



A publication of  
Bonefish &  
Tarpon Trust

# BONEFISH & TARPON JOURNAL

STEWARDSHIP THROUGH SCIENCE

2014 EDITION

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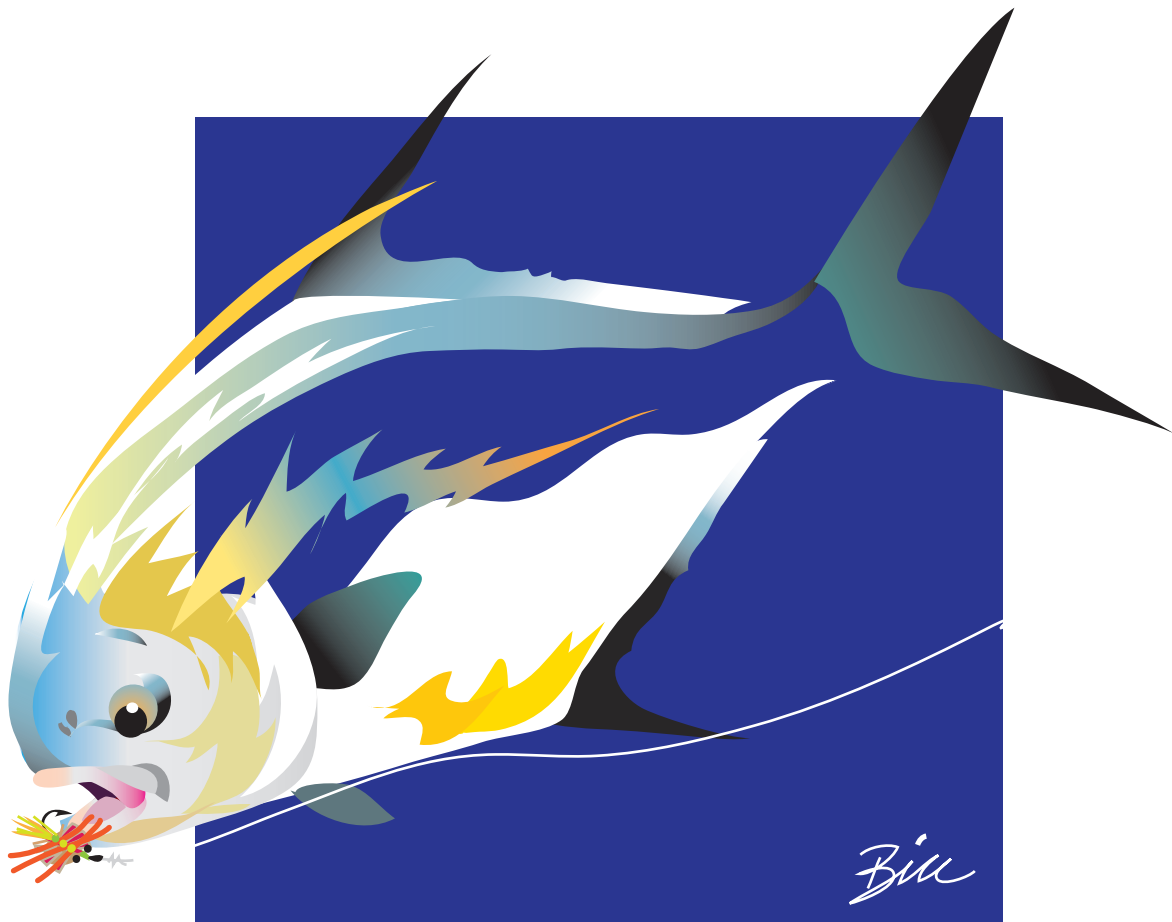
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BTT is proud to feature  
the 2014 Artist of the Year:

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# BONEFISH & TARPON JOURNAL

A publication of Bonefish & Tarpon Trust

2014 EDITION

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To conserve and enhance global bonefish, tarpon and permit fisheries and their environments through stewardship, research, education and advocacy.

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**Thank you for photography donations:**

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Cape Eleuthera Institute,  
Andy Danylchuk, Cole Fairbanks,  
Dan Ferraris, Mary Ellen Hommell,  
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Mark Sosin, Carl Trey

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**2014 Fundraising Events:**

Boca Grande, FL – January 31, 2014  
Naples, FL – February 15, 2014  
New York, NY – March 12, 2014  
Islamorada, FL – April 9, 2014  
Dania Beach, FL – November 7 - 8, 2014

Printed in the USA  
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Cover Photo by:  
Pat Ford



# Setting the Hook

## A Note from the Chairman and President

With a continued focus on our mission of sustaining and protecting abundant fisheries and rehabilitation of those that aren't, 2013 has been a year of progress and increased momentum for BTT.

New, detailed, and scientific observations of bonefish spawning rituals corroborated details of previous work and also revealed previously unknown spawning characteristics. This information will be of great value in two ways:

- It will help us focus our search for bonefish spawning locations in the Florida Keys, Bahamas, and elsewhere so these important areas can be protected. In fact, we are using this information to identify additional spawning sites in the Bahamas, and working with the Bahamas National Trust, Fisheries Conservation Foundation, Cape Eleuthera Institute, and local guides and lodges to protect these areas as National Parks. And as you read this we will be in the midst of searching for bonefish spawning locations in the Florida Keys.
- This information will also aid our efforts to reproduce bonefish and tarpon in a hatchery setting should supplementation become part of the answer to rehabilitate declining fisheries.

BTT and its many scientific partners (University of Miami, Florida Institute of Technology, University of Massachusetts, Florida International University, and others to come) have embarked on a comprehensive scientific effort to isolate and identify the bottlenecks that are restricting the number of adult bonefish in the Florida Keys fishery. This will be an expensive and multiyear effort. Major funding for the project is being raised by a joint fundraising collaboration between BTT and the University of Miami. We are also grateful and heartened by the several hundred individuals who regularly support the effort with four- and five-figure donations and the many tournaments and local fishing groups that have elected to direct event proceeds to BTT. This effort is the core component of the Florida Keys Initiative.

As interest grows in BTT's mission, we are expanding our local fundraising efforts in 2014. Hopefully, there is an event near you:

Boca Grande, FL – January 31, 2014    Naples, FL – February 15, 2014    New York, NY – March 12, 2014  
Islamorada, FL – April 9, 2014    Dania Beach, FL – November 7 - 8, 2014

Fundraising efforts in 2014 will be capped off with the 5th International Bonefish & Tarpon Research Symposium, to be held November 7 – 8, 2014, at the International Game Fish Association headquarters in Dania Beach, FL. The event will mark 15 Years of Progress in Conservation. This is the venue where the results of our efforts are shared, and where we hope to raise significant funds to continue our success.

We would not be able to hold these fundraisers or to raise the funds we so urgently need if not for the many lodge owners and equipment suppliers that provide us with items that we auction at these events. If you would like to become a sponsor please let us know. To these sponsors we are grateful, as we are to those who attend the auctions and bid on items, and to those who support the cause of improved fisheries with your time and dollars.

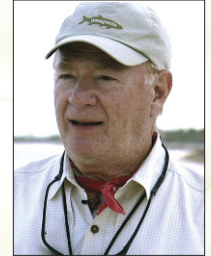
A big thank you to our many members of the board of directors who give tirelessly of their time and financial support. Thanks to our BTT staff under the leadership of Dr. Aaron Adams, as they spend countless hours in dedication to the cause. Welcome to new staff member Alex Lovett-Woodsum, Director of Development and Communications.

BTT and fishermen everywhere lost a very good friend this year in the passing of George Hommell, Jr. George was a founding and very supportive member of BTT and will be missed by all. A special BTT George Hommell Flats Restoration Fund has been established in George's memory, with fundraising events and conservation projects to come in 2014. Please stay tuned to our blog ([blog.bonefishtarpontrust.org](http://blog.bonefishtarpontrust.org)) for announcements.

Tom Davidson is a Founding Member and Chairman, and Matt Connolly is President of Bonefish & Tarpon Trust



Tom Davidson  
Chairman



Matt Connolly  
President

# Where you fish, Bonefish & Tarpon Trust is at work.

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What we do:

- Science for Conservation
- Habitat Conservation and Restoration
- Spawning Location Protections
- Angler Education



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**PROJECT PERMIT** - Population study, what, when and how they tick

To donate, join, learn more about us, or identify a project you'd like to be involved in, visit us on the web at

[www.bonefishtarpontrust.org](http://www.bonefishtarpontrust.org) or email us at [info@bonefishtarpontrust.org](mailto:info@bonefishtarpontrust.org).



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Aaron Adams, from Bonefish & Tarpon Trust, prepares for the hunt. VAL ATKINSON





Photograph: Capt. Joel Dickey.

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# Persistence. Diligence. Perseverance. Vigilance. Patience.

DR. AARON J. ADAMS  
is Director of Operations for  
Bonefish & Tarpon Trust

Photos by Dr. Aaron Adams

**T**hese characteristics are required of a successful flats angler. It is these characteristics that allow an angler to learn the ways of the flats, the habits and habitats of bonefish, tarpon and permit. How else can we explain the hours spent poling the flats just to learn how bonefish move on a dropping tide, or wading onto a mangrove flat to learn how far into the mangroves they will move on a rising tide? How else can we explain rousting in the dead of night for yet another dawn patrol after three fishless days, or dressing in foul weather gear before leaving the house in preparation for the long run across rough seas to ‘the spot?’ Standing for hours on a boat staked out on a sandbar waiting for strings of tarpon to swim by — sometimes they do, sometimes they don’t — can break an angler. Those whose focus is permit are a special breed, overflowing with these important characteristics.

There is really no substitute for time on the water, on days of good weather and bad. A favorite bonefish prey item in March might not get a second look in June, a cold front in November spurs a different reaction from permit than in March, although the tides are the same at full and new moons there is much that makes for different fishing. These are but a few of the infinite scenarios we encounter on the flats, each with their

own bucket of questions. We learn the answers only by the persistence and patience needed to spend time on the water.

It is these same characteristics that are needed for successful conservation.

It takes a great deal of persistence and patience to keep nose to the research grindstone to learn the ways of bonefish, tarpon, and permit: what makes them tick, what habitats are most important, how do they respond to habitat loss, where do they spawn, where do they migrate, where do the juveniles live, what do they eat, how do they handle catch and release?

Heavy doses of diligence and perseverance are required to apply new knowledge to conservation. What are the greatest threats to the fishery and how is our research knowledge best applied? What are the best approaches to achieving conservation goals? What coalitions and collaborations are most effective?

Vigilance is required always. What current threats need to be addressed? What threats are looming in the future? Are conservation gains being maintained? Is the health of the fishery steady or in decline? Are habitat or environmental changes affecting the fishery? Vigilance is the sustenance of those in the trenches, as there is always a new threat.



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Bonefish & Tarpon Trust is blessed to have the staff and membership that possess these characteristics and brandish them without hesitation. And the payoffs are starting to show.

After years of research in the Bahamas, the puzzle of “where are the juvenile bonefish” has been solved. And bonefish home ranges and spawning locations are being identified. We now know enough to work with collaborators in the Bahamas to propose habitat protection areas in the Bahamas, essential for the future of the fishery.

With this knowledge in hand, we can also better focus research, conservation, and restoration efforts in the Florida Keys. We now know, for example, the types of areas to search for bonefish spawning sites, and the most likely places to find juvenile bonefish. Knowing where spawning occurs and where juveniles live in the Keys (or if they do not) is essential to moving forward with restoration of the Keys bonefish population.

And recent work on spawning bonefish in the Bahamas taught us a lot about what would be needed to spawn bonefish in captivity for an eventual hatchery to help restore the Keys population.


You will learn about many of these efforts in this issue of the Bonefish & Tarpon Journal.

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After years of research in the Bahamas,  
the puzzle of “where are the juvenile  
bonefish” has been solved.

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Despite these and other successes, there remains much to do. There is much yet to learn about bonefish, tarpon, and permit biology. The threats to the flats fishery are many and varied, and new threats arise regularly. It will take every bit of our collective persistence, diligence, perseverance, vigilance, and patience to continue moving forward toward healthy fisheries in the future.

We have to be in it for the long game. That string of big tarpon will be here eventually, we just have to persevere. 



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# The Florida Keys Initiative

MIKE HODGE

is a freelance outdoor writer who lives and fishes in Florida

Photos by Alex Lovett-Woodsum

A little more than six months ago, Flip Pallot reached for the microphone and addressed dozens of eager anglers during a Bonefish & Tarpon Trust banquet. His message, delivered in a labored, raspy voice, was short and sweet and to the point.

***“There’s something wrong with our water.”***

Anyone who has ever slung a fly in the Keys and its nearby waters would not disagree. The Keys, by all accounts, is a world-class fishery. For tarpon. For permit. For redfish. Bonefish? Not anymore.



To solve any problem, you must first acknowledge that there is a problem, and a reason to do something about it. This past summer, BTT released a study evaluating the economics of flats fishing in the Keys. The bottom line: Keys flats fishing creates an annual economic impact of \$465 million. And money talks.

“That gives us a seat at the table,” said Dr. Aaron Adams, BTT’s Director of Operations. “What typically happens is you have a discussion with fisheries management and people will give testimony with their opinions, which is all necessary, but they’re only given so much weight. When we can step up and show the economic impact of a fishery, that typically raises eyebrows. It gives us some leverage. It allows us to make sure that flats fishing is part of the discussion and not considered an afterthought.”

Once the economic barometer was announced, it wasn’t long before more folks got involved, everyone from Keys’ business owners to local guides. And a sense of teamwork has emerged.

