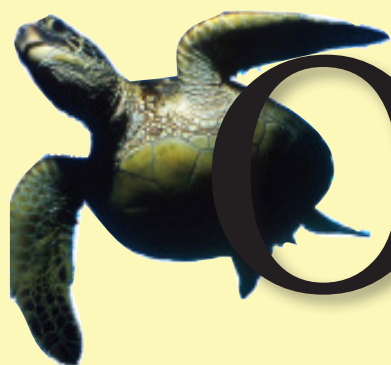




Florida Environmental

Outreach

Volume 16, Issue 1, Spring 2024

In This Issue

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Reel it in for the Reefs!

Sea Turtle Symposium 2024

Bonaparte's Gulls - A Gull Apart!

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Volume 15 Issue 4 Winter 2023

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Cover: Volunteer divers collectively removed over 700 lbs. of debris at the first annual *Reel it in for the Reefs* cleanup event. (Photo: Grace Pempek)

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A Year in the Life of a Marine Laboratory Coordinator

Emily Turla

Marine Laboratory Coordinator and

Ph. D. candidate in the Department of Biological Sciences

Florida Atlantic University



When thinking of how to write this “day in the life” article, it was difficult to come up with a typical description since the daily tasks can vary greatly. One thing about this job is that the priorities are always changing! Working with wild-life, specifically marine turtles, always makes for unpredictability. I’ve divided a description of a typical day into the different parts of the year, since that more accurately reflects what I may be found doing at any given time.

As the laboratory coordinator at the FAU Marine Laboratory, my responsibilities consist of the following: (i) keeping track of all the projects, as they are described on our marine turtle permit*, (ii) monitoring the training and activities of the personnel (undergraduate and graduate students) working in the lab, (iii) making sure that the turtles are cared for properly and that the lab is running smoothly, and (iv) working with the Director (Prof. J. Wyneken) to help meet the marine lab’s obligations.

When any of the FAU faculty plan experiments at the facility, I make sure the lab is prepared. All of this sounds straightforward but there are a lot of moving parts in a research laboratory that, annually, rears ~300 hatchling turtles (Figure 1) of the three species (loggerheads, green turtles and leatherbacks) nesting locally. We raise the turtles for several months to a size enabling us to determine their sex. Those animals must be closely monitored, cleaned, weighed and measured as they grow, and fed the correct diet for each species. We enlist the help of ~45 undergraduate students each year that need to be trained, scheduled and coordinated to complete those tasks. In addition, the lab supports several other projects done in collaboration with outside organizations. My job is to oversee all of them!

June to September: In the thick of data collection

These are the busiest months of the year at the Marine Lab. I always expect something unexpected, and never assume I can “just do it later!” My days typically consist of checking in new hatchlings into the lab, collecting and entering data, coordinating hatchling releases, making sure all the turtles in the lab are properly cared for, and herding all of the undergraduate students. We have students and collaborators



Figure 1. Top: Laboratory Coordinator Emily Turla standing amongst some of the tanks at the FAU Marine Laboratory filled with hatchling and post-hatchling sea turtles. In the background, turtles are cared for by as many as 45 undergraduate students every year. Photo Credit: FAU Division of Public Affairs. Lower Left: overview of some of the many tanks at the lab that shelter ~ 300 sea turtles as they grow each season. Lower right: Turtles are kept separated from one another to allow for close monitoring of individuals and to prevent aggression, especially over food.



Figure 2. A loggerhead sea turtle with a satellite transmitter attached. Adhesives are strong but flexible to accommodate growth; eventually, the tag will fall off. Two photocells keep it charged when the turtle is at the surface. Once there, the tag also sends a signal that's used to determine the turtle's geographic location.

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| <i>Gulf Specimen Marine Laboratories</i> | <i>University of the Virgin Islands</i> |
| | <i>U.S. Geological Survey</i> |



Figure 3. Emily swims with a juvenile leatherback shortly after its release into the Gulf Stream. This is one of the fun experiences that accompanies her responsibilities as a lab coordinator!

monitoring our study nests in the mornings, evenings, and nights, and I am one of the people they notify if they find hatchlings or need assistance. Sometimes, I'm the one out on the beach checking nests. One of our projects involves determining what happens to the juvenile turtles we release, specifically where their oceanic "nursery areas" are located. To find out, we attach satellite tags to each animal but developing appropriate methods to secure the tags on a growing turtle has not been easy! I've participated in the development of these attachment methods. As a "reward," I also participate in the release of tagged turtles after they are taken miles offshore (Figure 2). These are among my favorite duties since I get to be out on the water (Figure 3)! I keep a change of clothes, a bathing suit, and some dry shoes in my car since I never know what a day might turn into. These months feel like they last forever, but once they are over it seems like they flew by, and I am happy to have retained my sanity throughout that entire period!

October to December: Getting into a routine and writing annual reports

By this time, we have released many of our turtles but typically, we still have a decent number remaining in our tanks. Thankfully, by this time we no longer have to deal with an influx of new hatchlings. Students get more into the groove of things and days are more predictable, so I can let them handle the routine day to day tasks. We start to have "exit" meetings with our seasonal staff, designed to understand

how we can be more efficient and how we should approach next year's projects. I also start analyzing the data we've accumulated and come up with new ideas that form the basis for the research proposals that we submit in time for their review and approval before the next nesting season. Our reports to various permitting and funding agencies are due at the end of the year, so I accumulate all the necessary information required to get them written. By December, all our students go on winter break, so I get back to basics and participate in feeding, cleaning, weighing, and measuring the few turtles that still remain in our tanks (Figure 4).

January to March: Data analysis and writing

This period focuses on data analysis, writing manuscripts and progress reports, and preparing materials for research talks and conferences. I spend more time on the computer than anything else since so much needs to be accomplished before the next season. These months finally provide some time for catching up!

