FLORIDA KEYS NATIONAL MARINE

SANCTUARY

MAGAZINE **2025**

TRUE **BLUE**

RESTORATION BLUEPRINT IS FINALLY HERE

THE POWER OF COMMUNITY

SHIPWRECK DISCOVERY

FLORIDA KEYS NATIONAL MARINE SANCTUARY

MARINE PRESERVATION SOCIETY OF THE FLORIDA KEYS

APRIL 13, 2023

If Florida Keys National Marine Sanctuary buoys could earn travel miles, this 32-inch Sanctuary Preservation Area (SPA) boundary marker would be certified platinum following a 4,400-mile journey across the Atlantic Ocean. The buoy, believed to be from Western Sambo SPA near Key West, turned up on a beach near the small fishing village of Haverigg, located in the upper reaches of the United Kingdom.

THE MOMENT

Sand Key at sunrise.
Photo: Ryan Trueblood.

FLORIDA KEYS NATIONAL MARINE SANCTUARY

Florida Keys National Marine Sanctuary.
33 Quay Drive, Key West, FL 33040

This magazine was published by The Keys Weekly Newspapers, MMXXV.

On the cover: *Staghorn coral fragments ready for outplanting on the reef. Photo: Jay Clue.*

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1 of 1

Ocean | Sotheby's
INTERNATIONAL REALTY

of the unique

We live here, we give here

Left to right: Rob Bleser, Ian Koblick, Jodi Zifferer, Les Burke, Kurt Tidd, Sarah Fangman, Nick Davies, Sara Rankin, Steve Smith, Tom Davidson, Jr., Russell Post. Absent, Stephen Frink.

The Marine Preservation Society of the Florida Keys (MPS) is a nonprofit organization working to preserve and protect our beautiful Florida Keys waters. In an island chain boasting many marine organizations, MPS has already proven itself different. The faces on the MPS board are familiar community leaders and environmental stewards who founded MPS with a sharpened mission and organizational processes that give them a lot of freedom of action. This local structure is beneficial to the Florida Keys National Marine Sanctuary (FKNMS) and the broader community.

The key organizing principle is to keep preservation efforts and fund use local. As a volunteer group, this allows financial support to go straight to the marine ecosystem.

An example of these decisions proved a great one when a 1,000-pound fishing net with an attached 1,000-pound buoy was discovered, snagged precariously near the Eastern Dry Rocks Sanctuary Preservation Area and beside 30,000 outplanted corals. The sanctuary contacted other resources prior to MPS, but lack of funding and/or protocols were prohibitive to the immediate removal needed. The request for assistance was passed to MPS and approved within the hour, demonstrating the role of being local, nimble and responsive. The next morning, the salvor was on the water and the net retrieved.

"We live here and give here," notes MPS chairman Tom Davidson Jr. "Reacting quickly to this kind of need is at the heart of our mission. This type of rescue operation is precisely why MPS was created. Unfortunately, the day before the popular Alligator Reef Lighthouse swim, yet another commercial net floated into the area, and we had to repeat the process again."

The universally popular mooring buoy system is funded by MPS. Working with the Tourism Development Council, buoys are added annually to ensure continued additions of safe and convenient anchorage for boaters. Behind the scenes, MPS funded the Mission: Iconic Reefs website to advance awareness of FKNMS's vitally important program and one of the largest investments in coral restoration in the world and provided support for vital temperature sensing equipment to be deployed.

"By bringing funds local, the organization is more efficient," emphasizes retired Navy Admiral Kurt Tidd, MPS vice chairman. "We are deeply connected in the community and collaborate with all individuals and organizations. The decision to work real-time and with

More information is available via email to Sara Rankin at sararankin@marinesociety.org, or visit MPS's website at marinepreservationsociety.org.

Board Members Burke & Tidd have firsthand knowledge of conditions.

focus just makes sense – not just for us, but for those who want to see the greatest impact for their time and their financial support."

Working together with all is a strength of MPS. As area waters once again heated up in the spring of 2024, MPS paid for an emergency coral nursery, with assistance from the Ocean Reef Conservation Association (ORCA). "Without the collaboration and generosity of ORCA, the nursery would not have been possible. As a non-partisan group, this nursery was made available to all coral practitioners and the sanctuary on-demand. The threats to our marine environment are numerous, and the only way to meet them is by working together with logos set aside," states board member Jodi Zifferer.

MPS works. Their difference is most pronounced in that the organization acts as a conduit, getting dollars to sanctuary needs without reserving any funds for themselves. This new approach has proven very appealing to supporters, and MPS is currently welcoming others' support.

Scan the QR code to support the Marine Preservation Society

You can't always get what you want, but you get what you need

The Rolling Stones said it best: "You don't always get what you want, but you get what you need." While Restoration Blueprint's Final Rule (see page 14) does not represent everything desired by environmental organizations, it does represent unprecedented collaboration and compromise, landing in a Goldilocks zone of "just right" that launches a plan for strengthening the Florida Keys ecosystem relied upon by so many for their recreation and livelihoods. The Marine Preservation Society Board of Directors endorses Restoration Blueprint, and urges Governor Ron DeSantis to accept it in full.

Everyone will see their fingerprints on the final product, the result of 85 Sanctuary Advisory Council meetings, 50 community presentations, 70 public meetings, 80,000 public comments, coordination with a litany of governmental agencies and Congressional Acts. NOAA is adding 37 marine zones to protect sensitive habitats and species like deep-water corals, turtles and endangered birds. A new zone type will facilitate habitat restoration. At the same time, NOAA is eliminating five existing marine zones allowing fishing access in locations that have been closed since 1997. All of this will improve management consistency, support access, separate conflicting uses, and facilitate habitat restoration.

New regulations aside, Restoration Blueprint also includes an updated management plan that features six priorities: management effectiveness/adaptive management, water quality, restoration, visitor use management (including the number and location of mooring buoys), enforcement, and stewardship and engagement.

What Restoration Blueprint lacks in perfection; it makes up for in progress. The former was impossible to achieve, in no small part because of the relentless cascade of challenges that continued to arrive while the document was being designed. There is more work to be done, because of the list of ideas left on the table. The scale of the original design was admirable and understandable—but represented too large a lift. Moving forward, Florida Keys National Marine Sanctuary can respond to threats more quickly, taking on one or two challenges at a time—not 500—and this organization will have some ideas to share.

Restoration Blueprint doesn't celebrate every request, but it does celebrate what we did. So, let's celebrate.

Board of Directors
Marine Preservation Society of the Florida Keys

THANKS

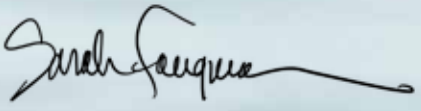
In September 2017, the same week I arrived as superintendent of Florida Keys National Marine Sanctuary, Hurricane Irma barreled across the region, leaving a sea of destruction in her wake. My welcome wagon was a reminder of both the challenges and the opportunities associated with managing this irreplaceable piece of paradise. The Florida Keys family has been inspiring to me because of the way in which people and organizations here work together through shared purpose. Faced with trials, this community turns challenges into occasions for coming together, and we should never forget how rare and special that is.

Now, as I transition to a new role as West Coast Regional Director of NOAA's Office of National Marine Sanctuaries, I leave behind what I am certain is a roadmap for answering another call: the delicate balance between access to and protection of our marine environment. Built on a foundation of collaboration, it is the long-awaited Restoration Blueprint, which is explained in great detail on the following pages.

The ecosystem found within the boundary of Florida Keys National Marine Sanctuary is a complex, critically-important environment, and one that has been facing serious challenges. Like previous trials that brought the community together, it is of the utmost importance that everyone do their part to help implement Restoration Blueprint, which includes a management plan of non-regulatory objectives fashioned as a strategic plan. Together, they show us a way forward. Likewise, I leave knowing that Mission: Iconic Reefs is up and running on a solid foundation, along with the knowledge that I am able to advocate for the Keys from an even stronger position of leadership within the sanctuary system.

So, allow me to circle back to the same place I began, by recalling Hurricane Irma. The destruction spawned by that storm delayed for several months the chance to gather the sanctuary team in one place. Once I had them in front of me, I asked our people to write down the answer to a pair of questions: Why are you here? and What do you wish for? As I faced this transition, I went back and re-read the answers to those questions, and the themes I heard still hold true: "I'm here because I love this environment." "I love this community." "I love the weather." "I love the lifestyle." And the answer to What do I wish for? was overwhelmingly: "I hope I can make a difference." That remains true today, and it must be continued.

See you soon,



Sarah Fangman

FOR THE MEMORIES


MISSION:
ICONIC
REEFS

The Dive Shop

RENEWING REEFS FOR FUTURE GENERATIONS

IN A RAPIDLY CHANGING WORLD

The inspiration behind Reef Renewal USA is the combined visions of Mike Echevarria and Ken Nedimyer. They come from widely different backgrounds, Ken being a commercial fisherman and marine biologist, and Mike being a successful attorney, but they share a common passion: to restore the coral reefs of the Florida Keys.

They began working together fifteen years ago while Ken was president of the Coral Restoration Foundation, and have worked closely together since then to restore coral reefs and inspire others to join the effort. In 2019 they started a new company called Reef Renewal USA and have been focusing on developing techniques for growing some of the more challenging corals to grow, such as most of the different species of brain and star corals. They have also been focusing on finding what they call the "winners", the corals that have survived disease and extreme water temperatures. With permits from The Florida Keys National Marine Sanctuary and the state of Florida, they have collected samples from hundreds of different stress hardened corals found throughout the length and width of the Florida Keys and are now cultivating them in multiple offshore nurseries throughout the Florida Keys.

After the devastating heat related losses to staghorn and elkhorn coral in the summer of 2023, they decided to focus more of their efforts on growing and planting heat tolerant brain and star corals. In 2024 they partnered with Seagrass Restoration Institute in Ruskin Florida to repurpose an existing aquaculture facility into an industrial scale coral farm develop designed to produce 300,000 tennis ball sized corals per year for restoration efforts in southeast Florida and the Florida Keys. The facility is currently being stocked and they anticipate sending their first shipment of corals to the Florida Keys in the spring of 2025.

Reef Renewal USA is also developing three new nurseries in the upper Keys to support restoration efforts at several of the most popular local dive sites as well as two of the Mission: Iconic Reef sites, Horseshoe Reef and Carysfort Reef. They will be working closely with the Dive Shop at Ocean Reef as well as the Ocean Reef Conservation Association to develop a robust community engagement program to help support efforts to restore Carysfort Reef.

Reef Renewal USA

SEAGRASS RESTORATION INSTITUTE

MISSION: ICONIC REEFS

Ocean Reef Conservation Association

The Dive Shop at The Reef, 39 Fishing Village Drive, Key Largo
305-367-3051, info@thediveshoporc.com, www.thediveshoporc.com

By Scott Atwell

TRUE BLUE

COOPERATION, COORDINATION AND COMPROMISE HAVE BEEN ESSENTIAL ELEMENTS IN ARRIVING TO THE FINAL ITERATION OF RESTORATION BLUEPRINT

Florida Keys National Marine Sanctuary was never meant to be a museum piece viewed from a distance — a philosophy that has placed an extraordinary burden on the quest to balance access with preservation of the ecosystem. But now, following more than a decade of research, technical expertise, partner agency consultation and thousands of public comments, NOAA believes it has landed in a Goldilocks zone of "just right," with release of Restoration Blueprint, the first comprehensive update to regulations since the sanctuary was established in 1990.

The result of this effort expands the sanctuary boundary to 4,539 square miles, an increase of almost 20 percent, and also includes a new management plan focused on understanding and improving the condition of sanctuary resources through reducing threats and addressing emerging issues. Together, they are known as Restoration Blueprint.

What began in 2011 with the publication of an alarming condition report, has culminated in a suite of rules designed to build back the ecosystem's resilience so it can better withstand the elements that caused these declines — hurricanes, diseases, vessel groundings, rising ocean temperatures, pollution and human interactions.

"The Florida Keys have experienced an onslaught of impacts that have put the environment and economy at risk," said John Armor, Director of the Office of National Marine Sanctuaries. "The Sanctuary staff has spent the last 13 years listening to the public, state agencies and federal partners to inform a robust and thoughtful blueprint that addresses impacts to the ecosystem to ensure it thrives for generations to come."

In the nearly 35 years since the sanctuary was established, Florida's population has increased by more than 75% and angler participation by half, while boat registrations in Monroe County leaped from 26,000 to 30,055 since 2010. Meanwhile, the number of visitor days in the Florida Keys has topped 20 million. All these indicators point toward increased use of the ecosystem.

"Over time, it's clear we need consistency and clarity in the regulations and it would be derelict to ignore what we have learned," said Sarah Fangman, who directed the last seven years of the project as Superintendent of Florida Keys National Marine Sanctuary. "We must be able to evolve and adapt more quickly, not waiting 20 years."

Sanctuary waters attract many visitors to the Florida Keys. Balancing access and protection is a priority of Restoration Blueprint.

A sanctuary science diver collects data at Elbow Reef, information that will drive future decision-making. Photo: Matt McIntosh/NOAA.

