GROUPERS' LAST STAND

THE CAYMAN ISLANDS' TRADITION OF MARINE CONSERVATION MIGHT SAVE THIS ENDANGERED SPECIES

BY JOSHUA STEWART

Pulling hand over hand down the mooring line in a 3-knot current, I ask myself, "Is this worth it?" I let go of the line and lose 60 feet of ground in seconds, forced to drag myself along the bottom toward the protected valley ahead. When finally I poke my head above the corals, I lay eyes on 3,000 Nassau grouper swimming lazily in place just a few hundred feet from me.

Worth it.

To find incredible natural events such as this annual Nassau grouper spawning aggregation (SPAG for short), I expect to travel off the beaten path: numerous flights, gut-wrenching car transfers, a boat trip or two. But this wonder off the west end of Little Cayman is easily accessible by direct flights from the U.S.

Step back in time a hundred years and this SPAG likely would have been considered insignificant, even at double its current size. Local fishermen say that when they were kids, this gathering was so thick with fish that you couldn't see the bottom, and it extended hundreds of yards in every direction. Another of equal proportions existed on the east end of the island, and there were two more on either end of Cayman Brac, 10 miles away. Seventy miles to the west, off Grand Cayman, there were even bigger massings — Nassau grouper spawning aggregations existed all over the Caribbean, many on an order of magnitude larger than the 3,000 fish here on Little Cayman.

But this comparatively small gathering is one of the last known intact spawning aggregations of Nassau grouper in the world. All others of this particular species — some of which might have exceeded 100,000 grouper — have been systematically fished out. Because of the Cayman Islands' conservation mind-set — 2011 is the 25th anniversary of the country's marine parks — as well as diminishing reliance on natural resources for residents' livelihoods, this particular SPAG has been protected for the better part of a decade.

Catching my first glimpse of the crowd, I take a minute to appreciate the spectacle before getting to work. Since 2003, the Reef Environmental Education Foundation has partnered with the Cayman Islands Department of Environment to better understand and protect the spawning aggregations of Nassau grouper through the Grouper Moon Project. To my left, REEF director of science Dr. Christy Semmens — who also directs the Grouper Moon Project — notes population estimates on her slate. Her husband, Dr. Brice Semmens, is busy tagging Nassaus: Counting ratios of tagged-to-untagged fish allows for a more

MOTHER NATURE WORKED HARD ON THIS SYSTEM, BUT MILLIONS OF YEARS OF EVOLUTION CAN BE WIPED OUT IN A SHORT TIME.

A Nassau grouper off Little Cayman displays its everyday raiment — a bicolor pattern signals time to spawn.

ALEXANDER MUSTARD

Frantic bicolor males mob a brown female; a grouper is tagged for tracking (opposite).

accurate estimate of population size, crucial in determining whether protection is working. Nearby, scientist Scott Heppell uses video-mounted laser calipers to accurately measure the fish.

I quickly realize I'm burning too much air at 100 feet to simply keep staring, so I switch on my video camera and get to work. The bottom is crawling with gravid females, up to 39 inches long and bulging with eggs. It's only a day after the full moon in February, and the actual spawning probably won't happen for a few days, evidenced by the high proportion of striped Nassau grouper still in their everyday colorations. Hanging just off the famous Cayman Wall is the spawning band. More of these fish are signaling they're ready to spawn, changing to their bicolor patterns: dark on the top with bright-white bellies. They swirl around in an enormous ball, gently bumping heads and rubbing sides, perhaps cozying up before the upcoming frenzy.

The scientists do everything they can in the short 20 minutes they have on the bottom: tagging, measuring and counting. I'm busy capturing video that we'll use to produce a public-service announcement in an effort to gain support for continued protection. It's not exactly a challenge — every inch of my vision is filled with grouper, large and small, striped and bicolor, bulging, exhausted and frenzied with anticipation.

Four nights later, the current has subsided to almost nothing — but some significant changes have occurred. Dropping down from our vessel, I'm carried back only a few yards as I drift down 100 feet to the reef. The number of striped Nassau grouper has dropped; now about 80 percent are in their bicolor spawning colorations. Almost all of the fish are off the bottom, massed in an enormous, shifting ball just above the reef edge. There's a tension in the water that says: *Tonight is the night*.