April to May: Preparing for the next season

By April we have usually released all the turtles collected during the previous nesting season, and we begin monitoring the nesting activities of the turtles that will furnish a new crop of hatchlings in the coming summer. Hatchlings typically begin emerging from those nests in late May so we are busy with preparations for the next batch of tur-

tles. Workdays during this time include inventorying our equipment, setting up data collection sheets, and lots of lab maintenance. I'm now busy training a new crop of undergraduate students to work on the projects scheduled for the coming summer. So, this time of year involves lots of planning, prepping, and anticipation!

Final thoughts

Being involved in all the projects supported by the marine laboratory is a truly unique experience! I have gained tremendous insight as well as appreciation for what is involved in the administration of a multi-purpose research program, one designed to better protect and manage several species of endangered marine turtles, to train and manage enthusiastic undergraduate students

to effectively assist in these efforts, and to learn more about the biology of these magnificent animals. At times it can be a lot to manage but to-do lists, calendars, spreadsheets, and open lines of communication help a lot! I am appreciative of the ebb and flow of the work throughout the year, tied so intricately to the nesting and hatching season of the sea turtles we so passionately study. Now, it's time to prepare for the next season and do it all over again!

Acknowledgements

Minor edits to the text were made by M. Salmon and J. Wyneken. Special thanks to Upwell for permission to use the photo in Figure 3.

For more information, see:

Website: biology.fau.edu/marine-lab/

Instagram: faumarinelab;

Facebook: FAU Marine Lab

*To work with endangered marine turtles requires a state-approved permit, administered by the Florida Fish and Wildlife Conservation Commission. Each project must be described in detail, reviewed by experts, modified according to their recommendations, then finally approved. The whole process takes several months to complete.

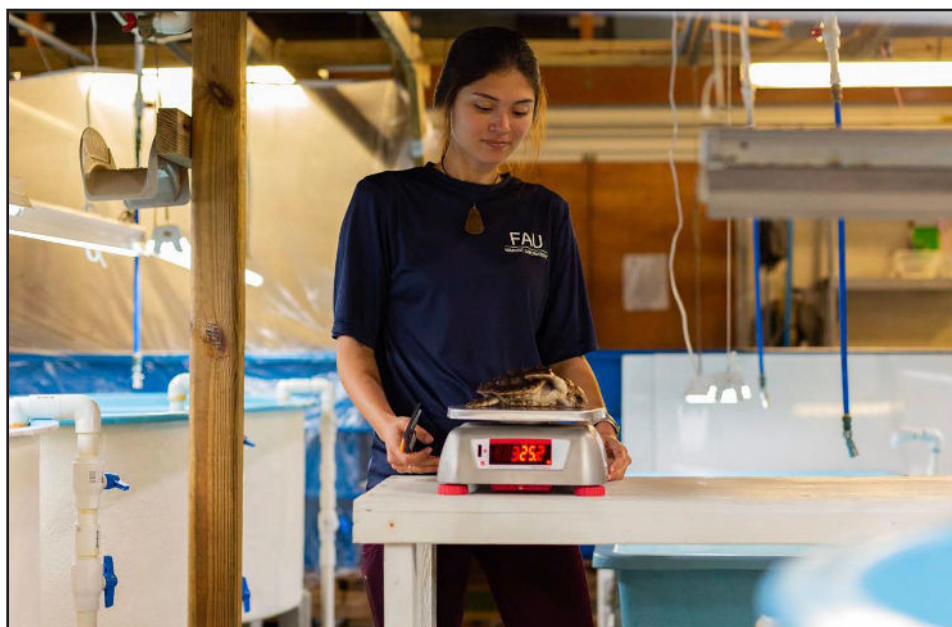
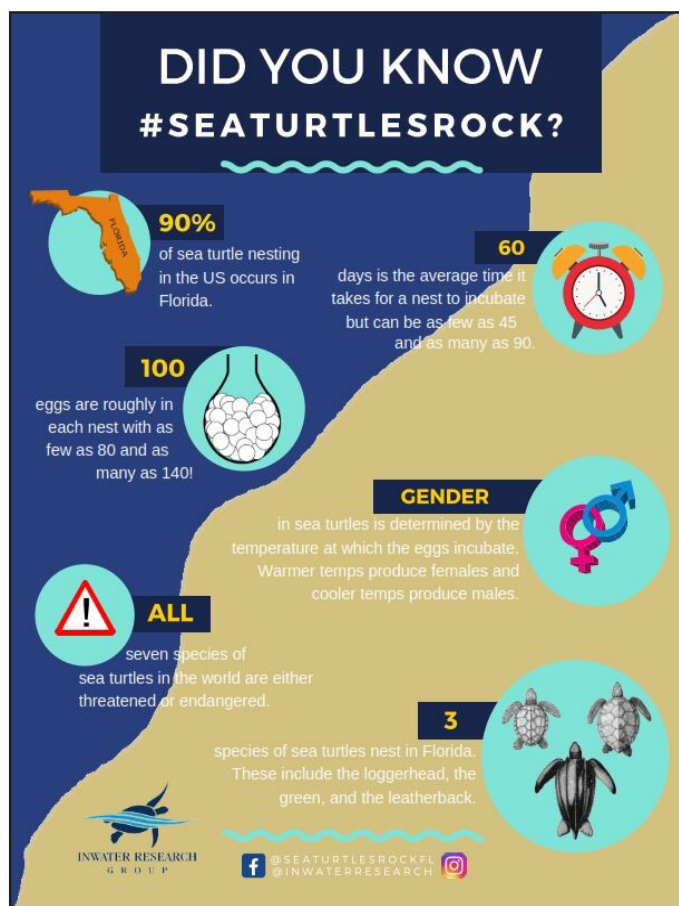


Figure 4. When students are on school break Emily gets back to basics, performing daily and weekly tasks such as weighing and measuring each turtle. Photo credit: Cameron Peters.



42nd Annual International Sea Turtle Symposium a Big Success!