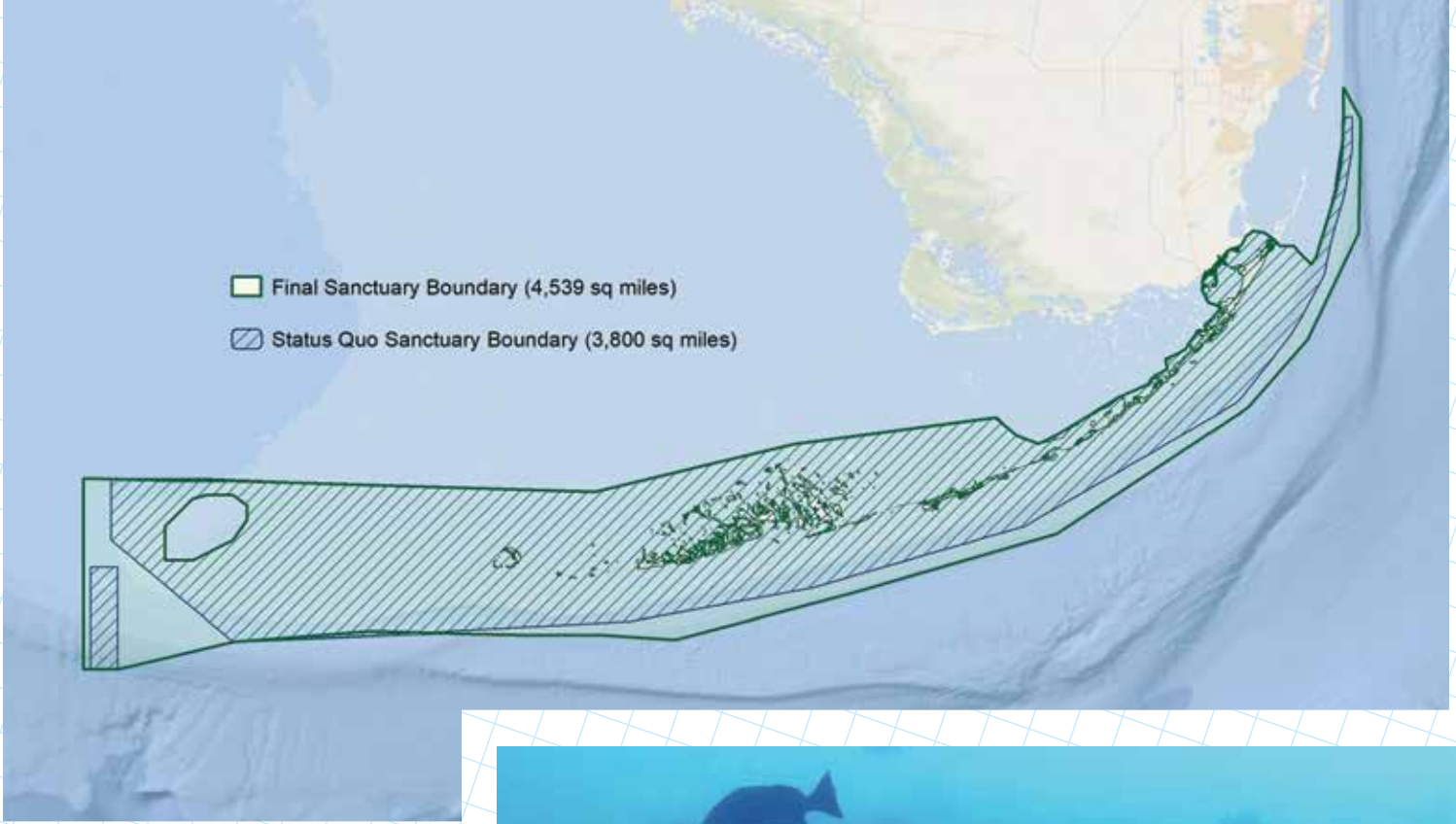
THE MANAGEMENT PLAN

Regulations are only one instrument in the sanctuary's toolbox. Present and future work is guided by a management plan which outlines non-regulatory actions that complement and support the rulemaking — actions largely focused on understanding and improving the condition of sanctuary resources through reducing threats and addressing emerging issues.

As examples, the plan calls for:

- Utilizing research to determine the effectiveness of existing management strategies that may inform future regulatory and marine zoning changes;
- Focusing on water quality and habitat restoration;
- Reducing threats caused by human uses and associated impacts through voluntary certification programs or the establishment of limited use areas;
- Developing best practices for the use of artificial substrates in restoration;
- Achieving higher public awareness, understanding, sustainable use and appreciation of sanctuary resources;
- And leveraging relationships with co-managers to offset shifts in available fiscal and human capital resources.

"The management plan works hand-in-hand with the regulations," said Policy Adviser Beth Dieveney, lead coordinator of Restoration Blueprint. "It provides direction for the sanctuary team to prioritize its work for meeting the mission of the organization."



SANCTUARY-WIDE REGULATIONS

Why did the sanctuary need to expand? Since 1990, a regulated zone has extended from the Atlantic reef line to beyond the sanctuary boundary as an "Area to Be Avoided" (ATBA), which prevents entry by vessels larger than 50 meters in length. In a nod to consistency, Blueprint closes the gap, extending the southern boundary of the sanctuary to mirror the ATBA, which adds 430 square miles. Meanwhile, the western reaches of the sanctuary now encompass the Tortugas Region, linking similar habitats in a concept known as ecological connectivity.

"A few years back we identified two spawning aggregations that were just to the west of Riley's Hump, but they were outside of the existing boundary of the protected area," said Dr. Andy Bruckner, the sanctuary's chief scientist. "By moving the boundary a mile to the west, we are investing in future populations of Cubera snapper and black grouper that spawn in the area."

Black grouper represent an important resource to fisheries, and protection of a spawning area is an investment in future generations.

Even farther west, Restoration Blueprint did not choose to include the 257-square-mile area known as Pulley Ridge, after deep-water corals located there gained protection from a no-anchoring regulation implemented by the International Maritime Association. The sanctuary's proposed regulation would have been duplicative.

Across the entire sanctuary, NOAA updated an existing regulation to explicitly prohibit discharge of any material from cruise ships other than cooling water, while adding a new regulation prohibiting the anchoring of vessels at risk of becoming derelict. In addition, the feeding and attracting of fish, including sharks, from any vessel or while diving is now prohibited, a regulation that does not affect traditional fishing. NOAA will consider issuing general permits to pre-existing fish feeding operators who are able to satisfy all general permit application requirements.

The Blueprint also includes regulatory changes to allow motorized personal watercraft operation in a small portion of the Key West National Wildlife Refuge, west of the Key West main ship channel around marker G13, where such operation is otherwise prohibited.

NOAA will delay by two years the effective date of a new regulation requiring large vessels to use designated mooring buoys, and a new regulation prohibiting anchoring in Sanctuary Preservation Areas (SPAs), Habitat Restoration Areas and the offshore, high relief reef area in Western Sambo Conservation Area. The purpose of this delay is to provide NOAA with adequate time to finalize a mooring buoy plan that will estimate numbers and locations of mooring buoys, secure materials, and install new mooring buoys (see page 24 for in-depth story).

"Many of our SPAs have active coral restoration happening," said Ben Daughtry, a Keys native and chair of the Sanctuary Advisory Council. "With so many environmental pressures already negatively affecting our live corals, making sure that anchor damage isn't one of them is really important."

Nursery sites like this one represent the future of coral reefs in the Florida Keys. Photo: Matt McIntosh/NOAA.

Finally, Restoration Blueprint updates the existing regulations to allow for rapid, temporary rulemaking to facilitate time-sensitive, adaptive management and response to emergencies. The new rule expands from 60 days to six months the time frame during which any temporary regulation can remain in place, with the option for one six-month extension.

"As I observed in the summer of 2023 when we were trying to protect some deep-water coral nurseries, creating an emergency rule is not an overnight process," said Ken Nedimyer of coral practitioner Reef Renewal, "and it's something that is carefully considered before being acted upon. Extending the duration will allow the rule to remain in effect for up to a year while the problem either resolves itself, or while a more permanent response can be developed."

Of the 4,539 square miles now within the sanctuary boundary, only one-fifth carry additional protections as managed marine zones such as Sanctuary Preservation Areas and Wildlife Management Areas. In a nod to simplification, Conservation Areas have been created by combining zones formally known as Ecological Reserves and Special Use Areas, while a new designation protects baby corals at in-water nurseries (Nursery Restoration Area) and outplant locations on the reef (Habitat Restoration Area).

New regulations provide a proactive opportunity to keep vessels from becoming derelict.

SANCTUARY PRESERVATION AREAS

Strategically located along the Florida Reef line, these discrete areas have long served as sentinels protecting endangered corals, with their locations delineated by 32-inch, yellow boundary buoys. By adding two, eliminating two and combining two, the total number of SPAs now stands at 17, a reduction of one. They range in size from the smallest, at 0.07 square miles (Cheeca Rocks), to the largest, at 3.78 square miles (Carysfort Reef). The total area of SPAs is 12.14 square miles.

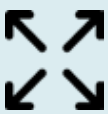
Three SPAs have been expanded toward the deeper reef, including Alligator Reef and Carysfort Reef to the 90-foot contour, and Sombrero Key to capture remnant and endangered elkhorn corals, and a historic black grouper spawning location.

Ninety-five percent of the sanctuary remains open to fishing, even as catch and release is eliminated at four Sanctuary Preservation Areas in an effort to simplify compliance. Photo: Main Attraction Charters.

Building on the pursuit of consistency, Restoration Blueprint eliminates the exception for catch and release trolling in four existing SPAs where it was previously applied (Conch Reef, Alligator Reef, Sombrero Key, and Sand Key), while also eliminating the practice of issuing bait fishing permits in all SPAs.

"User compliance is greatly reduced and enforcement greatly hindered when exceptions to regulations in specific zones are provided," said Fangman. "Over two decades of management experience with marine zones in the sanctuary points us to providing zones with consistent and clear regulations."

AT A GLANCE: SANCTUARY PRESERVATION AREAS

						
NO CHANGE	**EXPANDED**	**COMBINE**	**NO FISHING**	**NEW**	**ELIMINATED**	**NO ANCHOR**
Coffins Patch Cheeca Rocks Davis Reef Eastern Dry Rocks Hen and Chickens Looe Key Molasses Reef Newfound Harbor The Elbow	Alligator Reef Carysfort Reef Sombrero Reef	Grecian Rocks Key Largo Dry Rocks	Alligator Reef Conch Reef Sand Key Sombrero Reef All other SPAs	Turtle Rocks Turtle Shoal	French Reef Rock Key	All SPAs, effective 2027

The "no entry" area at Woman Key has been enlarged slightly as a buffer for turtles and historically-important bird populations. Photos: Matt McIntosh/NOAA, Kristie Killam and Jean Zuo.

WILDLIFE MANAGEMENT AREAS

While not exclusive to the backcountry, Wildlife Management Areas (WMA) are best known as nearshore locations designed to protect critical resources such as seagrass, turtles and threatened bird populations. Disturbances are managed by the placement of no entry, no motor and idle speed/no wake regulations. Restoration Blueprint expands the number of WMAs to 44, an increase of 62%. These locations are modest in scale, ranging from 0.01 to 6.37 square miles, when excluding the existing Tortugas Bank zone.

Descriptive words matter, which is why NOAA is eliminating "no access buffer" and "closed" zone regulations, and replacing them with a "no entry" regulation that has the same effect, while also aligning with state terminology.

Each year, loggerhead sea turtles nest on the beach and dunes of Woman Key, a ritual passed along from one generation to the next. Several species of wading birds also nest in the area, located 13 miles west of Key West, and a large number of shorebirds use the sand spits on the southeast side of the island. This existing marine zone is changed from "closed" to "no entry," and expanded to 300 feet offshore of the beach to further decrease disturbance to wildlife, where high concentrations of visitors may affect nesting.

"If somebody surprised you as you were walking down a hallway and it startled you, and that happened 10 or 20 times a day, eventually you would be emotionally worn out," said Chris Eggleston, Project Leader at Florida Keys National Wildlife Refuge Complex, who worked with NOAA and FWC in crafting new regulations. "The birds will eventually leave, and the loss has a cascading effect on the symbiotic ecosystem. Birds need the mangroves for nesting, the mangroves need nutrients from the birds, and fish need the mangroves to feed and live in as a nursery. If we lose one component, then the entire island becomes less productive."

At WMAs, Restoration Blueprint generally favors sanctuary resource protection over access where biological and impact data demonstrate a need; however, the least restrictive access regulations and zone size needed to meet the resource protection goals have been applied.

Restoration Blueprint includes 20 new WMAs. View the entire list here.

RESTORATION AREAS

Coral restoration is one of the most critically-important efforts taking place in the Florida Keys, and Restoration Blueprint acknowledges the imperative by protecting discrete areas where baby corals are being grown (Nursery Restoration Areas) and where they have been outplanted (Habitat Restoration Areas). The scale of these new areas is so slight, they are best articulated in acres instead of square miles. Together, they total just over 1,000 acres.

While these corals do not take up much area, their survival requires the highest protection. Habitat Restoration Areas prohibit fishing, anchoring, and discharges/deposits, among other things, though the anchoring prohibition is delayed until 2027. Within Nursery Restoration Areas, vessels must also remain in transit through the area, providing the greatest level of protection for the growing baby corals..

"Restoration starts with protection," said Dr. Phanor H Montoya Maya, Program Manager for Coral Restoration Foundation. "Controlling access, implementing special management status and reducing impacts — all strategies seeking to protect underlying resources — are actions that enable reef recovery, either natural or assisted. In our case, protecting coral nurseries aims to safeguard the stock used to restore coral reefs."

View the list of Nursery Restoration Areas here.

With a little love and luck, baby boulder corals (above) can grow into a sustaining structure. Photos: Jay Clue.

Meetings small and large informed the final iteration of Restoration Blueprint.

PROCESS

A child who entered first grade when the Restoration Blueprint began would be in college today, but what the process lacked in speed, it made up for with inclusiveness. In addition to the exhaustive public input, more than 50 external partners, in addition to another two dozen NOAA agencies, have been involved in its creation, right up to White House Office of Management and Budget. And, where Florida State waters intersect with 50% of the sanctuary, the area is cooperatively managed with the State of Florida, requiring collaboration with the Florida Department of Environmental Protection and Florida Fish and Wildlife Conservation Commission. Cooperation, coordination and compromise have been essential elements in arriving at this final product.

"Collaboration means more than listening," said Fangman. "It requires hearing and consideration — and that takes time. No one got everything, but everyone got something, and I'm hopeful that we have arrived at a set of decisions that everyone can embrace. More importantly, something we can all rally around."

To be sure, there will be no more decades-long process when future action is needed. But for today, Restoration Blueprint outlines a plan for building a more resilient ecosystem that remains vital to the cultural, economic and recreational future of the Florida Keys.

We Need the Restoration Blueprint— and Your Help

My term as Mayor of Monroe County ended recently, but when I assumed the one-year post my resolution was to start a new chapter for our reefs. I still need you to join me in that commitment. We must embrace the changes of the National Marine Sanctuary's Restoration Blueprint, understand what those changes mean for our daily interactions and uses of our local waters, follow the new rules, and help educate others about why these changes are so significant. The ocean and coral reefs of the Florida Keys do so much for us, and now it's critical we return the favor. It is our responsibility as stewards of this ecosystem to embrace the changes in how we interact with our coral reefs and nearshore ecosystems. We must all unite to make the Restoration Blueprint a success for the Florida Keys.

Restoration Blueprint's management plan, a complementary document to the regulations, is a guiding light for our reefs. Decades of marine science in Florida all point towards making marine life more likely to withstand the harmful effects of stressors like higher temperatures by reducing other pressures on sensitive ecosystems. Our community has made great strides and significant investments in improving water quality in the past two decades, including Monroe County's construction of a billion-dollar sewer system, and also investing millions of dollars in canal restoration, Still, we can continue to push forward in these efforts. We must pursue bold action on climate change to protect our oceans in the next few decades. And we must manage our oceans, especially our federal marine sanctuaries and state aquatic preserves, to better withstand the factors contributing to their degradation.

Marine conservation science shows us that maritime zones with strong protections can reduce the pressure on ecosystems, which works hand-in-hand with restoration efforts focusing on resistance to and recovery from the ill effects of climate change and increasingly severe marine heat waves. Reducing pressure on ocean ecosystems means we can't manage our marine sanctuaries like 'business as usual;' we must change something to make marine life more sustainable. All of us – anglers, divers, snorkelers, boaters, businesses, and more – must work together to keep our ocean as healthy as possible.

