construction of the LOVANGO nursery and supporting our social media and citizen science events. His extensive field experience and coral outplanting expertise has made him an invaluable member of the team.

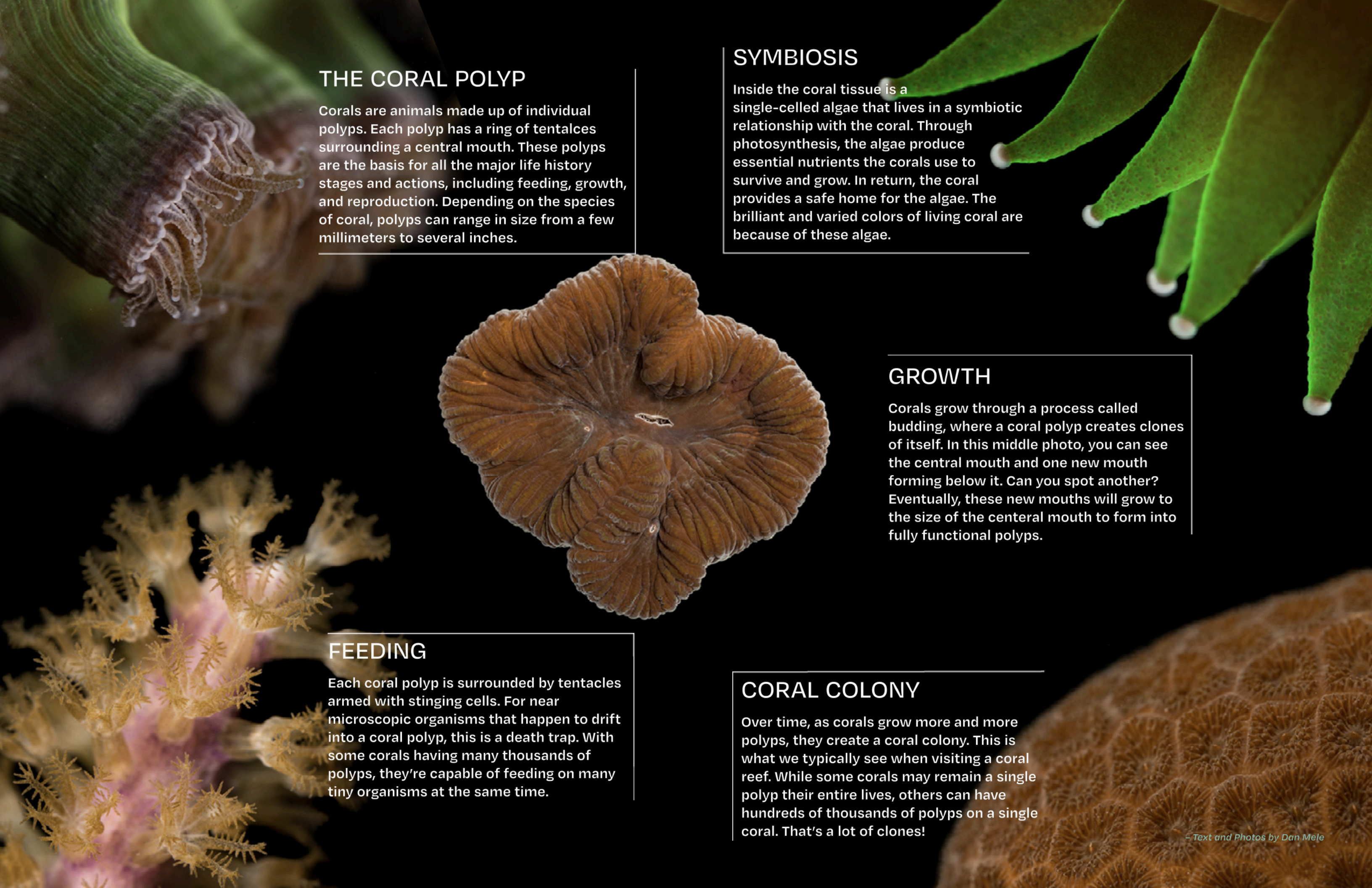
Rachel Ionata

Coral Aquarist Specialist

Rachel joined Reef Response in 2022 where she has been able to apply her experience with restoration and coral husbandry. She also has a background in using coral reproduction for restoration which we are excited to begin incorporating at Reef Response.

