INSIDE: FIX OUR WATER • THE BAHAMAS INITIATIVE • TARPON GENETICS RESULTS • CUBA

A publication of Bonefish & Tarpon TRUST

BONEFISH & TARPON Journal

STEWARDSHIP THROUGH SCIENCE • SPRING 2017

Your banana is not the Plague in a Peel.

Or Poseidon's Yellow Middle Finger of Doom.

It's a fruit.

From the tropics.

Beloved by babies, monkeys,

and baby monkeys.

Despite popular myths,

bananas possess no fish-frightening powers.

Just vitamins. And potassium.

So go ahead.

Bring your snack aboard.

Forget superstition. You have science.

You have the clarity of 580 technology.

COSTA

Bonefish & Tarpon Journal

135 San Lorenzo Ave. • Suite 860
Coral Gables, FL 33146

2017 Fundraising Events

Naples, FL – January 11, 2017
Boca Grande, FL – February 3, 2017
New York, NY – March 14, 2017
Islamorada, FL – March 30, 2017
6th International Symposium, Weston, FL – November 10-11, 2017

BTT's Mission

To conserve and restore bonefish, tarpon and permit fisheries and habitats through research, stewardship, education and advocacy.

A publication of Bonefish & Tarpon TRUST

BONEFISH & TARPON Journal

STEWARDSHIP THROUGH SCIENCE • SPRING 2017

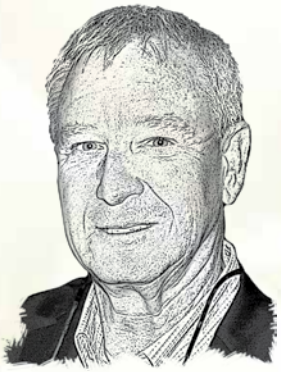
Features:

The Florida Keys Initiative 12
Fix Our Water 14
Tarpon Genetics: Connectivity Across the Atlantic 18
Bonefish Conservation & Restoration Program 26
Next Level Permit Tracking 28
Excerpt from A Passion for Permit 30
Of Bonefish and Contaminants: What is the Risk? 32
Cuba: Writing the Next Chapter 36
Juvenile Tarpon Habitat Mapping & Restoration 52
IRL Tarpon and Snook Nurseries 54

Updates/Reports:

Setting the Hook 4
Changing of the Guard 6
Perspectives 8
Tippets 10
Q & A with Florida Keys Guides 22
Keep 'em Wet Contest Results 38
2017 Featured Artist: John Swan 41
Trip of a Lifetime: Belize River Lodge 42
Ghost Stories 48

Setting the Hook



Harold Brewer, Chairman

Jim McDuffie, President

From the Chairman and the President

It's customary in these pages to reflect on the extraordinary accomplishments of the past year, and thanks to the support and collaboration of our many members, partners and friends, there is much for us to celebrate as we enter 2017. Whether in the Florida Keys, Bahamas, Belize, or elsewhere, BTT made new gains last year in research and science-based conservation. We continued closing in on the causes of bonefish declines in the Florida Keys, took steps to identify and protect important bonefish habitats in the Bahamas, improved regulations for flats species, and engaged anglers and guides in education campaigns aimed at improving flats conservation.

Our progress comes as a result of the 20 years of leadership by Tom Davidson and Russ Fisher, BTT's founding Chairman and Vice Chairman, who passed along their long-held responsibilities to others in November. Tom and Russ have made an indelible contribution to our organization, providing both a strong foundation and vision, as well as the inspiration for us to act with greater ambition on behalf of our mission. Our promise moving forward is to build on the successes of their leadership as we push to protect and enhance flats fisheries and habitats.

Much of what was accomplished in 2016 is summarized in articles appearing in this *Journal*, but several items deserve highlighting here. In March, BTT and its collaborator Harbor Branch Oceanographic Institute launched the five-year Bonefish Restoration Research Project, with the ambitious goal of discovering how to spawn and raise bonefish in captivity. Partially funded by a grant from the National Fish and Wildlife Foundation, the project when successful will provide another tool in the restoration toolbox. As the causes of Keys bonefish decline are identified and addressed, it may be necessary to provide supplementation in order for the bonefish to achieve more abundant and self-sustaining levels.

Even as BTT begins the challenging work of making bonefish stock enhancement possible, we have expanded other major projects, including two aimed at better understanding tarpon and permit movements via acoustic tagging. Acoustics will allow us to track fish in a range of sizes and over a span of several years. In the case of tarpon, we can also do so over a potentially vast region, stretching from Texas to the Carolinas. This research will help us link foraging and spawning grounds for permit, learn for the first time what tarpon between 20 and 50 pounds do in their travels, and determine how changes in freshwater flow (such as in the Everglades) influence tarpon movements, among other objectives.

The influence of changing water flows is one of several aspects of Everglades restoration and management of concern to us. In 2016, BTT launched the "Fix Our Water" campaign and became a founding member of the "Now or Neverglades" coalition, joining with other conservation organizations in addressing the growing water crisis in the state of Florida. In collaboration with partners, BTT is working to raise awareness and build grassroots support for Everglades restoration, especially among an angling community that has witnessed the devastating impacts to our fisheries of water management effects. Data from our tarpon tracking and other projects could be a meaningful part of this effort in the years ahead.

BTT is a science-based organization, and research to achieve specific conservation outcomes drives our efforts. One of the best examples of recent successes can be found in the Bahamas, where BTT scientists and collaborators continued the important work last year of identifying critical bonefish habitats in need of protection. Thus far, our research has contributed to the establishment of eight protected areas around Abaco and Grand Bahama. We plan to continue working with Bahamas collaborators to extend these habitat conservation measures to Andros, Long Island, Cat Island, Acklins, Great Exuma, and others. The time to act could not be better. As a participant in the Caribbean Conservation Initiative, The Bahamas has set a goal of protecting 20 percent of its marine and nearshore environment by 2020, which provides an unprecedented opportunity for flats conservation.

Our science not only contributes to conservation, it also shapes BTT's advocacy and education efforts. BTT provided knowledge and support to collaborators in the Caribbean in their advocacy efforts last year, most notably in opposition to the development of Blackadore Caye in Belize, as well as efforts to remove gill-nets from the flats in multiple locations in the Caribbean. BTT is also ramping up education efforts with a new flats ecosystem curriculum being developed in collaboration with the Bahamas National Trust for school students in the Bahamas. The curriculum will expose students to the ecological, economic and cultural significance of their flats environment and will be implemented later this year. We also expanded our Catch and Release Education Campaign in 2016 and, thanks to generous private support, BTT will produce special videos and other materials this year, all for the purpose of educating guides and anglers about the importance of practicing proper catch and release and fish handling. Already, hundreds of entries from around the world were submitted to our "Keep 'Em Wet" photo contest, and the winning photos can be found in this issue of the *Journal*. We believe educated anglers and citizens also become advocates for conservation.

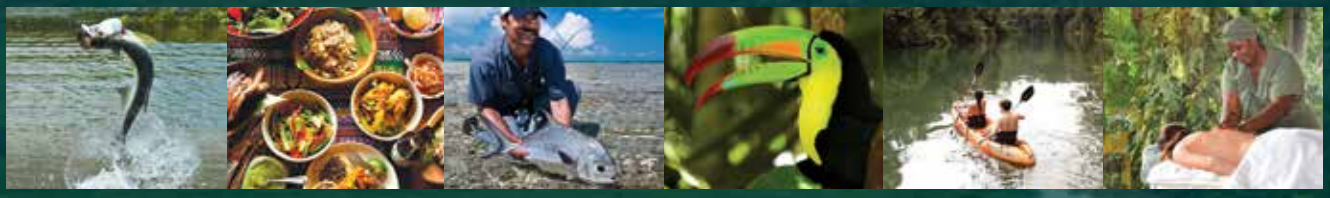
It was an exciting year pursuing research-driven, science-based solutions to the challenges facing our flats fisheries, and we hope you will enjoy reading the latest edition of the *BTT Journal*. And in recognition of the growing scope and pace of our work, you won't have to wait a full year for the next issue. The *BTT Journal* begins publishing twice a year in 2017 with the next issue due out in September—just in time to preview the 6th International Symposium, November 10–11, 2017, and BTT 20th Anniversary kick-off. The Symposium promises to be the best yet, and will showcase the great conservation strides that have been made in pursuit of our mission.

Thank you to all of our members, partners and friends. Our tremendous progress in 2016—and over the past two decades—is testament to your ongoing support.

BELCAMPO *Belize*

CATERING TO THE WORLD'S MOST DISCERNING FLY FISHERS.

(AND THOSE WHO HAVE NO INTEREST IN FISHING WHATSOEVER.)



NESTLED IN THE VERDANT HILLS ABOVE THE CARIBBEAN COAST, BELCAMPO LODGE BELIZE IS A SELF-CONTAINED 12,000-ACRE SANCTUARY OFFERING AN UNRIVALED FLY FISHING EXPERIENCE AND LUXURIOUS ACCOMMODATIONS. HEALTHY POPULATIONS OF PERMIT, BONEFISH, SNOOK AND TARPON THRIVE IN THE NEARBY MANGROVES, FLATS AND PRISTINE BEACHES OF SOUTHERN BELIZE. FOCUSING EQUALLY ON ANGLERS AND THEIR NON-FISHING COMPANIONS, OUR PASSION IS ENSURING EVERY GUEST HAS THE TRIP OF A LIFETIME.

BELCAMPO LODGE • PUNTA GORDA, BELIZE | BELCAMPOBZ.COM | INFO@BELCAMPOBZ.COM

1-888-299-9940 (WITHIN THE US) | +501-722-0050 (OUTSIDE THE US)

Changing of the Guard

Bonefish & Tarpon Trust Founder and Chairman Tom Davidson Steps Down After 20 Years

After two decades of dedicated service to Bonefish & Tarpon Trust, Tom Davidson stepped down as Chairman in November 2016. In addition to his important role as founding chair of BTT, Davidson has been a tireless champion of conservation causes across South Florida and the Keys, including serving on the boards of the Everglades Foundation, the Florida Keys National Marine Sanctuary and the Pennekamp Research Institute.

In the late 1990s, Davidson and a small group of like-minded friends became concerned about the declining bonefish population in the Florida Keys. They pooled resources to initiate early studies focusing on the fishery. Soon after, Bonefish & Tarpon Trust was formed, originally as Bonefish & Tarpon Unlimited (BTU), and quickly grew with support from a founding board representing the "who's who" of saltwater flats fishing.

Today, BTT boasts thousands of members from more than 20 countries, and in partnership with collaborating scientists and partner organizations, conducts research, stewardship, education and advocacy efforts on behalf of bonefish, tarpon and permit across the Southeastern United States and Caribbean Basin. Much of BTT's success is due to Davidson's leadership and vision and his steady hand at the helm for the past two decades.

"For twenty years, Tom has been the BTT visionary, leader, tireless advocate, ambassador, generous supporter and steward. He leaves us a legacy that will endure for decades to come," said Harold Brewer, who succeeds Davidson as Chairman. "No one replaces Tom, we simply follow in his footsteps. I'm honored and privileged to follow him as Chairman of BTT. It's an exciting time for the organization, and Tom has given us the foundation to continue to do great things."

As part of a multi-year transition plan, Davidson was named Chairman Emeritus. Fellow founder Russ Fisher, a longtime BTT Vice Chairman who for many years oversaw science and conservation programs, also stepped down and was succeeded by Bill Horn from Marathon, Florida. BTT Executive Director Jim McDuffie was named President.

"We owe a debt of gratitude to Tom Davidson and Russ Fisher for their longtime service to BTT," McDuffie said. "Thanks to their early and sustained efforts on behalf of the flats fishery, we have gained new knowledge about the species and developed the capacities needed to pursue conservation at a new and larger scale. We simply wouldn't be the organization we are today without them."

Left to right: Tom Davidson, Harold Brewer, Jim McDuffie, Russ Fisher, Matt Connolly


CONTROL FREAK
NEW
MIRAGE
OWN THE FIGHT with the most advanced patent-pending drag system ever designed. Infinite adjustment from zero to dead stop in a single drag knob rotation. Renders any previous perception of “smooth drag” to obsolescence. Completely sealed and maintenance free.
Orvis innovation. American made. Advantage angler.
orvis.com/miragereel
PROUDLY MADE IN THE U.S.A.
ORVIS
ORVIS®
160 YEARS OF PROVEN INNOVATION
©2017 The Orvis Company

Bonefish & Tarpon Trust Names New Honorary Trustees

Bonefish & Tarpon Trust named four new Honorary Trustees in 2016—each distinguished in their professional endeavors and commitment to conservation of bonefish, tarpon and permit.

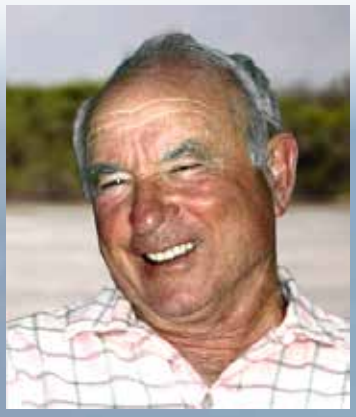
Yvon Chouinard may be best known as the legendary founder of Patagonia, yet the title of legend can just as easily be affixed to his many other passions over the years. Recognized as one of the leading climbers in Yosemite's "Golden Age," Chouinard is an outdoor enthusiast across many sports and innovator of gear and apparel known for bringing an environmental concern to the market. Patagonia has played an important role in building the BTT brand, even designing the organization's iconic logo, while Chouinard has been a regular cast member on the *Buccaneers and Bones* television series airing on the Outdoor Channel.

Singer, songwriter and actor **Huey Lewis** is a tireless advocate of BTT's mission. The Grammy Award winning Lewis, who has sold more than 20 million albums over a 36-year career performing with The News, is a life-long angler first introduced to the sport by his father. Lewis has assisted with multiple BTT events by making appearances and donating concert experiences for sale at auctions. He has also produced public service announcements promoting improved water quality, championed habitat protection in areas vulnerable to development in the Caribbean, and joined *Buccaneers and Bones* for several seasons.

Actor, producer and director **Michael Keaton's** career on the big screen and television has spanned almost 40 years. Among his many Hollywood distinctions, Keaton won the Golden Globe Award and Oscar nomination for his 2014 performance in *Birdman*. From his Montana ranch to the saltwater flats, Keaton enjoys fly fishing as an important connection with nature. A member of the *Buccaneers and Bones* cast, Keaton in 2016 added his voice to those opposing the destruction of fragile flats at Blackadore Caye with outreach to the Government of Belize and messages via BTT's social media.

Tom McGuane's body of work includes 10 novels, short fiction, and several collections of essays devoted to his life in the outdoors. He won the National Book Award for his novel *Ninety-Two in the Shade*, and has been anthologized in *Best American Short Stories, Best American Essays,* and *Best American Sporting Essays*. His fishing collection, *The Longest Silence*, is revered by anglers and is but one example of his work that has influenced fishing writing. A member of the American Academy of Arts and Letters and the Fly Fishing Hall of Fame, McGuane is a regular cast member on *Buccaneers and Bones* and an advocate of flats conservation.

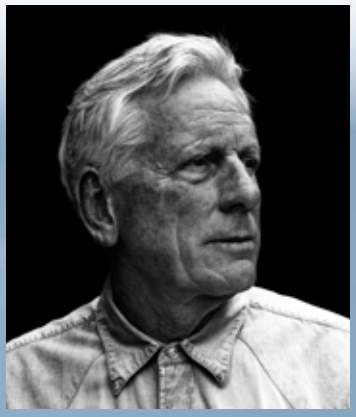
"BTT is an organization of people—concerned anglers and conservationists—who together achieve our mission," said BTT President Jim McDuffie. "We are grateful to Yvon, Huey, Michael and Tom for sharing their stages in the world with BTT."



