

The Art of Ocean Conservation
VOLUME 10, ISSUE 35
WINTER 2020
\$6.95

GUY ARVEY

MAGAZINE

The Politics of Shark Fins

Feds and Florida Battle to End Fin Sales

North Carolina's Magic Crystals

An Angler's Coastal Paradise

Tribute to Theophile

A Cajun Legend's Legacy

The Lionfish Compendium

How the Invader Has
Spawned an Entire Industry

Progressive Casualty Ins. Co. & affiliates. Annual premium for a basic liability policy not available in all states. Prices vary based on how you buy.



There's a reason they say, Curse like a sailor.
That's why we offer basic plans starting at \$100 a year
and options with Sign & Glide® On-Water Towing.

1.800.PROGRESSIVE | PROGRESSIVE.COM **PROGRESSIVE**

GUY HARVEY®

GHOFF
GUY HARVEY OCEAN FOUNDATION®



GHOFF.ORG



26 | EXTINCTION SOUP

18 EMMA THE TIGER

Lassie was a celebrity dog, Nemo is a famous animated clownfish and now there's Emma, a real life, 12-foot tiger shark that is achieving stardom.

BY **GEORGE C. SCHELLENGER**

20 A CAJUN LEGEND

Legendary Louisiana angler Theophile Bourgeois lived to fish and died while returning from a fishing expedition. He built a fishing community that mourns his loss.

BY **FRED GARTH**

26 EXTINCTION SOUP

Most of us have heard about the slaughter of sharks and their highly-priced fins that fuel a seemingly insatiable appetite for Shark Fin Soup in Asia. Shark advocate and founder of Shark Allies, Stefanie Brendl, tells the story with brutal honesty.

BY **STEFANIE BRENDL**

48 GUY HARVEY APPAREL

It's new, it's lively and it's available at a store near you and on the World Wide Web. Photo pro Alex Taylor went to Florida to highlight the new line of clothing in its natural element.

BY **GHM STAFF**

52 MAGIC CRYSTALS OF NORTH CAROLINA

Leave it to writer and fishing freak Nick Honachefsky to slay fish wherever he travels. This time he toured the Crystal Coast of North Carolina where he found inshore and offshore treasures.

BY **NICK HONACHEFSKY**

On the Cover:
Mako Dance
by Dr. Guy Harvey



LIONFISH CONUNDRUM

58 THE LIONFISH COMPENDIUM

They've become a household word and spawned a cottage industry. We look inside the wild world of lionfish and the people fighting back.

60 COAST WATCH ALLIANCE

A group of concerned citizens in and around Pensacola, Florida - the epicenter of the lionfish epidemic - have made progress in the battle against lionfish.

BY **BRAD RIFFE**

64 ALEX LUCE

A teenager from California became passionate about the lionfish issue and made an animated film. We discussed his concerns and his generation of conservationists.

BY **GHM STAFF**

66 LIONFISH UNIVERSITY

It's not an actual campus and they don't have a football team, but the folks at LFU are striving to educate the public about the growing threat of lionfish on the oceans.

BY **STACY FRANKS & JIM HART**

70 WHO'S IN CHARGE?

Lots of groups and individuals are working to control lionfish. Coordinating efforts and working together is the key to finding a solution.

BY **MEHGAN HEANEY-GRIER & STEVE GITTINGS**

72 WHACKIN' AND STACKIN'

Lionfish expert, Alex Fogg, discussed the business side of Lionfish Tournaments.

BY **ALEXANDER Q. FOGG**

74 CONFESSIONS OF A GARAGINEER

NOAA scientist Dr. Steve Gittings has been working on a lionfish trap for years in order to harvest the pests in deep depths, beyond the limits of scuba divers. His garage-laboratory is showing some interesting results.

BY **STEVE GITTINGS**

76 CONTROLLING LIONFISH WITH SOUND

University of Georgia researcher, Scott Noakes, is experimenting with underwater acoustics as a way to attract and trap lionfish.

BY **SCOTT NOAKES, UNIVERSITY OF GEORGIA**

DEPARTMENTS

10 GUY TALK Fishing Politics

Dr. Harvey discusses the work of the GH Ocean Foundation and future and ongoing projects for sustainable fisheries.

BY **GUY HARVEY, PhD**

12 THE BITE News, Notes & Gear

News and notes about the universe of fishing and marine conservation.

BY **GHM STAFF**

58 PHOTO PORTFOLIO Shawn Heinrichs

Professional photographer and filmmaker, Shawn Heinrichs, shoots a lot of big animals...with his camera, that is. Feast your eyes on his subjects.

78 LAST CAST Hooked on Sailfish

GHM Editor Fred Garth traveled to Guatemala for a sailfish conference only to realize his language skills were lacking.

BY **FRED GARTH**



SUBSCRIBE TODAY!

Stay informed. Be entertained. Help save the fish!

1-year: \$24.95

2-year: \$39.95

3-year: \$55.95



It's easy...



Visit GuyHarvey.com to subscribe today.

Interested in having a mag for the entire classroom? Call for special pricing...800.288.1227.

GUY HARVEY MAGAZINE OFFICES:

PENSACOLA, FLORIDA
Fred Garth, **Editor-in-Chief**

NEWYORK, NEWYORK
Merrill Squires, **Partner**

SHREVEPORT, LOUISIANA
Scott Smith, **Partner**

CREDITS TO:

PUBLISHER

Lost Key Publishing

Managing Editor

Danny Thornton

Art Director

James Scott

Designers

Dave Ham, Betsy Holt, James Scott

Circulation Director

Maura Jones

Director of Sales & Marketing

JJ Waters

Social Media Director

Brent Shavnore

Accounting

Karen Belser

Copy Editor

Kerrie Allen

Contributing Editors

Dr. Guy Harvey, Nick Honachefsky

Contributors

Stefanie Brendl, Stacy Franks, Alexander Q. Fogg, Fred Garth, Tess Gilbert, Steve Gittings, Jim Hart, Meghan Heaney-Grier, Shawn Heinrichs, Betsy Holt, Nick Honachefsky, Scott Noakes, Tomáš Nožina, Tre Packard, Courtney Platt, Brad Riffe, George C. Schellenger, Alex Taylor

Editorial Advisory Board

John Guidroz, Dr. Guy Harvey, Chad Henderson, Steve Roden, George C. Schellenger, Dr. Mahmood Shivji, Jane Tebbe-Shemelya

WE'RE GREEN:

Making magazines uses a lot of paper, which fortunately is recyclable and renewable. It also creates scrap paper that can be used wisely. This is one reason we have partnered with Royle Printing in Sun Prairie, Wisconsin. Their approach is to "Reduce; Reuse; Recycle", a philosophy shared with several of their business partners. Royle uses low-energy lighting and re-claimed heat from printing presses for energy. They source paper and ink from partners committed to sustainability and, most importantly, they recycle scrap paper and even dust that is re-manufactured into new products.

GUY HARVEY MAGAZINE (ISSN 2162111X) is published four times per year (quarterly) by Lost Key Publishing, LLC, 7166 Sharp Reef Road, Pensacola, Florida 32507. Periodicals postage paid at Pensacola, Florida, and additional mailing offices. POSTMASTER: Send address changes to: Guy Harvey Magazine, PO Box 13274, Pensacola, FL 32591-3274. No part of this magazine can be reproduced without express written permission from Lost Key Publishing. Occasionally, we may make all or part of our subscriber list available to carefully screened companies that offer products and/or services that may interest you. To subscribe to *Guy Harvey Magazine*, call our toll-free subscription number, 888.275.2856.

GUY HARVEY

GUYHARVEY.COM

GUY HARVEY®



YOUR PURCHASE
HELPS SAVE
OUR SEAS



DR. STEVE GITTINGS

Since 1998, Dr. Steve Gittings has been Chief Scientist for NOAA's National Marine Sanctuary Program, which encompasses the nation's twelve marine sanctuaries. Prior to his move to NOAA's head offices in Washington D.C. he was manager of the Flower Garden Banks National Marine Sanctuary offshore of the Texas coast. As a longtime and avid scuba diver, he has specialized in coral reef ecology and also has broad experience in conservation science, including ecosystem characterization and monitoring, damage assessment and recovery, and spill response. He has extensive field experience in scientific diving, ROV operations, and submersible use. Recently, Dr. Gittings has been developing traps designed to catch lionfish in waters beyond scuba depth. The traps minimize by-catch and ghost-fishing, and could create new opportunities for fishermen to help create a steady supply of lionfish to seafood and other developing markets. Gittings ocean-related articles and photography have appeared in numerous publications. He earned his Ph.D. in Oceanography from Texas A&M in 1988.

STEFANIE BRENDL

To say that Stefanie Brendl is an advocate for sharks is like saying water is wet. In many ways, she is as much of a shark as sharks are, in that she spends a lot of her life facing off with attorneys and politicians. As the founder and executive director of Shark Allies, Brendl has been fighting to protect sharks from overfishing, finning and general abuse during the past two decades. She has roamed the halls of state governments from Hawaii to Florida and is all too familiar with the nuances and corruption of politics. Originally from Bavaria, Germany, Brendl became a shark whisperer after she took up scuba diving, settled in Hawaii and started Hawaii Shark Encounters, a venture that focused on blowing the minds of tourists who snorkeled with sharks from the protection of a cage. Hawaii also turned out to be her introduction to legislation and Brendl successfully lead the charge to ban the trade of shark fins in Hawaii. That ban took effect in 2010. Along the way she became a cinematographer and filmmaker and produced a documentary called Extinction Soup about the perils of shark finning and the victory over finning in Hawaii. In the past two years, her abundant energy and networking has been focused on Florida where, as of this printing, the sale of shark fins is still legal. House Bill 401, which bans the sale of shark fins in Florida passed the House in December but still has to get the approval of Florida's senate. After her Floridian efforts, Brendl plans to cross the big pond and spread her shark love in Europe where some antiquated laws need her wisdom and guidance. Before she was consumed with shark advocacy, Brendl traveled the world on a sailboat with scuba gear and paragliders for exploring high and low. Apparently, it prepared her well for politics.



GUY HARVEY

GUYHARVEY.COM



GUY HARVEY
®

GHOF
GUY HARVEY OCEAN FOUNDATION

YOUR PURCHASE
HELPS SAVE
OUR SEAS

FISHING POLITICS

Back in my halcyon days growing up in Jamaica, fishing was a celebrated family activity. My parents and siblings all loved to fish and a day on the water was mostly about having fun, and of course, battling with mysterious sea creatures small and hopefully, large. Back then, politics was the farthest thing from our minds. In fact, putting the words “fishing” and “politics” in the same sentence was as foreign a concept as pouring seawater into our fuel. However, these days, fishing has become such a political hot potato that all dedicated anglers are affected to some degree. On an individual level, we all buy fishing licenses, follow bag and size limits and definitely keep our motor oil out of the ocean! As we move up the food chain, we’re dealing with Marine Protected Areas, illegal commercial fishing fleets, how to regulate highly migratory species like tuna and billfish as well as many, many more issues that come under the dominion of our political leaders.

My point, very simply, is that because politics and fishing are now so inextricably tangled that we must support those politicians who understand fisheries and the impacts - both good and bad - of recreational anglers. That’s why I was so pleased to have the opportunity recently to meet Florida’s new governor, Ron DeSantis. Even though I’m not a voter in the US because I live in the Cayman Islands, the Guy Harvey headquarters have been in South Florida for more than 30 years so I’m deeply invested economically and emotionally in Florida’s politics.

I was very encouraged to learn that Governor DeSantis seems to understand the direct correlation between Florida’s economy and environment. To any logical person, the connection is obvious. However, in past decades, this obvious logic was ignored by many of our political leaders.

One of the first things the new governor did after he took office was demand the resignations of the board of directors of the South Florida Water Management District (SFWMD). This group of political appointees were embroiled in controversy, accused of corruption and were responsible, at least in part, for not curtailing some of the worst red tides and blue green algae in Florida’s history. For this governor to step in and wipe the SFWMD slate clean was nothing short of a seismic shift for the state and a clear sign that his convictions are strong regarding conservation.

The non-profit groups that we, at Guy Harvey Ocean Foundation, interact with such as the Everglades Foundation, Bonefish and Tarpon Trust, the Coastal Conservation Associations and others, have a new optimism that Florida is truly on the road to recovery. We know, they know, and I believe the governor knows, that tourists will stop coming to Florida if we don’t have clean water, beaches that are free of pollution, air that is healthy to breathe and a sustainable fishery that supports the millions of anglers who love Florida. Of course, if tourism declines there’s a domino effect upon the economy.

When I flew to Tallahassee to meet with the governor, we discussed several conservation topics that are vital to Florida. He listened intently to our point of view and the dialog was impressively positive. In the coming months of 2020 and years beyond, I believe you’ll hear more from his office about marine and land conservation and the steps Florida will take to maintain, preserve and restore it’s incredible natural beauty.

In fact, in this edition of Guy Harvey Magazine, we explore in great detail two major marine conservation issues facing Florida and waters beyond the state: the



lionfish invasion and the overharvest of sharks, primarily for their fins. We've put together an expansive section on lionfish with the latest data - scientific, empirical and otherwise - on the spiny invasive creature. A lot of great progress is being made and, as I've always said, it's delicious to eat so try it if you have the chance.

We tapped Stefanie Brendl, Executive Director of Shark Allies, to write an incredibly comprehensive article on the state of sharks, shark fin soup and the intense politics surrounding that issue. She's a veteran in the battle and we're fortunate to have her expertise in the pages of this issue. Shawn Heinrichs, photographer extraordinaire, illustrates her article beautifully. There's a lot more to learn and enjoy so I'll wrap up and let you continue to review this issue.

Fishing has changed vastly since my young days romping around Jamaica and it will undoubtedly continue to evolve. It's my hope that you will join me, the Guy Harvey Ocean Foundation and the Guy Harvey Research Institute as we navigate the stormy political waters in our ongoing effort to insure sustainable fisheries, clean water and outstanding fishing.

On a person note, I'd like to welcome a new member to the Harvey family, our granddaughter, Harper Gillian Harvey, who was born to my son Alex and his wife xxx on December 13th, 2019. Congratulations to them! 🐟

Fair winds and tight lines!



GUY HARVEY, PhD

is an internationally-acclaimed artist, fisherman, scientist, and world traveler, who devotes much of his time and money toward ocean conservation.

Guy Harvey Raises Funds for Hurricane Relief Efforts in the Bahamas

Partners with Anglers for the Bahamas: Fishin' With a Mission

When Hurricane Dorian ravaged the Abacos and Grand Bahama island last summer with maximum sustained winds of 185 mph, it left thousands dead and damages that may exceed \$15 billion. Immediately in the wake of the tragedy, a lot of selfless people went to work to help in any way they could. Guy Harvey quickly designed a Bahamas Strong T-shirt and donated 100 percent of net profits to support the recovery efforts.

"I was born in the Caribbean and lived here all my life, so I am particularly heartbroken by the devastation in the Bahamas. We sympathize with our island neighbors and will help in any way we can," Harvey said.

To ensure their donations went to a worthy cause, Guy Harvey Enterprises teamed up with its various angling partners such as Papa's Pilar and Anglers for the Bahamas: Fishin' for a Mission, the brainchild of Bass Pro Shops founder and conservationist Johnny Morris.

"Beyond our pledge of financial support, we feel we can play a far greater role in supporting the Bahamas and its wonderful people by uniting anglers with an efficient and highly respected relief organization, Convoy of Hope," Morris said.