Photos: Dan Mele

Reef Response is a coral restoration program located in the U.S. Virgin Islands and based at the University of the Virgin Islands. The program was created to increase coral abundance and diversity while also empowering the local community to help mitigate the effects of changing environmental conditions. Reef Response's mission is to stimulate coral reef ecosystem health through coral restoration, promote community involvement through citizen science, and ensure best practices through scientific research.



THE CORAL POLYP

Corals are animals made up of individual polyps. Each polyp has a ring of tentacles surrounding a central mouth. These polyps are the basis for all the major life history stages and actions, including feeding, growth, and reproduction. Depending on the species of coral, polyps can range in size from a few millimeters to several inches.

SYMBIOSIS

Inside the coral tissue is a single-celled algae that lives in a symbiotic relationship with the coral. Through photosynthesis, the algae produce essential nutrients the corals use to survive and grow. In return, the coral provides a safe home for the algae. The brilliant and varied colors of living coral are because of these algae.

GROWTH

Corals grow through a process called budding, where a coral polyp creates clones of itself. In this middle photo, you can see the central mouth and one new mouth forming below it. Can you spot another? Eventually, these new mouths will grow to the size of the central mouth to form into fully functional polyps.

FEEDING

Each coral polyp is surrounded by tentacles armed with stinging cells. For near microscopic organisms that happen to drift into a coral polyp, this is a death trap. With some corals having many thousands of polyps, they're capable of feeding on many tiny organisms at the same time.

CORAL COLONY

Over time, as corals grow more and more polyps, they create a coral colony. This is what we typically see when visiting a coral reef. While some corals may remain a single polyp their entire lives, others can have hundreds of thousands of polyps on a single coral. That's a lot of clones!

Identifying Corals & Reef Critters

Snorkeling on a coral reef can be like visiting another planet. Look to your left, you might see two eyes poking out of the sand spying on you. Look to your right, there's a giant brain attached to the reef! What is this place?

Coral reefs are often called the rainforests of the sea due to the wide variety of biodiversity that can be found on them. You can think of the coral themselves as the trees in a rainforest. Without the trees, you would have no birds, and other associated wildlife. Without corals there are no fish, lobster or many of the beautiful organisms that inhabit a coral reef. The corals that Reef Response has chosen to work on restoring around Lovango were specifically chosen due to the importance for creating a healthy, balanced, and thriving ecosystem. Remember to take your time while snorkeling over our Restored Zone. The slower you go the more you'll see!

Making sense of what you're looking at on a coral reef is often a confusing task, but Reef Response is here to help!

In this spread are some of the coral species we are growing in the Restored Zone as well as some additional species you might see and what role they play in the coral reef environment.

– Text and Photos: Dan Mele



Elkhorn Coral – *Acropora palmata*

The iconic elkhorn coral was once a dominant coral species throughout the Caribbean, but has lost upwards of 90% of their populations. As its name implies, elkhorn coral looks like a pair of elk antlers that has been stuck to the reef floor growing upwards toward the sun. Keep an eye out for the hundreds of elkhorn coral that Reef Response has outplanted in the Restored Zone!



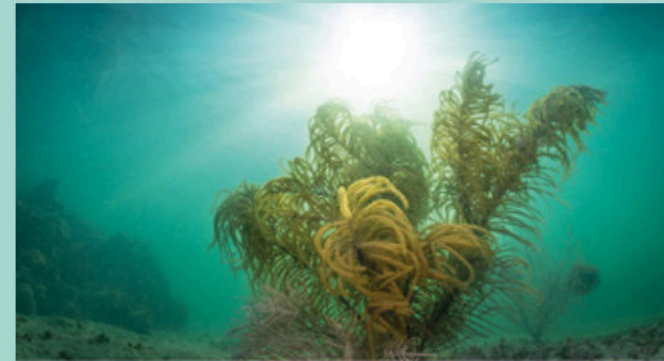
Staghorn Coral – *Acropora cervicornis*

Another iconic Caribbean coral is the staghorn, whose name derives from its resemblance to deer antlers. Similar to elkhorn, staghorn coral has also suffered heavy population losses over the last 40 years. Staghorn coral acts as nursery grounds for many juvenile and small fishes as they find protection from predators within the complex web of branches.



