

**Our World-Underwater Scholarship Society
Reef Environmental Education Foundation
Internship Final Report**



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My participation and experience at Our World-Underwater Scholarship Society's internship at REEF all began with a casual conversation with my assistant dive instructor and friend, Anya Watson. Anya was the Our World-Underwater Scholar of 2005. She handed me a scholarship brochure, and later that day, I investigated the society's website and learned about the REEF internship. This internship would be available at REEF Head Quarters in Key Largo, Florida during the summer. I was intrigued at the chance to work with a non-profit marine environment educational organization. Completing my senior year at the University of Connecticut in the Marine Science B.S. program, I was looking forward to becoming more involved with marine conservation. My passion would allow me to work well at REEF and help make a positive contribution for our environment.

So began the long application process. I mailed a package with a stack of application papers to Chicago in the end of December for OW-USS to review. Eager to hear back about the status of my application after several months, I emailed Roberta Flanders weekly to see if there had been any progress with the decision. I wanted this internship very much, and prayed for months that it would be an opportunity for me this summer. At last, in April I received a phone call from Lisa Mitchell, the Executive Director of REEF, offering the internship to me. Soon after, I accepted the offer and started making arrangements to head to Key Largo.

At the end of May, my car was packed to the maximum and I started my 29 hour drive from Connecticut to Key Largo. After a long, anxious drive, my adventure at the REEF Headquarters began.

The Reef Environmental Education Foundation (REEF) was founded by Paul Humann and Ned DeLoach in the early 1990s. Established as a non-profit organization, it “seeks to conserve marine ecosystems by educating, enlisting and enabling divers to become active stewards and citizen scientists.” REEF begins this by collecting scientifically valid data from divers and snorkelers about fish population density and diversity. In a sense, REEF takes an inventory of what fish species are present and in what quantity. This is also known as the Volunteer Survey Project (VSP).

The VSP was formed with input from the marine scientists at NOAA, the University of Miami and The Nature Conservancy. The REEF field methods were then monitored and evaluated by a team of ecologists for over two years. Their findings were then published in the Bulletin of Marine Sciences in 1996. These findings verified that the data collected by REEF volunteers were indeed highly valuable to the scientific community. It’s exciting to know that REEF’s website and scientific database is offered as free access to all. It contains over 129,000 fish surveys, which have been used as data for 55 scientific research papers, and are also available to read on the website. Some of the other projects that REEF is involved in include: monitoring of artificial reef sites; monitoring of fish species to aid in regulation decisions; monitoring of grounding sites; Grouper Moon; and the Lionfish- Invasive Exotic Species. Although these projects are an

important part of REEF, the VSP stands as the predominant project. During my summer in Key Largo, I mainly worked with the Survey Project.

The VSP allows REEF to obtain scientific data through citizen scientists, which further links the local community with dive operations and the scientific world. This project has divided the coastal waters of the U.S., Canada, Central and South America into several regional categories based on what fish are common to these regions. These regions are: California, Hawaii, Tropical Eastern Pacific, Northeast, and the Tropical Western Atlantic. The Florida Keys are in the Tropical Western Atlantic region, so I have become most familiar with this region. Fish surveyors are grouped as novice and expert. Novice surveyors include level 1, 2 and 3 level surveyors. Expert surveyors include levels 4 and 5 surveyors. Surveyors can advance by completing more fish surveys and passing the fish ID quizzes provided with each level.

Due to numerous REEF outreach programs, over 10,000 divers and snorkelers have been introduced to the VSP and are now participating in fish surveys and contributing to the database. This data provides large sample size of presence/absence and relative abundance of fish; indication of species distribution based on sighting frequency and abundance; specific species presence/absence and abundance lists for a given region, zone or site; and measures of species composition similarity between any combination of geographic areas. This has created the connection between the scientific community, the local diving community of divers and dive operations, including myself.

