Investigating settlement patterns of *Pterois volitans* in Eleuthera, Bahamas through the use of Standard Monitoring Unit for the Recruitment of Fishes (SMURFs)

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**Introduction**

- Lionfish (Figure 3) (*Pterois volitans*) are an invasive species in the Western Atlantic Ocean (Figure 1) native to the Indo-Pacific region (Morris, 2008).
- The widely accepted belief is that lionfish were introduced through the aquarium trade (Biggs and Olden, 2011).
- This venomous fish is competing economically important Bahamian fishes for resources.
  - Lionfish have a biphasic lifecycle (Figure 2).
  - Settlement in the transitional stage from pelagic to benthic life and the larval stage (Figure 4) and the juvenile stage (Figure 2).
  - 56% of settling fish die within the first two days (Almany and Webster, 2006).
  - Settlement rates have a large affect on adult populations (Jones, 1990).
  - Reef fishes predominantly settle during new moon stages (Thorrold et al., 1994).
  - Smaller reef fishes tend to be most prevalent in sea grass habitat followed by patch reefs and continuous reefs (Biggs and Olden, 2011).
- Little is known about the settlement stage of lionfish.

**Research Focus**

- **Research Objectives:**
  - Implement a new method for studying and targeting recently settled (i.e. new recruits) fishes.
  - Utilize SMURFs to understand the recruitment of lionfish in four different benthic habitats (seagrass, patch reef, and coral reef).
  - To monitor settlement and recruitment levels of lionfish and look for possible correlations with the lunar cycle.

**Methods**

- Four SMURFs were placed at four different locations: seagrass, sand, continuous reef, and patch reef. The SMURFs were placed at each location in a 20 by 20 meter square.
- Every seven days the mesh collection bags are collected from the appropriate SMURF.
- The mesh collection bags are removed and closed. It is replaced and anesthetic on the fishes. The chicken wire, which holds the rubble, is lifted and shaken the mesh bag is removed and closed. It is replaced and the collected one is taken to the lab to be analyzed.

**Results**

- Contrary to previous expectations, no lionfish were found in the SMURF samples as seen in the results chart in Figure 7. This may be due to a seasonal effect where water temperatures are known to encourage settlement predominantly during summer months (Thorrold et al., 1994).
- Additionally, placement and site location of SMURF units may need to be re-considered.
- The resulting pattern of crustaceans and their settlement correlation with the lunar cycles indicates that the use of SMURFs enables continued research that will make SMURFs a more viable option for observing the recruitment of lionfish. Ultimately, this research may help to fill gaps in understanding the lifecycle of lionfish and prove crucial to future management efforts.

**Discussion**

- Literature Cited:

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