Convoy of Hope, a four-star-rated charity for 16 years running, quickly plugged emergency responders into the front lines throughout the Bahamas. The group has previously worked in 48 states and more than 126 countries, responded to more

than 370 disasters, served 115 million people in need, and ensured more than 90 percent of every dollar raised goes to support on-the-ground relief.

Just two days after the launch event for Anglers for the Bahamas, the donations totaled nearly \$2 million and continued to pour in.

Even though the hurricane occurred months ago, donations are still needed. To give directly to relief efforts, please visit www.anglersforthebahamas.org.

Papa's Pilar Rums also teamed with the Guy Harvey Ocean Foundation creating "Papa's Pilar Relief and Rebuild." A donation of \$10 for every Dark Rum Relief Bottle and \$5 for every Blonde Relief Bottle, up to 15,000 bottles, was made to relief partners. The program was created in partnership with the Hemingway Family and Dr. Guy Harvey, who created and donated custom special artwork for the bottles.

"Papa's Pilar is inspired by Ernest Hemingway and strives to support causes that carry on his legacy," said Mike Myatt, Papa's Pilar Chief Communities & Conservation Officer. "We have a deep connection to the Abaco Islands' people and culture, and through our program with the Guy Harvey Ocean Foundation, we hope to support those affected by the horrific devastation of Hurricane Dorian as they begin to rebuild their lives, homes, and businesses."

In addition to the donation program, Papa's Pilar and Guy Harvey will be working with relief partners to develop an ongoing recovery and rebuilding program for the Abaco Islands in 2020 and beyond. [▶](#)



Anglers for the Bahamas Donations

Bass Pro Shops – \$1 million: \$500,000 in cash and \$500,000 in goods.

Tyson Foods – 125,000 servings of canned chicken valued at \$150,000 in honor of the late Don Tyson, former Chairman of the Board, a world-renowned fisherman, and founder of the Billfish Foundation

Jack Links Beef Jerky – 5,000 bags of high-protein jerky and an equivalent matching cash donation for a total gift of \$50,000

Textron TRACKER OFF ROAD Vehicles – \$100,000

Alan Williams – \$100,000

Mastercard – \$200,000 to Red Cross and waived interchange fees through November 15 to several charitable donations in the name of Bahamas relief, as well as provided waivers to help get local businesses back on their feet

Pure Fishing – \$75,000

Navico Marine Electronics – \$50,000

True Timber – \$25,000

Engel Coolers – \$25,000 in products

Country music star and avid angler Luke Bryan – \$10,000

Sunglass Hut – \$10,000

Champion Power Equipment – \$10,000

Tree House Kids, Inc. – \$10,000

Feradyne Outdoors – \$10,000

Springfield Striping – \$10,000

PS Seasonings & Spices – \$10,000

SOS – \$10,000

Leica – \$10,000

Champagne Metals – \$10,000

Additional generous support came from other initial partners including American Fishing Tackle Company, Famous Dave's BBQ, Barrows Excavation, Opie's Landscaping, Foggy River Realty, Keys Painting, Tom Boyce Excavating, and Martin Dingman. 🐟

Norwegian Cruise Lines

Norwegian Cruise Line Holdings, which operates the Norwegian Cruise Line, Oceania Cruises, and Regent Seven Seas Cruises committed \$2 million to its Hope Starts Here hurricane relief campaign in partnership with All Hands and Hearts. All Hands and Hearts used the funds for the emergency response efforts across the Bahamas, including debris cleanup and removal, and the rebuilding of community infrastructure such as houses or schools.

The company also resumed calls to its private island, Great Stirrup Cay, just weeks after the storm. Great Stirrup Cay experienced minimal beach erosion and was quickly restored with sand that had been previously ordered.

"We understand that tourism represents a significant portion of the Bahamas' annual GDP and we are actively involved in helping our neighbors get back on their feet by returning to the islands and providing them with the supplies necessary to rebuild along with the needed economic support that tourism brings," said Frank Del Rio, president and CEO.

To support the hurricane relief efforts of Hope Starts Here, please visit <http://www.nclhltd.com/hurricanerelief>. 🐟





Adopt a Fisherman Program

Global Empowerment Missions (GEM), a Florida-based non-profit whose founding board members have been involved in supporting more than 200 aid relief trips and global tragedies around the world in the past decade, developed a unique program to provide boats to local Bahamian fishermen who lost their vessels and, thus, livelihoods to Hurricane Dorian.

Gavin Knowles, an 8th generation Bahamian with a lifelong career in offshore fishing and tourism throughout the Bahamas, was the first recipient. Generous donors Silvia and Authur Swaun inspired GEM to launch the initiative with the donation of a 26-foot center console with twin 200 engines.

The Adopt a Fisherman program continues to actively seek donations of boats, rods, reels, crab traps, lobster trap, motor oil, and anything else that will help a fisherman rebuild his business and sustain the community.

For more information, visit <https://www.globalempowermentmission.org/hurricane-dorian>.



Captain Gavin Knowles

Bahamas Relief Efforts Marine Industry

Bradford Marine — Its service facility in Freeport, Grand Bahama, was fortunately, largely unscathed by Hurricane Dorian. The company's first priority was to make sure that all of its staff were safely housed and cared for and immediately after the storm, Bradford started sending vessels back and forth, bringing supplies that were gathered at its Ft. Lauderdale facility and shipping them down to Freeport to its deep-water port. Bradford also provided dockage for the Pacific Hope Cruise ship and many privately-owned yachts with documentation that were conducting supply runs.

Bradford Marine held a BBQ at its Ft. Lauderdale base to gather supplies and donations on September 9 and brought over 500 people together for the effort, bringing chain saws, generators, food, and toiletries that filled a container and the company's storage facilities. The company will continue to assist the residents of the Bahamas as well as customers who need to have services done, which will help keep the local population employed and make Grand Bahama a support center for the rest of the islands.

Shipwreck Park Pompano — Chairman Rob Wyre and his team from Shipwreck Park Pompano were immediately on the tail of Hurricane Dorian to provide supplies and support. With access to private planes, helicopters, and yachts, the non-profit started gathering supplies, which were stored on pallets at Sands Harbor Resort in Pompano Beach. Wyre accompanied videographer Victor Nappe on a helicopter tour of the Bahamas with Resolve Marine Group, which has been actively involved in marine solutions for many years. They were

distressed by the devastation they saw from the air, including the oil that had been blown from storage tanks when their tops were ripped off by the wind, scattering oil from the tanks over miles of marshy sand and sea grass, and Nappe captured heartbreaking footage of the immediate aftermath of the storm.

As a businessman, Wyre was thinking of long-term solutions—especially for the east end and the Abacos that were the most damaged from the storm and isolated from relief efforts by limited access. He and his team created a larger scheme plan—to provide desalination machines to process sea water and create fresh water, eliminating the need for all the plastic bottles of water that were providing a temporary fix.

Sustainability is in Shipwreck Park's DNA as the Park began with the development of an artificial reef in Pompano to help educate the community and grow more coral, bolstering the reefs, a core of the environment and an attraction for area divers and snorkelers. The group began planning a benefit concert, "One Love Bahamas," with all entertainment and services donated to raise funds for the desalination equipment. While originally planned for November 23, the concert was postponed until February 8 at the Amphitheater in Pompano Beach. Top-name national acts and local talent have been enrolled and Ticketmaster will handle event ticket sales. The commercial desalination units cost approximately \$7,500 each and can process a significant amount of fresh water, so the effort will be ongoing to help concentrate on one aspect of the island-wide issue. [▶](#)



Firetrucks to the Rescue

When a hurricane like Dorian leaves devastation in its wake, it's obvious that basic survival supplies are needed - drinking water, food, blue tarps, clothing, fuel. What's not as apparent is that emergency equipment that was destroyed has to be replaced as quickly as possible to create an essential lifeline for rebuilding the future.

In a series of somewhat random events, at least three emergency vehicles have been donated to Grand Bahama to help recovery efforts and service the local population. It all began in Temple Terrace, Florida (near Tampa) when their fire department replaced an older truck with a brand spanking new one.

"As usual, we put the old truck on a government website to sell," said Ian Kemp, Temple Terrace's Fire Chief, "and the top bid was only \$8,000. The truck was in good condition and had low miles so we thought about donating it. That's when the idea of giving it to the Bahamas came up."

Kemp said he didn't know where to begin the donation process, how to get the truck to the Bahamas and didn't know anyone in the Bahamas to reach out to. So he turned to Facebook and tracked down good friend in Ft. Lauderdale who spends a

lot of time in the Islands.

"Within an hour, my buddy sent me a name, Alan Davies, who has strong ties in Marsh Harbour," Kemp said. "Alan and I worked together to get the truck transported to the East Coast, then over to the Bahamas. Alan really made it happen. He did all of the heavy lifting."

The city council of Temple Terrace voted unanimously to donate the truck - a 2000 Pierce Quantum - take the \$8,000 loss and even outfit the truck with new hoses, new bunker gear and other life-saving equipment.

"We're very blessed to be able to help the people in the Bahamas, who are still suffering from the hurricane," Kemp said. "Saving lives is our business and I'm proud that our city was able to contribute to such a worthy cause."

Heartwarming, right? And, you might think that's the end of the story. It is not. After Temple Terrace's act of generosity, other cities got wind of the donation. "We started getting calls from other fire stations in places like Ft. Lauderdale asking about it. So, it was great to see other stations stepping up to help as well."





BAHAMAS STRONG

Enter Steve Gollan, Assistant Fire Marshall of the Ft. Lauderdale Fire Department. Similar to Temple Terrace, they had a truck and supplies going to auction when they received an email about the needs at Marsh Harbor.

"They'd lost everything," Gollan said, "their fire house, their trucks and they didn't have anything to put out house fires or do the work they needed to do."

The firehouse only expected to garner about \$9,000 for the truck so they began looking into donating it. The city manager loved the idea and the decision was made. Trouble was, they didn't know where to begin.

"I mean, we didn't know how to get a 44,000 pound truck to the Bahamas," Gollan said.

As it turns out, Ian Kemp had previously worked in Ft. Lauderdale and they'd heard about his good deeds. Ian directed them to Alan Davies and the rest is history.

"None of this would have happened without Alan," Gollan said. "He never said no to anything. He's an outstanding individual."

Ft. Lauderdale donated their 2004 Pierce Quantum and decided to go ahead and stuff it with all of the other fire-fighting equipment that had been slated for the auction such as nozzles, tools, structural gear, bunker gear and everything

else they had.

"Before we shipped it we also put new tires on it, new batteries, fixed the suspension and restickered it for Marsh Harbour," Gollan said. "We wanted them to have pride in ownership."

In addition to the truck, the stations in Ft. Lauderdale collected and moved over 500,000 pounds of food, water and other supplies to the Bahamas.

"At the end of the day, it was simply a matter of helping out a neighbor in need," Gollan said. "That's what it's all about."

To put a cherry on top of this cream pie of a story, one more emergency vehicles, an E-One Titan Airport Rescue Fire Fighting Vehicle (ARFF) also made its way to the Bahamas, donated by the Ocala City Hall and Fire Rescue Department. Guest who lives in Ocala? Alan Davies, the man behind the scenes who worked tirelessly to get things done but never asked for credit. In fact, he asked not to be honored. "I just wanted to do my part to help my lifelong friend in the Bahamas," Davies said, who owns Hydrodynamic Solutions, a wastewater management company.

Sorry Alan, but your kindness needs to be recognized and a lot of folks in the Bahamas thank you! 🇧🇸

EMMA T. SHARK

a.k.a. Emma the Tiger Shark

George C. Schellenger

Emma is a 14-ft. wild tiger shark who hails from the Bahamas. When she is in your presence, you feel it to your core. In fact, you have to catch your breath. She exudes a respectful curiosity that instantly makes you grateful for the natural world and all its wonders.

We are the fortunate ones; we've known her for more than 12 years. When she's not traveling extensively around the Western Atlantic, Emma makes her home in the Bahamas. She's been on Discovery Channel, Animal Planet, Facebook, Instagram, even Twitter. No wonder she's one of the most photographed wild marine animals in the world.

Emma was named after Emma Finn, an Australian SCUBA diver passionate about sharks. Tiger shark expert, shark diving pioneer, and conservationist Jim Abernethy named Emma. He introduced me to her in December of 2007. When I first saw her at Carcharias Cut, a reef in the Bahamas, I thought I was looking at a cartoon character. She was showing signs of pregnancy and she was huge. I remember looking into her eyes and instantly seeing there was something unique about this creature.

The next day, we moved to a crystal-clear, shallow water, 15-foot dive. The sea that day was so transparent—it just looked like everything was floating in mid-air. We spent hours and hours with 11 tiger sharks, including Emma. The only time we needed to get out of the water was to get more air and media for our cameras. This was one of the most incredible days of my life, one of my most indelible memories. I spent hours underwater trying to answer the question in my head: "How can I be in the water with such a ferocious predator, and have her seem so gentle?"

As I knelt on the sea floor mesmerized, I also found it hard to wrap my head around the interaction between Jim and Emma. He knew her by the pattern of white scars on her back, but there was more to

it than that. The surreal thing was it appeared to me that she knew Jim as well. Maybe it was the affection he showed her by rubbing her head. To my eyes, the relationship was real and tangible. In fact, I've seen Emma's behavior repeated again and again on numerous expeditions to Tiger Beach in the Bahamas.

Guy Harvey and Wyland met her during the filming of *This is Your Ocean: Sharks* in 2010. They were both amazed by her personality as well. "When Emma comes on the stage, everything changes," Wyland told me. As a producer documenting science, I know I'm not supposed to use anthropomorphism in describing a wild animal. What can I say? Emma breaks the mold. You could be in the water with half-dozen other tiger sharks, and if Emma comes in, there is a difference. We've introduced her to Sir Richard Branson, American war veterans, even high school students from the Cayman Islands. Each one of those times we were hoping for an Emma encounter, and each time she delivered. How did she know when to show up?

Emma the Tiger Shark has become an ambassador for sharks worldwide and a poster animal for the plight of sharks due to overfishing, by-catch, and the fin trade. If a shark like Emma exists in the ocean today, who are the other creatures we haven't met yet? Will we be fortunate to meet them and get to know them over such a long period of time? Again, I'm caught catching my breath, I hope we're not the last to know a wild animal like Emma the Tiger Shark.







Theophile Bourgeois on a typically epic day of Louisiana fishing.

Tribute to a Cajun Legend

by Fred Garth

There were many heartfelt articles, social media posts, and television stories about Theophile Bourgeois, the beloved Louisiana fishing captain, entrepreneur, and family man, who died at the helm of his airplane in August 2019. As he'd done for many years, he was bringing two clients back from another epic trout and redfish extravaganza at the Chandeleur Islands when a summer storm apparently sent the float plane into the Gulf of Mexico. The passengers survived, and I'm sure, absolutely, positively certain that Theophile was more concerned about their safety than his. Whatever heroic actions he performed in those final seconds were to protect those fellow anglers. Anyone who knew him knows I'm right. That was just the way he lived his life. Sure, there was a certain confidence, some called it cockiness, about him. But, at his core, he thought about others above himself.

I'll never forget my first conversation with him. "It's pronounced, Toe Feel," he said. "You know, like if your toe hurts, toe-feel." He'd explained his cajun name that way to countless others, always with a sly grin and a twinkle in his eye.

