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## Predator moves in Pretty but poisonous lionfish could hurt native species

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ONBOARD THE R/V CAPE FEAR | It was probably the worst-case scenario for researchers – and one that raises potentially worrisome questions about the future of important commercial fish species such as snapper, grouper and sea bass.

Four years ago, when reports started filtering in about divers seeing lionfish off the North Carolina coast, Paula Whitfield thought it was either a case of mistaken identity or a loner that had been released and somehow survived in the Gulf Stream's warm waters.

But Ms. Whitfield, a fisheries biologist with the National Oceanic and Atmospheric Administration, said she wasn't prepared for what researchers are finding during the 15-day mission off Southeastern North Carolina.

"They're everywhere," she said Tuesday roughly 50 miles southeast of Wrightsville Beach onboard the UNCW research vessel Cape Fear, as two more of the poisonous fish were brought aboard by divers.

Ms. Whitfield said researchers were hoping to find 30 specimens. But the two new lionfish brought the mission's haul to nearly 80 – with another week of diving still to go.

"They're not just doing well. They're thriving."

### Atop the food chain

Native to tropical waters half a world away, the Indo-Pacific lionfish isn't supposed to be here.

But with evidence mounting in recent years that pterois volitans has established a toehold along the Eastern Seaboard, Ms. Whitfield decided to conduct the first-ever Atlantic lionfish research mission.

The goal of the expedition, sponsored by NOAA's Undersea Research Center at the University of North Carolina at Wilmington, was to see how extensive the "invasion" by the lionfish is and what effect the interloper might be having on native species.

But the results so far aren't encouraging, researchers said, and could warrant a shift from any thoughts of eradication to somehow developing a management plan for a fish that lives in waters more than 120 feet deep.



STAFF PHOTO | KEN BLEVINS

Christine Addison with the National Oceanic and Atmospheric Administration holds one of two ovaries full of eggs from the abdomen of a female lionfish aboard the UNCW research vessel 'Cape Fear' around 50 miles off the coast of Wrightsville Beach.

"It wouldn't be bad if we were just finding adults," said the research center's science director, Tom Potts. "But now we're finding juveniles and pregnant females as well."

Spiny, colorful, poisonous and carnivorous, the lionfish could be the perfect invasive species.

As a top predator in its native Indian and South Pacific ocean habitats – a role filled by the grouper and snapper in local waters – the lionfish has no known natural enemies.

Ms. Whitfield said that largely explains its subdued behavior, which allows divers to approach to within a few feet of the fish.

"If not for the venomous spines, they'd be your dream fish because they're so easy to work with," she said.

But perhaps more worrisome is the lionfish's breeding pattern.

Although little is known about the fish, with only one scientific study ever done, it's believed lionfish spawn several times a season.

Holding a full ovary from a fish she was dissecting, NOAA research technician Christine Addison said each female can release between 5,000 and 20,000 eggs each spawning.

But it's how the eggs are dispersed that could explain the lionfish's rapid colonization of reefs and hard-bottom areas between Florida and Long Island, N.Y.

Because the eggs are buoyant, Ms. Addison said they could ride the warm waters of the Gulf Stream all along the Atlantic seaboard – one way lionfish or their eggs might have migrated up the coast from Florida, where many researchers think the first aquarium releases occurred.

"This fish seems to have everything going for it," Ms. Whitfield said with a wry smile.

### Lethal weapon

And then there's the lionfish's poisonous barbs, which could come as a surprise to local divers and local fish unused to coming across a lionfish in Atlantic waters.

Underwater research center technician Jay Styron knows firsthand the lionfish's lethal spines, which radiate from the fish's neck along with fins like a lion's mane.

Last week while retrieving a lionfish captured at about 135 feet, he felt one of the fish's barbs find a soft spot and slice through his wet suit.

"It initially felt a little worse than a bee sting," Mr. Styron said. "But as the dive went on, it started to radiate out and really get painful."

A week later, the stung area was still sensitive.

While uncomfortable, Mr. Styron said the sting didn't force him to miss a dive.

Although the lionfish's poison can produce localized and abdominal

pains in people, officials say fatalities are rare. Recommended treatments include bathing the wound in hot water and using antibiotics.

### New-found homes

If there's anything positive that scientists have found so far, it's that the fish is temperature sensitive.

Ms. Whitfield said lionfish have been found only in areas of warm water, with temperatures from the mid-60s or higher, in depths ranging from roughly 120 feet to an estimated 260 feet.

"That means they probably won't get any closer than maybe 25 miles offshore," she said.

But that leaves a huge swath of ocean for the lionfish to colonize.

"We've found them at 10 of the 12 places we've dived at, and in large numbers," Ms. Whitfield said.

Especially worrisome is that the reefs and hard-bottom areas favored by the interloper are also the nursery grounds used by important commercial and sport fish, such as snapper and grouper.

"We now know they're eating fish, not crustaceans or other shellfish," Ms. Whitfield said as Ms. Addison removed a small jar from a cooler containing three young sea bass found in a lionfish's stomach.

But with lionfish research in its infancy, it isn't known which fish are the foreigner's favorite foods and what impact the predator's arrival might have on native species.

"We know so little that anything we do out here can only help," Ms. Whitfield said.

Researchers plan to conduct more dives this winter to see how the lionfish are over-wintering off the Cape Fear Coast as water temperatures drop.

Ms. Whitfield also said she hopes to do some fish tagging and additional census data to gauge the newcomer's density and geographic range.

But she said she can already draw one conclusion without any additional research offshore or at the NOAA lab in Beaufort.

"I think they're here to stay," she said. "Unfortunately, that's something we can now say pretty confidently."