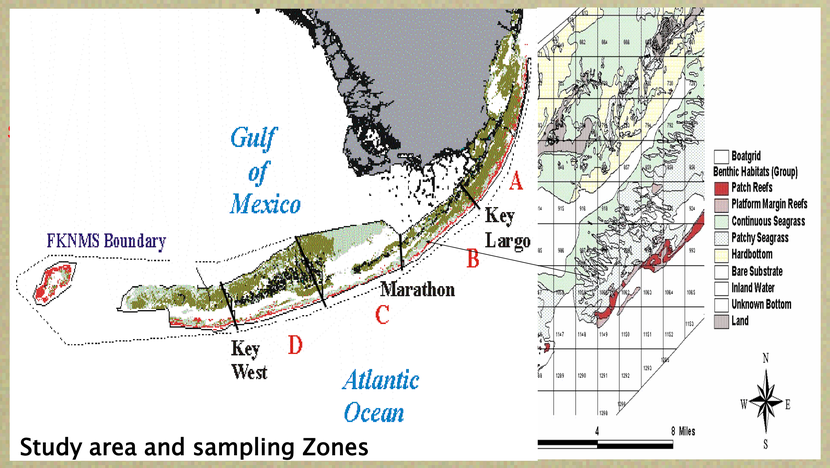
Mutton snapper (*Lutjanus analis*) Abundance Indices Based on a Fishery- Independent Visual Census Survey from the Florida Keys, Florida

Alejandro Acosta, Paul Barbera and Jim Colvocoresses[2]

Florida Fish & Wildlife Conservation Commission, Fish & Wildlife Research Institute
2796 Overseas Highway, Suite 119, Marathon, FL 33050 USA
[2]Fish and Wildlife Research Institute, St. Petersburg, FL 33701

METHODS

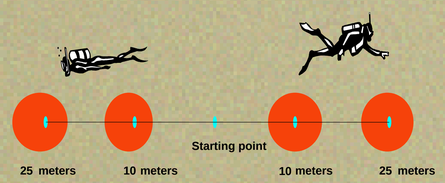
Visual surveys were conducted from May 1999 to October 2007. Thirty nine randomly select sites (13 in Zone A, 10 in Zone B, 6 in Zone C and 10 in Zone D) were conducted each month. Density (# fish/100 m2) was used as an index of relative abundance. Density estimates by year, strata, and zone were used for spatial comparisons.



Study area and sampling Zones

- The Florida Keys are subdivided in zones and grids (1nm^2).
- Available habitat in each grid is identified
- Sampling site within each grid is randomly selected

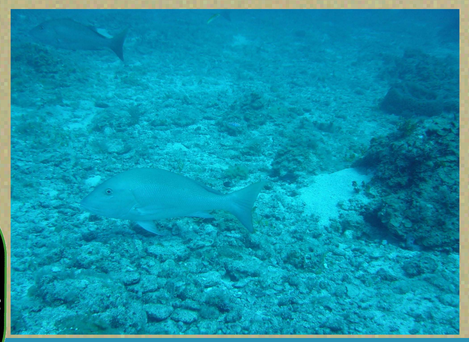
Four point counts surveys are conducted at each site



5m radius Cylinder

Point counts encompassed an area of 78.5 m

Each diver lays a tape in the pre- determined direction. The tapes were at least 15 m between the center of each point count. Normally the counts were centered on the 10m and 25m marks of the tape.



RESULTS

❖There were a total of 2198 dives conducted, and mutton snapper were only found in 539 dives.

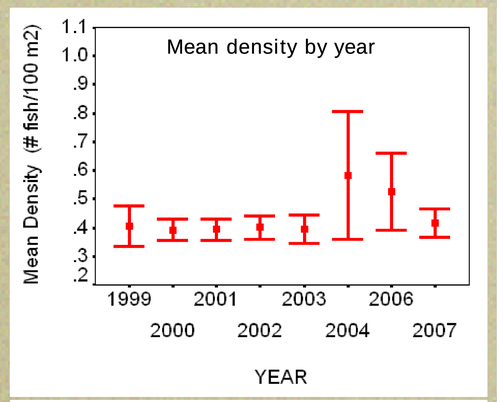
❖Mutton snapper were found on reefs ranging from low to high relief and from low to high bottom complexity.

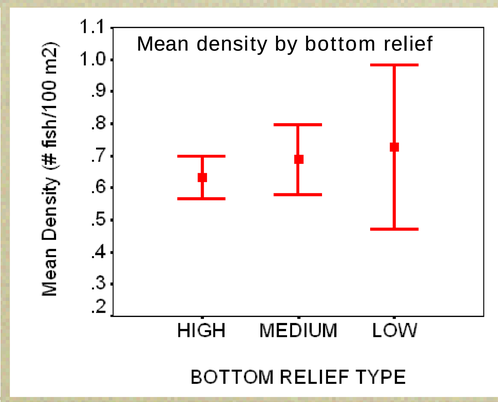
❖Increase in rates in 2004 and 2006 was due to divers observing proportionately higher numbers of juveniles.

