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Run-ins with an Invader!
A Chronicle of Lionfish Sightings in U.S. Waters

Expedition Background | Meet the Scientists

On August 1, 2002, a team of scientists exploring the ocean floor aboard the submersible *Johnson-Sea-Link II* happened across a strange fish that should *not* have been there. As pilot Dan Boggess "flew" the *Johnson-Sea-Link II* along Scamp Ridge off the South Carolina coast, scientists Scott Meister and Dan Russ videotaped their run-in with the invader!

Later, Scott Meister recalled the account of their strange discovery in his field journal:

Date: 2 August 2002
Time: 8:30 PM
Research Vessel:
R/V Seward Johnson
Location:
South Atlantic Bight
Latitude: 32° N
Longitude: 79° 30' W

We began our dive in the *Johnson-Sea-Link II* at about 4:30 pm. We'd been slowly hovering along the **reef** for a few hours when we came across a high rock ledge teeming with life. Schools of tomtate intermixed with vermilion snapper flashed above the feature, while small damselfish and wrasses darted in and out of the small holes in the reef.

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Watch videotape evidence that lionfish had probably begun multiplying in the Atlantic Ocean by 2002. The scientists in the submersible did a double-take as a lionfish, native to the Pacific Ocean, pops out from around the coral they were studying! Click here for further details.

Soft corals and sponges adorned much of the face of the wall, and a spiny lobster could be seen

clinging upside down to a small overhang. Having been down on the reef for about two hours already, my eyes had become accustomed to the standard shapes and sizes of the **species** we'd seen throughout the dive.

We were on the prowl for a sponge sample to bring to the surface, when I spotted what I first believed to be an unusual coral outcrop of some type. Long, slender spikes peeked out from behind a small rock mound, and my interest was immediately piqued.

This lionfish was sighted off the coast of North Carolina in August 2002 during a submersible dive in water more than 180 ft deep. Although the scientists were excited about their exotic find, they were not pleased to see the lionfish in U.S. waters.

As we came closer and checked out the spines, an odd-looking fish rose above the mound and turned to see what all the commotion was about. My heart jumped into my throat as I realized it was a *lionfish*! Everything about this fish seemed out of place when compared to the species we had observed so far. Long, sharp spines ran up its back, nearly twice the height of its body. Its **pectoral fins** resembled wings, which were also lined with sharp, slender spines. Its color contrasted strongly with the surrounding reef, with a zebra-like pattern of brown-and-white vertical bars along its body and dark circles imprinted on a translucent tail. This invader didn't dive for cover as many other fish its size did, but instead seemed to assume a defensive posture and moved toward us. Maybe their poisonous spines present a formidable defense against potential **predators**, but they are no match for a 26,000-lb submersible!

This dive was an amazing opportunity. Unfortunately, we sighted the lionfish late in the dive, and the sub was low on battery power. This gave us only a few minutes to try to capture this noteworthy specimen. During a short and heated pursuit, we spotted a second lionfish. We attempted to capture both fish without success. Before we knew it, time was up, and we had to surface and leave the lionfish behind. Although we did not return to the surface with a physical specimen, we did return with proof of our unlikely encounter on videotape.

On the following day, members of the science team made another submersible dive on a similar reef approximately six miles away from our lionfish sightings. This time, sub pilot Craig Caddigan maneuvered the sub through the reef, while scientists **Josh Loefer** of SCDNR and **Jeremy Potter** of **NOAA's** Office of Ocean Exploration observed the surroundings.

Josh, seated in the front of the sub with Craig, had high hopes we would capture a live lionfish. We didn't have to wait long. Only 30 minutes into the dive, we sighted another lionfish. We had plenty of battery power this time, so the lionfish was as good as ours.

This 2002 lionfish sighting over the Outer Shelf Reefs off Cape Fear, North Carolina, was noteworthy because lionfish are not known to go this deep (~240 ft) in their native Pacific habitats.***Click on image*** for larger view and further deails.

Or was it? The area was extremely rocky and provided many hiding places for our quarry. Nevertheless, the chase was on. At times, it appeared as though the lionfish was toying with us. It would allow the sub's suction nozzle to come within inches of its body, so close that we could see its fins ripple in the current created by the suction pump. Then it would dart away at the last moment and find cover. Several times we relocated the lionfish, flushed it from its hiding place and tried again to capture it. After a 30-minute chase in this fashion, the lionfish found a large rock overhang about 4 ft deep. It darted inside this well protected area, placing itself well out of reach of the submersible. Lionfish: 2; scientists: 0.

With our quarry out of reach, we reluctantly moved on and continued our scheduled dive activities. By the end of the dive we had spotted two more lionfish, but we had no time to pursue them. This brought the total number of lionfish sightings to five. Though it was exciting to see this many lionfish in such a short amount of time, these sightings suggest that they have established a foothold in this non-native environment, and may be actively reproducing in U.S. waters off North Carolina.

(top)

Expedition Background

NOAA's Office of Ocean Exploration supports expeditions all over the world to explore the Earth's last frontier: the ocean. One of these ocean expeditions, "Islands in the

Stream: Exploring Underwater Oases," took place on the NOAA Research Vessel *Seward Johnson* in July and August 2002. Scientists explored and investigated deep-water coral reefs, rocky outcrops, and hard-bottom habitats at the edge of the continental shelf off the U.S. southeast coast.

