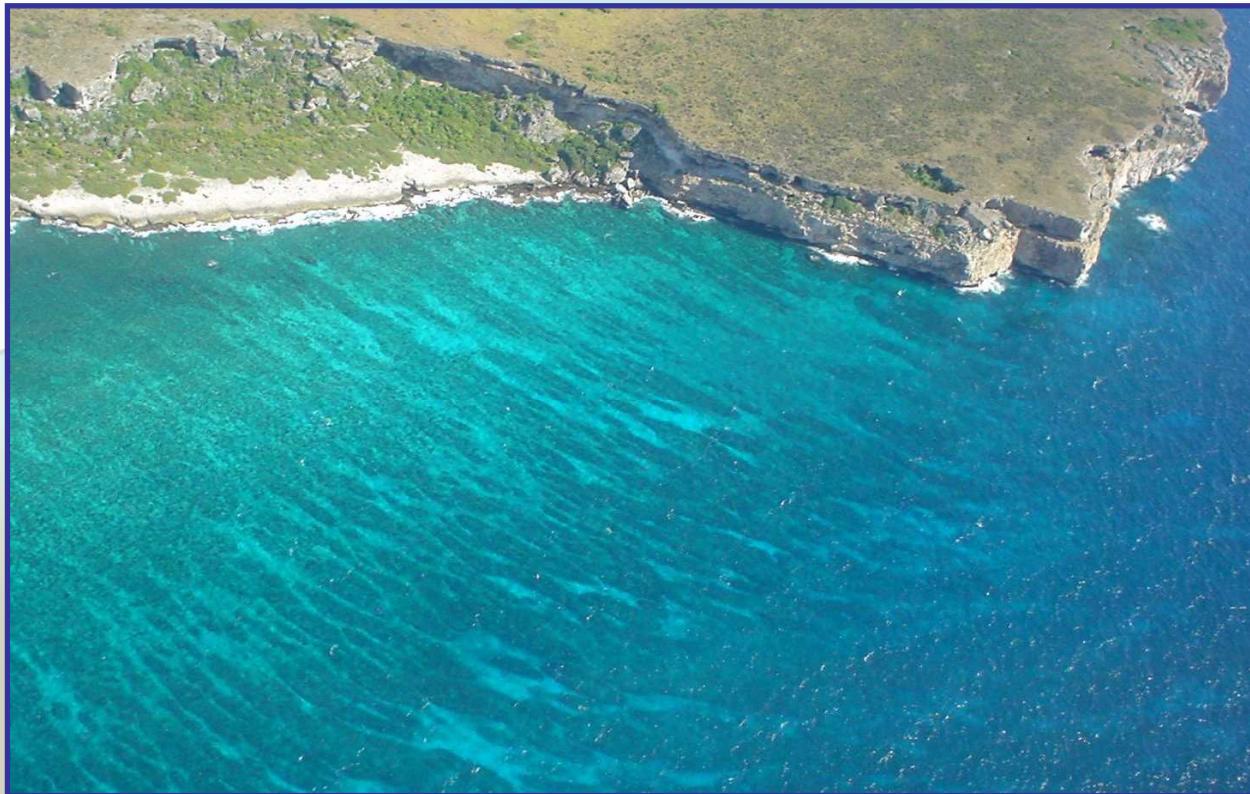


# FISH ASSEMBLAGE CHARACTERIZATION AND HABITAT CONNECTIVITY FOR MPA DESIGN CRITERIA



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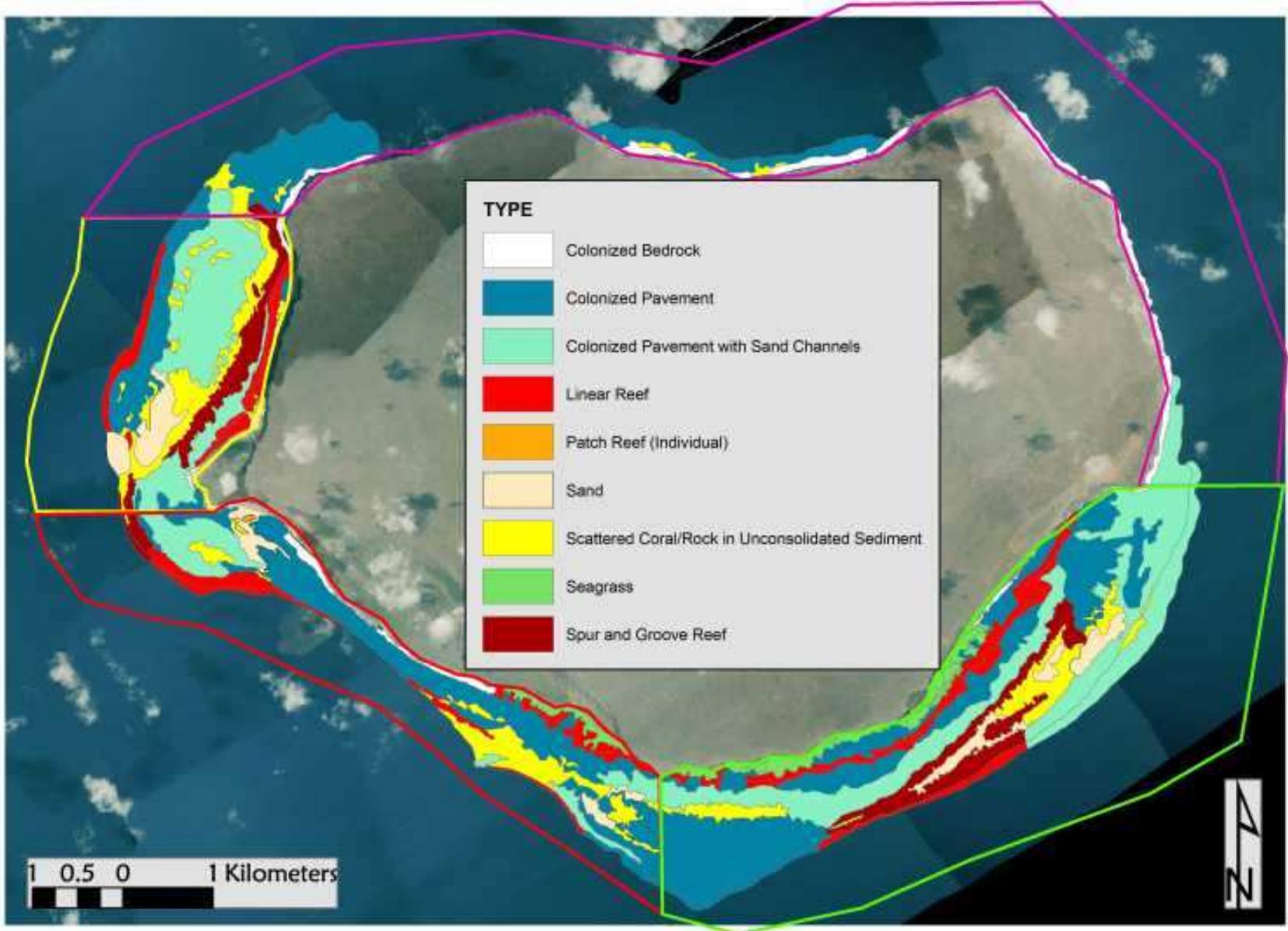
Department of Marine Sciences, University of Puerto Rico  
Mayagüez, PR 00681

