



Abundance, Spatial and Recruitment Patterns of Reef Fish in the Middle Florida Keys, Florida

Michelle Dancy, Alejandro Acosta, Karole Ferguson, and Jeffrey Simonds

Florida Fish & Wildlife Conservation Commission, Fish & Wildlife Research Institute
2796 Overseas Highway, Suite 119, Marathon, FL 33050 USA
Michelle.Dancy@myfwc.com



STUDY OBJECTIVES

Our goal is to describe the distribution, abundance, species composition, size structure, and habitat usage of juvenile reef fish in the middle Keys, and to develop a pre-recruit (juvenile) tuning index which may be used for future snapper stock assessments.



STUDY AREA AND SAMPLING DESIGN

A random-stratified site selection procedure, based upon the "Benthic Habitats of the Florida Keys" GIS system was used to select sampling sites. The Keys were divided into one longitudinal by one latitudinal minute numbered sampling "grids" (e.g., Fig. 1) and further divided into 100 0.1' x 0.1' "micro-grids" (inset of Fig. 1). All micro-grids touching land containing bottom habitat mapped as "Continuous Seagrass" or "Patchy Seagrass" were included in the sampling universe. During the 4 year study, 10 sampling sites were chosen from Grassy Key south to Boot Key each month (Fig. 1)

Sampling sites were characterized by shallow (<1.3m deep) mixed-species seagrass beds consisting of *Halodule wrightii*, *Thalassia testudinum*, *Syringodium filiforme*, *Acetabularia crenulata* and mixed algae that were located adjacent to the shore.

Sampling was conducted using a 21.3 m seine net. Density (# fish/100 m²) was used as an index of relative abundance

