# HABITAT-DEPENDENT RECRUITMENT OF TWO TEMPERATE REEF FISHES AT MULTIPLE SPATIAL SCALES

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# ABSTRACT

The distribution and abundance of reef fishes often has been attributed to several processes that result in a measure of recruitment success. In this study, I employ a large-scale experimental reef system to examine patterns of recruitment of two rocky reef fishes, the California sheephead (*Semicossyphus pulcher*) and the blackeye goby (*Rhinogobiops nicholsii)*. The experimental system covers 3.3 km of coastline and consists of seven blocks of eight reefs, each reef 1600 $m^2$ in area. I examined three reefs per block that represented low, medium, and high percentage cover of hard substrate habitat in the fall of 2001 and 2002 for newly recruited California sheephead and blackeye goby. Among different treatments of habitat coverage, recruitment of California sheephead was significantly higher on reefs of medium coverage than for other coverages, while the blackeye goby exhibited lower recruitment on reefs of low coverage than for other coverages. Within reefs, recruitment to "edge" (ecotone) habitat was significantly lower than "inside" the reef for each species in 2001. At the smallest scale, several measures of microhabitat structure were quantified, and rugosity was important in predicting the presence of a recruit for each species at this small scale.

The densities of recruits of California sheephead corresponded to the densities of age 1+ individuals the following year, suggesting that the spatial patterns of abundance among treatments of habitat coverage may be established very early in life, and the abundance of predators does not appear to influence the patterns observed in any survey. Very low densities of recruits for each species may have led to habitat-dependent patterns of recruitment through habitat selection at settlement and density-independent mortality because of the very low densities of recruits observed here. Longer temporal studies with variable recruitment are needed to determine the importance of habitat structure relative to other processes.

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