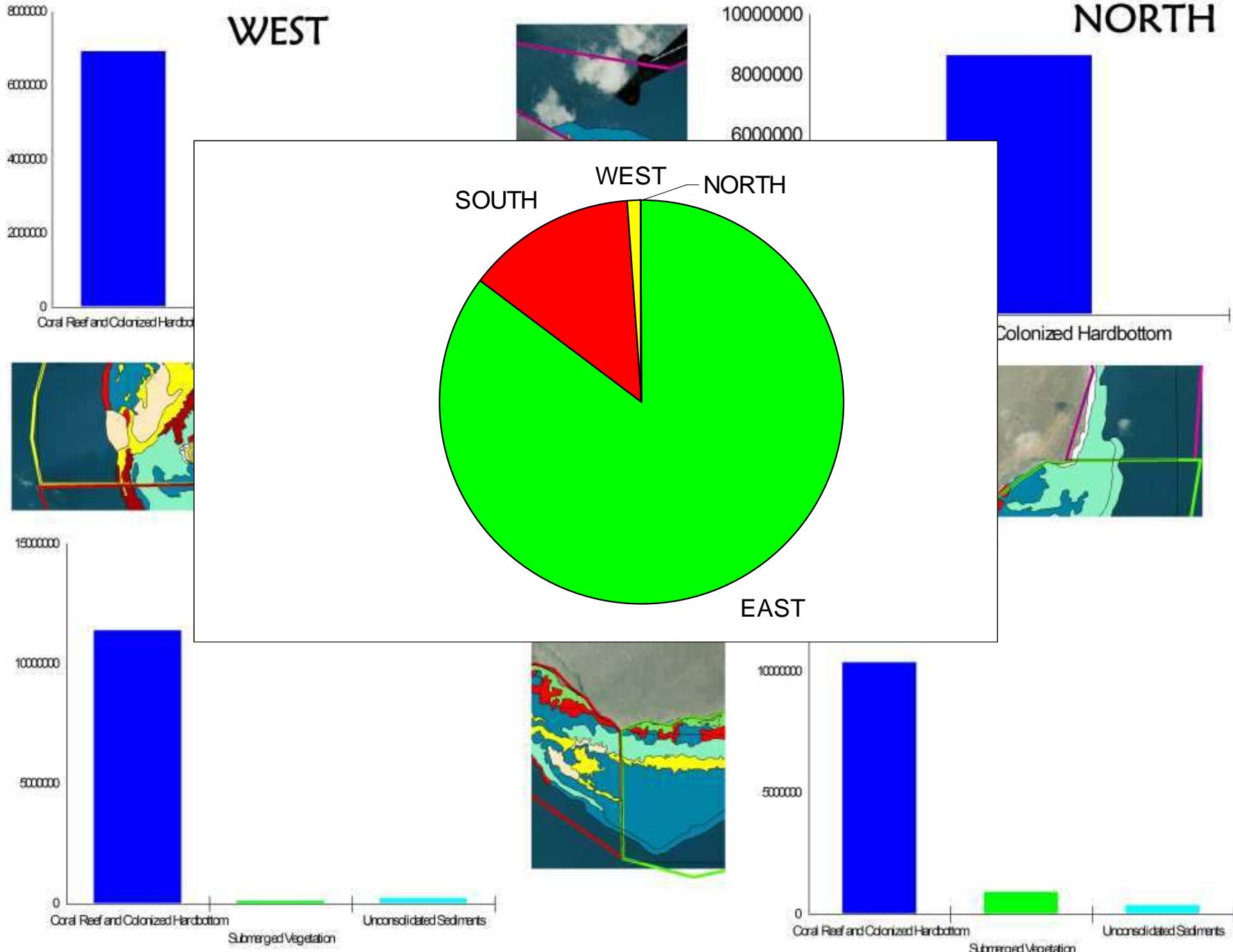
# Aims of this study

- Determine the distribution of shallow (<25 m) benthic habitats at Mona Island Natural Reserve (MINR)
- Describe the coral reef fish community of MINR
- Elucidate how habitats structure the reef fish community
  - Determine differences in the abundance of reef fishes by:
    - Stratum
    - Habitat type
    - Habitat patch size
    - Distance from habitat patches (Habitat Connectivity)
- Identify habitats critical for the completion of ontogenetic migrations of important fish species
- Provide a spatially explicit baseline for monitoring marine reserve effectiveness