Yvon Chouinard

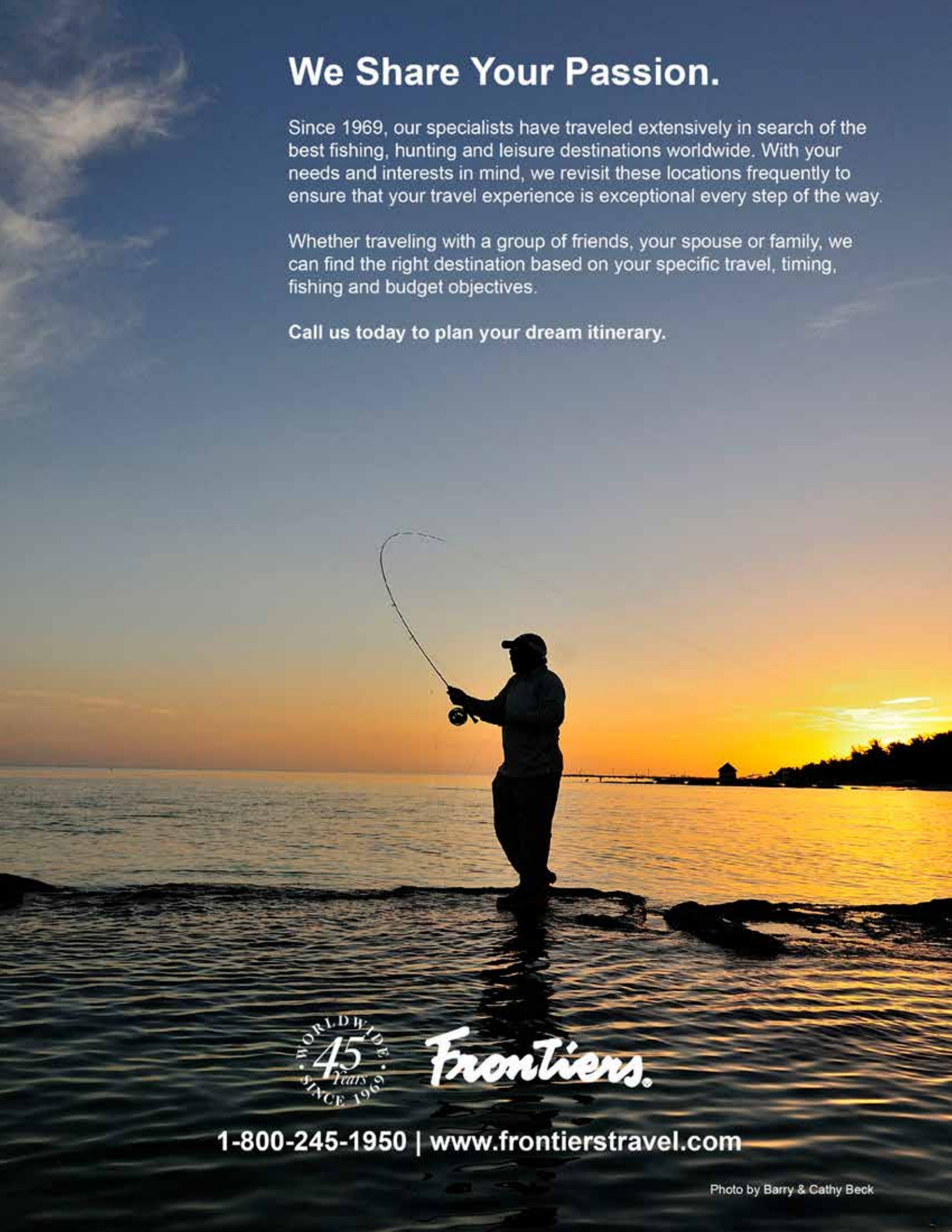
Huey Lewis

Michael Keaton



Tom McGuane

Photo: Scott Morrison


We Share Your Passion.
Since 1969, our specialists have traveled extensively in search of the best fishing, hunting and leisure destinations worldwide. With your needs and interests in mind, we revisit these locations frequently to ensure that your travel experience is exceptional every step of the way.
Whether traveling with a group of friends, your spouse or family, we can find the right destination based on your specific travel, timing, fishing and budget objectives.
Call us today to plan your dream itinerary.
WORLDWIDE
45 Years
SINCE 1969
Frontiers.
1-800-245-1950 | www.frontierstravel.com
Photo by Barry & Cathy Beck

Tippets

Short Takes on Important Topics

FWC SETS NEW BARRACUDA SIZE LIMITS

The Florida Fish and Wildlife Conservation Commission (FWC) listened to the testimony of many that the barracuda population is in trouble and passed new regulations for South Florida, creating a recreational and commercial slot of 15 to 36 inches fork-length, with an allowance of one fish over 36 inches per person or vessel per day. We especially applaud Commissioner Spottswood for leading this effort. Given the apparently poor state of the barracuda population in South Florida, BTT supports a much smaller slot limit, which would allow more barracuda to reach spawning size, but we are confident that the FWC will track the status of the barracuda population in the future, and make adjustments as necessary. The FWC previously implemented a bag limit of two fish per person and six fish per vessel.

Photo: Pat Ford

PROPOSED DEVELOPMENTS IN BELIZE THREATEN FLATS FISHERIES

At the time this piece was written, the saga of the Blackadore Caye development (Leonardo DiCaprio's development near San Pedro) was still unfolding. While the development group has officially withdrawn its plans to build overwater hotel suites on the protected flats around Blackadore Caye, the Belizean government's approval of the project set a dangerous precedent, opening the door to other developers. One has already proposed building 60 overwater cabanas on the flats surrounding Cayo Rosario, which is near Blackadore Caye and located within the same marine reserve. There are also rumors of another development with overwater structures being proposed on a nearby island.

To stay up to date, visit Defend Blackadore Caye's Facebook page.

CUBA UPDATE

Cuba's approach to flats conservation has been to declare large protected areas that are essentially catch and release zones (aside from strictly managed fisheries for lobster and other controlled fisheries). This approach has resulted in healthy habitats and robust flats fish populations. In addition to protected flats areas that have been long established, new protected areas are being created, which should increase flats fishing opportunities.

However, there are very few data on the fishing activities that occur outside of the protected areas. To what extent are bonefish, tarpon, and permit harvested as part of the commercial and artisanal fisheries? With countless coastal villages dotting Cuba's coastline, this is an important question for the long-term health of the flats fisheries. BTT has been working with colleagues from the University of Havana to answer this important question. Preliminary results suggest that the answer depends on the location. Some villages harvest large numbers of bonefish, for example, while tarpon are on the list in other locations. In some locations, bonefish, tarpon, and permit are absent from the harvest list. As more information comes in, our colleagues will work to get a better handle on the harvest rates, and use this information to create an education and conservation strategy.

COLLABORATION

Much of BTT's success is due to collaboration. Fishing guides are an important partner in BTT's efforts—from recruiting members, donating trips for auctions, and assisting in research projects. They are too numerous to list here, but the Conservation Captains webpage at btt.org has the full list, and we hope you will consider booking a trip with one of them! Similarly, we have many sponsors in the fishing industry, lodges and beyond that donate much-needed funds, traveling angler trips, and auction items to support BTT's mission. We hope you will take a look at our corporate sponsor page on the website and consider supporting these important partners.

TOURNAMENTS THAT SUPPORT

A huge thank you to the tournaments that supported BTT in 2016 by donating funds and raising awareness and support for our research. They included: The March Merkin Permit Tournament, The Cabin Bluff Tarpon Cup sponsored by Hell's Bay Boatworks, The Del Brown Permit Tournament, The WorldCast Anglers' Black Tail Invitational, The Lowcountry Tarpon Tournament, The Palometa Club Permit Tourney, and the Poonfecta Micro Tarpon Tournament. These events were fun for anglers and raised awareness and funds for BTT.

WORK IN THE YUCATAN

BTT's work in the Bahamas to determine the movement patterns of bonefish—home ranges, spawning migrations, spawning locations—has spurred a new research project in the Yucatan Peninsula that spans the Belize-Mexico border. Addiel Perez, a graduate student at ECOSUR in Mexico, is using tag-recapture to identify the important habitats for the region's bonefish and to use this information to formulate a management plan. Addiel is working extensively with fishing guides from Xcalak to San Pedro, and is honing in on a likely spawning location. This work is essential to the health of the region's bonefish fishery.

6TH INTERNATIONAL BTT SYMPOSIUM

The 2017 BTT Symposium will take place November 10-11, 2017, at the Bonaventure Resort in Weston, Florida. Don't miss this great event, which will kick-off BTT's 20th Anniversary celebration and feature science presentations, fishing workshops and classes, the second Art and Film Festival and our first ever Flats Expo, showcasing some of the newest innovations in flats fishing. Visit btt.org/symposium to learn more and purchase tickets.

BAHAMAS FLATS REGULATIONS

The Bahamas has implemented new regulations for the flats fishery. The regulations include a fishing license that is required for all anglers, and a restriction stating that if two or more people are fishing on a boat on the flats, they are required to hire a fishing guide. The new regulations also institute a new flats guide certification program. Many of the provisions in the new regulations were met with considerable opposition from anglers from around the world and guides throughout the Bahamas. A top concern of BTT is that the new regulations don't address the most serious threats to the fishery: habitat loss and degradation and illegal netting.

Photos: Aaron Adams

The Florida Keys Initiative

BROOKE D. BLACK, M.S.
Florida Keys Initiative Program Manager

A hallmark of BTT's success over the years has been its collaboration with others who share our concerns—and aspirations—for healthy flats fisheries. In the Florida Keys community, where every BTT initiative relies on partnership, we are benefitting from unprecedented levels of collaboration in pursuit of the mission.

Take for example the important question: Where do Keys bonefish come from? As this issue goes to press, BTT is concluding three years of bonefish genetics sampling. Thousands of bonefish fin clips collected by hundreds of anglers and guides from the Keys, Caribbean, and Gulf of Mexico are being analyzed at the Florida Fish and Wildlife Research Institute, the research arm of the Florida Fish and Wildlife Conservation Commission. The genetic analysis will show the extent to which the Keys and other bonefish populations are local, self-sustaining populations or rely on populations in other regions. By identifying where our fish come from, we can help determine where and how to manage for conservation.

The Florida Keys Initiative is also supporting the innovative Bonefish Restoration Research Project at Harbor Branch Oceanographic Institute, where scientists are working to spawn and raise bonefish in captivity. With the help of guides and anglers in the Keys, a small number of bonefish have been caught at multiple locations along the Keys for broodstock. If stocking becomes a viable restoration method, we will have tools available. Unlike past stock enhancement programs in other locations, BTT sees stocking as one tool that could be used in conjunction with others (like habitat restoration), and only for a short time–enough to bring the bonefish population to a self-sustaining level.

BTT's Epigenetics and Disease research is coming to a close in the Keys. This project is investigating how environmental factors, such as contaminants, affect bonefish health and the "software" that determines their health. For example, mercury may not necessarily damage the physical integrity of bonefish in an obvious way, but it can impact the reproductive system by altering the information contained in a fish's genes. This might result in less healthy or fewer bonefish in future generations. Results from this research could have implications on everything from sewage treatment to Lake Okeechobee overflow. We've been saying it for a while now: healthy habitats equal healthy fisheries.

Protecting fisheries is a tough battle, especially when habitats are also used for other purposes. The picturesque, warm waters that draw anglers to the Keys to fish for bonefish, tarpon and permit are equally enticing to other tourists. The Keys community relies heavily on that tourism and the activities that come with it. Catch and release fishing can be at odds with other on-the-water activities, but the economic impact fishing has on our local economy and our research results help us in our efforts to advocate for the fisheries. For example, BTT, the Lower Keys Guides Association, and other groups recently began a conversation with FWC, U.S. Fish & Wildlife Service and the Florida Keys National Marine Sanctuary regarding personal watercraft (PWC) use in the Lower Keys Backcountry. The group is developing better communication between guides, law enforcement, PWC operators and others to uphold current regulations and promote responsible use of a delicate resource.

Communication is also essential for showing how science can contribute to big-picture conservation. There is an ongoing discussion on possible regulations for Western Dry Rocks, an important fishing and diving area near Key West. Much of the attraction is that the area is home to large aggregations of fish, some of which are there to spawn. Thanks to the tracking of fish in Project Permit, we are finding that some of our flats permit move to Western Dry Rocks and other similar locations to spawn. This underscores the link between protecting the spawning fish and a healthy flats fishery. At face value, many regulations (such as closures of fishing for spawning fish) appear to be anti-fishing, but when we use science to formulate focused policy with the goal of ensuring healthy fisheries, everyone benefits.

Bringing together heavy hitters from all areas of expertise is necessary to nurse the Keys and South Florida's fisheries back to health. The ongoing fight over water management and the impact it is having on the region's fisheries and habitats is a good example of why we need to bring people together for a common cause. Combining science and grassroots energy, we can make the changes needed to restore the fisheries and protect them for the future.


WE CHASE FISH. WE CATCH FISH.
WE LET FISH GO.
THIS CAN BE HARD TO EXPLAIN.
It's something you either understand or you don't. The connection to a world bigger and more primal than yourself. The respect for the natural resource. These are the things that drive us, and just some of the reasons Hell's Bay Boatworks supports the conservation efforts of the Bonefish and Tarpon Trust.
THE WORLD'S FINEST HB SHALLOW WATER SKIFFS
HELLSBAYBOATWORKS.COM

Fix Our Water:
The Fight for Clean Water in Florida

BY NICK ROBERTS
Membership and Communications Manager, BTT

The national media coverage of widespread toxic algal blooms that plagued Florida's coastlines during the summer of 2016 cast a spotlight on the severe environmental damage being done by the state's continuing mismanagement of South Florida waters. Yet the challenges faced by Florida's recreational fisheries are nothing new. The state's water crisis has been decades in the making, and the toxic algae is only one of many problems caused by altering Lake Okeechobee's natural freshwater flows into estuaries. Releasing the lake's phosphorous laden water into the Everglades would violate restoration water quality standards, but holding it behind a leaky, 85-year-old dike during periods of high rainfall poses a danger to surrounding communities. And even if enough water could be sufficiently cleaned and sent south, its flow would be blocked by manmade barriers.

The alternative has been to discharge huge quantities of tainted water down the Caloosahatchee and St. Lucie Rivers, fouling their estuaries and killing seagrasses, oyster beds, baitfish and gamefish along the Gulf and Atlantic coasts. And with bitter irony, the Everglades are starved of water. One outcome of the reduced flows south is hypersalinity in Florida Bay, which triggered massive seagrass die-offs and more toxic algae.

Unprecedented in scale, the ongoing mismanagement of Florida's water is jeopardizing the state's nearly $10 billion recreational fishing industry. In response, Bonefish & Tarpon Trust launched the Fix Our Water Initiative last March seeking to engage anglers and the fishing industry in efforts to raise awareness and expedite revision of water management practices.

"Water defines our state, from the longest coastline in the contiguous US to some of the country's most unique freshwater systems," says Jim McDuffie, President of BTT. "Ensuring clean, abundant, more natural flows is the only way we can sustain balance in our ecosystems, ensure the health of our communities, and keep Florida among the top fishing destinations in the country."

Although water mismanagement is causing fishery problems throughout the state, South Florida has been hit hardest. Historically, clean, low-nutrient freshwater from Lake Okeechobee flowed south through the Everglades in a river miles wide and inches deep, known as the River of Grass. This natural "sheet flow" emptied into Florida Bay, creating a highly productive brackish water estuary and a world-class fishery. Today, however, the lake is a phosphorus pool measured at 50 to 100 parts per billion (ppb)—five to ten times greater than the water quality standard of 10 ppb. Until Lake Okeechobee water meets this standard, binding federal-state agreements will bar its release south to the Everglades.

Improved water quality is just part of the solution. Even if sufficient clean water was available now—and it is not—the

"Fix Our Water is about getting anglers to make their voices heard in an effort to enact policy changes."

For more information about how you can get involved, please visit: BTT.org/FixOurWater

dike surrounding the lake and a vast system of canals and levees criss-crossing the landscape block historic sheet flow. Only meager amounts of water make it south from the lake, and much of it is sluiced to the Atlantic, drying out the Everglades and resulting in hypersalinty in Florida Bay.

The greatest volume of water makes its way west and east down the Caloosahatchee and the St. Lucie rivers, causing a host of severe problems. Last summer's discharges destroyed millions of dollars' worth of habitat and fisheries restoration work in the affected areas. Altered freshwater flows in other parts of the state decimated oyster reefs in the Apalachicola area, impacted the juvenile snook population in the mangrove creeks in Charlotte Harbor by reducing the abundance of the fish's prey, and contributed to algae blooms, high bacteria levels, and fish kills in the Indian River Lagoon.

