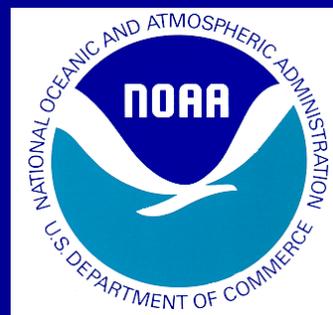


South Atlantic proposed MPAs: three years of pre- closure data on habitat and fish assemblages



Principal Investigators:
Stacey L. Harter
Andrew W. David

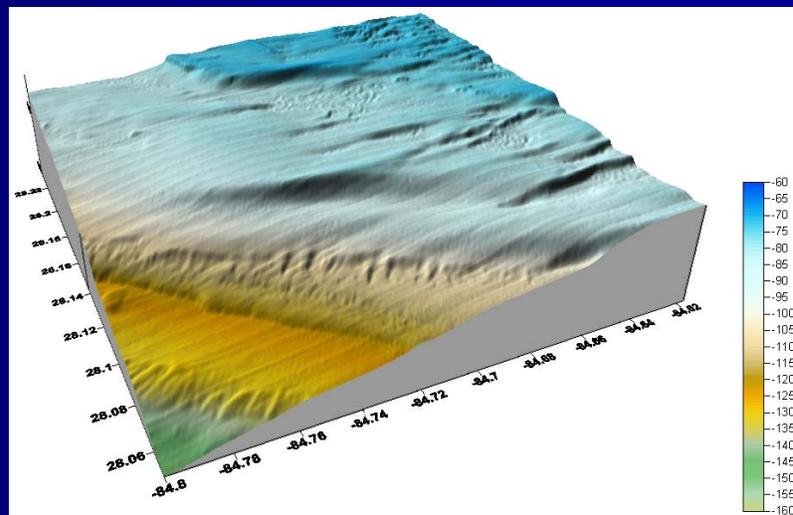
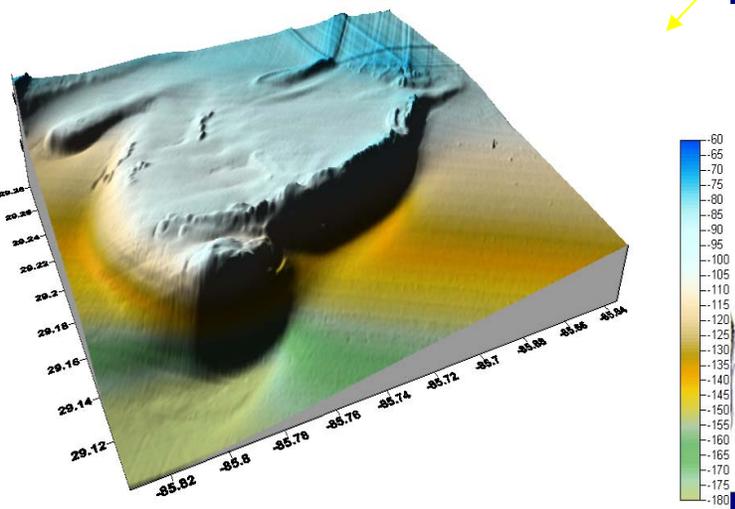
NOAA Fisheries, Panama City, FL



