Habitat Preferences of Redband Parrotfish (*Sparisoma viride*) and Stoplight Parrotfish, (*Sparisoma aurofrenatum*) as Determined by Fishery-Independent Visual Census Surveys in the Florida Keys

Alison Johnson, Alejandro Acosta and Marie Tellier

Parrotfish are found in all of the worlds tropical and sub-tropical oceans.

Parrotfish, so called for their tightly packed teeth which form a parrot-like beak are important herbivores to coral reefs. They use their specialized beak to rasp algae from dead coral and other substrates thus contributing to bioerosion and controlling algae. Stoplight and redband parrotfish also consume seagrass such as *Thalassia testudinum* and *Halimeda opuntia*, and are consequently observed feeding in a wide variety of habitats from coral reefs to seagrass beds. In light of these dimorphic feeding habits, this study asks two questions:

1) In which habitat are you likely to find stoplight and redband parrotfish?

2) When present, which habitats have the greatest abundance of stoplight and redband parrotfish?

Studies have shown that blue parrotfish (*Scarus coeruleus*), demonstrate an ontogenetic feeding shift from algae to sand as they progress from juvenile to adult. We are interested to see if the stoplight and redband parrotfish also demonstrate an ontogenetic trend:

3) Does ontogeny affect stoplight and redband parrotfish abundance in these habitats?

Two commonly observed parrotfish were studied.

Stoplight Parrotfish Juvenile

Stoplight Parrotfish Female

Stoplight Parrotfish Male

Juvenile Redband Parrotfish

Redband Parrotfish Female

Redband Parrotfish Male

This study involved a collaboration between four agencies.

The Florida Fish and Wildlife Commission conducted fish population surveys during 2008 and 2009 under a collaborative arrangement with the National Oceanographic and Atmospheric Association, National Parks Service and the University of Miami's Rosenstiel School of Marine and Atmospheric Science to evaluate abundance, spatial distribution, and size structure of reef fishes in the Florida Keys. The surveys are carried out by SCUBA divers who collect information on fish abundance as well as other parameters including habitat type.

Stoplight and redband parrotfish were identified, enumerated and visually sized to the nearest cm. ANOVA's were run on the entire dataset to obtain abundance and presence / absence values for each species. The datasets were then subdivided into juveniles and adults and ANCOVA's were run using "size" as the covariate. For stoplight parrotfish, all fish 15 cm and over were considered adults, while juveniles were less than 15 cm. Redband parrotfish 10 cm and over were considered adults and under 10 cm were considered as juveniles.

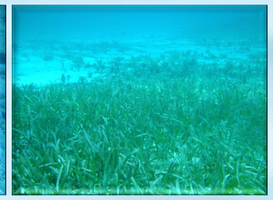
Six distinct habitat types were surveyed, but Artificial Reef was removed from analysis due to low sample sizes.

Continuous Reef (CR)

Spur and Groove Reef (SG)

Isolated Reef (IR)

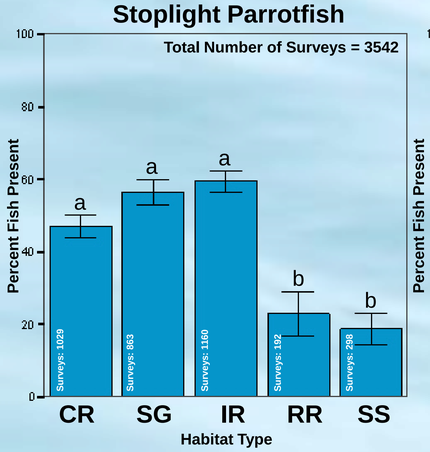
Reef Rubble (RR)

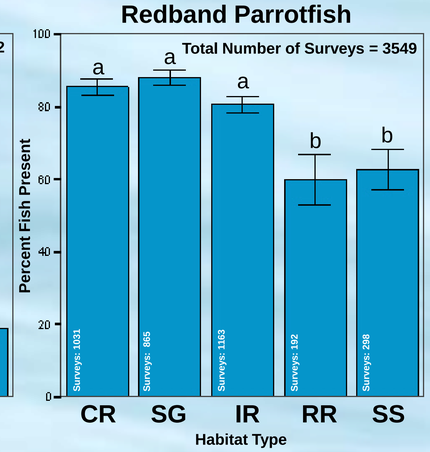


Sand and Seagrass Matrix (SS)

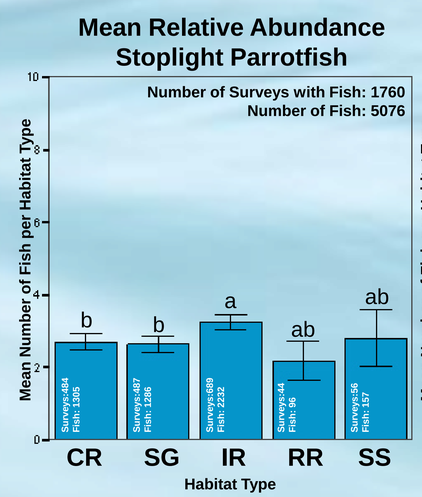
Artificial Reef (AR)