Fortunately for Florida's marine life, the proposed Restoration Blueprint allows us to change our behavior thoughtfully to create more sustainable oceans. The current zoning and management plan for the Sanctuary dates to the 1990s when conditions in the Florida Keys were very different and much better than they are now. We have a rare opportunity to embrace a plan for the Florida Keys that can nimbly and aggressively respond to current and future threats. It is a bold plan that responds to the issues of warming waters and coral bleaching, extreme heat waves, declining abundance of commercial and recreationally important fish, coral disease, overuse of some sensitive regions, and dying seagrasses.

If we want Florida's oceans, especially our beloved coral reefs, to sustain and thrive for future generations, we must strengthen protections and rules for its management now. At the same time, I am excited about Monroe County's artificial structure program, which I believe complements coral restoration work taking place in the Keys. I encourage the sanctuary to work with Monroe County to accelerate this initiative, and also with FWC to come to an agreement about the authority over fisheries.

I'm ready to take action this new year for what we love most, and I hope you are, too.

Holly Raschein
Board of Monroe County Commissioners

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FLOATING **NEW** IDEAS

WHEN THE FLORIDA KEYS MOORING BUOY PROGRAM LAUNCHED IN 1981, IT WAS HAILED AS A REVOLUTIONARY METHOD FOR PROTECTING DELICATE CORAL REEFS FROM ANCHOR DAMAGE. TODAY, THE NEARLY 200-MILE NETWORK FEATURES APPROXIMATELY 600 MOORINGS ACROSS MORE THAN 50 LOCATIONS. POPULAR DIVE SPOTS LIKE LOOE KEY REEF CAN ALONE FEATURE 50 BUOYS, BUT ON SOME DAYS, AN INFINITE NUMBER IS NEEDED.

A full house at Sombrero Reef as the full complement of mooring buoys is in use on a clear day. Photo: Daniel Eidsmoe.

"Management of the resource and ecosystem needs to constantly evolve, because things change," said Keys flats guide Will Benson. "Behaviors change. Interests change."

Anticipating Restoration Blueprint's changes to anchoring regulations inside preservation areas, the sanctuary's advisory council formed a working group last year to gather recommendations for advancing the mooring program into its next era, tapping Benson as co-chair along with fellow advisory council member Lisa Mongelia. Over several months and more than a hundred hours, the working group solicited ideas from user groups, identifying conservation and protection of the resource as its highest priority, even acknowledging that some buoy locations may be contributing to degradation of the reefs as a result of localized human impacts. "There is a component of overcrowding," said advisory council chair Ben Daughtry. "Too much human impact on many of our key reef sites in the sanctuary is becoming incompatible with healthy reefs. No anchoring will help to create a capacity cap of visitors to that area at one time. By only allowing vessels to be moored to mooring balls, we can help to relieve some of the congestion."

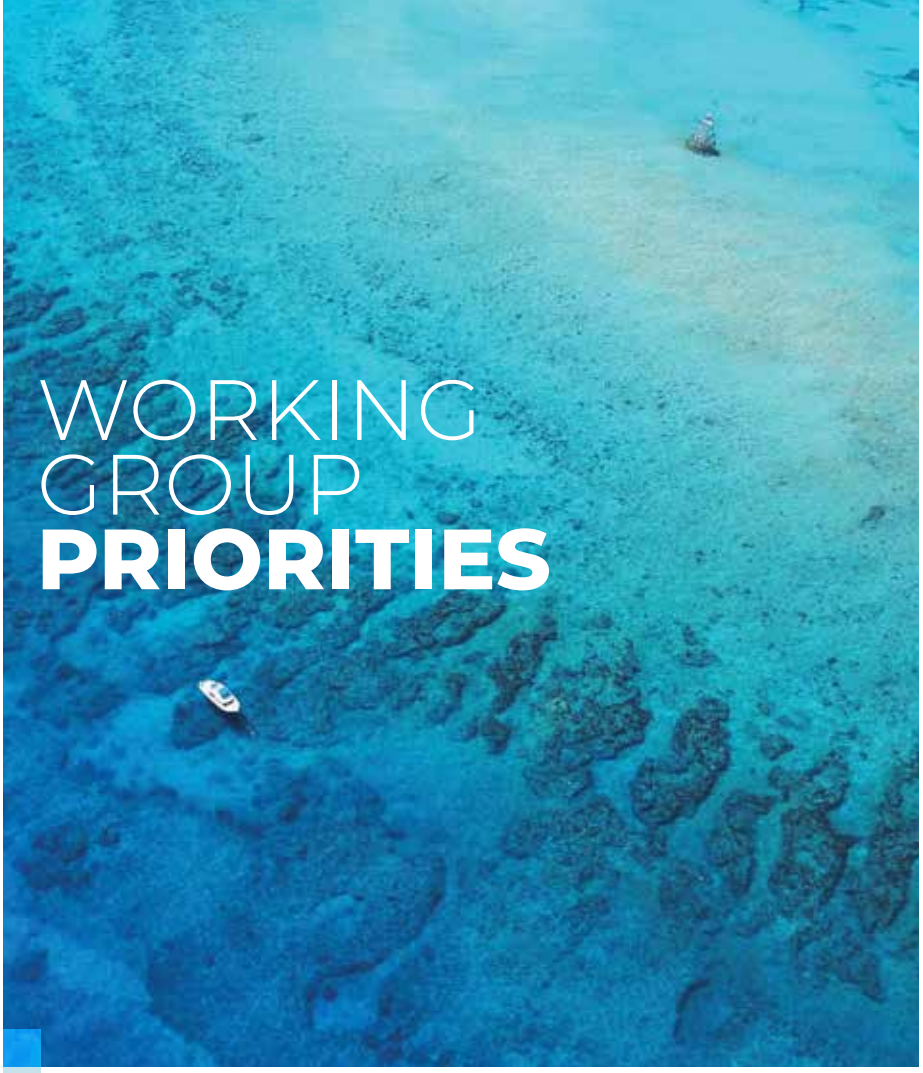
Inside sanctuary preservation areas, vessels have been allowed to anchor on sandy bottom when moorings are unavailable, and for the time being, that will remain the case. Restoration Blueprint's no-anchor regulation is being delayed two years to allow enough time for the sanctuary to build out a mooring buoy plan to accommodate the prohibition inside SPAs. Ideas being explored or considered include rotating mooring balls in some locations, adding or reducing them in others, introducing subsurface buoys for specialized use and creating specific zones away from the reefs for diver certification training. "I'm a diver and I've been in the Keys since the mid-'70s," said Mongelia, Executive Director of Islamorada's History of Diving Museum, "and you see buoys in areas that are too overused and other areas that are underutilized, and it just makes sense to get the reef some relief and adjust accordingly."

The ideas even ranged to the bayside, where navigational buoys can help protect critical seagrass habitat. At the same time, the working group acknowledged the costs associated with maintaining the system, suggesting that it may be time for private support. The sanctuary fields buoy teams in the upper and lower Keys, and much of their work time is dedicated to power-washing buoys and changing out downlines, an obligation that also includes several hundred boundary buoys and informational spar buoys. This kind of maintenance is critical to a reliable system, but the cost is separate and apart from installing hardware. "People are biting at the bit to help," Mongelia said. "Look at how many people help with coral restoration, sponge restoration, planting oyster beds or adopting a highway."

Organizations like the Monroe County Tourist Development Council and Marine Preservation Society of the Florida Keys have financially supported buoy infrastructure, and Benson believes in leveraging collaborations with local organizations for funding and manpower. But it will be up to the sanctuary to create a mechanism for that to happen. “The sanctuary is too big and too valuable at this point. Look at the economic impact to the Keys, South Florida and other states where ecosystem function and services are distributed. It’s too big and needs a lot of attention and funding. We understand the constraints of Congress and the budget they have and if we need to go supplement that and beyond that there are groups and stakeholders that understand how important it is and we have to find a way to get them involved.”

NOAA assigned coordinator Nina Garfield to manage the process of the working group, often mediating compromise among disparate voices, and a byproduct of their effort is a proof-of-concept for the value of the working group, which Benson hopes will expand to other disciplines in the sanctuary. “It’s always good to revisit programs and update them like updating software on a computer or phone. It will function better and more seamlessly.”

WORKING GROUP **PRIORITIES**



Move a portion of mooring balls from the top of **Molasses Reef** to the sandy area outside of the Sanctuary Preservation Area near Sand Island to support to support dive skills training and fishing boats that are currently anchoring there.

The **Lower Keys Guides Association** has developed a plan for channel markers at several channel access points in the backcountry to protect seagrass beds and provide safe access for boaters.

At **Horseshoe Reef**, temporarily replacing surface mooring buoys with subsurface buoys.

Place new mooring and marker buoys in south and northeastern corner of expanded **Alligator Reef Sanctuary Preservation Area** boundary, with additional mooring buoys outside of the current SPA zone.

"Transit Only" informational spar buoys at proposed coral restoration sites and installation of subsurface buoys on restoration sites based on needs from the reef restoration practitioners.

Reduce the number of mooring balls at **Carysfort Reef** to reduce impact on restoration efforts.

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SAVE A REEF

PROPER USE OF THE MOORING BUOY SYSTEM

1. LINE OF SIGHT

- The mooring buoy system was created for boaters to enjoy the reef without dropping anchor on threatened and endangered corals.
- More than 600 moorings are available on a first-come, first-served basis.

- Steer from a location where you can see the buoy during the entire hook up.
- Never motor directly across a shallow reef to get to a buoy.
- Maintain idle speed in the vicinity of the mooring buoys.

2. APPROACH

- Slowly approach the mooring buoy head-on against the wind or current. The mooring buoy pick-up line will be pointed toward you in the direction of the current/wind.
- Avoid meandering among the buoys and watch for swimmers, snorkelers, and diver bubbles.

3. PICK UP

- Safely retrieve the yellow pick-up line with a boat hook.
- Put your vessel in neutral to avoid entanglement.

PLEASE DO NOT TIE THE YELLOW PICK-UP LINE DIRECTLY TO YOUR BOAT AS IT PLACES UNDUE STRESS ON THE MOORING ANCHOR.

4. LOOP THE LOOP

- Run your boat's bow line through the loop of the yellow pick-up line and make sure to apply plenty of slack.
- Cleat both ends of your bow line to the bow of your boat.

5. SLACK

- Consider your vessel size and sea conditions to let out enough line so that the buoy is not pulled underwater and the line is horizontal.

- Rougher days require extra line to increase your "scope." More scope will make your stay on the buoy more comfortable and protect the buoys from wear and tear.

PLEASE DO NOT TIE UP TO A MOORING BALL FROM THE STERN OR MIDDLE OF YOUR BOAT AS THIS IS DANGEROUS TO YOU AND YOUR VESSEL, AND ALSO PLACES UNDUE STRAIN ON THE MOORING SYSTEM.

6. BACK AWAY

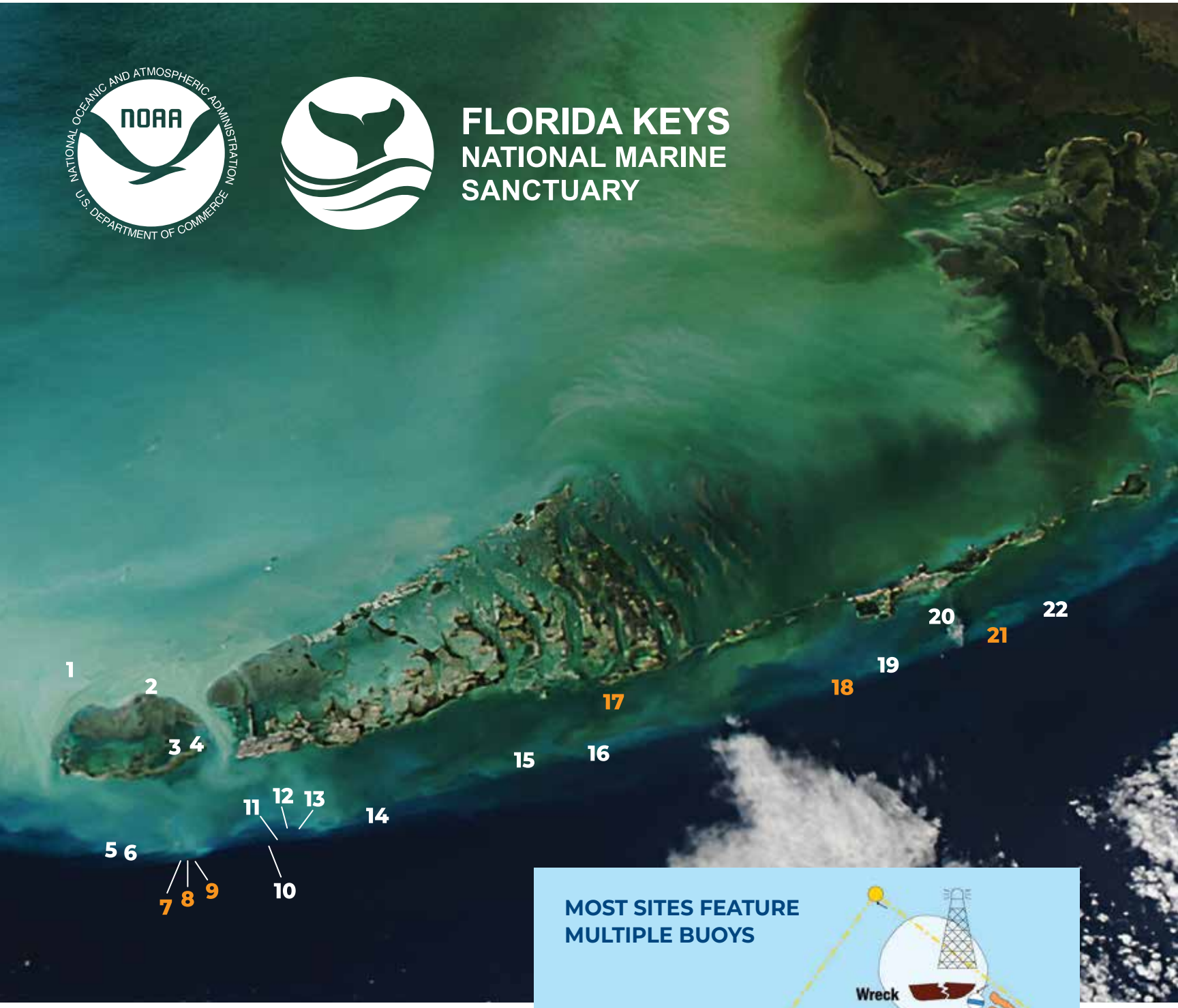
- When you are ready to leave, give the bow line some slack, then uncleat it and unthread it from the yellow pick-up line.
- Back away slowly so the propeller does not get tangled in the mooring line
- Steer clear of other mooring buoys nearby and always watch out for snorkelers or divers in the water.