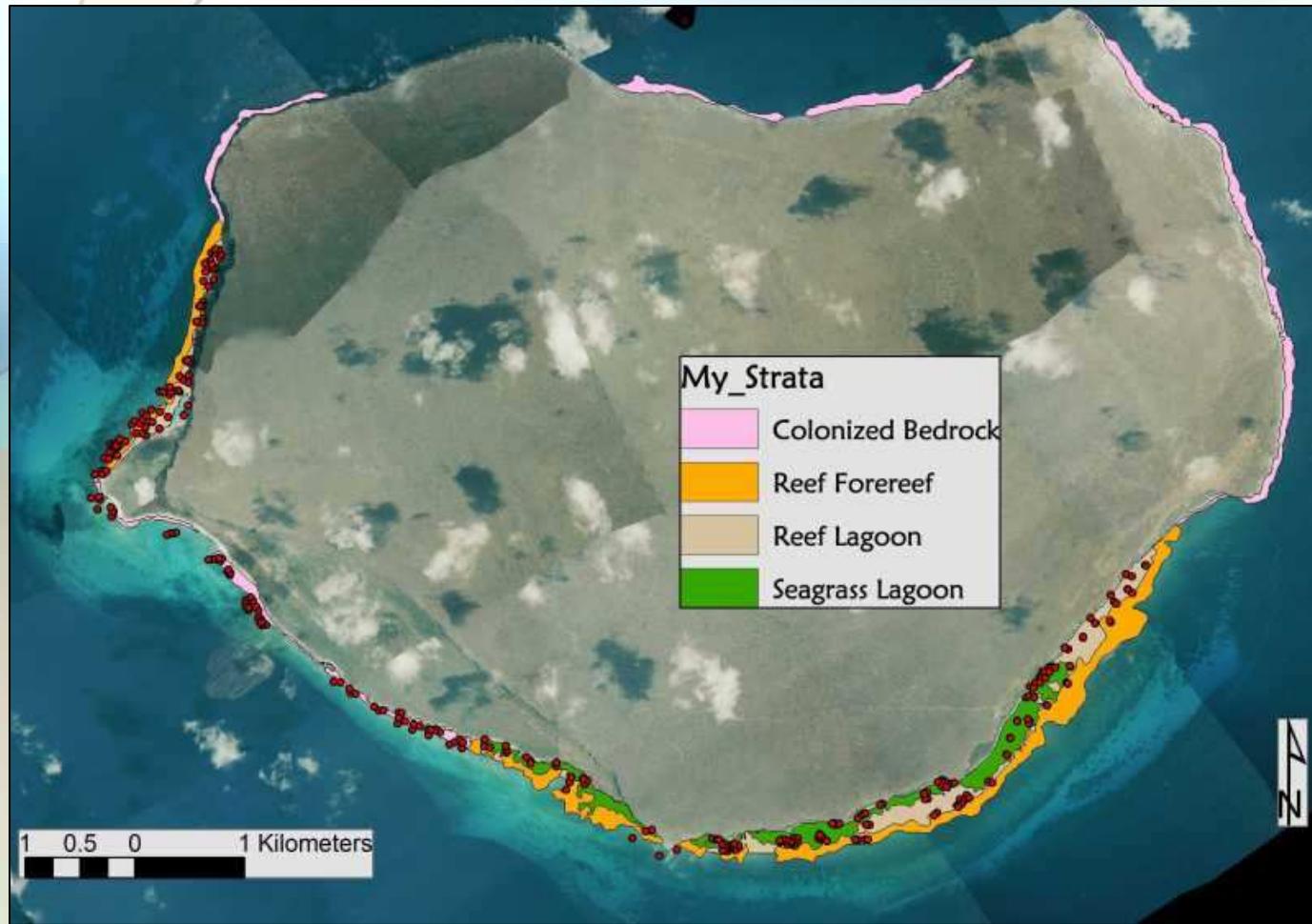
# STUDY SITE







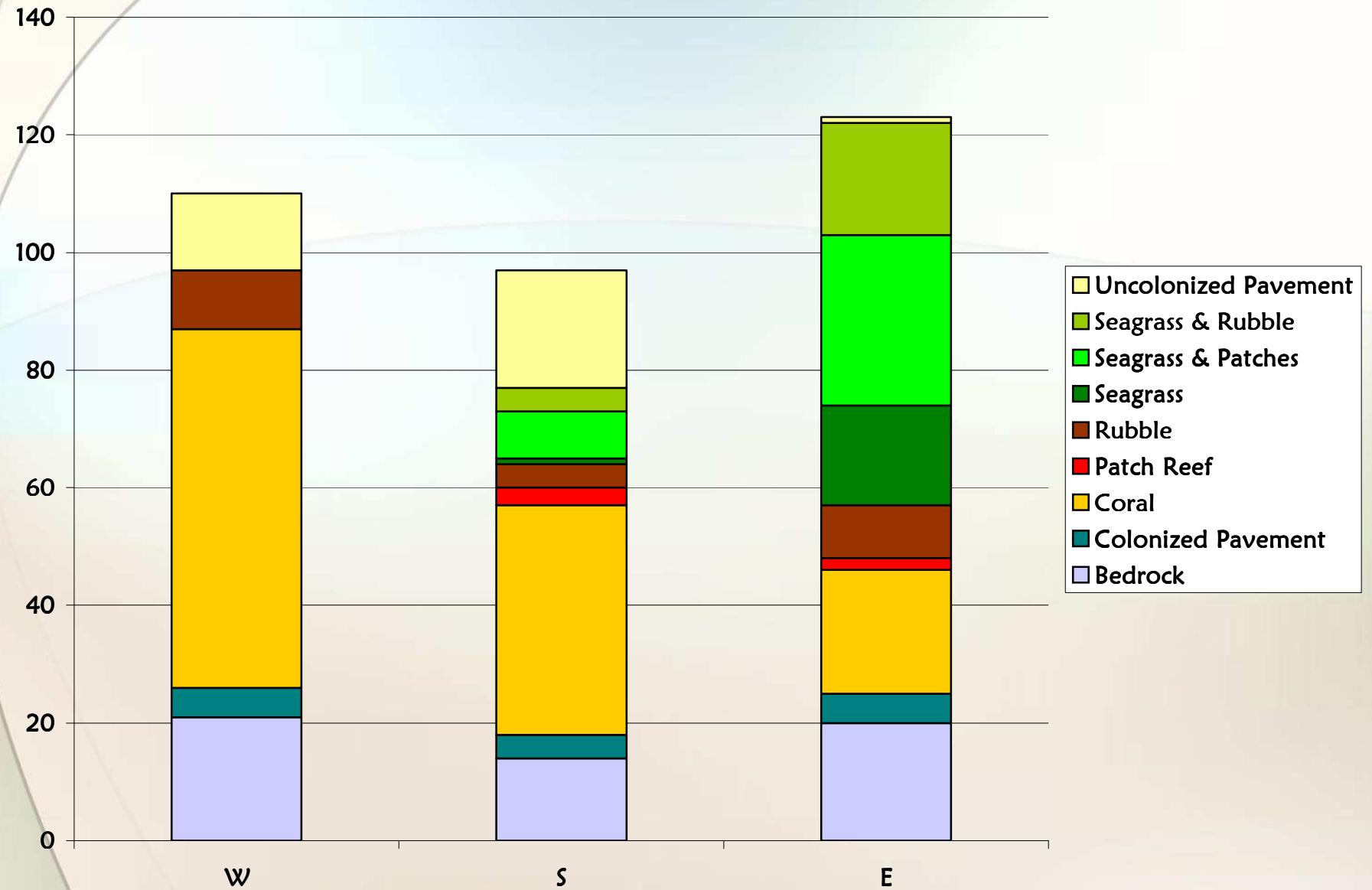
# Preliminary Results



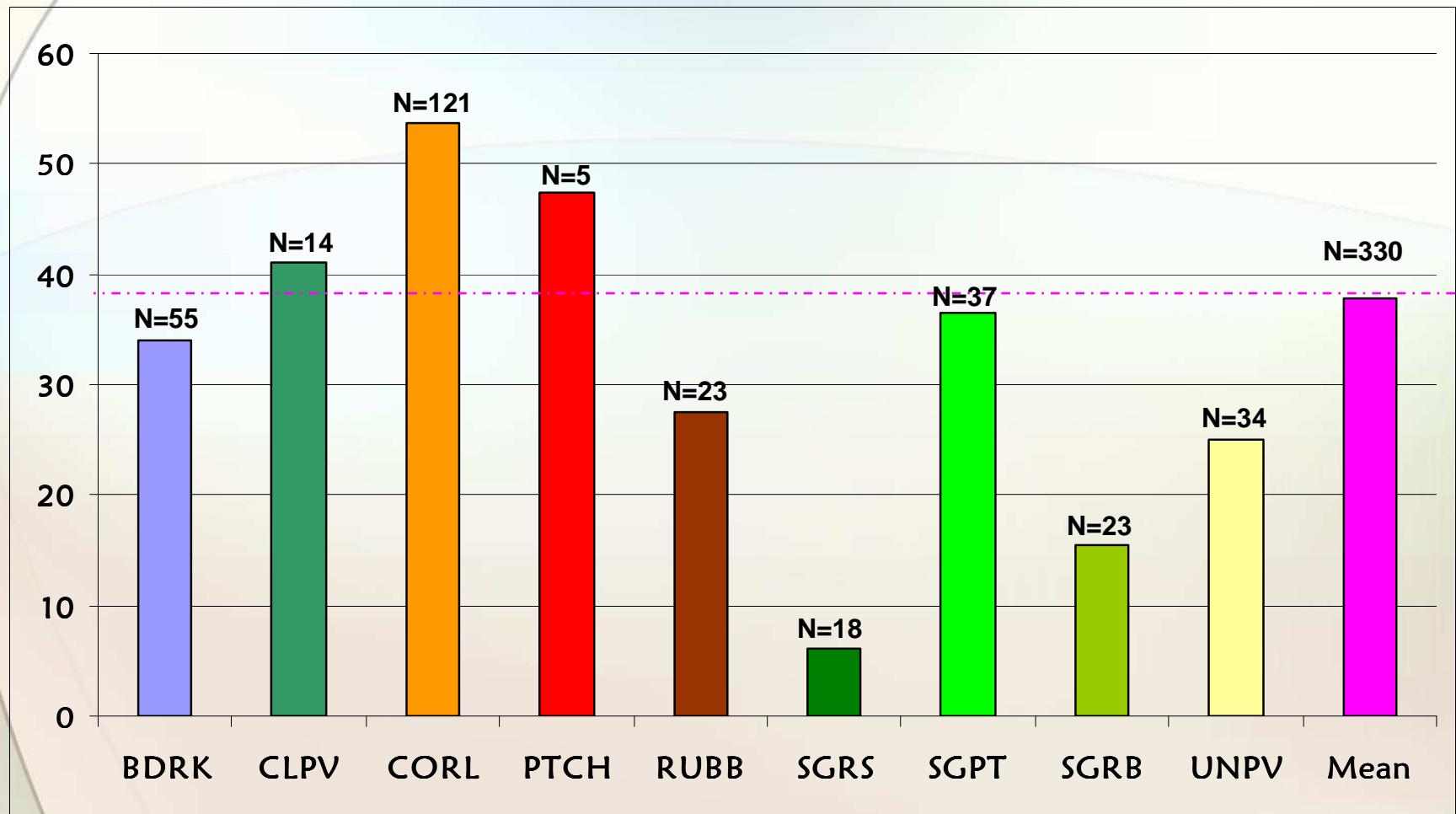
## Phase 1 Field Surveys

- o July 20 to August 3
- o 330 transects
- o Depths less than 5 m
- o Snorkeling
- o East, South and West strata
- o Sampled all habitats present
- o Estimated FL (cm) for selected species