I was introduced to REEF in the beginning of my internship and learned about its operations. After becoming familiar and comfortable with REEF, I was able to comfortably talk to people about what REEF is and what REEF does. Becoming familiar with navigating the www.reef.org website was the next step. Now I could also direct people with online questions. Learning the Tropical Western Atlantic fish was the following step. During the first week or two, I was in the same position as any beginning REEF member. I was starting from square one, wanting to know every species of fish in the book and their family. I began watching the Beginner Home Study DVD with the 50 most common fish in the Tropical Western Atlantic region. The DVD is produced by New World Publications and is narrated by Anna DeLoach. It is designed to help new REEF members get a jump start on learning their fish and provides nomenclatures for remembering the fish. Since then I have completed over 25 surveys and have taken my level 2 fish quiz. I am hoping to continue my fish identification knowledge after my internship, advance through the fish ID quizzes and become an expert surveyor. With each survey I learn new fish species and become more proficient and confident with the fish I have already learned. The *REEF Fish Identification: Florida, Caribbean, Bahamas* by Paul Humann and Ned DeLoach, has become like my bible this summer with sticky notes and book marks throughout the pages.

I can now identify over 75 species in the Tropical Western Atlantic region, and see over 50 fish on one dive. This knowledge has allowed me to be able to help teach fish identification as well. However, I am still learning my fish and will

always being looking for the “new faces” underwater and in the sand. As the saying goes, “practice makes perfect” so the more diving and surveying, the more familiar anyone can become with fish.

Throughout my time helping out at REEF Headquarters I have not only learned fish identification, I have learned a lot of the “behind the scenes” operations and duties that are involved in a non-profit organization. Anything from processing orders from the online store, to responding to the reefhq@reef.org email concerns and answering the phone, depositing the business reply donations at the bank, good customer service, organizing the mailroom, rewriting the starter kit inserts, and reworking the teaching curriculums. One memorable experience was digging out shredded paper from inside the shredding machine and piecing back together a document to obtain a number. Another is meeting the different people passing through the area who stopped into REEF Headquarters to check out what REEF is all about or to get underwater surveying supplies from the store. Not only does the REEF store have the underwater surveying supplies, but it also provides multiple identification books for fish, invertebrates and nudibranch for the different surveying regions, as well as REEF project or fish T-shirts, and “fun fish stuff.” I would welcome the visitors and introduce them to REEF if they weren’t already familiar with the organization. Some were interested in touring the unique REEF house, which is the oldest standing house in Key Largo. Built in 1913, it now serves as REEF’s Headquarters location. There is also a cistern on the side of REEF house, which holds a historical significance and there is a working project

to restore it. This yellow conch house holds a special meaning for the locals. Because the Headquarters has visitors stopping in, I learned that it is important it is to maintain a friendly, warm, and clean atmosphere, which also helps contribute to the welcoming REEF reputation.

One of the more profound insights of the internship is the operation management of a non-profit organization. It is essential to maintain organization and good management as well as prospective financial decisions. The majority of my time has been spent helping out in the Headquarters office. As mentioned above, answering phones, responding to emails, and talking to the people who stopped in were daily routines, as well as processing orders, trips to the post office and the bank. Simple things like learning to answer and transfer calls on a multi-line phone and fax system became crucial during the busy times. I even learned how to fix broken phones, create a password document and use a Live Mesh shared folder. All these things helped to run the office smoother and allowed us to work more independently and get more accomplished throughout the day. Maintaining the REEF store also became an important weekly task, as well as reorganizing the mailing room. Rewrites of the Starter Kit and Beginner Home Study packages was another task that I worked on when there were some quieter times at the office.

Reworking the teaching curriculums and organizing all the CDs related to them was another project. The Northeast curriculum has been in progress but has needed some strong direction. Lisa Mitchell and Christy Pattengill-Semmens, REEF's scientist who manages the database, contacted Bob

Michelson and Holly Bourbon who live in Massachusetts and are familiar with the Northeast marine species thru work and person interest. They are working with Christy and me to update the Northeast curriculum. Holly coincidentally was an assistant dive instructor for my scientific diving course and I got her involved in working on better forming this curriculum. Since I am from the Northeast, I had found myself having a special interest in working on this area. Also, I have previous knowledge and interest from past internships on invasive tunicate species that reside in the area. While these have not yet been surveyed for REEF, progress is being made towards including this data into the database.