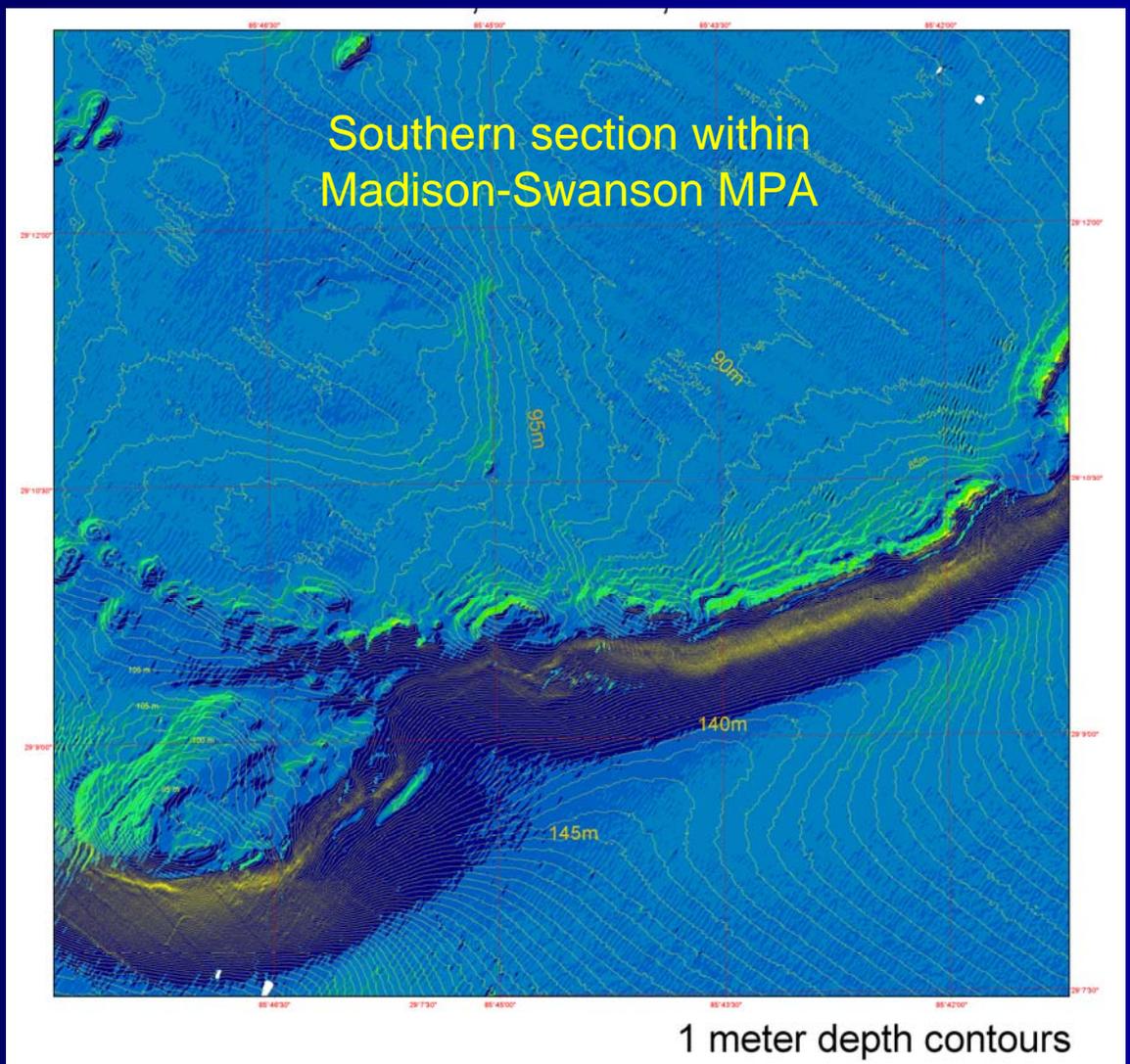
Similar project in NE Gulf of Mexico



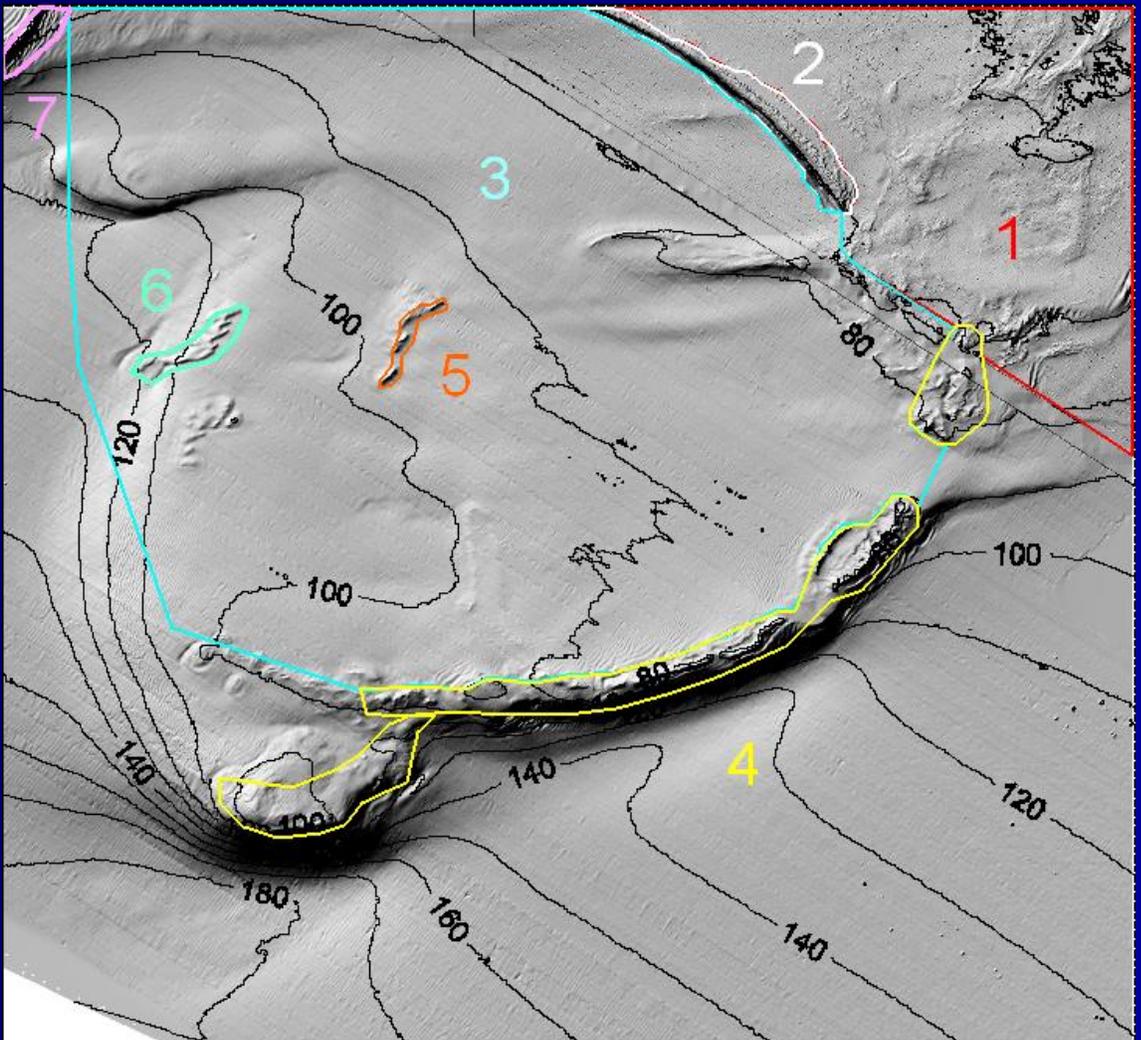
Gag Grouper

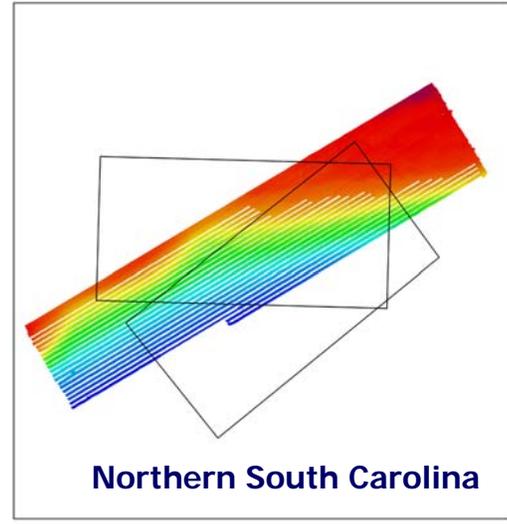
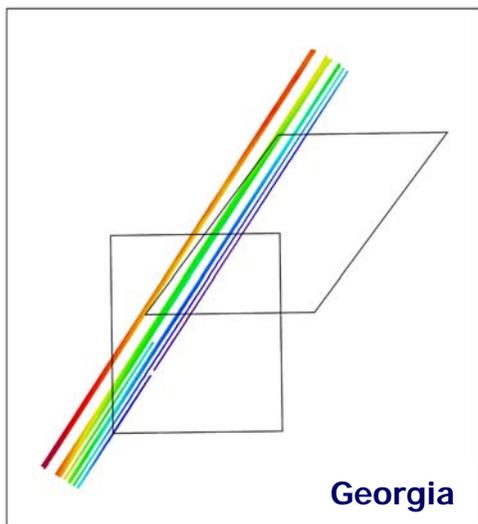
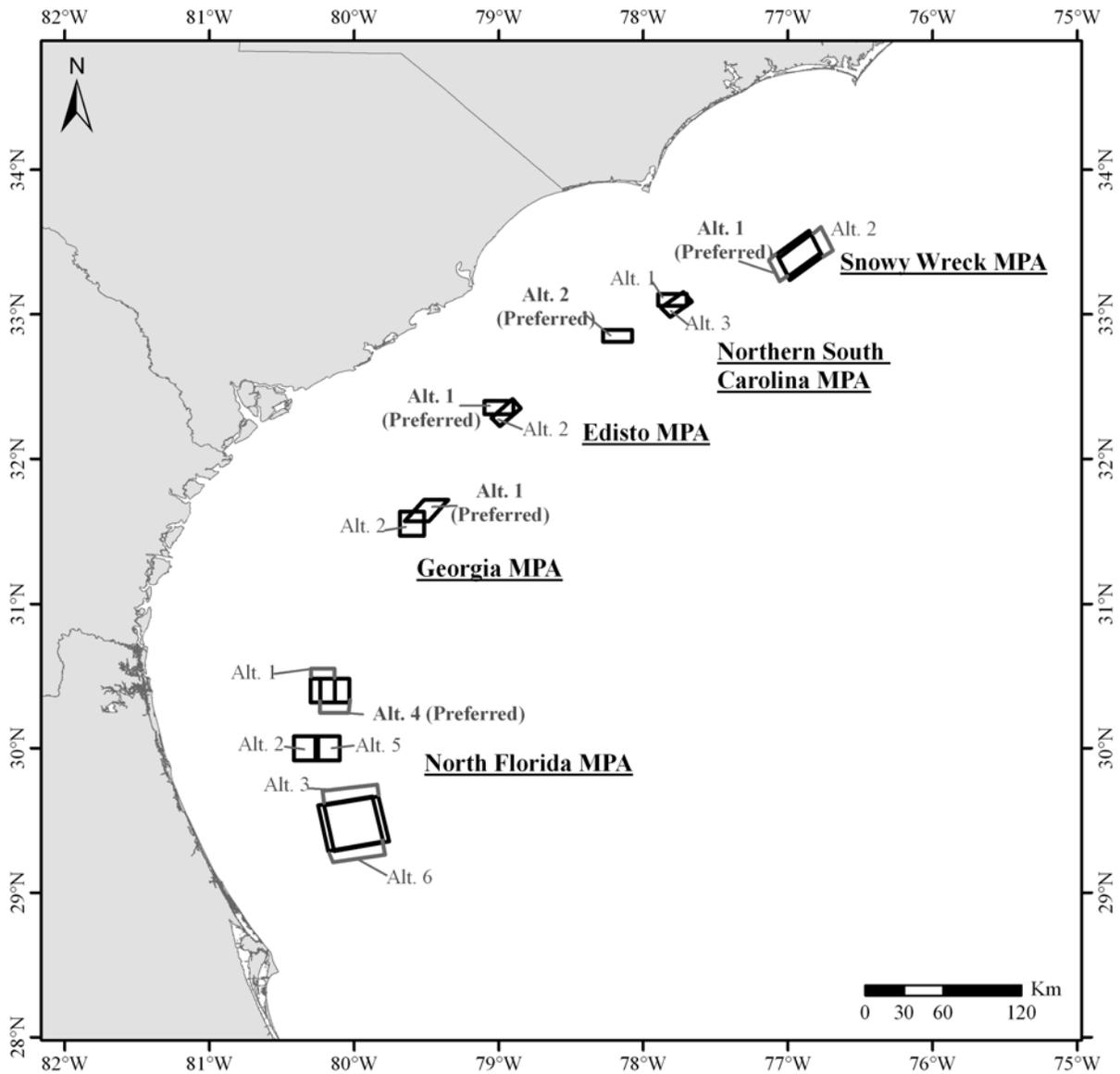