Larry Wood, Ph.D., Executive Director
National Save The Sea Turtle Foundation



For the 42nd time, the International Sea Turtle Society has gathered sea turtle experts, scholars, and enthusiasts each year for a week-long exchange of memories, ideas, and inspiration toward the common goal of protecting marine turtle populations worldwide. Starting with just a few dozen folks all those years ago, the attendee list now well exceeds 500 people representing dozens of nationalities around the world. This year's meeting was held in the busy coastal city of Pattaya, Thailand, at the spacious Dusit Thani Hotel and Conference Center. As is customary, the scholarly oral presentations took up most of each day, and various social events filled the evenings. To complement the oral presentations, dozens of research posters were displayed throughout the entirety of the meeting, allowing presenters to interact directly with their audience in a more leisurely and informal way as their schedules permitted. This year, the *National Save The Sea Turtle Foundation's* Florida Hawksbill Project staff presented a poster summarizing 20 years of hawksbill research in Florida, which generated considerable interest among our colleagues seeking ideas for additional hawksbill research of their own.

Themed "All In – All Together", this year's meeting highlighted both seasoned veterans of sea turtle biology and the efforts of young researchers newly entering the field. A unified message was passed along: "don't believe everything you've heard!" As time has gone by, some of the original paradigms of sea turtle biology are more and more often coming into

question as researchers take a second look. For example, twenty years ago, we learned that sea turtles are solitary animals; well, that's changing. Same with our beloved hawksbills; we were told they eat sponges; well yes, they do where we live, but in many parts of the world they don't! These and many other discoveries keep the meetings fresh and interesting from the scientific standpoint, but there were other topics being discussed as well. Talks concerning global interactions between sea turtles and fisheries were presented, as well as topics focused on conservation, management, and policy. Education and advocacy were front and center as always, and our Keynote speaker took us down memory lane to recall how the ISTS has grown and evolved into the entity it is today. Still, among the most rewarding stories come from the small, often remote coastal communities that have enacted grass-roots conservation efforts for the mutual benefit of themselves and the turtles, and even more, brought their story to the meeting.

ISTS42 SCHEDULE

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◆ WED, 27 ◆ • Regular Program • Silent Auction • Origin Stories • Live Auction	◆ THURS, 28 ◆ • Regular Program • Trading Post • Farewell Banquet • Awards Ceremony	◆ FRIDAY, 29 ◆ • Closing Sessions • ISTS Change in Presidency 

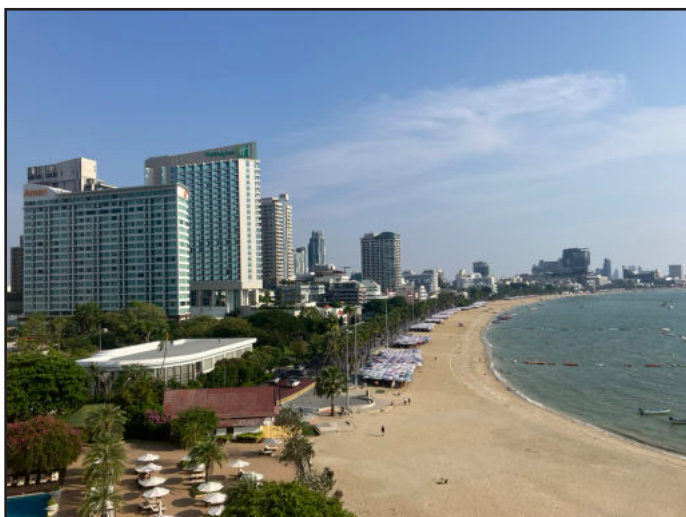
continued from page 9

Again this year, we are proud to announce that two students that have been partially supported by the National Save The Sea Turtle Foundation's Scholarship Program were the recipients of student research awards. Each year, students are eligible to have their presentations evaluated by a group of experts who choose winners among several categories. Taylor Brunson from the University of the Virgin Islands won best presentation for her studies with green turtles and invasive seagrass in St. Thomas, and Florida Atlantic University's Emily Turla won best presentation for her exploration of techniques to determine egg fertility in leatherback turtles. We also saw great talks and posters from several other past and present scholarship recipients, and we wish them the best as they work to complete their degrees.

We'd like to thank this year's ISTS President, Dr. Stephen Dunbar, and all the organizers of the meeting for making it another memorable year! For those of you interested, next year's meeting will be held in Africa for the first time in the meetings's history, here we come Ghana!



Student award winners included National Save The Sea Turtle Scholarship recipients Emily Turla, author of the previous article, from Florida Atlantic University (third from left), and Taylor Brunson from the University of the Virgin Islands (second from left).



The International Sea Turtle Society conference was held in the coastal city of Pattaya, Thailand, and we thank the city officials for welcoming us to their beautiful town! From the awe-inspiring cultural treasures to the street markets and restaurants in the bustling city, there was much to see and experience during our stay.





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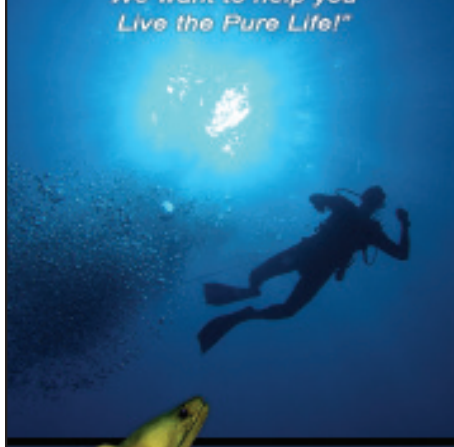
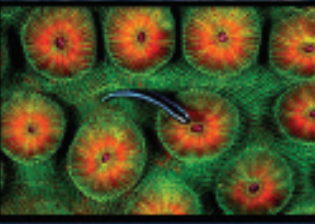
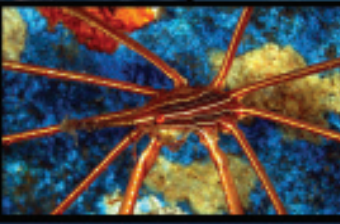
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Bryant Turffs
The Florida Manta Project

“Each spring, the east coasts of central and north Florida are host to an incredible yet overlooked wildlife spectacle. Hundreds of large adult manta rays, measuring 14 or more feet in disc width, aggregate together for the probable reasons of feeding and mating” says Jessica Pate, marine biologist and Founder of the Florida Manta Project (FMP). This event is largely unknown to the general public, and until recently, had also been overlooked by science. Since the ocean is often rough that time of year as numerous cold fronts pass through, the environmental conditions along this stretch of coast are likely the reason that the manta aggregation has avoided study. The waters are cold (by Florida standards) and highly turbid. Further, the event occurs offshore, largely out of sight for the general public. One community that has not overlooked the manta rays, however, is the recreational fishing community, which targets the aggregation to catch cobia, a popular gamefish.