"Anglers have to understand that unless we change the way water is managed in Florida, our fisheries could very well disappear," says Dr. Aaron Adams, BTT Director of Science and Conservation. "Fix Our Water is about getting anglers to make their voices heard in an effort to enact policy changes."

So what needs to happen? More natural flows of clean freshwater through the Everglades to Florida Bay must be restored now. This will also stop the destructive water releases into the Caloosahatchee and St. Lucie estuaries.

The plans to achieve these goals were approved in 1988 and 2000 by Tallahassee and Washington: Modified Water Deliveries and the Comprehensive Everglades Restoration Project (CERP). But each has been only partially implemented; progress has been far too slow given the accelerating environmental decline and languishing restoration efforts. For example, the first plan, "Mod Waters," took 28 years to partially implement. Excessive bureaucracy and inadequate funding—symptoms of insufficient political will—are the culprits.

"Politicians in Tallahassee and Washington need to be constantly reminded by constituents that the Everglades is crucial to their way of life," says Captain Daniel Andrews, President of Captains for Clean Water. "CERP is the largest ecosystem restoration project in the history of the world. It comes with a steep price tag, but the cost of inaction is much higher."

Within CERP is the Central Everglades Planning Project (CEPP), which is a bundling of separate high-impact CERP projects into one program. Initiated in 2011 to expedite restoration efforts, CEPP is designed to increase flows through the State's Water Conservation Areas between Lake Okeechobee and Everglades National Park. The plan calls for removing more than 25 miles of levees and canals, allowing more water to flow south from Okeechobee into the heart of the Everglades. Congress and the State must appropriate the funds to complete the various projects.

continued on next page...

Tarpon fishing in Florida Bay. Photo: James Buice

"It's pretty simple, if we don't fix the water soon, we will lose the habitats, and the fish populations will follow."

Billions of gallons of water being discharged from Lake Okeechobee into the St. Lucie River. Photo: Dr. Zack Jud

Discharges from Lake Okeechobee last year resulted in numerous fish kills throughout the region. Photo: Marjorie Shropshire

Ultimately, CEPP would restore more natural sheetflow to 10,000 acres of degraded Everglades wetlands and deliver more water to Florida Bay.

"CEPP is a solid step in the right direction for Everglades restoration," says Dave Preston, Director and board member at BullSugar.org, "but there is still much more that needs to be done. Scientists estimate that CEPP's completion would only reduce Lake Okeechobee's harmful discharges east and west by around 14 percent, as it does not address our crucial need for water storage south of the lake."

The National Academy of Sciences, the Water Institute of the University of Florida, and Everglades scientists agree that the critical missing piece of Everglades restoration is prompt construction of more "Stormwater Treatment Areas" (STAs) south of Okeechobee (STAs are essentially a mix of marshes and reservoirs). These STAs can scrub the phosphorus out of the lake water and store it for timely release into the Everglades. Since it will take 40 or more years to clean up Lake Okeechobee, and it's unlikely that South Florida's estuaries and fisheries can manage to hang on that long, the STAs are the only immediate solution to increasing the volume of clean water to send down the River of Grass to Florida Bay. The best sites for new STAs are on land held by U.S. Sugar and/or Florida Crystals. Unfortunately, plans to buy the land have stalled. Necessary funds were available through the 2014 Water and Land Conservation Amendment but the lack of political will and U.S. Sugar's new reluctance to sell have stalled the project.

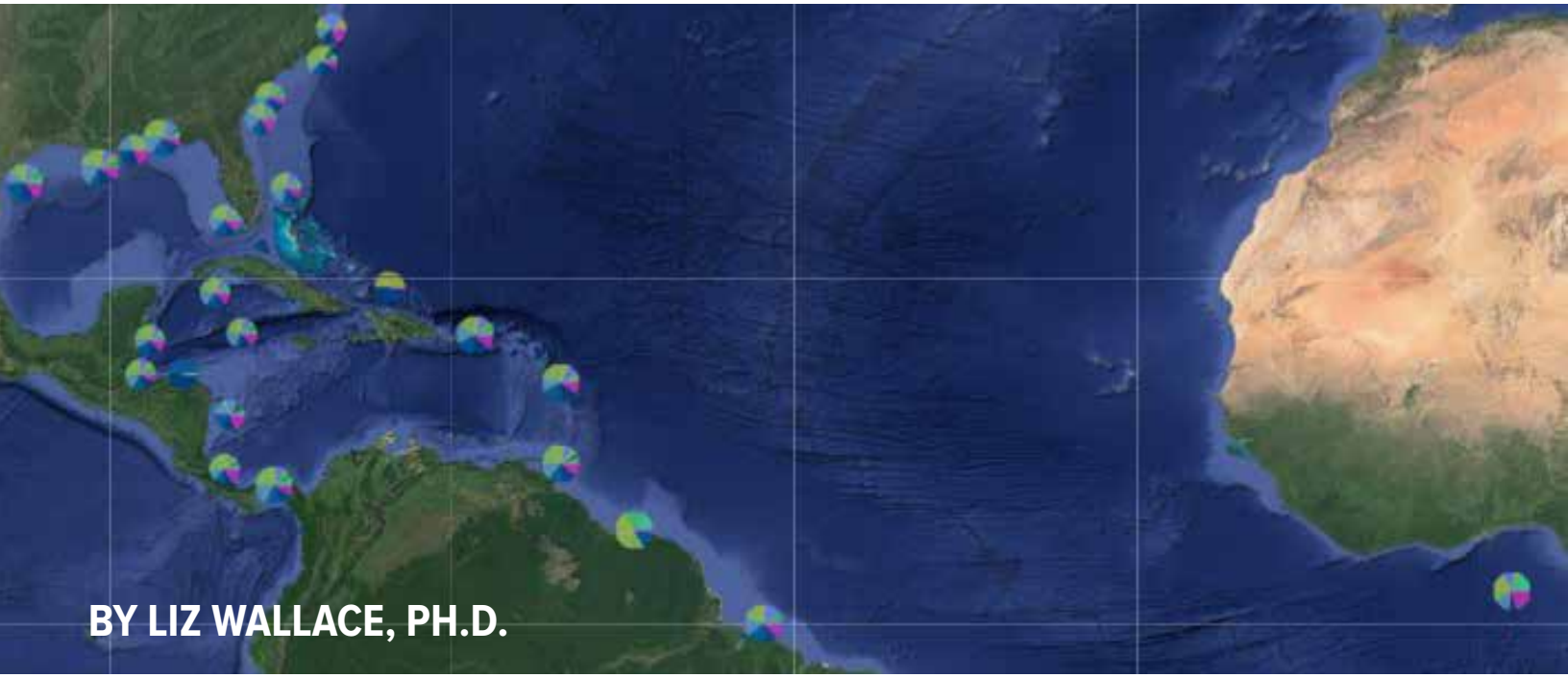
Hopes to move the STAs forward were spurred by Florida Senate President-elect Joe Negron and Florida Senator Rob Bradley, who recently introduced a promising new bill, which would allow for the purchase of 60,000 acres of land south of Lake Okeechobee. If passed, SB 10 is expected to provide 120 billion gallons of storage, dramatically increasing the flow of water to the Everglades, while simultaneously decreasing harmful discharges into the St. Lucie and Caloosahatchee estuaries by nearly 50%. Championed by Senate President-elect Joe Negron, SB 10 represents a significant breakthrough in the fight to restore the Everglades and save our fisheries. State Representative Thad Altman has bolstered restoration efforts by introducing the companion House Bill 761. But now is not the time to let up; anglers must keep making their voices heard in order to bring about meaningful change. With the information and regular updates shared through Fix Our Water, BTT will continue to support anglers' efforts to effectively advocate for the state's fisheries. Ultimately, their fate depends on how well we manage our water going forward.

"It's pretty simple," says Dr. Adams, "if we don't fix the water soon, we will lose the habitats, and the fish populations will follow."

Photo: Dr. Zack Jud

NOT INTENDED FOR INDOOR YOU.

YETI COOLERS ARE BUILT TO BE INDESTRUCTIBLE AND KEEP ICE FOR DAYS.
BUILT FOR THE YOU YOUR CO-WORKERS NEVER SEE. BUILT FOR THE RESTLESS.
BUILT FOR THE NOT-SO-AVERAGE WEEKEND. **BUILT FOR THE WILD.**



BY LIZ WALLACE, PH.D.

This map displays the genetic profiles from one microsatellite locus, Mat-22. Each pie chart is a tarpon collection area, and each color wedge is a unique microsatellite allele (repeat unit). Alleles were shared among all sites across the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea.

Tarpon Genetics Program Results: High Connectivity Across the Atlantic Basin Highlights Need For International Management

The Tarpon Genetics Program has concluded, providing illuminating results that will help build effective regional management and conservation plans for tarpon. This two-year collaborative study between BTT and the Florida Fish and Wildlife Conservation Commission (FWC) sought to study how many distinct Atlantic Tarpon (Megalops atlanticus) populations exist, and if more than one existed, where they were geographically located.

Thanks to the efforts of anglers, guides, lodges, and researchers, more than 23,000 tarpon scale samples were collected from all over the world, providing the study with a massive dataset for analysis. Many were collected from Florida waters during the previous FWC Tarpon Genetic Recapture Study, and scales were collected from tarpon in 24 other areas across the Gulf of Mexico, Caribbean Sea, and Atlantic Ocean. Different portions of tarpon DNA were examined to determine if the patterns in each individual tarpon were the same or different from other tarpon. If they were the same, then no matter where the fish were caught, they would be considered part of the same genetic population.

How many distinct tarpon populations exist?
Only one! A rigorous and comprehensive suite of statistical approaches was used to analyze the data. The overall level of genetic diversity in the Atlantic tarpon indicated high levels of gene flow (mixing over generations through interbreeding) across the entire region. Fish from Virginia to Louisiana and all across the Caribbean to Brazil displayed shared genetic profiles. Even tarpon samples collected from across the Atlantic Ocean, along the West African coast, shared these profiles. The results reveal that a single Atlantic tarpon stock exists. Although a preliminary study by McMillen-Jackson in 2005 suggested two stocks (West and East Atlantic), our study used a much more extensive dataset and advanced analytical methods to reveal trans-Atlantic connectivity and one region-wide tarpon stock.

How can gene flow occur over such great distances?
Two life history traits of tarpon likely maintain the high levels of population connectivity we observed across the region. First, adult tarpon are capable of long-distance migrations (tagged fish have been documented traveling more than 1700km). During this study, several long-distance recaptures were identified. Three fish first caught and sampled by anglers in Florida waters were recaptured by different anglers along the Alabama and Louisiana coasts more than three years later. These migrations increase genetic mixing, as fish from several areas likely converge on the same spawning sites.

Second, tarpon larvae can be transported great distances by ocean currents. This dispersal of young tarpon also increases mixing, as larvae originating from different spawning sites may settle in the same inshore location. The connections don't have to be direct, they can occur in step-wise fashion: a tarpon larvae spawned in Cuba may end up in Belize, where it grows up and spawns and its larvae are

continued on page 20...

BOCA GRANDE

THE EVERGLADES

MARQUESAS

SCARP RIDGE LODGE
COLORADO

CHALET PELERIN
SAVOIE

THE MOTHERSHIP
FLORIDA

BAHAMA HOUSE
BAHAMAS

TAYLOR RIVER LODGE
COLORADO

DEPLAR FARM
ICELAND

WWW.ELEVENEXPERIENCE.COM

One tarpon population (or stock) exists in the Atlantic Ocean. A combination of adult migrations and larval dispersal, carried in prevailing ocean currents, maintain the high regional connectivity.

transported to Florida. This connects Cuba, Belize, and Florida tarpon populations. It's important to note that it only takes a few percent of mixing between locations in each generation to result in a single population or stock.

Warm ocean surface currents in the region flow in a clockwise path, resulting in the movement of larvae among areas. Additionally, the South Equatorial Current (SEC) flows West from Africa towards Brazil and the southern Caribbean. Despite the distance between Africa and South America, the data reveal genetic connectivity in tarpon. This may occur through larval dispersal via the SEC and rare adult migrations, though migratory pathways have not been studied in the Southern Caribbean and Eastern Atlantic.

What do these results mean for tarpon conservation?
For the Atlantic tarpon population—which the International Union for Conservation of Nature recently classified as "vulnerable"—connectivity means conservation efforts must apply broadly across the region. Tarpon mature slowly; as a result, the Atlantic population will be slow to recover from past and ongoing declines. Effective management for increasing populations will require an international scope. Recreational and commercial harvest still occurs and remains unregulated in parts of the region—the continued harvest of tarpon in up-current areas like Louisiana, Mexico, and Cuba may negatively impact the tarpon population and fishery down-current in areas like Florida and The Bahamas if enough tarpon are harvested to cause a decline in how many juveniles are produced each year. Where regulations are lacking, conservation efforts should support the creation of harvest limits and encourage catch and release where possible. At the local level, protection of critical juvenile habitat remains an urgent need. Efforts to minimize juvenile habitat loss (particularly the loss of mangroves) and restore degraded habitat will also benefit local fisheries.

Given these findings, BTT will continue the regional approach to conservation. This includes efforts to improve fishery regulations; angler education on proper catch and release practices to ensure tarpon survive after release; identification of spawning locations (so these areas can be protected); and identification, protection and restoration of juvenile tarpon habitats. Although BTT's work on these topics has been ongoing, these new results provide BTT with more leverage as they continue to advocate for the protection and conservation of tarpon throughout their range.

Tarpon Acoustic Tagging

To supplement our growing knowledge of tarpon, BTT began a four-year tarpon acoustic tagging program in March 2016 to obtain scientific data that will be used exclusively to protect tarpon through improvements in fishery management. No specific data on fish locations will be distributed to the public—sorry!

The project is similar to the permit acoustic tagging project in that fish are implanted with tags and can be detected by an array of acoustic receivers. With more than 1,300 receivers in the water in the Gulf of Mexico, and another 3,000 plus along the coastal southeastern US (many scientific colleagues are also using acoustic tagging to study different species of fish), this project will be able to examine both local and long-distance movements by tarpon for many years.

Although satellite tagging previously funded by BTT provided valuable data, the tags typically only stayed on the tarpon for a few months at a time, preventing long-term tracking. Acoustic tags are smaller, less expensive, and can remain active for up to seven years. Because acoustic tags come in a range of sizes, they can be used on tarpon 20 pounds and larger, not just the extra-large adults that were the focus of satellite tracking studies.

This project will help answer such questions as:
- Is the tarpon population large and robust or small and vulnerable? If anglers in a particular location are fishing for the same fish every year, then the tarpon population is probably smaller than we think, and issues like shark predation are a concern.
- Do tarpon use the same spawning site each year or move among spawning sites? Ocean currents typically carry larvae from a spawning site to juvenile habitats in a specific geographic region. If the same adults use the spawning site every year, local adult losses will cause local declines in juveniles.
- How do changes in freshwater flows into coastal waters influence tarpon movements? Do the problems with Lake Okeechobee and the Everglades restoration impact tarpon?
- What are the movement patterns and habitat use of mid-size tarpon (20-50 pounds)? How are these tarpon impacted by coastal water quality issues? This size class, which is the future of the fishery, is very vulnerable to changes in coastal habitats and water quality.

BristolBayLodge.com
509-964-2094

Alaska's Premier World-Class Wilderness Fishing Lodge

Strategically located in the heart of America's largest state park, Bristol Bay Lodge has the distinct advantage of being utterly surrounded by pristine wilderness. The lodge's proximity to the watersheds within Wood-TikChik Park and Togiak National Wildlife Refuge means more fishing and less travel time, with flights averaging only 30 minutes. Abundant home water fishing is also minutes from the lodge. We also have day trips and overnight experiences that allow our guests to fish and see Alaska like no other Alaskan lodge. Bristol Bay Lodge has been in business for over 43 years. We would love to have you join us this Summer 2016.

Bristol Bay Lodge
ALASKA
Founded In 1972

The Guides Behind the Florida Keys Fishery

CAPTAIN CARL BALL

Ft. Lauderdale, FL
Experience: 20 years guiding in Biscayne Bay.

What's your favorite part about being a fishing guide?

The hunt: finding fish and figuring out what they want. No matter the skill of the angler, I enjoy working with people to catch fish that excite them.