High resolution (sub-meter) bathymetry and acoustic backscatter data revealed location of different habitat types



Strata were delineated based upon habitat similarity and geographic proximity. Sample sites selected randomly within each stratum.





Objectives

- Obtain estimates of reef fish density and species composition associated with bottom features within and outside the preferred proposed MPAs.
- Describe habitat features within and outside the preferred proposed MPAs.
- Document the relationship between habitat and species assemblages.

Gear Types

Remotely Operated Vehicle (ROV)

Pro: Surveys large areas

Con: Alters behavior of some fish



Stationary Camera Array

Pro: Does not alter fish behavior

Con: Limited area of coverage

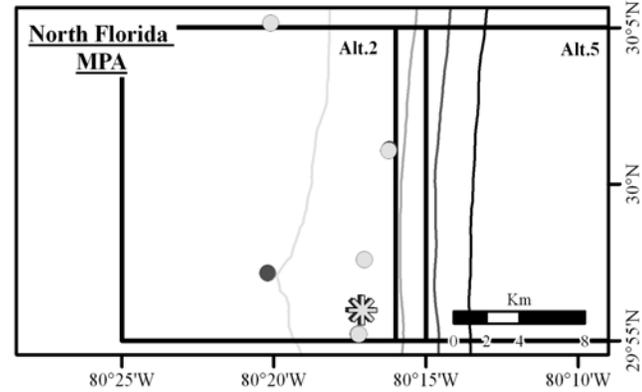
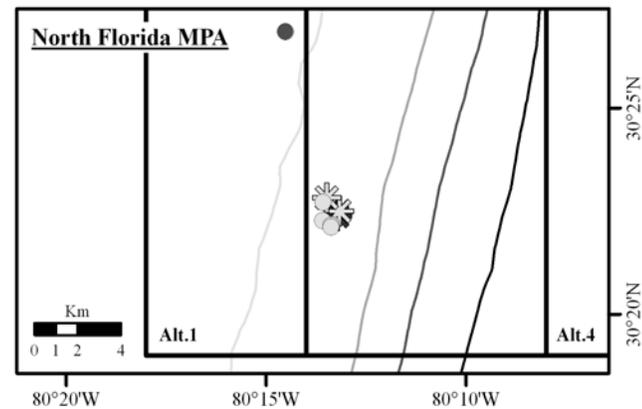
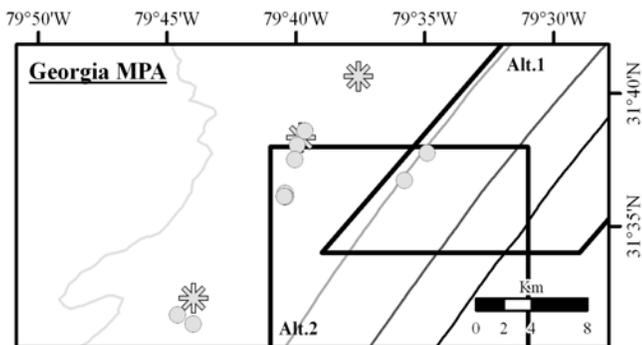
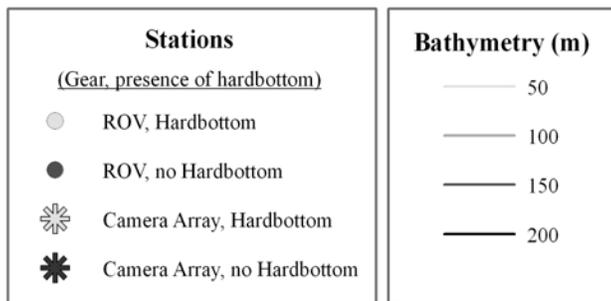
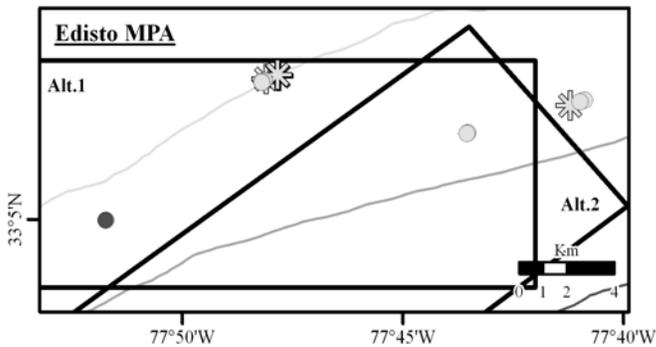
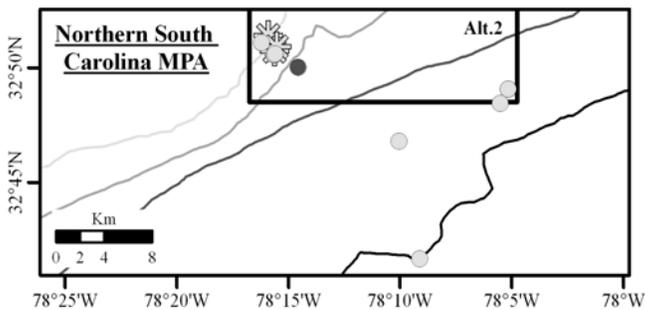
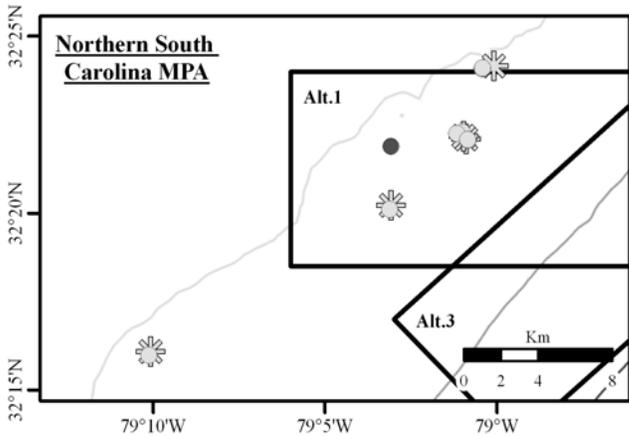
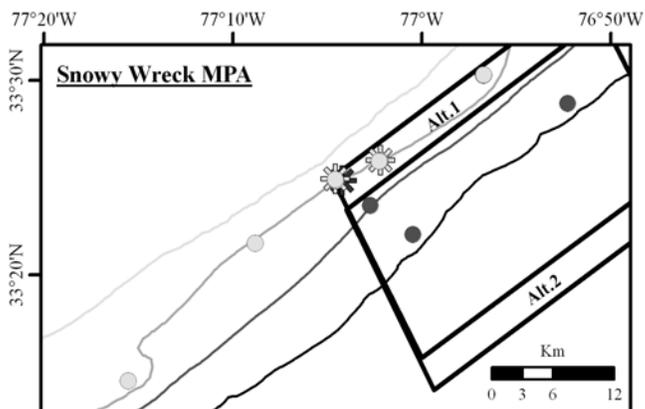