## Number of transects per habitat type in shallow (<5 m) strata



Mean density (fish/60m<sup>2</sup>) in different habitats, N=number of transects



# Top Ten Abundance List

Total number of fish: 12,537

Families:

## 1. Acanthuridae

- *Acanthurus bahianus*
- *Acanthurus coeruleus*

## 2. Haemulidae

- *Haemulon carbonarium*
- *Haemulon chrysargyreum*
- *Haemulon flavolineatum*

## 3. Scaridae

- *Sparisoma rubripinne*

## 4. Carangidae

- *Carangoides ruber*

## 5. Balistidae

- *Melichthys niger*

## 6. Lutjanidae

- *Lutjanus mahogoni*

## 7. Kyphosidae

- *Kyphosus sectator*

## 8. Serranidae

## 9. Chaetodontidae

## 10. Monacanthidae



Randall  
*Haemulon carbonarium*



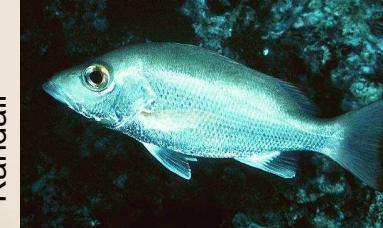
Floeter  
*Haemulon chrysargyreum*



Marsden  
*Haemulon flavolineatum*



Pattner  
*Carangoides ruber*



Randall  
*Lutjanus mahogoni*



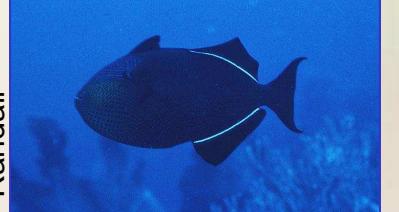