“It is our home pool so to speak,” BTT board member Bill Stroh said. “Through that focus, what we’ve done over the past year or so has resonated really well with the guides associations and the other constituents down there. I think we’ve become more relevant. The more relevant we become, the better work we can do and the better support we’re going to get for that work. I’m really excited about it. I think that is going to go a long, long way into realizing our dream

Countless theories why have percolated from local docks and into cyberspace. Truth is, no one really knows, at least at this point, what happened to the majestic flats speedster. This is a big reason why BTT started the Florida Keys Initiative, a series of studies and programs designed to protect what’s left of this treasured resource and restore it to previous glory.

Approaching its fourth year, the Initiative has chipped away to identify threats to the

Keys’ bonefish and other popular flats species. Nevertheless, no one knows exactly why the bonefish population declined, but more people than ever know there is something wrong with our water.



# STANLEY MELTZOFF (1917-2006)



Bonefish 8 - Mudding Up with the Tide (1972), oil on panel canvas, 15"x30"

As painter of the world's great saltwater gamefish, Stanley Meltzoff has no equal. Silverfish Press and Bonefish & Tarpon Trust are thrilled to announce a collaborative program featuring Meltzoff's incredible artistry. Visit [www.silverfishpress.com](http://www.silverfishpress.com) for originals and prints, and stay tuned for more on this exciting new project!



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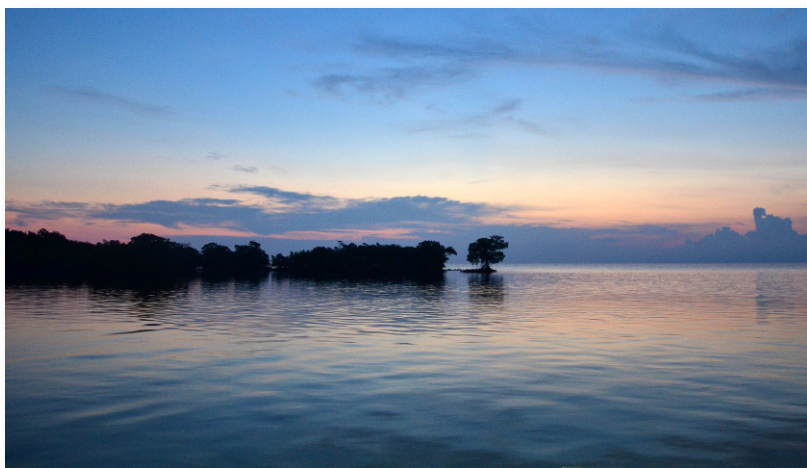
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of what we'd like to see happen down there. The most positive thing to come out of this is we have brought people together. And it's not us and them. It's all of us together."

With support from BTT, a handful of Keys' flats guides have outlined maps of their fishing areas to help direct possible restrictions in the Florida Keys National Marine Sanctuary, which is in the process of implementing a management plan. No boundaries have been decided, but BTT — and the guides — got their say.

"It's put BTT in a category where I didn't have it before," John O'Hearn, president of the Lower Keys Guides' Association, said. "Before I just sort of thought of it as a fundraising arm with marine science. Now it's become a flats fishing advocate."

Perhaps the biggest victory of the summer came in Lakeland, Fla. when the Florida Fish and Wildlife Conservation Commission, with input from BTT and its supporters, designated bonefish and tarpon as catch and release. The FWC eliminated the harvest of tarpon except in the pursuit of an International Game Fish Association world record.



Two months later, tarpon received even more protection when the FWC voted to eliminate the Boca Grande jig, a device often used by tournament fishermen in Boca Grande Pass.

Conservationists now hope that the no-snagging rule will allow tarpon to resume their pre-spawn ritual, which may have been disrupted by jigging and excessive pressure on the popular fish.

"During the last 10 years the Boca Grande jig became popular and extensively used, the behavior of the tarpon in the Boca Grande/Charlotte Harbor area definitely changed," Adams said. "Fishing, more importantly catching, wasn't as good with each passing year. The thought was the way the jig was fished vertically and using fish finders to stay over the fish didn't really give them any down time, and that affects their behavior."

While Boca Grande tarpon can rest more easily, so too can the Keys' tarpon. Earlier this fall, Keys residents voted to

reject a study exploring the dredging of Key West's main shipping channel to accommodate bigger cruise ships, a move BTT opposed because of the critical habitats that would have been affected.

"It's all part of the bigger picture," Adams said. "I think having the (economic) data helped change that conservation as well. It wasn't just a few crazy guides out there. It was of economic importance."

Even with those accomplishments, still looming is the decline of the Keys' bonefish, an issue that BTT has addressed with several studies, one of which focused on bonefish prey. However, that research recently revealed that the amount of prey is a marginal factor.

"There's no obvious smoking gun," Adams said. "At least for the moment, we can check off that box and put our efforts into other things."

O'Hearn, for one, believes the bonefish decline in part can be attributed to the freeze of 2010, which sent many a snook and other gamefish scurrying for cover after a stretch of record cold swept through South Florida.

"Since the winter of 2010, the bonefishing has been a shadow of what it was," O'Hearn said. "I'd say a third to a half of the population died that winter."


Is it weather? Is it water? Is it a combination? Adams and other researchers have pondered these questions for years with patience and perseverance.

"If it was that easy, we would have figured it out already," Adams said. "That's one of the challenges. The decline didn't occur overnight. The recovery won't occur overnight. It's like gaining and losing weight. You don't become overweight Monday through Friday. It takes a while."

The biggest challenge is staying the course, even with a detour or two along the way.

"It's a complex biological problem and identifying the controlling bottleneck will not be easy or a short analysis," BTT Chairman Tom Davidson said. "We're confident that we eventually will get there, and in the meantime through increased awareness and conservation and improved resource management, we should be able to sustain and hopefully improve the fishery."

Stroh, who serves as BTT's managing director for the Florida Keys, stressed the importance of a realistic, but positive approach to finding out what ails the Keys' bonefish.

"We should all come away with a sense of optimism," Stroh said. "The Florida Keys is still an amazing fishery. Fishing is still unbelievably good. Maybe the old-timers say you should have been here 20, 30 40 years ago. But at the end of the day, people who are traveling (to the Keys) can still enjoy tremendous, high-quality fishing. What we're trying to do is restore the fishery to what it was years ago and leave it that way for generations to come." 

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# Mapping the Fishery

BROOKE D. BLACK  
is BTT's GIS specialist and is based in the Florida Keys

Photos by Brooke D. Black

Over the past year, BTT's Florida Keys Initiative has taken shape and built upon the hearty community of guides and anglers that live and work in the southernmost archipelago. With a recently completed flats fishing economics study at its back, the Keys community dove into science head first. And with a flats fishery economic impact exceeding \$465 million annually, the flats fishery had a voice.



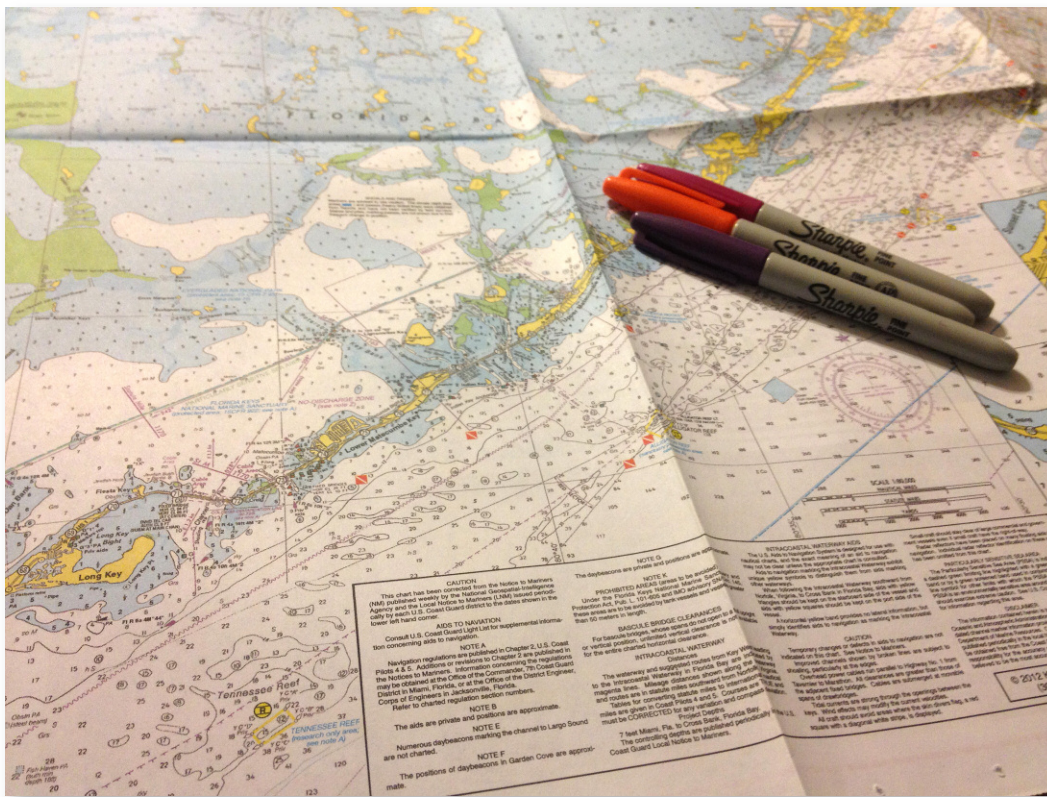
The disjunction between reliable scientific data and governing parties is one of the most confounding aspects of managing the catch-and-release flats fishery. Most of this challenge is born from the lack of mandate to report where, what and how much guides catch. Naturally, fish are released and it's business as usual. However, without data that is typical of the commercial fishing sector (how many fish are caught, which species, where catches occur, and fish size), it's difficult for management agencies to make informed decisions.

One of BTT's roles is to provide information about the flats fishery, the species in the fishery, and the habitats so that management decisions are better informed. A great example of this is BTT's GIS (Geographic Information Systems) approach in the Florida Keys.

Guides and avid anglers are no strangers to being the victims of an inquiry squad: 8-weight or 9-weight; Fast strip or slow; Incoming or outgoing? But sit them down with a blank map, a permanent marker, and a request to "show me where you fish", and watch eyebrows creep ever-farther up foreheads. That's right— for the latter half of 2012 and the better part 2013, BTT asked guides and anglers in the Keys to map where they fish for bonefish, tarpon and permit. The goal of the program is to provide information that can be used to protect fishing access to these areas, identify areas that are in need of protection from threats, and better understand the link between habitat health and the flats fishery.

All of this mapping, of course, was confidential, so don't even think about emailing us for Capt. Rob Fordyce's favorite tarpon haunts. In all seriousness, this type of work is critical to managing a fishery that is feeling increasing pressure from a variety of users in a shifting environmental regime.






In early 2012, the Florida Keys National Marine Sanctuary (FKNMS) began its management revision process. This process is congressionally mandated and requires the FKNMS to revisit its management policies in order to make amendments necessary for improving and upholding the health of the marine environment. Much of the Sanctuary waters are shallow, which is one reason the flats fishery is so good in the Keys. These habitats are also vital to the Keys' economy, as reflected by the \$465 million annual economic impact of the flats fishery. Thus, BTT entered into the FKNMS management revision process with a goal of identifying areas critical to the flats fishery to ensure they are appropriately managed with the traditional and environmentally-friendly sport in mind.

After collecting maps from many seasoned flats anglers and guides, squiggly lines and circles on paper became digitized GIS shapefiles. In other words, flats fishing in the Keys became an integral layer of spatial information that is currently being used in the management revision process for the FKNMS. The beauty of these data layers is that they allow people to visualize and interpret relationships between angling and the environment and apply those relationships to what we already know. For example, we understand that most flats fishing in the Keys happens on a technical skiff propelled by a 20' pole of expensive carbon, an activity with a small ecological footprint. We also understand where particular bottom habitats exist (seagrass meadows, open sand, hard coral, rock with sparse algae, etc.). When we combine fishing effort and habitat information, we are able to identify patterns that help guide conservation. In the management arena we can then state that such low-impact activities are actually a

conservation tool for protecting sensitive habitats of concern to the FKNMS. For example, a pole/troll/paddle zone is equivalent to a seagrass conservation area. A win for fishing, a win for management.

Paralleling the FKNMS process this past year was the release of the Everglades National Park (ENP) revised General Management Plan. This process is occurring under the same ruling as the FKNMS process but has been underway for nearly a decade. After the debut of the revised plan, many guides and anglers had a lot to say, but it was difficult to explain the spatial nature of the complaints. So we embarked on another round with blank maps and markers at kitchen tables and on restaurant patios. This time, guides and anglers were mapping critical running lanes and idle zones imperative for safely traversing Florida Bay. On the GIS side of the process, BTT was mapping critical water depth areas by using depth contour files provided the Florida Fish and Wildlife Research Institute. Again, by combining data layers, BTT was able to put forth logical suggestions to Everglades National Park with both the environment and flats fishing in mind. Those GIS layers are also currently part of the ENP process and we await the next release of management regulations.

In short, it was a highly technical and highly productive year for the Florida Keys. Anecdote met algorithm so fishing can contend in the management arena. More importantly, catch-and-release guides and anglers are digging their heels into the management process by way of valid science, which brightens the future for the fishery. 



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# Remembering George Hommell Jr.

ALEX LOVETT-WOODSUM

is the Director of Development and Communications for BTT

This past fall, hundreds gathered on the sand at World Wide Sportsman in Islamorada, Florida to remember and celebrate the life of George Hommell Jr., one of the pioneers of flats fishing in the Florida Keys and one of the early champions of fishing conservation. Tarpon rolled in the background as the sun set. Many people, including Johnny Morris of Bass Pro Shops, spoke, and fondly reminisced about their dear friend George, and everyone present laughed and cried at the tales they recounted. The location for the memorial was fitting, as Hommell helped found World Wide Sportsman, and was a consistent, welcoming presence there until shortly before his death. At the request of his children and with a declaration of support from Bass Pro Shops, Bonefish and Tarpon Trust announced the formation of the BTT George Hommell Jr. Florida Keys Habitat Fund in his honor, with the goal that funds raised will be used to help restore the Florida Keys flats to their former glory.

