Fish Community Structure and Abundance on Texas Artificial Reefs: A Preliminary Assessment

Estructura de la Comunidad de Peces y la Abundancia de Arrecifes Artificiales de Texas: Una Evaluación Preliminar

Structure des Communautés de Poissons et L'abondance sur le Texas Récifs Artificiels : Une Évaluation Préliminaire

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EXTENDED ABSTRACT

With the exception of the southwest Florida coast, the majority of the Gulf of Mexico is devoid of large expanses of natural hard bottom. Generally, the benthic environments of this region are characterized by clay, sand, or silt material (Parker et al. 1983). This lack of complex habitat has led to a great dependence on artificial reefs by fishermen and divers and numerous studies have documented increases in fish (adult, larval and juvenile) abundance and recruitment to oil and gas platforms and other artificial structures (Simmons and Szedlmayer 2011, Gallaway et al. 2009, Dupont 2008, Lindquist 2005, Szedlmayer and Shipp 1994). The state of Texas has one of the largest Rigs-to-Reefs programs in the United States, and has reefed 140 oil and gas platforms since 1990. Despite several decades of reefing, there have been few assessments of fish populations using these artificial structures. We are currently intensively monitoring 15 offshore artificial reefs along the Texas coastal bend. These sites vary in structure and relief and include toppled platforms, partially removed platforms, concrete culverts, Liberty ships, and barges. Surveys combine the use of remotely operated vehicle (ROV), SCUBA, and vertical longlines (VLL) to quantify the abundance and diversity of fishes inhabiting these reefs. In 2012 we observed >50 fish species on ROV video, including invasive Lionfish, *Pterois volitans*, and a variety of commercially and recreationally exploited snappers, groupers, and jacks. In particular, the Lutjanid species *Lutjanus griseus* (Gray Snapper), *Lutjanus campechanus* (Red Snapper), and *Rhomboplites aurorubens* (Vermillion snapper) made up greater than 25% of the total species abundance documented on ROV (Table 1). Year 1 data also suggest that reef type may influence fish community structure and abundance patterns, although further data analysis is necessary. Catch rates for Red Snapper from VLL were not significantly different across artificial reef structure types indicating similar fish densities among these habitats. However, partially removed platforms (i.e., cutoff rigs) appear to harbor larger Red Snapper than other reef types (Figure 1). With additional data collection and analysis, reef site characteristics such as water depth, number of structures, distance to nearest reef site, and structure age will be evaluated for their effects on fish community composition. In the end, our comprehensive assessment will provide guidance for best reefing practices to promote fish biomass and diversity in the Gulf of Mexico.

KEY WORDS: Artificial reef, platforms, Red snapper, ROV, vertical longline, fish community structure

Table 1. Species that made up greater than 5% of the total abundance for 2012 ROV video surveys.

Family	Scientific Name	Common Name	Percent of Total Abundance (%)
Carangidae	*Caranx latus*	Horse-eye Jack	13.4
Lutjanidae	*Lutjanus griseus*	Gray Snapper	11.2
Carangidae	*Caranx crysos*	Blue Runner	9.9
Lutjanidae	*Rhomboplites aurorubens*	Vermillion Snapper	9.2
Carangidae	*Selene vomer*	Lookdown	8.8
Ephippidae	*Chaetodipterus faber*	Spadefish	8.5
Lutjanidae	*Lutjanus campechanus*	Red Snapper	5.7

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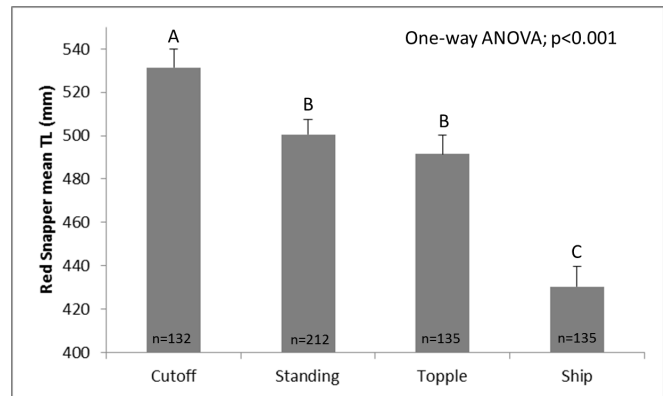
Figure 1. Size comparison of VLL-caught Red Snapper from various artificial reef types off Texas.