GRNMS National Marine Sanctuary

Invasive Species

Management Issue

As one of the largest near-shore live-bottom reefs of the southeastern United States, Gray's Reef National Marine Sanctuary (GRNMS) supports fish and benthic communities that are recognized nationally and internationally. The relatively warm year-round bottom temperatures make GRNMS susceptible to the impacts of invasive species, particularly as climate change continues. Invasive species in GRNMS need to be tracked, monitored, and studied so that impacts to resources can be assessed and potential management actions, such as eradication, can be evaluated.

NOAA diver observes invasive lionfish on ledge habitat in Gray's Reef National Marine Sanctuary. Photo credit: NOAA

Description

To date, at least four non-indigenous species are known to occur within GRNMS. Red lionfish (*Pterois volitans or P. miles*) have been sighted on live hardbottom during diver surveys varying from one individual in 2007, up to 28 lionfish in 2012, 15 lionfish in 2013, and seven seen in 2014. Three invasive invertebrates have been documented on manmade structures: orange cup corals (*Tubastraea coccinea*), Asian green mussels (*Perna viridis*), and titan acorn barnacles (*Megabalanus coccopoma*). Potential impacts of these and other organisms include competition, predation and disease transmission. Managers need better information in order to understand the threats posed by these invasive species, the risks of additional non-indigenous species introductions and how to address such threats.

Questions and Information Needs

1) What are the invasive species which represent the biggest threat to GRNMS?

2) What impacts are invasive species having on the resources of the sanctuary?

3) From where are invasive species coming into GRNMS?

4) What effective controls of these marine invasive species are currently available?

5) Are the invasive species already established spreading, and if so, at what rate?

6) Do corner buoy markers increase the opportunity for invasive species introductions (by providing a direct route to the bottom for settling organisms)?

Scientific Approach and Actions

- Conduct monitoring activities to track the presence and distribution of lionfish and titan acorn barnacle within the sanctuary.
- Investigate feeding habits of lionfish in GRNMS to determine impacts to natural resources.
- Investigate how various buoy anchoring materials/mechanisms affect the transport of invasive species.
- Integrate invasive species detection and monitoring into current monitoring protocols.

Key Partners and Information Sources

National Centers for Coastal Ocean Science, Skidaway Institute of Oceanography, Team Ocean Divers, Georgia Southern University, USGS

Sanctuary Resources Available

- Two research vessels complete with Captain and crew
- Staff to support field operations including science divers
- Habitat maps and bathymetry files

- Annual monitoring data of benthic and fish communities
- Up to date sightings information of known invasive species
- NDBC buoy located within the boundaries of GRNMS measuring atmospheric, oceanographic, and ocean acidification-related data (pH, CO_2, and noise)

Resource Needs

- Financial support
- Partnerships for: grant application, project design, data collection and analysis, reporting, and monitoring

Management Support Products

- Scientific papers and reports
- Presentations for scientific meetings, workshops, symposia and conferences
- Education and outreach products to inform general public

Planned Use of Products and Actions

- Use data collected on lionfish in GRNMS to develop and conduct education and outreach programs and products to inform the public about the impacts of invasive lionfish and the risks of other introduced fish on native populations.
- Develop education and outreach products to inform general public about research area issues and research results

Invasive Titan Acorn Barnacle has been documented on the NGDC buoy inside the sanctuary. Photo credit: Fran Lapolla, UGA

Program References

GRNMS Management Plan,

- Objective SR4: Activity SR4A and Activity SR4B

2008 GRNMS Condition Report and 2012 Addendum

- Question 9: What is the status of biodiversity and how is it changing?
- Question 11: What is the status of non-indigenous species and how is it changing?
- Question 12: What is the status of key species and how is it changing?