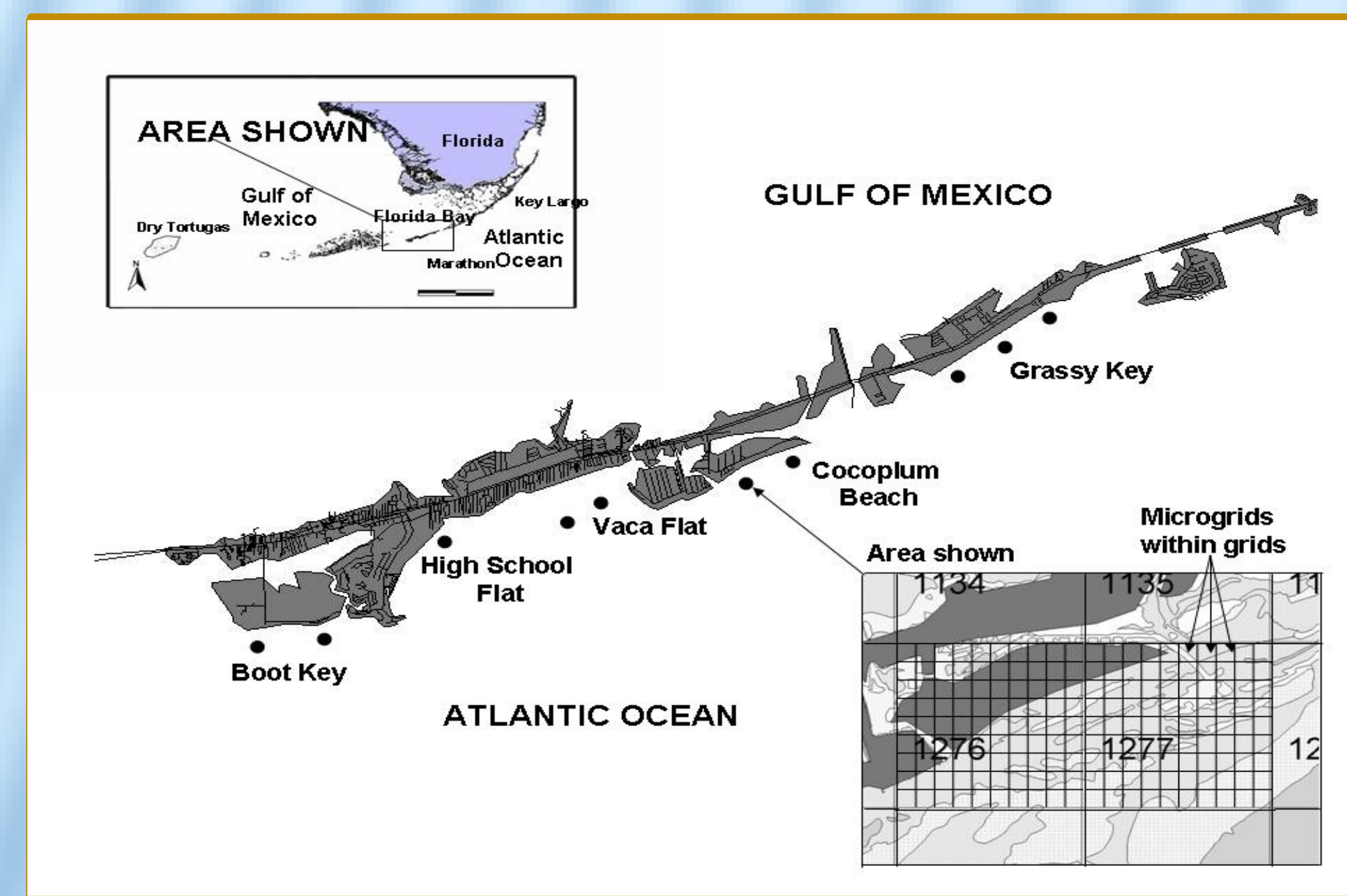
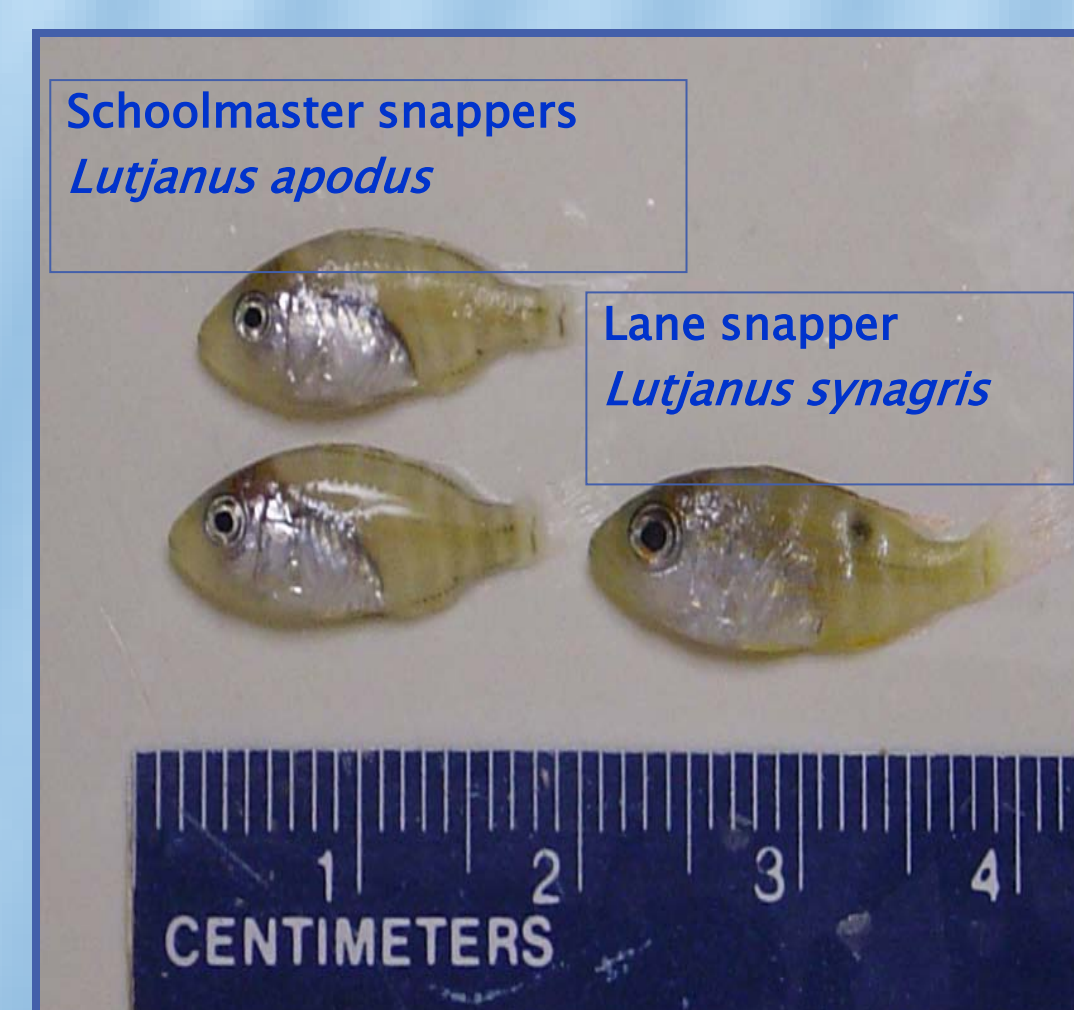