Hommell moved to the Keys in 1945, at a time when fly fishing was in its very early days, and began fishing by himself, eventually becoming a full-time guide. He is credited with refining the techniques for poling for bonefish, was one of the first people to trailer his boat around to find fish, and also developed a number of important shrimp fly patterns, including the Hommell Evil Eye. He guided president George H.W. Bush and was fishing buddies with baseball legend Ted Williams, helping him initiate the infamous Gold Cup Tarpon Tournament in 1964. He helped guide client Mac Miller to the fly fishing world record for tarpon in 1961, a record that was snapped a few days later by Joe Brooks with guide Stu Apte. A huge admirer of Hommell's, Apte later wrote in his 2008 memoir *Of Winds and Tides: A Memoir* "if I had to choose a guide for myself, George would probably be the one I would choose."


Hommell was an angling legend, but is perhaps best known for what he did off the water. In 1967, Hommell, along with fishing clients Carl Navarre and Billy Pate, founded World Wide Sportsman, a shop that was one of the first of its kind and remains one of the great landmarks in the Florida Keys. World Wide Sportsman made saltwater fly fishing more accessible and helped to grow the sport, and was also responsible for a number of innovations including the Billy Pate Reel, which changed the saltwater fly fishing world forever. In 1997, they sold the store to Bass Pro Shops, and that new shop remains a Keys landmark today. Bass Pro Shops founder Johnny Morris decided to keep the name World Wide Sportsman in part because of his tremendous respect for Hommell. While George's health permitted, he still came to



Photo by M.E. Hommell

the shop almost every day at the crack of dawn to greet customers with a smile.

In the 1970s, Hommell became one of the early proponents of fishing conservation. In the early days of saltwater fly fishing, guides killed most of their catch. By the 1970s, Keys guides started to notice that catch numbers were declining, and as a member of the Islamorada Fishing Guides Association, George became one of the first proponents of catch and release fishing. He promoted tarpon and bonefish protection and Everglades Restoration through World Wide Sportsman, promoted awareness about the importance of seagrass preservation, and under his leadership, Bayside Marina became the first certified "green" marina in the Keys. In 2002, Hommell was named one of NOAA's environmental heroes in recognition of his numerous contributions to conservation causes. In one of his most significant conservation initiatives, Hommell was a Founding Director of Bonefish and Tarpon Trust (then Bonefish and Tarpon Unlimited) in 1998. BTT Chairman Tom Davidson noted that Hommell's enthusiastic support of BTT was vital to the organization's success. He will be dearly missed by BTT and the greater fly fishing community, and will always be remembered for his incredible contributions to the sport of fly fishing and his deep commitment to conservation of his beloved fishery.

In his memory, BTT has established the BTT George Hommell Jr. Florida Keys Habitat Fund, which will be used to support BTT's efforts to bring back the golden years by bringing Keys flats habitats back to health. Donations to the fund can be made online at [www.bonefishtarpontrust.org](http://www.bonefishtarpontrust.org), by mail to 24 Dockside Lane PMB 83 Key Largo, FL 33037, or by phone at 321-674-7758. 

# Thinking Big in Conservation:




## BTT Board Member Paul Vahldiek

**A**s an avid outdoorsman, it has long been obvious to Paul that a personal commitment to conservation is necessary if those fishing and hunting opportunities are to be available to future generations. The great thing about Paul is that he follows through on his commitments.

A native of Houston, TX, and a Houston-based lawyer since 1980, Paul has long championed a model for sustainable fishing, hunting, and ranching in the western states. Never one to let others slow him down, Paul took western lands conservation as a personal challenge, and through land purchases and partnerships he has assembled an impressive swath of land in Colorado — The High Lonesome Ranch. These lands are part of his larger vision, taking shape as the Western Landowners Alliance, to foster a better private-public partnership for preserving and stewarding large tracts of land in the intermountain west.

Fortunately for conservation efforts in the Bahamas, one day Paul went fly fishing for bonefish. Paul immediately saw the conservation opportunities, and in 2009, joined with partners to purchase the Deep Water Cay Club on the eastern end of Grand Bahama Island. Deep Water Cay is one of the oldest bonefish fishing lodges in the Bahamas, indeed in the world, and is smack in the middle of fantastic bonefish habitat.

Even as they began to refurbish, expand, and modernize the Club, the focus on science and conservation that is so evident in Paul's projects in the western states continued. Following on the heels of his efforts at High Lonesome Ranch, Paul is supporting bonefish research in the Bahamas that will have real-world conservation implications. This won't only help keep the bonefish fishery sustainable, but will help to ensure that the residents of the east end of GBI will have jobs that allow them to continue living in this beautiful place. After all, a healthy fishery means that the Club stays full with happy anglers, which means more jobs at the Club and in support of the Club's operations.

As with his work in Colorado, Paul's interest doesn't stop with his favorite fish. After years of conservation work, he realizes the importance of conservation of the many parts that make up the ecosystem. In addition to supporting scientific research of bonefish, Paul is also interested in research that will support conservation of the coral reefs that surround the area, shorebird habitat, and other aspects of the marine environment that surrounds Deep Water Cay Club. 

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## Passing The Torch

# Permit Gain a New Friend

DR. AARON J. ADAMS

is Director of Operations for Bonefish & Tarpon Trust

**T**aking on the mantle of conservation is no easy task. Taking over that mantle from an avid conservation advocate can be too large a challenge for many. The flats world is fortunate that Dave Horn has taken the challenge head on, and is now a true friend of permit conservation.

Like many flats anglers, Dave began fly fishing at a young age in streams and ponds far from the tropical flats. A native of western Maine, Dave picked up the fly rod at the age of 7 — most of the streams and ponds near his home were fly fishing only — and honed his skills on trout and landlocked salmon. While in college at McGill University, he got his first taste of fishing for Atlantic salmon, and soon was spending a month each year fishing for these strong fish. But a life changing experience was in his future.

In the late 1980s, Dave traveled to the Keys and caught his first tarpon on fly. To top it off, he was guided by Jimmy Albright. As happens with so many anglers, that tarpon changed him. “That ruined me,” Dave said, “I pretty much gave up salmon fishing.” He had the flats bug, and had already decided that when he retired from his job in Boston, he would buy a flats skiff and a house in the Florida Keys and chase tarpon.

As Dave spent more time on the flats after fulfilling his retirement dream of a skiff and a house, he started to dabble with permit. As happens to so many, Dave had little success. So to learn more about how to catch permit he entered the Del Brown tournament (then held in March), and had the good fortune of meeting Jon Ain, perhaps the most permit-crazed angler on the planet. “I wanted to meet this crazed permit addict who’d gotten a tattoo of a permit on his calf after he won the Del Brown tournament” said Dave as he remembered his introduction to serious permit fishing and to Jon.


When the Del Brown tournament was moved to July, good friends Jon Ain and Dave Horn decided to start a tournament in March, which is when Del Brown preferred to fish for



Dave Horn

permit. But they didn’t want just any tournament: it had to have low overhead so it would generate significant proceeds for charity, which meant it would be run by volunteers, keep low entry fees to encourage a broad range of participation; limit participation to 25 anglers to reduce overcrowding on the flats; and to limit the tournament “swag” to the participants to maximize the proceeds. Their efforts were a success, generating sizable donations to BTT.

Jon was diagnosed with cancer in April of 2012, and died the following November. Just before he died, he asked Dave to become re-involved with the March Merkin, a request that Dave easily agreed to because it was important to let Jon know that the tournament would go on.

Dave should be proud that in his first year at the helm the tournament was a great success, donating \$25,000 to BTT. Now in his second year at the helm, Dave says “it makes me feel good to give back a little to the sport that has been so good to me.” Jon would have been very proud. 



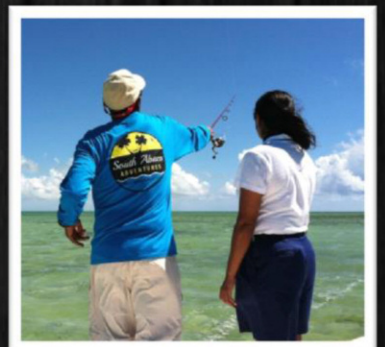
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# Juvenile Tarpon

JOELLEN K. WILSON  
is a graduate student at  
University of Florida

## Monitoring Program

The tarpon fishery in the state of Florida is a large contributor to the economy both from local recreational fishing and tourism, which is an important reason to be concerned about the well-being of the fishery.

Although the fishery is primarily catch and release, tarpon are still susceptible to decline. Because tarpon use different habitats throughout their lifetime, each stage of the life cycle is vulnerable to different disturbances. Juvenile tarpon rely on estuarine and creek habitats along the coast, which are impacted by coastal development. Loss or degradation of habitat will cause an immediate decline in the survival of juvenile tarpon — if there's less viable habitat than last year, the juveniles that depended on that habitat will not survive. If we keep losing juveniles in high volumes because of habitat loss, simple math tells us that the adult population will also be in decline.

One possible solution to address habitat loss is restoration. Restoration will allow us to enhance the existing juvenile tarpon habitat to compensate for habitat that is lost due to coastal development. To this end, Bonefish & Tarpon Trust has implemented a juvenile tarpon monitoring program in Wildflower Preserve, in Placida, FL, only miles from the world famous Boca Grande, FL. This is now conservation land that was once a golf course, and is owned and operated by BTT collaborator The Lemon Bay Conservancy. Eventually the land will undergo restoration to reverse negative impacts from the construction of the golf course and provide a more natural habitat for the juvenile tarpon.

Since juvenile tarpon habitat restoration has never been done before, BTT is conducting a study to gauge the success of the restoration. In this study we are comparing pre- and post-restoration sampling data of juvenile tarpon 1) survival, 2) abundance, 3) growth rates, 4) movement within the system, and 5) movement out of the system.

Each month, I lead a bevy of volunteers on a Saturday morning to sample three ponds at Wildflower Preserve that are inhabited by tarpon. We deploy a 600' center bag seine net using a 14' jon boat a total of four times throughout the morning. Once we capture tarpon they are immediately placed into a cooler full of oxygenated water to await processing. Then each fish is measured, scanned for a previously inserted PIT (Passive Integrated Transponder) tag, fin clipped for genetic identification, and if the fish is not



Photo by Alex Lovett-Woodsum

carrying one already and is longer than 7.5 inches, it is implanted with a PIT tag. Each PIT tag (a glass-encapsulated computer chip) has a unique ID number so we can identify individual tarpon.

PIT tags do not contain a battery so they will last the lifetime of the fish, much like microchipping a pet. The PIT tags can be immediately identified when manually recapturing a fish in the seine by scanning with a handheld wand or via a stationary antenna that is strategically placed at the only entrance/exit to the system. The data is housed in a computer attached to the antenna and includes PIT tag number, date and time of day. Tarpon DNA is uncommon in that each fish can be identified genetically through taking a fin clip sample — although the recapture is not immediately obvious in the field. A small tissue sample is taken from the caudal fin and sent to Florida Fish and Wildlife Conservation Commission's research laboratory in St. Petersburg, FL. There they are analyzing each fin clip and cross referencing with the fish captured each month to determine if there are recaptures.

As our first year of sampling comes to a close, we have successfully captured 844 juvenile tarpon — 154 of which were large enough to be PIT tagged. To date we have 15 physical recaptures (caught in the net again) of the 154 previously tagged fish and only 1 of which was caught in a different pond than first tagged. In short, it looks like they don't move much within the 3-pond system.

Since a typical tag-recapture study has a recapture rate of 3-5%, and the recapture rate in this study is 10%, we believe that our juvenile tarpon population in the study area is small.

Our data are also showing that growth in the winter months



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is stunted — it is not unusual to recapture a tarpon that experienced no growth between a January capture and a February recapture. However, growth is much greater during warmer months. We've recaptured tarpon that have grown 10 centimeters (4 inches) from February to September.

Thus far, 18 of the 154 tagged fish have been detected as they swam through the antenna. Because of the proximity of the antenna to the creek that leads out into the estuary and eventually the Gulf of Mexico, we believe that if the juvenile tarpon are able to reach the antenna, then they are also capable of leaving the Wildflower system when they outgrow it.

Once the restoration is completed (scheduled for fall of 2014), monitoring will continue to determine if it was in fact successful. Success would be seen in higher survival rates, a larger population, and more tarpon successfully leaving the system to enter the estuary.


BTT plans to replicate this study in other altered juvenile tarpon habitats throughout



Photo by Dan Ferraris



Photo by Cole Fairbanks

Florida, and eventually on a much wider scale. With each restoration project and accompanying monitoring data, we can determine which characteristics of a juvenile tarpon habitat are most productive for the population and replicate those features in future restorations. This will ultimately lead to an enhancement in the adult fishery by protecting and improving the juveniles. 





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# Memories are made of this...

MARK SOSIN

is an accomplished outdoor writer,  
TV fishing show host, and angler

Photos provided by Mark Sosin

pick it up. That was my first bonefish and it was caught on a bait casting outfit. Spinning did not come to the United States until after World War II.

Speaking of Dad, he always had trouble spotting bonefish in the water, but give him a spinning rod rigged with a light leader and a 1/4 ounce, yellow, Upperman bucktail and he would catch more bonefish blind casting than most people could hook when they saw the fish. His skill with that bucktail was incredible and I never met anyone who could even come close.