I look down at the scientists: Instead of clinging to the bottom, they're swimmingly freely in the mild current, doing their best to take advantage of the conditions and finish their work. My buddy and I have donned rebreathers, and we're in for the long haul, hoping to document the entirety of the spawning event on video for the first time.

As the sun begins to set, the grouper become more and more active. A female, bulging with an uncomfortable number of eggs, turns from her bicolor pattern to almost pure black, signaling she is ready to release her eggs. All at once, a dozen or more bicolor males rush to her and give chase along the reef. She twists and turns, crowded from every angle by frisky males, trying to weed out the slow and unfit. Dodging coral heads, she shoots over the wall and down the ledge, before finally racing straight up at top speed over open water. With this last action, every male in close proximity swarms as she releases her eggs in one huge, continuous burst, unleashing their sperm as they fight to stay with her. A cloud of gametes erupts, and just like that, the first rush of the night is over. The female, exhausted, settles on the reef and becomes almost catatonic while the males continue to fertilize as many gamete clouds as possible.

Out of bottom time, the scientists head back to the boat while we remain for the main event. An inky blackness descends on the reef as twilight fades into night. It's as though a switch has been flipped: All of a sudden spawning rushes are kicking off all around us, like fireworks on the Fourth of July.

Thanks to the quiet rebreathers, the spawning fish are undisturbed by our presence; even our video lights don't dissuade them. The only thing on their mind is the opposite sex — if a female comes shooting up in front of 2,500 lumens of modern LED technology, then 20 males come with her, and *we're* the ones who need to move. Again and again, spawning bursts happen all around us; on several occasions we're hit by uncoordinated fish zooming away.

Each burst releases a huge cloud of gametes so thick that it's impossible to see through, causing the 100-foot visibility to drop rapidly. Taking advantage, a Caribbean reef shark lunges into a spawning rush, mouth open wide. Missing all of the dozen grouper involved, the frustrated shark fires across the reef from side to side, trying in vain to grab hold of a plump meal.

The spawning continues for another 15 minutes, then ends as suddenly as it began. The occasional burst can be seen in the distance as we reorient ourselves, but for the most part, the fish begin to return to the bottom. Bicolors turn to solid blacks and the everyday striped coloration as they settle with gaping mouths and glazed looks into the nooks and crannies of the reef.

After grabbing a few more shots, we head back to the mooring line as our bottom time dwindles. Not five minutes after the grouper have finished their spawning, the current kicks right

WHAT IS THE GROUPER MOON PROJECT?

Historically, thousands of Nassau grouper have gathered at specific locations around the Caribbean to spawn during the January and February full moons. According to the Reef Environmental Education Foundation, nearly 50 of these aggregation sites have been documented around the region, but due to overfishing, the vast majority of them are no longer viable. One of these last remaining sites is on the west end of Little Cayman.

Since 2003, REEF has partnered with the Cayman Islands Department of Environment (DOE) and other conservation organizations to study the spawning grouper by monitoring their numbers and activities in order to better understand how to protect this valuable site. The project also includes acoustic tagging of fish, juvenile habitat research and the genetic study of the species found at the aggregation site to assess the possibility for spawning areas to recover fish populations if protected.

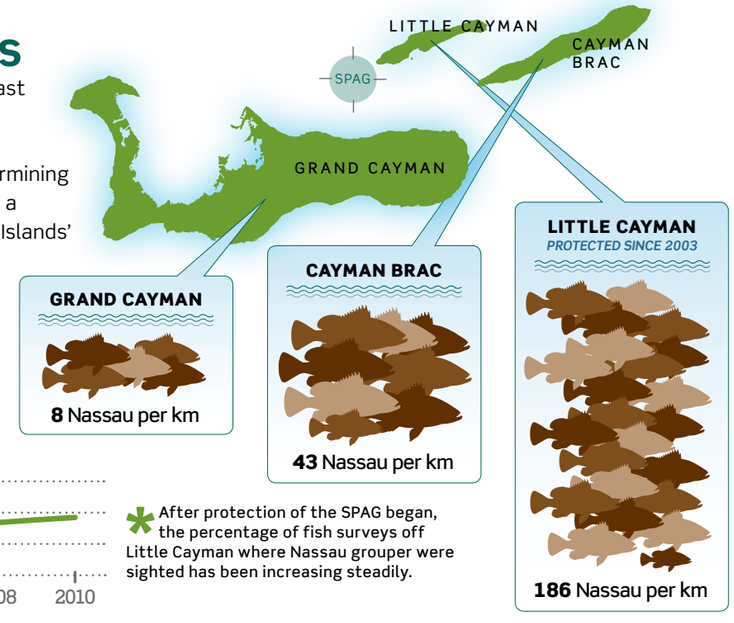
So far, results have shown that banning fishing at these sites has a direct and positive effect on the Nassau grouper population. That's why many scientists advise its continued protection.

