Scientists map fish habitat and movements at Gray's Reef Marine Sanctuary

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Two related research expeditions by NOAA scientists to track the habitat preferences and movements of fish at Gray's Reef National Marine Sanctuary may help managers protect overfished species such as red snapper and grouper. Research from the two expeditions appears in the current online edition of the peer-reviewed *Bulletin of Marine Sciences*.

"It's important to know exactly what areas to protect," says Matt Kendall, principle investigator on the habitat mapping project. "Certain fish gravitate to certain bottom types. If you want to protect red snapper, for example, you have to know where they live."

The projects tracking fish movements through telemetry will help researchers better understand the basic "life histories" of these fish. The South Atlantic Fishery Management Council, citing the "lack of basic management data as a major obstacle" to the successful management of these species, has recently called for a total ban on red snapper fishing to help restore stock levels. The ban is pending final approval.

According to the latest reports from NOAA Fisheries, black sea bass, red snapper, red grouper, and gag are among the region's overfished species. These studies are helping researchers better understand the movements and habitat preferences of these species, and their potential vulnerability to fishing. This knowledge will contribute to stock management and recovery of overfished species.

In the first of the two expeditions, researchers confirmed the importance of limestone ledges, which make up only one percent of Gray's Reef and only slightly more of the entire continental shelf of the southeastern United States. Scientists noted a distinct correlation between ledge characteristics such as height and degree of undercut to the types and numbers of fish found at the ledge. This information can help prioritize reef areas for management.

For example, gag and scamp, two grouper species prized by recreational fishermen, are nearly always present at ledges extending from a wall or structure by 12-18 inches - a ledge type that represents only a tiny fraction of limestone ledges in the sanctuary. Red snapper are typically present near ledges extending a minimum of 27 inches, a ledge type that also represents only a small portion of the limestone ledges in the sanctuary.

Kendall and his colleagues are not only mapping the relative value of Gray's Reef habitat for various fish communities, but also tracking how fish move around the sanctuary. Over the last two years, Kendall and his team have implanted tracking devices in fish which are being used in conjunction with sensors placed throughout part of the sanctuary.

These sensors will help them understand, for example, which fish are "homebodies" and which fish travel more widely. The data so far reveals that grouper tend to stay close to their preferred ledges, while snapper venture farther from their home territory.

The team's research not only has implications for the management of Gray's Reef Sanctuary but also for the management of reefs throughout the South Atlantic region. "If the fish have these kinds of specific relationships to the bottom habitat at Gray's Reef, there is no reason to think that these same relationships don't exist elsewhere in the southeastern United States," Kendall said.

Source: NOAA