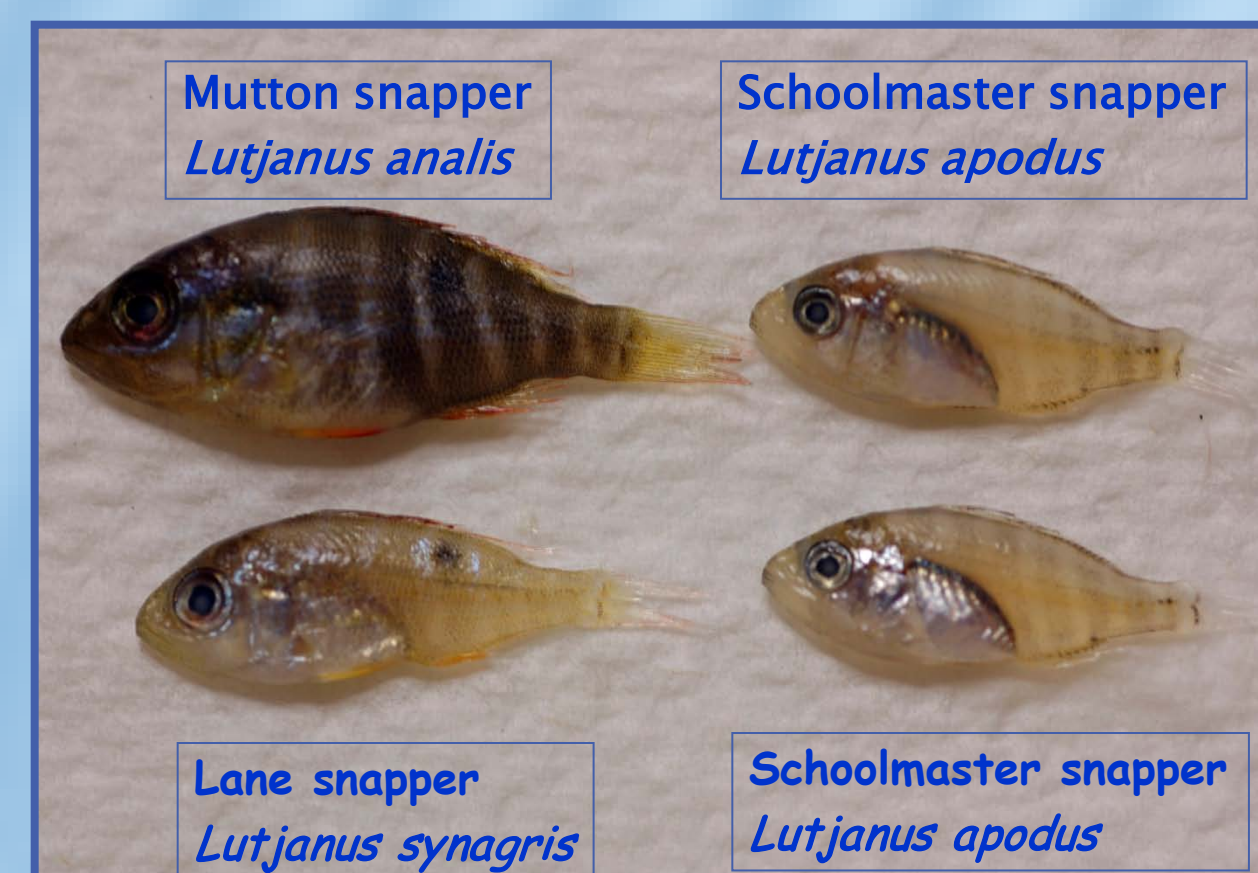