Sampling Design

- Sampled in 2004, 2006, & 2007
- Targeted hardbottom reef habitat
 - Local knowledge
 - Split beam acoustic bathymetry on ship in 2004
 - 2006 & 2007: used information from previous cruises.
- Sampled sites inside and outside the preferred MPA alternatives trying to hit as many of the habitats as possible.

Habitats

- Sand (SA)
- Pavement (PAV): no relief, but apparent presence of hardbottom (cracks/crevices, epifauna)
- Low Relief Outcrops (LRO): <1m relief
- Moderate Relief Outcrops (MRO): 1-3m relief
- High Relief Ledge (HRL): >3m relief, large boulders, overhangs



Videotape analysis

■ ROV:

- All fish identified and counted and habitat type noted from videotapes.
- Tapes divided into smaller transects (50-150m) within each habitat type.
- Fish densities calculated as #/hectare.

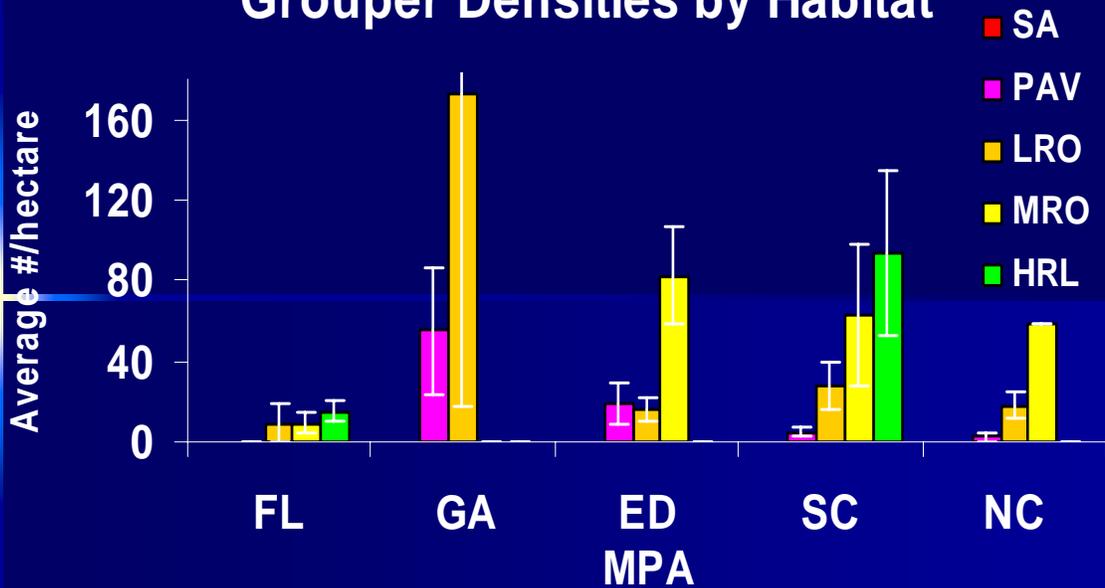
■ Camera Array:

- All fish identified and counted in 20 minute segment of tape.
- Abundance values calculated from max. number of a given species in the field of view at any one time.