Mustard Hill Coral – *Porites astreoides*

While most coral species have suffered large die-offs over the last four decades, there are a few that are still doing quite well! One of these is the mustard hill coral. While this coral doesn't contribute as much to reef structure as others, it gives homes to small creatures and takes up space on the reef where nuisance seaweeds would otherwise colonize.



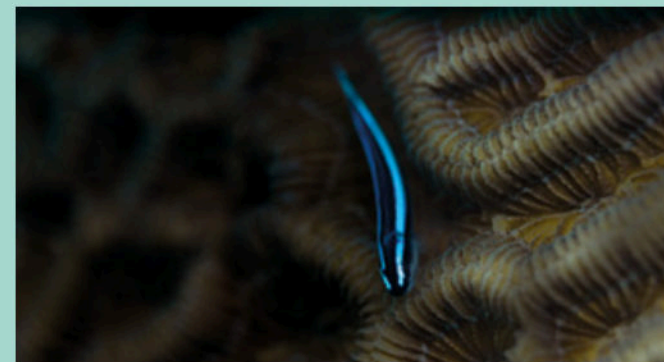
Sea Plume – *Antillogorgia bipinnata*

What are commonly mistaken for plants are actually a type of coral called a sea plume. As they sway back and forth with the waves, the tiny coral polyps feed by catching small organisms floating in the water. Look for fish hiding between the branches!



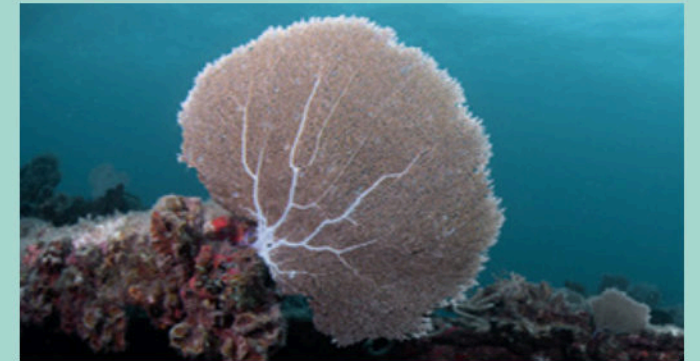
Long-spined Sea Urchin – *Diadema antillarum*

Just like we mow the grass in our lawns, corals reefs have their own version of a lawn mower called sea urchins. Crawling around on the seafloor, these black spiked balls feed on seaweeds that would otherwise grow out of control and smother the coral.



Caribbean Neon Goby – *Elactinus* spp.

The Caribbean neon goby is a type of cleaner fish. You can think of them as the coral reef dentists. They pick off parasites on larger fish – this helps the fish get clean and the goby gets a meal!



Sea Fan – *Gorgonia ventalina*

Similar to the sea plume, sea fans are also a type of coral that sways back and forth with the waves. Look closely and you might see their little mouths feeding!



Redband Parrotfish – *Sparisoma aurofrenatum*

Similar to sea urchins, many types of parrotfish are considered grazers. They get their name from their bright colors and parrot-like beak which can scrape the reef clean of nuisance seaweeds.



Christmas Tree Worm – *Spirobranchus giganteus*

What look like miniature trees are actually worms! Most of the worm is out of sight in a burrow, while the visible portion that looks like a Christmas tree filter feeds off tiny particles drifting in the water.

