



STONE SILENT

IN THE WAKE OF RED TIDE,
WARMING WATERS AND STRONG
STORMS THAT BATTERED
FLORIDA, THE STONE CRAB
POPULATION MAY BE IN DANGER

STORY BY

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ome 30 miles west of Marathon, Florida, deep in the predawn Florida Bay and headed toward the Gulf of Mexico, the 45-foot *Capt. Justin* is making nearly 18 knots. Thirty-year-old Justin Bruland checks the monitors in front of him, their glow illuminating his boyish face. The radar is an older-model Furuno, but he

swears it paints a clearer target than the newer one on his family's other boat, the vessel he usually runs, the 53-foot *Daddy's Princess*. Though the *Capt. Justin* is older, with just a single 740-hp Detroit Diesel, somehow she can still plane easily with a bigger load of pots. She's also cheaper to run. This year, that's critical.

Now and then, a lobster pot float looms like a ghostly head on the blue-green water, lit up by the forward spotlight. Then it vanishes, tossing, as the boat rumbles past. Bruland adjusts a travel pillow that cradles his neck and leans back in his chair. He's tired, probably because he was up at midnight, thinking about stuff.

He met his three-man crew at the Keys Fisheries dock in Marathon at 3:20 a.m., loaded ice, bait, drinks and food, and pushed off 10 minutes later. They have 600 stone crab pots to pull, bait and reset today, and he wants them all pulled before the full-moon tide turns and really gets ripping, tugging the floats underwater. It'll be a long day, 11 or 12 hours at least. He's headed 40 miles offshore to the stone crab fishing grounds that he and his father have worked for years as fishermen for Keys Fisheries, which supplies the world-famous Joe's Stone Crab restaurants with its signature delicacy.

"It's my job to be good at what I do," he says. "A lot of years, I am. Not this year. A typical good day's catch is 300 to 400 pounds. I'd be happy to get 250 pounds today, but I'm scared it's only going to be about 120."

He swipes at his iPhone and finds a photo of him and two crew, grins plastered all over their faces, standing by eight tubs that are brim-filled with 900 pounds of stone crab claws. "That was in 2017. That was the biggest day," he says. "It's just crazy how you can go from that to nothing."

Most commercial fishermen know that fishing goes up and down, stone crab more than most. Bruland's grandfather would say you get three or four good years, and then three or four bad ones.

But there's something different about this 2018-2019 season, and a kind of uncertainty has set in. The water quality issues that have disrupted Florida Bay—so similar in cause and effect as in other coastal areas including the Chesapeake Bay and the Gulf of Maine—have been sharply exacerbated by a red tide that plagued Florida's southwest coast in particular since the fall of 2017. While fishermen who work in the northern regions of the state have reported a pretty good season, anyone fishing areas near the red tide have seen few to zero crabs. Also disquieting are new findings by research scientists that stone crabs have a more limited window of tolerance to red tide than previously thought, and that crab larvae exposed to high concentrations of red tide don't survive at all. Scientists and fishermen, bracing for what they fear could be thin years ahead, are concerned about the population's resilience.

"I've seen years like this," says Gary Graves, who's been at Keys Fisheries since 1967 and is now vice president. "I don't remember how long ago, but one year we actually went to Mexico to buy crabs from Ensenada because we couldn't get enough stone crabs here. And then two years later, we had so many we couldn't sell them."

But even Graves, with a lifetime of experience and the oddly fatalistic optimism that comes with it, is uneasy. In a typical season, which runs October 15 to May 15, Keys Fisheries brings in 300,000 to 400,000 pounds of stone crab claws, Graves says. As of January this year, the company was 60 percent off.

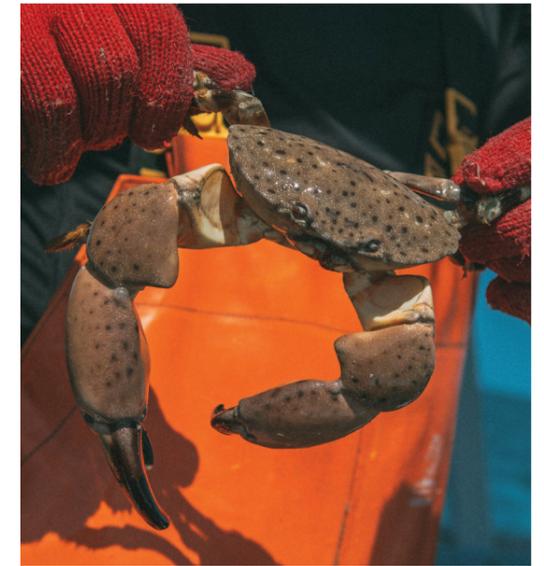
"I'm worried about next year, the way things are going," Graves says. "Everybody here has two species: crab and lobster. Next year could be a normal year; we just don't know."

