

Measuring Fish Diversity in Healthy vs. Propeller Scarred Seagrass

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Abstract

Seagrass beds are essential for habitat function. They provide residency for juvenile fish, while acting as carbon reservoirs. The future of seagrass beds are being threatened and destroyed by commercial and recreational boat usage. This study was intended to find if fish diversity was influenced by habitat fragmentation. A camera survey was conducted to measure fish diversity in healthy seagrass beds compared to propeller scarred seagrass areas. To measure fish diversity, four quadrats mounted with four underwater cameras were utilized and deployed in two locations in Biscayne Bay, Florida. Video data was analyzed to evaluate fish diversity as a function of different statistical parameters, such as day, temperature, light intensity, and tidal fluctuations. Diversity indexes were calculated for each sampling day at each location. Data was analyzed through use of Analysis of Variance (ANOVA), as well as t-tests through Excel. A t-test between the diversity index and sampling dates per location had a p-value of 0.499, proving to be no statistical significance between the diversity index and the sampling dates at each location. A regression analysis was produced for diversity against temperature and light. All R^2 values were less than 0.500, showing no significant linear relationship between these factors for both habitats. Two Two-Factor ANOVA tests with Replications were run: one comparing habitat type with diversity, temperature and light intensity, and the second comparing sampling date and tide with diversity, temperature and light intensity. Both ANOVA tests had a p-value greater than 0.05, showing that both were not statistically different. Diversity, temperature, and light intensity had a p-value less than 0.05 for habitat types and sampling date, showing a significant difference between these parameters.