Project Overview

The Rescue to Restore project is an exciting collaboration between the University of the Virgin Islands Reef Response Program and the Lovango Resort and Beach Club. Rescue to Restore is a science-based coral restoration project that focuses on three integrated zones around Lovango Cay: Rescue, Research, and Restored. Each zone contributes to Reef Response's mission to stimulate coral reef ecosystem health through coral restoration, community involvement, and scientific research.

Each zone in the Rescue to Restore project plays an integral part in achieving our goal of increasing coral abundance and diversity in the U.S. Virgin Islands.

The Rescue zone contains a rebar-table coral nursery that serves as a coral garden for restoration work. The rebar tables that spell out LOVANGO were installed in early 2022. Attached to the tables are small fragments of the endangered staghorn coral (*Acropora cervicornis*) that were rescued from reefs where they were found to be broken and would otherwise have died. The fragments were first attached to the rebar with zip ties but have

since grown around the rebar which now serves as their "ground" for growing. As they become larger and branch, trained Reef Response personnel take cuttings of them (much like you would do from a garden) and these cuttings are then transplanted onto reefs where coral restoration activities are taking place, like the Restored Zone on the north side of Lovango Cay. The Rescue Zone nursery therefore represents a continual supply of new coral "clippings" to help restore degraded reefs around St. Thomas and St. John.

The Research zone contains Reef Response's experimental work that is aimed at optimizing and evaluating the results of restoration. Within the Research Zone, located directly south of the Lovango Beach Club, we have implemented a multi-species experiment to determine whether certain types (species) of corals help to promote each other's growth. Future work will also include deploying oceanographic gear to measure changes in seawater movement in response to the restoration of corals to the area.

The Restored zone is where Reef Response has been concentrating the majority of our coral planting efforts. More than 1,000 corals have been planted on the reef in the Restored zone located on the north side of the island. These corals include multiple species, such as elkhorn and staghorn corals, star corals, and different types of brain corals. This reef was degraded likely by seawater



| Left: Brad and intern Kelsey Vaughn set out a restoration experiment in the Research Zone.

Below: an elkhorn coral planted by Reef Response is already sending out wave reducing branches after 6 months in the Restored Zone. |

All photos on this spread: Dan Mele

warming, disease, and storm impacts. The corals that we are planting on the Restored zone reef are known to be resistant to these types of stressors and we are finding already that they are growing and thriving on the reef. We are planting enough coral that we hope to "jumpstart" this reef into recovering on its own.

Each zone in the Rescue to Restore project plays an integral part in achieving our goal of increasing coral abundance and diversity in the U.S. Virgin Islands. Investment and collaboration by the Lovango Resort and Beach Club were key in allowing Reef Response to establish this successful program and we are all excited to continue our work together to restore Virgin Islands reefs.

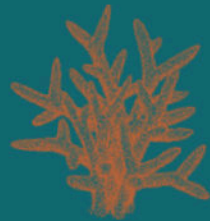
– Dr. Marilyn Brandt



| Staghorn corals planted by Reef Response in the Restored Zone create new habitat for fish. |

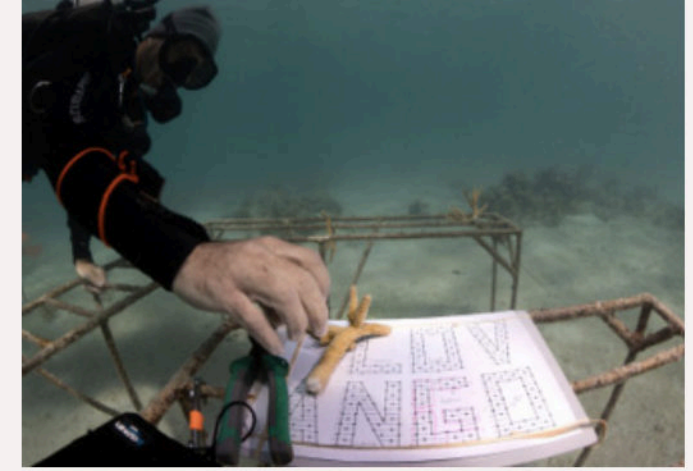


The Rescue Zone



The goal of the Rescue Zone is to create a nursery that will supply corals for priority sites around the territory.

| Sonora is creating images that will be used to build a digital 3D model of the nursery. |



Reef Response partnered with Lovango Resort and Beach Club to enhance efforts to restore coral reefs in the USVI. Reef Response efforts in the Rescue Zone focus on the charismatic staghorn coral (*Acropora cervicornis*), so named for its resemblance to deer antlers. This species is a quintessential Caribbean coral species that is fast growing and is used in many other restoration projects here in the US Virgin Islands, and throughout the region. Unfortunately, due to local and global stressors, staghorn coral has seen significant decline.