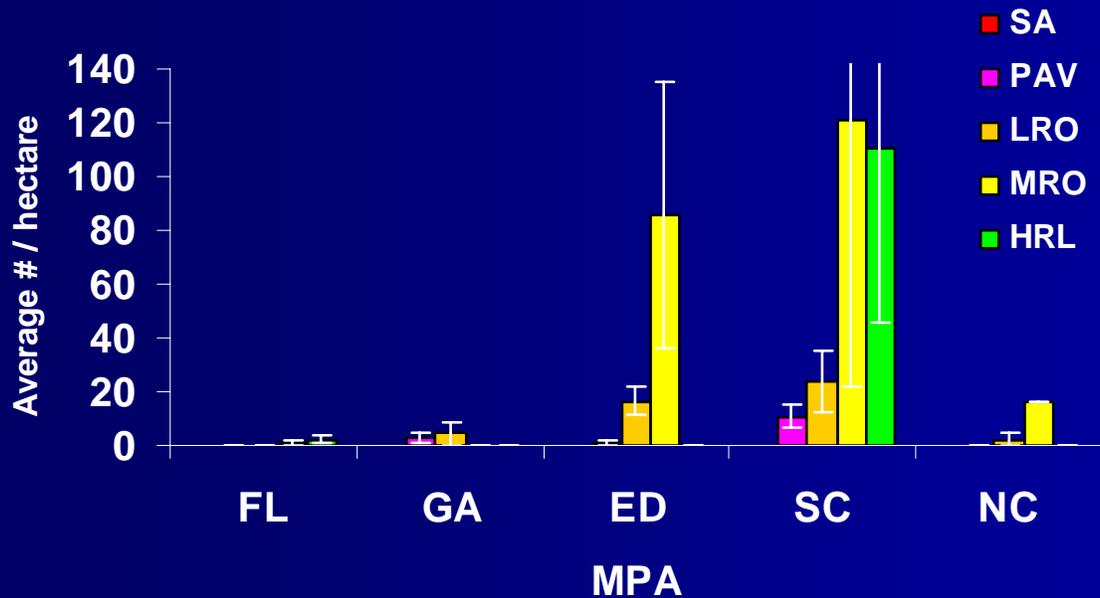
Relative Abundances from ROV Dives

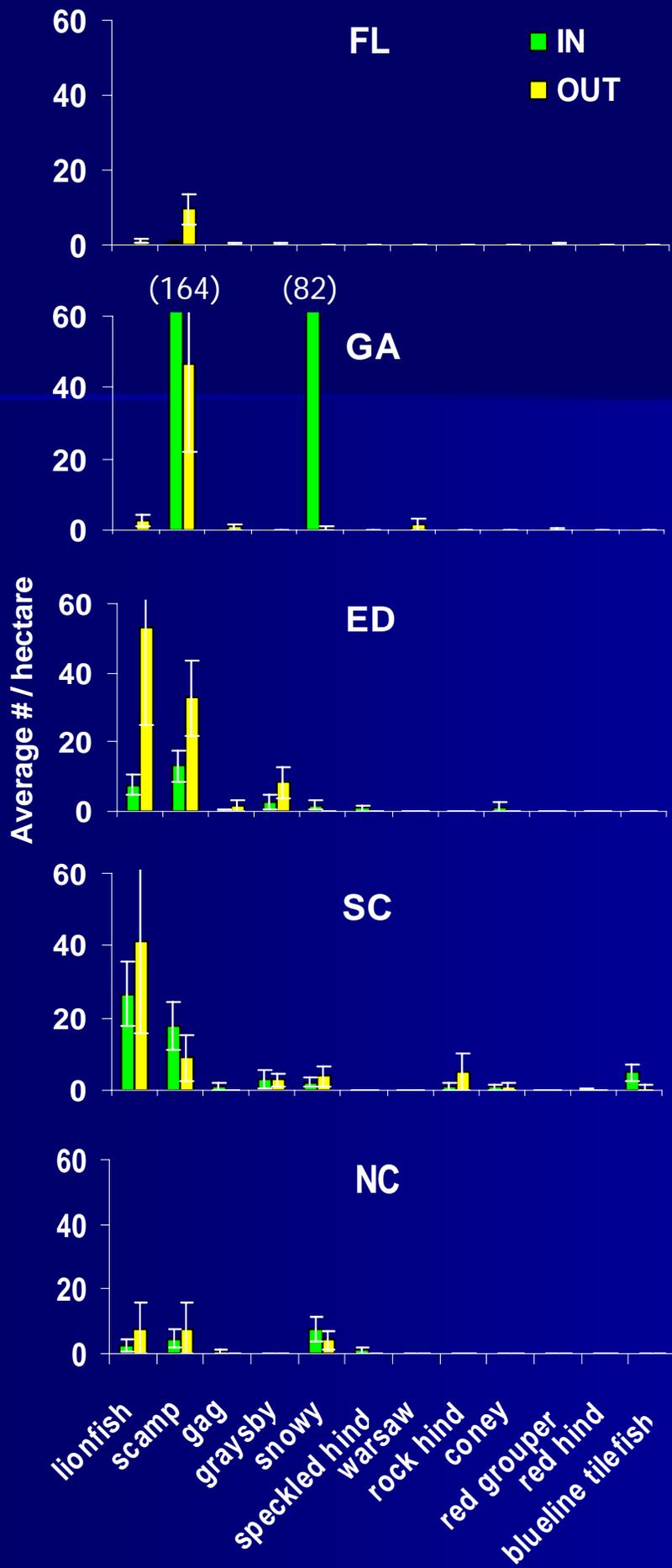
FL-IN		FL-OUT	
tomtate	29.0	tomtate	41.2
yellowtail reeffish	17.6	vermilion snapper	17.1
vermilion snapper	16.9	grunt	13.9
tattler	5.6	yellowtail reeffish	8.0
wrasse	4.1	striped grunt	4.5
GA-IN		GA-OUT	
flounder	18.5	scad	37.4
searobin	17.7	tattler	9.0
saddle bass	16.2	short bigeye	8.3
sand diver	12.3	red porgy	5.2
blackbar drum	8.5	bank sea bass	4.5
ED-IN		ED-OUT	
yellowtail reeffish	23.7	tomtate	53.9
wrasse	12.0	yellowtail reeffish	9.9
damsel fish	7.4	wrasse	5.1
tattler	6.7	purple reeffish	4.2
reef butterflyfish	5.6	reef butterflyfish	3.4
SC-IN		SC-OUT	
grunt	51.3	wrasse	14.2
tomtate	16.9	anthiid	14.0
boarfish	2.6	grunt	10.7
cubbyu	2.2	short bigeye	9.9
wrasse	2.2	tattler	4.8
NC-IN		NC-OUT	
anthiid	48.8	anthiid	45.7
rougtongue bass	32.9	red barbier	18.1
tattler	3.1	short bigeye	6.7
greenband wrasse	2.1	tattler	6.3
short bigeye	1.4	rougtongue bass	6.0

