5.5 Donaldson Reefmaker Triangle

- Location: Donaldson Reef
- Materials: Reef modules (steel and concrete)
- Maximum Depth: 55 feet
- Reef High Point: 43 feet
- Year Created: 2005
- Monitoring Date: 12/17/2010
- Total Cost: $7,950.00 (FWC 89% and Martin County 11%)

5.5.1 History of the Reefmaker Triangle Artificial Reef

Martin County received a $47,700 grant in 2005 from the FWC to enhance existing artificial reef sites by deploying sixty Reefmaker "Florida Special" artificial reef modules adjacent to existing reef materials in the Donaldson and Sirotkin reef sites and four stand-alone sites. These modules are large three-sided pyramids fabricated using concrete and steel. A portion of the grant in the amount of $7,950 was used to deploy ten additional Reefmaker modules within the Donaldson Reef area as a patch reef in the SE portion of the permitted area, indicated as the Reefmaker Triangle. A chart showing the location of the Reefmaker Triangle location is shown in Figure 15.

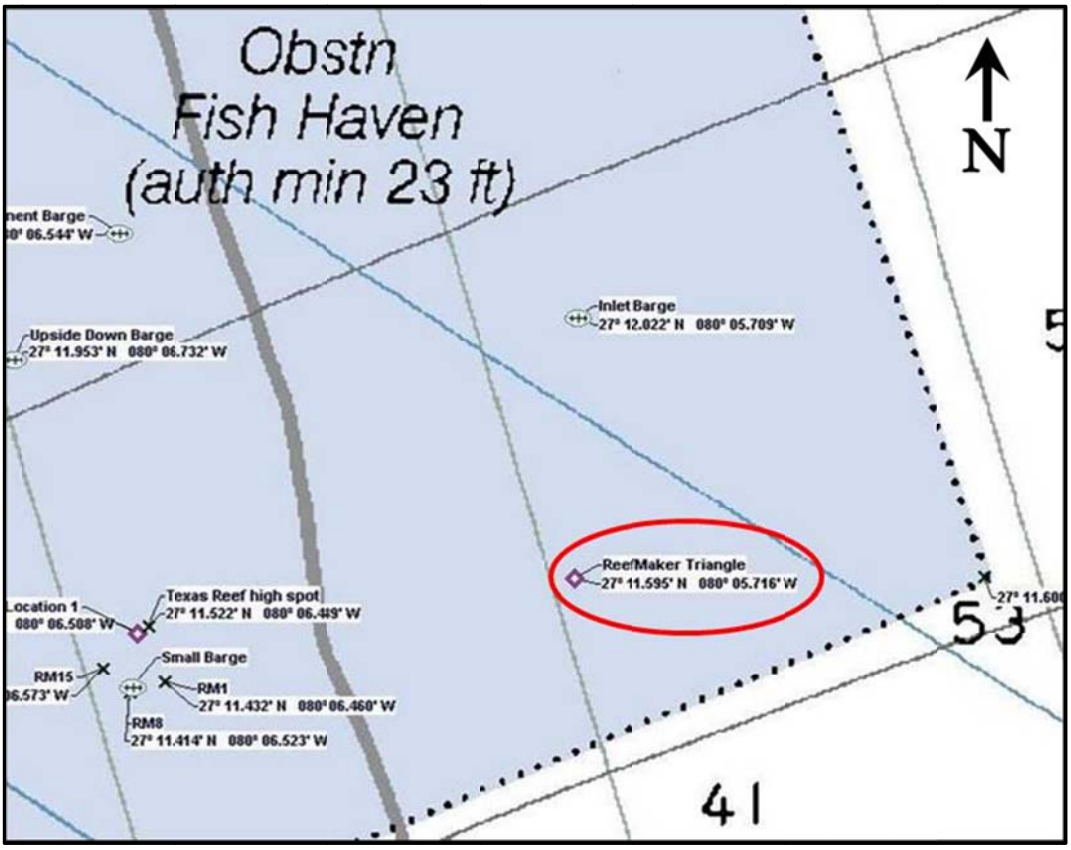

Figure 15. Chart view of the Donaldson Reef site showing the Reefmaker Triangle location.

5.5.2 Structural Summary

Each of the modules at the Reefmaker Triangle location was observed and found to be standing upright, stable and in their original positions. Settlement of approximately 1 foot was noted around the base of one module although it appeared very stable. The concrete components of the modules were intact however several steel components (typically near the base of the units) were observed to be corroded/eroded severely as shown in the photographs below. The photographs in Figure 16 are from the monitoring dive and show general conditions of the reef and some of the species observed during the dive.

Figure 16. Reefmaker Triangle Artificial Reef 2010 photos.

Identification of species in the photographs shown above in clockwise order from the upper-left photograph are (1) atlantic spadefish, (2) various marine benthic growth, (3) Unknown fish egg masses, and (4) black seabass.

5.5.3 Biological Survey Results

Fish surveys identified 14 species and indicated an increasing trend in species diversity since 2005. With black seabass and jacks representing the most numerous species in 2010, although grunts and snappers were also common. Invertebrate biomass on the artificial reef also appeared to have increased since deployment. Some of the most common species included sea urchins, seastars, encrusting sponges, spiny file clams and red netted barnacles. Table 14 and Table 15 present the fish and benthic species observed during 2010.

Table 14. Reefmaker Triangle Artificial Reef fish species census.

Family/Common Name	Species	2010	
		Abundance	Size
Serranidae			
Black seabass	*Centropristis striata*	A	J & A
Goliath grouper	*Epinephelus itajara*	S	A
Whitespotted soapfish	*Rypticus maculatus*	F	A
Carangidae			
Yellow Jack	Caranx bartholomaei	A	J & A
Atlantic bumper	Chloroscombrus chrysurus	A	A
Lutjanidae			
Lane snapper	*Lutjanus synagris*	F	A
Vermilion snapper	*Rhomboplites aurorubens*	A	J
Haemulidae			
Porkfish	*Anisotremus virginicus*	F	A
Tomtate	*Haemulon aurolineatum*	M	J & A
Pigfish	*Orthopristis chrysoptera*	A	A
Sciaenidae			
Cubbyu	*Equetus umbrosus*	M	A & J
Spot	*Leiostomus xanthurus*	F	A
Ephippidae			
Atlantic spadefish	*Chaetodipterus faber*	M	J
Rhincodontidae (Carpet Sharks)			
Nurse shark	*Ginglymostoma cirratum*	S	A
	Total	**14**	

Abundance Key: S=single, F=few (2-10), M=many (11-100), A=abundant (>100)
Size Key: A=adult, J=juvenile, A/J=intermediate

Table 15. Donaldson Reefmaker Triangle Artificial Reef benthic species census.

	Common Name	Scientific Name
Echinoderms	Variegated sea urchin	*Lytechinus variegates*
	Beaded Seastar	*Astropecten articulatus*
Mollusca	Spiny Fileclam	*Lima lima*
Crustaceans	Red-netted barnacles	*Megabalanus sp.*
Others	Unidentified type of sponge	