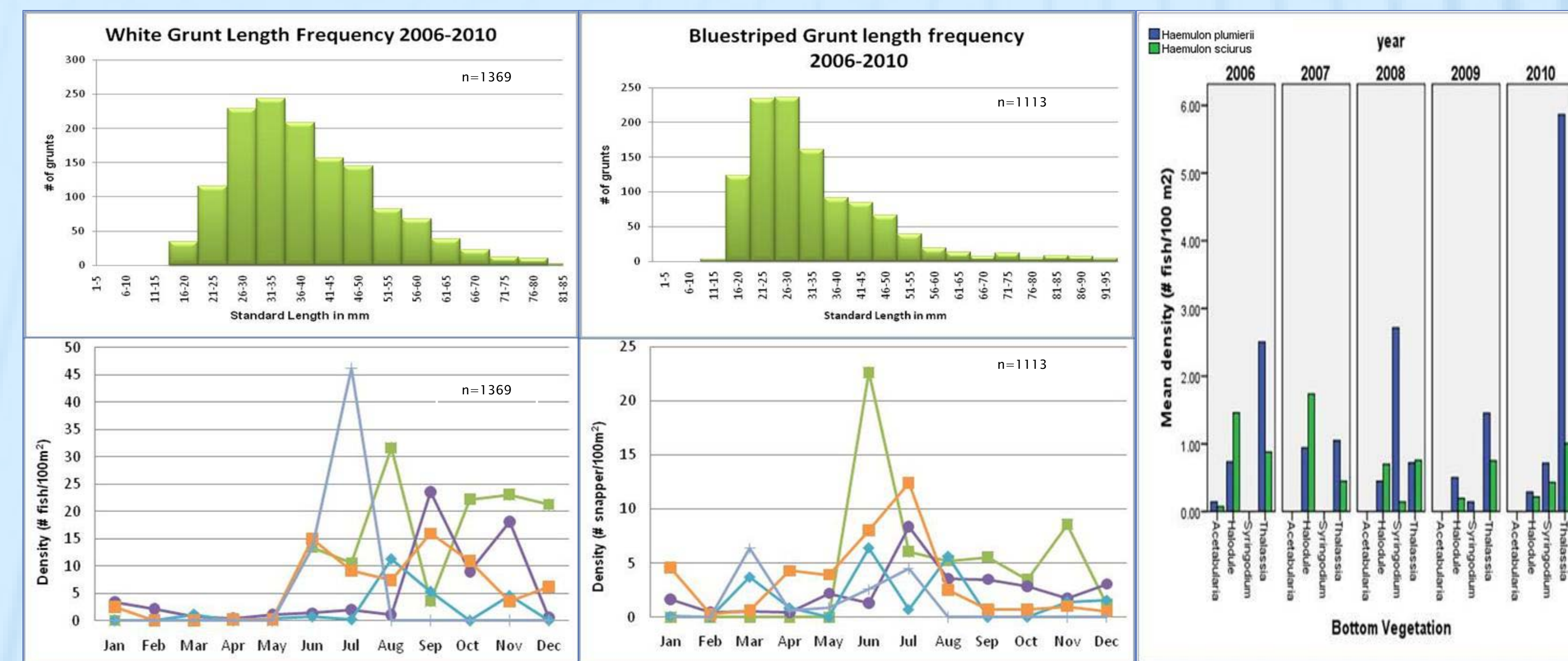
Figure 1. Map of sampling area showing location of 10 grids and inset showing micro-grid system.