A lot of folks have said that he was one-of-a-kind. It's true, but aren't all of us unique in our own way? Especially folks from Louisiana. And, I say that in the most endearing way. His uniqueness was admirable and inspirational and one that made other men and women a little bit jealous that they couldn't be him. We could all try to be like him. But that was the closest we could get. Theophile's one-of-a-kindness was that he had a supreme angling vision: to provide the most incredible fishing experience in the

planet's most incredible fishing waters—Louisiana, the undisputed redfish and trout heaven. That's why he had two float planes to get anglers to the sweet water in 30 minutes and to avoid three or four or five hours of knee and back-wrenching boat riding. The perfection of Bourgeois Fishing Charters trickled all the way down to the Community Coffee and the crispy bacon guests salivated for as part of their morning feast at his lodge.

His vision was not just about catching a lot of monster fish but also building a community of fishing.

He and his lovely mate, Ginger Jenne, bought and refurbished a 100-year-old-plus schoolhouse in the tiny outpost of Jean Lafitte (yes, the town is named for the famous pirate). The place has a lively Louisiana vibe with a massive lounge decorated in stuffed fish and other local critters set among some huge comfy sofas and a flat screen TV. There's a pool table and hundreds of photos of folks holding trophy-sized fish. Couples can reserve a private room, or if you're traveling solo, there are bunkrooms that can hold lots of eager anglers.

The dining room is appropriately outfitted with picnic tables that allow a clear view into the kitchen so you can watch the food fest action live. Guests walk about a hundred feet from the lodge to the dock to hop on a boat. You could sum it up in four words: eat, drink, sleep, fish. But, it's a lot more. The place is homey and relaxed and

seems to encourage anglers to tell stories—some true, many not. They'll usually be a running commentary about boats, fishing gear, hunting, and any other subject relating to the wildlife and wild life in Louisiana.

Like most others, I bonded with Theophile quickly. One strong commonality was our love of top water lures. Most anglers fish sinking lures along the bottom or mid-water and might catch more fish. My preference, and his, is top water. A lure walking across the surface generally catches less, but when a fish strikes, it's usually a big hoss daddy. That's why Toe liked 'em. It's why I like 'em. A few beasts is better than a bunch of peter trout in my book.

I had a lot of pure, unadulterated fun at his fishing camp. That's the experience he and Ginger provided. Smiles on tap. The fish we caught, the food we ate, the jokes, the van rides to New Orleans to dine on extraordinary cuisine from Dickie Brennan's kitchen. That's living, my friends. That's what life is all about. I'm lucky, like many others, to have experienced it. I hope to do so again but, sadly, without the man himself to wrap it all up in a perfect bow.

This morning, August 24, just three days after the tragic crash, I sat on my porch swing with some steaming coffee and looked out across perfectly calm water. It's a place I catch a lot of trout and redfish, too. I was writing a note to Ginger expressing my feelings:

"Dear Ginger, my heart is broken with yours and many, many others who loved and respected your man. I mourn his loss and his beautiful contribution to this world and our lives. He will always be with us in our hearts and souls and in the mystery of nature where his spirit will always live."

In the exact moment that I finished those words, the water in front of me churned with more violence than I've seen in 22 years living in this spot. At first, I thought they were dolphins chasing mullet, a common occurrence here. Then I saw the telltale thin, yellow fin of jack crevalle. The sound alone scared off a heron patrolling nearby. As water sprayed irrationally and the aggressive fish almost rocketed up onto the beach, I watched bait fish fly in all directions.

My mouth dropped open. The "mystery of nature" is all I could think of. I put down my coffee, ran over to my fishing rack, and grabbed my bait caster with a red and white Badonk-A-Donk tied to it. The serenity of my morning coffee moment had turned into chaos. The slick surface was now a white water madness. I jogged down to the edge of the water and threw the lure high and far.

I'd love to say that a beast of a jack ate that lure on impact and I fought that sucker for an hour and thanked Theophile for the gift. But no. As quickly as they'd made their appearance, they'd left. They were gone. The surface settled down. I made four more casts into the nothingness, hoping they were hiding under the surface. Eventually, I reeled in and went back to my porch swing and coffee, sitting there in stunned silence. Was it all just a cosmic coincidence. Maybe. Was Theophile sending me a message that there's fishing in heaven? I sure like to think so.

I finished my note to Ginger. *"My deepest love and sympathy to you and the Theophile family."* I hit send and slowly sipped on the coffee thinking the fish might return. But they never did. They were just a memory. A flash in time. A smile. A hope. A mystery of nature. Just like my friend. Just like all of us. 🐟





EXTINCTION SOUP

THE BLOODY BATTLE
ON SHARK FINS

BY STEFANIE BRENDL





Shark fins are dried on racks in Kaohsiung, Taiwan.

Photos by Shawn Heinrichs



Are we ready to get real about sharks?

We all know that sharks are vital for the ocean and a significant economic factor in many people's lives. But emotions run high when the discussion turns to shark fishing and shark-based tourism. The fight over who should and shouldn't get to utilize the resource, who gets to kill, feed, attract, watch, trophy-hunt, or catch and release these majestic creatures, has been going on for years.

Now, there's a battle brewing in Florida about the sale of shark fins, which is currently legal in the state. By far, the biggest offender in shark mortality is the shark fin trade. Fins fetch top dollar—as much as \$450/pound in Asia—for traditional Shark Fin Soup. It's considered a delicacy in China and other Asian countries and is still served at weddings and special events. Sadly, the demand is so high that millions upon millions of sharks—as many as 73 million sharks are killed annually to fulfill the voracious appetite for soup.

In recent years, twelve other states - including Hawaii, California and Texas - have already made the shark fin trade illegal. Florida has not and, therefore, has now become the major importer and exporter of shark fins in the United States even though very few Floridians benefit from those sales.

A movement to ban the sale of fins in Florida is growing. Proponents claim that any sale of fins contributes to the problem and makes the state complicit to the slaughter of sharks.

Sharks don't stand a chance if we continue to see them only as a collection of parts that can be dismembered and sold. If we want to talk about economic value, then we should recognize the true value sharks have to all of us. A live shark makes money for the state year after year from/through diving and fishing tourism. A dead shark makes money one-time, for one person, and only about \$200 per shark for the meat. Estimates are that a live shark can bring hundreds of thousands in tourism dollars during its lifetime.

Fishing, tourism, and ocean recreation on the Florida coastlines supports 609,899 jobs and contributes \$34.7 billion in GDP. Divers from all over the world flock to sites in Florida that promise bigger marine creatures like turtles, sharks, and rays.

So why are we not tackling the one blatantly destructive industry in our own backyard? Why are we standing by and letting finning happen in Florida when the trade of fins benefits so few of us?

The answer is not as easy as it may seem. What follows is an attempt to explain all of the many moving parts.

WHY DO WE HAVE A SHARK FIN TRADE IN THE U.S.?

You may be surprised to hear that the U.S. used to rank fairly high in the consumption of shark fin soup. That has changed dramatically in the last 10 years, through education and outreach, and through the passage of fin sales prohibitions in many states.

The ultimate reason we still allow shark fins to be sold is because there is money to be made. Pound for pound, shark fins are one of the most highly valued items on the seafood market. There is also a limited shark meat market and fins are considered a by-product of that industry, even though it's by far the most valuable part of the shark.

However, let's be clear, a ban on fin sales does not seek to end legal, sustainable shark fishing. Finning and fishing are two completely different activities. If a fin ban is enacted, sport fishermen will still be able to fish for sharks for recreation and commercial fishermen could still harvest sharks and sell the meat. The only thing that would be eliminated is the selling of one by-product—fins—the very product that will also be the demise of that industry if we don't stop abusing the resource.

Raw fins compiled and ready for processing.

Photos by Shawn Heinrichs



A TANGLED “NET”WORK

Many coastal states take part in the fin trade by freely permitting the transshipment of fins from other countries and by allowing local fins to enter the market. It isn't something most people are aware of because fins are not sold or advertised in the U.S. They are shipped off to Asia to be processed. Florida is currently the official fin trading hub in the U.S.

So let's address the elephant in the room: The claim that fin bans are bad for shark conservation and that sustainable shark fishing is the better alternative. This argument assumes that both are mutually exclusive. The goal is to take care of an obvious problem, the fin trade, and to develop sustainable fisheries. The fact that fin sales may be needed in order to make a fishery viable is an economic problem. It should not influence the evaluation of what is best for the species and the ocean.

Yes, the sustainability of shark fisheries is something that needs to be addressed. The science and conservation communities have asked for this for many years. But improvements to shark fishing practices would not be hindered by the end of the shark fin trade. After all, if a few million fewer sharks are taken for fins every year, it can only make fishing better in the long run.

Certain institutions and organizations try to convince us that the only way to protect sharks is to make sure shark fishing flourishes and that we will only protect sharks if we can get money from fishing. That is far from the truth.

SO THE QUESTION SHOULD BE... WHO BENEFITS FROM SHARKS, ECONOMICALLY?

On the shark fin side of things, fishermen and restaurants may be at the two extreme ends and most visible part of the fin trade, but neither seem to be getting rich. It is in the middle where the real money is made—by people in the import/export business.

Between 2015 and the middle of 2017, Costa Rican companies alone moved 180,000 pounds of dried shark fins through Miami International Airport on their way to Asia using two, small logistics companies. Those fins were valued at almost \$2.5 million dollars. Commercial shark fishermen in Florida, on the other hand, have average annual sales of only about \$336,000. This low number comes from a combined 22–24 fishermen—an average of only \$14,000 per fisherman per year. Even if you put aside the ethical questions of Florida being complicit in the slaughter of sharks, there just isn't enough money to justify allowing the sale of fins in the state.

It is impossible to estimate how much money is actually being made outside of Florida. The last official numbers from the Food and Agriculture Organization of the United Nations (FAO) show that the global trade of declared fins was \$438.6 million dollars per year. However, this may get confusing:

In 2011, NOAA reported an average of 36 metric tons of shark fin exports from the U.S., yet according to the FAO, other countries reported importing 295 metric tons of shark fins from the United States.





Other countries reported sending the U.S. seven times more shark fins than the U.S. reported receiving.

To use an appropriate cliché, it sounds like something fishy is going on. But what it really tells us is that current tracking of shark fins is highly inaccurate and ineffective and possibly intentionally deceptive.

Now, let's look at the true economic power of Florida's natural marine resources: fishing, tourism, and ocean recreation on the Florida coastlines support billions of dollars in GDP. The dive industry is a booming market that can be sustained indefinitely if we protect the animals and the reef. Divers from all over the world flock to sites in Florida that promise bigger marine creatures like turtles, sharks, and rays.

And the superstar of the Florida economy...drumroll please...recreational fishing. According to the Florida Fish & Wildlife Conservation Commission (FWC):

- Florida is #1 in the nation in saltwater anglers (2.4 million)
- 1,779,030 licenses were sold in 2016/17 (residents and non-residents)
- \$20,821,879 in revenue was generated in those same years

The economic impact:

- Saltwater recreational fishing - \$8 billion
- Supports 114,898 jobs

That pretty much speaks for itself. Good fishing depends on functioning marine ecosystems. Sharks are an important part of that.

Healthy shark populations are also an important factor in our future food security. Sharks are the white blood cells of the ocean. They keep fish populations healthy and strong through predation on the weak, sick, and dying fish. They also influence the behavior of the species they feed on. More than three billion people depend on the oceans for their primary source of protein, yet fish populations have been cut in half since 1970. We don't have resources to squander. Killing sharks for their fins is a massive waste of an important animal that we desperately need.

Are all stakeholders being considered equally?

Existing evaluations of what we should do about shark fins seem to be focused only on the impact shark fishermen would suffer if we ended the trade of fins. The discussions about fiscal impact only includes commercial harvesters and wholesalers of fins. The question of which citizens or stakeholder groups are also affected is officially answered with "Unknown." It is time that all stakeholders find representation in this matter.

Why are local fins from legally caught sharks not okay?

Wouldn't it make sense to use the fins from sharks that were caught commercially and harvested for their meat? Well, that's assuming that sharks are caught for other reasons and that fins are an afterthought. And that is, in most cases, no longer true. There are only a few shark species that have valuable meat. And the meat generally has high levels of mercury, so it's not healthy to eat in the

first place. Many fishermen catch and process those sharks according to the law and the true intent of fisheries rules. However, catching shark species that are not good to eat makes sense only if you are targeting the fins. That holds as much truth locally as it does globally.

There are also technical issues with allowing local fins to be sold: Legal fins keep the pathway open for illegal fins. To make that point a bit clearer, let's examine how fins are moved. Fins can change hands multiple times. They are moved from one country to another, imported and exported, then re-imported once processed. They are loaded and unloaded from fishing vessels out at sea to larger transportation vessels, from ships to docks, either finned or still attached to a shark. They're moved from docks to containers, from shipyards to transportation companies, to processing locations and back again. Ports and airports don't seem to have standardized codes to label fins. Sometimes they are thrown together as general seafood, sometimes there is a code for fins, but no differentiation between wet or dry fins. (The weight of dry fins is vastly different than that of fresh fins.) Basically, it's a hot mess! This is why it is nearly impossible to tell legal from illegal fins.

And then we get to the enforcement issues. Currently, the determination of whether a fin is legal or not must be made when a shark is landed at a harbor. Was the shark landed with fins attached? Where was it caught? In federal or state waters? Once the fins have been cut and the body processed, it is extremely difficult to identify the species the fins came from. It could have been from a protected and/or endangered species. In many cases, only a DNA test can give you a conclusive determination. Illegal finning can take place and no one will ever be the wiser. And the state and federal agencies have limited manpower to monitor every single port and airport, every day of the year. The loopholes are so big you could drive a ship through them.

Authorities don't have a handle on what is coming and going. And when anyone is caught with fins, as has been the case multiple times in Florida in recent years, the case gets shuffled from state to federal agencies until it gets filed away as "pending," never to be acted on. Proof of this is the 2017 shrimp boat incident in the Florida Keys where a boat was caught with a pile of loose fins. It was a clear case of finning, that may or may not have taken place in federal or state waters. It shouldn't matter, because it's illegal in either place. But it seems unclear which agency will finally deal with it. This incident happened two years ago.

If you think this was an isolated incidence, think again. According to NOAA, there have been 85 cases of finning since 2010 in the U.S. (there are no details of how many sharks were finned per case). And, according to the FWC, "Between January 2012 and December 2019, Commission law enforcement officers issued a total of 54 citations for failure to land a shark in whole condition, which may or may not include finning violations."

As long as you allow legal fins to be channeled through your territory, it's a free for all for illegal fins to come through your ports and an incentive for illegal finning to continue.

And last but not least: How can we condemn other countries for

participating in the global shark fin trade and at the same time be a supplier to that market? It doesn't matter how small our contribution may be in the scheme of things. We either support the trade or we don't. If it is wrong to overfish sharks just to fill a bowl of soup, then we should not make excuses just so we can keep profiting a little while longer.

Couldn't we just limit imports to countries that use high standards of fishing similar to ours?

This sounds like a noble proposition, but it is a much more theoretical than practical. The notion that we can force other nations to "establish" and observe rules and regulations on shark fishing is far-fetched at best.

Globally, 182 countries and the European Union signed agreements that prevent the export of certain endangered species. How effective their agreements are is another question. The E.U. fishery has elaborate regulations established, and they still catch people finning all the time. And as a U.K. study revealed, 50 percent of sharks being sold in that market are still from endangered species.

Now, if that happens in the E.U., how do you imagine monitoring other countries around the world? How would this be implemented? Technically, most countries have denounced finning, and many require sharks to be landed whole, but nothing has changed in how many fins are traded. So this gets us

right back to square one.

Will NOAA or the fisheries agencies attempt to tell the E.U. that their fisheries regulations are not up to "our standards?" The fins sold in one country could have changed hands multiple times and may not have actually been fished in their own waters. Certifying imports from other countries requires processing through multiple federal departments. The complexity turns into a quagmire of red tape that no one would be willing to pay for or manage.