How have you seen the South Florida fishery change since you started guiding?

Throughout my career, one line comes to mind that so many people say. "I remember when…" It seems the fishing is never as good as it used to be. I used to have a lot more bonefish and permit spots. There are fewer good spots and fewer fish in them. For me, tarpon fishing has been pretty consistent depending on the seasonal weather pattern. Tarpon get fished a lot, but anglers are becoming more conservation-minded and are learning how to handle and fight tarpon for a healthy release.

In what ways have you participated with BTT?

I tagged bonefish from 2009 through 2011 then began collecting bonefish fin clips in 2014. I have been tagging permit since 2010. This year I donated a couple days to collect bonefish blood samples and I have always donated trips for fundraisers. I collected tarpon tissue samples for FWC and the Tarpon Genetics Recapture Study from 2009 until 2014 and was the 8th overall top sampler for the study. I was also on the permit panel for the last two BTT symposiums. I have always tried to make clients feel like they are a big part of the work BTT is doing by telling them about the various programs and why we are collecting samples and tagging fish.

Who's a fellow fishing guide or fishing legend you look up to and why?

Captain Bob Branham. He has seen it all and is willing to share his experiences with you. He is a conservationist who has supported bonefish research for as long as I can remember. And of course he knows his fishery as well as anyone can.

What piece of advice would you give to the next generation of guides and anglers fishing South Florida?

Do something to support BTT and other conservation organizations. Donate trips and help out with research. Support habitat restoration and preservation. And remember, it's not always about catching ALL the fish. Take time to enjoy the overall experience of being out on the water.

CAPTAIN JOHN O'HEARN

originally from Baltimore MD, now living on Big Pine Key. Experience: 17 years guiding, primarily fishing the Marquesas and Lower Keys.

Why did you decide to become a fishing guide?

After graduating from college, I quickly realized that my degree in anthropology offered little in the way of job opportunities. Out of ideas, I decided to move to the Keys in the hopes of catching my first bonefish. One thing led to another, and here I am today.

What's your biggest concern about your fishery today?

The biggest challenge this fishery faces is the impact of an expanding population on a finite resource: More cars, more boats, more impact, more pressure, more pollution, more waste, more everything. Unless regulators and the fishing community adapt, I fear for the future. The recent statewide rally cry for Everglades restoration and improved water quality is a great step. Hopefully the public and our elected officials have the resilience to see it through. The fishing community needs to find better ways to interact with each other and the fishery as we move forward. Better defined (and followed) rules of etiquette would go a long way to better sharing this resource. But perhaps hardest of all, we might need to learn when enough is enough. How many bonefish or tarpon do we need to catch from a given spot or on a given day? It feels great at the time, but it's rarely as good the next time. A little restraint could go a long way, and I'm trying my best to be more thoughtful about that.

How have you gotten involved with BTT?

I currently serve on the Board of Directors of BTT. I have tagged permit and bonefish and fin clipped bonefish. I was also fortunate enough to be guiding Nat Linville when he caught a tagged permit.

What's a piece of advice you have for the next generation of guides?

Go fishing as much as possible. No matter the weather, if you have set aside the time, go fishing. Get invested and active in the fishery. Participate in BTT data collection efforts. Join local conservation organizations like BTT, the Lower Keys Guides Association or the Florida Keys Guides Association. Make your voice heard. Attend public meeting hosted by state or federal management bodies and speak up. Send emails to elected officials. Don't be silent. No one knows a fishery or ecosystem better than those who use it every day.

Four guides with a combined 87 years of guiding experience throughout the Florida Keys and Biscayne Bay offer insight into their fishery and some of the opportunities and challenges it faces today.

CAPTAIN MARK KROWKA

Islamorada, FL Experience: 40 years guiding from Palm Beach to the Marquesas and everywhere in between.

Tell us a memorable story about a day on the water in South Florida.

One of my most memorable days on the water was the first time I got to fish with Al Pflueger. Joe Rodriguez was poling us, and Al wanted me to take the first shot at tarpon that morning. He put down his rod, and sat back on the cooler. It was like Picasso watching you with a crayon in your hand, I was so nervous. Al is a one of a kind, once in a lifetime fisherman who can cast a fly, spinning rod, and bait caster with equal excellence, and then be just as productive going offshore with heavy tackle trolling, or kite fishing, or deep dropping. He has no equal. As a bonus, he is one of the nicest gentlemen you could meet, in or out of fishing circles.

What's your favorite thing about guiding?

My favorite part of guiding is, by far, the long-term relationships enjoyed with families I've fished over many years. From parents, to children, to now the grandchildren, it is truly cathartic for me.

How have you seen the South Florida fishery change (for better or worse) since you started guiding?

Sadly, there is not one part of South Florida's fishery that has changed for the better in my limited lifetime. It is still great, and Islamorada is still the best place to fish in the world, but each year seems to get a little bit tougher to produce.

What's your biggest concern about your fishery today?

There is no one single biggest concern about today's fishery. Most declines are due to multiple causes: pollution, water management, more people, strains on the fish from both recreational and commercial boats. It seems incredible that these fish, particularly the bonefish, tarpon, and permit, want to return to the locations where they are accessible year after year.

What piece of advice would you give to the next generation of guides and anglers fishing South Florida?

Many of the newer guides are so competitive (which is a great attribute), but some to the point of fishing for themselves, and not for their anglers. That reputation can become established early on, and is not good for long-term angler/guide relationships. The very best guides who ever lived could walk into the center of any full stadium at a sporting event, and likely nobody there would know who they are. You have to do this for the love of fishing, and helping people catch fish. That is ultimately what guiding is really about.

CAPTAIN DEREK RUST

originally from Whitman, MA
Experience: 10 years guiding with Rusty Fly Charters out of Hawk's Cay Resort, Duck Key.

Tell us a memorable story about a day on the water in South Florida.

I had plans to fish the one day with my friends Jason and Dan, but the weather looked terrible. I told them it wasn't worth them driving down from Miami to go fly fishing in 20 knot winds and black skies. Their eternal optimism won out, and we headed out in the elements. We checked a few flats with absolutely no visibility, and we were pretty content cracking jokes and giving each other a hard time. We were running on the ocean side of Marathon trying to find somewhere to hide from the wind. In the distance, we could see something floating in the water that looked like a capsized boat. We drove over to it and found a person treading water next to a flipped over 16' open catamaran-style sailboat. The poor guy was freezing and had been in the water for hours drifting around because he couldn't right the boat in the winds. We got him on our boat, gave him a dry jacket and towel, and took him to Hawk's Cay to warm up.

We dropped him off and went back out to retrieve his sailboat for him. He urged us to leave it, thinking we couldn't get it upright. We headed back out anyways and before I knew it, Jason had the sailboat tied up and we pulled it upright and towed it back to the ramp and got it on the trailer. His parents were there and thanked us and tried to give us some money for helping out their son, which we declined. No more than ten minutes later, the dark skies gave way to pure blue, and we found some happy, muddling bonefish and caught some on fly. We probably shouldn't have gone, but we ended up being able to help someone and had some great fishing. You just never know until you go.

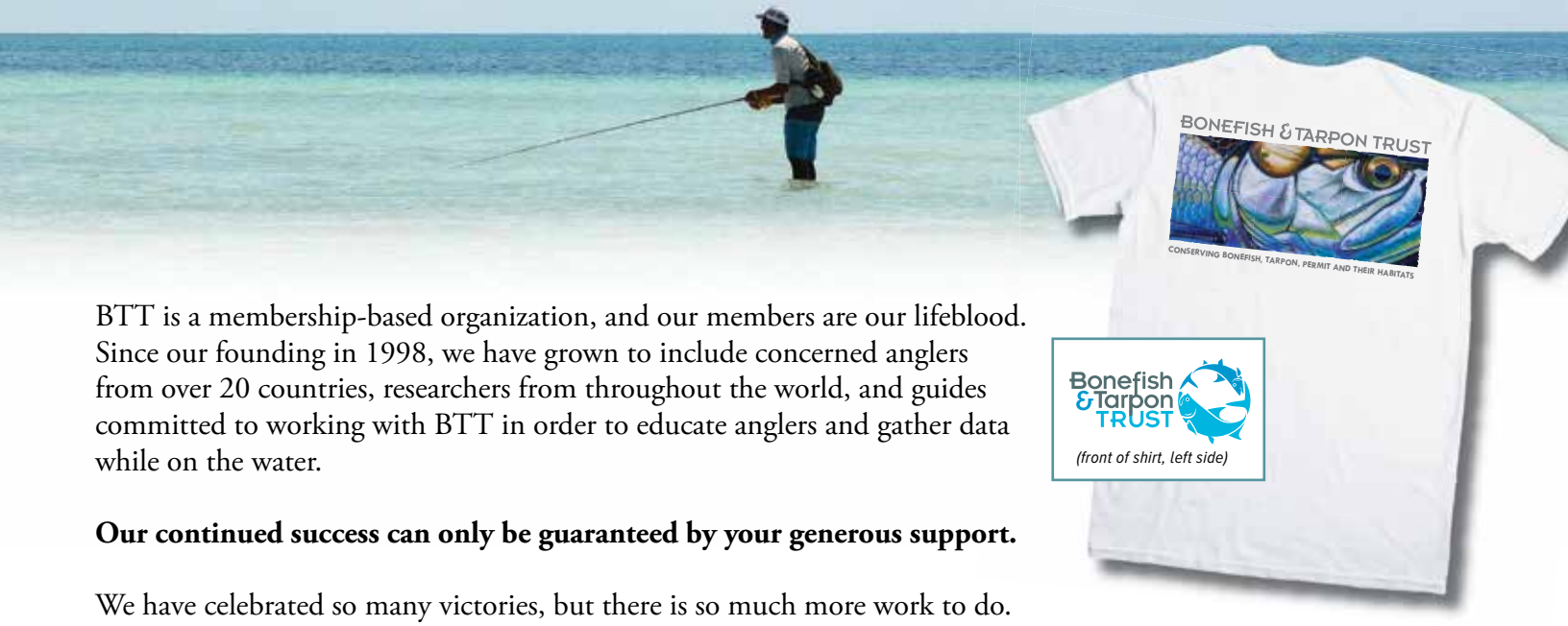
What's your biggest concern about your fishery today?

My biggest concern for our fishery is 100 percent the quality of the water. We need to fix our water now. We know what needs to happen to make it right, now we just need to make it happen.

What piece of advice would you give to the next generation of guides and anglers fishing South Florida?

My best advice to the next generation would be to protect our resources as best as you can. Practice good catch and release, and spread the love of fishing to as many people as possible. Get off your phones and get outside! I feel the best way to preserve the fishery for the future is to join organizations like BTT, and use your right to vote and elect people who care about trying to fix environmental issues.

Join Today. Protect Tomorrow.



Bonefish & Tarpon TRUST
(front of shirt, left side)

BTT is a membership-based organization, and our members are our lifeblood. Since our founding in 1998, we have grown to include concerned anglers from over 20 countries, researchers from throughout the world, and guides committed to working with BTT in order to educate anglers and gather data while on the water.

Our continued success can only be guaranteed by your generous support.

We have celebrated so many victories, but there is so much more work to do. We need your support to do it! A stronger membership base equates to added research dollars and more voices to benefit bonefish, tarpon, permit, and their valuable habitats.

Please help us in our mission by joining, and urging your friends, guides, lodges, and fishing clubs to join. Depending on the level selected, members will receive new BTT items that include a T-shirt with artwork by Derek DeYoung, new BTT hats, rods and reels, and more. Please fill out and mail in the form below or go to **www.btt.org** and click "**Join BTT**" to become a member today.

Bonefish & Tarpon TRUST

For our present members, thanks again for your valuable support; for our members-to-be, stand with us on behalf of bonefish, tarpon, and permit.

Yes, Please enroll me as a member of BTT!

Please charge to my ◯ Visa ◯ Mastercard ◯ AMEX ◯ Discover

Account Number

Expiration Date____ /____ CVC _____ Signature _____

◯ I have included a check with this application.

Name _____

Address _____

City_____State_____Zip _____

Country_____ Phone(_____) _____

Email_____

My t-shirt size is ◯ SM ◯ M ◯ L ◯ XL ◯ 2X ◯ 3X

Who may we thank for referring you to us? _____

MEMBERSHIP CATEGORIES

- ◯ $35 Military / Student (under 25)
- ◯ $50 Member
- ◯ $100 Premium Member
- ◯ $500 Conservation Sponsor
- ◯ $1,000 Gray Ghost Sponsor
- ◯ $2,500 Permit Patron
- ◯ $5,000 Silver King Sponsor
- ◯ $10,000 Tarbone President's Circle
- ◯ $25,000 Tarbone Chairman's Circle

◯ **Please do not send me any incentives. I would like 100% of my donation to go toward research.**

To expedite the benefits of your membership, please apply online at **www.btt.org**.

Mail to:
Bonefish and Tarpon Trust
135 San Lorenzo Ave.
Suite 860
Coral Gables, FL 33146
786-618-9479

Bonefish Conservation and Restoration Program

PAUL WILLS, PH.D.
Harbor Branch Oceanographic Institution
Florida Atlantic University

JON SHENKER, PH.D.
Department of Biological Sciences
Florida Institute of Technology

Eggs collected from bonefish after the initial hormonal injection – fish are getting very close to spawning, and a variety of hormones and procedures will be used in 2017 to induce complete egg maturation and spawning.

Though the Florida Keys are still a world-class fishing destination, the decline of the region's bonefish population over the past decades is a tremendous concern to anglers, fishing guides, scientists and resource managers, and a threat to the Keys economy.

Bonefish & Tarpon Trust is leading the way to answering the vital questions of what might be causing the problem and how the population can be restored to healthy levels.

An important part of BTT's efforts are focused on evaluating potential sources of the problem by funding multiple studies, including the sources of larval bonefish that may be coming from locations in the Caribbean; changes in prey abundance in the Keys; chronic long-term responses to toxicity and environmental stressors in the changing Keys environment; changes to habitats.

These critical studies will help identify the causes of bonefish population decline in the Florida Keys. As the causes are discovered and plans formulated to fix them, helping the bonefish population recover will be equally important. In recent years, our understanding of bonefish reproduction in wild populations, primarily through field research in the Bahamas, has grown significantly. We are using that knowledge to drive a major new project to spawn bonefish in aquaculture systems, rear their larvae, and produce juvenile bonefish. This five-year program, funded by a partnership between BTT and the National Fish and Wildlife Foundation (NFWF), seeks ultimately to provide partner organizations with a new restoration tool in the form of stock enhancement—a tool that will be available in the event that the Florida Keys population needs a boost to sustainably return to its once abundant levels. The project is being conducted at the Aquaculture Research Park at Florida Atlantic University's Harbor Branch Oceanographic Institution (HBOI) in Fort Pierce, Florida. HBOI has one of the preeminent aquaculture programs in the southeast US, with facilities, experienced research scientists and technical support all ideally suited to this ambitious undertaking.

The goals of the program include learning what controls production and survival of larval and juvenile bonefish in culture systems and in natural habitats. Juveniles produced in culture can be used to identify optimal juvenile habitat in the Keys, and to help target habitat restoration efforts in the natural ecosystem. While we don't anticipate releasing large numbers of juveniles into the wild, having the ability to produce those juveniles is a very handy tool to have if needed in the future.

Pioneering studies by Dr. Andy Danylchuk (University of Massachusetts) and Dr. Aaron Adams have given us a great start to understanding when and how bonefish spawn. Their efforts have led to discovery of half a dozen sites in the Bahamas where bonefish gather in huge schools just prior to spawning. Building on their initial studies, we've caught fish from those schools, implanted

Jon Shenker preparing an injection of reproductive hormones in a mature bonefish.

Paul Wills (left), Chris Robinson, and Bob Halstead (former BTT staff, and now a grad student at HBOI) checking on the reproductive condition of bonefish in a culture tank at Harbor Branch.

them with sonic tags, released them back into the schools, and followed them offshore on their nighttime spawning run. Other fish have been established in temporary tanks on land, where we've attempted to get them to spawn so we can start to learn how to incubate their eggs and grow their larvae. The research team is close to obtaining viable embryos, which will be a focus of upcoming trips to bonefish spawning sites in the Bahamas.