Back in the 1950s, we would walk the original bridges in the Florida Keys and drag a beat up old plug on the surface. This was usually on the uptide side and it was not uncommon to use conventional tackle with the drag locked down pretty tight. The strikes were vicious and came without warning, often slamming you into the bridge railing. The battle seldom lasted long. You could count on the fish cutting the line or leader on the concrete bridge supports.

The old bridges were very narrow and the roadway came right up to the steel railings, leaving barely enough room for a person to avoid being hit by a car. When a bus or a semi



**W**e had just cleared the mouth of Angola's Cuanza River in a small, primitive boat when the guide announced that there was only one way to catch tarpon in these African waters. "You have to troll a silver spoon," he told us, "or the tarpon won't bite. I asked if I could try something else first and he agreed. On my second cast with a 66M18 Mirrolure (green back, silver sides) tied to a bait casting rod, a 100-pound tarpon was airborne. The strike came as no surprise. This was the same technique we used throughout the Florida Keys in harbors and deeper channels. "There are now two ways to catch tarpon in the Cuanza River," the guide announced.

My father rented a rowboat with a 5 HP outboard at the foot of Miami Beach in January 1940 and he took me bonefishing for the first time. Dad had fished with Captain J.T. Harrod out of Miami's Pier 5 and watched as Captain Harrod chummed up bonefish by tossing out pieces of fresh shrimp. I cannot say for sure who started this practice, but it was in use in the 1930s. We simply cast a whole shrimp among the chum and it didn't take long for a bonefish to



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Photography by Adrian E. Gray

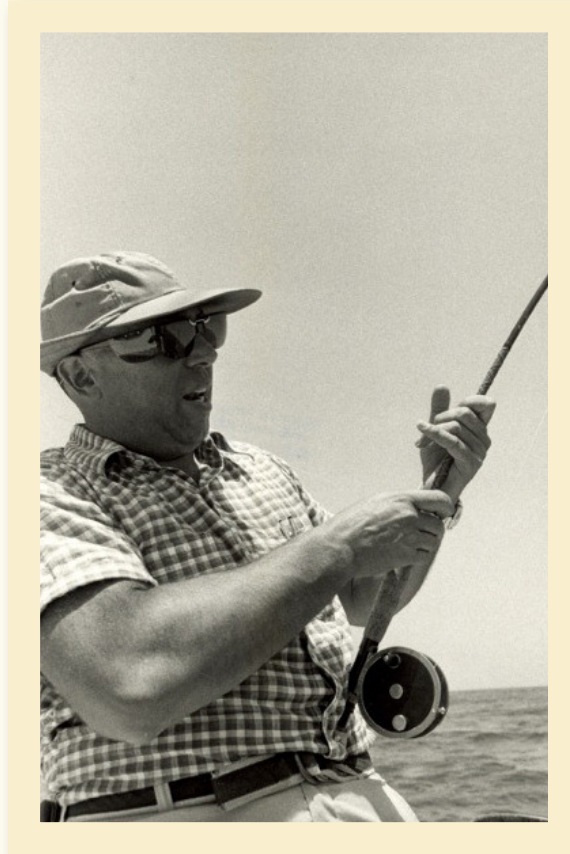
with its large rearview mirrors approached, your only choice was to climb over the railing, hold on with one hand with the rod in the other hand, and lean away from the roadway. Otherwise, the mirrors would hit you. One other caution is worth noting. You never fished near any of the traffic signs on the bridge. People had a habit of driving by at night and shooting at them. Just about all the signs on the bridges had bullet holes in them.

Not every tarpon fishing memory oozes fun and exciting thoughts. In the mid 1960s, I was fly fishing for tarpon aboard a friend's boat in the Lower Keys. We took turns poling each other. As a small school of tarpon approached, I cast to the lead fish and it ate the fly. That tarpon was unquestionably the largest I have ever hooked on fly and was much larger than any recorded in the record books. It was so big that when it tried to jump, it could not get its whole body clear of the water. In those days, fly fishing was done with 12-pound test leader and a foot of heavier abrasion leader.

The outcome was in doubt for a long time, but I finally managed to exhaust the fish and it was only a matter of minutes before we could land it. Suddenly, my partner yelled "Break her off, break her off." Without thinking or asking why, I clamped down on the fly line and the 12-pound leader popped. It turned out that a local guide had just motored around the corner of the key and my friend didn't want him to learn this spot (which the guide knew anyway). To this day, I think of that fish and regret breaking it off without questioning the reason.

Whenever I fished the flats for bonefish or tarpon, I always had a couple of backup rods rigged for other species. We were shooting a television show on Mexico's Yucatan Peninsula when a pair of oversized jack crevalle swam right past our boat and continued down the flat. I picked up a spinning rod with a topwater plug and cast as far as I could in the direction I last saw the jacks. My retrieve was a fast, walk-the-dog movement and I suddenly saw a wake behind the plug. A strike followed and the battle was on. Imagine my surprise when I saw the plug in the mouth of a bonefish instead of a jack. The bonefish had grabbed that topwater plug and the rear set of treble hooks was in its jaw. If you had told me before this that a bonefish would chase a fast moving hunk of wood on the surface, I would not have believed you.


Strange things can happen on the flats. We were poling along looking for cruising sharks in the shallow water. I was holding a spinning rod with a dead balao for bait when we suddenly spotted a large tarpon finning in the current. I made three or four casts in front of the fish, but the tarpon ignored the balao. Then, the silver king started to move off. In desperation, I made a long cast and the balao almost hit the tarpon on the head. Instead of spooking, it whirled around, inhaled the balao, and the battle was on.



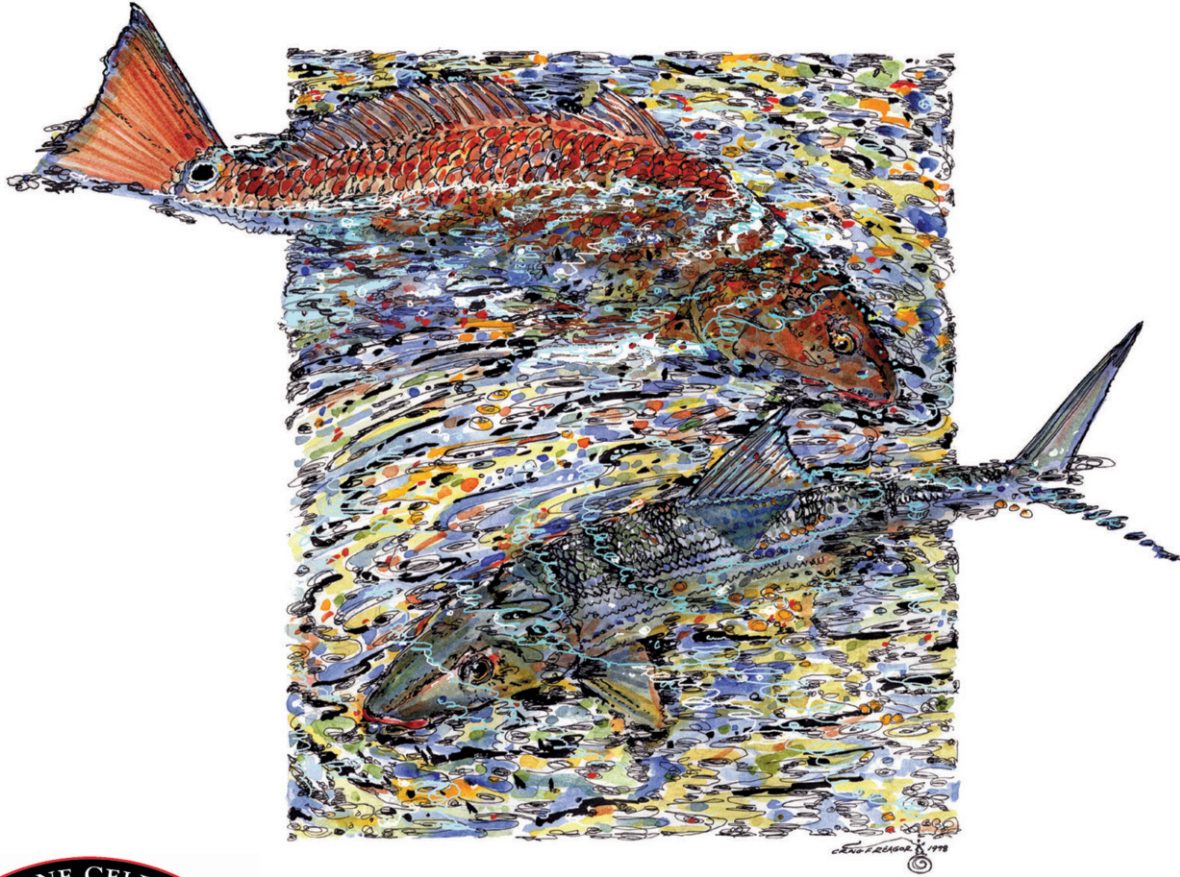
Bonefishing on the ocean side of Soldier Key in Miami's Biscayne Bay and using live shrimp for bait, I had two spinning rods rigged. One had a split shot sinker to get the shrimp to the bottom quickly and the other only had the shrimp. Since the water was deeper, I held the rod with the split shot. We spotted a school of bonefish and I made a cast. Somehow, the shrimp got snagged on the bottom, so I put that rod at my feet and made a cast with the rod that only had the shrimp. Suddenly, the rod at my feet literally flew overboard and was being dragged away faster than you can read this. We poled after it and finally recovered the rod, but the bonefish was gone.

Guides tell me that the vast schools of bonefish that we saw in Biscayne Bay and the Florida Keys a half century ago are long gone. On the first of the incoming tide, if you poled a skiff from Upper Harbor Key toward the Contents, you saw upwards of 1,000 bonefish. Almost any flat you approached in Biscayne Bay had fish. Standing on Channel 2 bridge in the Keys, I once saw a massive school of bonefish finning in the current on the surface.

Back then, if you could get a bait, lure, or fly in front of a school of tarpon, a fish would eat it. If you couldn't put a dozen fish in the air on a tide, it was a poor day. And, you didn't have to wait hours for the tide to be right in one place just to hold the spot. One day, three of us were casting flies to schools of tarpon and we decided to see how many strikes we could get on a single cast. When a fish ate the fly, you simply held the rod still until it spit the fly out and then you began the retrieve again. My best effort was three strikes on a single cast, but one of the other two anglers had four strikes.

It's comforting to know that the Bonefish and Tarpon Trust is working tirelessly and diligently to bring back some of those days that I hold so dear in my memory. 

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# My Favorite Fish



**CAPTAIN BOUNCER SMITH** is a long-time charter captain who fishes out of Miami Beach

Photos by Captain Bouncer Smith

**A**s a charter boat captain on Miami Beach, I am asked every day, “What is your favorite fish?”

I never hesitate with my answer, “Tarpon.”

When they ask why, that’s also an easy answer that is best explained with examples.

Every year in late September or early October, schools of mullet flow down the coast of Florida on their migration from northern waters. They are escorted and abused by an array of predators — jacks, snook, sharks, and more — but none inspire the excitement of a tarpon blasting through the school of mullet, an explosion that will challenge any July Fourth fireworks display.

These are so well-fed from feasting on mullet for weeks that they can be frustrating fish to catch. But that doesn’t really matter — the show is almost as good as any hook-up.

The best way to catch a tarpon during this time of year is to use a live mullet as bait around your favorite inlet on the outgoing tide. Hold on tight because plenty of tarpon will chase and crash your mullet over and over again until finally you hook.

I fish out of Miami Beach Marina on a 33-foot center console Dusky with twin Evinrude outboards. Many of my clients are businessmen entertaining their customers or vendors. They

grab a few snacks, a six-pack of beer and join us at the dock late in the afternoon.

We head out of the inlet and run up Miami Beach for half a mile and set up a drift a couple hundred yards off the beach. We fish medium-size live shrimp on 6/0 VMC circle hooks, and use 20-pound spin tackle complemented by 50-pound leaders.

When fishing the beaches for tarpon before dark, the bait should be about halfway between the surface and bottom. If the wind is light, rig with just the circle hook to take the bait down a bit. With more wind, a split shot might help. On very windy days, which are often the most productive, a 3/8 ounce “hook-up” is the way to win. I like to use 50-pound waxed

thread to tie the hook tight up against the bend of a 7/0 VMC circle hook and then bait the “hook-up” with a live shrimp. The tarpon is securely hooked on the circle hook. We catch a much higher percentage that way.

In contrast, if I am fishing after sunset I want the bait near the surface so don’t use any weight.

Here is a typical scenario on my boat while tarpon fishing off the beach. The client’s customer or vendor is taking in the beautiful weather, the sunset, the music floating from South Beach, and the relaxation. Just as they get into relaxation mode, “ziiiiiing,” a reel drag screams and they are on their feet with a rod in hand. They are connected to my favorite game fish.

---

**Just as they get into relaxation mode, “ziiiiiing,”**  
**a reel drag screams and they are on their feet**  
**with a rod in hand. They are connected**  
**to my favorite game fish.**

---



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Sometimes these tarpon rookies are from the Midwest and have caught a trout, bass or pike. But this tarpon rises from the sea and shakes its head, stretching six feet long. Their jaw drops, and they are mesmerized by my favorite fish.

Another scenario might occur from January through April. It's zero dark thirty, and with engines off the boat is drifting along the coast. But instead of drifting live bait, silence is necessary to hear tarpon feeding on shrimp at the surface.

One hundred and fifty feet downwind tarpon start to explode on shrimp drifting in the surface current. The lights of Miami reveal the tarpons' location, and guide a plug cast into the fray. Three cranks of the reel and a tarpon is on. On the

good nights, dozens of tarpon from 30 to 150 pounds can be jumped. This is why tarpon are my favorite fish.