Cobia (*Rachycentron canadum*) have a commensal relationship with manta rays, a form of partnership which preferentially benefits the fish while causing no particular harm nor benefit to the ray. The Cobia are afforded protection by the larger ray, and gain swimming efficiency by drafting in the wake of the large wings. Cobia are popular with the sport fishing community because they both fight vigorously and are good to eat. Historically, only a small dedicated group of anglers knew of the manta/cobia partnership and purposefully sought out the manta rays to catch cobia. With the advent of social media, knowledge of this event grew virally, and today all manner of weekend warrior and dedicated anglers alike target the aggregation. Unfortunately, this increased pressure causes harm to the rays and fishery alike. “With so many people coming at them, we aren’t seeing the rays like we used to see,” Says Captain Blair Wiggins. “Back in



Cobia (*Rachycentron canadum*)

the day, I don't recall seeing many rays without cobia," adds Captain Scott Lum, "but, now it's harder to find rays with cobia."

Despite the protections afforded in US waters, Florida's mantas are clearly impacted by the recreational cobia fishery. "The primary threats that we see to these manta rays are strikes from boat propellers and entanglement in fishing lines," observes Jessica Pate. Boat strikes and line entanglement have been regularly observed in both the central and South Florida populations and each have the potential to cause severe injury or death. To help mitigate against these impacts, the FMP has studied the practices of local fishing communities and, with the information gleaned, created outreach campaigns to increase awareness about the hazards facing mantas.



An aerial view of a manta ray and a cobia swimming together.

Recently, the FMP interviewed professional anglers about the fishery. They noted that the fishery had increased in popularity in recent years, likely due to the spread of information online. They also noted that the increased fishing pressure has resulted in a decline in the size and number of cobia captured in the fishery, and reportedly altered manta ray behavior as well. Anglers believe the rays now spend less time at the surface, and more often react to the presence of boats by quickly diving. The professional anglers identified the need to educate novice anglers and to control the flow of information more tightly in order to improve the fishery. Many anglers, "don't take the time to approach the rays right, they don't take the time to make the right cast," says Captain Blair Wiggins. He also notes that frequent accidental hooking causes, "the rays look like Christmas trees coming through," due to the number of lures that had foul-hooked the rays.

The FMP has begun an education campaign based on the best practices gathered from professional anglers which are, fortunately, both safer for the rays and more productive for fishing. "You have to approach these rays in a way where you are not disturbing them," instructs Captain Blair Wiggins, "because the more calm the ray is, the more calm the cobia is going to be." To decrease the quantity of boat strikes that occur, professional anglers suggest operating at slow speed and keeping a safe distance from mantas. They note that the rays are often near one another and to stay vigilant because most times a ray is spotted, there are likely more nearby. Ideally, the boat should approach at slow speed, parallel to the manta ray, slightly ahead or directly to the side of the ray to set up for a successful cast.



A manta ray with large boat propeller injuries.

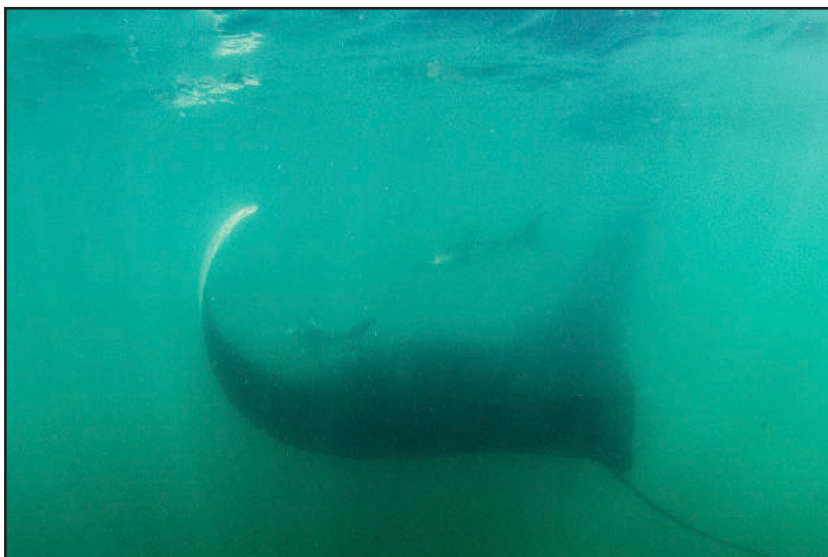
Professional anglers recommend always casting outside of the ray's wingspan, and never on top or across the ray to avoid foul hooking. They note that the lure does not need to be especially close to the ray to entice a cobia to come out and feed. "You can almost always talk them (cobia) into eating the bait where you want them to," says YouTube fishing personality Joey Antonelli. Accidents will of course happen, so when a lure lands in a bad spot it is recommended to hold the rod high and retrieve the bait quickly, skipping it across the surface to avoid hooking the ray. In the unfortunate event that a ray is hooked, it is recommended to retrieve any slack line and point the rod at the ray and break the line. Hopefully, this will result

in the line breaking near the leader, and will not leave the ray with a long trailing line, in which it can become entangled.