To help increase the abundance of staghorn coral on the reefs around Lovango Cay, as well as other USVI locations, we designed and built a coral nursery to grow healthy, resilient corals. As trees are to a rainforest, corals are to a reef, and as such, our goal is to plant more “trees”.

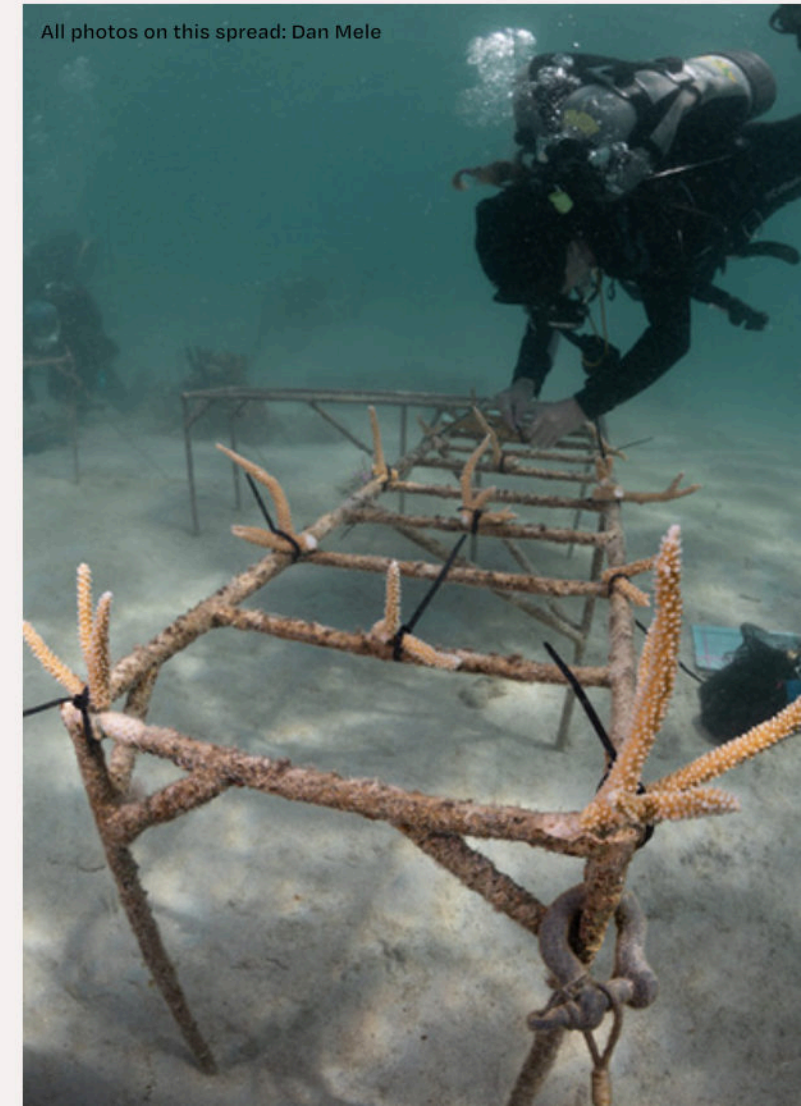
The first step is to establish nurseries to grow corals to a suitable size for planting them onto the reefs. Corals have the ability to reproduce sexually. In nature, a coral colony may break into multiple pieces because of high wave action, a process called “fragmentation”. If the resulting coral fragments are lucky and fall in the right place, they will reattach to the sea floor and start growing fast to create a whole new coral colony. However, many of these fragments do not reattach and they ultimately die. We utilize the fragmenting and reattaching ability of corals to populate our nurseries. We carefully fragment corals and care for them to promote their growth in an accelerated but healthy manner in the nursery.