And tarpon can even be caught back at the dock. Consider this scenario. Back at the dock after a good day of fishing, cleaning the day's catch. Your 10 year-old son wants to catch one more fish, so you hook on a big scrap from the fish you are cleaning to the spinning outfit he has in his hands. He steps to the water's edge where you have been throwing your fish cleaning scraps. As the bait drops toward the bottom the line starts to move, he raises the rod tip, the line comes tight, and as the reel screams a Silver King erupts from the surface. Your kid is hooked up to my favorite fish.



## Fishing Tips from Bouncer

When fishing live mullet you can't beat a bridle band through the nostrils and an 8/0 VMC circle hook.

For fishing to busting tarpon at night, I use a plug rod rigged with 4 feet of 60-pound mono ending in a 7/0 VMC circle hook that is slipped through the eye of a surface plug or shallow running lipless plug like the Twitchin' Rap. Tie a 7/0 VMC circle hook to the end of your leader and then slip the hook through the eye where you would usually tie your line. The other option, is to use that 50-pound waxed line and tie your plug to the bend of the circle hook. Both ways work great.

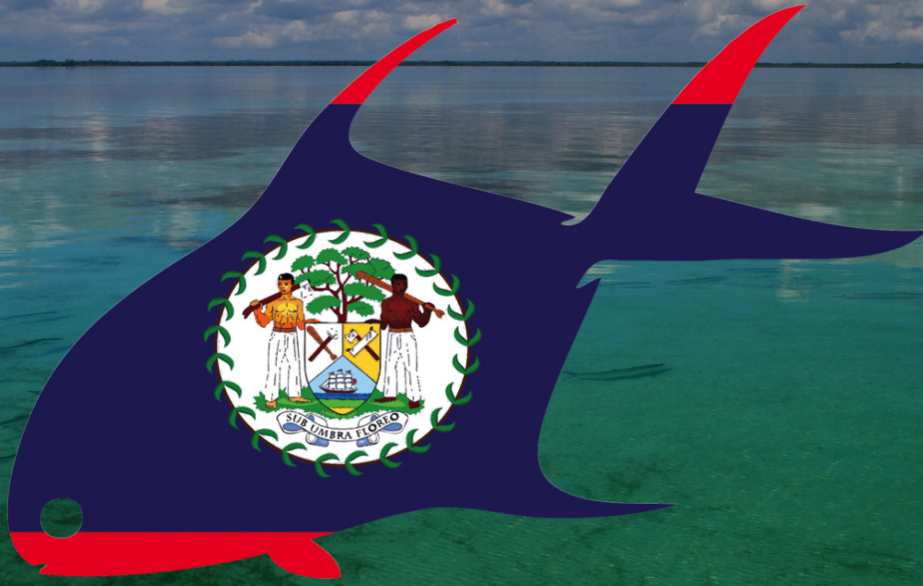
Not only is it now illegal to kill a tarpon in Florida (with few exceptions), we should strive to make sure tarpon are released in good shape so they survive. To improve tarpon survival, circle hooks are the only way to go with live bait, dead bait and most plugs. My clients and I have caught untold numbers of tarpon on DOA shrimp, Tsunami Shrimp, MirrOlures, Rapalas and plenty of jigs and plugs by tying the lure to a circle hook. And also be careful when taking a photo. A big tarpon should never be lifted by the gill plate for a picture. Float the tarpon with the photographer near the tail and the angler at the head and the fish will appear as big as it will be in your memories.

Tarpon are suckers for dead bait. A fish cleaning station where scraps regularly end up in the water will probably hold some tarpon. If you live on the water, a daily routine of throwing a few sardines or chunks of bait in the water every morning or afternoon may result with daily visits from my favorite fish.

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# Conservation News

## & Initiatives

### New Regulations

2013 has been a landmark year for new regulations protecting our fisheries, and much of it is owed to the support and hard work of our members and supporters. The Florida Fish and Wildlife Conservation Commission (FWC) unanimously passed legislation making bonefish and tarpon catch-and-release only in the state of Florida. The new regulations went into effect on September 1st, 2013. BTT supporters were instrumental in getting the new regulations passed.

The newly adopted regulations include the following provisions:

- Eliminating all harvest of tarpon with the exception of the harvest or possession of a single tarpon when in pursuit of an IGFA record and the angler must possess a tarpon harvest tag from FWC.
- Keeping the tarpon tag price at \$50 per tag but limiting them to one tag per person, per year.
- Modifying the tarpon tag program, including reporting requirements and shifting the start and end date for when the tarpon tag is valid.
- Requiring that tarpon remain in the water and are released near the site of capture.

- Discontinuing the bonefish tournament exemption permit that allows tournament anglers to temporarily possess bonefish for transport to a tournament scale (this brings the state in line with similar rules in the National Parks in the Keys).

Shortly after the victory in Florida, South Carolina followed suit, passing more protective tarpon legislation. Under the new statute, only one fish per day may be taken and no fish under 77 inches in fork length may be taken. Fred Allen, founding member of BTT and a South Carolina state house lobbyist who worked on the bill as a volunteer said, "South Carolina is proud to do a small part in preserving a resource we all share."

Another notable legislative victory occurred in Florida when the FWC voted to outlaw the Boca Grande jig, a snagging device believed to disrupt tarpon pre-spawning aggregations in Boca Grande Pass.

In Key West, citizens overwhelmingly voted against a proposal to study the effects of dredging the Key West harbor to make way for bigger cruise ships. Conservation groups, including BTT, were very outspoken against the proposed dredging because of the vast habitat destruction that would occur.

### The Florida Keys Initiative

When you talk to anglers and guides who have fished for a long time in the Keys, there are a few common themes. They are all concerned about the decline of bonefish populations, and the decline in water quality. BTT is working hard to answer the questions about why the bonefish populations have declined, and serve as an advocate for the fisheries and the anglers and guides that enjoy them. We have made great progress in the Florida Keys, and there is much more to come in 2014 and beyond. Here are some of the highlights from the past year:

- Successfully completed a study valuing the economic impact of the Florida Keys flats fishery at over \$465 million per year, valuable information that will be used as leverage to support conservation
- Worked to pass new regulations making bonefish and tarpon catch and release only in Florida
- Worked with guides and anglers to create Geographic Information Systems (GIS) maps of bonefish, tarpon and permit fishing areas in the Florida Keys to be used to protect fishing access to these areas, identify areas that are in need of protection from threats, and better understand the link between habitat health and the flats fishery



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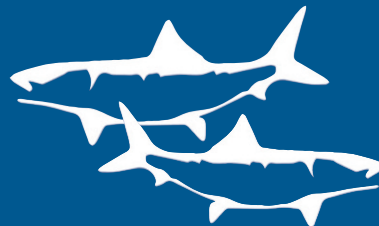
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Photo by Andy Danylchuk



Photo by Alex Lovett-Woodsum

- This GIS information is being used by Everglades National Park (ENP) and the Florida Keys National Marine Sanctuary (FKNMS) in their management revision process
  - Successfully completed a bonefish prey study, determining that prey loss is not the “smoking gun” in the decline of bonefish populations in the Keys
- Despite great progress, there are still many unanswered questions and a lot of work to do. These are our focuses in the Florida Keys over the next few years:
- Conduct a comprehensive water quality assessment, and serve as a leading advocate for improving the quality of our waters
  - Continue the search for juvenile bonefish and bonefish spawning habitats in the Florida Keys so these areas can be studied and protected
  - Continue working with ENP and FKNMS on the management revision process to create plans that benefit the habitats, anglers and guides
  - Conduct a bonefish contaminant study to see if contaminants are affecting bonefish populations

We need your support to accomplish all of our goals and restore the Florida Keys flats fisheries. Please donate to the Florida Keys Initiative by visiting [www.bonefishtarpontrust.org](http://www.bonefishtarpontrust.org)

## Bonefish Spawning in the Bahamas

Bonefish support a fishery worth hundreds of millions of dollars annually, which is threatened in many areas by habitat loss and degradation, and by overfishing. Scientists are scrambling to identify and protect critical habitats and identify other ways to conserve this vital fishery.

Bringing to light new information to aid conservation efforts is a recent study of final-stage bonefish spawning behavior in the Bahamas. Aaron Adams, Director of Operations for Bonefish & Tarpon Trust (BTT) and associate research professor at Florida Institute of Technology, presented the results to the Environment Ministry in the Bahamas on Dec. 9. He and other marine scientists sponsored by BTT recently tracked a school of more than 10,000 bonefish as they went through final spawning stages. The scientists observed the bonefish swirling, bumping into each other and gulping air in 30 feet of water in mid-afternoon, before heading off shore at night to spawn. The school went to over 160 feet deep in water depths of several thousand feet and then rushed upward, releasing eggs and sperm as they reached 80 feet below the surface, before moving back into shallow waters.

These observations help define the conservation needs to maintain this vital fishery. Habitat loss—degradation of shallow flats and nursery areas, disruption of water flow patterns by construction of roadways and causeways, and coastal water pollution—have all been implicated in loss of bonefish populations in many areas. The current research defines another critical need for conservation: protecting the spawning aggregations. These aggregations are vulnerable to commercial fishing harvest and disruption of spawning behavior from intense recreational angling, as well as destruction of the aggregation habitats by coastal development and ship anchoring.

In recent years, researchers in the Bahamas determined that the fish undertake long-distance migrations from their home locations to gather in large schools in discrete spawning regions, and then offshore to very deep water to spawn. This spawning migration requires a much-expanded conservation outlook that links critical deep and shallow habitats.

## Catch ‘Em for the Cause

Traveling angler trips are a great way to support BTT. The funds raised from the trip go directly to BTT, and you will have the opportunity to fish in amazing locations, get to know your fellow anglers and BTT scientists, and help with scientific research for BTT.

Get in touch about the following traveling angler trips:

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[www.bonefishtarpontrust.org/BelizeRiverLodge](http://www.bonefishtarpontrust.org/BelizeRiverLodge)

The Palometa Club May 9-16, 2014  
[www.bonefishtarpontrust.org/PalometaClub](http://www.bonefishtarpontrust.org/PalometaClub)

Belcampo Belize June 14-20, 2014  
[www.bonefishtarpontrust.org/Belcampo](http://www.bonefishtarpontrust.org/Belcampo)



# Tropical Seagrass Beds

DR. AARON ADAMS  
is Director of Operations for Bonefish & Tarpon Trust



Photo by Alex Lovett-Woodsum

## *Think Like A Fish*

At its most basic, flats fishing is about being able to see the flats from the fish's perspective. This is how the better guides and anglers consistently put themselves in the right place and time to find fish, whether bonefish, tarpon, or permit. But even being in the right place at the right time isn't always enough. It's also important to know how fish are using the habitat and what prey are available so that the right fly or lure is tied onto the end of the leader.

## Seagrass as Habitat for Prey

One of the most important flats habitats is seagrass. In some locations the seagrass beds are extensive and lush, in other locations seagrass coverage is sparse. But in areas where seagrass occurs, it is an important gamefish habitat.

Tropical seagrass beds (primarily Turtle Grass, *Thalassia testudinum*, with some Shoal Grass, *Holodule wrightii*, and Manatee Grass, *Syringodium filiforme*) are usually located in shallow areas that are protected from excessive current and wave action. (Although Turtle Grass can grow as deep as 100 feet, it is usually found much shallower due to light requirements.) At first glance from the bow or poling platform, these seagrass beds are underwater lawns with a limited number of organisms living among the blades of grass. But on closer inspection, an observant angler will see a habitat teeming with life. Since seagrass beds are shallow and very productive areas that provide food for many species, they are attractive areas for numerous small organisms, many of which are cryptic (well camouflaged to match their surroundings) and/or very adept at using the seagrass blades for shelter. It is the abundance of small organisms – such as shrimps, crabs, and small fish — that attracts bonefish, tarpon, permit, and other gamefish.

One important ecological function of seagrass is to reduce the velocity of the currents that flow over grass beds so that sediment particles carried in the water by these currents drop to the bottom. This acts as a filter, keeping sediments from reaching reefs, and provides

food for numerous organisms that feed on the micro-organisms attached to the sediments and on decaying plant and animal matter (this collection of sediments, plant, and animal matter is called detritus). In addition, seagrass supports a diverse array of algae and invertebrates that attach to the surface of the grass blades. In turn, these organisms fall prey to grazers and predators, and in this way the productivity of the seagrass beds supports the food web that brings bonefish, permit, tarpon, and other fish into the shallows.

Tropical seagrass beds support an incredibly high diversity of species of fish, crabs, shrimp, copepods, amphipods, worms, algae, urchins, and a host of other organisms that are gamefish prey. The abundance of species, or even the types of species found in a seagrass bed may change among locations, so although the general list of prey items may be similar, the favored prey items will likely vary. This, in part, explains why some flies are pounced upon by fish on one seagrass flat, but completely ignored by fish in other locations. In addition, abundance and presence of potential prey items changes seasonally due to factors such as temperature and life cycles of these prey species.

For example, studies of bonefish diet show that most Florida bonefish had crustaceans in their stomachs, while clams were most frequent in stomachs of bonefish from Puerto Rico. I found similar differences in prey preferences for permit in the Virgin Islands. On St. Croix, U.S. Virgin Islands, where permit come into shallow seagrass beds that are mixed with coral rubble to feed, they show a preference for small clams and small sea urchins. However, in the nearby British Virgin Islands, where permit are most often found in shallow seagrass beds that are intermixed with sand flats, crabs and shrimp were high on the permit menu. These differences in diets of bonefish and permit among locations is most likely due to differences in the abundance of prey items.



