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# A Sense of Purpose

📅 March 21, 2022    @ Amy Lee; photos courtesy Christy Pattengill-Semmens

The Grouper Moon Project, now in its 20th year, documents the spawn of Nassau grouper off Little Cayman.

## Christy Pattengill-Semmens, Ph.D., and the power of citizen science



Pattengill-Semmens holds slates and cameras for REEF citizen scientists getting ready to conduct Volunteer Fish Survey Project surveys.

**Hometown:** Phoenix, Arizona

**Years Diving:** 34

**Favorite Dive Destination:** Little Cayman is special because of the conservation work our team has done through the Grouper Moon Project and the time I've spent there with my family.

**Why I'm a DAN Member:** Diving around the world with REEF and conducting conservation research in the field means that having support from DAN is essential for the health, safety, and peace of mind for our whole family.

**AT THE INTERSECTION OF DIVING**, conservation, science, and education, you'll find marine biologist and citizen science innovator Christy Pattengill-Semmens, Ph.D. As co-executive director of the nonprofit Reef Environmental Education Foundation (REEF), she oversees the Volunteer Fish Survey Project, one of the world's largest and longest-running marine life sightings programs. The project aims to engage divers and snorkelers to collect valuable data on fish populations.

To teach people how to identify what they see in the ocean, Pattengill-Semmens travels the globe leading educational dive expeditions while collecting her own fish survey data and encouraging others to do the same. She is occasionally accompanied on these trips by her husband, Brice, a fisheries scientist and fellow fish ID expert, and their three ocean-loving kids: Gracie, 19, Tatum, 16, and Emery, 14, also all divers.

## Fish Surveys and Serendipity

Her fascination with the natural world initially drew Pattengill-Semmens to study the ocean, and by fourth grade she knew she wanted to become a marine biologist. She spent her summers in high school attending a marine science camp in California at Catalina Island Marine Institute, where she earned her scuba certification.

She logged even more hours underwater in Catalina while completing her undergraduate degree in biology at the University of Southern California by assisting with a research project to study aggression in damselfish. She documented garibaldi nesting behavior to determine how often they would chase away other fish from their egg patches or algae gardens. Observing these feisty, bright-orange algae farmers was her first foray into the world of fish watching. Thousands of dives later, she is still fascinated by fish behavior.

A requirement for her minor in environmental science resulted in an internship in Key Largo, Florida, with The Nature Conservancy, where she helped pilot test the survey protocol for what would eventually become the REEF Volunteer Fish Survey Project.

“At first I didn’t know any Caribbean fish,” Pattengill-Semmens said. “I had never been to the Keys, and I was the guinea pig to see if someone with minimal experience could learn to collect meaningful data. We were writing down all the fish we saw, and the colorful, cacophonous coral reefs overwhelmed and amazed me.”

Conducting the first REEF surveys in 1993 proved to be a life-changing experience, and the summer Pattengill-Semmens spent as an intern shaped the trajectory for her career and her entire life. After beginning work on her doctorate at Texas A&M University, she was invited on a research trip to the newly designated Flower Garden Banks National Marine Sanctuary (FGBNMS). Now a full-fledged fish enthusiast, she changed her doctoral focus from researching mud-dwelling invertebrates to instead studying the fish assemblages in the sanctuary.

She coordinated several research cruises each year filled with citizen scientist volunteers eager to collect data in an unexplored place. In 1996 she was honored as the FGBNMS Volunteer of the Year for her work expanding educational opportunities and increasing awareness of the sanctuary’s resources.

Her research also opened the door for collaboration between the National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries and REEF; after completing her doctorate in zoology, she was hired as REEF’s first staff scientist. In addition to staying in contact with REEF, she also kept in touch with fellow intern Brice, and they married in 1998.

## Conservation in Action

For more than two decades, Pattengill-Semmens has directed the Volunteer Fish Survey Project’s expansion from its roots in the Caribbean to tropical and temperate seas worldwide. The project now includes 10 survey regions. She develops educational and training materials for each region, including fish identification courses, ID guides for use in the field, and online learning tools.

She also facilitates incorporating data from REEF’s marine sightings database into resource management, policy, and scientific literature. “These data, collected by recreational divers and snorkelers, have an impact on marine conservation and ocean science,” she said, “and this information would not exist otherwise.”

REEF data have been an important source of information on the status and population trends of Florida’s endangered Atlantic goliath grouper. By helping to verify juvenile habitats, identify recovery patterns, and document the positive effect the species has on reef systems, this information helps state agencies assess the impact of reopening the goliath grouper fishery.

She and Brice are also the lead scientists for the Grouper Moon Project, a successful conservation science effort that has brought together government, scientists, and fisheries to save endangered Nassau grouper in the Cayman Islands. Now in its 20th year, the project is regarded as a blueprint for

endangered species conservation. For their work on the project, they were named *Scuba Diving Sea Heroes* in 2019.

Pattengill-Semmens attributes the Grouper Moon Project's success largely to its collaborative nature. "Nonprofit, academic institutions, government, local businesses, the general public, and the fishing community all came together," she said, "and through collaboration and everyone's passion and dedication, we were able to achieve this amazing conservation success story. It's inspiring because it provides hope that this can be done in other places."

## The Joy of Discovery

Pattengill-Semmens is passionate about the power of citizen science to shape an individual's perspective and affect conservation. "Citizen science provides a meaningful connection to nature, whether you're diving in the ocean or walking through a forest," she said. "You gain a sense of purpose by contributing to something bigger than just you."

The thrill of seeing something new, such as a rare or unusual fish, is one of the most exciting parts of citizen science. As any experienced fish surveyor or birder knows, as your sightings list increases, so do the time and effort it takes to find a species you've never seen before. Her list totals more than 2,200 different fish species, and one that she hopes to someday add to that count is the weedy sea dragon. "Even the people who have done thousands of surveys still have more to discover," she said.

Aside from the excitement of seeing a new fish, some of Pattengill-Semmens' most cherished memories are the opportunities she and her family have had to be in the field together. They typically spend several weeks in Little Cayman each winter to research the Nassau grouper spawning. Last summer they traveled to Costa Rica with a group of REEF citizen scientists to collect fish survey data and participate in other eco-activities such as birdwatching.

"We are lucky to be part of a great, supportive community," she said, "and because of that, we never felt like we had to choose between having a family and being field biologists."

In celebration of her achievements in diving, science, and conservation, Pattengill-Semmens was inducted into the Women Divers Hall of Fame (WDHOF) in 2021. She also serves on the board of trustees for both WDHOF and the Gulf and Caribbean Fisheries Institute. She hopes to continue inspiring people to engage in and learn about the world around them.

"One of the biggest challenges in conservation today is not only raising awareness about issues but also getting people to feel like they can make a difference," she said. "That's why involvement in citizen science projects like REEF's are so important. It creates a connection to nature and empowers divers and snorkelers."



Pattengill-Semmens was inducted into the Women Divers Hall of Fame in 2021.

## Explore More

*Watch Christy Pattengill-Semmens discuss citizen science and ocean conservation in this video.*

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Q1 2022

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