



**NOAA Teacher at Sea
Tara Treichel
Onboard NOAA Ship NANCY FOSTER
April 15 – 27, 2008**

NOAA Teacher at Sea: Tara Treichel

NOAA Ship NANCY FOSTER

Mission: Lionfish Survey Cruise

Date: Sunday, April 27, 2008

Geographical area of cruise: Onslow Bay, Atlantic Ocean off of coast of N. Carolina

Weather data from the bridge

Visibility: 10 n.m.

Wind: 11 knots

Waves: 1-2 feet

Ocean swells: 3-4 feet

Sea temperature: 23.0

Air temperature: 23.0

Science and Technology Log

I wanted to explain a little more about the purpose of the Lionfish study. The technical name of the study is Assessment of Lionfish Ecosystem and Fisheries Impacts. The Principal Investigator/Chief Scientist is Paula Whitfield, who works out of the NOAA Lab in Beaufort, North Carolina.

Several years ago, Paula had heard reports of Lionfish seen off the coast of North Carolina.

A recreational diver, Paula visited these sites to see for herself; what began as a casual observation turned into the guiding question for a complex Lionfish ecosystem study that is now in its seventh year. As I understand, the guiding questions framing the study are:

1. Initially the scientists needed to understand, to what extent Lionfish have invaded the coastal waters of the eastern US. Under this broad question fall many sub-questions: Are they successfully reproducing? How large is their population? Are they expanding their geographic range, and is their population growing? Finally, what biological and physical factors may limit their survival (i.e. what environmental conditions do they need to survive)?



At a depth of 120 feet, the water has absorbed red, yellow and green wavelengths of light, muting the brilliant colors of these Lionfish and other reef organisms (the Lionfish in the foreground is partially illuminated by the video camera.) Photo courtesy of Thor Dunmire, NURC.

2. After the initial research results revealed a widespread and well-established presence of Lionfish, researchers refined their objectives to better understand the fisheries and ecosystem impact of Lionfish. This is a very broad question and includes many sub-questions such as: What species are they eating? Is the number of “conspicuous fish” species (large and easy to see and count) decreasing in areas where Lionfish are present? Are the number of “cryptic fish” species (small typically prey species that hide within the habitat) decreasing in areas where Lionfish are present?
3. The scientists also seek to better understand how Lionfish impacts may be further complicated by other variables such as overfishing and climate change. Examining this question requires looking at many other aspects of the marine ecosystem as indicators of ecological health. Sub-questions are: How are the physical and chemical ocean parameters changing over time (e.g. sea temperature, ocean currents, chemical composition)? How are algal populations changing over time? How are invertebrate and soft-bottom communities changing over time?



Paula Whitfield (right), Chief Scientist of the Lionfish study, and I take a moment to enjoy the sunshine.

Initial results of the study were eye-opening. Everywhere the research team went, they found Lionfish. From 2004-2007, the data across the sampling sites showed an increase in population of well over 300%. Considering that these fish have no known predators, and females release 30,000 eggs at a time, it is not hard to imagine the severe impact that these fish could potentially have on the marine food web and ecosystem.

In addition, Lionfish are tropical reef fish, which require warm water to survive and reproduce. As climate change occurs, it is conceivable that Lionfish could expand their range in response to rising sea temperatures or a shift in Gulf Stream currents.