Size, Composition, and Spatial Structure of the Annual Spawning Aggregation of the Red Hind Grouper

DOUGLAS Y. SHAPIRO[1] AND YVONNE SADOVY[2]
[1]*Department of Marine Sciences*
University of Puerto Rico
Mayaguez, PR 00709
[2]*Fisheries Research Laboratory*
P.O. Box 3665
Mayaguez, PR 00709

ABSTRACT

The red hind, *Epinephelus guttatus*, spawns during the week preceding full moon each January at traditional aggregation sites along the southwest coast of Puerto Rico. Aggregations were examined over a five-year period. The horizontal dimensions and density of the aggregation were measured on successive days by divers stretching a measuring tape over the array of fish and by counting numbers of fish within a large, rectangular grid laid over the site. Sex ratios were estimated both by spearing all individuals encountered over a small portion of the aggregation and by sexing a large sample of fish caught on hook-and-line from a boat on the surface. Females significantly exceeded males in number. Within the aggregation, individuals appeared to rest on the bottom and seek shelter as small clusters of 2 – 12 fish. Spearing individuals from such clusters revealed that half of the clusters contained one male and several females; the remaining clusters contained no male. Spatial dispersion was estimated statistically by laying colored rocks at the site at which each fish was first seen for all fish within a large grid. Different colors were used for rocks laid on successive days during one aggregation. The location of each rock was later plotted by measuring the X- and Y-distance of each rock from the nearest grid boundary. Nearest-neighbor analyses revealed that individuals were statistically significantly clumped on most days after an initial period when the aggregation was building. Although spawning was never observed, the statistical clumping and the one-male, many female structure of many visually obvious clusters suggest that males and females probably do not mate randomly within the aggregation, but mate with individuals within their cluster.