For more information on the project, visit reef.org.

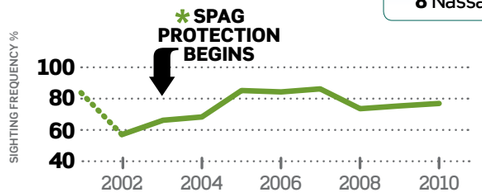
DOUG PERRINE; OPPOSITE: COURTESY KRISTEN LUKE

Protection Works

Little Cayman is home to one of the last healthy SPAGs in the Caribbean. REEF studies have tracked the success of protecting the site from fishing, determining that a no-take rule does indeed make a difference. In December, the Cayman Islands' government will decide whether to renew the current fishing ban.



Sighting Frequency



*After protection of the SPAG began, the percentage of fish surveys off Little Cayman where Nassau grouper were sighted has been increasing steadily.

back up — within 10 minutes it's at least 2 knots, as though the grouper knew the current was strengthening and cut their frenzy short accordingly.

Obviously, Mother Nature has worked hard perfecting this system, but millions of years of evolution can be wiped out in a few short years. The protection that the Cayman Islands have afforded this particular SPAG over the past seven years has had significant and tangible results, and very few in the scientific community would disagree that Little Cayman has the healthiest population of Nassau grouper anywhere in the Caribbean.

But come December 2011, this protection will end unless the government chooses to renew the current fishing bans. The tradition of catching Nassau grouper has been a cultural staple of the Cayman Islands for decades, if not centuries, and a very vocal fishing community is calling for the protection of spawning aggregations to end. But protecting the SPAGs of the Cayman Islands benefits divers and fishermen alike, and encourages a healthy marine ecosystem, a rarity in today's Caribbean waters. Protecting the Nassau grouper by protecting the spawning aggregation ensures a healthy fish stock to keep fishermen in business for years to come — and supports many more decades of healthy dive tourism too.

To follow the story and find out how you can help, visit Cayman Islands Department of Environment at **doe.ky** *and* **reef.org**.

About the author: *New York City native Joshua Stewart, 22, was the Our World Underwater Scholarship Society's 2010 North American Rolex Scholar. A passionate diver and underwater videographer, Stewart participated in the Nassau grouper study as part of his scholarship year and continues to be active in other marine conservation projects. To find out more about the scholarship, visit owuscholarship.org.*

SEE IT FOR YOURSELF

SCAN THIS TAG to see Joshua Stewart's footage of Little Cayman's Nassau grouper spawning event.

What the Stakeholders Are Saying

ROB HEDGES
Director of Operations, Central Caribbean Marine Institute
"Grouper spawn only in aggregations. If the ban is lifted, too many fish will be removed. Grouper for future generations, whether it be for fishermen or tourism, can be achieved only by preserving what we have now."

PETER HILLENBRAND
Owner, Southern Cross Club
"The importance of protecting the Little Cayman SPAG cannot be overstated. If fishermen want Nassau grouper on their home reefs in the future, it's paramount that they be left alone at the very time they are propagating their species."

TIM AUSTIN
Deputy Director, Department of Environment, Cayman Islands
"The Department's current position, following two decades of research, is that fishing the spawning aggregation is unsustainable and should be avoided." For more comments, visit sportdiver.com/caymanspag.

Juvenile Nassau grouper

COURTESY DOUG CHAMPION