Jessica Pate says that she, “hopes that anglers will follow these best practices and maintain respectful relationships with other anglers, as well as the cobia and manta rays.” To limit fishing pressure, professional anglers also recommend waiting until after the season has concluded to share images online. Perhaps most important takeaway is to be patient when fishing, and to practice techniques, including casting, to make good on opportunities when they occur.

Globally, manta rays are in decline. The greatest threat to their numbers is targeted fishing for use in traditional Chinese medicine, though they also suffer from coastal development and pollution, climate change, and incidental harm from boats and non-targeted fishing. Fortunately, manta rays are listed on the endangered species act and are protected from harvest within the United States, but it is still too early in their study to know if this population is stable, increasing, or decreasing.

There is still much to be learned about Florida’s manta rays, and the FMP remains dedicated to unraveling these mysteries. On-water and aerial surveys are being used to better understand everything from the distribution and population status of Florida’s mantas to their behavior and feeding ecology, including exciting information about feeding aggregations and courtship behavior. More information about the Florida Manta Project’s work can be found at (<https://marinemegafauna.org/americas/florida-manta-project>) and a video guide to the fishing best practices is available on YouTube. Every new piece of data helps us learn and citizens are encouraged to report manta sightings and include photos where possible. Sightings can be reported to Florida@marinemegafauna.org. “Working with anglers in this area for manta research and conservation is critical,” says Jessica, “it’s only by working together that we will make positive changes for the future.”



Two cobia swim alongside a large manta ray.

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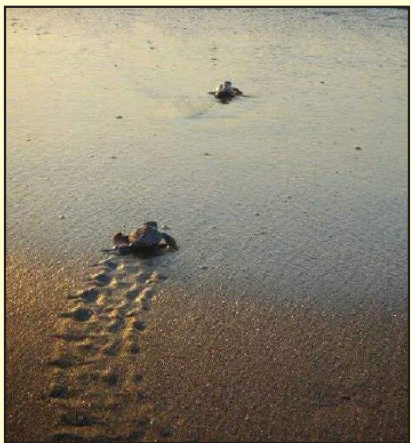
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Florida Hawksbill Project: 20 Years

Larry Wood, Ph.D.

Founder, Florida Hawksbill Project

Recently, a milestone was reached for the Florida Hawksbill Project – 20 years has passed since we captured our first turtle of the study! The idea for the project originally came to me as I was scuba diving along one of Palm Beach reefs and noticed how ‘friendly’ the hawksbill turtles were with the divers. So much so that the dive guides had several of them named, and to the delight of their customers, could reliably count on seeing the same turtles in the same places over and over again. Unlike most greens and loggerheads we encounter on the reefs, the hawksbills didn’t seem to mind the close presence of divers, and I soon realized the opportunity this unusual behavior provided to me to undertake a study of some sort. Arguably, the hardest part of in-water research is catching the turtles to begin with, but given the hawksbills’ unusually complacent nature and comparatively modest size, it wasn’t difficult to grasp them and gradually bring them to the surface for a full work-up. Since no one had previously attempted a study similar to this one, my expectations were modest, and figured I’d maybe find a couple of dozen turtles at the most. As it turns out, the first couple of dozen were in the books only five months after we began, and the numbers continued to grow to the point where the sample sizes allowed us to undertake some meaningful studies. Since then, we’ve tagged over 300 individuals, re-captured nearly 100 of those for additional data, and created partnerships resulting in numerous peer-reviewed publications that now form the groundwork for all sorts of future studies in Florida and elsewhere. So far, we’ve explored hawksbill physiology and health, gender, genetics, behavior, movements, and more, with new studies now in the works.



Long-time Florida Hawksbill Project volunteers Rick Newman and Anna Bennett with the 300th hawksbill of the study.



Of particular interest, we wanted to re-visit the gender-ratio study that we published almost 20 years ago. It is well-established that the gender of any turtle hatchling is determined by the temperature of the egg during incubation, with a tendency toward feminization at higher temperatures. Given concerns of a continuously warming climate, a number of studies have used nest temperature data to predict the resulting ratio of males to females that are produced at nesting beaches around the world. These studies, however, are predictive, so we’d like to take another look at the gender ratio among young turtles we encounter on the foraging grounds themselves, which of course are the survivors of the most challenging stage of a sea turtle’s life. Back in 2006-2008, we started collecting small blood samples from the hawksbills I was catching in Palm Beach for a graduate student to determine their sex using a testosterone assay (we can’t tell their gender externally until they are adults). Since those turtles hatched in the early 1990’s, they represent the parent generation of the smaller turtles we’re finding more recently in Monroe County, who would have hatched around 2015. In collaboration with the NE Aquarium, the blood samples we’ve been collecting from the younger ones over the last few years will also be tested to determine the turtles’ gender, then compared to the earlier results to see if the population as a whole has shifted one way or the other. The results will be informative either way, and since we can trace the turtles’ origins through genetic testing, we can help validate or question the results of nest temperature studies in those regions.

Which leads me to another project we have underway with a Ph.D. student at the University of Florida, who will be applying new, updated techniques to explore the genomes of Florida’s hawksbills. Over 10 years ago, I collaborated with some geneticists to analyze small skin samples from the hawksbills we encountered in Palm Beach. Since hawksbills don’t nest in Florida, we were curious what beaches they may have come from to begin with. This question is addressed using mitochondrial DNA (mtDNA); which is, among other things, unique in that it is passed down only from the maternal side of the parental pair. Since female sea turtles stick to the same nesting beaches (or regions) for multiple generations, small differences in mtDNA sequences develop between different populations of females, providing unique geographic ‘fingerprints’ from which a



“Bella” the entangled hawksbill was given expert care at the Loggerhead Marinelife Center in Juno Beach, Florida.

reference library can be built. We can then compare the mtDNA found in the turtles we capture in Florida against the known library of distinct Caribbean hawksbill ‘haplotypes’, as they are known, to assign them to particular nesting populations. Since many years have passed since this study was published, a Ph.D. student at the University of Florida (currently being supported by a *National Save The Sea Turtle Foundation* scholarship), will be combining new laboratory techniques with an updated haplotype library to much more accurately describe the population dynamics of Florida’s hawksbills. Plus, he has plenty of DNA in hand for additional genomic sequencing, which provides a framework for a variety of future studies.