Also, there is, by no means, a consensus within the research and science community that the U.S. shark fishery is as sustainable, superior, and exemplary as is frequently touted by supporters of a "Sustainable Shark Fishing Act" that is proposed in Congress.

If you have followed the discussions that have been going on amongst scientists and shark researchers, you will see how controversial the issue really is. "Sustainable shark fishing," as it is presented to the world and to legislators, is in no way a scientific fact. It is at best a hopeful theory. And at worst, it is an attempt to derail legislation that would take the U.S. out of the fin trade and delay action for several more legislative sessions. It also gives people a way to once again take the mediocre middle ground and be (falsely) seen as doing something "environmental," but achieving nothing on behalf of shark conservation.



*The end product - shark fin soup.
Photo by Tre Packard/PangeaSeed*

If we eliminate the legal trade, won't we boost the black market?

No. We have already learned these lessons with other endangered species products. When the ivory trade was made illegal, poaching of African elephants plummeted. When, in 2008, a decision was made to allow limited legal trade of stockpiled ivory, poaching shot back up and illegal ivory was being laundered freely through this legal market. Let's not repeat those mistakes.

There will always be an underground market because shark fins are so profitable. A fin trade ban will not save all sharks, but it will severely limit how the trade is conducted.

Why can't there be a compromise?

To anyone who is new to the fin issue, it may seem as if a fin ban is extreme. The fact is, there have been a series of compromises over the last 20 years. At every turn, half-measures were proposed that have slowed down the progress, with the reasoning being that "at least it's a move in the right direction." The result of all those weak attempts is that shark populations have been plummeting, with more species being listed as threatened every year.

It started with the prohibitions on the act of "finning," as far back as in 2000. Because it didn't work, the next wave of laws required that sharks "must be landed whole." The next attempt was "sharks landed whole with fins naturally attached," and even that didn't make a dent in the trade. It changed how sharks were brought to shore, but in turn, it may have fueled the creation of shark meat markets, because fishermen that wanted fins were now required to bring in the whole shark.

How many more partial compromises must we go through to appease the political process? It is time to close the loopholes once and for all. Ending the sale of fins would stop those that land sharks for their fins and that use meat sales or donations simply as an excuse and a way to make their fin harvest legal.

A fin ban IS a compromise. Shark fishing, on a global scale, is generally seen as unsustainable and something that will come to an end due to overfishing at some point in the future. A fin trade ban is only asking for ONE practice to end: The selling of fins. No U.S. fisherman makes a living exclusively off the sale of fins.

Unless we take some big, bold steps that are effective, we will not have anything left to save. Rather than fighting and justifying why we must leave things be as they are, efforts and funding should be invested to help the industry transition to new practices.

It has been decades since the alarm bells were rung on the fin trade. It is no longer okay to comfortably and safely stay on the fence on this issue, whether you are a fisherman, a politician or a scientist. Clearly, everyone prefers harmony and would rather avoid controversy. But change is tough and requires us to deal with uncomfortable steps along the way. Navigating those steps can be difficult, but that is why strong leadership is key. Protecting the environment and turning around this runaway trend to destruction is not for the faint-hearted.

Stefanie Brendl is the Executive Director of Shark Allies. Find out more at sharkallies.com.

Dried fins displayed in a shop in Hong Kong.

Photo by Tre Packard/PangeaSeed





A TEACHING MOMENT

If you have kids or teach kids, we've put together a couple of questions/exercises to enlighten young minds on the value of sharks for our oceans.

- 1) Discuss with students how the trade of shark fins is similar to other endangered species products, such as elephant ivory and fur coats.
 - a) They are used as a symbol of the status of wealth.
 - b) They have no practical or essential use (shark fins hold no nutritional value).
 - c) They are generally hunted in poor countries, then exported to wealthy countries.
 - d) The demand for the product is decimating wild populations of rare animals.
- 2) Discuss the superstition and belief system behind the medicinal use of animal products such as rhino horn, bear bile, shark fins and cartilage, and manta gill rakers.
 - a) It is based on a mistaken belief that the strength and virility of the animal will transfer to the human.
 - b) Markets are often created by the producer, not the consumer, in order to sell one more product that they can harvest from wild animals.
 - c) Products, such as shark cartilage, are put on the market without any proof of health effects. All that is needed is advertising and making people believe that it works.

SUSTAINABLE SHARKS?

The notion that U.S. shark fishing is managed sustainably banks heavily on research that shows that some species are in recovery. But it seems these numbers are mostly determined by using fisheries data from the early 1990s as a baseline, when many species were already heavily depleted. Many coastal shark species underwent severe exploitation prior to 1993.

In the northwestern Atlantic Ocean, stock assessments conducted on coastal species such as sandbar sharks, dusky sharks, hammerhead, tiger, blue and white sharks showed declines from 64% to 80%. Ironically, and unfortunately, these species are also the ones most valued for tourism.

In the Florida Keys, large shark species, with the exception of nurse sharks, are rare. Fishing records from 1930s show that in those days they routinely caught 100 sharks a day.

According to recent stock assessments of 64 U.S. shark stocks, 40 have "unknown" overfished and overfishing status. This means we have no idea whether more than 60% of shark stocks in the U.S. are being overfished.

So yes, there may be a few shark populations that have stabilized or show signs of increase due to stricter regulations in recent years, but being stable at a greatly reduced number does not mean we are doing a great job at managing sharks.

WHEN TAGGING GOES WRONG

Tagging of “legal” fins is the new, shiny object on the shark fin front. It’s a “solution” proposed to solve the shark finning conundrum. That is, to tag fins of legally harvested sharks so they can be traced, accounted for, and, ultimately, sold for profit. The idea is that local, legal fins could be sold, while imported fins could be banned. On the surface, it may seem like a simple solution and a welcomed answer to everyone involved in the fight over fin regulations. If the goal is to try to avoid controversy, tagging has some appeal. But if we want to actually reduce shark mortality and attack the shark fin problem head-on, tagging is not an effective solution.

Applying a fish tagging scheme to shark fins is assuming that fins are harvested, moved, and marketed like other food fish. They are not. It is far more complicated than that. When a fish is tagged, that tag generally stays with the product (as has been done with red snapper in the past). When a shark is landed, and the fins are cut off, the animal and the product are separated. There is no traceability of species or of origin once the fin is removed. The process would also create a mechanism to launder illegal fins, whether they were illegally finned or imported. The moment you attach a tag to a fin, it would essentially become a legal fin.

Tagging would legitimize any fin. What does that do to the enforcement process?

The tracking of species wouldn’t be improved. We know shark catches and the total value of fins taken, but what species those fins are taken from is unclear. Unless every single fin is DNA tested, which is logistically impossible, we essentially rely on self-reporting.

NMFS data for shark landings in Florida shows how unreliable that method is: in 2016, out of the total 591,871 pounds of total shark landings, 195,661 pounds are simply described as “shark” without identification of species. That is roughly one-third of all sharks landed.

And here is a math problem: How many fin tags do you allow per shark? Four or six fins? It differs depending

on the species. As long as species quotas have not been met for that season, commercial harvesters are limited to 45 large coastal sharks allowed to be harvested per day, per vessel (in federal waters)—that comes out to 225 tags per day, 900 tags per week (at four fishing days), 3,600 tags per month, or more than 43,000 tags annually/per permit. Currently, there are 119 permits for direct catch in Florida, so now we’re at millions of “legal” fins that the state could potentially contribute to the shark fin market.

In addition to 45 large coastal sharks, harvesters in federal waters are not limited in how many small coastal and pelagic sharks they can take. There are also 128 permits for incidental shark catch and four for smoothhound sharks. So, now the number of tags that need to be supplied could potentially double or triple.

The point is, there is a real danger here that a tagging scheme would incentivize catching more sharks than are currently being taken. These concerns only scratch the surface. Dig deeper and more problems and loopholes appear.

The overarching concern is that tags could potentially end up being a carte blanche stamp of approval for shark fins, which would empower fin sales and keep channels open for the fin trade, locally and nationally. With millions of these tags floating around, the potential for black market intrusion is just too great.

Perhaps the greatest concern is the moral and ethical question of being in the shark finning business in the first place. By participating in fin sales, we’re endorsing and legitimizing the shark fin trade, which is responsible for the global slaughter and decimation of sharks. It makes us more than complicit. We’re actually promoting an activity that is throwing our oceans out of balance. Is that something Florida wants on its résumé?

The only real solution is to get out of the shark fin business completely. No tags. No fins. No more loopholes.



*This reef shark had its dorsal fin cut off and got away. Most likely it will have died days later.
It was spotted on Juno ledge in Jupiter, Florida in May 2019. Photo by Matthew Imm*





SHAWN HEINRICHS







The opportunity also came up to deploy the hydrophone near Green Turtle Cay in the Bahamas. As it turned out, this site provided some of the best lionfish calls to date. Ironically, the primary deployment site was an old satellite dish that had been dropped in approximately 18 feet of water.







The opportunity also came up to deploy the hydrophone near Green Turtle Cay in the Bahamas. As it turned out, this site provided some of the best lionfish calls to date. Ironically, the primary deployment site was an old satellite dish that had been dropped in approximately 18 feet of water.



The opportunity also came up to deploy the hydrophone near Green Turtle Cay in the Bahamas. As it turned out, this site provided some of the best lionfish calls to date. Ironically, the primary deployment site was an old satellite dish that had been dropped in approximately 18 feet of water.







The opportunity also came up to deploy the hydrophone near Green Turtle Cay in the Bahamas. As it turned out, this site provided some of the best lionfish calls to date. Ironically, the primary deployment site was an old satellite dish that had been dropped in approximately 18 feet of water.

FROM HEAD TO TOE IN THE FLORIDA KEYS

It's safe to assume that Guy Harvey, Ph.D. and professor of Marine Biology, was not thinking about t-shirts when he painted billfish, sharks and other marine life back in the 1980s. Yet, over the past three or four decades, his art's ubiquity can be directly attributed to the Guy Harvey line of apparel which is sold just about everywhere. Fishermen first starting wearing Guy Harvey shirts because they were practical, functional and beautiful. Now, that same philosophy has spread into an angler's complete wardrobe from hats to shoes, that is, literally from head to toe.

To highlight the new line of Guy Harvey clothing, what better place to go than the Florida Keys and who better to test its style and durability than actual fishing captains and dedicated anglers? With those thoughts in mind, we linked up with Capt. Mike Rathjen who runs the Ballie Who III, a state-of-the-art, 46-foot, Warren O'Neil offshore sport fishing boat out of Whale Harbor Marina in sunny Islamorada.

All of Capt. Mike's charters are private, meaning the fishing experience is tailored to the angler's skill level and preferences. The Ballie Who takes complete novices or experienced anglers and guides them to mahi mahi, tuna,

marlin, snapper, grouper, and more. For our private trip, we were catching photographic images rather than fish and Mike and his crew excelled in that area as well.

While blasting offshore in big boats like the Ballie Who III for billfish and sharks has been a staple of Guy's fishing prowess (he's a Hall of Fame Fisherman, BTW), no true fishing freak journeys to the Keys without wetting a line on the crystal clear flats and reefs. So, just to make sure that the Guy Harvey gear performed inshore as well as offshore, we tracked down Capt. Augie Moss of Here Fishy Charters and Captain Mike Venezia, at <http://bonefishingislamorada.com/>. Both specialize in backwater species from bonefish to snook to tarpon to redfish and are members of the Florida Keys Fishing Guide Association.

Captain Augie Moss grew up in Chicago but has been fishing the Keys since he was 11 when his parents bought a house in Key Largo when I was 11. He jokes that he majored in fishing at the University of Miami which might be true because after practicing law in Chicago for four years, he escaped to Islamorada in 2012, and started guiding full time right away. With a 2015 27-foot Conch, and a 2013 Maverick HPX he patrols offshore and inshore waters.

WORN BY BOAT CAPTAINS & DEDICATED ANGLERS, GUY HARVEY APPAREL IS PRACTICAL, FUNCTIONAL AND BEAUTIFUL.