| The Reef Response team and student interns stock the nursery with coral fragments for the first time. |

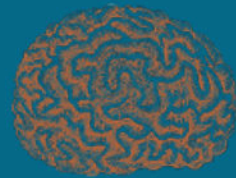
We wanted to build a unique nursery to capture the attention of visitors. Our one-of-a-kind nursery spells out L O V A N G O in 6ft x 4ft block letters. It was designed, constructed, and installed by our Reef Response team. We attached the staghorn corals to the structures allowing them to grow out and provide us with a continual supply of corals to be relocated onto the reefs surrounding Lovango Cay. Our ambitious collaboration between a coral restoration organization and a resort highlights the benefits that coral restoration provides for us all.

– Dr. Marilyn Brandt

All photos on this spread: Dan Mele



The Research Zone



The goal of the Research Zone is to test new techniques to guide our restoration efforts.

| Kathryn measures the growth of coral in a research plot. |

All photos on this spread: Dan Mele

Coral restoration is an emerging and evolving field that involves replanting (also known as outplanting) resilient corals onto degraded reefs.

In many cases, degraded reefs become inundated with plushy macroalgae that not only looks unappealing but can outcompete the existing coral populations. The goal of coral restoration is to enhance coral populations so that reefs return to a coral-dominated healthy state. A healthy state for a coral reef consists of a high abundance of corals resilient to environmental conditions that support and create habitats for important fish and marine creatures. This is no small task and involves collaboration from other scientists, businesses, government entities, and most importantly, members of our community. This also means we must consistently work together to find the most effect ways to restore our reefs.

What is interesting about coral restoration is that every location is a little different in how outplanted corals react to their new homes. For us scientists, this is an exciting opportunity because there is room for innovation and creativity in how we outplant coral in an attempt to make each site we work at as successful as possible. Scientific research guides this process and helps us best tailor our restoration efforts to each of our sites. Some of the factors we take into consideration include how much light will the corals experience, if the site has high wave action or is in a high current zone, is there suitable sea floor to attach corals, are there predators that will severely inhibit coral growth, and are there other beneficial creatures like herbivores that may aid growth. Also, each coral species has its own strengths and weaknesses, and preferences for different environmental conditions. We combine our scientific assessments of each site and our knowledge of each coral species to decide which coral species will have the highest survival in which places.

Here at Lovango, one of our studies we are excited about involves looking at how outplanting different

types of corals closely together may benefit each other. This project focuses on the charismatic staghorn coral (*Acropora cervicornis*). This species is used in many other restoration projects here in the US Virgin Islands and throughout the region because it is fast growing and vitally important to Caribbean reefs. However, this coral species can be prone to predation and has historically been susceptible to disease outbreaks. Since this is such an important species for coral restoration, we are working to figure out new ways to keep our outplanted staghorn corals as healthy as possible.

To do this, we are planting our staghorn corals in combination with the Boulder Star Coral (*Orbicella annularis*), which may act as tasty alternatives to typical staghorn predators we see on our reefs like snails and the bearded fireworm. Additionally, we have included the Mustard Hill Coral (*Porites astreoides*) in this study because this species has shown disease resilience in previous research. The Mustard Hill Coral may provide an immune barrier against disease if outplanted close to our staghorn corals. These outplanted corals are monitored monthly so we can document changes in coral growth and note if we see disease, predation, or any other sort of mortality on our corals. So keep your eyes peeled because you may see us hard at work off the shore of Lovango's Waterfront Restaurant during your visit!

– Kathryn Cobleigh

| Brad and intern Kelsey Vaughn set up research plots for Reef Responses multi-species outplanting experiment. |



The Restored Zone



The goal of the Restored Zone is to bring back the natural beauty of the Lovango reef.

[The Reef Response team outplants fragments of elkhorn coral in the Lovango Restored Zone.]