Aside from all the science, every now and then we get the opportunity to connect our work with the community in a more tangible way. Recently, one of the hawksbills we had tagged several years ago was photographed by a local scuba diver during a random encounter on a reef just off the coast of Palm Beach. Unfortunately, the turtle had become entangled in fishing line around both flippers and the neck, and worse, the front right flipper appeared to be abnormally swollen from lack of circulation.

Once the word went out to the dive community, it didn’t take long for our Florida hawksbill Project team, led by Anna Bennett, to coordinate an in-water rescue. Just a few days later, the turtle now known as “Bella” was located



Though “Bella” was lucky to receive treatment, she is an unfortunate example of what can happen when turtles interact with fishing line.

and safely transferred to the Loggerhead Marinelife Center in Juno Beach, Florida, where she underwent surgery to remove the severely damaged flipper. Though she’ll be lacking one front flipper for life, many observations have proven that sea turtles can survive and reproduce quite successfully under those conditions, so she’ll be released back to her home on the reef upon her full recovery.

The Comprehensive Florida Hawksbill Research and Conservation Program

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Bella's injuries aren't uncommon. Coral reefs, whether natural or artificial, attract marine life, which naturally attracts fishermen. Inevitably, lines will get tangled and hooks will get snagged, leaving few options but to cut them loose. Eventually, the nearly invisible and highly durable lines sink to the bottom and wind their way through the habitat, tangling tightly among all the corals, sponges, and seafans. Much like an underwater spider web, unsuspecting marine animals of all sorts find themselves entangled and immobilized. Those that can manage to break free often take some with them, causing further injury down the road.

In an effort to reduce the impact of fishing line and other marine debris on our local reefs in Palm Beach, the **National Save The Sea Turtle Foundation** recently sponsored the first annual "Reel it in for the Reefs" cleanup event. What started a simple idea to spend a day cleaning up the reefs quickly grew into a community-wide event that involved 8 dive boats, 150 divers, and in the end a pile of debris that weighed over 700 lbs! We can't thank enough all the dive boats that participated, the divers who dedicated their dives to retrieving debris, and the great people at Debris Free Oceans who separated, identified, weighed, and disposed of the enormous pile of garbage. After the dives, all of the participants were invited to Locale Gastropub in Lake Park to celebrate the event with good food, live music, and a nice array of raffle prizes. We're already excited about planning next year's bigger and better Reel it in for the Reefs event!





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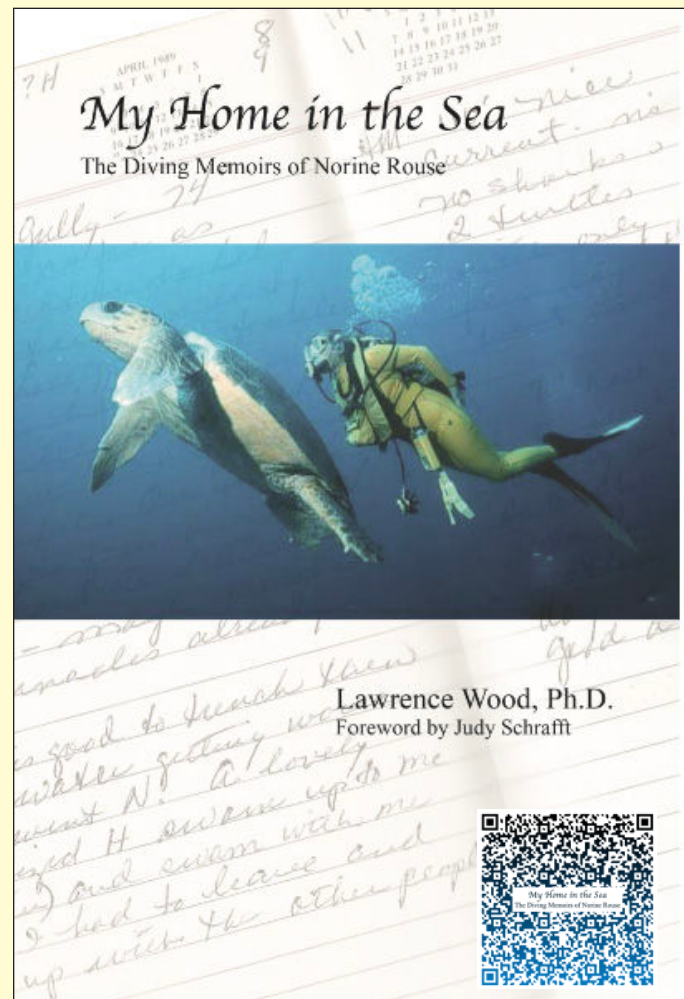


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Compiled from her own hand-written journals, ***My Home in the Sea: The Diving Memoirs of Norine Rouse*** chronicles the life and times of a living coral reef community through the eyes of a true scuba-diving pioneer. Among the first female scuba instructors ever certified, Norine Rouse brought her passion and skill to Palm Beach, Florida, where she co-founded the Scuba Club of the Palm Beaches. During her multi-decadal career as a scuba instructor, she fell in love with the reef and its inhabitants, and through her steadfast journal-keeping, provided a rare glimpse into the challenges and triumphs of life in this underwater world.

From her legendary love for sea turtles to her notorious fearlessness of sharks, Norine's journal entries provide unique insights into the natural history of dozens of marine species, and first-hand observations of the effects of both natural and man-made impacts on the coral reef environment. Moreover, her entries were infused with the wonder and awe the reef inspired within her, which never wavered throughout her long career. Look for it at your favorite bookseller!