The program at HBOI started in March 2016 with the reconfiguration of existing tank facilities to hold adult bonefish for broodstock. Procedures were developed to capture fish and transport them to HBOI, to maintain them in captivity, and to induce them to spawn in our culture tanks. With the assistance of Captain Bob Branham, we caught two fish from Biscayne Bay in late spring. The fish readily handled the transport to the lab, and quickly began feeding on shrimp in a large aquaculture tanks. That success led to a larger broodstock collection effort in July. BTT's Brooke Black coordinated a five-day effort in the Middle and Lower Keys that enlisted the efforts of Captains Richard Black, David Denkert, Bo Sellers and angler/BTT friend Rob to catch 20 fish, hold them in tanks at the Keys Marine Lab on Long Key before bringing them to HBOI, where they readily adapted to captivity.

With spawning season upon us (bonefish spawn between late October and April), we examined the reproductive condition of the fish at HBOI in early November 2016 by extracting gonad samples from the bonefish. Several of them were indeed producing eggs. Our team will monitor their development carefully in upcoming months, and perhaps use injections of reproductive hormones to help them get ready to spawn. While waiting for spawning, new larval rearing protocols will be developed, so we'll be ready to tackle the next major challenge.

2017 promises to be an exciting year in our growing knowledge of bonefish reproduction and our capacity to spawn and rear fish in a laboratory setting.

Photo: Jacqueline Chapman

Next Level Permit Tracking:

Using Acoustic Telemetry to Identify Permit Movements and Inform Conservation

BY JACOB W. BROWNSCOMBE, PH.D.

For many anglers, sight fishing for permit on the flats is considered one of the most exciting and challenging angling experiences out there. The flats fishery is primarily for sport, and is therefore almost entirely catch and release. Permit also frequent nearshore reefs and shipwrecks, where, in Florida and other places, harvest is more common by both anglers and spearfishers.

With growing numbers of anglers pursuing permit in South Florida, there is an increasing need to better understand permit population dynamics, spatial movements, and habitat use to ensure the sustainability and conservation of this vibrant fishery. This is particularly important in the Florida Keys given that permit are subject to varied levels of protection from harvest over both space and time. The Special Permit Zone (SPZ), established in 2011 by the Florida Fish and Wildlife Conservation Commission, provides protection from harvest from Biscayne Bay south through the Keys. Within this region, harvest of permit is prohibited from May through July with the goal of protecting them during spawning. Outside of this season, anglers are allowed to harvest one permit over 22-inches fork length per person per day within the SPZ. There is no closed season outside of the SPZ, and two permit over 11-inches fork length may be harvested per person per day, one of which may exceed 22-inches.

While these regulations provide some protection for permit, it is unclear whether they are sufficient to ensure a sustainable fishery. We know permit are reproductively active throughout the summer months, and may visit nearshore reefs to spawn outside of the protected period of May through July, when they would be more vulnerable to harvest. Further, the spatial scale of permit movements is unclear, as is how much they move outside of the SPZ and become more vulnerable to harvest.

Recognizing the need to better understand permit populations, Bonefish & Tarpon Trust, in collaboration with Costa Del Mar and the Florida Fish and Wildlife Conservation Commission (FWC), initiated Project Permit in 2011. The first stage of this project uses external dart tags, deployed with the help of many fishing guides and anglers in Florida, Mexico, Belize, and Cuba. To date there have been 18 recaptures of tagged permit in Florida, the majority in close proximity to the original tagging location in the Florida Keys, indicating these fish tend to stick around the same areas. However, one individual tagged in Biscayne Bay traveled over 60 miles north, where it was harvested outside of the SPZ. A second permit tagged in Biscayne Bay was recaptured on an offshore wreck near Key West–likely a migration to a spawning location.

The second stage of Project Permit, launched through the generosity of BTT board member Dave Horn and the March Merkin Permit Tournament, was initiated in 2016, aiming to better understand spatial movements and habitat use by employing a more advanced tracking technique—acoustic telemetry. This technique involves tagging permit by surgically implanting acoustic transmitters in the fish; these tags emit ultrasonic signals that can be detected with specialized receivers that are placed throughout the flats, nearshore reefs and shipwrecks in the Florida Keys and beyond. To date, 19 permit have been tagged throughout the Lower Florida Keys. Early findings confirm evidence from the dart tagging studies, but with more detail—permit tend to visit the same regions of the flats very frequently, and do not appear to move among different regions of the Lower Keys. When anglers and guides target fish in a particular spot, these are likely certain groups of fish that regularly frequent the area. However, some fish tagged on the flats made larger-scale movements to known spawning locations on the Florida Reef Tract from mid-June to late July of 2016. These broad scale movements were likely related to spawning, providing insight into the timing and locations of permit spawning on the reefs.

The permit acoustic tracking project will continue for two more years, providing additional, much-needed insight into permit movement patterns in the Florida Keys and beyond. As we learn more about permit movements, we will be armed with the information needed to advocate for informed management of the fisheries to ensure they are around for many generations to come.

This project would not be possible without the support of donors, who can sponsor individual permit tags or receivers. Donors receive updates on the project including the general movements of their sponsored fish. This project is also supported by many fishing guides, including Captains Rob Kramarz, Zach Stells, Travis Holeman, Will Benson, and Sandy Horn.

If you are interested in supporting this project, please email info@bonefishtarpontrust.org for more information.

Photo: Jacob Brownscombe

Photo: Ariel Wile

The Tracking Technology – Acoustic Telemetry

Acoustic telemetry involves tagging fish—typically internally by surgical implantation—with acoustic transmitters that emit ultrasonic pings through the water that can be tracked with receivers strategically placed in the ocean throughout the area of interest. These "listening stations" can detect fish movements over extended periods of time and space. The fish must be within range of a receiver to be detected, and this range varies depending on environmental conditions (e.g., water depth, wave action), typically from 50 to over 1000 yards. The transmitters implanted in permit function for two years, and each transmitter has a unique signal that indicates which individual is being detected. To retrieve the data from the receivers, each station must be visited at least once per year to download the information and learn which fish have been visiting the area. By placing acoustic receivers in various regions and habitats of coastal Florida and beyond, we are able to track the movements of individual permit for unprecedented periods of time and space to gain a comprehensive understanding of their movement patterns.

A Passion for Permit: The Art of Being a Permit Angler

Photo: Frankie Marion

A condensed excerpt from the recently released book *A Passion for Permit*

BY JONATHAN OLCH

What drives *you* as an angler? There are few predilections for flats fishing more scintillating than arriving ocean-side just as a fiery red sun pops out of the terra firma on the eastern horizon. *Carpe diem*—seize the day! There is not one wisp of wind. It is full high tide. The guide is poling silently. Not a word is spoken. Approaching the edge of the flat, a kaleidoscopic array of colors and shapes grace the water beneath me. Gazing along the surface, a lone black sickle-shaped tail floats up 120 feet away, penetrating the slick. It is always a privilege to observe a relaxed permit.

Moments later, gleeful vibrations emanate from that feeding permit's tail. He has found a meal. The resulting concentric ripples on the surface casually pulse their way along until they reach my feet. The electric connection I feel with that permit from those subtle shock rings amplifies, radiating upwards from the water to my unsettled stomach and beyond. My heart starts pounding through my chest. I realize I am distinctly short of breath. It is a moment when time stops. I am completely focused on the task at hand. Instinctively, I have morphed into a *ninja*. My muscle fibers twitch in anticipation while every micro-movement I make is calculated and concealed. *That's* how much I relish interacting with these amazing creatures.

Spotting, Stalking and Casting to Permit

There is most definitely a mixture of some art and some science involved in spotting permit on the flats. Some people just can't spot fish—or have convinced themselves they can't. Spotting permit consistently, and on a timely basis, requires constant eye scanning. Scanning the water for permit requires a constant back-and-forth motion of the eyes, *randomly and in all directions.* You are looking for an assortment of clues: movement, no movement, the shape of a tail, the silhouette of a head, a fleck of black that might be linked to movement or shape. Permit, like a number of other fish species, crustaceans and cephalopods, possess the wondrous ability to readily change color.

Another vital aspect of visual acuity is your ability to focus on permit *behavior* when you are fishing. If I have learned anything in my years of wide-ranging permit fishing, it is that permit exhibit different behavior, different "body language," during the evolving phases of a tide.

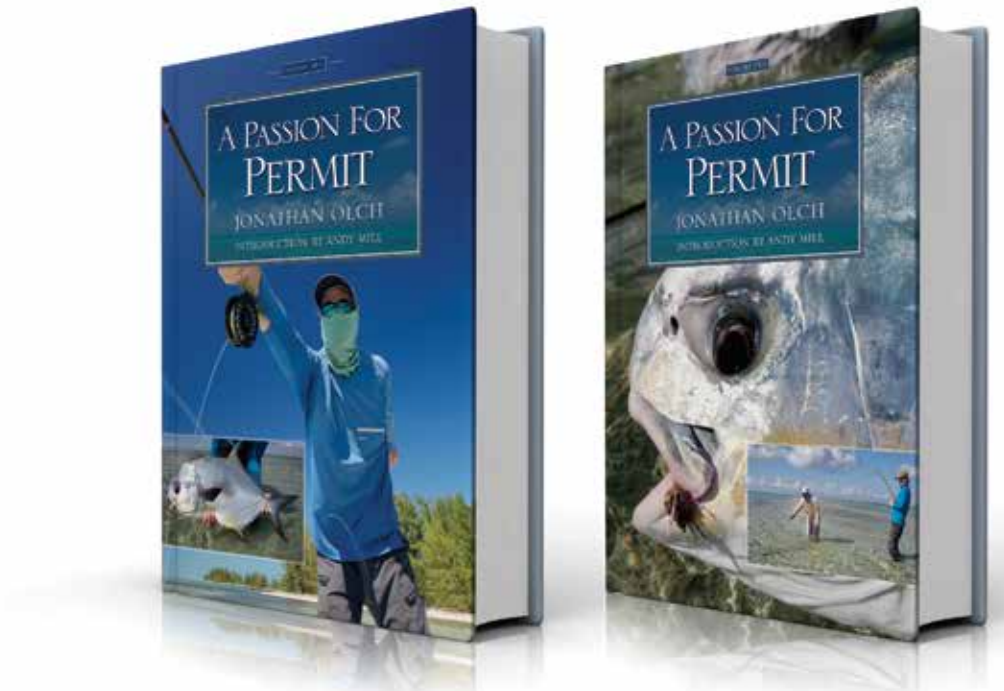
The observations you make on the flats and the resultant questions you ask yourself evolve continually. For instance, has the tide ebbed, where aggressive feeding has stopped and you are dealing with traveling fish that need extra enticement? By how much will you lead the fish if you see a similar permit? What do you want your fly to do? Sink like a stone or track quickly through the water?

Finally, you must ask yourself what changes—if any—should you make in fly selection, weighting, presentation, and angling strategy to increase the chances of hooking the *next* permit that swims past?

THE MOST COMPLETE BOOK
ABOUT CATCHING PERMIT ON THE FLY
IS NOW SHIPPING — ORDER YOURS TODAY!

A PASSION FOR PERMIT

BY JONATHAN OLCH



TWO BIG GORGEOUS VOLUMES,
MORE THAN 1,100 PAGES, $150 PER SET

"Olch has succeeded in capturing what it takes to consistently catch permit, along the way polishing all the gazillion little pieces that add up to becoming a world-class angler. Now his incredibly hard-won knowledge is all yours.

Congratulations, Jon—this is a masterpiece."

From the Introduction by **Andy Mill**, Multi-Gold Cup Tarpon Tournament Winner, Olympic Downhill Skier, and Author of the Award-Winning ***A Passion for Tarpon.***

Order your copy of the two-volume ***A Passion for Permit*** online at www.wildriverpress.com or telephone Wild River Press at 425-486-3638.

SPECIAL OPPORTUNITY:
Order a Conservation Edition and we will donate $500 to Bonefish and Tarpon Trust's Project Permit.

For a sneak preview go to www.apassionforpermit.com

WILD RIVER PRESS

Of Bonefish and Contaminants: What is the Risk?

BY JENNIFER REHAGE, PH.D. ROLANDO SANTOS, PH.D. AND CHRISTINE BECK, ***Florida International University, Project Bay Bones***

In our effort to chip away at what is driving the bonefish decline in South Florida, we tackled the question of pollution. Could contaminants be part of the problem for South Florida bonefish? And if so, *which contaminants, how badly, and where*?

Most often, contaminants enter fish habitat via runoff from the coast. Common sources include agricultural, industrial and urban activities on land. Worldwide, studies have shown that contaminants continue to pose a threat to fish and the valuable fisheries they support. To take a look at this in South Florida, we conducted a risk assessment of the threat of chemicals. We put numbers on the likelihood of bonefish being affected by contaminants (given the concentrations they may be exposed to in the environment) and the harm these concentrations are known to cause.

In this project, we searched every published study, report, and database on contaminants for Biscayne Bay, Florida Bay and the Florida Keys. The first finding of the study: there is not as much information on contaminants in our coasts as one may expect. We only found 31 studies from the past 40 years that looked at some type of contaminant in South Florida. Over half of the studies were conducted in Biscayne Bay, and only four were conducted in the Florida Keys. Agencies like the South Florida Water Management District routinely monitor canals for contaminants like pesticides, but there is no similar systematic program testing coastal waters throughout South Florida, with a couple of notable exceptions (e.g., NOAA's Mussel Watch Program—the longest running coastal contaminant program in the US).

The 31 studies evaluated in our assessment point to the second key finding in our study: the highest level of pollution is found in Biscayne Bay. Different types of contaminants were found above federal and state guidelines, particularly in sediments. This included metals like Arsenic and Copper, the banned pesticide DDT, and two types of chemicals called PAHs (currently used) and PCBs (banned in 1979), originating from fossil fuels and electronics respectively. In Florida Bay, the types of reported contamination were fewer, and mainly related to pesticides in a few locations. Here, both banned and currently used pesticides were detected above guidelines in water and sediment. It is worth noting that sediment contamination is of particular concern for bonefish, given their foraging behavior on bottom-associated prey like crabs, shrimp, and fish like toadfish that live in or on the sediment. For the Keys, data were very limited and pointed to a localized risk from pharmaceuticals in Key Largo.

continued on page 36...

Copper concentrations throughout South Florida for 1995-2010: white indicates low concentrations that pose no risk, yellow indicates concentrations known to cause negative effects on fish health, and red denotes concentrations known to be lethal. Most points show no risk, but risk is present in areas close to canal outflows along the mainland in central and southern Biscayne Bay.

Millie Jo Paini releases a gray ghost back to its old haunt. Jardines de la Reina, Cuba. **Rich Paini**

Taking care.

Over 40 years ago Patagonia's first environmental grant was given to a river restoration group, and we've been supporting fish-specific causes ever since. We believe angling and conservation go hand in hand, and we've given over $13 million to grassroots organizations working to protect wild fish and their habitats around the world. To us, fly fishing isn't about taking—it's about taking care.

patagonia®

Photo: Alex Woodsum

Next, we determined risk by comparing the concentrations found in the environment to those known to harm fish in laboratory studies. And here is a bit of a wrinkle—there are no lab studies that examine the sensitivity of bonefish to any chemical. Therefore, we had to approximate risk by looking at other fish species and their sensitivities to the chemicals detected at high levels in South Florida. We assigned a cutoff for acceptable risk —the cutoff most scientists use is 10%, which means that a chemical is deemed 'safe' at a concentration that only affects 10% of species that were studied, and causes no harm to 90% of fish.

Using this criterion and closely examining the harm caused to fish at the concentrations found in South Florida, Copper popped out the most. This suggests that the highest risk from contaminants for bonefish in South Florida is likely stemming from Copper. And more specifically, Copper in Biscayne Bay. Risk is localized along the mainland coast and close to canals (see map for detailed locations). This is no surprise, as two previous risk assessments in freshwater in South Florida point to Copper as a risk to aquatic life. Until this study, we did not know that risk also extended out to the coast. Copper is used in agriculture as a pesticide, and enters coastal waters from runoff from agricultural fields. Additionally, Copper is directly applied to water to control algae, a widespread practice in many water bodies. Copper levels in Biscayne Bay do not seem to be declining, since Copper tends to be stable and accumulates in the environment.