RESULTS

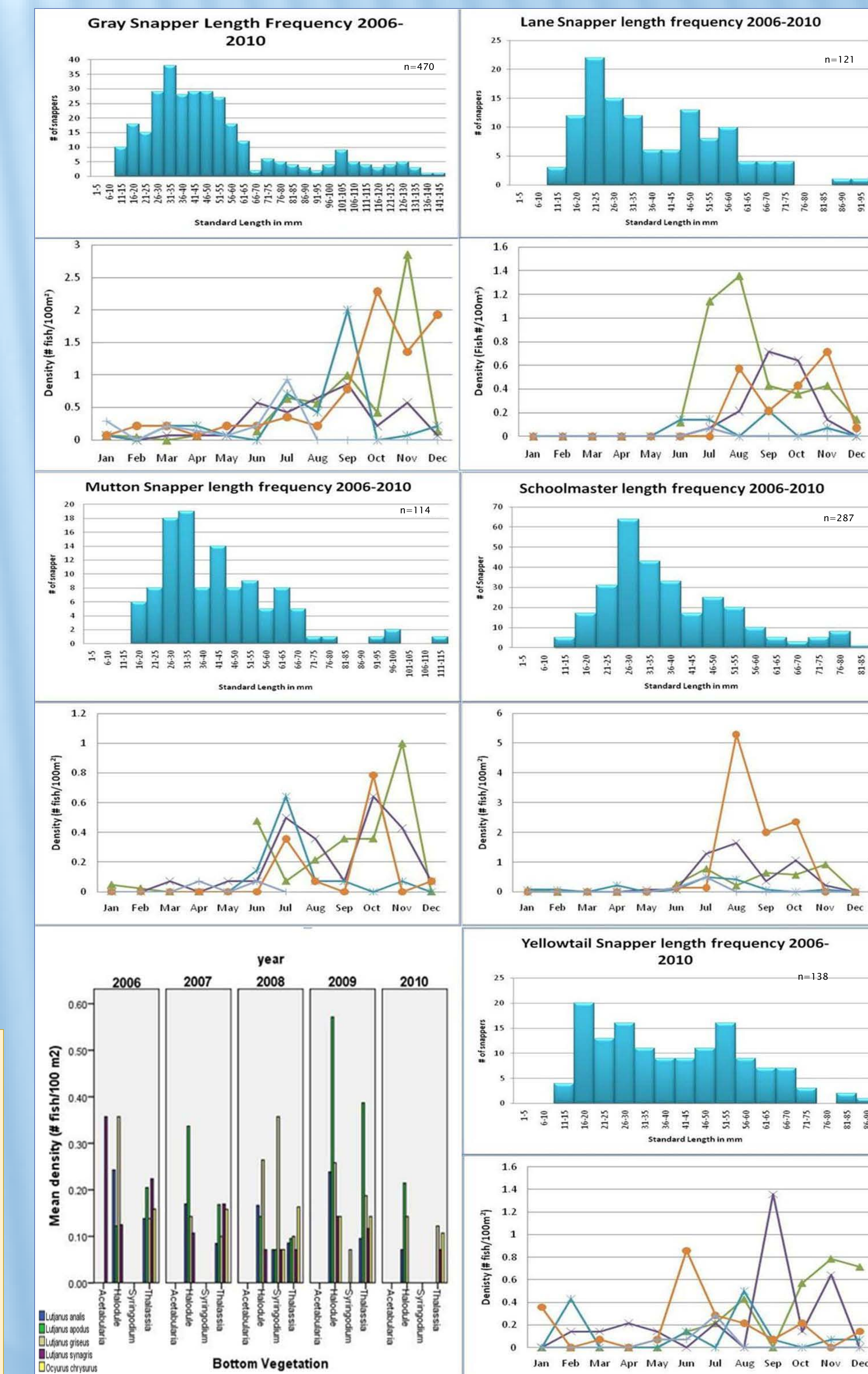
GRUNTS

White grunts (*H. plumieri*) and bluestriped grunts (*H. sciurus*) were among the top 10 most abundant species collected accounting for 9% (n=3,969) and 4.4% (n=1,995). 99% of these 2 species were juveniles (<100mm SL) and only 2 and 5% were new recruits (<20mm SL). They were most abundant from June to October and these were positively correlated with the spawning season for the species (May to June).