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Two parrots are depicted, their bodies constructed from a dense arrangement of yellow, orange, and red flower petals. They have black beaks and large, white, circular eyes. The parrot on the right has a green leafy tail. They are perched on a dark, textured branch.

“Reel it in for the Reefs” - An Epic Collaboration Among the Palm Beach Dive Community

Grace Pempek, Resident Photographer, The Kyalami Scuba Club

The Kyalami Scuba Club recently helped to lead a large-scale clean-up dive, specifically addressing the issue of discarded fishing line that is all too often seen at our favorite dive sites in Palm Beach. Titled “Reel it in for the Reefs” this unprecedented event was put together with the generous sponsorship of the *National Save The Sea Turtle Foundation*. In total, 8 different dive boats offered free spots to 150 locals who wanted to volunteer their time to come out and help us clean the reefs in honor of Earth Day and the upcoming nesting season.



As a local diver here, I have to say I have never seen anything quite like it. I was immensely proud to be a part of an effort that collectively brought up 725 pounds of marine debris! It was such a beautiful sight to see the dive community come together to protect what we all love. No competition, no rivalries - just an absolutely amazing day of hard work with an incredibly fulfilling outcome.

For starters, the 1st thing I tell anyone who wants to help clean up the reef is that it is not necessarily for beginners. While I never want

to discourage a newly certified, very enthusiastic diver (we need all the ocean stewards we can get!) - there is the very real possibility that someone well-meaning but inexperienced can do more harm than good to the reef - or even worse, to themselves!

Some considerations... we tend to see the greatest accumulation of fishing line around artificial reefs and wrecks. These are havens for fish, and fishermen know it - making them easy targets. The challenges with diving our wrecks is they are deeper than our reefs - meaning you'll go through your air quicker and risk running into deco if you're not careful. They also tend to have more current, meaning proper weighting and buoyancy control is critical so you're not blown off the wreck.

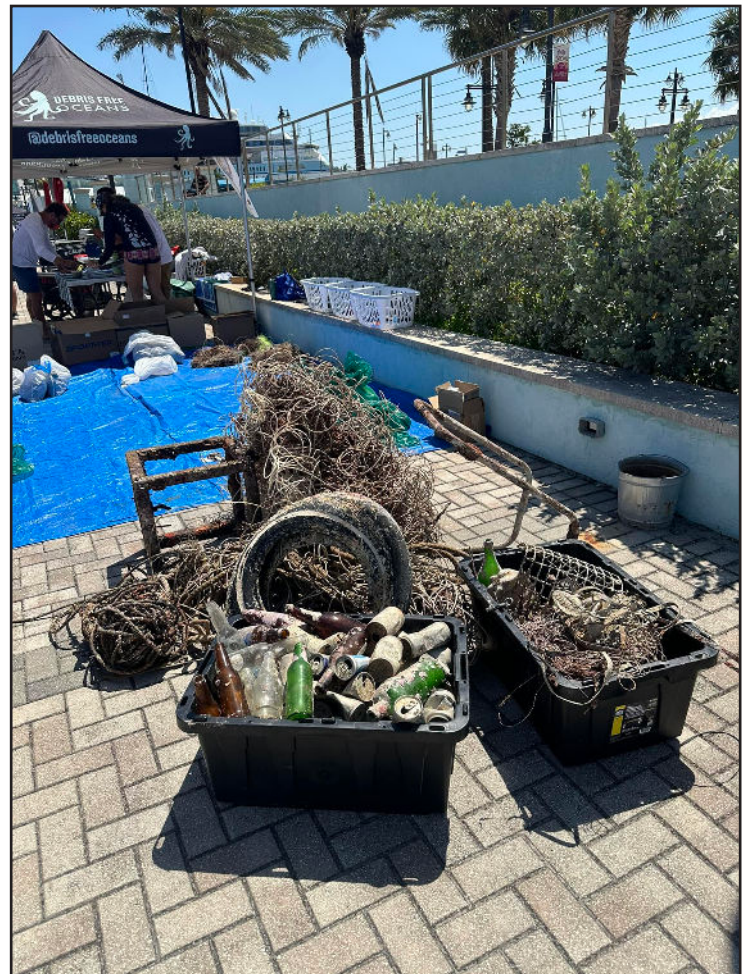
Essential supplies are gloves, a cutting tool, and a mesh bag; three items you can easily add to your kit bag.

Once you have your dive skills honed and your supplies readily available, you can easily make a difference by collecting marine debris every time you dive with the Kyalami Scuba Club. Want to learn more about how to help in a responsible manner? Sign up for our Dive Against Debris course - a specialty course taught by our awesome instructors. They will go even deeper into how to collect all sorts of debris, and you can also learn how to share the data with the scientific community to make your impact even greater.

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A Gull Apart!

David S. Addison

Science Department, Conservancy of Southwest Florida
Naples, Florida 34102

A few years ago, while I was eating breakfast at an open-air restaurant in Bonaire, N.A. I happened to glance up at the rafters. There gazing eagerly at the surroundings were about a dozen Laughing Gulls (*Leucophaeus atricilla*) i.e. LAGU. Their opportunity was not long in coming when the couple next to me left, leaving their partially eaten meal. No server was around to clear the plates, so they were on the table in seconds wolfing down the scraps (Fig. 1). They were soon back in the rafters waiting for their next chance. Funny sequences like that can lead people to view all gulls as noisy, opportunistic, beach-loafing scavengers. One size does not fit all though. A particularly good example are Bonaparte's Gulls (*Chroicephalus philadelphia*) i.e. BOGUs. They are winter visitors to Florida.

BOGUs were not named after Napoleon, but instead were named in honor of Prince Charles Lucien Bonaparte, a well-respected ornithologist in the U.S. and Europe in the 1800s. Prince Charles was Napoleon's nephew.

