Gray's Reef National Marine Sanctuary
Biodiversity

Management Issue

An estimated 200 species of fish have been recorded at Gray's Reef National Marine Sanctuary (GRNMS). Several species of marine mammals, sea turtles and sea birds all utilize the sanctuary at various times of the year. Diversity at GRNMS is very high compared to shelf sites at similar depths elsewhere, but there are no baseline data to determine how it may be shifting. In order to adequately protect Gray's Reef National Marine Sanctuary resources, managers need to understand biodiversity in the sanctuary and how it might be changing due to natural events and anthropogenic activities.

Description

Gray's Reef National Marine Sanctuary is one of the largest nearshore live-bottom reefs in the southeastern United States. The sanctuary contains both rocky ledges and sandy flats and is comprised of scattered limestone rock outcroppings which support soft corals, non-reef building hard corals, bivalves and sponges as well as associated fishes and sea turtles.

The live-bottom habitat of GRNMS is of particular biological importance because it contains biological assemblages consisting of sessile invertebrates such as sea fans, sea whips, hydroids, anemones, ascidians, sponges, bryozoans and corals. The sanctuary also attracts reef-associated fishes including bottom-dwelling and mid-water fish species.

Scamp (*Mycteroperca phenax*) cruises over a sponge-and-invertebrate-encrusted ledge habitat. Photo credit: NOAA

Questions and Information Needs

1) What is the baseline biodiversity within sanctuary?

2) What are appropriate indicators of biodiversity?

3) How do the indicators of biodiversity change over time?

4) Does fishing activity alter indicators of biodiversity in the sanctuary, and if so, how?

5) What data sets exist from which historical biodiversity information can be extracted?

6) Are there biodiversity "hot spots" which require added protection and/or resources?

7) How do episodic hydrographic events (e.g. cold water intrusions and Gulf Stream eddies) impact biodiversity in the sanctuary?

Scientific Approach and Actions

- Conduct a literature search of biodiversity related information to evaluate what is already known about biodiversity in the sanctuary.
- Solicit contributions of unpublished data sets for use in determining biodiversity indices.
- Develop database into which biodiversity related data can be stored for analysis.
- Conduct field biodiversity assessments for benthic infauna, invertebrate and fish assemblages.
- Gather information on human use of the sanctuary to determine if/how those activities are impacting biodiversity.
- Gather information on hydrographic events to evaluate how they may be influencing biodiversity.

Key Partners and Information Sources

Georgia Southern University, NOAA's National Centers for Coastal Ocean Science, Skidaway Institute of Oceanography, Reef Environmental Education Foundation, South Carolina Department of Natural Resources, NOAA's National Center for Coastal Environmental Health and Bimolecular Research

Sanctuary Resources Available

- Two research vessels with captain and crew
- Staff and volunteers for data collection and field support, including SCUBA support
- Monitoring Data from the implementation of a Research Area to assess human use impacts
- Benthic Habitat Maps

Resource Needs

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

Management Support Products

- Annotated bibliography of literature related to biodiversity within the sanctuary.
- Database of existing information related to biodiversity
- GIS layer of biodiversity information
- Education and outreach products that utilize biodiversity information to educate the public on the unique and valuable nature of the sanctuary

Planned Use of Products and Actions

- Education and outreach products that utilize biodiversity information to educate the public on the unique and valuable nature of the sanctuary
- Incorporate biodiversity information into management decisions about use of the sanctuary
- Identify areas of high biodiversity for increased protection

Program References

GRNMS Management Plan

Objective SR2, Activity SR2A; Objective SR3, Activity SR3B; Objective SR4, Activity SR4A, Activity SR4B; Objective SR5, Activity SR5B

2008 GRNMS Condition Report and 2012 Addendum

- Question 6: What is the condition of biologically structured habitats and how is it changing?
- Question 8: What are the levels of human activities that may influence habitat quality and how are they changing?
- Question 9: What is the status of biodiversity and how is it changing?
- Question 10: What is the status of environmentally sustainable fishing 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?
- Question 13: What is the condition or health of key species and how is it changing?
- Question 14: What are the levels of human activities that may influence living resource quality and how are they changing?