Randall  
*Acanthurus bahianus*



Randall  
*Acanthurus coeruleus*



Randall  
*Sparisoma rubripinne*

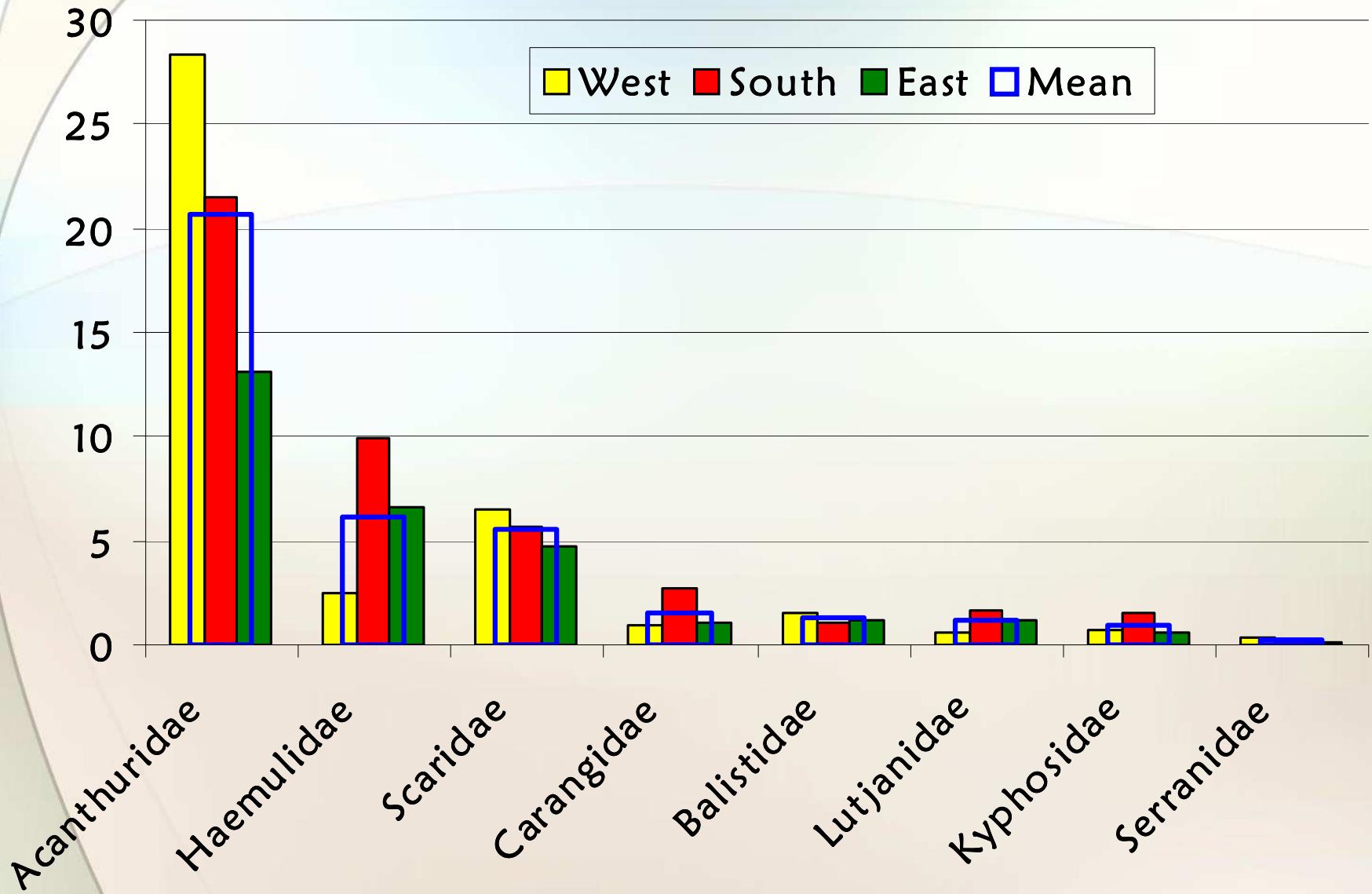


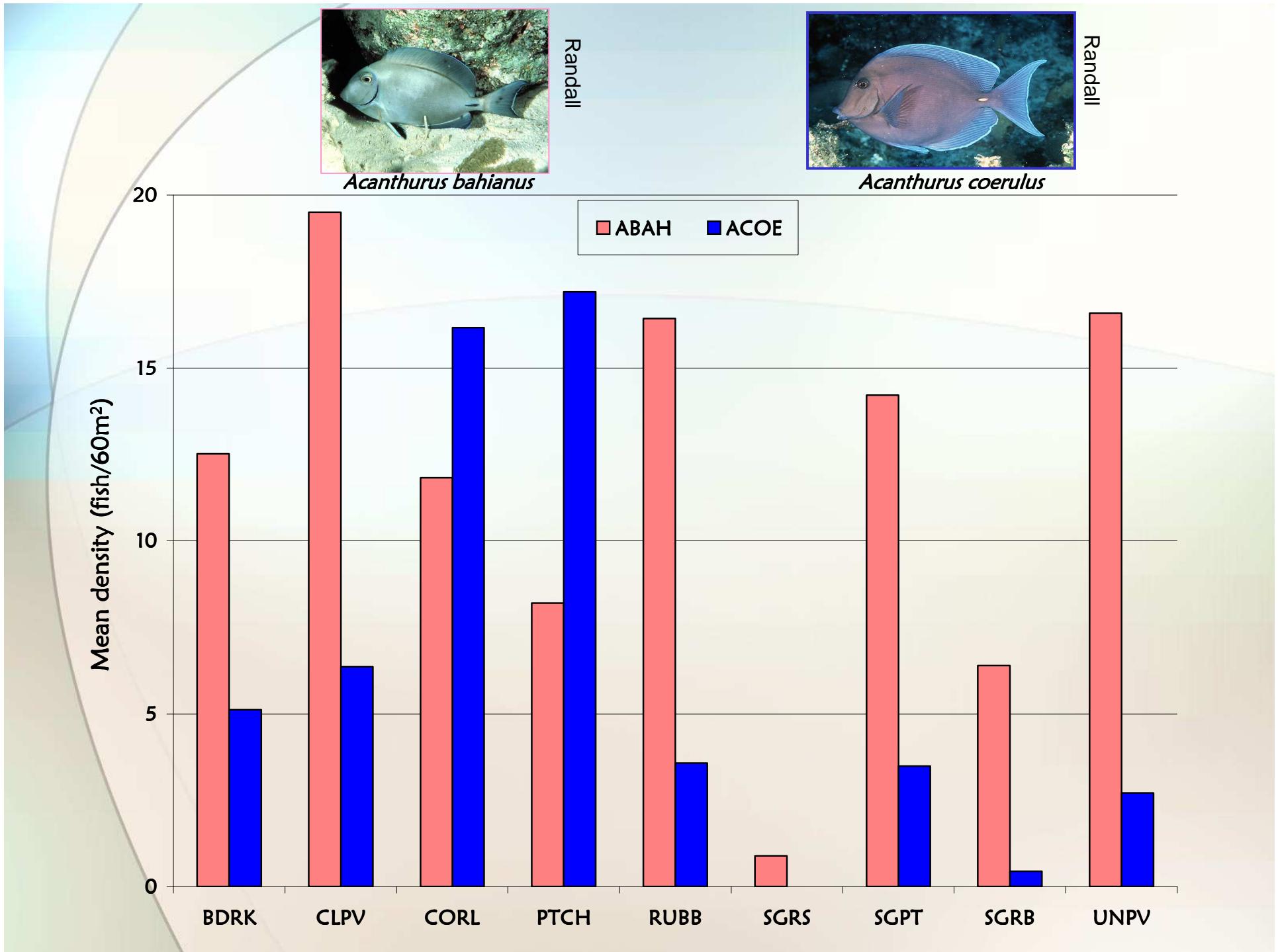
Randall  
*Melichthys niger*

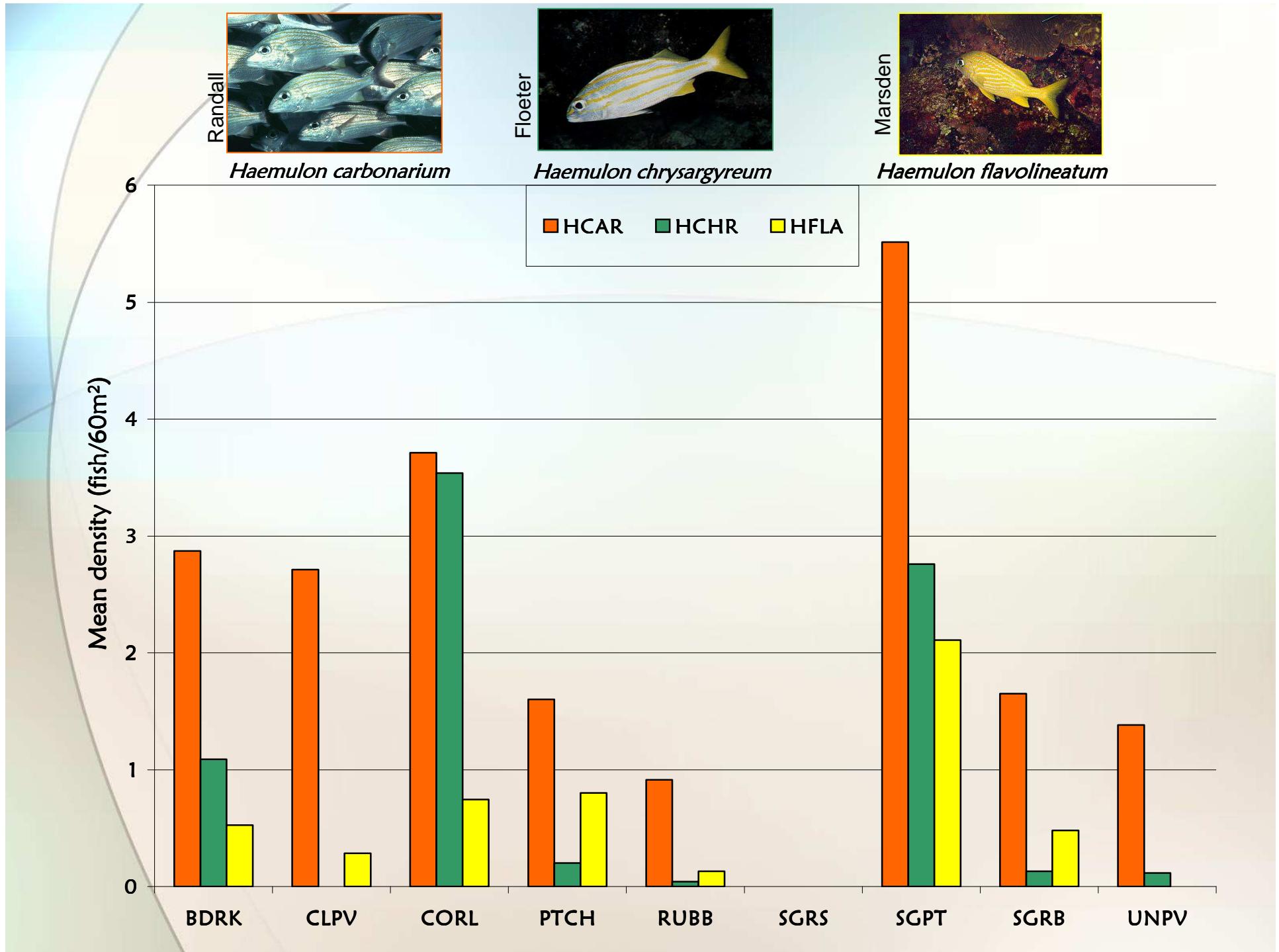


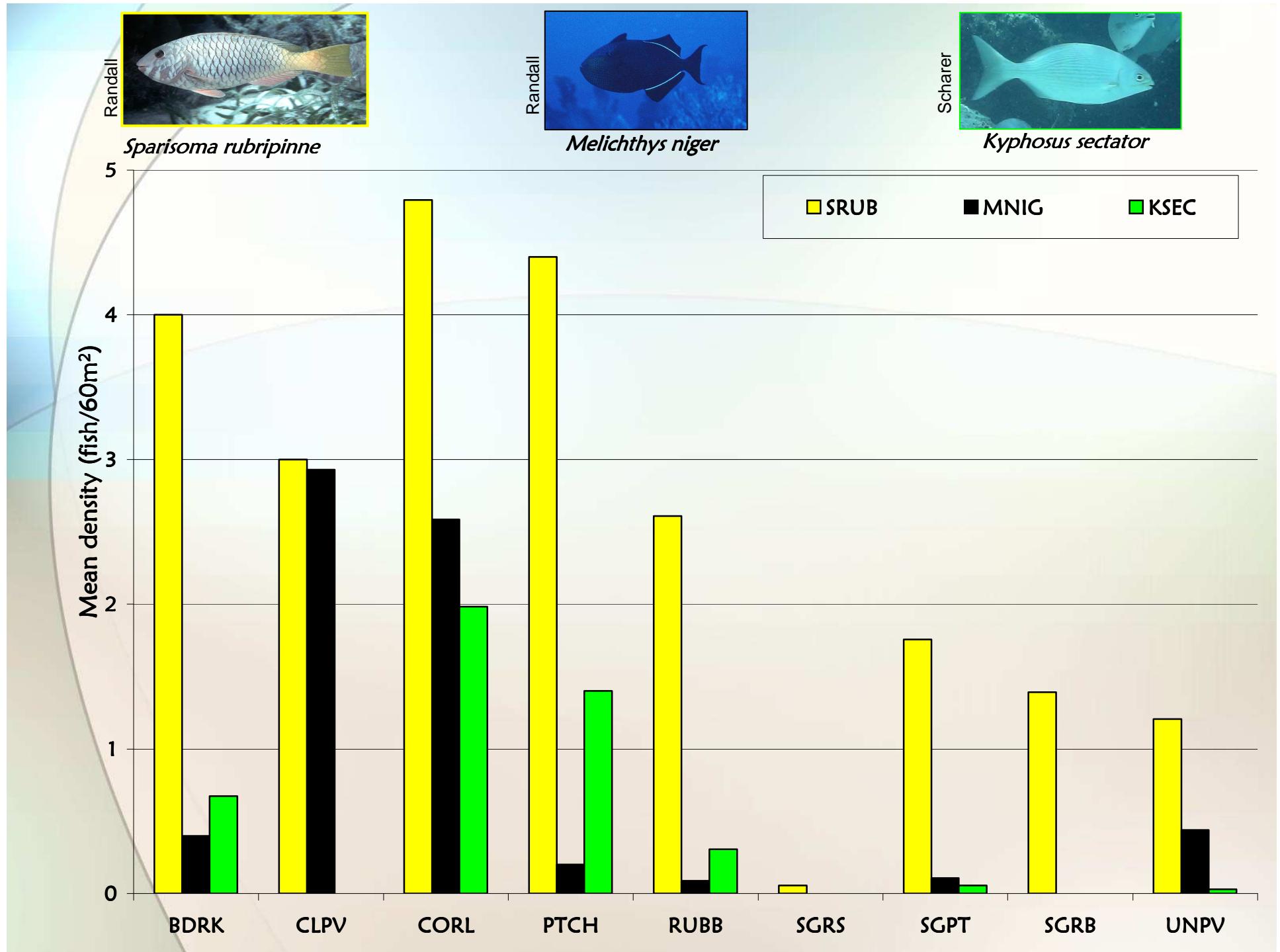
Scharer  
*Kyphosus sectator*

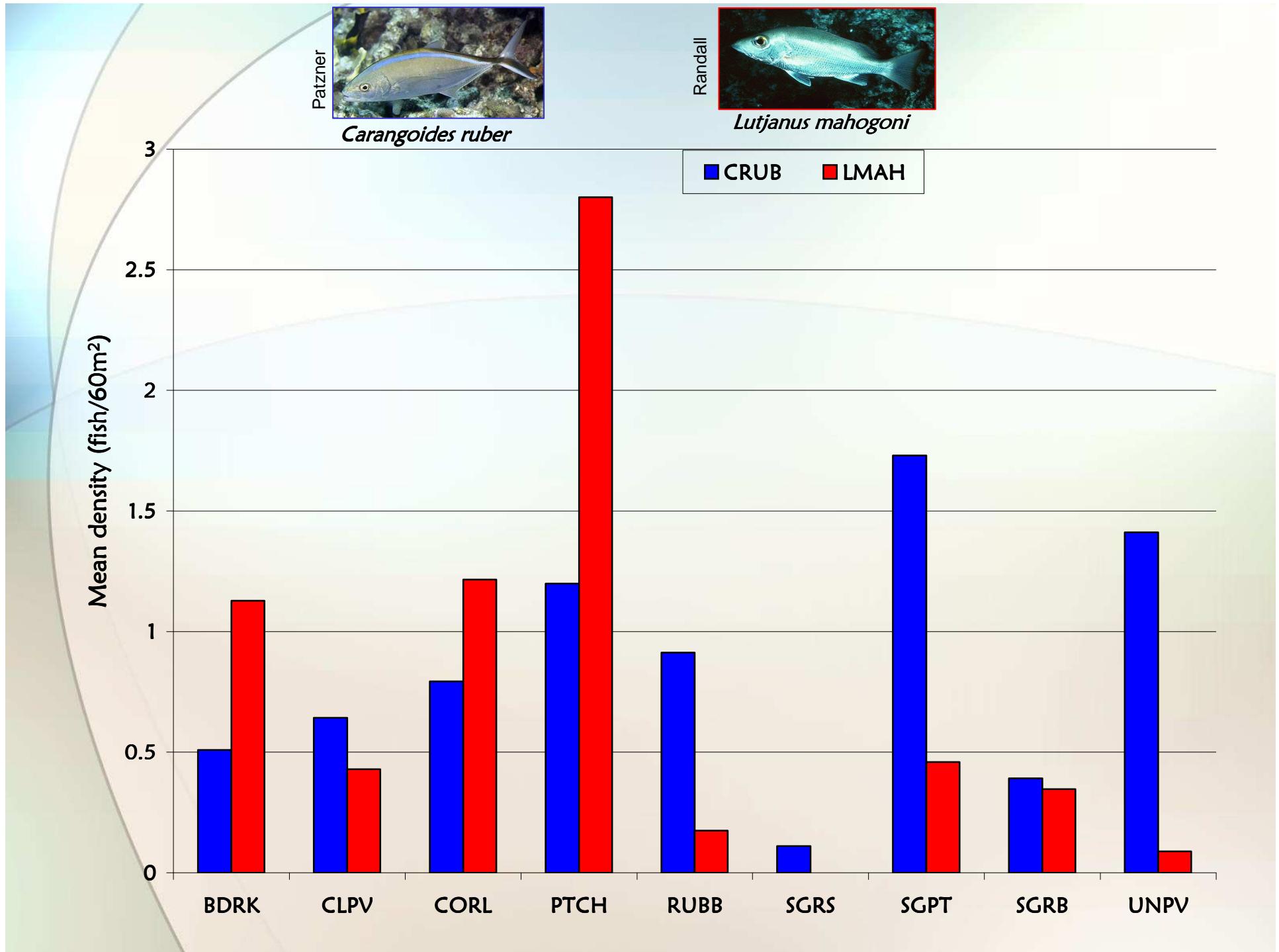
Mean density (fish/60m<sup>2</sup>) pooled for top 8 families