BOGUs have an estimated worldwide population of 260,000 to 530,00 and, for a welcome change, are considered a species of least concern. They are the smallest (L 13.5", WS 33") wide-ranging gull in North America. Little Gulls (*Hydrocoleus minutus*), a mostly Palearctic species,



Figure 2. Bonaparte's Gull in winter plumage. Note the dark spot on the side of the head.

are smaller (L 11", WS 24"), but in North America their range is limited to small populations on the eastern seaboard, the Great Lakes, and Canada.

BOGUs migrate from their breeding grounds in Canada and Alaska in late fall and early winter.

During migration they keep to themselves and don't flock to dumps as do other gulls, a trait that sets them apart. Data from Christmas

Bird Counts suggests that roughly 20% of the total population migrates to the Pacific Coast, another 60% through the Great Lakes and Mississippi Flyway, while the other 20% moves southward along the Atlantic. The southern extent of their winter range extends into Mexico, Cuba, and the Bahamas. In Florida they are typically seen in small groups or individually (Fig. 2). Bonies, as they are sometimes called, begin leaving Florida for their breeding grounds in February and March.

BOGUs can be confused with the larger LAGU; however, their legs vary in color from pink to orange as opposed to the black legs of LAGUs. Their flight is also distinctive from other gulls. With their small bodies and proportionally longer wings, their flight seems effortlessly buoyant, very much like that of terns (Fig. 3). Their grace in the air becomes even more apparent when they are feeding. BOGU's diet varies seasonally and includes small fish, euphausiids, amphipods, insects, crustaceans, snails, marine worms, grasshoppers, beetles, locusts, ants, and bees, so it's not surprising their feeding behavior is variable. During the breeding season, they are principally insectivorous. They use their aerial agility to hawk insects, especially during termite dispersal flights, or to pluck



Figure 1. Laughing Gulls gobbling table scraps in Bonaire, N.A.



Figure 3. Bonaparte's Gull taking flight. Note the long wingspan compared to the body length.

aquatic insects from the water's surface while swimming. They also feed commensally by following diving birds, Common Loons (*Gavia immer*) for example, and grabbing small fish that are forced up from deeper water. I've also watched them for many hours while they feed along the coast. They will swim along and dip unsuspecting small fish and shrimp from the surface. Bonies also dive for prey. They hover a few feet above the water before dropping to catch a fish or shrimp. They augment this dabbling behavior by diving from heights of 5-10 ft. and swimming short distances just below the surface in pursuit of a meal.

They are also kleptoparasites as they are not above stealing earthworms from Dunlin (*Calidris alpina*) and Black-bellied Plovers (*Pluvialis squatarola*).

BOGUs also have the distinction of being the only species of gull that nests in trees. They arrive in the boreal forests of northern Canada and Alaska in June. Nesting sites are located almost exclusively in conifers near lakes, streams, ponds, and muskegs. They nest singly, but also form loose colonies of 2-20 pairs. Both parents build the nest which is constructed of sticks, lichen, and moss (Fig. 4). It is typically 10-20 ft. above the ground. Only rarely is a nest built

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on the ground. The 2-4 greenish eggs take about 22-24 days to hatch. The hatchlings are semi-precocial and emerge with their eyes open. They leave the nest 2-7 days after hatching by jumping to the ground and following the parents to the nearest water. Beyond this, the breeding biology of BOGUs is not well understood. For example, ornithologists don't yet know how long it takes chicks to fledge. Other voids include data on hatching success, nestling growth, adaptations for nesting in trees, and the size of the nesting populations. There are also no long-term studies of individually marked BOGUs. Such efforts would provide needed data on mate and site fidelity, reproductive success, recruitment, nesting population numbers, and life span. Odd as it may seem, more is known about their foraging during migration and at wintering grounds than is known about their foraging during the reproductive season.



Figure 4. Bonaparte's Gull at its nest in northern Manitoba, Canada. The black head and white eye-rings are present during the breeding season. Photo credit: © Bob MacDonnell

The reasons for this are associated with their behavioral biology. During the breeding season, they are widely dispersed over the vast northern boreal forest. They don't nest in large colonies as do other gulls and are relatively secretive nesters. Their nesting season also occurs during the early and mid-summer months when black fly and mosquito populations peak. I've put up with the hordes of mosquitos and no-see-ums for years on sea turtle nesting beaches in Florida, but the swarms of black flies I encountered in Newfoundland a few years ago were just as impressive. The logistics of conducting fieldwork in remote, northern forests coupled with multitudes of biting insects makes it a rough road to go when it comes to studying the lives of these remarkable gulls. The insects may be great food sources for insectivorous birds, but when it comes to collecting data in the field on BOGUs, one must really want to be there. The side of this coin that has helped BOGUs maintain a stable population relates to the remoteness of their breeding range from human disturbance, their wide dispersal, the fact that their nest sites are cryptic, and the profound abundance of biting insects. The good news is that BOGUs are seasonally present across the U.S. in numbers. They are a delight to watch, so if you happen to see a gull delicately hovering low over the waves and periodically dipping to the water's surface to catch a small fish or shrimp, it just might be a Bonie. Don't forget to enjoy the show!

Acknowledgements

My thanks to my wife, Peggy, for her proof reading and timely suggestions.
All photos are by the author unless otherwise indicated.

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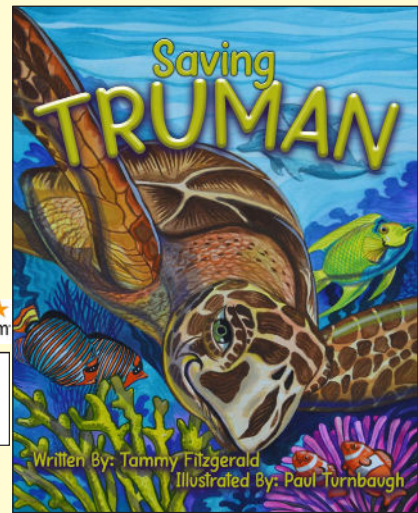
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