The purpose of the expedition was to conduct geological, biological, and ecological observations of these habitats, and to collect samples for further analysis to better understand these little known and poorly understood areas. Scientists on the expedition used a variety of methods to collect data and information, including the *Johnson-Sea-Link II*, a four-person submersible that completed 48 dives during 33 days at sea. It was during one of these dives that scientists came across the invasive lionfish and videotaped it from the window of the *Johnson-Sea-Link II*.

Click on PLAY to watch video

Watch a video of the *Johnson Sea-Link II* research submersible as Steve Ross chief scientist of the "Islands in the Stream" expedition describes the mission plan the day they videotaped a lionfish in U.S. waters.

Source location:
http://oceanexplorer.noaa.gov/explorations/02sab/logs/aug08/media/dive.html

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(top)

Click on PLAY to watch video

Transcript: Almost exactly one year after the first video documentation of the red lionfish in Atlantic waters, scientists diving in the *Johnson Sea-link II* stumbled upon another specimen. After watching the video, several scientists were surprised to see the fish living in an area with so little bottom

relief. Much like the fabled cartoon Roadrunner, the elusive fish seemed to be taunting the sub pilot as it easily pirouetted around multiple attempts to capture it. Given that this was our first dive anywhere in this area, seeing this lionfish was like hitting a bull's eye with the first dart.

This begs the question: ***"Just how many are out there?"***

Source Location:
http://www.oceanexplorer.noaa.gov/explorations/03bump/logs/aug07/media/lionfishvideo.html

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Meet The Scientists

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Meet some of the scientists that provided evidence that lionfish were multiplying in the Atlantic Ocean, and were swimming much deeper in the Atlantic than in their native habitat!

Scott Meister
Biologist
Marine Resources Research Institute
South Carolina Department of Natural Resources

Scott Meister is a fisheries biologist for the Marine Resources Monitoring and Prediction (MARMAP) program, a co-operative between the South Carolina Department of Natural Resources and the National Marine Fisheries Service. His research background includes life history studies of black and bank sea bass, as well as the deeper-dwelling wreckfish. Scott also has a great interest in the movement patterns of offshore reef fishes and is currently wrapping up a 5-year mark/recapture study of gag grouper and greater amberjack in the Atlantic. Having been turned on to science at a young age, Scott enjoys working with local schools to promote awareness of the marine environment. Scott has a BA in environmental science from the University of North Carolina at Wilmington.

Joshua K. Loefer
Marine Biologist
Marine Resources Research Institute
South Carolina Department of Natural Resources

Josh Loefer is a marine biologist with the South Carolina Department of

Natural Resources. On the *Island in the Sea* expedition, he assisted with cruise logistics, data acquisition, GIS analysis, and sample collection. Josh earned a BA in biology from Furman University in 1996, and an MS in marine biology from the University of Charleston (SC) in 2000. His main research interests include the life history of sharks, snappers, and groupers; satellite telemetry tagging of billfishes and sharks; and the hydrography of the Charleston Bump complex.

(top)

Jeremy Potter
Sea Grant Fellow
NOAA Office of Ocean Exploration

Jeremy grew up in West Virginia and graduated from Davidson College in North Carolina. Immediately after college, he worked as an observer in Alaska's Bering Sea crab fishery, and later as an instructor at the Wallops Island Marine Science Consortium. In 1997, he spent oa year teaching English in rural Japan. Three years later, he returned home to pursue his interests in international environmental politics, facilitation, and negotiation. Jeremy is a master's student at the Duke University School of the Environment. His current research in international fisheries policy focuses on the Japanese pelagic longline industry. His fascination with the deep sea led him to NOAA's Office of Ocean Exploration, where he is a Dean John A. Knauss Marine Policy Sea Grant Fellow. Jeremy coordinated Web site contributions and assisted with database management for the *Islands in the Sea* expedition.

Dr. Steve W. Ross
Research Coordinator
North Carolina Coastal Reserve
Principal Investigator, Outer Shelf and Slope Project

Dr. Ross is a native of North Carolina and has spent most of his career involved in the marine sciences of that area. He earned a BS in zoology from Duke University, a master's from UNC-Chapel Hill, and a PhD from NC State University. He has been the research coordinator for the NC Coastal Reserve Program for 12 years. He holds adjunct faculty appointments at North Carolina State University and UNC-Wilmington. His area of specialization is ichthyology (the study of fishes), particularly in areas of ecology and life history (age, growth, feeding, reproduction) studies. He has conducted numerous, diverse projects in estuaries and offshore waters and has served as chief scientist on many cruises, including several using submersibles. On the *Islands in the Stream* expedition, Dr. Ross and his team assessed the fish communities of several unique deep-water habitats off the southeastern U.S. coast. In particular, they studied energy flow (trophodynamics) and relationships of animals to various habitats, including coral banks, canyons, and rocky areas. The ultimate goal of such studies is to provide information for these poorly known areas that will facilitate management and protection of productive habitats.

Dr. Pamela Cox Jutte
Marine Scientist
Marine Resources Research Institute
South Carolina Department of Natural Resources

Pam Cox Jutte grew up in central Ohio, and developed an interest in marine invertebrates during her undergraduate years at Duke University. After finishing her BS in biology in 1993, she began graduate work at the University of California at Berkeley. Upon the completion of her PhD in 1997, she came to work as a marine scientist for the South Carolina Department of Natural Resources. Her research projects have focused on the condition of nearshore hard-bottom reefs following ocean disposal, the biological and physical effects of beach nourishment, and habitat quality in tidal creeks and coastal waters. She also serves as adjunct faculty at the College of Charleston's Graduate Program and the Medical University of South Carolina's Marine Biomedicine and Environmental Sciences Program.

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