# Ontogenetic migrations

Nemeth



Nemeth



Scharer



Scharer

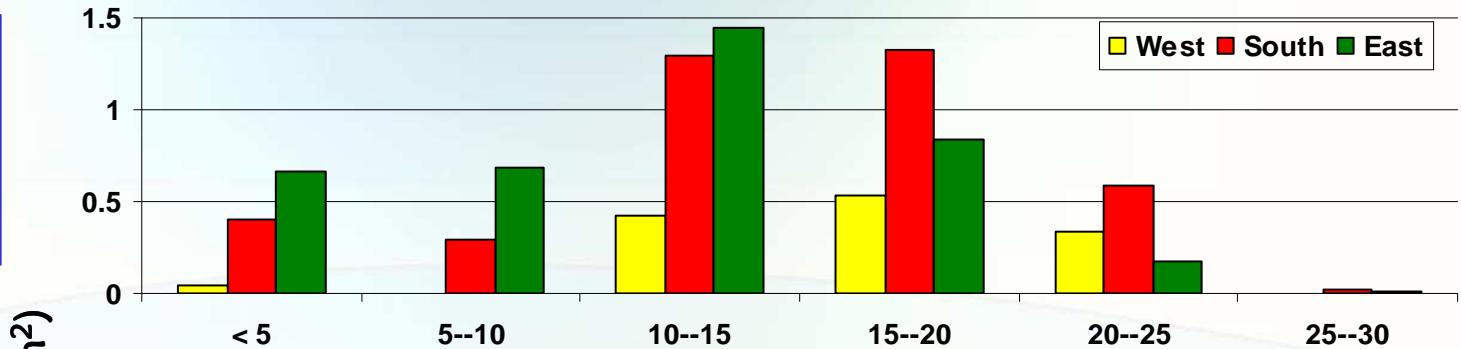


# Size classes by strata

Randall



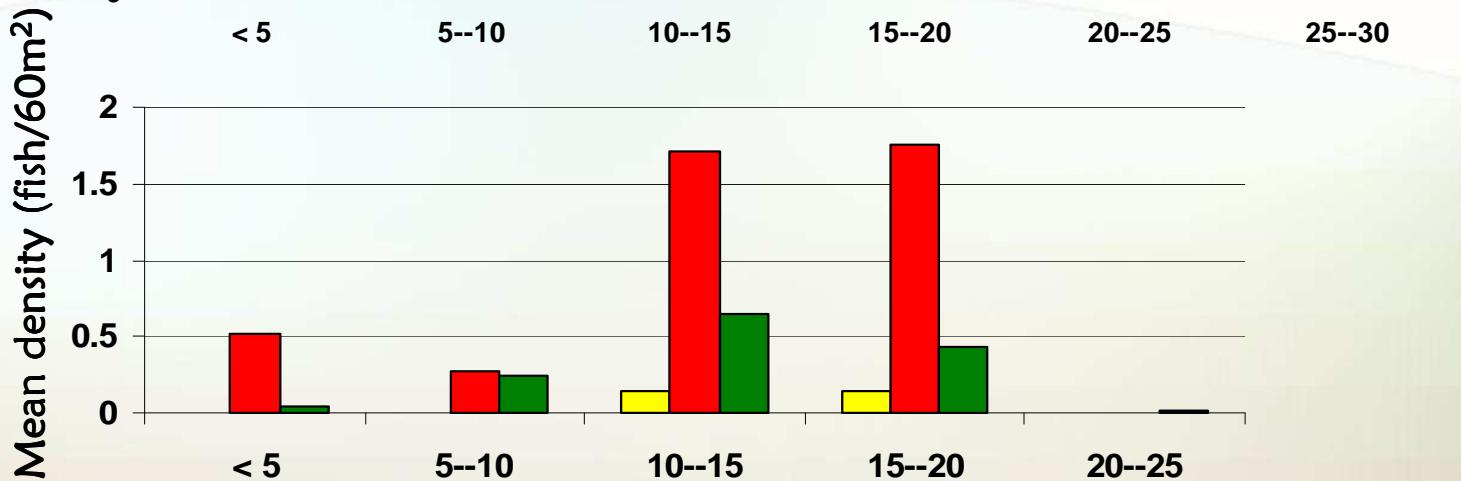
*Haemulon carbonarium*



Floeter



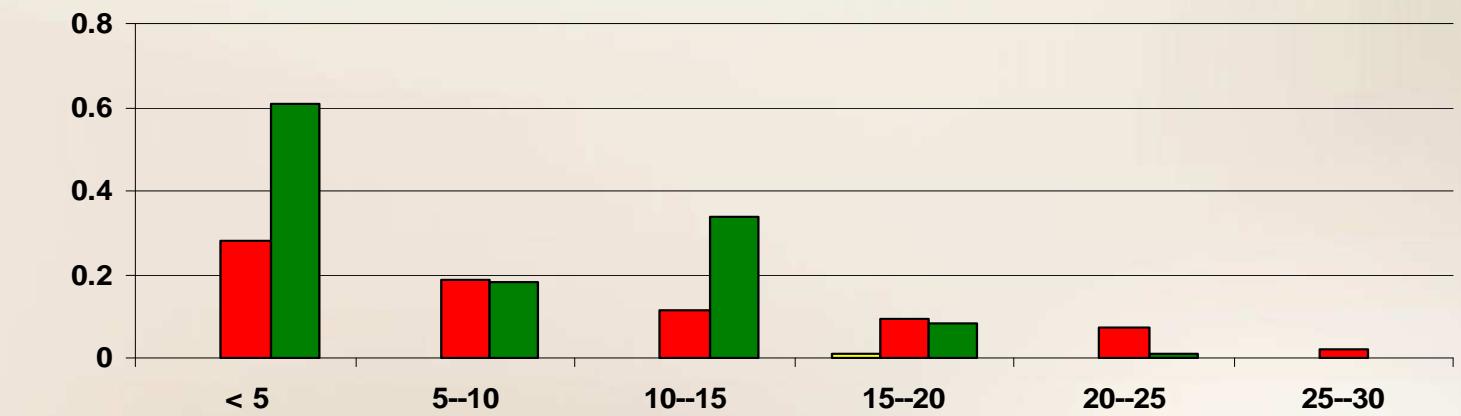
*Haemulon chrysargyreum*



Randall



*Haemulon parra*

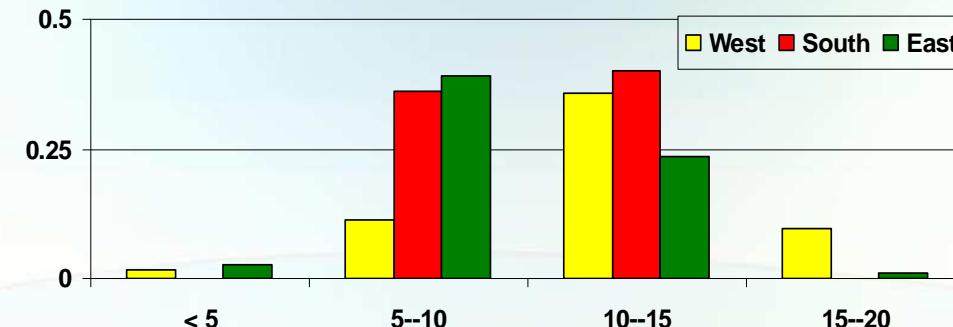


# Size classes by strata

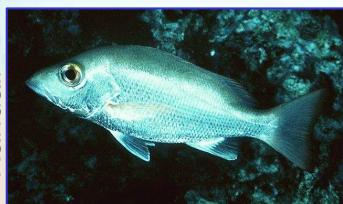
Marsden



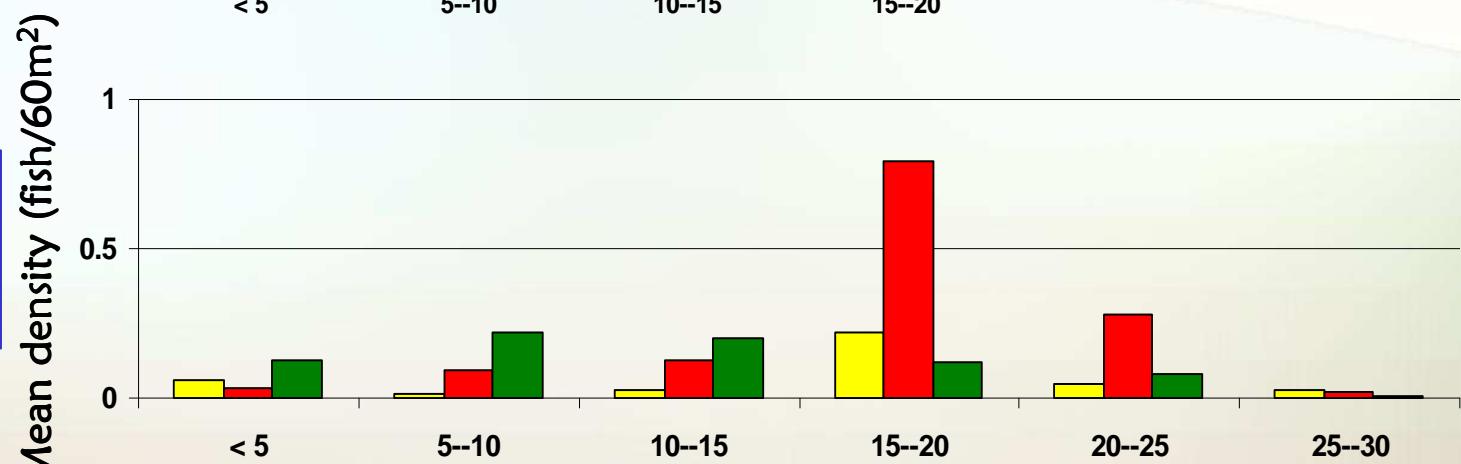