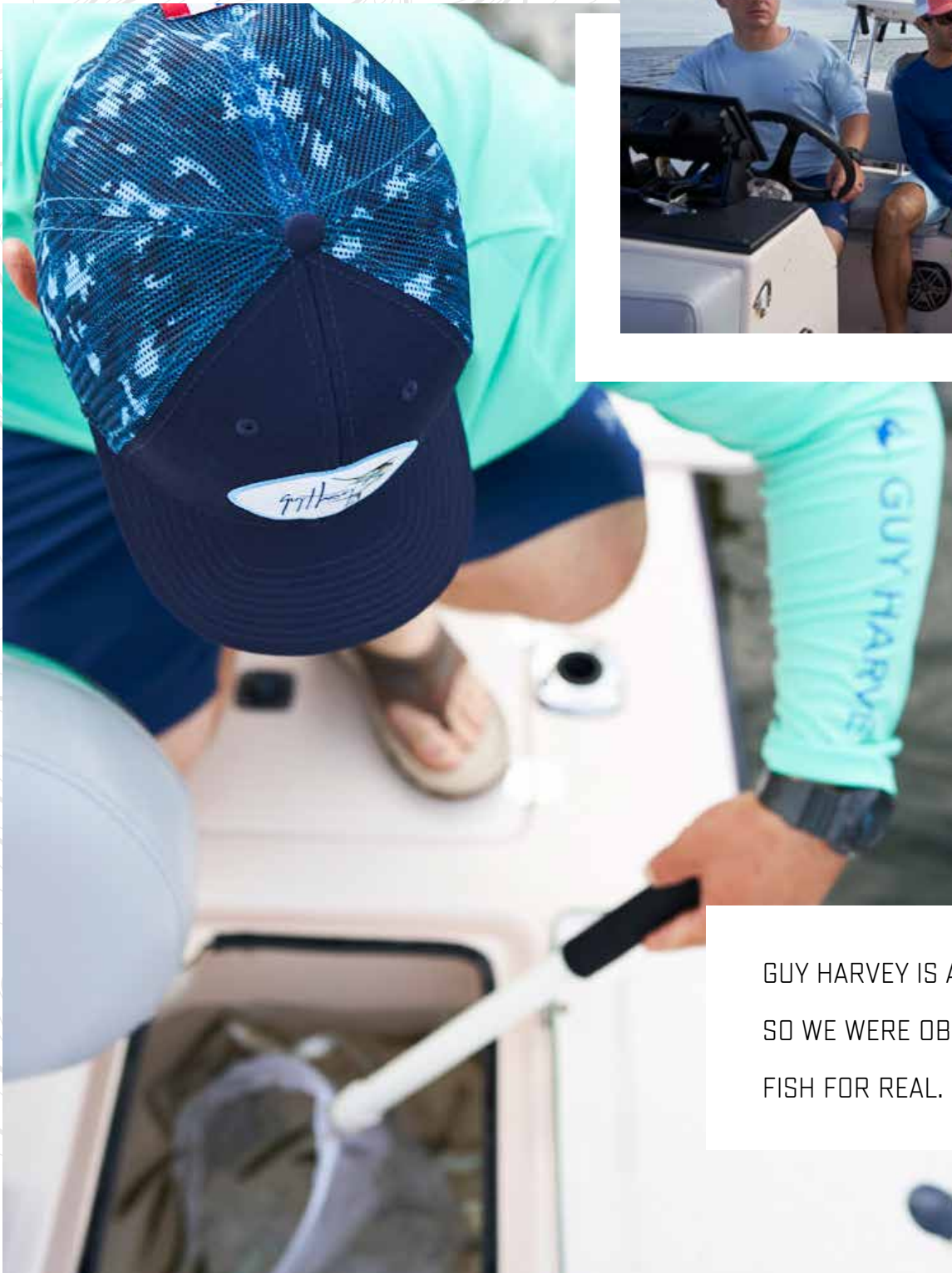




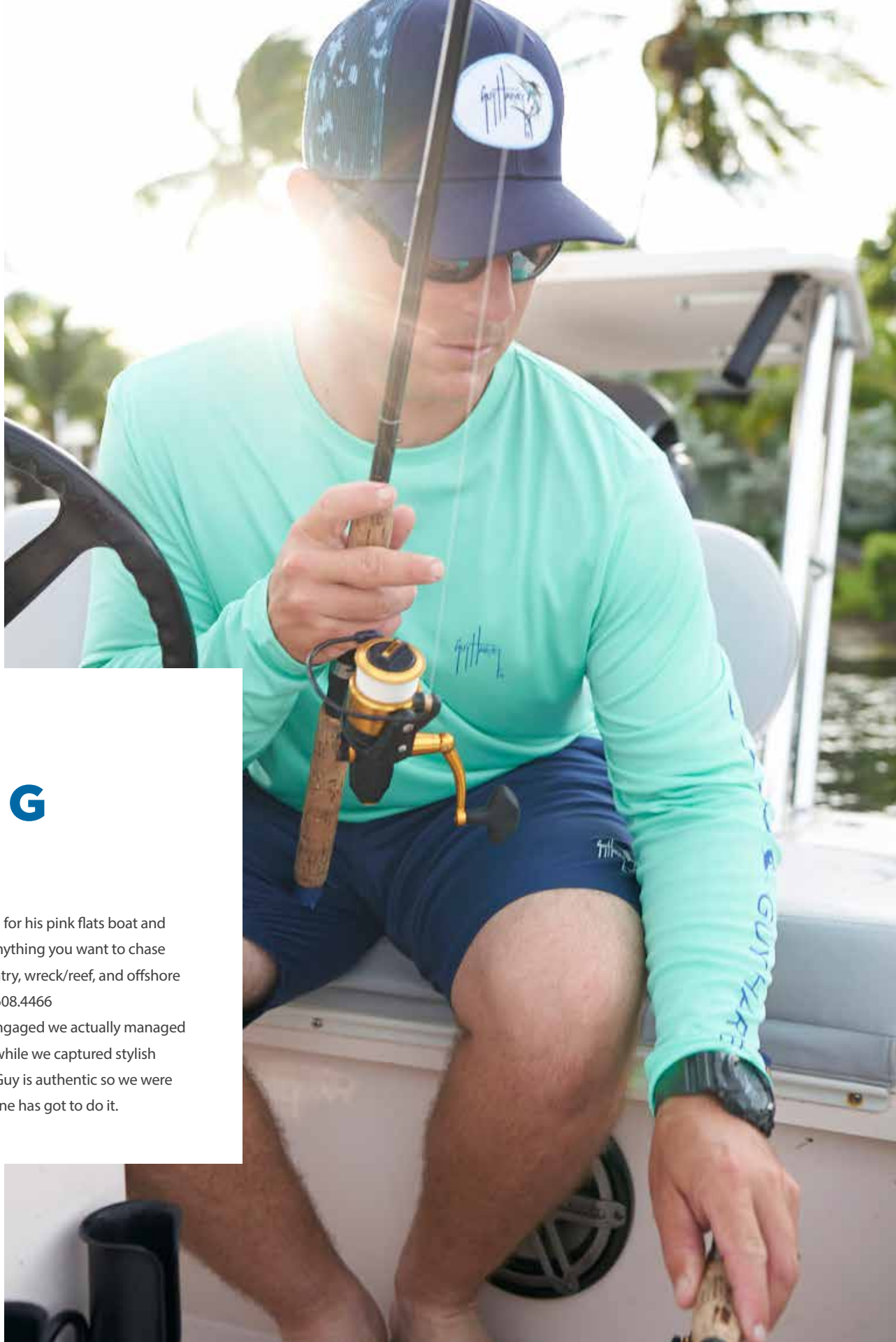
FUN TIMES

When we weren't out fishing, we had a little time to chill out on the dock, do a bit of kayaking and just cruise the marina and maybe leave an artistic "impression" with some "soulful" shoe art. How 'bout that?





GUY HARVEY IS AUTHENTIC,
SO WE WERE OBLIGATED TO
FISH FOR REAL.

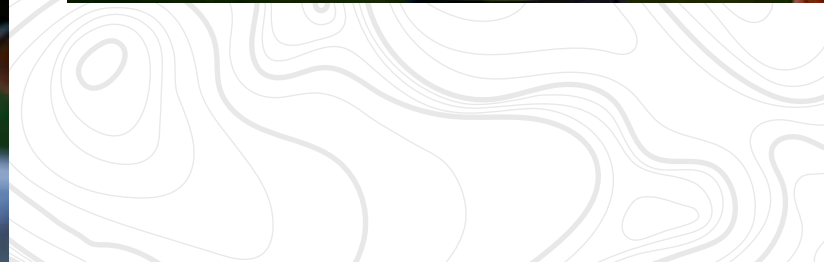


GONE FISHING

Capt. Mike Venezia is known for his pink flats boat and is all about bones, tarpon and anything you want to chase inshore. He also offers backcountry, wreck/reef, and offshore fishing. Capt. Mike a call at 954.608.4466

With Augie and Mike fully engaged we actually managed to trick a few fish on our hooks while we captured stylish photos. I mean, if nothing else, Guy is authentic so we were obligated to fish for real. Someone has got to do it.

THE FISHING, THE FOOD, THE
NEW FRIENDS AND ESPECIALLY THE
APPAREL, WERE ALL TOP SHELF.



WORK HARD PLAY HARD

After a few days of hard work - if you can actually call going out on boats, fishing to our hearts content and taking pictures "work" - the crew was ready for a little down time on the beach. With some fresh seafood and beverages in hand it was time to relax and enjoy. Turns out Capt. Mike and Capt. Augie can navigate the kitchen as well as a mangrove forest. The food and drink capped off an incredible Keys extravaganza. The fishing, the food, the new friends and especially the apparel were all top shelf.







Treasures of **THE CRYSTAL COAST**

NICK HONACHEFSKY

Down along the southern Outer Banks, North Carolina, the barrier islands stand apart in character and spirit, so much so that they go by a different name—the Crystal Coast. The sleepy tourist beach town of Emerald Isle simply sounds like it belongs here. I checked into a sublime, aquamarine-sided beachfront home on Emerald Isle, quaintly nicknamed Susie's Hideaway, tossing my bags on a plump couch, and opened the sliding window doors to feel the rush of the Atlantic surf breeze tickle my face. A deep inhale, and I was already tying fishing rigs, set to explore the treasures of the Crystal Coast the next morning.

OFFSHORE GOLD – DAY ONE

A warming sunrise peeked over the Atlantic. I was greeted dockside by NC Aquarium at Pine Knoll Shores Activity Director Wayne Justice, who promptly fashioned a Bojangles chicken and biscuit breakfast sandwich into my hand. “We pride ourselves on the chicken and biscuits here in North Carolina,” said Wayne proudly with a big, down-home smile as we stepped aboard Captain Stewart Merritt's Salt Air Ventures on the Beaufort Inlet. The engines of the Privateer rumbled, and we pointed the bow 29 miles offshore. As we crossed the turbulent, white-watery shoals, Justice pointed out Shackelford Banks where, in 1995, adventurers found the actual shipwreck of Captain Edward Teach's, aka Blackbeard's, pillaging vessel—Queen Anne's Revenge. “They pulled up a couple of cannons and dinnerware and booze bottles, but no treasure of any kind,” noted Justice as we passed the area. “Scholars now think the shipwreck wasn't an error of nautical misjudgment, but that Blackbeard took his treasured bounty and left his crew on board, then scuttled the ship to take it all for himself.” Fair enough for a pirate.

Passing by the shoals, we set up about 14 miles offshore to set up in 110 feet of water on some naturally occurring submarine rockpile ledges. Merritt busted out the bait consisting of Spanish mackerel heads, sardines, and frozen pogies. Justice dropped a bait down and in a split instant upon touching ground, was first to score to reel in a beauty—a 15-pound gag grouper. Merritt and I proceeded to battle three more gags up to 20 lbs. in the mix. “We are out here tagging sand tiger sharks for research all the time,” said Justice, “but it's great to come out and fish for once.” The bite was happening. Justice dropped down another mackerel chunk and his rod was buckled over again, this time a wrist-wrenching battle, and we all knew it was something with muscle and gusto. A deep bronze coloring appeared with a huge, 35-lb. almaco jack attached to the line.

Wayne's glory for the pool winner didn't last long. I dropped down my chunk bait and doubled over immediately, sweating in the 95-degree heat, to haul in a bruiser 40-lb. amberjack. Justice and Merritt were both congratulatory, but the big one was yet to come. Another head chunk down, and another big hit. Merritt balanced the rod on the gunwale, wrenching in the beast crank after crank; after 25 minutes, we got a big, brown color that Justice thought was a sand tiger; but a long whiptail came into focus that was attached to a huge, 200-lb. southern stingray. Glorious enough for sure, but two shadows followed the beast upward. Quickly, I grabbed a Hyperlastics Dartspin lure and dropped it down beside the stingray, sporadically twitch-jigging it off the stingray's wingtips to convince a 10-lb. cobia to strike. Wreck fishing off the coast was nothing short of exemplary.

After fishing, on Wayne's recommendation, I met up with his brother Denny, who bartends at the Caribsea restaurant in Emerald Isle. Denny ordered me a meal fit for a king with succulent crab cake, maki rolls adorned with red pepper, and a sweet glass of Pinot Noir. Day one was a success.

INSHORE GEMS – DAY TWO

The next morning, Justice and I were joined by one of my childhood friends, now retired Lt. Colonel Steve Schultze, who lived in the area, to explore the shallow backwaters of Bear Creek in Swansboro. Looking for a scrap with some backwater redfish, we met up with Captain John Mauser of Tailing Tide Guide Service on his 18-ft. East Cape Fury skiff.

Mauser poled us over shallow waters encrusted with oyster beds way into the backcountry marshes, sometimes scraping the hull in six inches of water. Rigged with light tackle, Mauser fixed the push pole in the bay mud and spoke out loud, "Toss the plug next to that bank and pop it." Justice flung a Rapala Skitter Walk toward the spartina grass banks, pulling it off, blurping it on the surface, when Wham!—a 24-in. redfish exploded on the lure. Justice then proceeded to bag another sweet, 27-in. redfish that was released to fight another day. We worked the grass banks fastidiously to get some continuous blow-ups from reds.

Halfway through the trip, the silence of the backwater beauty was interrupted by blasts from 50-caliber guns on the nearby military gun range on the other side of Bear island. I could see Schultze's thoughts go inward, reflecting on his time spent defending our country. As the sporadic booms from gunfire resounded between casts, Schultze softly said to me on the side, "Man, all the years I spent here, and I never knew this beauty existed behind the range." I saw him crack a reserved smile.

Though Justice had the hot hand on the reds, Schultze and I weren't done yet, casting gold spoons and DOA paddletails to score with tree southern flounder to add to the tally. As the noon sun was high in the sky, I remembered something I read about fossil shark teeth hunting in the area.

"What's this I hear of Shark Tooth Island?" I asked Mauser. "Oh yeah, that's the spot where Pleistocene and Miocene era shark teeth wash out from the inland deposits and lay along the beach. I love taking kids there."





The dropping tide cleaned up the muddy waters where we decided to make a stop by Shark Tooth Island. Wishing to find a jet black Megalodon tooth sticking out of the banks, we all kept our eyes focused downward and amassed a cool collection of millions-year-old goblin shark teeth and stingray barbs, digging through the shell piles, and scanning the water line as it lapped up along the beach. I filled my pockets like a kid in a candy store with all sorts of shark teeth. Mauser then offered me fly-casting lessons for fun, a most relaxing way to end the day. Departing Mauser at the dock, Schultze and Justice both went home to eat dinner with their families and I, once again, met up with Denny at Caribsea, this time to gorge on blackened shrimp and scallops with gorgonzola sauce and tuna meat with ginger celery and poke-style sesame oil, celebrating the day's events.

THE HUMAN TREASURE – DAY THREE

Day three, winds were gusty at 30 knots, way too high to get out and fish effectively. I met with Jess Hawkins, a retired marine scientist with the NC Dept. of Marine Fisheries who now runs back bay ecotourism charters, engaging in various activities like shelling, snorkeling, wild horse searching, and bird watching. Hawkins and I were both kind of discouraged not to be able to get out for an ecotour to explore the Crystal Coast Sound, so in a comforting down-home southern drawl, Hawkins belted, "You ever have a shrimp burger?"

I replied, "I mean, yeah, I've had shrimp sandwiches before in my travels."

"But you ain't never had one like this," said Hawkins as we pulled into a ramshackle BBQ joint that looked like it was someone's backyard food stand—the famous Big Oak Drive-In Bar-B-Que. He was right. Stacked between two soft buns, loaded with fried shrimp, special hot sauce, and slaw, we grabbed our goodies and sat on a beach bench, eagerly chomping on a world-class shrimp burger, and just shot the breeze about fishing and the ocean; two new friends hanging out, simply enjoying the day. After gorging upon the shrimp sandwich, I dropped by the NC Aquarium, where Justice proudly showed me the aquarium inhabitants and all the conservation-minded initiatives the NC Aquarium embarks upon to preserve, protect, and promote the marine ecosystems. "We want to the public to know they can drop by and experience the marine life if they can't get out on the water," said Justice. "It's all about building the relationship between the environment and people and closing that gap to keep people informed and interested in our world."

Reluctantly, I had to leave the Crystal Coast behind the next morning. The days on the boat were done, but I hadn't finished up fishing just yet. I called Schultze to meet me at the beach, picking up some frozen shrimp at Reel Outdoors tackle shop, and casting out bottom hi-lo rigs into the surf in front of Susie's Hideaway. As the evening set in, Schultze and I were transported back in time, fishing shoulder to shoulder together just as we did as kids growing up, pulling a medley of small bluefish, stingrays, blacktip sharks, and whiting out of the rolling surf. We were in our glory, laughing and carrying on like old times. As we packed up for the night, Schultze turned to me and said, "Brother, I've lived around here a long time and this is one of the best days I've ever spent here, fishin' with you." Likewise, Steve. The Crystal Coast always offers up new golden finds, but more importantly, helps you rediscover those treasures you always knew were there.