All photos on this spread: Dan Mele

Restoration is a lengthy and intensive process that does not have a defined finish line. When can we say that we have “restored” the reef? The reality is the reefs will probably never return to their pristine condition before human impacts, but that does not mean they cannot be restored to a flourishing stable state. A restored and resilient reef provides many benefits but how do we at Reef Response assess our restoration progress? We evaluate our progress by continuing to monitor our coral outplants and the overall status of the reef compared to before we began our restoration efforts.



[Kathryn outplants staghorn coral in the Restored Zone using a 2-part marine epoxy]

There are different methods and metrics to track the success of restoration efforts. One way to measure the health state of a reef is to measure the percent coverage of the reef floor comprised of living coral. By this we mean if you took a photograph from directly above the reef and blacked out everything but living coral you can estimate the overall percent coverage of coral compared to the entire reefscape.

The seafloor of a coral reef is made up of many organisms. While corals are a primary component, they are not the only group competing for space on the reef; sponges, seaweed, and others compete for the limited space on the reef. Our goal is to restore the north shore of Lovango reef to historic coral density. To meet our goal, we aim to achieve 10% coral coverage on the reef, meaning that at least 10% of the reef floor will be covered with healthy, living coral.

We began outplanting corals on the north shore reef of Lovango in December 2020 and have outplanted over 1000 corals to date. If you have ever tried to start a garden or have house plants, you will know that not everything survives and grows; the same is true for coral gardening. We follow best practices and are continuing to adapt our methods in response to the emerging science to ensure the highest rates of survival and success. The Reef Response team is working diligently to reach our restoration goals.

You do not have to be a marine biologist to help coral restoration efforts. While visiting Lovango, and other destinations with coral reefs, you can help protect our reefs by reducing plastic and other waste, not touching or accidentally bumping into the corals, and wearing reef-safe sunscreens. But the fight to restore our coral reefs extends beyond the Virgin Islands. Everyone can help protect and restore the reefs, even from home, by reducing carbon emissions, refusing single-use plastics, and remaining educated on current environmental issues. Reef Response thanks you for your help!

Reaching our restoration goals will help bring back the natural beauty of the Lovango reef for all of us to admire and enjoy.

– Brad Arrington

Coral News

We are very excited about our on-going project of 3D modeling the LOVANGO nursery structures! This cool project will allow us to create three-dimensional animations showing the coral growth progress over time.

Reef Response Coordinator, Kathryn Cobleigh, gave a presentation at a coral restoration conference in Key Largo, Florida in September 2022 about the unique relationship between Reef Response and Lovango Resort and Beach Club. Sharing the success of our partnership will hopefully encourage other resorts to support local coral restoration efforts!

We are keeping busy at Lovango! Since December 2020, Reef Response has consistently outplanted corals across our Rescue, Research, and Restored zones. Our Restored zone has been our most active outplanting site, with close to 1000 pieces of corals attached to the reef, comprised of over 10 species!



The Reef Response team have begun outplanting corals within the Virgin Islands National Park waters on St. John. This is the first time restoration has been done in the National Park in the USVI. The LOVANGO coral nursery will help supply corals for the National Park restoration efforts as well.

Based on the success of our rebar LOVANGO nursery, we plan to install a rebar nursery near the University of the Virgin Islands spelling out UVI. We will use this new UVI nursery for growing corals but also for training of UVI students.



| Above: Five fragments of elkhorn coral outplanted in the Restored Zone begin to fuse together to form into one larger coral colony

Left: The 'A' from the rebar frame that spells 'LOVANGO' is populated with coral fragments.

Facing Page: Kathryn and intern Stephanie Hibberts monitor the multi-species experiment in the Research Zone. |

All photos on this spread: Dan Mele

Meet Kahlifah Powell

Kahlifah is a University of the Virgin Islands undergraduate student and intern with the Reef Response team

– Interviewed by Elisa Bryan

Hi Kahlifah, can you tell me a little about yourself?