In laboratory experiments on fish, the Copper concentrations at levels found in Biscayne Bay caused reduced feeding, increased respiratory rate, and physiological changes. Higher concentrations have been associated with changes in fish size and weight, overall health, behavior, and reproduction. In a few locations in Biscayne Bay, the levels detected should be fatal to fish. Although these areas along the Biscayne Bay shoreline are not prime bonefish habitat, bonefish do occur in this part of the bay and could be at risk, including areas where juvenile bonefish have been found in the vicinity of the C-111 canal basin. Another part of the puzzle is that Copper is highly toxic to invertebrates such as crabs and shrimp, highlighting another potential pathway of negative effects on bonefish—by affecting their food.

Because data on contaminants are sparse, it is impossible to know the full extent of risk of exposure to bonefish in South Florida. However, we know that Copper poses a high risk to bonefish in Biscayne Bay, and this needs to be examined because there is potential risk along the mainland coastline of Biscayne Bay, particularly close to canals, and it includes habitat of interest for juvenile bonefish. There also needs to be more widespread sampling for contaminants throughout South Florida. The expense of such sampling is beyond the scope of BTT, but this is an issue that we will address with the local, state, and federal agencies that are tasked with environmental monitoring.

What does this mean for the bigger picture of South Florida bonefish? It means that, although unlikely to be the only cause, contaminants could certainly be part of the problem. Importantly, it serves as a reminder to ask ourselves, are we doing all we can to prevent contaminants from entering fish habitat? We should all take steps to reduce our environmental impact and consider the choices we make on a regular basis that could be directly or indirectly contributing to contaminating our waterways.

INTRODUCING THE X ROD

COMMAND THE WATER

sageflyfish.com

STORY & PHOTOS BY JAMES BUICE

Cuba: Writing the Next Chapter

There is a photograph from 1960 of Ernest Hemingway presenting a trophy to Fidel Castro for winning Hemingway's fishing tournament. John Updike best summed this exchange as being like "Shakespeare presenting the blue ribbon of Best Cake Baked to Queen Elizabeth." Shortly thereafter, the curtain was drawn between the United States and Cuba, creating a line of demarcation between past and present. Cuba remains today a country rooted in the past, plodding forward to an equivocal terminus. The familiar classic cars lining the streets of Havana, holiday celebrations of past socialist victories, and Marxist Era statues all pay homage to a country clinging to the past while the next chapter remains to be written.

Our group arrived in Havana on the eve of one such holiday directed at memorializing Castro's first open attack against the Batista regime 62 years ago. This was it, the Cuba of my youth. A bearded Fidel, ever-present cigar and olive fatigues, animated hands gesturing as he barked into a microphone. Here in present day Havana the hands of the clock had seemed to all but stop and rejoice in that bullish state of totalitarian rule.

Five days later, my image of Cuba would be forever changed. Following a week of fishing aboard the Georgiana liveaboard around the Península de Zapata—not far from the infamous failed American assault on the Bay of Pigs in 1961—the enduring beard and military fatigue clad silhouette was replaced by a clean-shaven fishing guide named Yenney, festooned in a bright blue trucker hat and smoking Cuban cigarettes. His finger pointed not into a crowd of comrades, but at two approaching permit. In a calm voice, "Ricky, eleven o'clock, one hundred feet, palometa." My angling partner Rick Hirsch, far from being a participant in any docile collective, readied himself. A well-placed cast intercepted the cruising fish and soon we were all admiring a stout Cuban permit.

This trip was of an exploratory nature, led by Dr. Aaron Adams to acquire fin clips from bonefish in new areas. It also sought to gather information on the local ecosystem and let us interact with local guides and scientists, efforts BTT has been undertaking since before the recent warming of relations between Cuba and the U.S. A near mirror image of the Florida Keys backcountry region, Zapata is a splendid testament to the effects of thoughtful conservation. The future of Zapata—like many things in Cuba—was not always certain. In 1959, Fidel pledged to drain the swamp in order to provide usable land for mass rice cultivation. Thankfully, this promise never came to fruition and the ecosystem continues to prosper under its protective designation as a National Park. Tarpon, permit, various species of jacks, barracuda, and bonefish all create opportunities for anglers, the latter possibly extending past Cuban waters. One theory—which will be clarified when the results of BTT's bonefish genetics study are released

BTT board member Rick Hirsch with a nice Cuban permit.

next year—surmises that some bonefish larvae spawned from regions in Cuba could very well make their way to the Florida Keys as they drift for nearly two months at the whim of open ocean currents, making Cuba a potential breeding ground for Florida bonefish and highlighting the need to monitor and protect both fisheries.

As the United States eases sanctions against Cuba and relations are improved, a new line separating the before and after is being created. Castro's recent death pushes Cuba into uncharted territory. Zapata and other shallow water Cuban estuaries will be threatened by the forces that come with globalization, westernization, or whatever you want to call it. While commercial sport angling concessions are limited, fishing pressure is always a concern, as is pollution, exploitation of the resource, as well as illegal gillnetting and harvesting by opportunistic locals. On my trip, we saw and destroyed several gillnet stakes left for future use or possibly abandoned, the latter being unlikely according to our guides.

Progression into the "new" Cuba is tenuous, but amidst geopolitical jockeying, the shallow water flats and the fish that call these places home are natural ambassadors to two countries divided for over half a century. If BTT's steady relationship with Cuban guides, scientists and resource managers is any indication, we are hopefully headed in the right direction. Luckily the fish have no political affiliation and are perfectly content with challenging anglers on a unilateral level. Only in time will the next chapter be written.

KEEP 'EM WET™ Photo Contest

First Place: Collin Ross

Catch and Release Tips

BROUGHT TO YOU BY SUNBRELLA

Practicing proper catch and release is an important part of being a good steward of the flats fisheries. How you handle fish in a catch and release fishery has an impact, and can make a difference in whether a fish survives post-release.

Minimize Air Exposure. Bonefish exposed to air for more than 15 seconds are **much more likely** to die post-release. All fish need water to breathe!

Keep tarpon over 40" fork length in the water. Research has shown that tarpon over 40" are susceptible to being harmed by handling, which is why Florida passed a law that they must remain in the water. It's good practice for everyone, whether or not it's required where you fish.

If you handle a fish, make sure you use clean, wet hands. Dry hands or hands covered in sunscreen are much more likely to remove the fish's protective slime and cause infections.

Use barbless hooks. This reduces the amount of handling needed to remove the hook, and makes it less likely the hook will get stuck.

If the fish swallows the hook or fly, cut the line as close to the hook as possible. This causes less damage than removing a deeply set hook, and most fish are able to reject the hook or it dissolves over time.

Keep the fight short, but not TOO short. Long fight times result in exhausted fish, which are more vulnerable to predators. A fish reeled in too quickly is more likely to thrash around and potentially injure itself.

Use tackle that matches the fish and conditions. If you use too light a rod, you will have a hard time landing fish within an appropriate amount of time.

When reviving a fish, be sure water passes over the gills from front to back. Moving a fish backwards doesn't allow it to breathe. Always move fish forward (moving them in circles works well).

Thank you to everyone who submitted photos in the 2016 Keep 'Em Wet™ Photo Contest. We received hundreds of entries from BTT supporters around the world! Please consider joining the Keep 'Em Wet™ movement by reducing fish handling, and taking pictures of catch and release fish dripping wet or in the water. We can all play a big part in preserving these fisheries for the future!

Second Place: Matt Fitzgerald

Third Place: Randy Farber

Thank you to our contest partners:

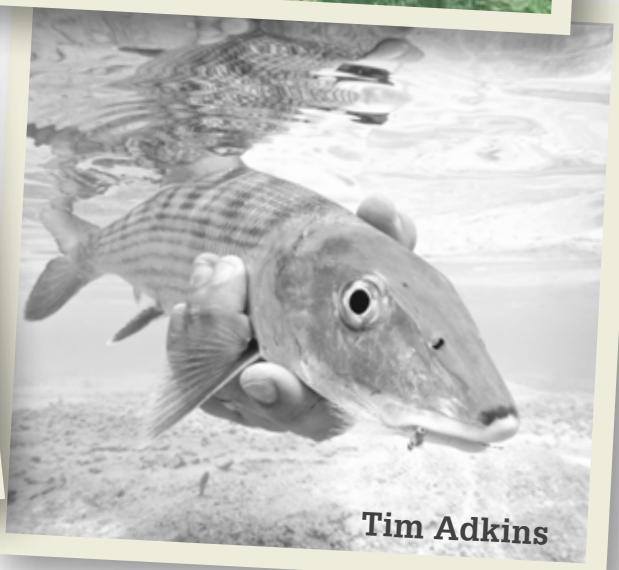
Orvis, Keep 'Em Wet Fishing™, Fishpond, YETI, Arc Fishing and Montauk Tackle.

Honorable Mentions:

Flip McCririck
Wallis Higginbotham
Scotty Thompson
Kristen Cili
Edgardo Cruz
Tim Adkins
Chris Venezia


Scotty Thompson


Wallis Higginbotham


Tim Adkins


Flip McCririck


Chris Venezia

Featured Artist

John Swan

John Swan (b. 1948) "Tails" signed "John Swan" lower right, oil on canvas, 20 by 30 in.

John Swan is the 2017 Featured Artist for The Bonefish and Tarpon Trust. 50% of the proceeds from the sale of "Tails" will go directly to BTT, whose mission is to conserve and enhance global bonefish, tarpon, and permit fisheries and their environments through stewardship, research, education, and advocacy.

John Swan was born and raised in Maine and studied at the University of New Hampshire. In the 1980s, Swan was painting local rural landscapes until he completed a fly fishing painting that appeared on the cover of *Gray's Sporting Journal*. This early success with a sporting scene ensured that hunting and fishing subjects would be an integral part of Swan's work in the years to come.

Considered one of America's foremost sporting and wildlife artists, Swan is equally adept in watercolor and oils. His paintings bring to life fishing and hunting trips to places as far afield as the bonefishing mecca of The Bahamas and Canada's Gaspe Peninsula, also a favorite sporting haunt of renowned impressionist Frank W. Benson (1862-1951). "I paint wherever I can fish," he admits. The result is a body of spectacularly immediate works set in the world's premier sporting destinations.

Based on firsthand experience, and often created en plein air, Swan's paintings are imbued with freshness: the energy of a tarpon struggling against the line or the quietude of a hunter's early dawn preparations.

Among his distinctions are one-man shows at the American Museum of Fly Fishing, the King Gallery of New York, and the Stephen O'Brien Jr. Fine Arts Gallery of Boston. His awards include being named Artist of the Year three times by the Atlantic Salmon Federation as well as being the Ducks Unlimited International Artist of the Year in 1987. He was previously named the BTT Artist of the Year in 2010. He has illustrated numerous books including Joseph Bate's classic *Atlantic Salmon Fishing* and Thomas McGuanes's anthology *Live Water*.

Pre-Sale Estimate: $8,000.00 - 12,000.00

Trip of a Lifetime: Belize River Lodge

Photos: Dr. Aaron Adams

BY AARON ADAMS, PH.D.

Imagine sitting at your desk at work, tending to the business of the day, when you receive a call from an unknown number. You let it go to voicemail. When you finally check it, you learn that you've won the Trip of a Lifetime and you are the lucky BTT member who won a free trip to fish at Belize River Lodge!

That's what happened to Brent Nash in early 2016. After taking some time to digest the news, Brent and his wife Jean joined BTT's Director of Science and Conservation, Dr. Aaron Adams, and BTT board member Mick Kolassa for three days of great fishing and hospitality at Belize River Lodge in September, 2016. Their timing was pretty good. The trip came three weeks after Hurricane Earl blasted through Belize–long enough for the lodge to get back to normal operations and for the fish to shake off the storm's impacts.

The main targets for the trip were tarpon, snook, and bonefish. Because of the heavy rains that fell on interior Belize, the rivers were running high, pushing small tarpon and snook onto the outer mangrove islands and channels. Blue skies and light winds on two of the three fishing days made for perfect sight-fishing conditions. Even when the third day threatened precipitation early, the rain showers were avoided and the clouds parted to open blue skies by lunchtime.

Wouldn't you know it, Brent recorded a Flats Slam on fly on his first day flats fishing in Belize, catching a nice snook, tarpon, and bonefish. Jean caught her first bonefish on fly. Not a bad way to introduce themselves to the flats of Belize! On the second and third day, no more slams were recorded, but everyone caught multiple fish of two species on each day. The intrepid anglers spent some time chasing and casting to the ever moody permit, but only got a few follows and close looks.

As always, the guides and the folks at Belize River Lodge were fantastic. The guides kept the anglers on fish, the food was authentic Belizean goodness, and everyone felt at home in the comfortable lodge in the jungle.

"Mike, Marguerite, and the staff at Belize River Lodge were just great. The service, attention, and food were all top notch. And of course our guide Pedro and the fishing were great as well—it did not hurt that I caught my first flats slam on the first day," said Nash of the trip. "In addition to my first snook, we caught many bonefish, lost a nice tarpon after multiple jumps, caught a small tarpon and visited several Mayan sites. That doesn't cover the rejections we had from other tarpon and permit, which just makes me want to go back! Jean and I sincerely appreciate everyone involved, both for this trip and for the great work BTT is doing."

BTT is grateful to Belize River Lodge for hosting the 2016 Trip of a Lifetime. To learn more and book your next fishing trip to Belize River Lodge, visit: www.belizeriverlodge.com.

Thank You

To Our 2016 Event Committee Members

Boca Grande, FL

Event Chair: Rick Hirsch
Cole Fairbanks
Mark Spurgeon
Susan Spurgeon

Islamorada, FL

Duane Baker
Adolphus Busch IV
Carmen Perez-Padron
Bert Scherb
Bill Stroh

New York City, NY

Bill Andersen
Rick Bannerot
CD Clarke
Paul Dixon
Jon Fisher
David Nichols
Walt Noonan
Dave Perkins
Alex Powers
Graham Uffelman

Jackson Hole, WY

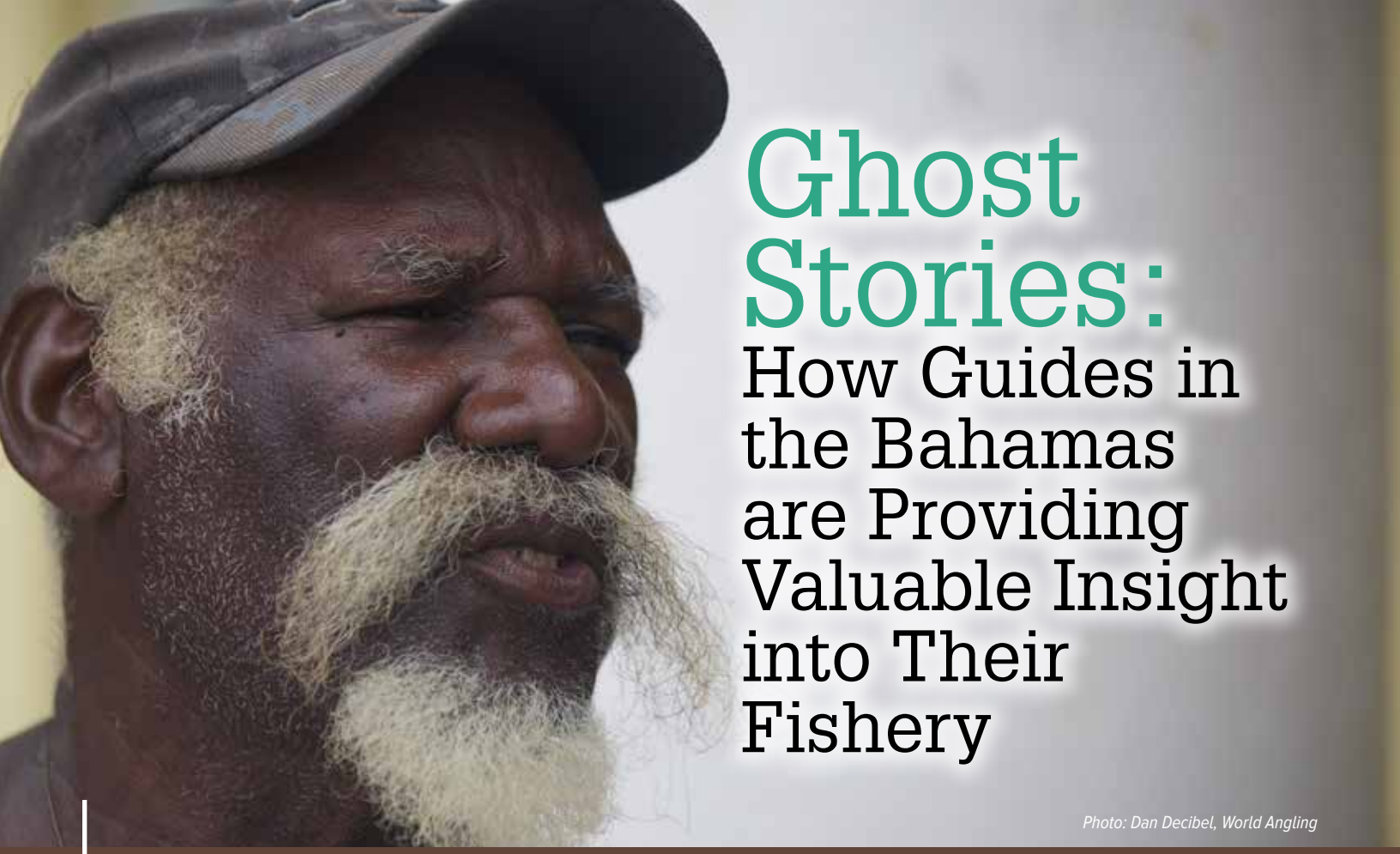
Michael Dawkins
David Decker
Kay Jones
Bill Klyn
Alex Maher

THE ONLY MAGAZINE DEDICATED TO FLY FISHING IN SALTWATER

tail
FLY FISHING MAGAZINE

SUPPORTING THE BONEFISH & TARPON TRUST SINCE 2011

WWW.TAILFLYFISHING.COM



Ghost Stories: How Guides in the Bahamas are Providing Valuable Insight into Their Fishery

Photo: Dan Decibel, World Angling

Andros elder Mr. Ralph Moxie on how catching bonefish on a fly compares to other methods: "You can go out there and catch one fish on a fly, the guest, and it means so much more to you than if you use a spinning rod and catch a hundred. It is that enchanting, to catch a fish on a fly rod."

