Nearshore Hard-Bottom Community Survey of the Florida Keys

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This study examines and quantifies sessile structure, motile invertebrates, and fishes in the nearshore hard-bottom habitats throughout the Florida Keys (from Key Largo to the Marquesas Keys). Thirty-two permanent sites, stratified by species richness and structural complexity of sessile invertebrates, are repetitively visually surveyed to monitor any regional declines or improvements in habitat quality and fish/invertebrate communities. Two types of surveys are done: a sessile invertebrate survey and a motile survey. Sessile surveys are used to characterize the habitat; in addition patch sizes and height of algae and seagrasses are recorded. Motile surveys are used to characterize the diversity and distribution of the motile invertebrates and fish community; concurrently, benthic macroalgae and seagrass surveys were conducted. Size distributions of fish and spiny lobster are also recorded as part of the motile surveys.

We observed 30,951 fish among 176 different taxa. The most abundant species of fish we recorded was the white grunt, *Haemulon plumierii* (4,766 fish), which represented 15.40% of all fish recorded during visual surveys from fall 2003 to fall 2006 (Table 1). The most abundant snapper was the gray snapper, *Lutjanus griseus*, with 3,275 fish, representing 10.58% of all fish recorded. The gray snappers represented more than 75% of all snappers, whereas only 19 mutton snappers, *Lutjanus analis*, were counted, representing 0.06% of all fish surveyed or 0.44% of all snappers (Table 2).

The size distribution of mutton snapper was highly skewed to the left (Figure 1). Sixty-three percent of all mutton snappers were less than 15 centimeters in total length, and 47.4% were less than six centimeters in total length. Throughout this study, the nearshore hard-bottom habitat was found to be a nursery habitat for many fish species. However, because of the small number of mutton snapper recorded and the proximity of seagrass beds and mangrove from a large number of the sampling sites, we cannot definitively conclude that the nearshore hard-bottom is a mutton snapper nursery habitat. We observed no seasonal variation in size from fall 2003 to fall 2006, but we counted on average twice as many mutton snapper in fall as in winter or spring. No relationship between mutton snapper abundance and water temperature or salinity could be documented to this point.

Among the 19 mutton snappers found in the nearshore hard-bottom habitat, 21% were found in channels, 31.6% in the Gulf, 36.8% in Florida Bay, and 10.5% on the ocean side of the peninsula. Almost 70% of the snappers were found in the gulf-bay region. Almost 80% of the mutton snapper recorded during this study were found at sites with low structural indices, and 89.5% of the mutton snappers were found in locations with medium species richness of sessile invertebrates. No mutton snappers were found at locations with low species richness.

Table 1. Relative abundance of the five most abundant fish species recorded during visual surveys in the nearshore hard-bottom habitat of the Florida Keys from fall 2003 to fall 2006.

Scientific Names	Common Names	Relative abundance
Haemulon plumierii	White grunt	15.40%
Lagodon rhomboides	Pinfish	13.58%
Lutjanus griseus	**Gray snapper**	**10.58%**
Eucinostomus spp.	Mojarras	8.27%
Haemulon aurolineatum	Tomtate	4.93%
Others		47.24%

Table 2. Total and relative abundance for all snapper species recorded during visual surveys of the nearshore hard-bottom habitat of the Florida Keys from fall 2003 to fall 2006.

Scientific Names	Common Names	Total abundance	Relative abundance
Lutjanus griseus	Gray snapper	3275	10.58%
Lutjanus synagris	Lane snapper	906	2.93%
Ocyurus chrysurus	Yellowtail snapper	111	0.36%
Lutjanus spp.	Unidentified snappers	21	0.07%
Lutjanus analis	**Mutton snapper**	**19**	**0.06%**
Lutjanus apodus	Schoolmaster	6	0.02%
Lutjanus mahogoni	Mahogany snapper	3	0.01%
TOTAL		**4341**	

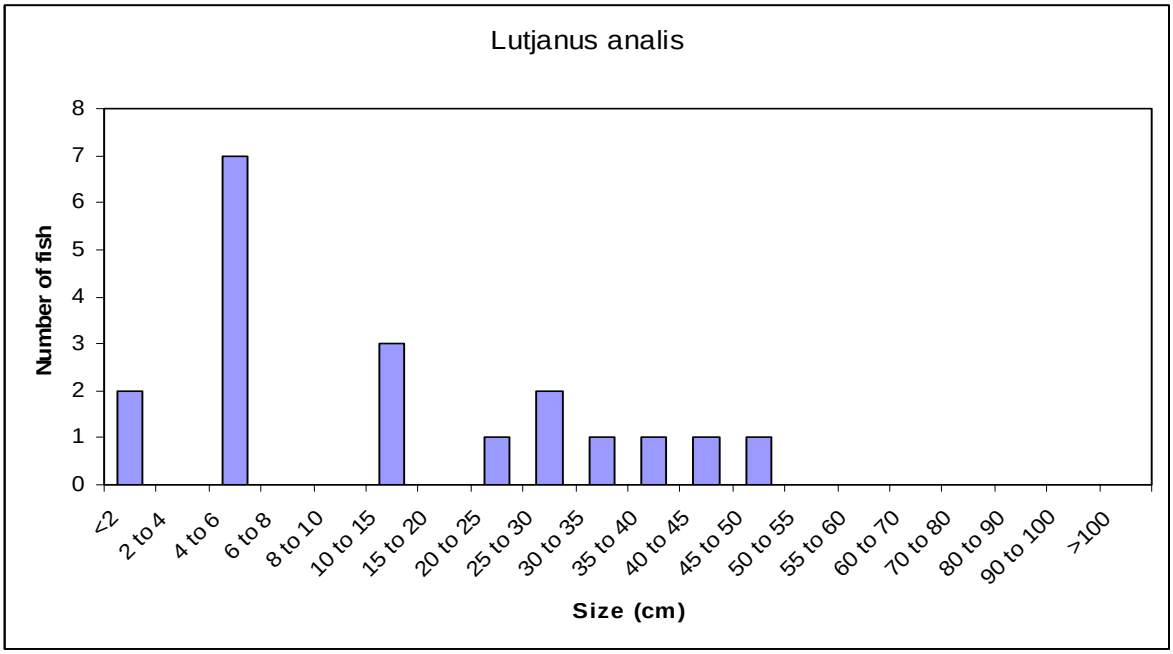

Figure 1. Size distribution of mutton snapper, *Lutjanus analis*, in the nearshore hard-bottom habitat of the Florida Keys.