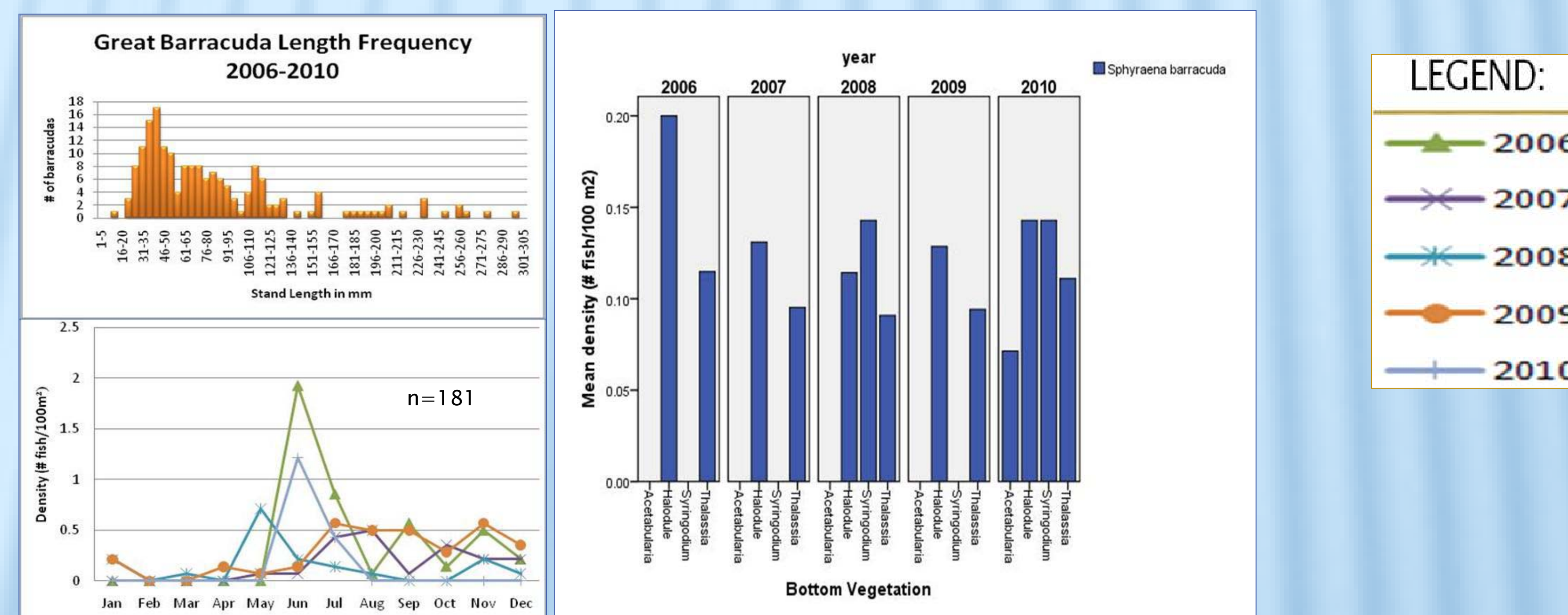
SNAPPERS

1130 snappers were collected and measured, of which 959 were juveniles. Approximately 96% (n=1085) of those collected were young juveniles (<100mm SL). Of the 96%, 53% (n=575) were settlement stage individuals (<40mm SL), including 479 early-stage juveniles (>20mm to <40mm SL), and 96 new recruits (<20mm SL). Gray Snappers (*L. griseus*) were the most abundant collected. Juvenile abundance peaked from July through November suggesting that higher numbers of adults were spawning from the early summer to early fall.



BARRACUDA

181 Great barracudas (*S. barracuda*) were collected. 69% collected were juveniles (<100mm SL) and only 1 was a new recruit (<20mm SL). Peak abundance was during June and July suggesting that spawning takes place during spring and early summer.



CONCLUSIONS

Our data suggests that beach seines adequately sample juvenile reef fishes which use the nearshore seagrass beds as a nursery ground. Our results also provide a picture of a species' spawning and year class success in the Florida Keys...

Snappers: Recruitment pulses for snappers peaked in late summer and fall, in response to the peak spawning season in spring and early summer.

Barracuda: The peak of young-of-the-year in shallow nearshore habitats in June and August suggested that spawning occurs in the spring and summer.

Grunts: Higher densities were found during the summer and fall in response to the peak spawning season (April-June).

In this study, we have identified a positive relationship between seagrass and the abundance of juvenile reef fish across a wide array of seagrass habitats in the middle Florida Keys. This suggests that any future ecosystem based management approach should include nearshore seagrass habitats.

ACKNOWLEDGEMENTS

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