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However, we can use our knowledge of the general makeup of communities found in tropical seagrass beds to generate a list of types of prey items that will most likely be present on any seagrass beds you might fish, and give you a head start on deciding which flies to put in your fly box.

## Prey and Flies

Although the number and types of species may vary among locations, most tropical seagrass beds have members of particular families living among the grass blades. We can use this information to narrow the list of probable prey items we might find on a particular seagrass bed. For example, crustaceans (primarily crabs and shrimp) are usually abundant in seagrass beds. An important characteristic of these crabs and shrimp is that although the species may vary, the general colorations and behaviors can be strikingly similar. For example, both swimming crabs (Portunidae) and walking crabs (Goneplacidae), probably the most common small crabs on tropical seagrass beds, will scurry for cover rather than try to outrun a pursuing fish, but they will generally differ in where they can be found.

Swimming crabs will usually be found in seagrass beds with soft or sandy sediments and usually bury in the sediment as a defense strategy, while walking crabs prefer seagrass beds with some rocky habitat mixed in and will scurry into the nearest hole or under the nearest rock. Crabs from both families will be colored so they are well-camouflaged in their surroundings — whether green in areas of thick Turtle Grass or mixed tan and green for areas where coral rubble is mixed with the seagrass.

Shrimp will also take on the coloration of their surroundings, although some — like the grass shrimp — may be mostly clear. The most common species of shrimp found in tropical seagrass beds are members of three families: common shrimp (Pennaeidae) are what we usually think of when we think of shrimp, and are usually found in the same areas as swimming crabs; mantis shrimp (Squillidae) will live in holes among coral rubble or will live in burrows in soft-bottomed seagrass beds; snapping shrimp (Alpheidae) are usually found among rubble or empty shells within seagrass

beds; and grass shrimp (Palaemonidae) live on and among the grass blades. Depending upon the species and their habitat, in order to escape from predators the shrimp may burrow into the sediments, scurry under rocks or into burrows, hide among the bases of the grass blades, or grab onto seagrass blades and try to become ‘part of the seagrass’. Many of these shrimp are more active at night than during the day, so may be more accessible to bonefish near dawn and dusk.

Even in areas where crustaceans might not be the most common food item, such as on St. Croix, U.S. Virgin Islands, where clams are a favorite for permit, flies imitating crabs and shrimp should be high on your list of go-to flies. Crustaceans are almost always on the list of prey items found in stomachs of gamefish in

tropical seagrass beds.

Most importantly, crustaceans can be imitated with a fly. Even though bonefish in a particular location may eat a lot of small clams, a clam fly isn’t really feasible, but a small shrimp or crab that looks similar to a local species may be the next best choice — and provides a better meal.

Tropical seagrass beds are also home to dozens of species of fish. For example, in a recent

survey of a seagrass bed in the Caribbean, 91 species of fish were recorded. Some of these species are present year round, such as gobies, blennies, mojarra, wrasse, and parrotfish. Excluding the larger gamefish that were recorded in the survey, most individuals of the fish species are relatively small (generally less 4"), are fed upon by numerous gamefish throughout the year on an opportunistic basis, and generally comprise a relatively small but important portion of the diet.

Other species are present seasonally, such as juveniles of many larger species that inhabit reefs and deeper water as adults. The list includes grunts, snappers, surgeonfish, wrasses, and parrotfish. During summer months, these juveniles can be important food items for gamefish, especially barracuda, jacks, snappers, and even bonefish. Numerous times I’ve caught bonefish feeding in seagrass beds using a Deceiver or other baitfish pattern. Chico Fernandez tells the story of catching a nice bonefish in the Florida Keys and upon landing the fish it barfed out a juvenile yellowtail snapper.

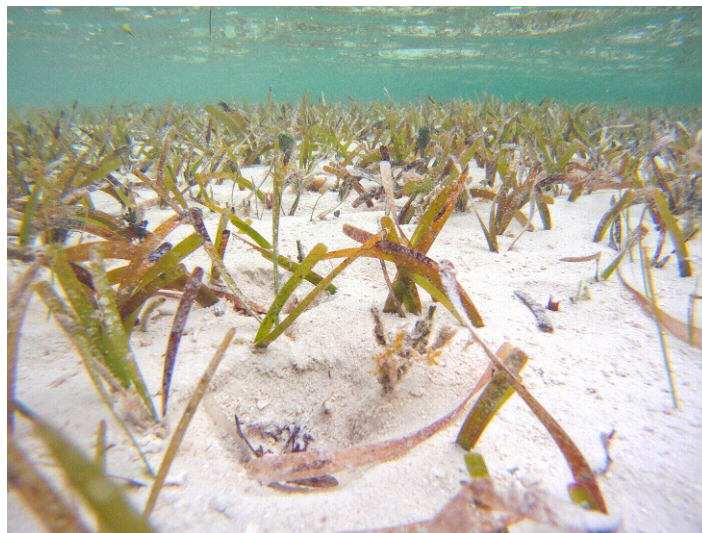


Photo by Dr. Aaron Adams

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## Day - Night Change over

There are also notable day-night changes in the activities of many species found in seagrass beds. This is especially true for many of the crustaceans, many of which are far more active at night. This is why dusk and dawn can be great times to target large fish feeding in shallow water. Dusk and dawn are the change-over times for the day and night groups of species, so fish feeding during these times have access to prey that are both coming out to feed and returning to shelter. So although many gamefish can be found feeding throughout the day, their most active feeding times might be when light is lowest. For example, on Caribbean islands, large snappers will often forage in shallow seagrass beds at night, and can be targeted with a fly rod at both dawn and dusk. Bonefish and permit can be found searching for small swimming crabs along shallow seagrass shorelines at dawn and dusk, especially on an early rising tide.

## Baitfish

Although this discussion has so far focused on the bottom-oriented organisms that rely directly on seagrass habitat, seagrass lagoons are also home to numerous fish that remain in the mid- and upper-levels of the water column, such as numerous species of herrings (Clupeidae) and silversides (Atherinidae). Seagrass lagoons are attractive to these species because these areas are relatively shallow, sheltered, and calm, and are not as heavily populated by predators as nearby reefs. These species tend to school during the day and disperse at night to feed. Although their abundance can vary seasonally, these species are generally present throughout the year, and during the daytime hours these species are preyed upon by virtually all larger fish species, so you should carry an abundance of flies imitating these baitfish (from 1" to 6").

## Presentation

In general, areas of thick turtle grass will have more total species and a greater number of individuals than areas of sparse turtle grass. (In other words, greater

density of seagrass blades usually means a greater density of potential prey items). However, the thick grass blades also provide more places for prey to hide and escape predators, so the feeding efficiency of predatory fish is often lower in areas of thick seagrass than in areas of sparse seagrass. This will be especially true during the day, when many prey species (e.g., shrimp) are usually deep within the seagrass. In contrast, areas of sparse seagrass provide some shelter for small organisms but also provide a situation where the predatory fish have a better chance of spotting and then successfully pursuing and catching prey.



Photo by Dr. Aaron Adams

The density of seagrass blades is also an important factor when it comes to fly or lure selection and presentation. Remember that the usual strategy for crabs and shrimp to avoid a predator is to perhaps make a quick, darting move, and then bury in the bottom sediments or scurry into a hole or under grass blades. This means that flies that imitate crabs and shrimp are normally fished on or near the bottom. This will affect what flies to choose and how to fish them in different types of seagrass beds. For example, a shrimp-imitating fly that is fished near the bottom is more likely to be spotted and taken by a fish if it is in an area of sparse seagrass. In thick seagrass, the fly may become lost in the seagrass and never spotted.


In general, when fishing shallow areas, I like to fish lightly weighted or unweighted flies in areas with thick seagrass, and lightly- or medium-weighted flies in areas of sparse seagrass. Not only are weighted flies more likely to become lost in thick seagrass and never seen by the fish, they are also more likely to snag blades of seagrass. Also, tying fly patterns in the bend back style, or simply with the wing tied in so it covers the hook point (like a Fernandez snapping shrimp) makes flies semi-weedless. In deeper areas of thick seagrass I like to use heavily weighted flies if I want to get the fly to the bottom quickly, but if I am sight-fishing I make sure to cast the fly close enough to a spotted fish that it sees the fly sink to the bottom. Otherwise, the fly will surely get lost in the thick seagrass.

In areas with thick seagrass I like to cast streamers (small clouser minnows are a favorite — either with beadchain or lead eyes, depending on the water depth) and retrieve the streamers with quick, short strips so the fly rides just above the tips of the grass blades. This is a good imitation of the behavior of many of the small fish that live in turtle grass beds. In areas with schools of small baitfish, retrieving the fly so it rides near the surface give you a good shot at jacks and small tarpon and barracuda.



Photo by Dr. Aaron Adams

Some of the best spots to target in turtle grass beds are where there is a change in the thickness of grass blades — a noticeable contrast between an area of thick

seagrass and an area of sparse seagrass. Gamefish will cruise along the edges where these two areas meet, often zig-zagging across the boundary into both areas. Presenting the fly to a fish over sparse seagrass gives you more options: use either unweighted or weighted versions of crabs or streamers; use varied retrieves — bounce the fly on the bottom or move it quickly through the sparse grass blades. Open sand potholes in thick seagrass present similar opportunities. Areas of thick seagrass that change abruptly to sand or very light seagrass present similar opportunities, and even more options with fly selection. 

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(front of shirt, left side)



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# Movement Patterns of Bonefish Around Culebra, Puerto Rico

## *bonefish on the edge?*

DR. ANDY DANYLCHUK  
JAKE BROWNSCOMBE  
CHRIS HAAK  
DR. JACK FINN  
DR. STEVE COOKE  
ROXANN CORMIER

Photos by Dr. Andy Danylchuk

Over the past 10-15 years, a considerable amount of research has been conducted on bonefish in The Bahamas and Florida Keys, adding substantially to what we know about movement patterns, reproductive activity, juvenile habitat, and thermal ecology. In addition, research in those locales has clarified the impacts of catch-and-release on physiological stress, hooking damage and post-release mortality. One very important finding from the work in The Bahamas was that bonefish are not just residents of the shallow flats but use a broad range of coastal habitats, including making seasonal migrations to deep water to spawn. Unlike their tidally driven movement patterns into and out of mangrove creeks that are adjacent to land, these deeper water movement patterns are driven more by seasonal lunar patterns and the cover of darkness. Ongoing research in The Bahamas continues to reveal that coastal flats, tidal creeks, and deeper-water transitional habitats are essential habitats for bonefish, further confirming that bonefish are not simply creatures of the flats.

Given the broad distribution of bonefish in the Western Atlantic and association with coastlines of vastly different bathymetries, the results from studies conducted in The Bahamas and Florida Keys may not be completely transferable to other regions. For instance, the same vast movements of bonefish tagged in the Florida Keys may not occur in places where the coastal habitats are fragmented. Many questions emerge when considering the spatial ecology of bonefish inhabiting broad, shallow flats connected to the shoreline (such as in The Bahamas and the Keys) versus the movement patterns of bonefish that are found on reef flats that are spatially disconnected from other shallow, coastal habitats; reef flats typical of the Caribbean islands. For instance, do bonefish spend as much time on reef flats as they do in tidal creeks and broad flats connected to the coastline? Are daily movements of bonefish as tidally driven on reef flats as they are in broad coastal flats in The Bahamas? Do pre-spawning aggregations occur if the distance between shallow flats and spawning sites is short? Do bonefish make similar seasonal spawning migrations if reef flats are in close proximity to deep water spawning sites?



Addressing these and many other questions are important for the development of a framework for the conservation and management of bonefish throughout the Western Atlantic. In 2012, thanks to a University of Puerto Rico Sea Grant, and additional support from the University of Massachusetts and from an 'Adopt a Bonefish' campaign, we are embarking on a study to quantify the spatial ecology and movement patterns of bonefish inhabiting coastal waters of Culebra, Puerto Rico. Culebra, one of the Spanish Virgin Islands, is relatively small (12 square miles) and the coastal bathymetry is typical of small islands throughout the Caribbean Basin, possessing shallow reef flats, narrow lagoon zones, and small coastal embayments. The reef flats just off the coast of Culebra are home to bonefish, as well as permit and tarpon. This charming island is a popular tourist destination from day-trippers from the mainland island of Puerto Rico, and residents take pride in the relatively pristine marine environment.

Similar to several recent projects in The Bahamas, we are using acoustic transmitters and an array of fixed receivers to track the movement patterns of bonefish around Culebra. To examine broad scale movement patterns of bonefish, thirty receivers are

deployed as a series of nodes and small curtains around three reef flats and the perimeter of the island, while an additional 25 receivers are deployed as a fine-scale net of detection across one specific reef flat to quantify detailed movement patterns and habitat use. Coupled with habitat mapping, the high-resolution positioning system will provide a valuable opportunity to understand the relationship between bonefish behavior, habitat use, coastal bathymetry, and habitat connectivity for bonefish.

As of May 2013, we surgically implanted 50 bonefish with acoustic transmitters and are rapidly amassing a large data set of detections. Preliminary analysis of the broad scale movement patterns shows an extremely high degree of site fidelity, meaning that bonefish tagged on a particular reef flat are rarely, if at all, being detected on neighboring reef flats or elsewhere. For example, one bonefish tagged on a reef flat frequented by anglers was detected over 95,000 times across 10 months but never on receivers deployed on the other reef flats or around the perimeter of the island — this fish is a true homebody! Even for bonefish that have moved among flats, these movements have been very few (less than 1% of the total number of detections for each individual) and these bonefish returned to their 'home flat' within a day or two. This high degree of fidelity has not been documented for bonefish in The Bahamas and Florida Keys. Data for bonefish detected in the fine-scale array of receivers is also quite impressive as it shows limited overlap of habitat use for individuals in the same school on the flat at the same time. Could this mean there is a social hierarchy of bonefish within a school? Exciting! Also exciting is that in August 2012 we surgically implanted an acoustic transmitter in a large permit (a first for this species), and as of May 2013 there has only been a handful of days we have not detected this fish on our receivers. This permit (we call him Hermon) appears to also have very high site fidelity but a larger home range than the bonefish tagged from the same reef flat.