Tom Karrow, a doctoral candidate at the University of Waterloo and a Research Fellow at the University of the Bahamas, has been interviewing fishing guides on Bimini, Grand Bahama, Abaco, Exuma and Andros as part of a BTT project to record their knowledge and incorporate it into future conservation strategies. Specifically, BTT is seeking to document the history of the industry, assess the sustainability of the tourism sector, examine fisheries population dynamics and inventory critical habitats. The project is also providing remarkable perspective and fascinating stories about an industry that is central to the region's economy and culture—and from a group of stakeholders who know it best. Thus far, Karrow has completed nearly 80 formal interviews with guides, some of whom were born as early as the 1930s, and shares below what we're learning along the way:

Why is this study important?
From an industry perspective, the flats fishery is a tourism venture that is dependent on healthy habitats and fish populations. As anglers, we all want our children and grandchildren to feel the joy of pursuing and catching elusive flats species, so understanding as much as we can about these fisheries and knowing how to address conservation challenges they face is vital.

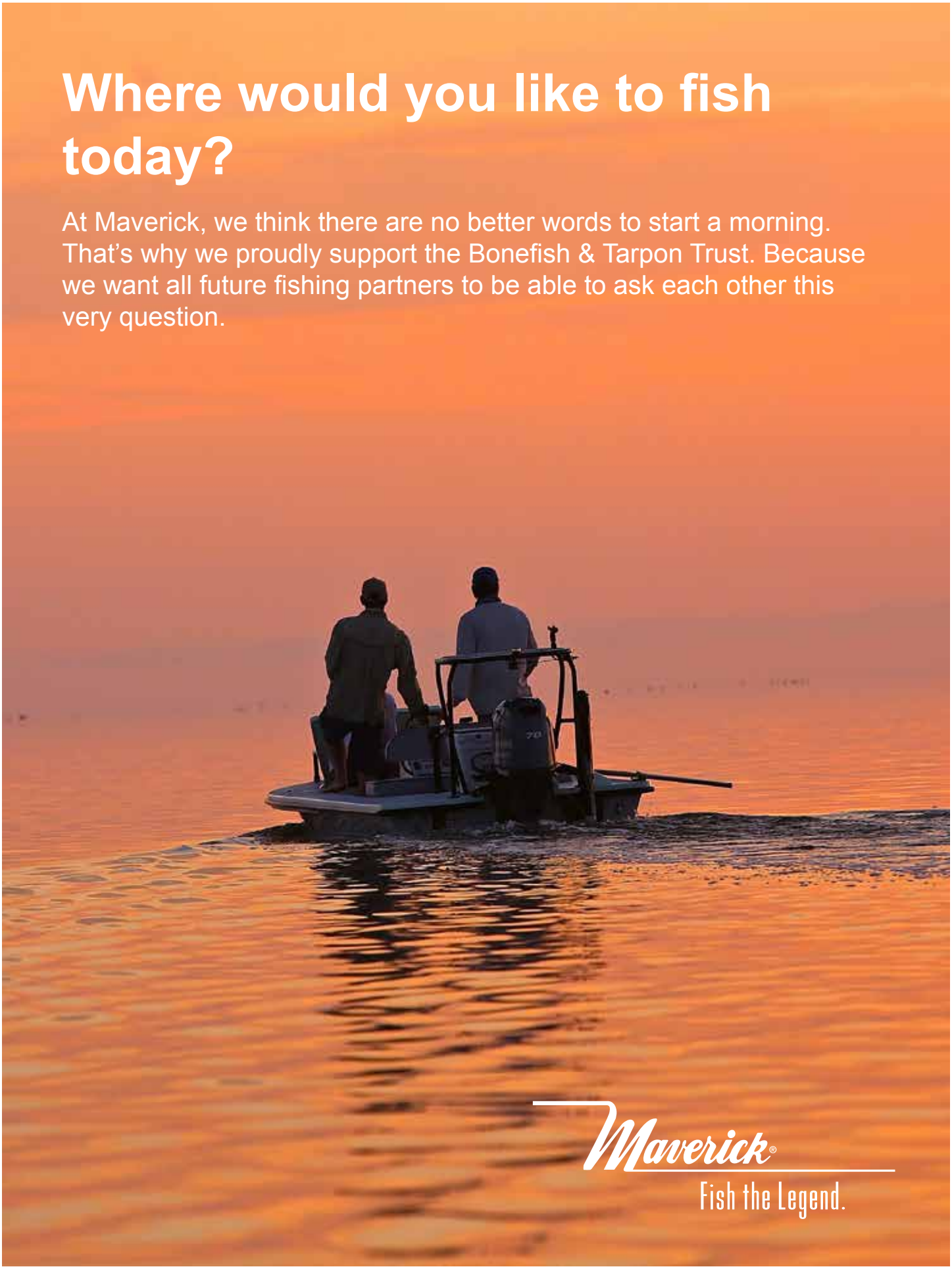
To assess changes in fish populations, historical baselines are needed to determine how well the fishery and habitats are doing today compared to the past. Unfortunately, these data didn't exist for the flats fishery in the Bahamas and many other places. The information gained in these interviews is building that historical baseline. Although results are still being evaluated, some concerning, yet interesting trends have emerged.

What do we know about the fish populations in these regions?
According to the guides I've interviewed, there appear to be generally fewer bonefish, tarpon, barracuda, snapper, conch and lobster populations on Bimini, Grand Bahama, Abaco, Exuma, and Andros compared to the 1950s, when recreational bonefishing began in the islands. Some of the elders born in the 1930s feel declines had already occurred by the 1950s, perhaps a result of subsistence or commercial fishing pressures. Causes for declines are unknown, but angling pressure, fish handling, predation, habitat loss, harvest, climate change and a host of other variables are potentially to blame.

And the guides who have fished these waters for many years, what do they think are the causes of declines?
Some guides attribute bonefish population drops to increased shark

Where would you like to fish today?

At Maverick, we think there are no better words to start a morning. That's why we proudly support the Bonefish & Tarpon Trust. Because we want all future fishing partners to be able to ask each other this very question.



Maverick®

Fish the Legend.

Photo: Dan Decibel, World Angling

Andros elder Mr. Jeff Ferguson on his concern over excessive garbage on the flats affecting bonefishing:
"If we don't get the young people into securing their garbage, if they keep throwing that garbage on the flat…fish got a sense of sense… sensitive too, just like a human, if they meet garbage they ain't going to stay amongst that garbage. We have got to really try to get that out of the people that are doing that…make sure to secure your garbage…don't throw it out there on the flat."

predation, while others note losses in sea grass beds, potentially impacting the forage available for bonefish to feed on. Since declines have apparently been ongoing since the 1950s or before, there are likely large-scale issues at play. Given bonefish behavior, local issues may also be influential. Since bonefish typically have a small home range, site-specific events can have highly detrimental effects on a local population: a single net across a nursery creek, development of a new resort, or an oil spill are real-world examples that can have highly detrimental efforts on a local bonefish population.

Do you find variability among the islands?

Not surprisingly, the degree of change appears to vary between islands, and even within single islands. In some locations, slight increases in bonefish numbers are being observed in recent years, perhaps a result of greater awareness of the economic importance of these fish, which led to net bans, local education, enforcement efforts and reduced angling pressure. However, these increases are relatively small compared to the historically high bonefish numbers reported by elder guides dating as far back as the 1930s.

Increases in permit abundance were reported on some islands, and on all islands turtles and sharks (of all species) are apparently more abundant. Significant increases in recent years appear related to government-imposed regulations banning extraction of turtles and sharks, and most guides feel higher numbers of both species are negatively affecting bonefishing.

What are the island-specific factors believed to be influencing the bonefish fishery?

Abaco: Guides on Abaco independently—and nearly unanimously—expressed their concerns about the increased frequency and intensity of hurricane activity. Shallow marl flats on the west side of Abaco appear particularly susceptible to storm damage, and more frequent strong storms have seemingly impacted successive generations of bonefish, while simultaneously impacting habitats. Guides are also concerned about increased boat traffic leading to fewer fish and longer rides to find fish, a sentiment shared among all interviewed guides on all islands.

Andros: Bonefish populations appear more stable on Andros than on other islands. Vast flats and greater access to deep water creeks, cuts and channels seem to have spared Andros from problems expressed by guides elsewhere. Likewise, tarpon and permit populations appear stable, although pursuit of these species is on the rise.

An interesting conundrum arose in the discussion about permit on Andros and elsewhere. Are guides actually seeing more permit, or are they simply looking for them more as a result of increased demand from anglers? Some guides think that there are just more permit—they are fishing the same water and simply seeing more fish.

Exuma: The Peace and Plenty Lodge, a historical fixture in Exuma, closed their bonefish lodge doors in 2008, a response to the global economic slowdown. Although anglers are still hosted by the original P&P lodge in Georgetown, according to guides and P&P management, there has been a significant decline in the number of anglers. According to guides on Great Exuma, the bonefish population declined considerably in the 1980s and 1990s, reaching a new low around 2008. Apparently, the bonefish population has since rebounded to pre-1990s levels, and although this is a positive trend, older guides note that the populations are still far below where they were many decades ago, a common trend across islands.

What have we learned thus far from these interviews?

While results of this research are still being evaluated, some concrete conclusions can be drawn. It is clear that guides in the Bahamas possess a great deal of knowledge about local habitats and processes. They are proud of their country and their fishery, and they want to help preserve it. It is also clear that declines in fish populations, regardless of the causes, will result in reduced tourism and economic hardships for a great number of Bahamians, and the guides recognize this. It is also evident that much more work is needed. Better understanding the causes of change, while working to mitigate declines and enhance increases, will help preserve this fishery and others like it. It's in our best interest and that of successive generations that we continue learning about our natural world, which will enable us to better protect it.

At **Thrive Creative Labs**, our mission is to drive the courageous to explore, enjoy, and thrive outside.

By partnering with **Bonefish & Tarpon Trust** to refresh their brand and reinvigorate their website, we help ensure that there are still healthy habitats and fisheries for us all TO LOVE & EXPLORE.

thrive
creative labs

Learn more about our strategic marketing & web services at

thrivecreativelabs.com

3000 DOVERA DRIVE • SUITE #140 • OVIEDO, FL 32765 • 407.971.2244

PHOTO COURTESY: **LUKE WILLIAMS**

Juvenile Tarpon Habitat Mapping and Restoration

On the surface, an altered habitat may look healthy. However, BTT's research findings paint a different picture.

BY JOELLEN WILSON, M.S.
Juvenile Tarpon Program Manager

How do contractors build a house without a blueprint? Simply put—they don't. The same principle holds true for restoration of juvenile tarpon nursery habitats. To effectively design a tarpon nursery habitat, we must first understand what characteristics are essential for juvenile tarpon. The Juvenile Tarpon Habitat Mapping project is helping us do just that.

Extensive research in southwest Florida has made it clear that altered habitats are not ideal for juvenile tarpon. Wildflower Preserve, BTT's first examination of juvenile tarpon habitat characteristics, contained high densities of juvenile tarpon. At first glance this appeared to be a good thing, but it turned out that the high abundance of juvenile tarpon resulted in poor growth. When juvenile tarpon left the habitat after surviving their first year, they were smaller than they should have been, putting them at higher risk of predation. Hopefully when Wildflower habitats undergo restoration (scheduled for completion in 2017 by the South Florida Water Management District) juvenile tarpon growth rates and survivability will improve.

In another study in Florida, BTT is comparing different nursery habitat restoration designs to see which designs result in the best juvenile tarpon habitats. To do this, we have sampled in degraded habitats that are scheduled to be restored. We'll then sample the different restored habitats to figure out which are best for juvenile tarpon, enabling us to integrate those features into future habitat restoration projects.

In the midst of our Florida restoration studies, BTT was contacted by a fishing guide in South Carolina about the presence of juvenile tarpon in marsh impoundments historically managed for waterfowl. South Carolina was previously thought to be outside the geographical range of juvenile tarpon due to prolonged cold temperatures experienced during winter. BTT funded a two-part study that included tagging and tracking fish in the impoundments and a laboratory study of temperature tolerance with the main goal of answering one question–do juvenile tarpon survive winter? Between August and November, a team of researchers from University of South Carolina's Baruch Marine Laboratory tagged over 600 juvenile tarpon with Passive Integrated Transponder (PIT) tags, which allow individual tarpon to be identified and tracked.

We assumed, similar to their Florida counterparts, the South Carolina juveniles would remain in the impoundments at least until spring. However, immediately preceding the first winter cold snap in December, there were no further detections or sightings of juvenile tarpon in the impoundments; the majority left the impoundments in late November and the remaining perished after the cold snap. Laboratory studies found that juvenile tarpon were able to tolerate temperatures as low as 48°F, but eventually succumbed when temperatures remained that low for 24 hours. These results indicate that juvenile tarpon don't survive winter, but we are working with fishing guides and anglers in a search for older juveniles (12–30 inches, two years old) that would indicate that some do survive.

Juvenile Tarpon Habitat Mapping was the logical next step in finding crucial nursery habitats and diving deeper into what ideal nursery habitat should look like. Starting in January 2016, BTT asked anglers for their help finding locations with tarpon 12" and under. Anglers provided GPS coordinates, which are kept confidential by a single BTT scientist with plenty of safeguards, to ensure we can gather the most specific information about each site without exposing locations to the public. Anglers were also asked if there were larger tarpon (over 12") present at the site while the little fish were there. It's important to know if tarpon are able to grow to larger sizes before emigrating or if they are getting too big and overstaying their welcome by competing for food and space with smaller tarpon. Also important is the seasonality of tarpon at each site. We especially want to find nursery habitats that juvenile tarpon can live in year-round without exposing themselves to predation or having to expend extra energy by moving to other habitats. Absence of tarpon during certain seasons may be a sign that the habitat is lacking in some way and they feel the necessity to leave in order to survive. Finally, anglers are asked to specify if the habitat is natural or altered. This helps us prioritize the habitats which are most in need of protection (natural habitats) or restoration (altered habitats). Unfortunately, the vast majority of locations we have identified have been altered, mainly through coastal development. There will be plenty of opportunities for habitat restoration as we move forward with the Juvenile Tarpon Program.