Travel Info for
**THE CRYSTAL
COAST**

**NC AQUARIUM
AT PINE KNOLL SHORES**

A vast marine playground exists at the NC Aquarium at Pine Knoll Shores. Stunning marine habitats filled with freshwater and saltwater fish species abound, along with amphibians, reptiles, and even bald eagles to exhilarate and delight visitors. But the Aquarium is also heavily involved in scientific research. “We have a citizen science project called the Spot-A-Shark Program that encourages divers and anglers to contribute to the growing database of sand tiger sharks,” states aquarist Ara McClanahan. “Divers and anglers take photos of sand tiger sharks and upload them. Each sand tiger has a unique spotting and pattern to identify and track specific sharks, and we’ve found they engage in site fidelity, sticking around the same shipwrecks year after year. The shipwrecks are very important habitat for breeding females.” Visitors can take guided tours to explore the splendor of the Aquarium as well as host educational programs for both children and adults alike. “The Aquarium is much more than just a place to gaze at marine life,” states Danielle Bolton, PR coordinator of the Aquarium. “We are in the field contributing to the scientific community. We are here to create a family tradition to make memories learn and grow. It’s a very real experience.”

www.ncaquariums.com/pine-knoll-shores

WHERE TO STAY

The Crystal Coast encompasses 18 miles of beach including the towns of Emerald Isle, Atlantic Beach, Cape Lookout, Beaufort, Pine Knoll Shores, Morehead City, Harker’s Island, Salter Path, and Indian Beach. Beach home rentals are outfitted to the max—quaintly-themed houses saturated with nautical flare overlooking the Atlantic. Check out Emerald Isle Realty for your stay in paradise.

www.emeraldislerealty.com

HIDDEN GEMS

Crystal Coast EcoTours

Capt. Jess Hawkins, 252-241-6909

www.crystalcoastecotours.com

NC Maritime Museum

www.ncmaritimemuseumbeaufort.com

Caribsea, Emerald Isle

www.caribsearestaurant.com

Any and all adventures can be found through

www.crystalcoastnc.org

FISHING CAPTAINS

Capt. John Mauser

www.tailingtideguideservice.com

Capt. Stewart Merritt,

www.saltairventures.com,

252-725-1725

Photo by Tomáš Nožina on Unsplash





Lionfish invading the gulf coast.



LIONFISH
CONUNDRUM

COAST WATCH ALLIANCE

BY BRAD RIFFE

COAST WATCH ALLIANCE

A MULTI-PRONGED ATTACK ON LIONFISH

Eradicating a species from the planet is, sadly, a special human talent. From the dodo bird to the sea cow to passenger pigeons and many, many others, the road to extinction has been paved by man. Then there's the ubiquitous lionfish, we've all heard so much about. You'd think, given our stellar record of erasing creatures from the face of the Earth or the sea, that we'd be able to kill off a fish that is, one, easy to spear and, two, delicious to eat. Unfortunately, the removal of lionfish has presented us with a unique set of challenges and, so far, the crafty critters with venomous spines have not succumbed to man's ingenuity or insatiable appetite for seafood.

The good news is that many organizations with bright people are working hard to crack the code. Coast Watch Alliance (CWA), a non-profit founded in 2014 to tackle issues that affect our coastlines and offshore ecosystems has a special loathing for lionfish. Headquartered in Pensacola, Florida, the epicenter of the lionfish outbreak, CWA is a collaboration of divers, recreational anglers, scientists, and business owners working to conserve and protect coastal and marine environments. In addition to battling lionfish on multiple fronts, the organization's mission includes the removal of marine debris resulting from commercial and recreational fishing activities, as well as addressing man-made water quality issues that impact reef systems.

Because the gulf coasts of Northwest Florida and Alabama now have some of the highest densities of lionfish in the world, Pensacola has been dubbed the "Lionfish Capital of the World." At the turn of the 20th century, the town's moniker was the more-appealing, "Red Snapper Capital of the World." Schooners with massive live wells would regularly bring in 30,000 to 40,000 pounds of red snapper and grouper in the early 1900s.

These days, the snapper and grouper populations are under strict management via bag limits and seasons, while lionfish grow unabated and are only able to be harvested by divers with spears. To make matters worse, lionfish pose a significant threat to those prized snapper and grouper and other economically viable game



LIONFISH CONUNDRUM

fish. They are opportunistic feeders and will not hesitate to devour juvenile snapper, grouper, flounder, amberjack, octopus, or whatever is available.

Some have viewed this invasion as an insurmountable problem. However, CWA has approached it as an opportunity to help reduce harvesting pressure on native seafood species, while also providing an economic opportunity for local fishermen and divers, seafood suppliers, and entrepreneurs. While the complete eradication of lionfish is not currently considered realistic, we may be able to reduce their numbers to low enough levels to allow native species to thrive. CWA is trying to accomplish this, not only through removal efforts, but through education and public outreach as well.

Accordingly, the all-volunteer group has implemented a four-stage plan. First, to bring expanded awareness of the lionfish threat in order to engage further action. Second, to promote the culinary value of lionfish in hopes of increasing the demand for this sustainable seafood choice. Third, to increase ecotourism through harvesting dive trips. And finally, to promote citizen science through lionfish research.

Of course, if you're going to put a dent in the lionfish population, you need a lot of hunter divers and they, in turn, need a boat. Enter the *LionSlayer*, CWA's high-speed, all-aluminum, custom, 26-foot dive/fishing boat used to liberate lionfish from their habitat. Through a \$100,000 Impact 100 grant, CWA outfitted the *LionSlayer* with the tools to harvest lionfish as well as perform marine debris cleanups. The boat, decorated in lionfish

murals, also attracts a lot of attention at fishing and diving events such as the annual Lionfish Removal and Awareness Day (LRAD) event.

Working alongside the Florida Fish & Wildlife Conservation Commission (FWC), CWA helped co-host the inaugural LRAD festival in May 2015, which drew upwards of 3,000 visitors to the downtown Pensacola area. This event, now in its sixth year, along with associated spearfishing derbies held across the state, has resulted in the removal of more than 40,000 lionfish. CWA continues to remain an active participant in LRAD and organize removal events, such as the one-day Pensacola Lionfish Classic in October 2019.

In addition to working on the state level, CWA has expanded its footprint nationally with NOAA. The group was recently awarded the only permit by NOAA to lead the Flower Garden Banks National Marine Sanctuary Lionfish Invitational, an expedition that runs twice a year to harvest lionfish from protected reefs in Texas Gulf waters. The lionfish taken



Lionfish is a mild fish that has many culinary uses.

One of the greatest ironies of the lionfish issue is that the demand is far higher than the supply. Restaurants and seafood markets buy whatever is brought in, but if a harvesting method such as trapping proves successful, lionfish could be on the plate from New York to LA. In addition to pleasing the palate, they also contain a higher percentage of the healthy Omega fatty acids than a lot of popular seafood and, unlike highly popular fish, like tuna, grouper, or swordfish, lionfish have very low concentrations of heavy metals. Currently, they bring top price (\$6.50/pound) so divers can sell them at a premium.



Coast Watch Alliance's
Lion Slayer Vessel

from the Flower Garden Banks are used for research purposes by NOAA.

One of CWA's most notable contributions the lionfish saga came from one of its founding members, Bryan Clark, who created a lionfish map database (fwcreefrangers.com) to support FWC and the Alabama Department of Natural Resources (DNR). Clark's software is used to document lionfish detections and densities, as well as allow local divers to track and more efficiently cull lionfish from local reefs.

If you ever wondered whether a small group of dedicated individuals could make an impact, CWA has your answer. Their efforts are paying off and their plan is to turn up the heat. They continue to organize marine debris removal events and lionfish derbies, develop roadmaps for lionfish harvesting practices, create markets for lionfish products, and work on changing laws that inhibit conservation strategies. In the case of lionfish, it's an enemy CWA hopes to defeat and eat into submission. 🐟



Coast Watch Alliance's
Lion Slayer Vessel



Brad Riffe &
Deanna Richburg

Coast Watch Alliance is a 501(c)3 nonprofit, which relies entirely on an amazing group of ground- and water-based volunteers. If you would like to get involved, or are interested in helping out with your time or resources, you can contact CWA at briffe@coastwatchalliance.org.



PERSONAL PROFILE

ALEX LUCE





A budding filmmaker and conservationist, Alex Luce is also an ocean-loving teenager trying to make a difference. When he learned about the lionfish epidemic, he was inspired to make a short, animated film under the title REEFBEAT. In a series of fortunate events, young Luce found his way to Lionfish University and its co-founder Jim Hart, who happens to be a screenwriter. Hart, Luce, and Stacy Franks, who co-founded LFU with Hart, collaborated on the film that hopes to educate kids about the lionfish problem.

We decided to dive inside the mind of a young marine conservationist to see what inspires him, what his future goals are, and if he thinks his generation is motivated to protect the marine environment.

GHM: How did someone way out in Oakland, California, get interested in lionfish?

Alex: I love spending time in the ocean, like surfing and snorkeling. A few years back, I convinced my parents that we should all get certified as scuba divers. I saw some interesting things as a snorkeler, but scuba diving opened up a whole new world for me. When I learned that lionfish were destroying the reef, that sparked my interest in understanding how lionfish became an invasive species. For my 8th grade International Baccalaureate (IB) final project, I decided that studying lionfish and ocean conservation would be a good research project. An important part of the project is to take the research and turn it into a community action.

GHM: Have you ever been diving with lionfish? If so...where? If not, would you like to?

Alex: Last summer, my family dove in Roatan, a small island off the coast of Honduras. During this trip, we found that lionfish were an invasive species and were a good thing to eat to help the reef. My dad and I then took a class and got certified to spear the lionfish. This summer, I was in Cozumel. The good news is that the lionfish invasion has been controlled there. I saw only one throughout my 15 dives. However, I know from my research that other parts of the Caribbean are much more impacted, like

the waters around Florida

GHM: Is filmmaking a career you want to pursue?

Alex: I love filmmaking, and I'm still learning a lot about what it takes to make different types of film. This summer, I learned about documentary films and worked with a group of other kids on a story about water rights in urban settings. I hope this is something that I can pursue professionally someday.

GHM: Do you think other kids your age are also socially conscious like you? If so, in what way?

Alex: Yes, this is part of the way we are growing up and being educated. At EBI, our 8th grade project is not only about learning how to do research, but also turning our knowledge into social action. That's why I'm grateful to Lionfish University for helping me identify a community need and use my love of videos to have an impact on the younger generation. Our generation has to make the future that we want to live in.

GHM: What are some other threats to the ocean that concern you?

Alex: I am also concerned about plastics in the ocean and pollution in water. For another school project, a group of my friends and I made a game about the great Pacific garbage patch. The goal of the game was to collect as much trash as possible and not damage your ship.

GHM: How did you find out about Lionfish University?

Alex: I was introduced to Lionfish University by Mr. Bradley Mart, a family friend. He is also involved in ocean conservation efforts with different non-profit organizations. After some email exchanges, Ms. Stacy Frank and Mr. James Hart suggested that we collaborate on making a short film using cartoon characters. I'm really grateful to each one of these individuals for taking the time to help me get started. I've never had an opportunity to work with adult professionals before and they made it enjoyable.

GHM: What message do you hope other kids will get from your video?

Alex: My main goal of this video was to educate younger kids about lionfish and how they are harming the ecosystem. Kids like to watch videos that other kids make. Hopefully, this will inspire them to learn more.

GHM: Would you like to produce other lionfish related videos, why?

Alex: Yes, I'd like to continue to make videos about lionfish, maybe some targeted toward a broader audience. The need for awareness and action is ongoing. I hope that in future production, I could use real footage from my diving.

GHM: Have you ever eaten lionfish? If so, when and where and how did you like it? If not, would you like to eat lionfish?

Alex: I have never eaten lionfish. I would like to try some especially because everyone says it's delicious. And like the slogan says, "Eat 'em to beat 'em." 🐟



BATTLING LIONFISH ON LAND

BY STACY FRANKS & JIM HART

“Lionfish
are bad...”

ALEX FOGG, MARINE BIOLOGIST

Okay, maybe it's not the lionfish that are bad, but the invasion. We've also heard about their spread across the Bahamas, Bermuda, Gulf of Mexico, Caribbean, East Coast of the U.S. and South America to Venezuela. Now, the Eastern Mediterranean is being overrun, seemingly unchecked. Without introducing any of the culling controls developed, tested, and implemented in the West, the map of the Mediterranean may soon mirror the USGS view of the invasion below.

ENTER LIONFISH UNIVERSITY

Fortunately, a widely diverse group of activists have come together, forming a ragtag army to fight this common enemy. In 2012, a clan of those lionfish soldiers formed Lionfish University with a mission to promote education, awareness, and research. While LFU may not be an official university with highly touted sports teams and frat parties, the non-profit, 501C-3 organization encourages scientific endeavors with a number of grants for innovative research. One such grant went to University of Georgia student Emily Noakes, who is studying lionfish reactions to playbacks of lionfish calls recorded by Dr. Scott Noakes, also of UGA (see article, page xx). LFU has also been instrumental in funding Dr. Steve Gittings' lionfish trap research and development (see article page XX). A grant to Dr. Janelle Fleming at the University of North Carolina was used to continue testing of Dr. Gittings' trap.

As an educational organization, LFU members attend a variety of trade shows, conventions, and summits to get the word out that lionfish, in the wrong oceans, are bad for the environment, but in the hands of the right chef, are great to eat. From the Diving Equipment and Marketing Show (DEMA) to the Food Expo in Las Vegas, LFU continues its focus on solving the lionfish conundrum. And they've taken their fight to Washington, DC, for Capitol Hill Ocean Week (CHOW) an annual event that





brings together ocean conservation organizations, elected officials, and the public. At the extremely popular NOAA fish fry, LFU and Coast Watch Alliance (CWA) served hundreds of portions of lionfish to crowds lined up to get their taste of this edible invader. Most came back for seconds and thirds because the fish was so tasty or perhaps they also knew that lionfish are a green food, high in omega-3 fatty acids, and low in mercury.

LFU has also utilized social and mainstream media, producing one of the first lionfish conservation ads and a Public Service Announcement (PSA) featuring Miss Cayman Islands, Lindsay Japal. A visit to the LFU website and YouTube channel offers PSAs such as Lionfish 101, which is a short introduction to the lionfish invasion (<https://youtu.be/uStjKoNsuPU>) for students and school education programs. The PSA with Lindsay Japal and Chef Thomad making lionfish ceviche is on YouTube (<https://youtu.be/WJLfL9s99sw>), as well as the latest PSA in a series on lionfish culling safety tips (<https://youtu.be/pv1VzLqyhk>). The group also collaborated with Polly Alford and Claire Wood, authors of the cookbook appropriately titled “Cook Lionfish,” which contains a variety of outstanding recipes.

LFU was founded by ocean conservationist Stacy Frank, renowned underwater photographer Courtney Platt, and screenwriter Jim Hart, who has penned numerous Hollywood movies including *Contact*, *Hook*, *August Rush* and *The Hot Zone*. The three dive junkies started a grassroots effort

to share information and resources relating to the infestation of lionfish and focus on the dissemination of information to the diving and fishing communities around the world.

To expand its reach and extend public awareness, LFU assembled a diverse and widespread network of volunteer field reporters to bridge information gaps between invaded areas and to educate the public. LFU also added an esteemed panel of volunteer science advisors: Dr. Steve Gittings (chief scientist for NOAA’s Office of National Marine Sanctuaries), Dr. Lillian Tuttle (currently working on postdoctoral research at the University of Hawaii at Manoa), Alex Fogg (marine biologist and marine resource coordinator for Okaloosa County, Florida), Holden Harris (PhD candidate in Interdisciplinary Ecology at the University of Florida), and Simon Dixon (marine biologist with an MS in Conservation Biology), and Dr. Stephanie Green, Assistant professor of Biological Sciences at the University of Alberta, Canada. This team of scientists has published and posted studies, reports, and project updates on LFU public platforms.

The lionfish invasion continues to evolve and so must our efforts to fight back. LFU is not alone. Many are sharpening their spears as well as their wits to join the battle. Whether spearing, trapping, eating, or making jewelry from lionfish, the time has come to roll up our wetsuit sleeves and dive into the next adventure this invasion will bring. 🐟



Alex Fogg filleting lionfish.



Lionfish is a culinary delicacy.