Grouper Densities by Habitat



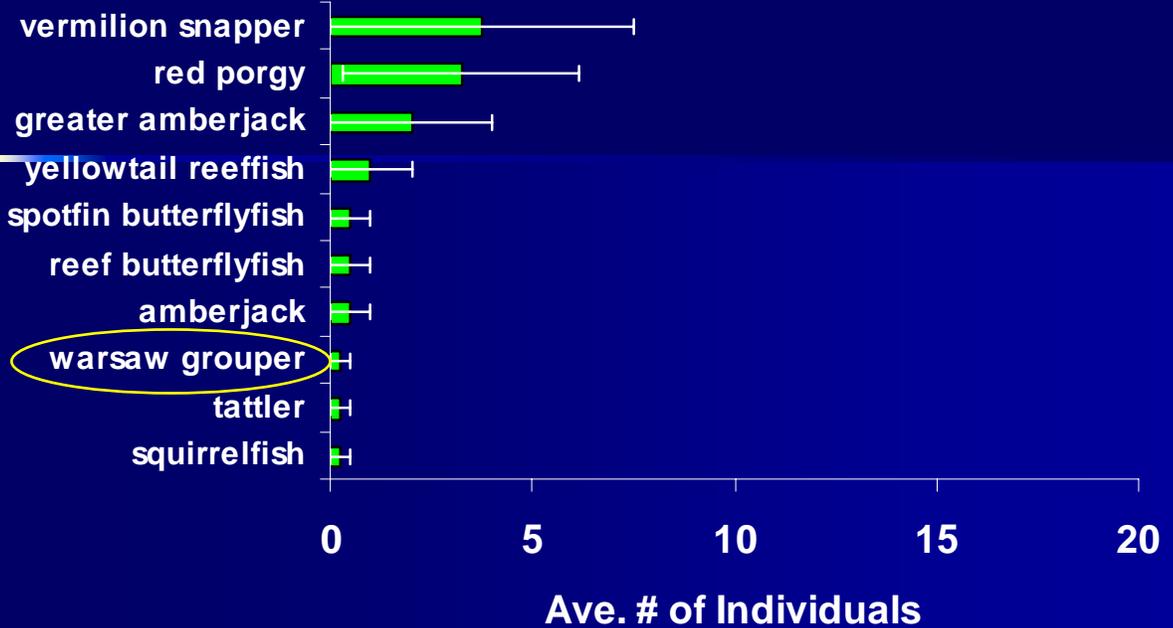
Lionfish Densities by Habitat



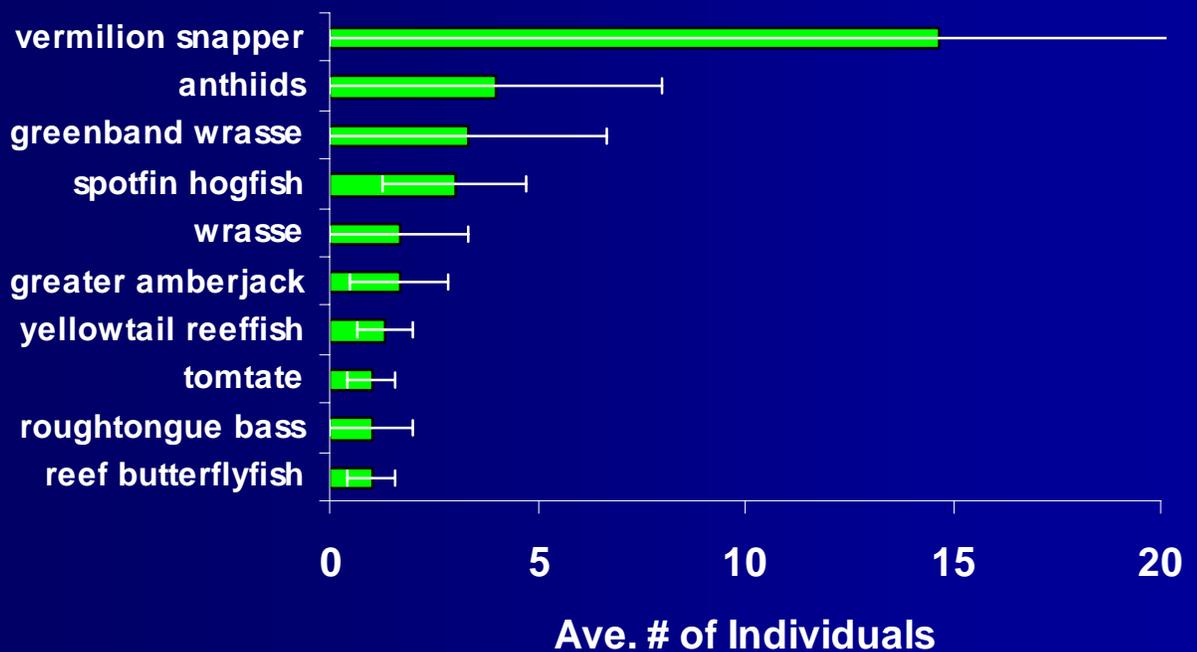


Camera Array Results

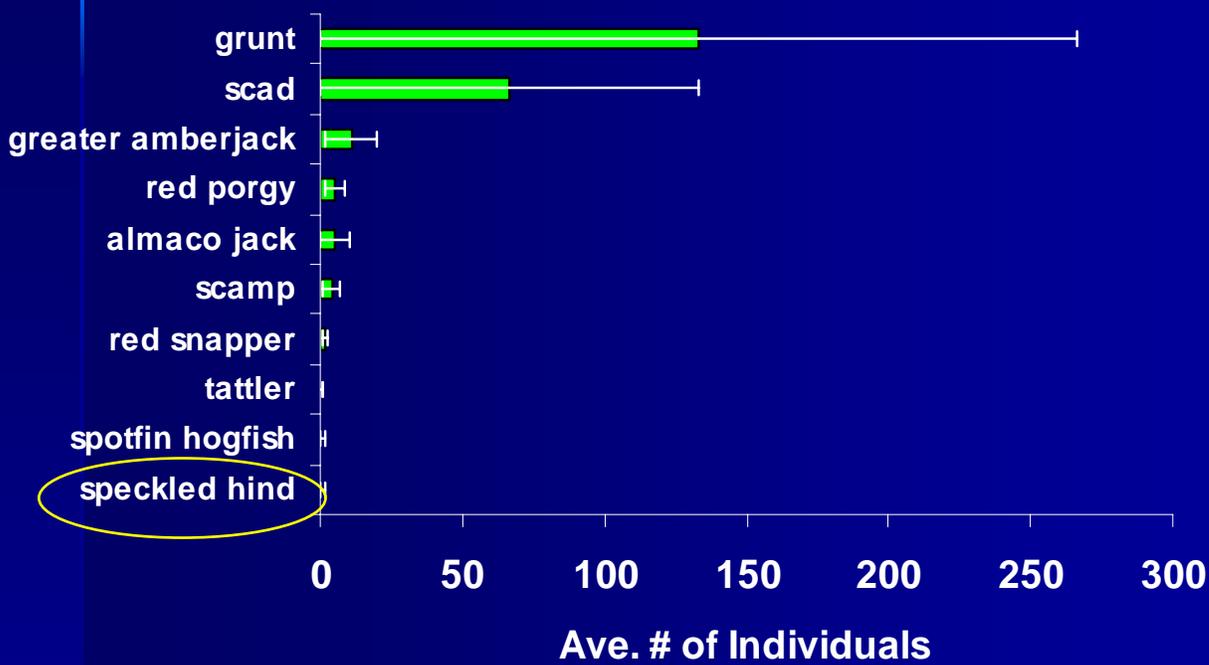
FL-IN



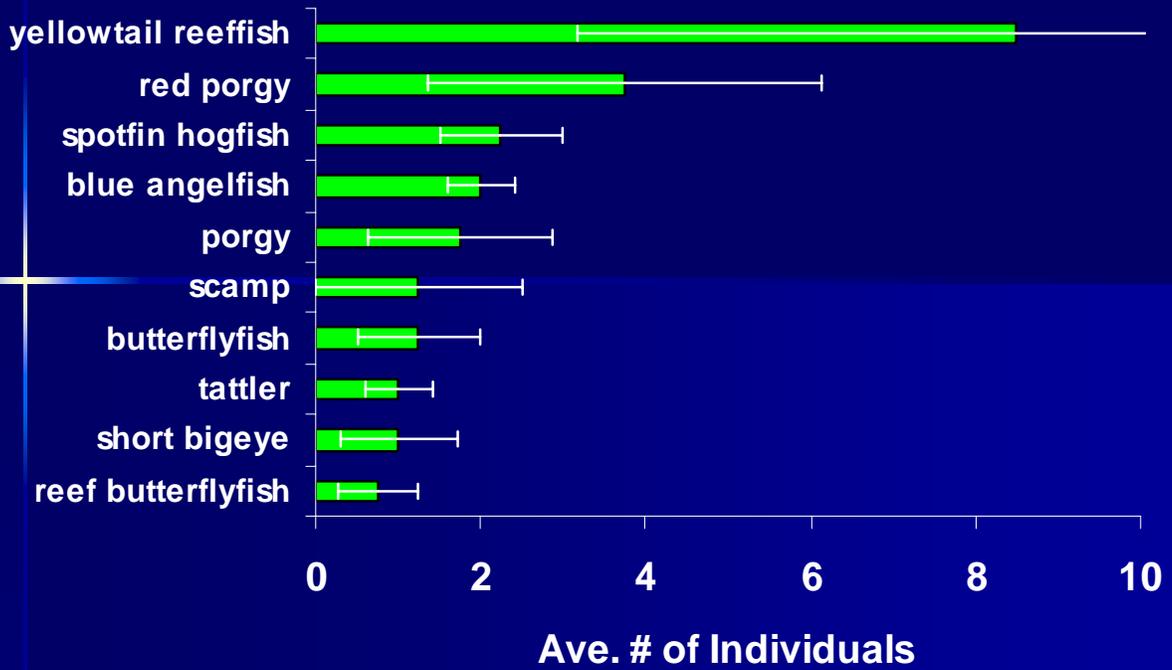
FL-OUT



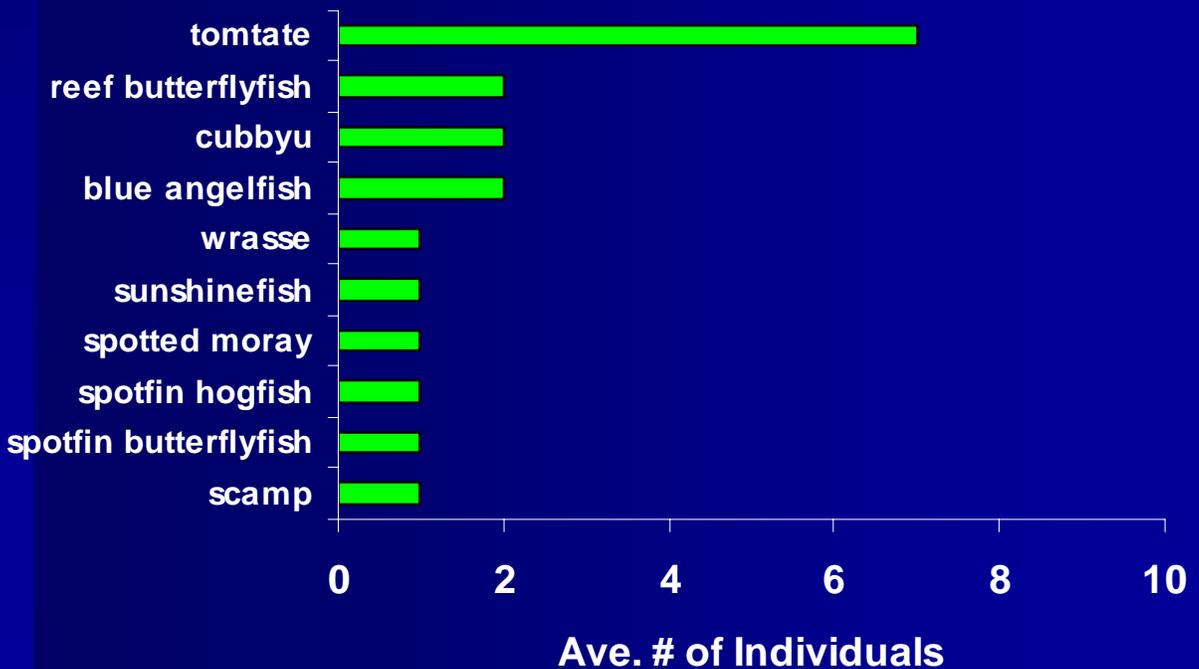
GA-OUT



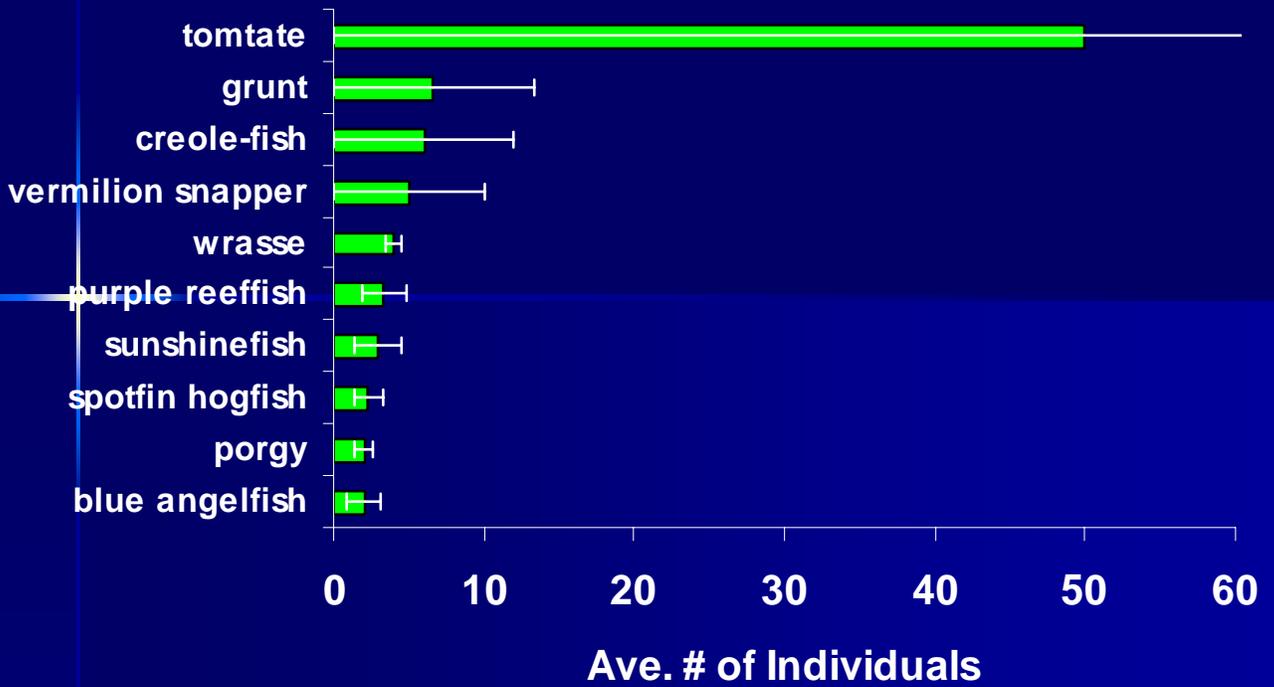
ED-IN



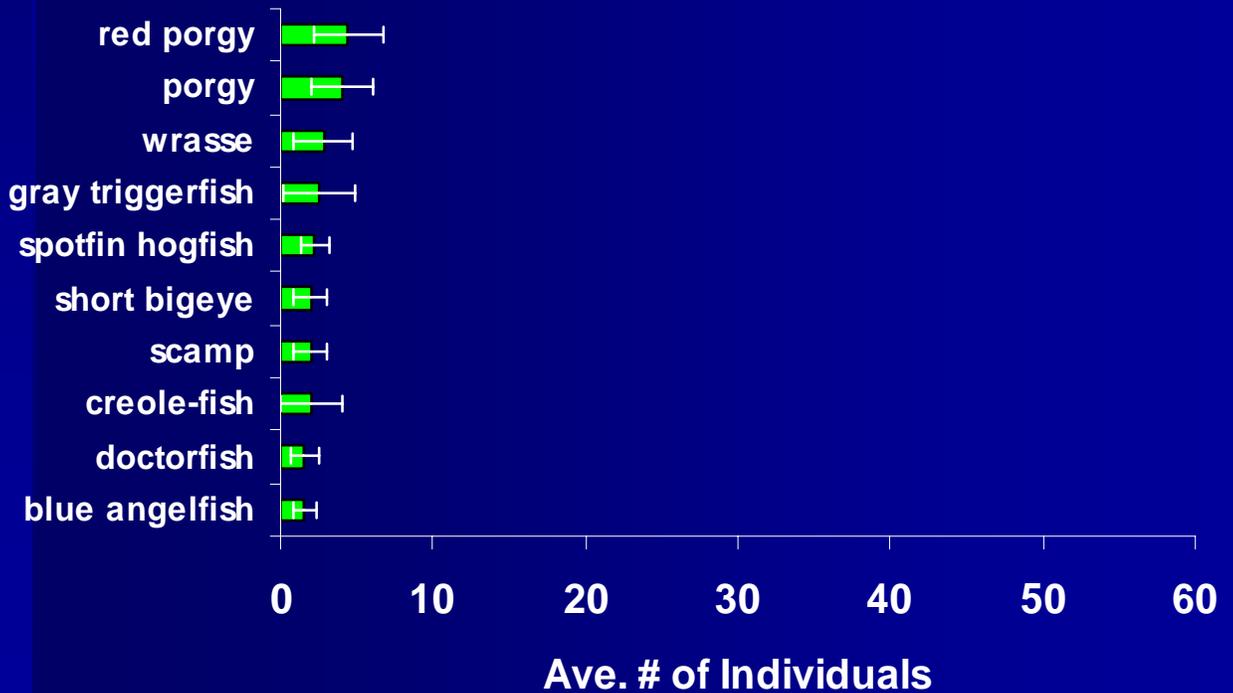
ED-OUT



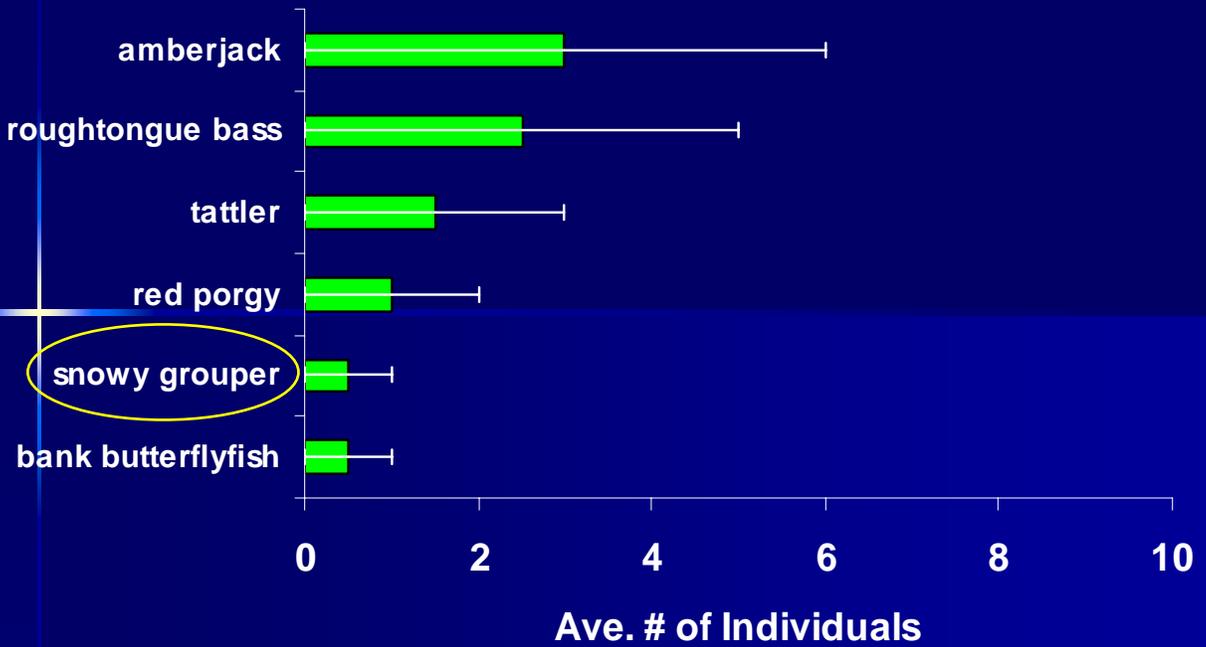
SC-IN



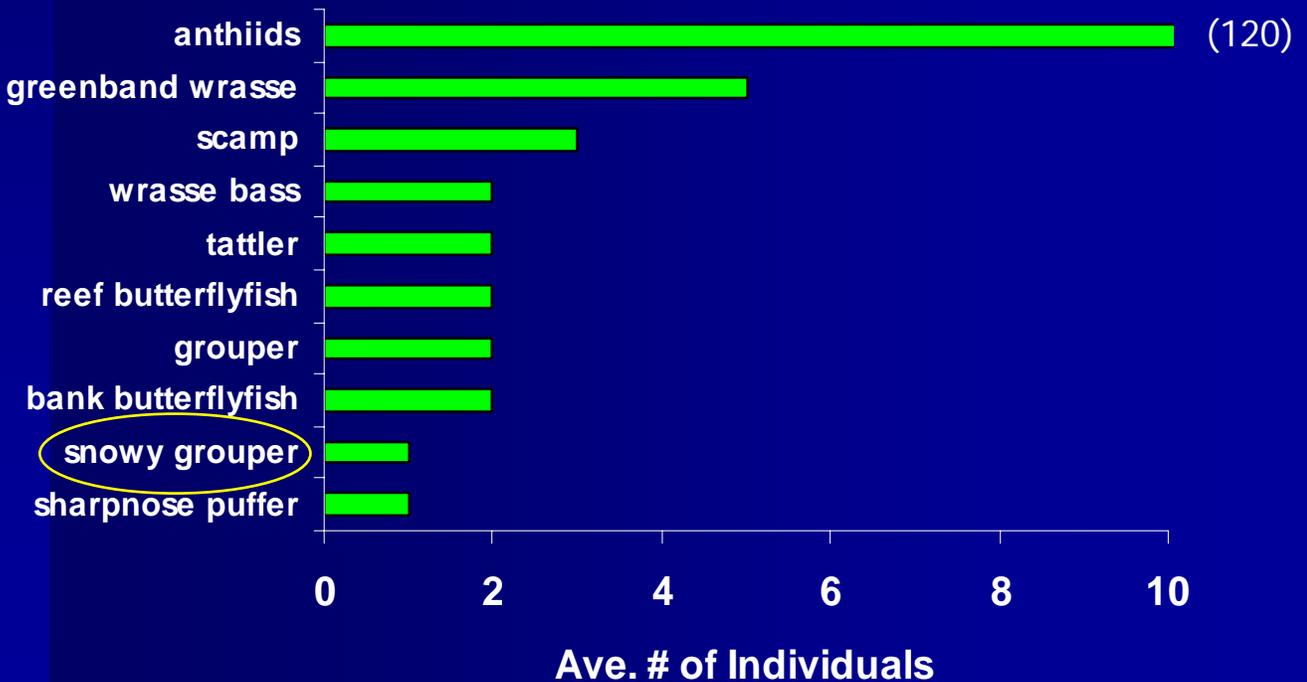
SC-OUT



NC-IN



NC-OUT



Summary

- Observed 4 out of 7 target species. These include: snowy grouper, warsaw grouper, speckled hind, and blueline tilefish.
- Depth/habitat of ROV dives may explain why we did not see tilefish, misty grouper, or yellowedge grouper.
- Grouper and lionfish densities increase with increasing habitat complexity.
- Scamp was the most abundant grouper.
- Lionfish displayed densities comparable to or higher than scamp for the majority of MPAs.

Summary

- Unique opportunity to obtain pre-closure data (habitat, target species densities, species composition).
- Will continue research after fishing pressure is reduced to compare population levels (as long as funding continues).

Summary

Based upon similar work in the Gulf of Mexico, the two factors most likely to affect the success of shelf edge MPAs targeting reef species with strong site fidelity are:

1. selection of locations containing sufficient amounts of suitable habitat
2. a vigilant enforcement program.

Acknowledgments

- Funding provided by SEFSC (2004) and Coral Reef Conservation Program (2005-2007).
- NOAA Ship R/V DELAWARE II
NASA Ship M/V FREEDOM STAR.
- Marta Ribera, Steve Matthews, Lance Horn, Craig Bussell, Kevin Joy, Chris Palmer, John Brusher, Michelle Satterwhite, and LT Jeff Taylor.