7. REMEMBER

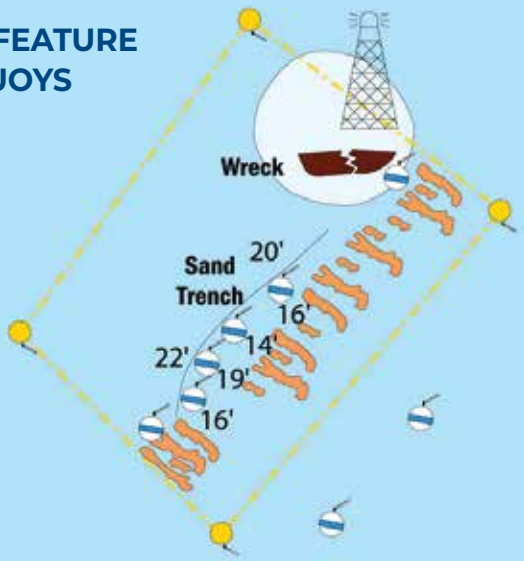
- Correct use of a buoy will prevent unnecessary wear and tear on the mooring system, while protecting your vessel and the vessels of others. There is no cost to use the reef mooring buoys maintained by the sanctuary, but keep in mind there are moorings buoys in anchorages throughout the Keys that do charge a fee.
- Sailboats should not leave large sails deployed as steadying sails when on a buoy, as this puts too much strain on the mooring's eyebolt.
- Larger than average vessels must check depths to avoid contact with the bottom.
- Florida Keys National Marine Sanctuary assumes no liability for the use of the buoys.

To report a missing buoy, email: KeyLargoBuoy@noaa.gov
www.FloridaKeys.noaa.gov/buoy

FLORIDA KEYS NATIONAL MARINE SANCTUARY

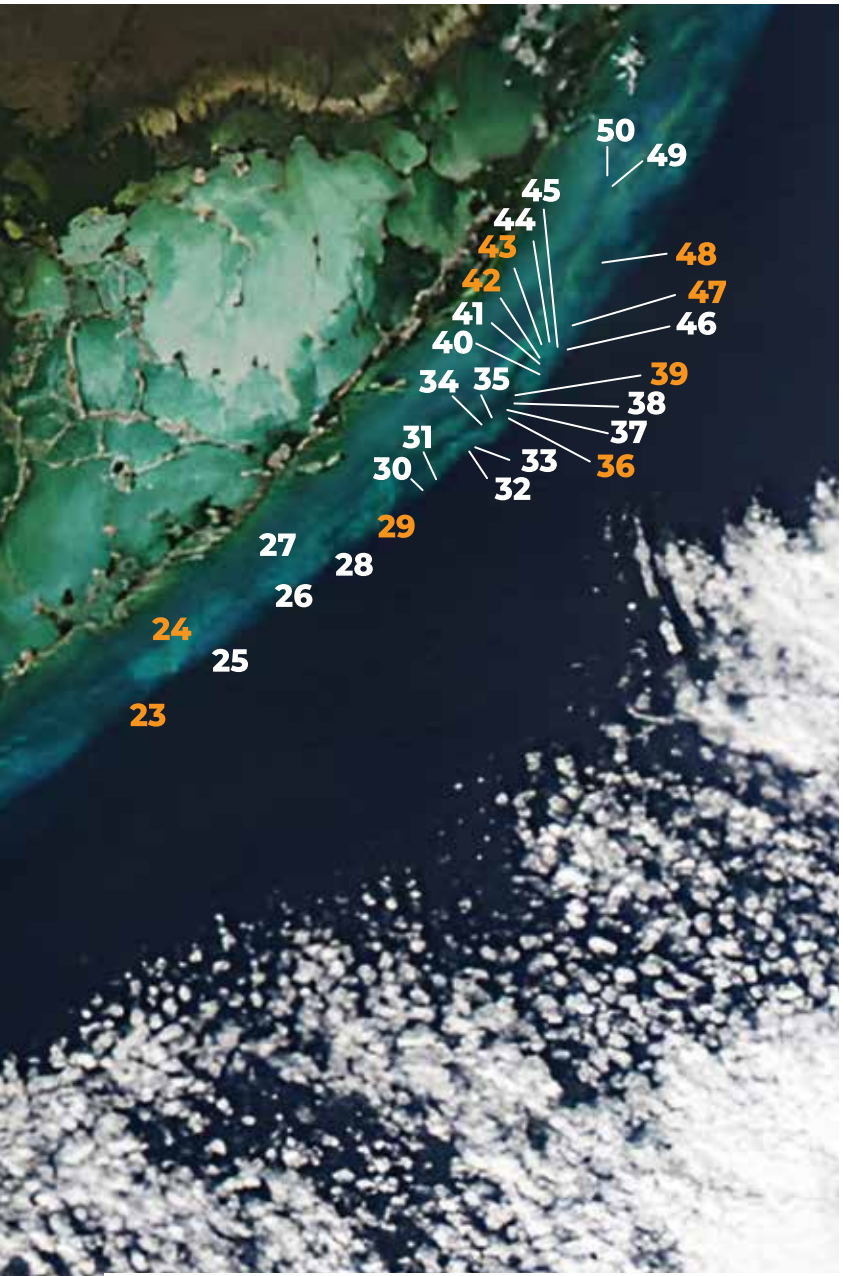


MOST SITES FEATURE MULTIPLE BUOYS



ALLIGATOR REEF
Sanctuary Preservation Area

Support sustainable tourism and protect the beauty of our sanctuary when you **book with a NOAA-recognized Blue Star Operator.**



MOORING BUOY SITE LOCATIONS

1. Amesbury #
2. Cottrell Key
3. Archer Key
4. Mule Key
5. Lost Reef 1
6. Western Dry Rocks
7. Sand Key Reef
8. Rock Key
9. Eastern Dry Rocks
10. Cayman Salvor #
11. Nine Foot Stake
12. Toppino's Marker 32
13. **Vandenberg #**
14. Pelican Shoal
15. Adolphus Busch #
16. **Looe Key**
17. New Found Harbor
18. **Sombrero Reef**
19. North America *
20. Marker 48
21. Coffins Patch
22. Adelaide Baker *
23. Alligator Reef
24. Cheeca Rocks
25. Eagle #
26. Crocker Reef
27. Hen and Chickens
28. Davis Reef
29. Conch Wall/Reef
30. Snapper Ledge
31. Pickles Reef
32. **Duane #**
33. **Bibb #**
34. Wolfe Reef
35. Three Sisters
36. **Molasses Reef**
37. Sand Island
38. White Banks
39. **French Reef**
40. Benwood *
41. **Spiegel Grove #**
42. **Grecian Rocks**
43. Key Largo Dry Rocks
44. Roy's Reef
45. North Dry Rocks
46. Horseshoe Reef
47. **The Elbow***
48. Carysfort Reef
49. **Turtle Rocks**
50. **North Patch**

Bold = At least one large vessel mooring available for >65'. # = Artificial Reef. * = Shipwreck Trail site.
Yellow = Sanctuary Preservation Area.

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Scout's **Honor**

WHILE FAST-GROWING ACROPORID (BRANCHING) CORALS WITHERED ON THE VINE IN 2023, BOY SCOUTS WERE NURTURING A STAR CORAL THAT BOUNCED BACK.

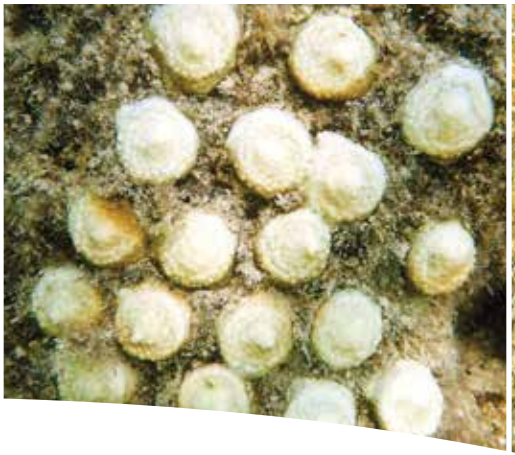
Did you say your name was Orbicella faveolata? Genotype number one? It's a pleasure to meet you! I hate to begin by talking about the weather. It seems that's the first thing we do when meeting someone new, but it was really hot back there in the summer of 2023 and, jeez, you look no worse for the wear! I mean, just like all the other corals, when those water temps blew past 86 degrees, your symbiotic algae said "adios" and left you white as a ghost. But those others died — and you didn't. That makes you sort of a "coming back from the dead" story, the kind of thriller we can sell to Netflix. I'm kind of nervous and just babbling on, so why don't you begin at the beginning and tell me all about it. Whattaya say?

By Scott Atwell

Coral is a living animal. It eats. It breathes. It reproduces and, when conditions are just right, it is virtually immortal — surviving for thousands of years. So, when coral practitioners adopt reef restoration as their life's work, it is not unnatural to personify their progenies. By sight, they can tell a brother from his cousin and, every now and then, may even call them by name as they eye-drop a liquid meal of plankton and amino acids before tucking them in for the night. In the most literal sense, it is an act of nurturing. Which explains why tears fogged up many a facemask in the summer of 2023, when coral practitioners descended into Florida Keys waters in the aftermath of a smothering heat wave that was as lethal as it was swift. Before their salty eyes, several generations of thriving coral outplants had curdled overnight into a snowy carpet of death across the sea floor. While traditional heat waves build slowly, like a teapot on the stove, this one was different — so severe that some corals seemed to skip right over bleaching on the way to instant mortality.

"The first time I heard the oceans were starting to bleach, I didn't want to believe it," said former STEM Commissioner Julia Bartlett. "I thought, 'It'll be ok. They always come back.' But the first time I went out in 2023, and I put my face underwater — it was a ghost town. It was quiet. It was not as vibrant and loud as I usually hear it. There were no colors. It was gray. So much sediment was stirred up and everything looked covered in dust."

A dead coral head that has been "reskinned" with OF1 mountainous star coral outplants. Photo: Julia Bartlett/Sea Base.



Same spot, seven months apart. OF1 mountainous star coral discs bleached but did not die. Photo: Julia Bartlett/Sea Base.

Bartlett was checking on corals that she and her colleagues had outplanted a year earlier as part of the Boy Scouts of America Sea Base program at the Brinton Environmental Center (BEC), where she served as a marine educator for four years. Sea Base has been around since 1980 as a summer camp for Scouts, who arrive from around the world for a week of water-based activities like sailing, fishing and scuba diving. At the BEC, coral restoration was added to the science curriculum five years ago with the introduction of its very own land-based coral nursery, where Scouts immerse themselves in coral husbandry activities like water quality testing, micro-fragmentation, and cleaning raceway tanks containing baby corals. These corals are nurtured by Scouts and Sea Base staff until they are ultimately planted on Florida's Coral Reef.

"Scouting has always had a strong conservation ethic," said Tim Stanfill, Assistant General Manager of Sea Base. "Scouts also believe that it is our responsibility to leave things better than we found them. Because Sea Base operates in the Florida Keys National Marine Sanctuary, we understood that it was our responsibility to help conserve and restore Florida's Coral Reef and in 2019 built Scouting's first coral nursery. We did this for two reasons — first, to save the reef we love, and second, to empower young men and women to engage in the process of building a better world."

There is plenty of work for the Scouts. Sea Base raceways contain over 15,000 corals distributed across eight species, and one in particular, mountainous star coral *(Orbicella faveolata)*, has proven to be a resilient survivor. Corals, like humans, carry genetic diversity, which strengthens the ability of species to resist diseases, pests, changes in climate and other stresses. In 2020, nearby Mote Marine Laboratory provided Sea Base with a genetic strain of Orbicella faveolata labeled OF1, which was fragmented into hundreds of genetic replicas and nurtured on land by the hands of Scouts until they were large enough for outplanting.

RESKINNING

One of the challenges with using mountainous star coral in reef restoration is the glacier-like pace with which they grow. The boulder species grows very slowly, gaining just 0.3 inches per year, compared to the 3 to 4 inches fast-paced staghorn and elkhorn can grow. But a novel approach is building on previous work. Literally. In a technique described as "reskinning," new corals are placed over long-dead coral boulders, creating a sheet of discs that will fuse together to create a new, living surface.

In the Lower Keys, near Newfound Harbor, Sea Base leaders set their sights on a huge boulder of dead star coral that was 300 years in the making. Working in 20 feet of water, Sea Base in 2022 began to meticulously adhere more than a thousand OF1 discs to the structure, assembling the foundation of a revitalized colony.

But one year later, the most sustained marine heat wave since 1991 fell on the boulder. Exposed to above-average temperatures for extended periods, symbiotic algae living inside coral tissue remove themselves and leave the structure colorless, without nutrients, and at risk of dying. When the Sea Base team returned to their outplant site, they found nothing but white discs on the dark, dead surface of their host. Then, the unexpected happened: As waters cooled, the symbiotic algae returned,

Julia Bartlett shows Scouts how to turn one coral into two, a process called micro fragmentation, before adhering them to discs where they will grow in the Sea Base Brinton Environmental Center land-based coral nursery. Photos: Nick Zacher/NOAA.

and within seven months, 95% of this one genetic variety had recovered.

"They not only regained their color, they were thriving and starting to fuse together," said Dr. Abigail Clark, a marine scientist and National Assistant Director of STEM Programs of the Boy Scouts of America. "Based on the anecdotes and pictures I had seen, I was prepared for the worst. Seeing them doing so well gave me tremendous encouragement and hope that we're on the right track."

Sea Base now operates 18 different High Adventure programs for Scouts out of four locations — two in the Florida Keys, one in the U.S. Virgin Islands, and one in Marsh Harbour, Bahamas — serving 16,000 participants annually. "A big part of the Scouts being citizen scientists is to ignite a spark," said Sea Base registrar Andrea Watts Raslich, "for them to go on and continue this set of values about sustaining our oceans and habitat in a sustainable way."

The power of that idea is vested in the "give me a fish, teach me to fish" parable. "The service project makes me feel like I did something good," said Matthew McAllister, a Scout from San Diego. "We saw videos from before last year when the corals were beautiful and I hope that eventually it will be as beautiful as it was. I want this coral reef to look like the one in Hawaii."

As you read this, Sea Base is back in Newfound Harbor outplanting more discs of OF1, in addition to other reefs as one of the newest partners of NOAA's Mission: Iconic Reefs. For Clark, whose childhood visits to Boston's New England Aquarium inspired her pursuit of marine science, the opportunity is a full-circle moment. "I remind the Scouts they are part of history. What sets us apart is the power of youth engagement. They quite literally have a hand in the restoration of Florida's Coral Reefs."

Outplanting of coral is conducted under Florida Keys National Marine Sanctuary permit FKNMS-2021-101-A1.