LIONFISH RESOURCES, INFORMATION & PRODUCTS

The Reef Environmental Education Foundation (REEF; www.reef.org), a pioneer in citizen science-based ocean conservation, has volunteers all over the world. Their members routinely conduct fish population counts during their dives and report the data to REEF. When lionfish appeared in Florida and the Caribbean, leaders like Lad Akins set the stage for early research and response on what has become a massive invasion. Currently, Dr. Alli Candelmo, REEF's Invasive Species program manager, supervises numerous lionfish derbies in Florida that remove thousands of lionfish from the Gulf and the Atlantic each year—and that is still not enough.

Over 19,000 lionfish were harvested this past spring during the Emerald Coast Open Lionfish Tournament in Destin, Florida. The largest lionfish derby yet, with \$48,000 in cash prizes, was held in conjunction with Florida's statewide Lionfish Removal and Awareness Day (LRAD), organized annually since 2015 by the Florida Fish and Wildlife Conservation Commission (FWC).

FWC held a Lionfish Summit in Cocoa Beach, Florida, in 2018 that brought together leading scientists, managers, and activists to assess the problem and offer solutions and strategies for future Lionfish Busters.

The recently published, 82-page comprehensive report on the Summit highlights the need for new traps and robotic technologies to stem the invasion, particularly those that would encourage deep-water commercial fishing, adding lionfish to the catch as a way for fishermen to generate income while doing conservation. [🔗](#)

FWC Report: <https://myfwc.com/media/21337/2018lionfishreport.pdf>

Executive Summary: <https://myfwc.com/media/21338/2018lionfishsummary.pdf>

COAST WATCH ALLIANCE

A 501c3 non-profit organization, founded to help protect our precious marine and coastal resources in the Gulf of Mexico and the Western Atlantic Ocean, including fighting the lionfish invasion.

<https://www.coastwatchalliance.org>

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Florida Fish and Wildlife Conservation Commission: Good resource for information about fighting the lionfish invasion in Florida, and the invaded areas.

<https://www.myfwc.com>

LIONFISH UNIVERSITY

A 501c3 dedicated to education, awareness, and research related to the lionfish invasion. Volunteer to be a field reporter.

<https://www.lionfishuniveristy.org>

LIONFISH CENTRAL

This 501c3 does the work that companies don't like to do, like software development, website development, analytics, mapping, content creation, blogging, and a whole lot more. Their services are free for qualified organizations in the lionfish fight.

<https://www.lionfishcentral.org>

MONTEREY BAY AQUARIUM SEAFOOD WATCH PROGRAM

Helping people make better seafood choices for a healthier ocean. Lionfish is a best choice.

<https://www.seafoodwatch.org>

REEFSAVE

A non-profit volunteer organization that does scientific research, education, and training to implement strategies that protect Western Atlantic and Caribbean reefs from loss of marine life.

<https://www.reefsave.org>



COOK LIONFISH

A cookbook by Polly Alford and Clair Wood full of delicious recipes for lionfish or any white fish.

<https://www.amazon.com/Cook-Lionfish-Polly-Alford/dp/1457558521>

LIONFISH CARIBBEAN JEWELRY

Beautiful jewelry made from lionfish fins.

<https://www.lionfishcaribbean.com/lionfish-jewelry>

LIONATOR POLE SPEARS

Find equipment for spearing lionfish.

<https://www.lionatorpolespears.com>

NAUTICAL PASCHENS

Beautiful, functional lionfish art clothing.

<https://www.nauticalpaschens.com>

REEFSAFE

Oxybenzone-free sun protection products tested safe for coral reefs.

<https://reefsafesun.com>

ZOOKEEPER

Lionfish containment units, heat packs to treat stings, spears, and other equipment to fight the lionfish invasion until a natural predator emerges.

<https://www.zkstore.com>

NERITIC DIVING

Find equipment for spearing lionfish.

<https://neriticdiving.com>



Lionfish demonstration.



Lionfish University



Harvested Lionfish.

MEHGAN HEANEY-GRIER

& STEVE GITTINGS

WHO'S IN CHARGE?



Meaghan with a fresh catch of lionfish.

In recent months there have been reports that lionfish population may be declining. The science is unclear but reports from divers indicate that something seems to have changed. The question is, where is Mother nature in all of this?

Perhaps a way to answer that is to ask why numbers in some places are suddenly dropping. We are hearing more and more such reports. We've been looking for years for evidence of predation by native species like large groupers, barracudas, sharks, and others. Fishermen have reported seeing lionfish now and then in the stomachs of their catch, but not often. We don't know of any harmful parasites that are infesting lionfish in their new habitat. And until recently, no diseases have been reported in lionfish invaders. These are things we might expect from nature. Failing to see natural control quickly taking the reins has heightened concerns over the lionfish threat, but ironically, it has also served to motivate the troops of diver/harvesters to stay the course.

Some people think lionfish are going deeper. But we really don't have any data to confirm that, even though we know the highest densities of lionfish are found below diver depths of 130-foot-plus. Some say the lower numbers mean lionfish must be getting eaten by native species, even if we don't see much evidence of that. If adults aren't being preyed on, perhaps larvae or juveniles are eaten before having a chance to grow and reproduce. They are almost certainly much easier to swallow than the spiny adult fish. We've watched Nassau grouper swallow large lionfish that were speared or just coaxed away from shelter. Sometimes they go down without any sign of distress by the grouper. Other times, it takes several seemingly uncomfortable minutes to get the lionfish to go down without sticking in the grouper's throat.

Recent reports of skin lesions on lionfish might mean lionfish are being affected by diseases they

have not been exposed to in their native habitat. High levels of crowding may be allowing diseases to spread among the fish in the invaded range. That happens in all kinds of crowded situations—cattle in feedlots, fish in fish farms, and humans on planes, in schools, and so on. Combined with other natural controls, like predation and food shortages, nature alone could eventually tame this invasive beast, or at least declaw it.

But is nature actually regaining control? You don't have to be a scientist or salty seafarer to know that Mother Nature will have the final word. Lucky are those who haven't been at her mercy in the face of a raging fire, the path of a hurricane, or the rush of flood waters. But for lionfish, she seems to have been fairly slow to join the battle. Lionfish populations grew seemingly unchecked



“we are collectively trying to right our wrongs and become part of the solution rather than remaining part of the problem.”

for decades in most places before showing any signs of waning. For our part, while we watched and waited to welcome nature to her rightful command, the dedicated, motley forces of resistance geared up to give her a helping hand in solving a problem we admit we started, defying the onslaught as best we could.

As nature ramps up her efforts on lionfish, we can also consider what lionfish have taught us about our role in finding solutions and taking action in other environmental challenges. Most of us understand that there is a daunting complexity to natural systems. Our influence on them, and our ability to fix problems is constantly questioned and ever-changing. But as we pass eight billion people on the planet, there is no question that good, bad, or ugly, we have an impact.

So do we, can we, and are we actually making a difference? Absolutely! What we do individually every day makes up that collective impact. As with lionfish, solutions start with individual decisions to make a difference. Choose smartly what we buy, support, share, and talk about. And the more we know about new technologies, innovation, and ingenuity, the better the choices we can make.

The assault by lionfish certainly ranks toward the top of modern ocean invasions. What

stands out so far in this case, however, is the effectiveness of the combined efforts of regular people who care—the dedicated individuals who have socialized their efforts, scientists who saw the need to understand the threat, regulators who jumped on the problem as soon as they saw it, and entrepreneurs who saw an opportunity to put their expertise to work as a driver for solutions.

To date, all this hard work and collaboration has paid off, helping to keep shallow-water invasive lionfish populations in check and protecting native ecosystems. Right from the start, observers reported it, scientists confirmed it, and a lot of people have been doing whatever they could to fight it.

We know that the lionfish problem was not too big for humans to start, but is it too big for us to stop without nature intervening? Exotic species have a way of spreading beyond our control very quickly, making conservation a brutal uphill battle. It happened with zebra and quagga mussels that changed the Great Lakes’ ecosystems, fire ants that displace native ants and kill animals that disturb their mounds, European starlings that ravage crops, Asian kudzu that smothers forests, and brown tree snakes that decimated the birds of Guam. And there are many, many other examples infamously

marking our species’ knack of not always thinking through the potential consequences of our often selfish actions. The open ocean makes control even harder.

With lionfish, we are collectively trying to right our wrongs and become part of the solution rather than remaining part of the problem. So far, we’ve changed spearfishing rules in some places to allow hunting. We mustered armies of human predators who are doing a great job controlling lionfish in shallow water. We told people “Eat ‘em to beat ‘em!,” rallied restaurants to feature this “exotic” species, enticed people to pay more for this “delicacy” and do their part to save the ocean. We have published tasty recipes in lionfish cookbooks, and turned the fish’s beautiful fins into art, all of it helping people make money and creating jobs while helping control the invasion in the process.

But is that enough? We still haven’t touched lionfish populations in deep water. We hope traps will do their part, but the fish have spread so far and wide, it remains to be seen how much of a difference deep water fishing can make.

Ultimately, we have to keep up the fight and hope that Mother Nature will join our efforts to tame this invasion. There are early signs of her intervention. We know from experience that she’s in for the long haul. 🐟

WHACKIN' STACKIN'

ALEXANDER Q. FOGG

Marine Resource Coordinator, Okaloosa County Board of County Commissions, Emerald Coast Convention and Visitors Bureau

We know lionfish are bad and they must be harvested. We also know they are good for you and taste great. Currently, scuba divers are the most efficient mechanism to get large quantities of lionfish out of the water. These same divers are the ones who brag about how many they can catch during a dive, in a day, on a dive trip, and in their lifetime. This affinity for competition blossomed into something that is very common in the fishing world -- tournaments -- or derbies as many in the lionfish community call them. These events didn't pop up overnight. There was a time in the first few years after the start of the invasion when groups of divers would get together and hunt lionfish to see who could get the most, the largest and the smallest. Divers, researchers, managers, nonprofits and local businesses worked together with the common goal of removing lionfish from local waters. The winner(s) would be awarded enough money to pay their bar tab and maybe cover their registration. There would be coolers filled with lionfish sitting around with people bickering about who had to "deal with" disposing of them. Researchers would leave the event with more samples than they could process and some poor soul would have to fillet a ton of lionfish or give up and dispose of them some way.

Since those early days, the derby and market worlds have changed dramatically. We have watched lionfish events go from loosely organized Saturday afternoon outings to large events that span months. Many attract hunters from multiple states, and include festivals, concerts, and other events. These derbies also bring in resource management agencies, large wholesalers and retailers, renowned chefs, and generous sponsors.

Today, those same derby divers (has a nice ring to it) still compete for the same bragging rights they sought at the beginning of the invasion, but also for tens of thousands of dollars in prizes provided by sponsors. Some have achieved a level of fame that permeates the diving and fishing communities

months or even years after the event concludes. These divers have become focal points for print and video media, documentaries, and social media.

It's hard to say how the increased frequency and publicity surrounding lionfish derbies affected demand for lionfish in the commercial market, but it is clear the supply from derbies and divers has not met market demand. Lionfish derbies provide a surge of lionfish into commercial seafood markets well beyond the collection areas. Now, wholesalers line up at derbies to buy every lionfish that comes in, at a premium price no less, even lionfish only a couple inches long. It didn't used to be like this. Without commercial demand, we used to struggle to find ways to dispose of hundreds, if not thousands of pounds of lionfish.

Gradually, local restaurants began purchasing lionfish, but for only about \$2.00 per pound in the early days, a price paid for lowly catfish or mullet. Once



Alex Fogg Collecting Lionfish Data during LRAD.

restaurants realized lionfish is not only a high quality seafood, but also a major hit among patrons, the price and demand began to climb. Since 2013, when the lionfish market really started to grow, there has been a significant increase in the number of commercial lionfish harvesters and lionfish sales reported and tracked by the Florida Fish and Wildlife Conservation Commission (FWC). Today, lionfish is considered a top quality seafood, highly nutritious, low in mercury and other harmful chemicals, and highly versatile. There are even two dedicated cookbooks, and at \$6.50 per pound, the price reflects this high quality and exceeds most other local commercial species of fish.

In 2019, the Emerald Coast Open Lionfish Tournament, co-hosted by the Emerald Coast Convention and Visitors Bureau and FWC, removed 14,119 lionfish weighing in at 7,176 lbs. Based on the market price ranging from \$4.00 to \$6.50 per pound, depending on fish size, the total wholesale value of lionfish sold during this two-day event was more than \$42,000. If you calculate the retail value from the restaurants that eventually served those lionfish to hungry patrons, the value might be as much as \$200,000. Virtually all the lionfish were sold to licensed wholesalers by derby participants who possess the basic Saltwater Products License, which can be bought for a mere \$50.

I am not an economist or a social scientist but I have seen these fish invade the ecosystem, then the economy, which is perhaps the only part of the invasion that has been positive. Time will tell whether lionfish derbies and the lionfish seafood market will continue to develop; in the meantime, ask for lionfish at your local restaurant and if you are a diver, consider participating in a lionfish derby. [👉](#)



LIONFISH CONUNDRUM



Collecting and sorting lionfish at LRAD.

An underwater photograph showing two large, circular fishing traps made of black mesh. A blue buoy with a white top is attached to the traps. The water is clear and blue, with some sandy bottom visible. The title 'CONFESSIONS OF A GARAGINEER' is overlaid in large white letters on the left side of the image.

CONFESSIONS OF A GARAGINEER

STEVE GITTINGS

Spearfishing alone will not defeat the lionfish invasion, which never takes a break and happens well beyond the reach of scuba divers. Reinforcements are needed in the form of commercial fishing fleets equipped with traps designed to catch lionfish in deep water.

Looking back, I guess you could call it a “Double Eureka!” moment.

Sitting at a science conference, listening to talk after talk after talk is not always as exciting as it sounds! So in 2013, as I dutifully squinted at data and jotted down facts at a fishery conference, Joanna Pitt began her talk about the lionfish invasion and her group’s attempts in Bermuda to modify the entries to lobster traps so they would catch lionfish rather than lobsters. It struck me immediately as a perfect solution. Fishermen could use gear that they already own, change it slightly, fish it during closed seasons

for lobster, make money on lionfish, and protect deep water ecosystems in the process.

Eureka!

And lionfish do come up in lobster traps. But when they do, the traps tend to not have what the fishermen want—lobsters. Those sell for about \$10/lb., lionfish for \$6/lb.

As Dr. Pitt was showing underwater pictures of her traps, I noticed that only a fraction of lionfish were actually inside them. There were quite a few that hovered over and around the traps. Lionfish apparently liked being near the structures, but didn’t seem particularly attracted to the bait inside.

I wondered if there might be a way to catch the lionfish outside the trap.

Not long after that, I was invited by Stockton Rush, founder and CEO of OceanGate, to dive in a submersible off the southeast coast of Florida. The

objective was to determine the extent of the lionfish invasion beyond scuba diving depths.

The seabed between 200 and 400 feet off Fort Lauderdale is mostly sand, interrupted by small outcrops, scattered sunken boats, a lot of tires (some of the two million used in a failed attempt to make an artificial reef in the 1970s), and some lost fishing gear.

The junk was the key. Hanging out near almost every piece was at least one lionfish. The really low profile junk had either no lionfish or small ones. The larger pieces had larger lionfish and more of them. It seemed that all it took to attract a lionfish was vertical relief.

Eureka, again!

Actually it wasn’t a huge surprise that fish were attracted to the structure. Fish Aggregating Devices (FADs) are widely used to increase catch rates. But lionfish seemed more tightly associated



with the debris than other fish. They were also very docile compared to other fish and wouldn't flee when approached.

Why not exploit those traits?