*Haemulon flavolineatum*



Randall



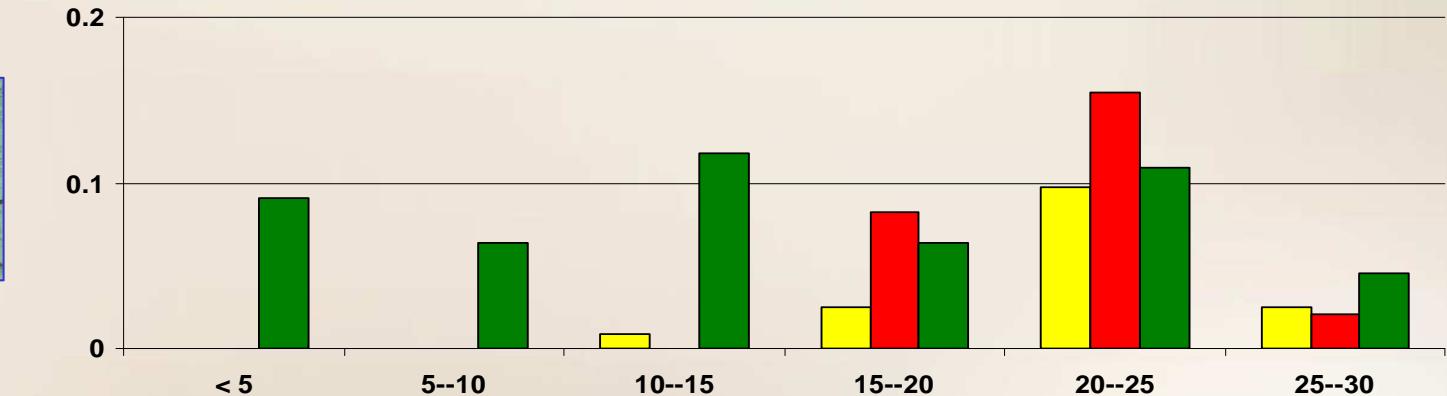
*Lutjanus mahogoni*



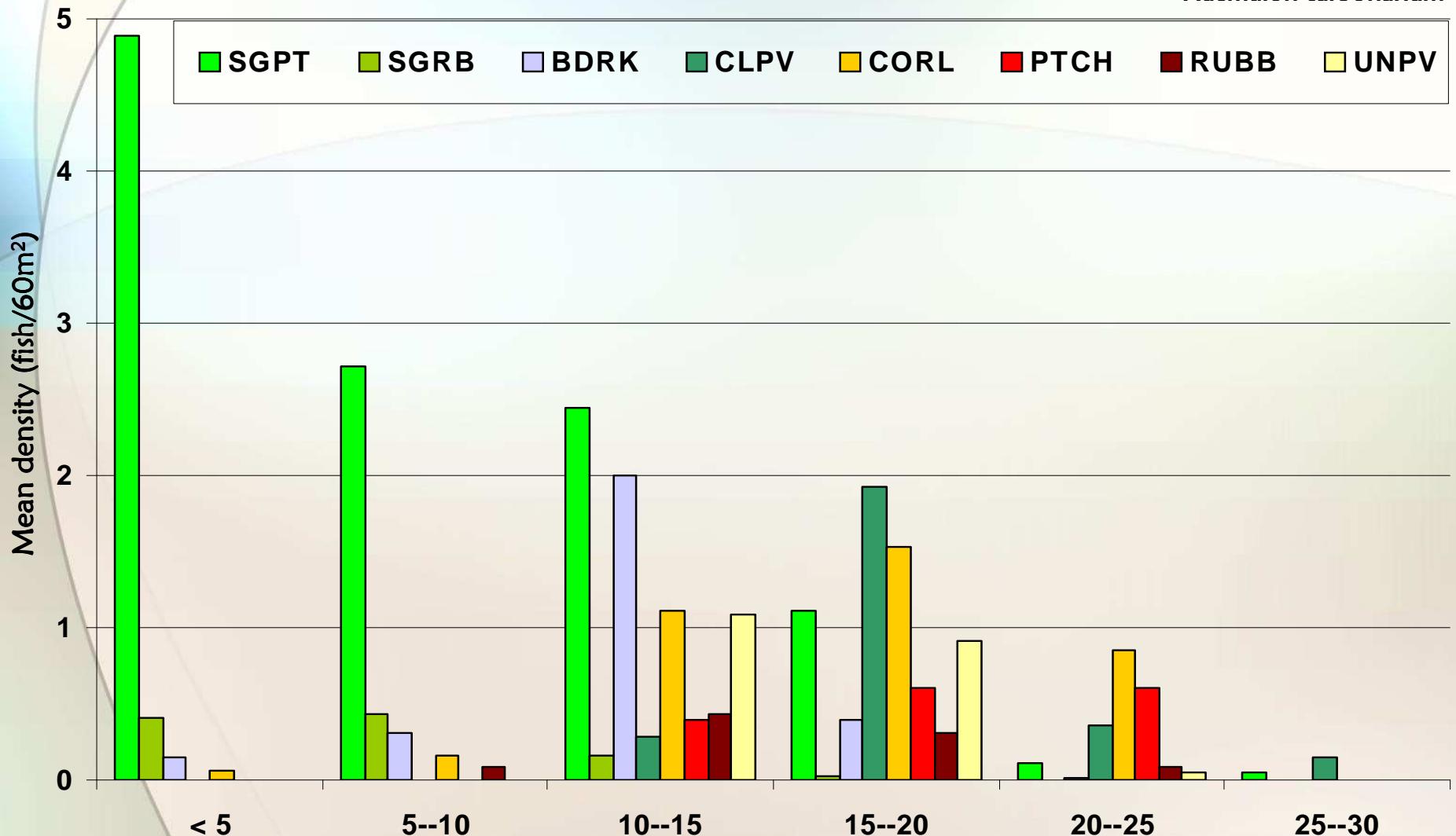
Scharer



*Lutjanus apodus*



# Size classes by habitat type



# Future Work

- Surveys of deeper habitats (5 – 25 m)
- GIS analysis of habitats
- Examine influence of connectivity between shallow and deep habitats



## Acknowledgements:

- Caribbean Coral Reef Institute
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- Michael Nemeth