By Scott Atwell

Happy Birthday, ***Mission: Iconic Reefs***

DEC. 9, 2019
KEY WEST

The announcement was scheduled for a Monday, and at precisely 10:32 a.m., Florida Keys National Marine Sanctuary Superintendent Sarah Fangman stepped to the podium to make a proclamation of hope: Mission: Iconic Reefs (M:IR), an unprecedented restoration effort to recover seven iconic reefs in the Keys, has launched as one of the largest investments ever undertaken in coral restoration.

"We cannot afford not to act," she said, using the double negative for emphasis. "We must take action to reverse course. These systems are in a state that without our active help they cannot recover fast enough. That is why it's time for bold strategies."

Five years later, that strategy is well underway along seven reefs in the sanctuary.

"When Mission: Iconic Reefs launched it was only an idea — nothing more than words on paper," said Jennifer Moore, the program's senior man-

A panel discussion about Mission: Iconic Reefs followed the program's introduction on that December Monday in 2019.

ager. “There was no staff, other than the goodwill of partners and NOAA employees working ‘other duties as assigned,’ yet today, we are 20 strong as a team with over $35 million raised from various sources to implement the plan. Most importantly, practitioners are outplanting corals on the reef, research is underway alongside restoration, and terabytes of data are being collected and analyzed. Given the typically slow wheels of government, our five-year pace has been nothing short of astonishing. Even the need for my new role as senior manager is evidence of how far we have come.”

TEAM-BUILDING

NOAA, the parent organization of M:IR, is tasked with managing, implementing, monitoring and communicating the program’s progress. Meanwhile, the work of propagating and outplanting corals is handled by partner organizations like Coral Restoration Foundation, Mote Marine Lab, Reef Renewal, and even the Boy Scouts at Florida Sea Base (see page 36). When M:IR was announced, it was unknown how long it would take partners to ramp up production, but their corals were introduced onto the reef almost immediately.

“When attempting such a bold endeavor, it’s critically important to have a diverse team of people working together to address challenges and opportunities,” said Ken Nedimyer, Technical Director for Reef Renewal USA, an organization that grows and outplants corals. “Each of the different partners working in the M:IR program have different strengths, and as we work together in our strengths, we can accomplish more than working individually. The science of coral reef restoration is evolving rapidly, and no single organization can address all of the needs, so by working collaboratively, we can divide the work up and accomplish the mission.”

MISSION: ICONIC REEFS

IMPLEMENTATION

Two percent. That was the baseline of coral cover that existed when M:IR was envisioned. In response, program managers designed a 20-year, phased implementation approach to grow that number to 15% and, ultimately, 25%, restoring the seven reefs to a self-sustaining ecosystem.

“The 2% have managed to survive so they can tolerate the bleaching and other stressors,” sanctuary scientist Dr. Andy Bruckner said in 2019. “But they’re in such low numbers they can’t repopulate naturally. The science has come far enough now that we have the ability to bring them back, and do this kind of work at scale.”

Estimating the number of adult corals needed to achieve ecological restoration of selected species was equal parts science and art. The calculations estimated 5 million coral fragments could build the 500,000 coral colonies needed to achieve the ultimate goal of 25% coral cover.

“The number and size of fragments vary by species and method,” said Michelle Loewe of NOAA’s Restoration Center. “One M:IR coral is a cluster of coral fragments that have fused together to make one coral of a certain size diameter that will continue to grow to reproductive maturity.”

Almost 40,000 corals have been outplanted on the M:IR sites, and plans are in place to exponentially increase the kind of capacity required to fulfill the need. Reef Renewal USA recently opened a new facility in Ruskin, Florida that will allow them to generate as many as 300,000 corals in a single year. “The next five years will look very different than the first five years,” Nedimyer said. “There will be much more emphasis on growing and outplanting the non-Acroporid reef building corals, and there will be a whole new wave of lab-reared, stress-hardened corals introduced into the restoration pipeline.”

Elkhorn	Staghorn	Star	Brain
12,396	19,378	5,361	66

Survival numbers differ from outplant numbers, but the 25% goal remains constant. As more corals are outplanted, the M:IR Field Team conducts monitoring to track the percentage of coral coverage at the sites. As more data is collected, Loewe says adjustments will be made to the estimated number of corals needed to achieve the target percent cover.

SUMMER 2023: ADAPTIVE MANAGEMENT

M:IR was designed with a strong foundational framework of adaptive management. Through frequent monitoring and evaluation of program status, goals, and even outplant performance, managers, scientists, and reef restoration partner practitioners can adjust plans over time, especially under changing climate conditions.

An example of adaptive management was showcased during and following the summer marine heat wave that caused widespread severe bleaching and mortality throughout the Florida Keys in 2023. Managers quickly organized a rescue effort to evacuate baby corals from sizzling in-water nurseries, and place them in land-based facilities where temperatures could be controlled. Thousands of corals, including some of the last known genotypes on the Florida Reef, were relocated in a pair of rescue events organized by NOAA, ensuring the genetic diversity of Florida's coral reef-building species.

Meanwhile, restoration partner Reef Renewal USA focused on an alternative solution: relocating 2,800 corals from its shallow Tavernier nursery to a deeper in-water location nearby, where temperatures were reading 2 degrees cooler. Florida Keys National Marine Sanctuary mobilized its entire organization to meet an uncompromising deadline, permitting and installing nearly 100 new seafloor anchors in 70 feet of water to accommodate vertical ropes that suspend the growing coral fragments in the water column.

During the 2023 heat wave, Reef Renewal relocated corals to a temporary, deep-water nursery where temperatures were cooler. While these corals cannot thrive long-term at deeper depths, their brief stay provided an example of adaptive management.

RESEARCH AND DEVELOPMENT

As a research project inside of a restoration program, M:IR is pushing the envelope boundary of science. One example is a new vacuum-like device testing ways in which *Palythoa* can be removed without dispersing fragments to other parts of the reef. The fast-growing communal zoanthid can be a nuisance when it overtakes suitable planting areas. Practitioners have also trialed deployment of shading structures that both lower the temperature of the water beneath them and reduce the amount of direct sunlight, which together contribute to coral bleaching.

STEWARDSHIP

The effort to put Florida Keys coral reefs on track for recovery requires long-term collaboration among many partners. Iconic Reef Guardians provides an opportunity for the diving and snorkeling public to lend a hand. Powered by professional dive shops that recognize the symbiotic connection between protection and recreation, pilot programs and working groups are quickly graduating to community diver opportunities. So far, the program has engaged 27 dive professionals through its comprehensive online training platform. These instructors are required to complete thorough training to prepare them for teaching conservation-focused experiences to recreational divers and snorkelers.

Guardians will be able to assist in the removal of the menacing yellow-footed snail, which can eat more than one square centimeter of coral each day. On a recent mission to Carysfort and Elbow reefs, volunteers organized by the National Marine Sanctuary Foundation removed more than 1,000 snails.

A small but mighty cloth shade can reduce the temperature of water surrounding baby corals in a shallow nursery. Photo: Matt McIntosh/NOAA.

All of this is to say that M:IR is a unique restoration program that emphasizes comprehensive solutions worthy of its status. “The M:IR initiative will continue to serve as a global model,” said Coral Restoration Foundation’s Phanor Montoya-Maya, “inspiring large-scale restoration efforts worldwide while ensuring the Florida Keys’ reefs adapt to shifting conditions and thrive as resilient ecosystems.”

Scan to view the website.

Scan to view the M:IR 5 year report.

10 QUESTIONS

Keen eye: Lawrence hovers over the outline of a wreck in the Florida Keys, which resembles an innocuous pile of rocks. Photo: Brenda Altmeier/NOAA.

1. How were you inspired to become a maritime archaeologist? My family always visited historic sites on vacations and when I was young I attended an archaeology camp at my local natural history museum. Not long after, I received my scuba certification when I was 13. Through reading scuba magazines, I learned that I could combine both my interests and it set the course for my life.

2. What is the preparation for this kind of work? The field requires a varied skill set ranging from the hands-on to the academic. I need to know the technical aspects of diving and remote sensing survey, but also

WITH **MATTHEW LAWRENCE**

MARITIME ARCHEOLOGIST, FLORIDA KEYS NATIONAL MARINE SANCTUARY.

how to conduct historical research in archives and museums. My training at East Carolina University's Program in Maritime Studies laid an excellent foundation.

3. What interested you in coming to the Florida Keys? Prior to my graduate degree, I attended the University of Miami and enjoyed visiting the Keys and learning about its history. Before I started working at the Florida Keys sanctuary full-time, I joined maritime heritage coordinator Brenda Altmeier for specific projects and learned there were multiple lifetimes of maritime heritage work to be done in the sanctuary.

4. When will we know everything we need to know about maritime heritage in the Keys? The vast period of human activity in the area, believed to be over 10,000 years, means there are countless stories to reveal through archaeological investigation. The stories are about the lives of regular people, those who are generally neglected in our history books. Learning about humanity's past provides the context for understanding today.

5. What's the most fascinating, untold story in the Keys? I'm passionate about bringing the story of the steamship Valbanera back into people's memory. This tragic shipwreck cost the lives of almost 500 people in a 1919 hurricane. Most were immigrating to Cuba from Spain and the Canary Islands. Many of South Florida's residents may have ancestors who were on the ship, but as this event has slipped from memory, they have lost this connection to their past.

6. Why is it important to leave artifacts untouched? Think of the artifacts as pages in a history book. Moving those pages— or worse, removing them entirely without documentation — robs everyone of their history.

7. What's the most interesting, professional opportunity you have experienced? Working for the Office of National Marine Sanctuaries has allowed me to explore such disparate places as Swains Island, American Samoa and Utqiavik (Barrow), Alaska. These remote spots and the interesting people who live there have been highlights of my career.

8. What's on your bucket list? There are so many places to explore, both above and below water. My list is too long to relate. In the near future, I'm hoping to dive more in the Lower Keys, in addition to assisting Papahānaumokuākea Marine National Monument in the Pacific Ocean. A visit to Spain is also near the top.

9. What do you do on a day off? When the wind is blowing, I enjoy gardening or reading. If it's calm I'm on the water, diving.

10. What parting advice do you have? Rather than advice, I'm hoping readers will join me in being heritage stewards. Underwater cultural heritage is non-renewable, so we must treat it carefully. Many people think underwater archaeological sites vanish in no time at all. That's not true, as attested to by submerged indigenous archaeological sites and Greek shipwrecks that are thousands of years old. Take only pictures so that future generations will get to have the same experience of discovery as you. If you discover a new archaeological site or artifact, please report it to the Florida Keys sanctuary or other appropriate management agency.

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Sea turtles, a symbol of global wildlife conservation, are an iconic part of the history and beauty of the Florida Keys. The chain of islands is home to 5 species of sea turtles. All five of these species are classified as "endangered" or "threatened" and are afforded protection under U.S. Federal and Florida State Law.

The Turtle Hospital, located in the heart of the Florida Keys has been successfully rescuing, rehabilitating, and returning sea turtles to the wild for over 37 years. The non-profit hospital was the first State licensed veterinary hospital for sea turtles in the world. Covering over 200 miles of coastline, The Turtle Hospital's positive impact is augmented by the strong support of the tight knit island community. Recreational boaters, charter boat captains and crew, US Coast Guard, and Florida Fish and Wildlife Conservation Commission; caring individuals and agencies work together for the greater good, the health of the island's marine turtles.

How it works; someone, just like you, is out for a day of diving, fishing, or just enjoying the island's clear blue-green waters and spots a sea turtle in distress. They call Florida Fish and Wildlife (FWC), The Turtle Hospital's 24 stranding hotline, or radio the US Coast Guard (USCG) on VHF radio, channel 16 with their location. The caller stays with the turtle until help arrives. If FWC does not have a boat in the area to respond, then Turtle Hospital staff grabs their rescue gear and recruits a USCG crew or a local captain and responds to the rescue call out at sea. The team works together to bring the sick turtle onto the boat and to The Turtle Hospital for care. This can take a massive team effort with some turtle patients weighing over 300 pounds! The Turtle Hospital fields over a hundred rescue calls a year and has rehabilitated and returned over 2500 turtles back to the wild.

Education plays a critical role in the Turtle Hospital's mission. The hospital is open to the public daily with educational programs offered 365 days a year. Over 115,000 people visit the Turtle Hospital annually and the admission fees fund the sea turtle care. Six out of ten rescue calls come from individuals that have attended one of The Turtle Hospital's programs. It is a win/win for sea turtles and the island community. In addition to on-site programs, the Turtle Hospital offers free virtual field trips to classrooms around in the world via Skype and Google Hangout.

The Turtle Hospital serves as a positive role model for eco-tourism and its work is far reaching. The hospital's social media platforms currently garner over 600,000 followers with educational videos reaching over 47 million viewers worldwide.

COMPASSION IS CONTAGIOUS!

FOLLOW US SCAN ME

DONATE SCAN ME

Visit The Turtle Hospital at turtlehospital.org

By Rachel Plunkett

SHIPWRECK IDENTIFIED

NON-PROFIT GROUP HELPS SANCTUARY TEAM DOCUMENT 1911 GROUNDING

1

For more than a century, its remains have been scattered across a 300-foot area in 20 feet of water near French Reef in the upper Keys, known only by a snarled pile of wire rope rigging that inspired locals to call it the "Cable Wreck." But this mystery site inside Florida Keys National Marine Sanctuary has recovered its true identity, thanks to the help of 18 instructors and advocates from the nonprofit organization Diving With a Purpose (DWP), who joined NOAA researchers to document the site off of Key Largo.