Another project that I have been working on this summer has been executing the idea of creating a better connecting between REEF and local dive operations in the Florida Keys. This would be implemented through educating people on fish counts and REEF's purpose and program at the dive shops. "How to Catch a Diver with a Fish" is a business-to-business presentation that was created for the owners and the employees of the dive shops to help them understand the purpose of REEF. These presentations help to establish a bond between dive shop employees and REEF. The next step was for the dive shops to purchase "fish watching" materials, such as the Reef Fish ID book, and Beginner Home Study kits from the New World Publications. Next, dive trips were scheduled for a REEF volunteer or me to teach a fish identification course on the boat. Here we would talk to the divers one-on-one and teach them about what fish they would see in the area and about the REEF survey project in general. This is where the bond is formed with the diver. The ultimate goal is to

show the divers a more environmental and fun purpose for diving. This benefits the dive operation by providing a memorable and educational experience for the divers, leading to more revenue for the shop thru more dive trip sales as well as "fish watching" product sales. This plan also served as an outreach program for REEF, gaining more survey divers and donations-- and of course providing a good time for the diver.

Fish surveying becomes an addicting asset for divers, including myself. It becomes like a search or "I Spy" dive. Divers find themselves wanting to find every fish in a family within the region. Or the diver is looking for that rare fish. There are always more fish to learn, and drawings and pictures of the "new face" that the diver will look up in the fish identification book on his/her diving surface interval. Often times, Lisa and I would come up from a dive, paging thru the Fish ID book looking up the juvenile phases and "new fish" after a dive. This caused other divers to trickle over to join in on the fish discussion.

One exciting experience was when we were diving off the beaten path of the Benwood wreck into the sandy area and spotted a Spiny Flounder. Although we were not sure what it was then, we discussed the distinctive features and analyzed the flounder species within the Florida, Caribbean area. The Eyed Flounder is a species that we thought this fish could have been because it was more common to the area. However, the distinctive features of the fish matched that of the Spiny Flounder, which was rare to Florida. When I entered my fish survey into the database, Christy (who checks over the submitted data) questioned me on this reporting. She told me that this flounder has not been

reported at all throughout all the Florida Keys regions (over 20,000 surveys). So this led to our Spiny Flounder hunt. We went out with an underwater photographer and found the Spiny Flounder again, took pictures of it and sent it to the experts. Later that evening it was confirmed by Paul Humman, that yes, indeed it was a Spiny Flounder! This extended its region and changed the distinctive features listed in the ID book. There is always more to learn!

The Great Annual Fish Count (GAFC) is a program that REEF created for the month of July that helps more divers learn about fish identification. Through the GAFC Fish ID seminars and dives are set up throughout all survey regions. I helped advertise these events by posting them on the GAFC calendar on REEF's website. Furthermore, the GAFC publicizes REEF and its mission through these educational diving events. One of Key Largo's GAFC events, held at Horizon Divers (a local dive shop in Key Largo), was actually filmed and shown on Fox News. This event included a number of REEF's local volunteers who came together to conduct fish surveys. I was very excited to be recorded while conducting a fish survey dive. It was also very exciting as an organization to have REEF's outreach event be recorded and shown online and three times on Fox News.

"REEF links the diving community with scientists, resource managers and conservationists through marine life data collection and related activities." Through interning at REEF this summer, I learned how this link is possible and in full action at REEF. Having just graduated with a science degree, it has been a real life experience on how to connect this passion with the business and

recreational worlds. Through this link, the mission to conserve marine ecosystems is successful.

I think back to the spring, anxious to get involved in this internship. I think about my summer, experiencing the internship at REEF and how valuable it has been. And as I think now about the fall, I know that I'll be able to apply my experience and knowledge I have gained from this internship to my professional life. I am thankful for the opportunity to participate in this internship as well as for the experiences and knowledge that I have received from REEF. A special thanks all the assistance from George Wozencraft, Martha Sanders and Roberta Flanders from the Society as well as from Lisa Mitchell and the rest of the REEF staff as well as the dedicated volunteers at REEF. I will be carrying my knowledge with me through my further endeavors, and of course will still be conducting fish surveys and continuing to learn new fish faces. And after all, Jacques Cousteau said, "The best way to observe a fish is to become a fish, or a reasonable facsimile thereof..." So let's get out the slates and books and hit the water!