A high degree of site fidelity has clear implications for conservation and management of bonefish in the Caribbean. Such high reliance on a relatively limited area means that the disturbance or loss of that habitat could disrupt feeding patterns and reduce the energy available for growth, reproduction, and survival. Limited mixing of bonefish among flats and high fishing mortality, via gillnetting for example, could depopulate a flat for a long period of time. This could not only be detrimental to bonefish stocks but also to local communities that are dependent on revenues generated by tourism, including catch-and-release recreational angling for bonefish and other flats species, such as permit, inhabiting small isolated reef flats in the Caribbean. With our 'Adopt a Bonefish' program, conservation-minded anglers have made significant contributions to this project, providing key information for management of bonefish and other flats species. With continued support, we hope to deploy another 30 bonefish tags in 2014 but on two other isolated reef flats on the opposite side of Culebra. By tracking these as well as our existing tagged bonefish, we hope to provide even more information about the



spatial ecology of bonefish inhabiting coastal habitats typical of the Caribbean. Not only will such information help broaden the baseline knowledge of bonefish ecology, it will also allow resource managers to make informed decisions regarding the implementation of management tools, such as marine protected areas and net bans. 🐟

### About the Authors

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# The Bahamas Bonefish Tagging Program Continues

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AARON SHULTZ  
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Photos provided by Cape Eleuthera Institute

**B**lue skies, blue water and endless flats disrupted only by tailing fish. This is undoubtedly the scene that comes to mind when one thinks of bonefishing in The Bahamas. For scientists, though, a day in the field is anything but a walk on the flats. Sometimes trading in wading shorts for a wetsuit, and opting for rain gear instead of sun gear, biologists work through conditions from hurricane force winds to bone-chilling water temperatures to continue tagging efforts as part of research efforts in The Bahamas.

## *Method to the Madness*

This collaborative conservation effort between the Bonefish and Tarpon Trust (BTT), the Fisheries Conservation Foundation (FCF), the Cape Eleuthera Institute (CEI) and numerous lodges and independent guides throughout The Bahamas, was implemented to assess the Bahamian bonefish population and to best manage the fishery. Tagging bonefish allows for the tracking of their movement and growth, information essential to conservation.

The challenge is that successful tag-recapture studies require large numbers of animals to be captured, tagged, then released back into the environment. For concentrated tagging efforts, researchers trade in their fly rods for a seine — a large (up to 300 feet long) net with a weighted bottom — to corral fish. Resembling something out of an old western film, seining involves a team of several researchers, boats and guides hustling across the flats, deploying the seine as they go, to encircle schools of bonefish. Although this is a less stealthy approach than most bonefish anglers are used to, it is an effective means for capturing and tagging large numbers of bonefish. This October in South Andros, for example, 700 bonefish were captured and tagged in a single weekend, and of the 2,000+ bonefish tagged or recaptured on the island of Eleuthera, 80% were initially captured by seine.



Not a typical scene on the flats. Guides and BTT, CEI and FCF scientists work together to seine and tag bonefish on Abaco.

## *Habitat use and movement*

Understanding habitat use by bonefish is integral not only to a successful day on the water, but also to identifying critical bonefish habitat. Recapture data suggests that individual fish regularly utilize relatively small home ranges. CEI researchers recently observed further evidence of “site fidelity” by bonefish by following the capture and transport of eight fish to a new location that was 20 miles from their home location. In subsequent months, these fish were recaptured at the original home tagging location, which means that they traversed some 20 miles of unknown territory to return home.

In contrast with their use of small home ranges throughout the year, long distance movements associated with spawning have also been observed. Spawning migration routes of at least 70 miles one way have been identified on Abaco, 40 miles one way on North Andros, and 17 miles on Eleuthera. In each of these islands, bonefish were tracked returning to their home range after spawning, and this level of site fidelity likely plays a critical role in bonefish population dynamics that has important conservation implications.





One of the largest bonefish tagged to date, this 27 inch fish was tagged and released near Grand Bahama Island.

.....

Such findings shape  
our understanding of bonefish  
ecology and our approach  
to conservation  
of the resource.

.....

### *Moving forward...*

Such findings shape our understanding of bonefish ecology and our approach to conservation of the resource. This research relies on the reporting of recaptures by independent anglers and tagging efforts by bonefish guides across the Bahamas. To contribute, report recaptures to the BTT, support Bahamian guides that participate in the tagging program, and consider making a donation to the program. 🐟



Scientists and guides rush to close a seine net around a school of bonefish as Hurricane Sandy brought cool temperatures and lots of rain. Notice the school of bonefish pushing water near the opening of the net

**Table 1.** Summary statistics for bonefish tagged in The Bahamas. Bahamas-wide catch totals are presented for the number of bonefish tagged and recaptured; Bahamas-wide mean lengths are presented for all length data. All lengths are reported in inches.

Location	Number Tagged	Number Recaptured	Mean Fork Length	Minimum Fork Length	Maximum Fork Length
Eleuthera	1770	323	15.9	7.9	23.4
Abaco	2100	51	17.0	10.5	32.0
Exuma	177	0	16.6	9.0	25.8
South Andros	722	3	19.2	9.0	28.0
Deep Water Cay	738	21	17.3	8.7	28.0
Grand Bahama Island	429	19	19.0	10.0	27.0
MEAN	5936	417	17.5	9.2	27.4

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# BTT Bonefish Tagging Efforts Expand to South Andros

ZACK JUD  
is a Ph.D. candidate at  
Florida International University  
Photos by Carl Trey

In October 2013, the Bahamas Initiative (a collaboration between BTT, Fisheries Conservation Foundation, and Cape Eleuthera Institute) waded into the fabled waters of South Andros. While a handful of bonefish had previously been tagged by guides in South Andros, this was the first large-scale tagging effort on the island. As most anglers probably know, catching a tagged bonefish (or any tagged fish for that matter!) is a once in a lifetime experience. But from a research perspective, the more fish we have tagged in a given locale, the more likely we are to get valuable data from recaptures — data that we will use to identify growth rates, movement patterns, habitat use, and overall health of the area's bonefish population.

Despite a lingering cold front and 25 knot winds, the BTT-led research team managed to tag more than 650 bonefish in four long days on the water. The team was comprised of myself, Stacey Doorman and Carl Trey from Cape Eleuthera Institute, and Allan Benjamin (aka Volunteer Extraordinaire).

To even their odds in the face of ugly weather, the team reluctantly set down their fly rods, and instead relied on a 250' long soft mesh seine net to capture bonefish for tagging. Working closely with guides from Deneki's Andros South Lodge — Sparkles, Freddie, Charlie, and Ellie — the researchers used the net to quietly encircle large, and oftentimes fast-moving, schools of bonefish. Unfortunately,

herding bonefish into a net is a bit like herding cats...they rarely go where you want them to. All too often, a school made a last-minute U-turn, slipping right back out of the closing net. To put the odds in their favor, the BTT team asked the guides to try to find the largest schools of bonefish possible, figuring that with enough fish in the water, they'd be bound to get a few to swim into the net. Well, the guides clearly know their fishery intimately, putting the researchers onto many huge schools of bonefish, some containing more than 1,000 fish. Worries about catching enough fish during the trip were quickly replaced by worries about running out of tags!

In the first day of tagging, a single net haul resulted in the capture of more than 400 fish (not counting several hundred more fish that managed to stay out of the net as the big school split in half). After a catch that size it took hours to get all of the fish tagged and measured.

On day two, in the midst of a raging lightning storm, the team again managed to capture a huge school of bonefish, numbering close to 500 fish. Facing fading light and a long, rainy run back to the dock, the crew made the tough decision to call it a day before they had tagged the entire school. We ended up releasing several hundred untagged fish so we could make it home before dark. There are just that many bonefish in South Andros!



A bird's-eye view of the BTT research team hard at work. A school of 500+ bonefish quietly circles inside the net.

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A guide from Andros South lodge prepares to release a group of tagged bonefish.

Rapidly deteriorating weather reduced the number of fish caught on the last two days of the trip, but the crew still managed to tag fish in all of the popular South Andros fishing spots — Grassy and Little Creeks, the west side, and the southern cays. We don't want to tell a fish story, but there are some awfully big fish swimming around South Andros wearing a new piece of numbered jewelry, courtesy of BTT.

On BTT research trips, the work doesn't stop when the boats are docked and the nets are out of the water. An important part of these trips is explaining BTT's conservation efforts to local guides and lodge owners. Without the continued support of these folks, our work wouldn't be possible. I am happy to report that our efforts to protect Andros' bonefish into the future were very well received, and all of the guides and lodges in South Andros seem eager to report recaptures back to BTT. With the busy season cranking up, it's only a matter of time before clients begin catching our tagged fish.

Despite the economic value of the bonefish fishery on Andros, we still have many unanswered questions about the fish that call the island home. How big of an area do these fish use during their life? How quickly do they grow? Where do they spawn? What habitats are most important for the conservation of the species? What do we need to do to assure that the incredible South Andros



One of the big bonefish that South Andros is known for.

fishery is protected for years to come? Although it will still be some time before significant numbers of recaptures start rolling in for South Andros, the work we began last month is the first step in coming up with answers to these important conservation questions.

Special thanks to Mike Saunders, Jordan Sly, Kyle Shea, and the rest of the crew at Andros South Lodge for helping make this a successful trip. 🐟

# Flats Research & Bahamian Youth

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is Director of the Cape Eleuthera Institute

Photos provided by Cape Eleuthera Institute

From tagging bonefish in Abaco to exploring mangrove creeks of South Eleuthera, educational outreach programs provide the opportunity for Bahamian students to experience the life of a bonefish researcher and guide in The Bahamas. Outreach is one of the most exciting facets of the Cape Eleuthera Institute's (CEI) approach to education. A Bahamian nonprofit located in South Eleuthera, CEI's mission is to promote conservation of marine and coastal ecosystems of Eleuthera, The Bahamas, and the greater Caribbean by facilitating the research of resident and visiting scientists, supporting the education of students at all levels, and promoting outreach efforts to enhance conservation awareness of local and global communities. Currently, CEI's Educational Programs are developing outreach initiatives to introduce Bahamian youth to current research projects conducted at CEI, including bonefish and flats research.

## Summer Field Courses

Outreach programs at CEI emphasize experiential education as a method to reach students. With this experiential approach,

students leave the classroom behind to see, feel, and even taste (e.g., salty black mangrove leaves) as a means of connecting with the environment. It also allows students a rare opportunity to participate in current, ongoing research projects with CEI's resident research scientists. For the past three summers, CEI's Flats Ecology and Conservation Program has offered "Flats Week" to high school students from the US that are interested in bonefish and the marine sciences. For a full week, participants spent time on the flats with CEI researchers and Bahamian guides to learn about habitats that are important for bonefish, general bonefish ecology, and how that knowledge is useful from both an angling and a conservation standpoint. Based on the success of this international program, CEI has collaborated to provide the same experience to local Bahamian students.

Friends of the Environment, in partnership with CEI, offered the first flats field course on Abaco last summer, a collaborative effort that introduces an excellent model for future outreach programs in the Bahamas. The program, held in Marsh Harbour, Abaco, consisted of five local Abaconians in their late teens to early twenties. These students had the opportunity to not only

learn how to fly fish, but also dip into the research conducted on the Bahamian flats ecosystem. As "citizen scientists," they contributed to ongoing research by tagging 20 bonefish in Crossing Rocks, about 12 miles south of the Marls. Tagged fish were then released and hopefully will be recaptured by fly fishing guides and anglers. Researchers use length and recapture location to estimate growth and track movements throughout The Bahamas.



Flats camp participants measure, tag and release a juvenile lemon shark captured on Abaco while learning about the ecological role predators play in the flats ecosystem.



The flats field course in Abaco was facilitated by two research scientists, Justin Lewis from Grand Bahama and Zack Jud from Florida International University, lead educator from CEI, Tiffany Gray, and the Education Officer at Friends of the Environment, Cassandra Abraham. The collaboration between scientists and educators proved to be successful for facilitating a meaningful experiential education for the participants. By relying on researchers to teach and lead “citizen scientists” into the field to gather data for their projects, students get to experience a day in the life of a scientist first hand. In addition, this method of teaching gives students the opportunity to gain ownership over the research, leading to a greater understanding of its importance and its value in the long-term. Students become stewards of their natural environment and utilize these resources in a sustainable manner.



A student hauls a seine net under the instruction of CEI and Friends of the Environment research staff. By using a seine net to capture organisms, students have the opportunity to observe both bonefish and their prey items.

## Outreach & Bahamian Fisheries

By experiencing the environment, contributing to data collection, and interacting with scientists and guides, such education opportunities will cultivate an interest and understanding for the marine resources. Whether studying lobster, sharks, conch, or bonefish, students come in direct contact with species strongly tethered to both the Bahamian economy and the health of the marine environment on which this economy is based. A highlight for students during the Abaco Field Course was working with local fly fishing guides at the Black Fly Lodge at Schooner Bay and private guide Buddy Pinder of Casuarina Point. Through field experience, students were able to see what a typical day as a guide might be like. They also capitalized on the opportunity to ask for guides’ perspectives on bonefish conservation initiatives, as well as discuss some of the benefits and challenges of guiding in The Bahamas. During these interactions, students learned firsthand the value of bonefish in the fly fishing industry. Although students were familiar with the extent of the bonefish’s cultural importance, they were impressed to learn that the economic value in the Bahamas is also staggering, worth an impressive \$141 million dollars annually.