All I needed to do was come up with a device that would attract fish to a structure, then close around all the fish that surrounded it. To avoid the capture of unwanted fish, it would be baitless as well as a "non-containment" trap, meaning it would allow fish to come and go at will, then trap only those tightly associated with the FAD and docile enough to stay in place while a net closed around them. Lionfish is one of the few species with those traits.

I soon became a "garagineer." As my wife and neighbors watched with amusement, I built contraptions in my garage that could test the concept I called a "FAD-based, non-containment curtain trap." Really rolls off the tongue, no?

I was obsessed. I woke up all the time thinking about ways to make PVC frames, net curtains, hinges, harnesses, and FADs, and ways to drop traps so they would land upright on the bottom.

Not being an actual engineer, progress was slow. But I eventually had a prototype. It was an open PVC cube, four-feet on each side, with a central FAD made of five-gallon buckets with branches made from garden edging, and a curtain of netting that could slide up the sides when the trap was pulled, capturing whatever was within the frame. With permits in hand, and help from Lionfish University, Coast Watch Alliance, and some great volunteers, we tested it in about 110 feet of water off Pensacola.

It worked! Lionfish swam over from nearby artificial reefs within minutes of seeing the trap, gradually collecting around the FAD. They barely moved as the curtain closed around them. No bait—just a FAD—so hardly any bycatch (unwanted fish). If larger fish like snapper and grouper were nearby, they tended to move around more, be less attracted to the baitless FAD, and most would bolt as the trap began

to close. Lionfish stayed. The lack of containment meant fish weren't under any stress until they were brought up. It also left little chance for ghost fishing (trapping fish that are never retrieved) if the trap is lost.

I had thought that would be it for me. I demonstrated the concept of the "FAD-based, non-containment curtain trap." I assumed the fishing world would take that idea and convert it to new fishery built around lionfish.

Not so much. It soon became obvious that the prototype would not be enough. I would need a viable trap that could be used commercially.

Back to the garage. I went through several trap models, each about six-feet in diameter, but each with some sort of fatal flaw. Too many fish outside the frame. Too many fish escaping. Lines tangling somewhere on the trap. Too slow through the water. FADs acting like wings, causing the trap to land on its side. Always something. But gradually, the traps improved. Removing all vertical structure other than the FAD, and simplifying the FAD made it descend more easily through the water. I hinged the trap so it would fold like a taco and descend even faster, and added curved deflectors to the frame to force the trap open when it touches down. And I rigged the harness to hold the frame closed and keep the fish from escaping.

At the same time, interest was building. People spoke in meetings and conferences about the need for traps. I distinctly recall Guy Harvey urging me, "You've gotta get this done!" Many asked to help improve and test the traps. James Morris and I debated FAD and design options. Randy Guthrie bent and welded the first batch of six folding traps. Peter Angelotti had the great idea of bending rebar into tight loops to create weldless hinges so just about anyone could build a frame inexpensively and without special equipment. Marc Moran built the bender that did it. Lionfish University, Coast Watch Alliance,



ReefSave, Alex Fogg, Holden Harris, Janelle Fleming, and people in other countries have tested different trap models. We're all trying to understand whether they actually have conservation and/or commercial potential. We know they work well around artificial reefs, but what about natural reefs? How close do they need to be to source reefs? Do they work better than lobster traps or fish traps? Do they get any bycatch? How can we make sure they open every time they hit the bottom? Do they drag across the bottom in currents? Could animals become tangled in their float lines?

Importantly, for lionfish traps to be legally used commercially, permits are required. Regulators want to know that the traps minimize bycatch, ghost-fishing, bottom impacts, and entanglement risk. In fact, they are now convinced enough to permit commercial testing.

It is on this threshold that we now stand.

The concept works. The new traps attract lionfish more than other fish. They seem to catch more lionfish than other traps (though more tests are needed). And they operate well, meaning they usually open. Unlike the robotic and electronic traps that are showing promise, these are fully mechanical and inexpensive, probably under \$100 each if built in bulk. Like all traps, however, for fishermen to use them, they also need to figure out how to fish them, then decide if the cost of new gear is worth it.

These are things that only the pros can do. It's time for the professional fishing community to take the wheel. They will likely improve on every aspect of the traps—material selection, frame design, netting, FAD, lines, etc. They can test different deployment and retrieval options, including weighting of the traps, line and surface float configurations, and

connecting many traps together in what they call trawls. They'll also test different soak times in different habitats to fish as efficiently as possible, ultimately deciding whether the traps are worth their time and money.

I've always hoped that the prospect of a viable lionfish fishery would be incentive enough to make the fishing community flock to new trap designs. While there is some interest, those who currently catch lionfish are using traps they already own—primarily lobster traps—to remain cost-effective. Getting their professional input to test and improve the new traps will mean finding ways to supply traps and pay for their time. Only then will it even be possible to attract them to the FADs, and for the traps to reach their conservation and commercial potential.

It's not garaging anymore.



CONTROLLING



LIONFISH

WITH

SOUND



SCOTT NOAKES, UNIVERSITY OF GEORGIA

MMy definition of a lionfish problem changed several years ago when I was invited to dive with Coast Watch Alliance offshore Pensacola, Florida. Prior to this dive, my primary experience with lionfish was in the Gray's Reef National Marine Sanctuary (GRNMS) offshore Georgia where we might see only 20 lionfish a year. On that dive offshore Pensacola, there were easily over 100 lionfish congregated around a small, three-by-seven meter artificial reef structure. It was during that dive that I realized how bad the lionfish invasion had become and that spearfishing alone would not control their population. I also realized that lionfish had taken over most of the artificial and natural reefs along the Florida panhandle. With this knowledge, I realized this would be a good location to conduct acoustical research.

In 2014, I initiated a research project in GRNMS designed to gain baseline soundscape data, which is basically eavesdropping on the reef to assess the biological activity. During that project, I realized a lot of fish communicate through vocalizations such as grunts, thumps, and clicks.

Of course, many of the sounds produced around a reef are well below a diver's ability to hear, but those sounds can be amplified through the hydrophone. Research has shown that sharks and some fish are attracted to certain types of noise. Fish have sensory receptors to pick up sound and vibration to locate prey, mate, identify danger, and judge their proximity to objects. Based on my knowledge that some marine animals utilize sound and my acoustical experience at GRNMS, I started asking if lionfish made any sounds and, if so, would it be possible to turn it against them by utilizing their calls to help fight the invasion of the southeastern waters.

Soon after my initial dive offshore Pensacola, I started deploying the hydrophone in predominantly high lionfish populations offshore Pensacola and the Bahamas to collect lionfish calls in the wild. At the same time, a research group at the NOAA lab in Beaufort, North Carolina, was attempting to record the calls of captive lionfish. During agitation, they were able to successfully record several short calls composing of about five beats.

The lionfish calls I recorded in the wild were typically much longer than the captive calls with upwards of 15 to 20 beats. A call sounds much like someone rapidly hitting a drum multiple times and then a short pause followed by a final beat. Most fish vocalizations consist of a grunt or two, a burp, or a series of pops, so the lionfish call is definitely unique and stands out in an acoustical file.

The hydrophone deployments offshore Pensacola proved to be highly successful, capturing several lionfish calls during multi-day recordings. By reviewing the acoustical files graphically, the entire file doesn't have to be played back to identify calls. Each sound created underwater is picked up by the hydrophone and is visible in acoustical spikes shown graphically depending on the sound amplitude. One of the smallest marine creatures on a reef, the snapping shrimp, makes up the majority of the reef noises and its sound is best described as bacon frying.

The opportunity also came up to deploy the hydrophone near Green Turtle Cay in the



Lionfish Call: Satellite Dish near Green Turtle Cay, Bahamas.

Bahamas. As it turned out, this site provided some of the best lionfish calls to date. Ironically, the primary deployment site was an old satellite dish that had been dropped in approximately 18 feet of water. There were only about 20 lionfish at the site, but they had to compete with numerous other fish for space. During one 24-hour period, over 20 lionfish calls were recorded. In addition to deploying the hydrophone at the site, a GoPro camera was mounted on the seafloor and programmed to take time-lapse photos every five minutes. One of the calls was made at the same time the camera snapped a photo of a lionfish standing guard next to the hydrophone while another fish challenged the territory. Not only was this call very clear, but it also indicated that the lionfish calls were of a defensive nature.

As an extension of my work, I got my daughter Emily involved in lionfish acoustical research. As a soon-to-be senior at the University of Georgia (UGA), double majoring in Biology with a Marine Emphasis and Ecology, she spent the summer conducting acoustical research on the lionfish. Lionfish University provided a small grant to help jumpstart Emily's research. Alex Fogg of Okaloosa County, Florida, donated four juvenile lionfish, which were housed at a research

facility near the UGA campus. Through a series of non-invasive tests, the lionfish were exposed to my previously recorded lionfish calls as well as reef soundscapes. It is still early in the research effort to fully comprehend the results of the experiment, but the lionfish appeared to respond to some playback calls with shorter thumps. Additionally, Emily recorded some of the lionfish making the full, multi-beat drumming calls when they were aggravated, primarily when they were first moved from their home tank to the larger test tank. This breakthrough answered a primary

question as to whether or not the juvenile fish understood or could produce the same calls previously recorded in the wild. Further acoustical experiments will continue during 2020 in an attempt to clean up the captive lionfish calls and monitor their responses.

It is not known yet if the lionfish calls can be used in the fight to stop their invasion, but we are getting closer to understanding their behavior. Additional behavioral research is desperately needed if there is any hope to control their rapidly growing population. [▶](#)



HOOKED ON SAILFISH



FRED GARTH

For the past 25 years, Fred D. Garth's articles have appeared in numerous books, magazines and newspapers around the world.

The first Spanish words I learned were *cerveza* and *baño*. That was a primo vocabulary for a 20-year-old college kid trekking through Mexico. But it did not prepare me for future business ventures south of the border.

Case in point, I traveled recently to Guatemala City (population: 2.5 million, elevation: 5,030 feet) for a sailfish conservation symposium. Shortly after I arrived, I was politely informed that all of the presentations would be in Español. A couple of early clues for me might have been that: one, I was in a country where every man, woman, and child spoke Spanish, and two, all of the presenters were from Central America.

Thinking quickly, I conjured up the magical forces of Google. The all-knowing and all-powerful company's translation software is, as you would expect, amazing. However, Google Translate was only as effective as my finger-speed on the keyboard and the wifi connection, which was surprisingly strong. In addition to Google's fairy dust, I had some good Karma shining down on me. The organizers had seated me next to Ursula Marais, who speaks several languages and is the friendly manager of Tropic Star Lodge in Panama. She graciously led me from darkness to the light.

The powerhouse gathering of fishery conservationists was titled the *Segundo Foro Centroamericano Público-Privado para la Protección del Pez Vela y Desarrollo del Sector Turístico de la Pesca*, which I now know translates to the Second Public-Private Central American Forum for Sailfish Protection and Sector Development of Fishing Tourism. That is an extremely long title for an extremely important issue: growing tourism by protecting sailfish. Or protecting sailfish in order to grow tourism. *Lo mismo*. Experts from each country outlined the conservation programs they have implemented and how to best coordinate their efforts across the fertile region.

As well-traveled anglers know, the waters of the Pacific Ocean from Mexico to Columbia are some of the most prolific fisheries in the world. Known as the Eastern Tropical Pacific (ETP), the area encompasses a gathering of some of Earth's

most extraordinary islands—the Galapagos archipelago, Isla de Cocos, Malpelo Island—as well as hundreds of seamounts, canyons, and conditions that create a perfect habitat for sea life. Dr. Nelson Ehrhardt, the longtime and respected fisheries expert who recently retired from the University of Miami after a stellar 45-year career, explained (in Spanish, of course) how high levels of nutrients ride in on oceanic currents and combine with an ideal combination of salinity, oxygen, and water temperature, and conspire to make these waters extremely hospitable for mahi-mahi, sailfish, blue marlin, tuna, black marlin, and a host of others. His presentation revealed highly-defined areas where fish aggregations occur and how those regions slide up and down the coastline as the seasons change.

Ehrhardt's and others' studies have been compiled over many years of tagging and tracking and now offer a roadmap for regulators to follow in order to keep the ocean *vibrante* for recreational anglers who inject *grande* amounts of revenue into *la economía*. But, as we know all too well, it's not only sport fishermen who covet these valuable fish. Many legal and illegal commercial vessels have targeted the ETP for decades, threatening to devastate the ecosystem and, as a result, stymie a thriving tourism economy. These are the reasons that regional conservationists are joining forces.

The sailfish conference was organized primarily by the Guatemala fisheries department and Niels Erichsen, director of Pacific Fins Resort on Guatemala's Pacific Coast. Representatives traveled from Panama, Costa Rica, Nicaragua, Guatemala, and the United States to share their knowledge and discuss ways to collaborate. Perhaps the most ambitious sailfish conservation programs have been implemented in Guatemala, a point Erichsen drove home in his impassioned presentation. For example, it's against the law to harvest billfish or sell their meat in Guatemala, a transgression that carries a fine of as much as \$5,000 dollars and/or jail time. Considering the average wage in Guatemala is about \$10 per day, penalties that high have shut down the sale of billfish meat. At least on the open market.



The Guatemalan government determined, quite astutely and with data provided by fishery researchers, that a live billfish generates far more money through tourism than a dead billfish sold only for its meat. It's the same valid argument that has been used for protecting sharks from mass slaughter. Shark diving and shark fishing are both massive tourism drivers. Shark meat is cheap, not healthy (high mercury levels), and not particularly tasty, although some may argue that mako and a few others can be delicious. The point is, there are other fish that are more sustainable, taste better, and are healthier to eat than sharks and billfish. So, why kill the golden goose or, in this case, billfish and sharks—the biggest ticket draw for sportfishermen?

While illegal fishing, longlining, and purse seining all remain serious problems in the ETP and across the globe, the good news is that this collaborative effort among Central American countries is gaining momentum. Numerous groups are focused on protection issues such as CABA (Central American Billfish Association), BCP (Billfish Conservation Project), OSPESCA (Organization for Fishery Protection in Central America), FECOP (Fishing Protection of Costa Rica), not to mention the IGFA (International Game Fish Association) and the GHOF (Guy Harvey Ocean Foundation) that are pitching in as well. In order to ensure that the ETP remains a fishing hotspot, this collaboration and strength in numbers is essential. It's also paramount that funding pipelines are established to support these programs, which is why global organizations like BIOFIN (Biodiversity Financing) attended the conference.

The road to success for achieving a truly sustainable billfish population in the ETP may be long and filled with potholes, but there's a formidable convoy already rolling down that highway. And, it is amazingly impressive to see the clear vision and cooperation among these neighboring countries, especially when you consider the

negative impression that many Americans have of Central America politics, based on today's skewed media narrative.

The bottom line for the Joe Anglers of the world is that the ETP is, without a doubt, the place to catch a lot of mind-blowing fish, cross a few items off your bucket list, and perhaps, enjoy some of the best rum on the planet. Our dollars spent on travel contribute directly to the conservation movement and help it to build momentum.

After the conference, I was fortunate enough to travel to the coast to Puerto Quetzal in search of some offshore fishing. Amazingly, in just one day, we caught 40 sailfish. My brain almost exploded with joy, my soul was fulfilled, but my back throbbled with pain. But, at least I added two more words to my Spanish vocabulary: *farmacia* and *aspirina*. 🐟

Next issue: How to Catch 40 Sailfish in One Day!



GUY HARVEY
®

GHOFF
GUY HARVEY OCEAN FOUNDATION

**YOUR PURCHASE
HELPS SAVE
OUR SEAS**