We are grateful to the anglers who have already responded to our habitat mapping call-to-action. Although we've received a great number of responses, we could always use more juvenile tarpon locations to help with the mapping project. If you are aware of any juvenile tarpon (12" and under) locations or know of anglers targeting these size classes, please contact JoEllen WIlson at jwilson@bonefishtarpontrust.org.

Tarpon and Snook Nurseries in the Indian River Lagoon

The largest tarpon so far was caught and tagged by Jake Rennert. This fish should have left Bee Gum two or three years ago.

A drone's eye view of a portion of the Bee Gum Reserve, a mosquito control impoundment in Indian River County purchased by the Indian River Land Trust for restoration and conservation.

BY JON SHENKER, PH.D.
Department of Biological Sciences
Florida Institute of Technology

Mangrove swamps–muddy, smelly, hard-to-reach habitats that most humans avoid–are prime nursery habitats for juveniles of many fish species. Their complex structure provides cover for juvenile fishes to hide from predators, and places to stalk their own prey. The stagnant waters often found in isolated mangrove habitats limit large fish predators due to the lack of oxygen, making the marshes valuable nursery habitats for some of our favorite species–including tarpon. Marshes are even better nursery sites for one of our least favorite pests–mosquitos.

Back in the 1800's, mangrove and freshwater marshes caused early settlers and cartographers to give the formal name Mosquito County to what is now Brevard and Indian River Counties and the surrounding area. Not a very effective way to entice more residents and visitors to the area! To control salt-marsh mosquitoes, dikes were built around thousands of acres of mangrove and *Spartina* grass swamps along the Indian River Lagoon. The resulting impoundments were filled with water to prevent mosquitos from breeding in shallow, isolated pools. Resource managers eventually realized that the marshes were no longer serving as valuable nurseries for fish, so they installed culverts through some dikes. The Rotational Impoundment Management (RIM) system was developed to flood the marsh and then close the culverts during the summer mosquito season (May to October), and allow water (and hopefully fish) to move freely during the fall and winter.

Bonefish & Tarpon Trust, the Indian River Land Trust, and Florida Institute of Technology are working in collaboration to determine whether the RIM strategy works for juvenile tarpon and snook. Our early efforts show that snook and tarpon don't migrate out of the nursery habitats in response to the RIM schedule of open culverts between October and May. However, we discovered if we modify the RIM procedures, we can increase movement of juvenile tarpon and snook from the nursery into the Indian River Lagoon.

For the past 18 months, BTT and its partners have been working in the Bee Gum Reserve, a 100-acre impoundment on the barrier island just north of Vero Beach, Florida. The site, owned by the Indian River Land Trust, looks like a great nursery habitat, but has limited connectivity to the surrounding lagoon due to the RIM culvert system. Dr. Aaron Adams, BTT's Director of Science and Conservation, developed the technique being used by a team of students from the Florida Institute of Technology. The team—led by Tony Cianciotto—was *ordered* to go fishing, and to insert PIT tags into caught tarpon and snook. PIT tags are the same type of microchip identification tags that a vet inserts into dogs and cats. Antennas were installed around the culverts connecting the marsh to the lagoon, and data loggers attached to the antennas record the passage of individual PIT-tagged fish through the culverts. It's just like the automated toll booth systems on many highways—the pass in your car is like a PIT tag, and the toll booths have antennae to read tags as cars drive through.

Tony Cianciotto inserting a RFID tag into the abdominal cavity of a juvenile tarpon.

During summer, fall and winter, the crew caught, tagged and released over 300 juvenile snook and 60 juvenile tarpon in Bee Gum. The antennae at the culverts detected all the tagged fish swimming close to the inner edges of the culverts, indicating 100% survival from the tag implantation.

Although the culverts were open from October to May, connecting the impoundment and the Indian River Lagoon, only seven fish left the safe confines of Bee Gum for the Lagoon. In May, the culverts were closed so the impoundments could be filled with water for mosquito control.

Why didn't the fish leave? Dr. Adams' studies in southwest Florida suggest why: in the natural habitats he studied, juvenile snook left their first-year nursery during the summer, vacating just in time for the arrival of the next crop of baby fish. In the RIM system, the culverts are closed during summer, preventing this important migration.

To determine if juvenile tarpon and snook would leave the Bee Gum impoundment if the culverts were opened during summer, the Indian River Mosquito Control District graciously agreed to perform a summer "drawdown." They opened the culverts for 10 days in July, allowing the juvenile fish to emigrate if they wanted to, then closed the culverts and pumped water into the impoundment to resume mosquito control for the remainder of the summer.

The fish took full advantage of the drawdown. Nearly half of the tagged tarpon and more than 30 tagged snook left Bee Gum during the first open tidal cycle. Since the fish had to travel around 75 feet through a very dark, narrow culvert, they must have had a very strong urge to emigrate.

Are summer drawdowns a solution to allow fish to leave their nursery habitat and still maintain mosquito control for the region? It's a very good start. The team is going to repeat the study during 2017, and couple it with a similar study in a nearby unmanaged mangrove marsh habitat (a location that has a natural creek connection to the open lagoon). If we find that juveniles emigrate from the natural system during summer, and drawdowns allow similar movement from impoundments, we're well on the way to developing an inexpensive modification of the RIM strategy that can improve tarpon and snook populations in the Indian River Lagoon. This study is a prime example of how research can be turned into important conservation action that can help improve fisheries.

Bonefish & Tarpon Trust thanks its generous donors from 2016

We regret any omissions or errors due to printing deadline.

$100,000 +

National Fish and Wildlife Foundation
Ocean Reef Conservation Association

$50,000 - $99,999

Robertson Foundation
Sunbrella

$25,000 - $49,000

Bairs Lodge
Bass Pro Shops
Belcampo Belize
Teach Green Charitable Foundation
Tom Davidson, Sr.
Eleven Experience
Thomas M. Evans
Frontiers Travel
Christopher B. Galvin Family Foundation
Hell's Bay Boatworks
Indian River Land Trust
Paul Tudor Jones
Maverick Boat Company
March Merkin Tournament
Bill Pastore
Yellow Dog Flyfishing Adventures

$10,000 - $24,999

Anonymous
The Baltoro Trust
Belize River Lodge
Harold & Mona Brewer
Bristol Bay Lodge
John Buford
Adolphus A. Busch
Phil and Mary Beth Canfield Charitable Fund
Evan Carruthers
C.D. Clarke
Costa Del Mar
ColdPruf
Deep Water Cay
The Farmer Family Foundation
Russell Fisher
The Thomas and Elizabeth Grainger Charitable Fund
Guides Trust Foundation
Guy Harvey Ocean Fund
W. August Hillenbrand
Tim & Karen Hixon Foundation
Peter R. Kellogg
Bill Legg
Anne Lovett & Steve Woodsum
William Michaelcheck
Mostyn Foundation
David E. Nichols
The Gordon & Marcia Olch Trust
Orvis
Rich Family Foundation
Trek Safaris
Adelaide Skoglund
Charles Smithgall III
Alan R. Steele
Jim & Jonnie Swann
Richard Uihlein

$2,500 - $9,999

Anonymous
William E. Andersen
William F. Bahl
Mary Barley
Edward Benford
Black Tail Invitational
Blue Sky Family Foundation
Boca Grande Real Estate
Bullard Foundation
Cabin Bluff
Charles Causey
Charles Brennan
Copley Fine Art Auctions
Cortland Line Company
Patrick Coughlin
Cove Point Foundation
Joseph H. Davenport
Delphi Club
Donate Well
East End Lodge
Elm Grove Foundation
Thomas M. Evans Jr. Foundation
Flamingo Cay Club
First Cornerstone Foundation
The Florida Keyskeeper, Inc.
Florida Keys Outfitters
Greg & Shannon Fay
Marshall Field
Christopher Galvin
Gasparilla Inn
Jim Gilmore Jr. Foundation
Goldman Sachs Gives
Randall Greene
Robert Hewett
Richard L. Hirsch
Mark Hoffman
H2O Bonefishing
Ed Inman
Izaak Walton Club, Useppa Island
John D. Johns
Art Kaemmer
Kenneth J. Karl
Gregory G. Kelly
C. W. Kraft
James D. Lang
Lowcountry Tarpon Tournament
Charles Lunsford
Donald MacKenzie
John Maddox
Mangrove Cay Club
Hank Manley
Ted Margo
George Matelich
Mark McGarrah
Merrill Lynch, Pierce, Fenner, & Smith Inc.
Walter D. Merritt
Mikita Foundation
Gene Milner
Montauk Tackle
Moorhead Family Fund
John Moritz
H. B. Morley
Mote Marine Lab
John L. Nau
Nautilus Reels
John Newman
Skip and Cyd Nielsen
North Riding Point Club
Northern Trust
John Oster Family Foundation
Palometa Club
Douglas Patterson
Loretta S. Patterson
Roy Patterson
Rodman Patton
Perk Perkins
The Perkins Charitable Foundation
El Pescador Lodge
William Platt
Polk Brothers Foundation
Rep Your Water
Stephen Reynolds
Rio Piedra Plantation
Dee Rolph
William Rowley
Sage, RIO, Redington
Jeffrey H. Salzman
Bert Scherb
Gary Schermerhorn
SeaWolfe Foundation
Cecil Sewell
The Walter V. & Judith L. Shipley Family Foundation
Nelson Sims
Paul Skydell
Edwin R. Stroh
Sweetwater Brewery
Kirk Tattersall
Scott Taylor
Thomas Terry
John Turner
Tyger Forge
Urban Angler
Vanderbilt Family Foundation
Vanguard Charitable
Daniel Vapnek
The Gilbert Verney Foundation
Warwick Foundation
Thomas Watson
Timothy T. Weglicki
Henry E. & Consuelo S. Wenger Foundation Inc.
Oliver White
Tyler Wick
The Winthrop Foundation of Athens, GA
Stephen Zoukis

$1,500 - $2,499

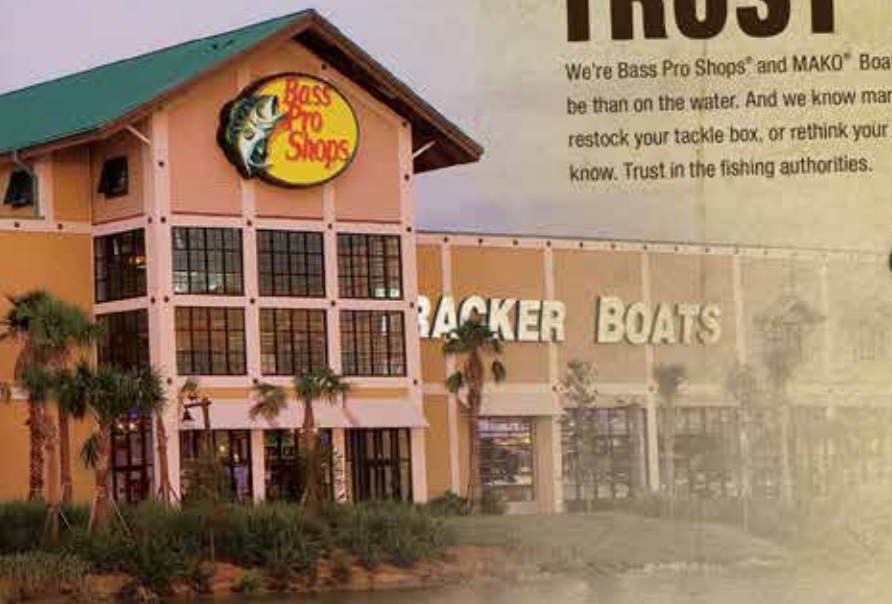
George Albrecht
ARC Fishing
The Theo B. Bean Foundation, Inc.
Jim Bokor
Dale Clift
Joseph B. Crouch
Allen Damon
Anthony P. Davino
Michael Dawkins
The Drollinger Family Charitable Foundation
Ronald Elenbaas
James H. Greene
Jeff S. Harkavy
David Higley
John Howerton
Doug Hudson
IGFA
Hamilton E. James
Courtney and Michael Katzenstein Family Fund
Bob Lepczyk
Live Water Properties
Kevin Ludwig
James Lyon
P. Andrews McLane
R.K. Mellon Family Foundation
Gray Murray
Orlando Outfitters
Wright Palmer
Steve Peet
Alex Powers
John W. Salisbury
Chris Sawch
Gary Schermerhorn
Jeannie Schiavone
Sear Family Foundation
Thomas Snyder
Scott Willard
World Angling

$1,000 - $1,499

Anonymous
Matthew Andrews
Allen Fly Fishing
Donald L. Asher
Paul C. Aughtry
Jim Belk
Ralph Booth
Jeffrey Bowling
The Broadfield Foundation
Christopher Buckley
Eric Burnett
Community Foundation of the Chattahoochee Valley
John Cleghorn
Earl Cohen
John R. Cornell
Bob Cosgriff
Scott N. Christian
David Decker
Caribee Boat Sales & Marina Inc.
Carlo Derosa
Derek DeYoung
Charles Duncan
Joe Exum
Stephanie and Lawrence Flinn, Jr. Charitable Trust
Scott Feringa
Joyce K. Ferrie
Richard Finlon
Stuart M. Goode
William Gottwald
David Haber
William Hespe
Cecil Hernandez
William Horn
Patrick Hylant
Michael Jones
Christopher Jordan
Dikran Kashkashian
Pete Kelso
Larry Kendrick
John Killian
Richard R. Kracum
TJ Kukk
Rick Lang
Bill Lunsford
Ralph L. MacDonald
Mark Mahaffey
Robert Maricich
Meredith McCord
Bill and Martha McLaughlin Family Foundation
Gary Martin
William McMaster
Rodman W. Moorhead
Ford McTee
John S. Mengel
Greg Moffitt
Norcross Wildlife Foundation
Wayne Nordberg
William J. Nutt
Oz Ozuna
Nina Patterson
The Peil Charitable Trust
Mark Pigott
Travis Pritchett
Steve Renehan
Michael Rietbrock
Irl Rosner
Rough-J-Ranch Foundation
McAndrew Rudisill
Diana Rudolph
Gerald Ryan
The Sample Foundation
G. J. Savage
James Scott
Joel Shepherd
Chip Shotwell
Peter Snow
Steve Stanley
Craig L. Stemmer
Bailey Sory
Tamarack Preserve
Joe Traba
Graham Uffelman
Paul Vahldiek
Travis Wallick
Georgia Welles
Bruce Williams
Jim Worden
WorldCast Anglers
Steven Zoric

WHEN FISHING IS YOUR FIRST PRIORITY, TRUST THE EXPERTS

We're Bass Pro Shops® and MAKO® Boats—the two greatest forces in fishing. For us, there's no better place to be than on the water. And we know many of you feel the same way. So when you're ready to upgrade your boat, restock your tackle box, or rethink your rod and reel selection, there's no need to shop around. Go with those who know. Trust in the fishing authorities.



Bass Pro Shops

FLORIDA MAKO

ROAM FREE AT **BASSPRO.COM** or **TRACKERBOATS.COM**

facebook.com/basspropshops twitter.com/bass_pro_shops

Now with 14 locations in Florida

Go to **BASSPRO.COM** to find the one nearest you.

BP142563

DORSEY PICTURES

INCREDIBLE ANGLING ACTION | NON-STOP ENTERTAINMENT | BONEFISH, TARPON & PERMIT

FISH ON!

BONEFISH & TARPON TRUST

Buccaneers & Bones

Tom Brokaw Bill Klyn Lefty Kreh Yvon Chouinard Huey Lewis Michael Keaton Jimmy Kimmel Liam Neeson

Once again, the Buccaneers have returned to Belize. This season, to the legendary waters surrounding Turneffe Flats Lodge. Where "Permit Fever" has infected the entire crew, and the only known cure is to either catch one…or die trying!

AIRS JANUARY - JUNE 2017

OUTDOOR CHANNEL HD High Definition

2017 MARCH MERKIN PERMIT TOURNAMENT

March 13 - 16 at Key West Harbour Yacht Club

We are the largest and most competitive catch, tag and release Permit tournament in the world. We both salute BTT and help to support its vital work in research with proceeds from our tournament

"Every Inch Counts"
MARCH MERKIN
PERMIT TOURNAMENT
KEY WEST, FLORIDA - MARCH 2017

The Florida Keys & Key West
come as you are
MONROE COUNTY TOURIST DEVELOPMENT COUNCIL

For information visit www.marchmerkin.com