According to the state Fish and Wildlife Conservation Commission (FWC), the Florida stone crab fishery provides 99 percent of all stone crab landings in the United States, and it's always in the top five fisheries for the state. Data from 1987 to 2018 show a peak of just over 3.5 million pounds in the late 1990s, dropping as low as about 2 million pounds in 2005-2006 after Hurricane Wilma. (Hurricanes can drive animals away, scour the bottom, alter habitat and destroy gear.) While averaging about 3 million pounds per season, the numbers fluctuate dramatically from year to year, with a steady decline in landings over time.

But as variable as fishing can be, guys like Bruland are talking about the red tide that recently

Right: Before dawn, the crew aboard Capt. Justin works the waters about 40 miles offshore of Marathon, Florida.





made worldwide headlines. The microscopic species that causes most Florida red tides, *Karenia brevis*, is always present, but it exploded in late 2017 and 2018, particularly along the Gulf Coast near Tampa, Sarasota and Everglades City, the self-named “Stone Crab Capital of the World.” Countless thousands of fish washed up on the beaches, along with hundreds of dolphins, manatees and sea turtles, all killed by the toxic tide that just wouldn’t quit.

During that time, Bruland says, the water out in Florida Bay was the color of mahogany, and as boats plied the tidelines and windrows of algae, their engines overheated from sucking so much of the stuff into intakes. Worse, pots came up empty or nearly so. Even now, when the FWC’s daily red tide map is showing normal levels, the crabs remain sparse south of Tampa Bay.

“This most recent red tide event has disproved the previously held belief that crustaceans, especially stone crabs, are able to persist in red tide,” says Michelle Kerr, a spokesperson for the FWC Fish and Wildlife Research Institute. “On a short-term scale, they can handle low oxygen levels, but with sustained low dissolved oxygen, like we see during prolonged red tide events, they lack available food once the other organisms die off, and exposure to red tide toxins can cause

significant mortality within the population.”

At 6:25 a.m., under a lemon sky, Bruland eases back on the throttle and points to the float marking the first of four strings he will pull today. They’ve been soaking at about 40 feet for 15 days, longer than usual, but that’s one way fishermen are trying to cut costs, walking a line between letting their pots and warps get too fouled with growth, and giving them enough time to catch crab. A lot of fishermen have quit stone crab for the season and are just lobstering, he says, and he knows at least one guy who gave up and started an ice business instead.

Aft, Bruland’s three crew set to work. In smooth choreography, they snag the floats as Bruland brings the boat alongside. They drop the warp in the hauler, drawing the pot to a steel ramp hanging off the stern. The ramp then kicks upward, bringing the pot to the transom, where the catch is culled. The pot is rebaited and stacked for resetting later. Most of the catch is tossed back—small fish, different crab species. Every now and then, one stone crab shows up with a claw big enough to pluck off, which happens with a quick twist, the claw tossed into a tub. Then the crab goes back overboard, where it will survive the amputation and eventually grow new claws, or it won’t.

This is part of the difficulty in accurately

Left: Justin Bruland has been fishing for stone crabs for some time, but he’s bracing for what could be very thin years ahead.



Left to right: A stone crab pot is drawn up on a steel ramp; Capt. Justin back at the dock in Marathon; total haul of stone crab for the day won't cover the captain's expenses

assessing the stone crab population, says Ryan Gandy, a research scientist with the FWC's Fish and Wildlife Research Institute. Unlike other fisheries, where catch numbers accurately reflect an individual, two landed stone crab claws could have come from one or two crabs. Nor can claw landings provide information about sex ratios, growth rates or crab sizes, all critical data for assessing the population's status. In 2005, FWC started its own monitoring program at nine sampling stations on the Gulf coast, and only now, after assessing a decade of variables and fluctuations, are scientists starting to get a clearer picture.

"We're starting to get a better handle on the impacts of red tide," Gandy says. In southwest Florida where the recent red tide was strongest, "it had a very large impact on the stone crab population. The concern is [that] the resiliency of the stone crab population is down, and it's going to be difficult to recover from it."