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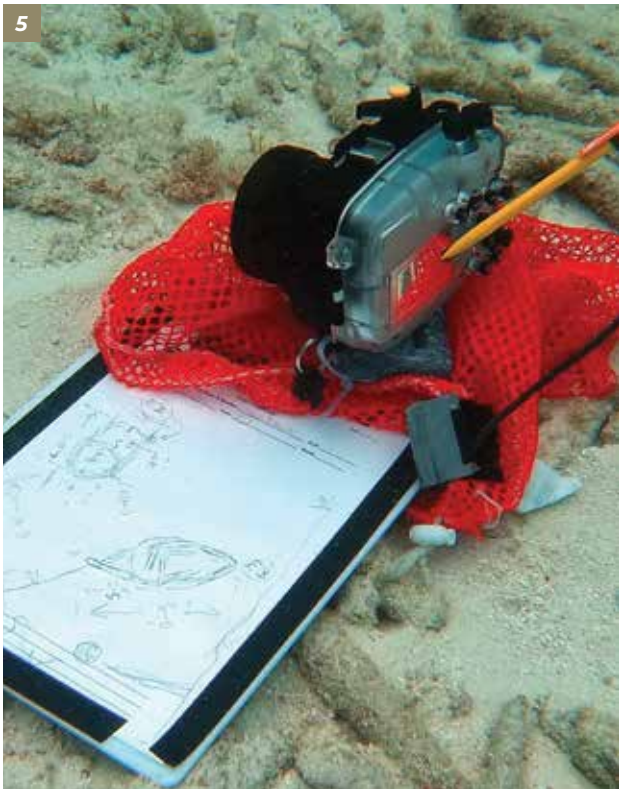
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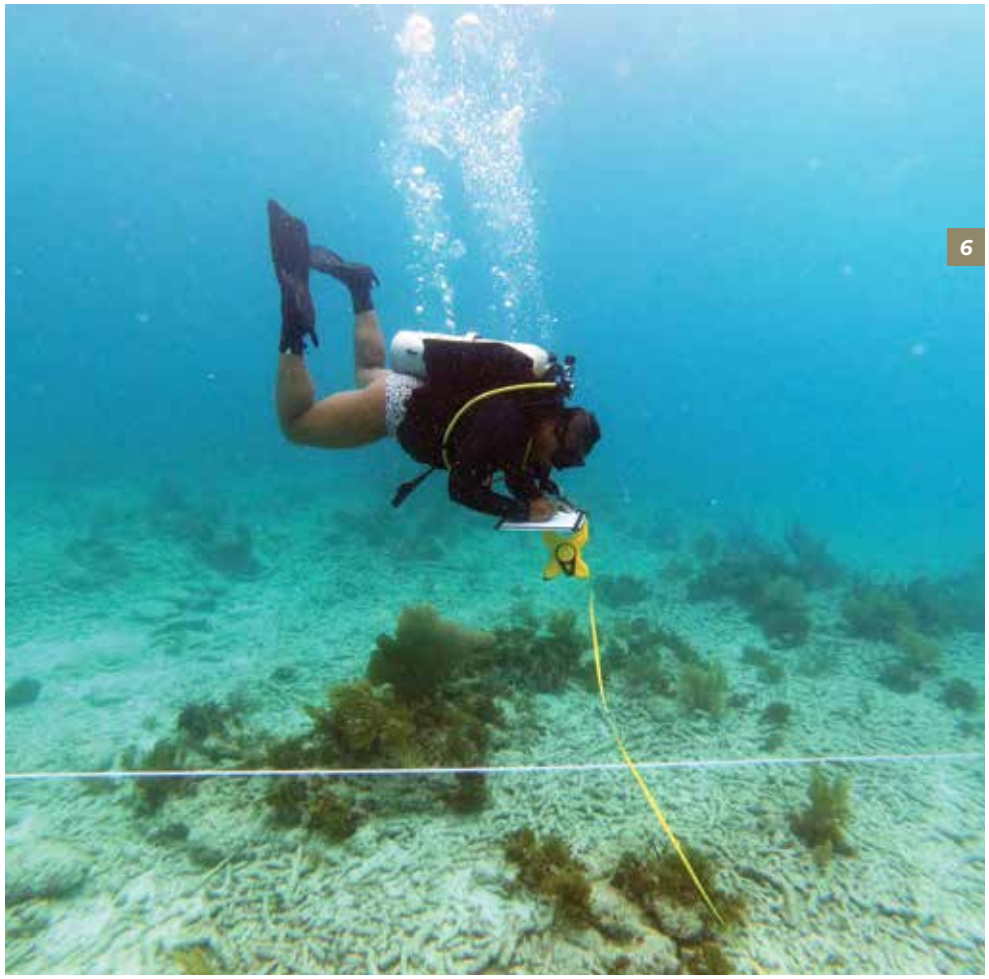
The four-masted schooner *Star of the Sea* was carrying lumber from Pensacola, Florida when it grounded at French Reef in the Florida Keys in October 1911. Using historical records, sanctuary researchers identified the names of almost a dozen ships that wrecked on French Reef in the 19th and 20th centuries, corresponding with the general time frame of artifacts found there. Detailed recording by the Diving With a Purpose team revealed several artifacts, including the remains of rigging, a steam boiler, and hoisting winch which most closely matched what would be found on a large schooner. The only vessel of this kind lost at French Reef was *Star of the Sea*, which was built in Bath, Maine in 1887, and was originally named *Katie J. Barrett*.

"The wreck is largely unknown to the current Keys community," said Sanctuary Maritime Archaeologist Matthew Lawrence. "The wreckage is low profile and it's not in a spot where most people dive, snorkel or fish, even though it is easily accessible. It's great to bring an unknown story back to life, with a touchstone like a shipwreck to give it physical presence."

Divers working the wreck came to the Florida Keys from as far away as South Africa for the week-long activity during the summer of 2024, which began with extensive land-based training. Half of the Diving With a Purpose team was composed of instructors or instructors-in-training who had experience in underwater mapping, while the other half had never done this kind of work before. The group also included Stanford University anthropology professor Ayana Omilade Flewellen. Divers were divided into teams assigned to a specific section of the shipwreck, making dozens of sketches and hundreds of measurements that will soon produce a detailed site map drawing. That task falls to 80-year-old Gayle Patrick, who made her final dive on this mission. Patrick is an architect by trade and has experience with computer-aided drafting. Patrick first became scuba certified in 2000.

“Ms. Patrick’s expertise results in a polished product, but by no means is that her only contribution,” said Lawrence. “Her understanding of the mapping process, combined with her technical drawing expertise, means that I assign her the most complicated areas to draw. I know she’ll be able to distill the wreck down to its essence.”



1. Star of the Sea *was originally named* Katie J. Barrett. *Maine Maritime Museum.*

2. Diving With a Purpose members practiced taking measurements of a mock wreck site on land before going into the field. Photo: Brenda Altmeier/NOAA

3. The DWP team assembles on board their charter vessel, operated by Rainbow Reef Dive Center, before departing for the shipwreck. Photo: Diving With a Purpose

4. This boiler is a feature that helped narrow the identification of the wreck to Star of the Sea. *Photo: Brenda Altmeier/NOAA*

5. Camera and slate used by the DWP team. Photo: Brenda Altmeier/NOAA

6. Stanford University anthropology professor Ayana Omilade Flewellen was part of the team taking hundreds of measurements on the French Reef site. Photo: Matthew Lawrence/NOAA

7. DWP advocate Jana Johnson measuring an iron rigging artifact. Photo: Matt Lawrence/NOAA

8. Gayle Patrick, an architect by trade, will create a final sitemap of the wreck area from individual sketches. Photo: Brenda Altmeier/NOAA

The wreck site has also been captured in a photogrammetric 3D model from more than 2,500 individual images taken during the survey work. The shipwreck is one of more than 800 historical sites located within sanctuary waters. One of the goals of the National Marine Sanctuary System is to provide opportunities for people to learn about our nation's maritime heritage through experiencing it themselves. Historical sites within Florida Keys National Marine Sanctuary are open to diving and snorkeling, and DWP has been working with the sanctuary for over a decade to document shipwrecks for visitors and those who may never visit the site. "They are just a great group of people," said Brenda Altmeier, the sanctuary's maritime heritage coordinator. "There is just too much work to do, and we couldn't do this on our own. It is very labor-intensive."

Please help conserve our maritime heritage and do not damage or remove historical resources. If you discover a historical resource within Florida Keys National Marine Sanctuary, do not disturb it. Instead, make note of where and what you found and then provide this information to sanctuary staff. Be a good steward; take only pictures and leave only bubbles.

CORAL
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FOUNDATION™

Because it's about much more than marine life...

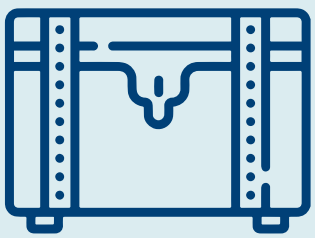
learn more about our mission at coralrestoration.org

OUR COMMUNITY

IT TAKES A VILLAGE TO RAISE A SANCTUARY,

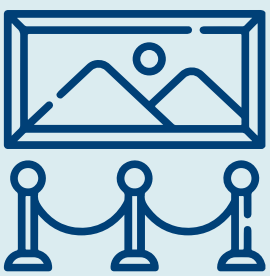
AND OUR COMMUNITY CAME THROUGH IN A BIG WAY IN 2024.

Public presentations and events reached **2,627 PEOPLE.**



Traveling trunks were used by five teachers and reached **243 STUDENTS.**

The Blue Star program trained **504 TOUR OPERATOR STAFF MEMBERS.**



Sanctuary exhibits housed in community locations reached **390,362 PEOPLE.**

Florida Keys Eco-Discovery Center welcomed **25,215 VISITORS.**

Volunteers contributed **2,552 HOURS** to our mission this year, the equivalent of **$82,000 IN IN-KIND SUPPORT**. Advisory Council members provided another **1,067 HOURS**.

DÉJÀ VU ALL OVER AGAIN FOR VOLUNTEER OF THE YEAR

Stephen Patten is two-timing us — in a good way. The 68-year-old retiree, whose first name is pronounced Stef-an, has been named Florida Keys National Marine Sanctuary Volunteer of the Year for a second time, reprising the honor he first earned in 2019.

"I guess I'm on a roll every five years," Patten quipped, "so I have 2029 to look forward to."

By that time, Patten will have multiplied the 1,000 volunteer hours he's logged as a docent at the Florida Keys Eco-Discovery Center, not to mention his time serving as a member of the Sanctuary Advisory Council.

Agard, former superintendent Sarah Fangman and Trueblood honor Patten with his second Volunteer of the Year plaque.

You can find Stephan Patten every Friday afternoon at the Eco-Discovery Center in Key West.

"Stephen is an authority on the environmental history and communities of the Keys," said Eco-Discovery Center manager Kristina Agard, "and does a wonderful job introducing visitors to not only the Eco-Discovery Center, but to the environment around it as well. Stephen ensures everyone walks away with a deeper understanding of our delicate ecosystems and how we can all help to preserve them."

You could say that Patten labored for half a century to get here. In the early 1970s, he enrolled at Oregon State University to pursue a career as a park ranger, but a dearth of jobs at the time forced him into the military. He became an Army medic on the way to a nursing career that made him a leader in the liver transplant movement as president of the National Association of Clinical Nurse Specialists.

"All of us are born with responsibility before we get privileges," Patten said, "and it's a responsibility of every individual to find where they can make a difference in society and do it. It's one of the reasons I was a nurse for 40 years, and the reason I'm volunteering and trying to give back to the environment I love so much."

Patten is in his third term on the Sanctuary Advisory Council, serving as the primary Lower Keys Citizen at Large. A scuba diver since 1972, you can also find him in the water on occasion, enjoying the coral reefs and generating first-hand knowledge for his tours at the Eco-Discovery Center.

"As volunteer coordinator, I love when I can match a volunteer with the right opportunity for them to feel like they are making a difference — giving back to their community, and having fun at the same time," said the sanctuary's Liz Trueblood. "Our volunteers allow us to reach more people with the important message of protecting the unique ecosystems in the Keys."

OUR COMMUNITY


Ben Daughtry

KEYS NATIVE DAUGHTRY LEADS ADVISORY COUNCIL

BEN DAUGHTRY joined Florida Keys National Marine Sanctuary Advisory Council more than a decade ago, after building a strong network of contacts across all disciplines of fishing and marine life. He is CEO of the immersive marine experience at Aquarium Encounters, and president of Dynasty Marine Associates, a Marathon-based company supplying Florida and Caribbean marine livestock to public aquariums, wholesalers, and retail stores since 1984.

In June 2024, Daughtry was elected chair of the council after serving the last four years as vice chair.

"The number one thing I'm looking forward to is getting Restoration Blueprint and the management plan pushed through," said Daughtry. "It's been a decades-long journey and everyone has put a tremendous amount of work into it. Seeing it come into law is certainly a goal of mine and everyone on the council. We will continue to face a tremendous number of challenges, especially the heat wave that caused so much devastation, and we'd have to be incredibly lucky to not have a similar thing happen this year. That will take a lot of our energy and time from a restoration standpoint."

Dr. Erinn Muller, Associate Vice President of Research for Mote Marine Laboratory, was elected vice chair. Dr. Muller sits on the council in the Research and Monitoring seat. Terms for chair and vice chair are two years each, at which time they may be re-elected for an additional two years.

We're gonna need a bigger boat! Tony Young's haul in the Lionfish Derby was another winning effort.

CAPTAIN TONY YOUNG MAY BE FOREVER YOUNG — the name of his charter company — but that's not the case for one of his prime fishing targets: the invasive lionfish.

Each year, Young participates in the annual REEF Lionfish Derby, a huge event that brings together divers, fishermen, conservationists and chefs to remove the harmful species from local reefs.

For Young, a certified Blue Star operator, it's an opportunity to showcase his dedication to the sanctuary and the craft of spearfishing. His team is a perennial first-place title holder, putting up numbers that are hard to challenge. Over the past two years, Forever Young shot a combined 900 fish during the two-day tournaments. Most importantly, their efforts helped build awareness of lionfish while creating a demand for them at dinner time. All of Young's lionfish wind up in Chef Michael's restaurant in Islamorada for the community to enjoy, all the while enhancing the balance of the reef ecosystem.

— Scott Atwell

BLUE STARS SHINE

In 2022, Dawson led the rescue of a pregnant sea turtle dubbed Harris, and later helped with the turtle's release back to the ocean. Photo: JoNell Modys, Florida Keys News Bureau

DAN DAWSON discovered his life's passion at an early age. While working with his dad's building business in Denver, Dawson earned his dive certification in the Keys at age 21, and it changed the trajectory of his life.

Dawson began taking vacations to go diving, got his captain's license in Stuart, Florida, and moved to St. Thomas in the U.S. Virgin Islands to captain sailing boats and dive. Along with his wife Mollie, they purchased Horizon Divers in 2005.

"Moving to the Keys and seeing how people react to the beauty of the water and the reefs is refreshing," Dawson said, "which keeps me involved as much as I can to help protect this wonderful place we call home. Also, I want my kids — and, one day, grandkids — to be able to enjoy the Keys as well."

Today Dawson is one of just a handful of Keys divers specializing in JJ-CCR, a rugged and highly technical rebreather developed for highly experienced divers that recycles diver breathing gas in a closed system and makes underwater diving silent and nearly bubble-free.

Certified by the Florida Keys National Marine Sanctuary as an environmentally responsible Blue Star operator, Dawson is also acclaimed for leading the 2022 rescue of Harris, a 175-pound pregnant sea turtle — the second largest on record that's been rescued. Harris, who had a weighted fishing lure snagged between her neck and a fin, was rehabilitated at the Turtle Hospital in Marathon and later released.

Dawson is also an avid underwater photographer and has served as a Florida Keys National Marine Sanctuary advisory council member. He and Mollie met in middle school and have been married for 25 years. They have three children: Madeline, who is earning her doctorate in physical therapy; Gavin, a student at Florida State University; and Haylie, a junior in high school.