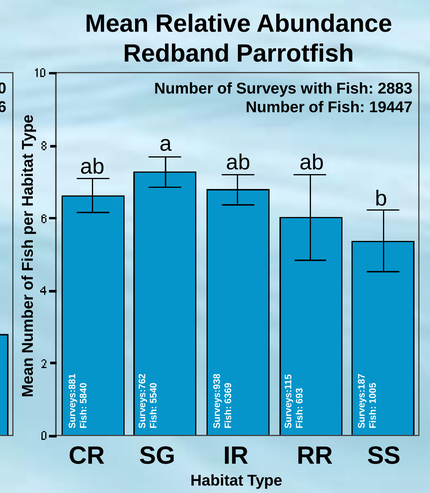
Stoplight and redband parrotfish were more likely to be observed on continuous, spur & groove and isolated reef and less likely to be found on reef rubble and seagrass.



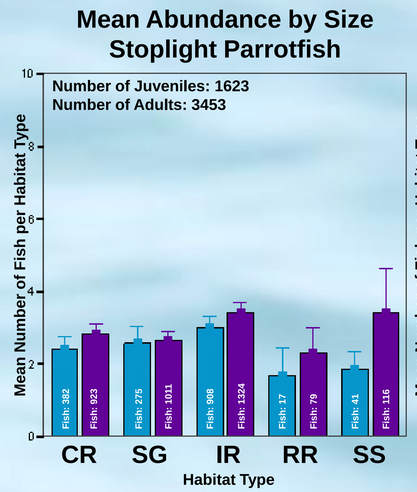


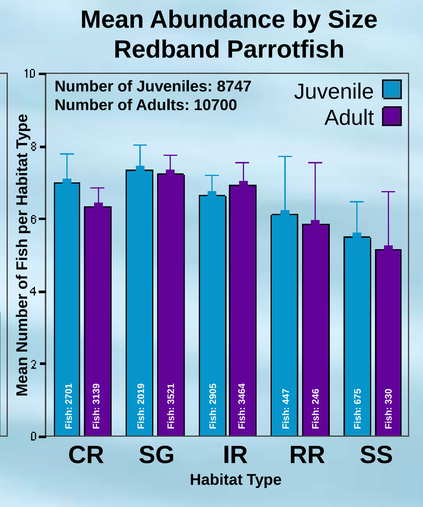
When present, stoplight and redband parrotfish were equally abundant across all habitat types.





No ontogenetic trends in habitat preference were observed for either the stoplight or redband parrotfish.





Parrotfish do exhibit habitat preferences but size doesn't matter!

1) Stoplight and redband parrotfish were more likely to be observed on reef rather than non-reef habitat.

2) Stoplight parrotfish and redband parrotfish were equally abundant on all habitat types. Although, statistically, stoplight parrotfish were more abundant on isolated than contiguous and spur and groove reef whereas redband parrotfish were more abundant on spur and groove reef than sand and seagrass. This is likely due to large sample sizes.

3) Ontogeny did not significantly impact habitat preference.

How do our results compare with other studies?

Stomach content analysis for stoplight and redband parrotfish has confirmed that diet consists primarily of algae and to a lesser extent, seagrass (Munro 1983). Thus, our observations agree with that finding.

Although ontogenetic feeding shifts have been observed for blue and stoplight parrotfish, this study did not confirm these trends (Overholtzer & Motta 1999; Bruggemann 1994a).

Literature and photographs were obtained from the following sources:

Bruggemann, J. 1994. Comparative analysis of foraging and habitat use by the sympatric Caribbean parrotfish Scarus vetula and Sparisoma viride (Scaridae).. Marine Ecology, 112: 51-66.

Bruggemann JH, van Oppen MJH, Breeman AM (1994a) Foraging by the stoplight parrotfish Sparisoma viride. I. Food selection in different, socially determined habitats. Mar Ecol Prog Ser 106:41-55.

Munro, J. L. 1983. Caribbean Coral Reef Fishery Resources. ICLARM, Manila, Philippines, 276 pp.

Neu, C.W., C.R. Byers, and J.M. Peek. 1974. A technique for analysis of utilization-availability data. Journal of Wildlife Management 38:541–545.

Overholtzer KL, Motta PJ (1999) Comparative resource use by juvenile parrotfishes in the Florida Keys. Mar Ecol Prog Ser 177:177–187.

Parrotfish photographs by Reefnet (reefnet.ca).

Habitat photographs by Alison Johnson.