Philip Gravinese, a postdoctoral student and scientist at Mote Marine Laboratory in Sarasota, has been studying the effects of the red tide on stone crabs since November 2017. First, he studied "sublegal" crabs, those that would need another one or two molts for their claws to grow big enough for legal harvest. Exposing them to red tide in the lab for nine days, he found that during the first two to three days, the crabs showed no effects, but over time, they stopped eating, their stress levels went up, and they began to die—a 40 percent mortality rate, though he notes that in the wild, stone crabs may be able to flee the worst of the red tide.

More disturbing, though, were the results of his tests of larvae. Exposing them for 96 hours to high and medium concentrations, and a control with no red tide, he found a 40 percent drop in survival at the medium concentration relative to the control groups. "In the high concentration we saw 100 percent mortality by 72

hours," he says. Also, the larvae behavior changed; they became disoriented, sluggish, "equal to animals that were anesthetized that would just passively sink," Gravinese says. "The red tide was changing their swimming orientation but also resulting in them being incapacitated."

And, it's not just the red tide that's a concern. Tens of thousands of dead animals decomposed, creating hypoxic conditions where the stone crabs live. "It's likely they got hit with the red tide and became stressed. They have a window of tolerance in the red tide: three to four days," he says. "Then the hypoxic conditions come in, and we think that might be contributing to their mortality."

But, Gravinese echoes Grant, Gandy and Bruland when he says it's impossible to point to just one thing as the cause for the drop in the numbers of stone crabs. Just as with other water bodies up and down the East Coast, from the Chesapeake Bay to the Gulf of Maine, warmer

waters and stronger storms are exacerbating the problems that nutrient pollution and runoff from agriculture cause, along with development and a growing coastal population.

"The single biggest driver is population, and we're downstream of all of it," Bruland says. "When I was a kid, you could see the water 20 feet down. It's definitely not like what it used to be."

Gravinese agrees. "Water quality conditions in these coastal areas has taken a hit. Excess nutrients, more coastal development, and the more rain you have, the more runoff there is. I don't think there's any one silver bullet to explain why the crab populations are declining. Red tide, warm water, coastal pH—all of these factors create a stressful condition for some of the animals."

By 7:30 a.m., the first string is pulled, and Bruland is moving to the next. One quarter of the day's catch is in the boat, and it has come to only 28 pounds. By 9 a.m. the second string is in: 18 pounds. Bruland does some quick math: \$520 for the crew today, \$250 in fuel, \$350 in bait. That comes to \$1,120. At a dockside market price averaging \$14 a pound, 100 pounds of crab will barely cover the day's

expenses, not to mention put nothing in the kitty for gear, maintenance or the \$2,000 he just paid for a new powerhead on his generator.

A fisherman named Gary comes on the VHF radio and commences an off-and-on conversation about family, health, weather, crab prices and of course, fishing—the conversation of watermen all over the world. But the dominant subject is stone crab.

"Anybody catching stone crabs anywhere?" Gary asks.

"Far as I know, it's terrible everywhere," Bruland answers.

"We all got families," Gary muses. "Normally I have some reserve, but I'm tapped. Had to take a big loan."

"I think everybody's tapped," Bruland answers. "A lot of people went to loans, and it's turned into a real disaster."

The loans became necessary, he says, after Hurricane Irma mauled the Florida Keys in 2017. The lobster season was basically lost, and people had to replace destroyed gear. They still haven't received federal disaster aid, Bruland says, adding, "It will be a very tight summer."

For a time, Bruland considered a career as an accountant. He attended Florida State University, graduating in 2011 with a degree in business management. But it didn't stick. He couldn't see himself in an office. What stuck was what he grew up with: water, boats and family.

That's where he still sees his future,



which is why he's involved in the long-term picture, working with scientists such as Gravinese and sitting on the Sanctuary Advisory Council of the Florida Keys National Marine Sanctuary, as well as being active in the Florida Keys Commercial Fishing Association and the Organized Fishermen of Florida.

Bruland and his crew pull the final line in at 12:15 p.m. and start resetting the strings that haven't already gone back overboard. The total haul for the day is a meager 85 pounds. "Doesn't even make the day's expenses, but it's all about the next time," he says. "Even struggling out here is better than sitting in an office. I enjoy what I do, but it's more fun when the catch is better." 📍