— Laura Myers, Monroe County Tourist Development Council

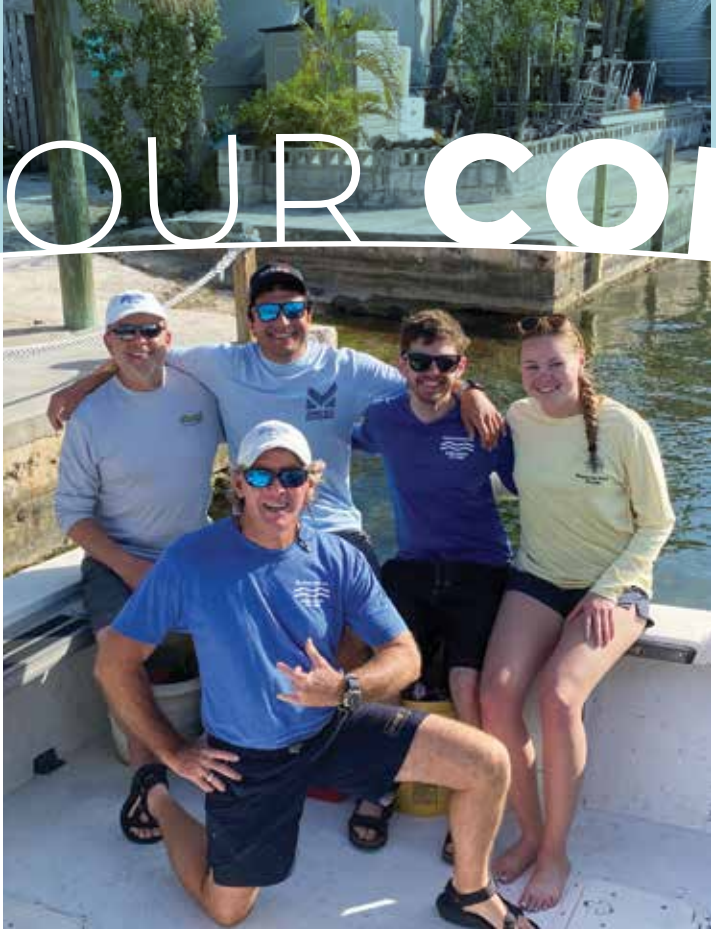
Islamorada fishing guide and captain **STEVE FRIEDMAN** loves water: salt water, fresh water, white water, blue water and particularly clean water. His love of water includes prioritizing the preservation and restoration of the South Florida ecosystem, and the management of fisheries that provide a safe haven for the Florida Keys fish he loves to catch: tarpon, bonefish, permit, redfish and snook.

In the Keys, Friedman served on a committee that founded the Florida Keys National Marine Sanctuary's Blue Star Fishing Guide program, with certification encouraging guides to adopt responsible, sustainable fishing practices. The sanctuary also developed a Blue Star program for dive and snorkel operators.

Blue Star certification "signals to customers that they are dealing with a quality, professional fishing guide with knowledge and integrity," Friedman said. He's also founding board member and former president of Florida Bay Forever, a nonprofit environmental protection organization, and was commodore of the Florida Keys Fishing Guides Association for six years. Besides charters with his company, A Fishing Guide, Friedman also conducts eco-tours.

— Laura Myers, Monroe County Tourist Development Council

OUR COMMUNITY



Catherine Yeoman is wearing the yellow shirt, seen post-dive with Quiescence Captain Steve Campbell (in front), and back row, l-r: Yeoman's step dad Curtis Hicks, Quiescence instructor Luke Durso, and Yeoman's step-brother Jordan Hicks.

THIS GUARDIAN ACCEPTS THE MISSION

One day soon, Texas A&M University will confer upon Catherine Yeoman a doctorate in veterinary medicine, but that will only be the start of her career journey. Yeoman wants to specialize in aquatic medicine, a discipline barely touched upon in veterinary school.

After graduation, the Iowa native will have to find specialized externships and a residency, but in the meantime, she has been generating her own knowledge, launching an aquatics club that brings in vets who teach fish anesthesia, drawing blood and conducting physical exams on fish.

And Yeoman has donned the coral cape of Iconic: Reef Guardians, the program that allows community divers to take part in restoration of legendary Florida Keys reefs. Not long ago, Yeoman was trained by Guardians operator Quiescence Diving on how to recognize the signs of coral bleaching, and she then set out on a dive charter to photograph and document the location of corals that met the criteria. Because corals are animals, they require veterinarians, and Yeoman describes her Keys' experience as hands-on training for her future profession.

A total of 1,009 snails were removed during this effort in the Upper Keys.

PESKY SNAILS NO MATCH FOR REEF VOLUNTEERS

It's a fact, yellow-footed snails love to munch on coral, so keeping them off our reefs is a priority for Mission: Iconic Reefs. Florida Keys National Marine Sanctuary-affiliated staff and partners regularly team up for dives focused on these predators, and on one mission this summer, removed more than 1,000 snails from Carysfort Reef and Elbow Reef. Both are critical offshore sites that support some of the largest remaining elkhorn coral and staghorn coral populations in the Florida Keys. Blue Star Diving operators Quiescence Diving Services LLC and The Dive Shop at Ocean Reef led the mission.

Students and leaders at Sugarloaf School overlooking the fruits of their clean-up labor.

GUARD EXPANSION: SOON TO BE DISTRICT-WIDE IN MONROE COUNTY SCHOOLS

They are pint-sized guards with an out-sized impact, removing over 34,000 pounds of debris from their school campuses and communities, planting native species, composting and working to minimize plastic waste in schools and neighborhoods. And, it's all part of their education curriculum. Classrooms from as far away as Tampa have been connecting with their local watershed, and Florida Keys National Marine Sanctuary, by engaging in hands-on environmental stewardship projects as part of NOAA's Ocean Guardian School program, which implements school- or community-based stewardship projects across five program pathways: Watershed Restoration, School Garden/Habitat, Energy and Ocean Health, Marine Debris, and 6Rs (Rethink/Reduce/Refuse/Reuse/Recycle/Rot).

Rigorous environmental curriculum is part of the Ocean Studies philosophy, so is the fun of drawing.

Between 2017 and 2024, NOAA and partners have supported 10 Ocean Guardian Schools in Florida, with $69,889 in grant funding going directly to schools. Now, the impact of the program in the Florida Keys is growing, with more schools and money on the way. Additionally, the sanctuary and United Way of Collier and the Keys are working with Monroe County schools to become a NOAA Ocean Guardian School District, which would implement and sustain district-wide programs and policies that demonstrate the district's commitment to protecting and improving the health of their local watershed and our one global ocean. Monroe County would become just the second school district in the nation to earn the distinction.

OUR COMMUNITY

GOAL CLEAN SEAS

Kurt Tidd first dipped his mask below Florida Keys waters in the 1970s as a Naval Academy midshipman. Forty years later, as a four-star admiral, he retired to the Keys and promptly took up arms of a different sort, volunteering to remove ocean debris as part of Goal: Clean Seas.

"I knew one person couldn't do much," Tidd said, "but the work of dive shops like Key Dives collectively working together has a multiplying effect, giving people a reason to dive beyond being a tourist and not take for granted this resource, but to help keep it for their kids to enjoy."

Goal: Clean Seas was launched in 2018 as a joint effort between the Florida Keys National Marine Sanctuary and the National Marine Sanctuary Foundation in the wake of Hurricane Irma, which littered nearshore waters with debris of every sort. Since then, the foundation has funded more than $430,000 worth of dives, and the program is now led by one of the principal dive shop volunteers, Cortney Benson.

"It's a mixed blessing," says Tidd, who has been on 99 cleanup missions. "When you finish a dive, there's the satisfaction of seeing the pile of debris that you have removed, but then there is frustration that we keep finding the same things on the reef." Boat anchors, monofilament, lobster traps and lures are consistently found lodged on the reef, but Tidd has also found fishing poles, lawn chairs and building materials inappropriately dumped at sea. The work may never be complete, but it's good to know divers like Kurt Tidd are answering the call to duty.

Documenting the clean-up work through photography is another way Kurt Tidd is giving back.

You name it, and GCS volunteers have come across it, but abandoned anchors are a critical threat to delicate coral reefs. Photos: Kurt Tidd.

GCS BY THE NUMBERS SINCE 2018

109,000 POUNDS DEBRIS

1,548 TRIPS

7,719 RECREATIONAL DIVERS

3,531 PROFESSIONAL DIVERS

5.36 MILLION SQUARE METERS CLEANED UP

11,499 UNDERWATER HOURS

DISCOVERY SATURDAY FUELS BANNER YEAR FOR ECO-DISCOVERY CENTER

Florida Keys Eco-Discovery Center has been enjoying its most active year since the COVID pandemic, with more than 3,000 visitors rolling through the turnstiles each month, on average. The summer of 2024 also saw the return of Discovery Saturday, a monthly, hands-on session for elementary school-aged kids.

The line-up featured presentations by National Park Service (Dry Tortugas), FWC Lobster Lab (lobsters), Force Blue (sea turtles), National Weather Service (hurricanes), Reef Relief (marine ecosystems), Monroe County Sheriff's Animal Farm (responsible pet ownership), and Key West Art & Historical Society (the whole Key West).

"I'm excited to offer more activities for our local and visiting littles" said Eco-Discovery Center Manager Kristina Agard. "Having a safe place for our youngest visitors to be themselves and a supportive environment for families to learn about nature is so very important."

Top to bottom: Still one of the few free attractions in Key West, the Eco-Discovery Center is on track for a banner year of visitors.

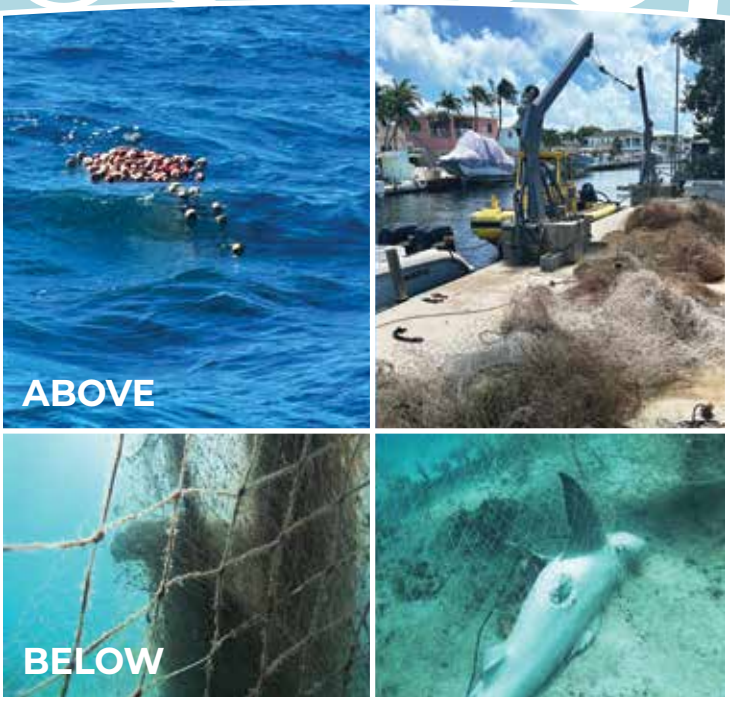
Lobster Lab left inspired a lot of young students to come out of their shells...so to speak.

For the second straight year, the Key West Mermaid Festival called the Eco-Discovery Center home for a day, driving a record number of starry-eyed visitors.

THERE'S AN APP FOR THAT!

Whether you are a seasoned pro or first-time visitor, Marine Sanctuary Explorer is a great tool to have in hand when enjoying Florida Keys National Marine Sanctuary. With GPS precision it can tell you when you're approaching a managed zone, with tips on how to safely enjoy the area. With the full list of Blue Star dive and fishing operators, it can help you plan a visit on land and sea. Look for this free mobile app in the Apple and Google stores.

OUR COMMUNITY



Top: Like an iceberg on the surface, most of the trouble was below the water line. Bottom: Dead sharks weighed down the net, further complicating the salvage effort.

COMMUNITY EYES LEAD TO NET GAIN

When the call came in, the ghost net was less than a mile from the delicate corals of Alligator Reef Sanctuary Preservation Area, and in less than 24 hours competitors would be headed in that direction as part of an annual swimming contest to the lighthouse. Sundance Watersports made the initial sighting, phoning the U.S. Coast Guard who connected with Florida Fish and Wildlife Conservation Commission officers, who then notified the sanctuary's response team. It didn't look like much on the surface, but below the water the net covered some 50 yards, weighed down by dead fish, including a pair of sharks. After the sanctuary secured funds for the salvage, the job was completed in two days, with NOAA law enforcement surmising the debris drifted in from an international location where that type of gill net is legal. And who paid for the salvage? The Marine Preservation Society of the Florida Keys.

SUPERMAN WORKS ALONE, BUT BATMAN IS A TEAM PLAYER

He's known around the office as Buoy Batman — call him and he will come. There are volunteers and then there is Terry Helmers, Florida Keys National Marine Sanctuary's MVP of lending time and talent (that's MVP for Marine Volunteer Personified).

The 71-year-old retired IT administrator answers the call for help whenever the sanctuary needs an extra hand from a NOAA-certified diver. Usually, it comes from the Upper Keys buoy team, for whom Helmers fabricates buoy downlines and then takes to the water to install new anchors in the sanctuary's rapidly-expanding network of mooring buoys.

"Buoys are appealing for me," Helmers says, "because when you get all done putting a buoy in, just as you're leaving, a boat with a family pulls up and ties up to your brand-new buoy. 'I did that. You can enjoy that buoy because I did that.'" Helmers is closing in on 1,000 volunteer hours with the sanctuary, underscoring the vital role of volunteers in the sanctuary's mission.

"Our volunteers are an amazing group of passionate people with diverse talents," said volunteer coordinator, Liz Trueblood, "Some volunteer a few hours a month, others for several hours a week. This adds up to over 2,500 hours per year."

Aside from his sanctuary volunteerism, Helmers has removed more than 50 derelict tires and almost 18,000 pounds of trash from our nearshore waters this year.

Helmers draped in buoy hardware that he fashioned before placing in sanctuary waters.

THE SQUARE GROUPER BAR AND GRILL

My Favorite Joint

TUESDAY THRU SATURDAY
LUNCH 11AM - 2:30PM | DINNER 5PM - 10PM

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My New Joint...

BECAUSE TWO JOINTS ARE BETTER THAN ONE

TUESDAY THRU SATURDAY 4:20PM - 11PM

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THURSDAY THRU MONDAY
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SQUARE GROUPER *Sunset Lounge* MY KIND OF JOINT

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WEDNESDAY THRU SUNDAY
4:20PM - 11PM

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Photo: Mote Marine Lab

By Allison Delashmit

ESTABLISHED RELATIONSHIPS PROVED CRITICAL IN THE FACE OF A CRISIS, MAKING THE CASE FOR COLLABORATIVE PARTNERSHIPS IN THE FACE OF ECOLOGICAL DISTURBANCES

SAW SOMETHING **SAY** SOMETHING

A group of four sampling teams from Bonefish & Tarpon Trust, Florida Gulf Coast University, and Florida Fish and Wildlife Conservation Commission staging at Cudjoe Gardens Marina before sampling various locations after sundown in February of 2024. These teams were collecting water quality measurements, water samples, benthic algae samples, and live symptomatic fish from each location with the help of LKGA Captains carefully navigating the backcountry waters.