Hi! I'm from St. John and in my senior year at the University of the Virgin Islands. My major is marine biology with a minor in environmental science. After I graduate and complete my National Guard training, I plan to enroll in the Masters of Marine and Environmental Science program at UVI and eventually, earn a Ph.D.

How were you introduced to the Reef Response program?

When I was in the Emerging Caribbean Scientists program I wanted to do something with coral restoration so I interned with Dr. Brandt. She introduced me to the different coral restoration steps. One of the projects she had me work on was measuring coral growth and... I was hooked. When Dr. Brandt offered to extend my internship I thought "Yes! Let's do this!". Eventually she asked if I wanted to become a part of the Reef Response team.

What is the hardest part of working on this team? What is the best part?

Well, because of my class schedule I can't go with the team on all their dives. I wish I could! I would



like to participate more but class comes first. Still, I've been able to participate in some outplanting, like at Hull Bay Beach.

The best part is that I'm always treated with so much respect. As if I'm an equal on the team. I really appreciate that. Plus, it's fun!

What are your long term career plans?

I plan to get my Ph.D. so I can open a restoration and conservation facility on St. John for corals and mangroves. Right now there are only a few outplanting sites on St. John and no on-land facility. We use on-land water tables for newly fragmented pieces of coral. When they grow to a certain size we move them to an underwater nursery. From there, once they're big enough, we outplant them to the reefs. I want to set that up.

Also, I really want to go into the schools, like elementary classrooms, to educate the young kids about corals and coral restoration.

| Above, Kahlifah fragments coral specimens.
Photo by Kathryn Cobleigh |

| The pillar coral *Dendrogyra cylindrus*, with its tentacles extended, is one of the more charismatic corals you'll find on Caribbean reefs. |



You can help! Even a little effort goes a long way.

Choose reef-safe sunscreen – using a mineral-based sunscreen whose active ingredients are zinc oxide and titanium dioxide. If you are unsure whether the sunscreen you brought in your suitcase is reef safe just avoid anything with the harmful chemicals Oxybenzone and Octinoxate.

Take care while boating – When boating, do not drop anchor on any corals or against the reef.

When diving and snorkeling – Do not touch corals or any other marine life. Make sure to be cognizant of your fins and hoses to make sure you are not kicking corals or getting hoses tangled in the reef.

Reduce your carbon footprint – Limit carbon emissions. For example, switch to using products like energy efficient light bulbs.

Support sustainable fishing – Some tasty and sustainable local options include: Lionfish, Mahi Mahi, Bonito, Mackerel, and Snapper.

Reduce pollution – Minimize fertilizer use. When washed into waterways, the nutrients from fertilizer can pollute the water and can cause harmful algae to bloom.

Refuse single-use plastic – Use refillable water bottles, skip the straw, and choose glass, metal, bamboo or compostable products whenever possible.

Support ocean-friendly tourism – Reach out to us by visiting our Reef Response website, social media or our local dive shop partners to get involved!

| A healthy thicket of staghorn coral blankets the seafloor providing endless nooks and crannies for reef critters to hide in. |

All photos on this page: Dan Mele



Community involvement is an important component to successful coral restoration efforts.

Get involved!



| Jason and Kathryn pose with student volunteers at one of our coral nurseries |

Reef Response is a growing organization. Not only are we increasing our restoration capacity throughout the territory, but we are working hard to expand our citizen scientist opportunities for both local Virgin Islanders and guests to be involved with our work. Restoration is a time intensive process that relies heavily on people power, which makes community involvement a huge component to successful restoration efforts.

If you are interested in keeping up to date with our restoration efforts, follow Reef Response on facebook, instagram, and twitter for updates!

Know an aspiring marine biologist? The University of the Virgin Islands (UVI) offers both undergraduate and graduate marine science degrees and is always eager to chat with enthusiastic students. If you or anyone you know is interested in pursuing opportunities in coral restoration specifically, please contact us directly at email: reefresponse@uvi.edu and website: reefresponse.org. We are happy to answer any questions you may have!

Photo: Dan Mele



Photo: Dan Mele
Magazine design: Elisa Bryan


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