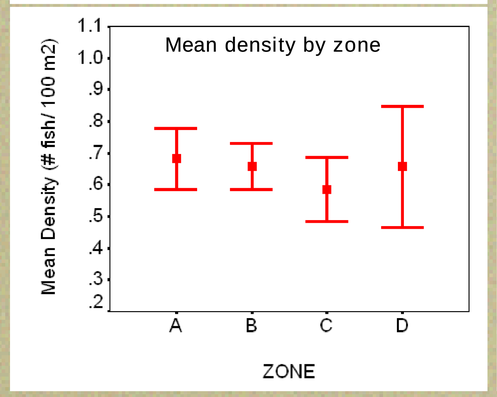
❖There were more adult mutton snappers in the Upper Keys (Zone A) and Lower Keys (Zone D) than in the Middle Keys (Zones B and C).

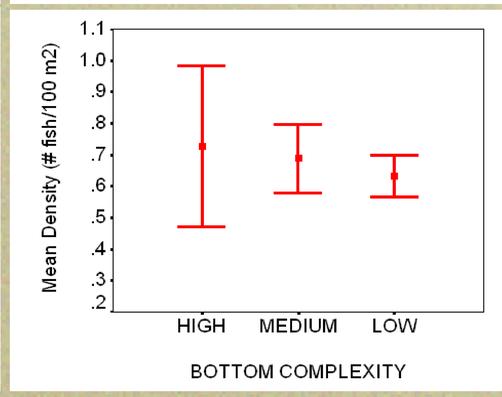
❖Adult mutton snapper were observed in deeper waters.

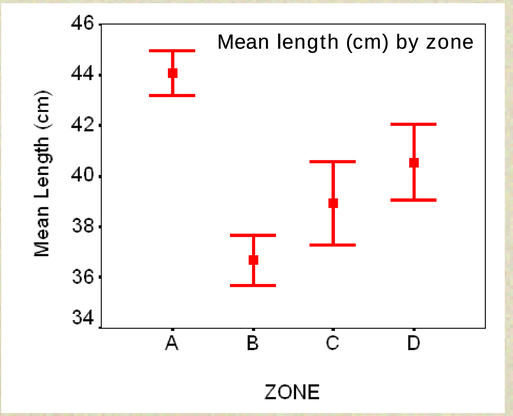
❖Only four species out of 22 were associated with mutton snapper life stages.

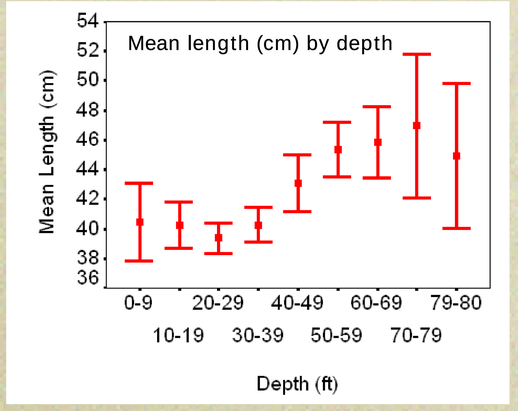












Species associated with juveniles (TL < 37.5 cm) and adult mutton snapper based on logistic regression coefficients

Scientific name	Common name	Juveniles	Adults
Epinephelus morio	red grouper	0.69	
Epinephelus fulvus	coney		0.56
Epinephelus cruentatus	graysby	-0.80	
Lutjanus griseus	gray snapper	0.47	
Lutjanus jocu	dog snapper		1.04
Lutjanus synagris	lane snapper		0.82
Ocyurus chrysurus	yellowtail snapper		-0.33
Haemulon album	Margate		1.02
Haemulon macrostomum	Spanish grunt		-1.10
Haemulon melanurum	cottonwick	0.61	
Haemulon sciurus	bluestriped grunt		-0.67
Haemulon striatum	striped grunt		1.07
Chaetodon ocellatus	spotfin butterflyfish	0.41	-0.31
Chaetodon capistratus	foureye butterflyfish	-0.53	
Chaetodon sedentarius	reef butterflyfish		0.29
Holacanthus ciliaris	queen angelfish		0.47
Pomacanthus arcuatus	gray angelfish		0.50
Pomacanthus paru	French angelfish	0.62	
Bodianus pulchellus	spotfin hogfish		-1.99
Bodianus rufus	Spanish hogfish	0.51	0.30
Lachnolaimus maximus	hogfish	0.86	0.53
Balistes vetula	queen triggerfish	0.68	0.76

CONCLUSIONS

❖Density of mutton snapper for each year was similar and the apparent differences between years were attributable to factors such as: life stage (adult & juveniles), reef type, zone, bottom complexity.

❖Examining the visual survey data by life stage (juvenile or adult) allowes us to develop an index for both life stages.

❖The survey allowed us to determine the species associated with mutton snapper.

❖Our visual census survey provides a relative index of abundance of mutton snapper in the Florida Keys.

❖These data will continue to provide a reliable index for the management of this valuable resource.

ACKNOWLEDGEMENTS

We would like to thank: all the members of the Keys Fisheries Research finfish team for their efforts in the field, laboratory, and office. Funding for this work was supported in part by the State of Florida Saltwater Fishing License monies.