It's a battle as old as time — scientist v. fisherman — fueled, perhaps, by ego or historical, ancestral fears, or maybe even misunderstood philosophies on conservation; but for unknown reasons, the fishing community has long revered the scientific community as foes. To fishermen, inquiries from scientists often sounded off alarms of possible fishery closures, new regulations, or even a permanent change that affects livelihoods. Similarly, scientists were often left with unanswered ecological questions when key stakeholders refused to entertain discussions that could lead to solutions for known and unknown issues.

But flats fishermen didn't count on patient scientists like Dr. Ross Boucek, from Bonefish & Tarpon Trust, who kept showing up. He kept listening. He kept asking questions until fishing guides answered. He kept pushing forward with impactful research, answering key questions that local fishermen had long been wondering about their changing fisheries. Questions like "What are permit actually eating?" and "Are human contaminants affecting fish populations?" or "What affects priority species spawning activities?"



From left to right: At the beginning of the spinning fish disturbance, captains from the Lower Keys Guides Association collected symptomatic fish in local culverts from which Dr. Ross Boucek drew blood samples. FWC Water Sampling on Captain Mike O'Brien's Boat: Two FWRI researchers filtering water samples at locations where symptomatic fish were frequently being reported. These researchers were on LKGA Rapid Response Network Guide, Captain Mike O'Brien. FWRI researchers collecting water quality samples aboard the boat of Lower Keys Guides Association Rapid Response Network Captain Chad Huff.

Fishing guides from the Key West and Lower Keys Fishing Guides Association (also known as Lower Keys Guides Association or LKGA) started seeing scientific data that confirmed suspicions about their fishery and started asking even more questions of BTT and Dr. Boucek. "Once the fishing guides understood that science was not only beneficial in identifying and understanding current and trending ecological impacts to the fishery, they started craving more answers," said Boucek. "They understood the power of science and how it breeds the opportunity for real impact."

With a welcome mat placed at a cracked front door, curated research designs began to unfold for BTT and LKGA's priority fish species like permit (T. falcatus.) Since 2009, LKGA fishing guides have been collaborating with BTT scientists about the Florida Keys fishery, and research projects started to form (like BTT's Project Permit), collectively strengthening communications with regulatory managers as well as state and federal agencies (like Florida Fish & Wildlife Conservation Commission and Florida Keys National Marine Sanctuary), and the stage was set for new, innovative research for historically important, priority fish species for both BTT & LKGA. But in the fall of last year, these symbiotic relationships between fishermen, scientists, and state/federal agencies would become more important, and more necessary, than ever.

Summer of 2023 was one for the record books, but not the records anyone wanted to remember. July of that year was the hottest month ever recorded in the Florida Keys. During the heat wave, normally crystal-clear blue waters of the Lower Keys turned murky and brown from algae, a familiar situation for Upper Keys guides in Florida Bay but new to the LKGA. Meanwhile, the unprecedented elevated water temperatures resulted in mass coral bleaching and other environmental casualties and stressors throughout the summer. But, as the water cooled, and the summer damage was assessed and accepted, another ecological issue was arising, somewhat quietly. In late October, Dr. Boucek started receiving calls from LKGA guides witnessing unusual spinning behavior in bait fish. After several reports from multiple fishing guides, with reports expanding to multiple species acting oddly, Boucek started personally mapping where the reports were coming from, which were initially contained to a relatively small area in the Lower Keys. "It became quickly obvious that something wasn't right," recalled Captain Andrew Tipler, LKGA's President Emeritus. "As a professional fishing guide for over 20 years, I had never seen this sort of behavior before." To better track sightings, the LKGA created an online reporting system on their website for guides and fishermen to report unusual fish behavior or fish kills. By late December, Boucek suspected something bigger was happening, as the spinning zone seemed to be widening and the species affected started growing in numbers, and he instinctively created a working group of sorts to start mapping out a strategy to collect information to determine what was happening and why.

A pair of FWC researchers hitch a ride with Lower Keys Guides Association Rapid Response Guide Network Captain Nicholas Calabro, heading to a sampling location in search of symptomatic fish to bring back for necropsy in Marathon.

Hundreds of samples have been collected by multiple researchers from identical locations during the same time point to compare data over time.

Ultimately, subject matter experts and scientists from multiple organizations and state agencies answered the call for help from Dr. Boucek. These organizations included Florida Gulf Coast University (who've been studying Gambierdiscus, a common dinoflagellate in the Florida Keys for 20-plus years), Dauphin Island Sea Lab and University of South Alabama (toxicology and ecological risk of harmful algal blooms and various toxins), Florida International University (human pharmaceuticals in fish), Florida Fish & Wildlife Conservation Commission's Fish & Wildlife Research Institute (harmful algal blooms, fish disease and mortality, fish ecology, water quality, and data from the Fish Kill Hotline, marine fisheries and sawfish research) and Florida Department of Environmental Protection (water quality.)

This unlikely group of brilliant minds, typically working in their collective silos, brought together by Bonefish & Tarpon Trust, started meeting together with nothing more than reports from fishing guides — no money for new research, but all with a desire to help. Sampling started in January 2024 with multiple organizations traveling to the Florida Keys to collect water and fish samples. LKGA guides were poised and ready to help, greeting visiting scientists with Keys hospitality providing boats ready to take them to active sites for collections, offering community connections, and in some cases, even a place to stay on short notice. Sampling would continue through the spring and summer, and to date, hundreds of water, fish, and algal samples have been taken and analyzed. Many possible causes have been ruled out like red tide, parasites, or common water quality issues like unusual dissolved oxygen or low/high salinity. However, some things have revealed themselves as possible clues, including elevated levels of toxin-producing algae, Gambiersicus spp., but no absolute cause has been identified. The research continues.

Also ongoing is an open flow of information-sharing between the fishing and scientific communities, which came to each other's rescue in a big way. Trust is earned, and it was certainly acknowledged during this latest ecological conundrum in the Florida Keys. With appropriated funds pending from the Florida Legislature and supported by the Governor, plans are being devised and additional grants applied for to continue to research and understand the spinning fish issue and ongoing water quality concerns, but also in preparation for the next ecological event. "Perhaps a silver lining of this spinning fish event was to help us become better poised and proactive," said Boucek, "instead of reactive, to future ecological disturbances."

Allison Delashmit is Executive Director of the Lower Keys Guides Association.

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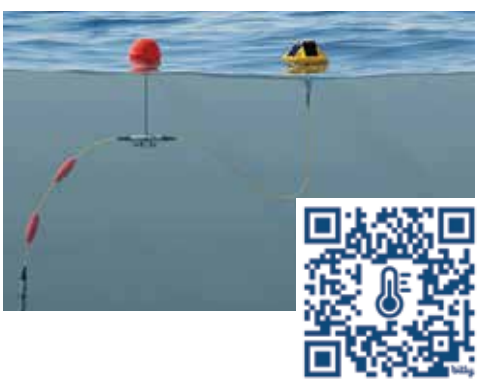

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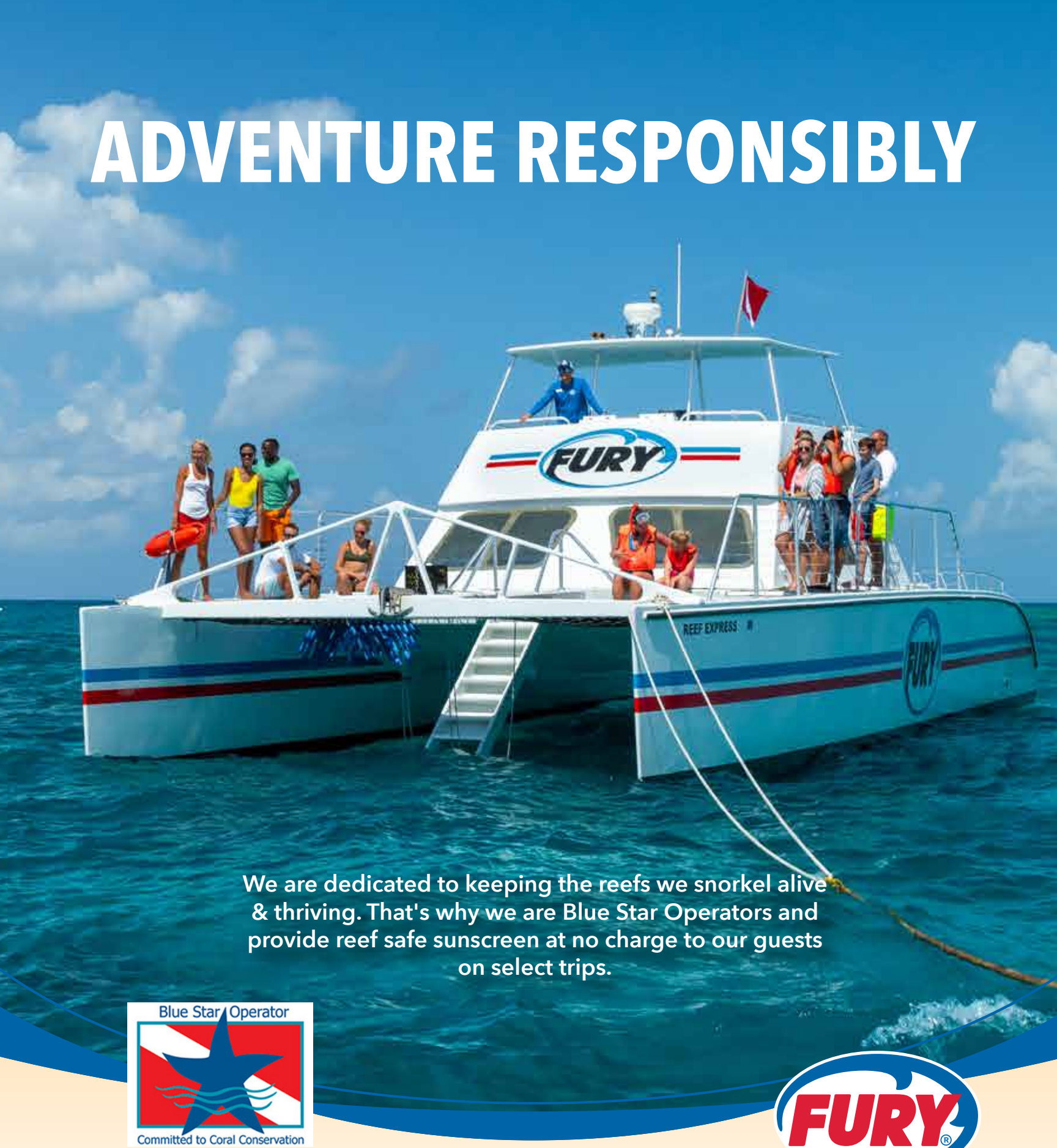

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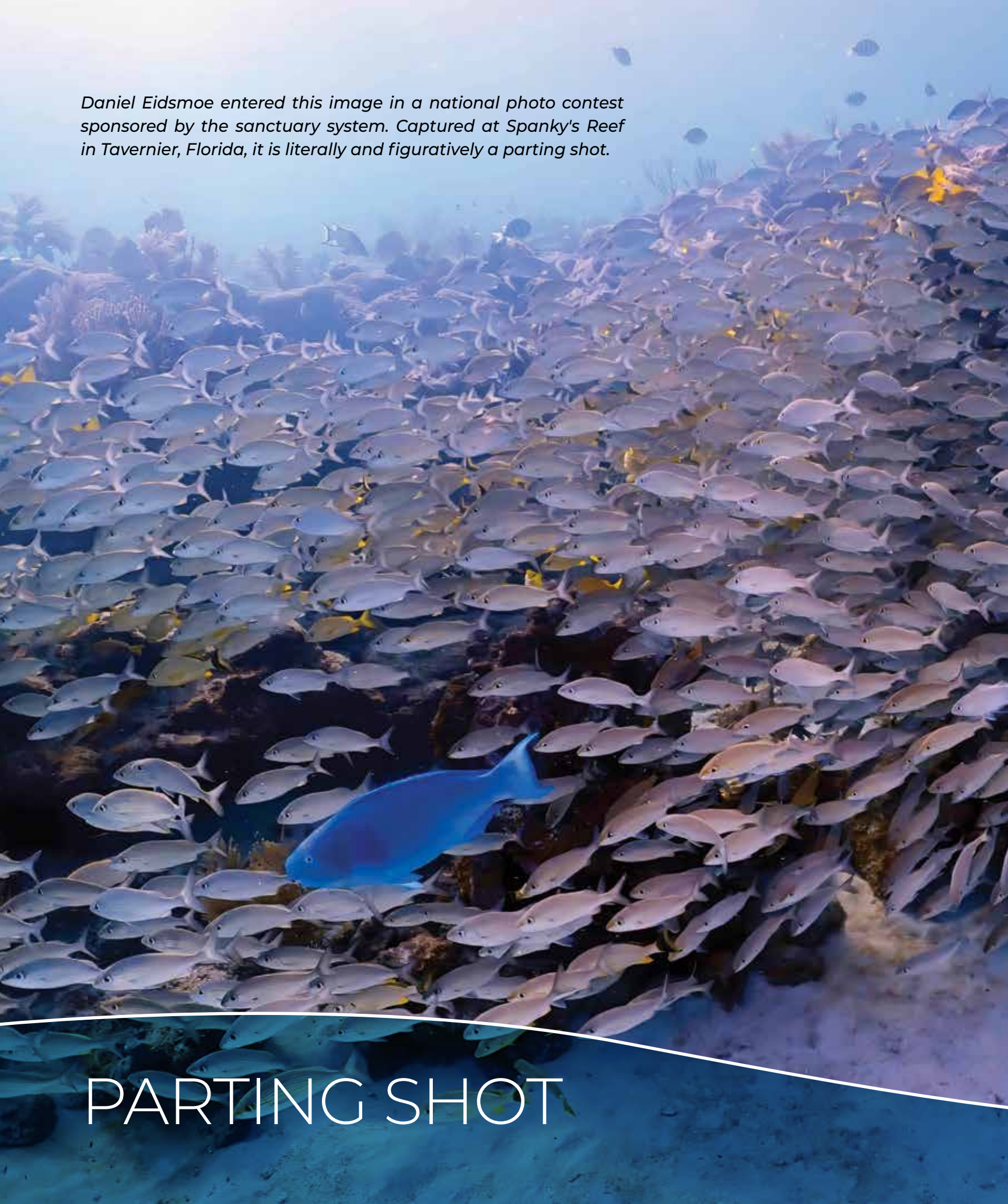

Daniel Eidsmoe entered this image in a national photo contest sponsored by the sanctuary system. Captured at Spanky's Reef in Tavernier, Florida, it is literally and figuratively a parting shot.

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