Many out islands, such as Eleuthera, rely largely on fisheries and marine tourism for employment. If these resources are not managed and used in a sustainable manner, the chance that they will be available for future Bahamians is at risk. It is imperative to share the research so that stakeholders may use the information to make informed decisions. If students can appreciate these resources and see a need for their longevity and protection, fisheries may ultimately benefit through the support group built by future generations. In this way, outreach efforts lead to the recruitment of future Bahamian scientists, fly fishing guides, and policy makers. Therefore, the high potential for this level of outreach to impact bonefish as a sustainable Bahamian fishery is exciting for the species and The Bahamas as a whole.




Cape Eleuthera Institute hopes to work in partnership with Friends of the Environment and other Bahamian conservation organizations in the future to further facilitate successful outreach programs. Through these relationships, CEI will inspire the next generation of fly fishing guides and anglers to take ownership over their resource!



CEI staff identify juvenile fish captured in a seine net. By handling juvenile fish, students gained an appreciation for the diversity of organisms found in the flats and mangrove ecosystems.



For information on upcoming field courses at CEI, please contact Karen Knight ([karenknight@ceibahamas.org](mailto:karenknight@ceibahamas.org)). If interested in supporting CEI's Flats Ecology and Conservation Program or CEI's continuing outreach efforts, contact Zach Zuckerman ([zachzuckerman@ceibahamas.org](mailto:zachzuckerman@ceibahamas.org)) or Aaron Shultz ([aaronshultz@ceibahamas.org](mailto:aaronshultz@ceibahamas.org)). 



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ARTIST OF THE YEAR

Al Barnes

I always felt that if I had been born or grew up on the east coast, I would be a much different artist. Texas, with its shallow bays and estuaries, just doesn't have the diversity of water craft as New England. We moved to the coast, Port Isabel, when I was in the fourth grade. There were two ferry boats making the daily trips between south Padre Island and the mainland. The captain of one of the vessels would let me ride for free and even steer and throw the dock lines at times. I was hooked.... It was the nautical life for me. I always knew I was going to be an artist having been drawing long before I started school. I sold my first painting, a sloop, when I was in the sixth grade.

I wanted to be a commercial artist and in those days, BC (before computers), you had to know how to draw to be successful. After marrying my wife Nanci, (of 52 years), I landed in Dallas as an art director, freelancer, and illustrator. After 13 years and a large mural commission, I was ready to move back to the coast, to Corpus Christi. I had taken some trips to the Bahamas and crewed on several boats between New England and the Caribbean, from Texas to Florida and from Florida to Belize. When I saw the clear turquoise water of the Caribbean, I knew



what was going to be my favorite subject matter for the rest of my life. In my time there, I was able to record native boats, the way of life, and the waterfront as it had existed for hundreds of years. Those images are still the source of many paintings today.

Most of my work is done in the studio. I do enjoy plien aire and sketching but most of the time it's just too damn hot to go outside. We've had 34 days of 100 degree plus in a row now. I work in oil primarily, with some watercolor and pastel. My paintings usually originate with the thought, "I need to paint some water." I have tried many times to start out with a subject, and paint around it, but it just doesn't work for me. I prefer to start out with the sea/landscape and see what appears in it along the way. Sometimes birds fly in, sometimes boats float in, sometimes both. That's what I like about marine art. Events happen at a slower pace... you have time to see them.

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# Cuba Collaboration

DR. AARON J. ADAMS

is Director of Operations for Bonefish & Tarpon Trust

Photos by Dr. Aaron Adams



**A**fter numerous communications with colleagues in Cuba, we began a collaborative bonefish tag-recapture program in Cuba in 2008. The goal of the program, as in the Bahamas, is to identify the important habitats and areas for bonefish to ensure these locations are protected. The great advantage to working in Cuba is that the recreational fishing areas are already protected from harvest, thus the question is whether these protected areas are large enough.

The initial focus of the tag-recapture effort is Las Salinas, on the south coast of Cuba, part of the Cienaga de Zapata National Park. The area is a vast expanse of shallow sandy-mud, very similar to the Abaco Marls in the Bahamas. Thus far, their tag-recapture results match those from the Bahamas — nearly all of the bonefish have been recaptured very near the location where they were tagged. This suggests that bonefish have a very small home range and the Las Salinas area protections are sufficient and effective.

However, there was another piece of the puzzle.

In Las Salinas (and in some other locations) fishing guides maintain detailed log books to record fishing effort, fishing locations, catch, and bonefish size. With these data, they are able to track catch rates over time, which provides an indication of population status (stable, increasing, decreasing) and catchability (a proxy for fishery quality). This information is used to control fishing effort, so that the bonefish population is not overfished (high catch rates are maintained).

In the 2006-2008 time period, they noticed a decline in catch rates. After we discussed the decline in catch rates, the regulations, and extent of the area closed to fishing, we determined that the most likely cause for the decline was netting occurring outside the protected area. Such netting would impact bonefish migrating out of the Las Salinas area to spawn.

After some research, they found that industrial-style net boats had begun moving from the north coast (which they had overfished) to the south coast in pursuit of bonefish and other inshore fish species. This effort was previously unknown to them. It is likely that these boats were harvesting bonefish as they left the Las Salinas protected area on spawning migrations.

Much to their credit, they were able to get the net boats banned from the area in 2010. Since that time, their catch rates have trended upward, indicating a growing bonefish population. In addition, in recent years they had two recaptures outside of the flats — both on the eastern side of Las Salinas, near the dropoff to deep water in the Bay of Pigs. The habitat characteristics of this location match known spawning locations in the Bahamas, and the long-distance recapture location and timing also match spawning migrations in the Bahamas. Thus, the removal of netting, which likely focused on bonefish migrating to spawn, likely saved their fishery.

All of the recreational fishing concessions in Cuba occur in Marine Protected Areas, where only catch and release fishing is allowed (plus some highly regulated lobster



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harvest). The Cuban government uses this 'closed areas' approach for all of the fishing concessions, and appears to be in the process of expanding recreational fishing operations. The question now becomes what is the best approach to identifying and protecting such areas, and how to sustain the fishery?

In November 2013, we traveled to Cuba to participate in a

workshop entitled "Sportfish as a Conservation Tool" to talk about habitat protections to allow healthy recreational catch-and-release fisheries.

In addition to attending the conference, we also visited two fishing areas: one area on the south coast (San Lazaro) that had been closed for decades, never fished, and opened to recreational fishing just a few months ago; one area on the north coast (Cayo Santa Maria) that had suffered from industrial-level net fishing for decades, apparently peaking approximately 10-15 years ago. Based on overfishing issues and a new emphasis on sportfish as conservation tools, large nets were banned last year — in the northern area as well as nationwide.

The San Lazaro (and adjacent Las Salinas) region is a small version of the Florida Everglades and Florida Bay. A large freshwater watershed drains into extensive coastal wetlands and expansive flats, cays, seagrass beds, and limestone bottom. Las Salinas is mostly soft, open bottom, similar to the Abaco Marls, and has a healthy bonefish population but low abundances of other sportfish. San Lazaro has more diverse habitats and a more diverse fishery, including bonefish, tarpon, permit, snook, and cubera snapper in the shallows.

There is no industry or agriculture in the watershed, so no pollution or impacted runoff. The seagrass has no algae growing on it, and there is no evidence of bluegreen algae. This is an extremely healthy fishery in an area with untouched habitats. There is also very high bird diversity, including large roseate spoonbill nesting colonies and abundant flamingos. With appropriate management and habitat protection, this fishery will remain strong.

The Cayo Santa Maria area is much like the lower Florida Keys. In fact, the hotel and marina are accessed by a causeway that links small cays, similar to US Highway 1 in the Keys. This causeway was built approximately 10 years ago. There are four hotels on the outermost cay that cater to European tourists. A 5th hotel is presently being built. At present, these hotels are the only possible threat to habitats in this area. As with San Lazaro, there are no apparent sources of pollution or habitat damage. Our two-day tour of the area revealed pristine habitats and excellent water quality.

However, other than tarpon (20 – 60 pounds) and permit (up to 30 pounds) feeding on shrimp, crabs, and small fish





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on the surface in a channel that drained the flats, there were no gamefish. We toured large areas of mangroves and seagrass flats and saw no gamefish. In fact, we saw few fish at all. It appears that the industrial netting wiped out all but the fish that inhabit the deeper channel. In one lagoon, we did come across approximately five muds that were made by juvenile bonefish — all approximately 8 inches in length. These are all less than one year of age, so we hope the fishery will recover quickly.

During our stay at Cayo Santa Maria, fishing guides told us that they used to see large schools of bonefish, but that the netting wiped out the bonefish approximately 10-15 years ago. Since that time, there have been few to no bonefish in the area. Based on their descriptions of large aggregations of bonefish, the locations of these aggregations (bays near deep water), and the time of year these aggregations occurred (winter), it is clear that the net boats targeted pre-spawn aggregations of bonefish, essentially wiping out the population. This new information raises new questions: is it possible that the bonefish population decline in the Florida Keys is partly due to the overfishing of bonefish on the north coast of Cuba; did some of the larvae from Cuban spawning bonefish used to travel to the Keys; as the Cuban bonefish population recovers, will this have a positive influence on the Florida Keys bonefish population?

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The conservation approach  
to the flats fishery in Cuba  
is encouraging.

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The conservation approach to the flats fishery in Cuba is encouraging. There are many opportunities to learn about these fisheries, and to share information BTT has learned through our extensive research. With continued collaboration the flats fisheries of Cuba should remain healthy, and those that have been damaged should improve, and the lessons learned in Cuba can be applied elsewhere. 

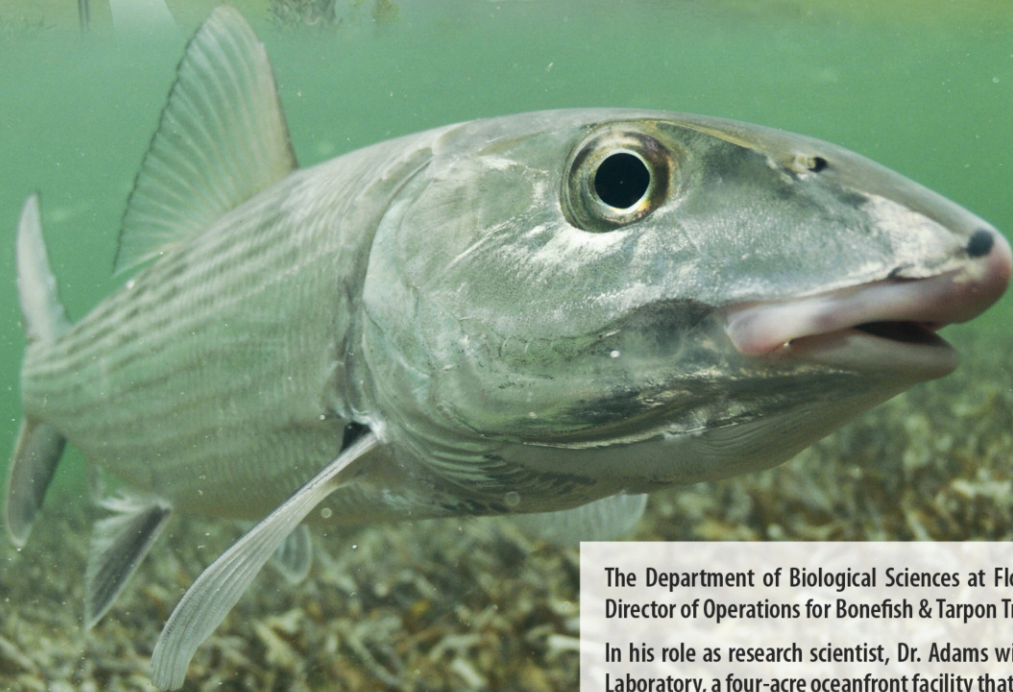


  
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The Department of Biological Sciences at Florida Tech is delighted to welcome Aaron Adams, Director of Operations for Bonefish & Tarpon Trust (BTT), as the newest member of our faculty.

In his role as research scientist, Dr. Adams will be based at the Florida Tech Vero Beach Marine Laboratory, a four-acre oceanfront facility that supports leading efforts in marine aquaculture and fisheries research. With Dr. Adams's assistance, we hope to integrate development of bonefish and tarpon stock enhancement into the operational mission of the facility.

BTT will also benefit from collaboration with Florida Tech's newly formed Indian River Lagoon Research Institute (IRLRI), which is dedicated to improving and sustaining the health of the estuary through the restoration of its mangrove and sea grass habitats—critical nurseries for tarpon and other fish species.

In honor of Dr. Adams, we invite members of the BTT to visit our main campus in Melbourne, Fla. and the marine laboratory in Vero Beach. We would be happy to give you a tour of both facilities. Please contact us at [biology@fit.edu](mailto:biology@fit.edu) or (321) 674-8034.

With warmest regards,

*Jon Shenker*

Jon Shenker, Ph.D.  
Associate Professor, Biological Sciences  
Member of the Board, Bonefish & Tarpon Trust

*Richard B. Aronson*

Rich Aronson, Ph.D.  
Professor and Head, Biological Sciences

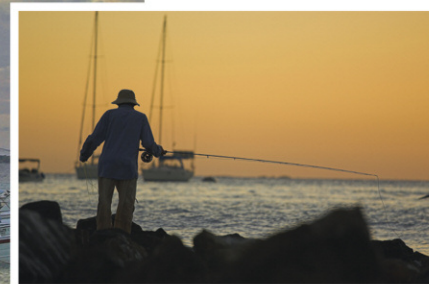
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