

Table 19. Ralph Evinrude Artificial Reef Benthic Species Census.

	Common Name	Scientific Name
Echinoderms	Rock Boring Urchin	<i>Echinometra lucunter</i>
	3 Rowed Sea Cucumber	<i>Isostichopus badiotus</i>
Cnidarians	Sea Anemones	<i>Aptasia sp.</i>
	Hydroids	Unidentified species
	Algae Hydroids	<i>Thyroscyphus ramosus</i>
Ascidians	Overgrowing Mat Tunicates	<i>Trididemum solidum</i>
	Giant Tunicates	<i>Polycarpa spongiabilis</i>
	White Speck Tunicate	<i>Didemnum conchyliatum</i>
Crustaceans	Yellowline Arrow Crab	<i>Stenorhynchus seticornis</i>
	Giant Hermit Crab	<i>Petrochirus diogenes</i>
	Spiny lobster	<i>Palnulirus argus</i>
Mollusca	Rock Snails	<i>Muricidae</i> (Unidentified Species)
Ectoprocta	Encrusting Bryozoans	Unidentified Species
Polychaeta	N/A	<i>Spiroridae</i>
Porifera	Star Encrusting Sponge	<i>Halisarca sp.</i>
	N/A	<i>Clathria sp.</i>

5.6 KYLE'S CROSSBAR REEF

- Location: Donaldson Reef
- Materials: Indian Street 30" sq. concrete piling cut-offs (various lengths)
- Maximum Depth: 63 feet
- Reef High Point: 49 feet
- Year Created: 2012
- Monitoring Date: 09/09/2012
- Total Cost: \$80,860 for both reefs (67% FWC & 33% Martin County)

5.6.1 History of the Kyle's Crossbar Reef

In July 2012, this memorial artificial reef was deployed in the Donaldson Artificial Reef Site off the Coast of Martin County in remembrance of Kyle Conrad, 21, a local student athlete and water enthusiast who lost his life in tragic mishap in early December 2010. The artificial reef was built using precast concrete piling cut-offs from the Veterans Memorial Bridge Indian Street project. The reef site received two barge loads of pile cut-offs that varied in length from 3 ft to 31 ft and weighed approximately 904 tons. Figure 18 shows a chart with the location of the Kyle's Crossbar artificial reef.

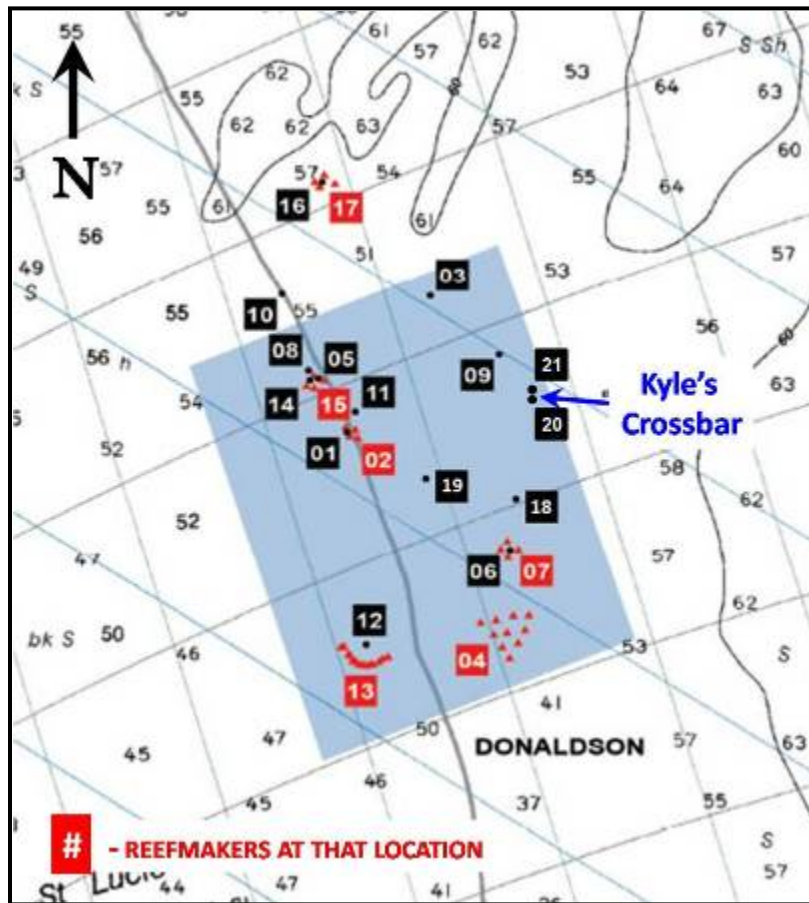


Figure 18. Chart of the Donaldson Reef site showing the Kyle's Crossbar Reef location.

5.6.2 Structural Summary

The Kyle's Crossbar Reef has a seafloor footprint of 111 ft (north/south) by 120 ft (east/west), almost a perfect circle. The entire reef was built from the same type of concrete components (piling cut-offs), so visually it appears as a very symmetrical, cone shaped reef with a profile height of 14 ft. The varying lengths of the piling cut-offs have yielded many overhangs, tunnels, and voids that formed during deployment which makes for an endless pattern of hiding places for fish and benthic creatures to inhabit. Given the configuration, it is anticipated that these heavy and dense components should remain during storm events and winter swells. Depth measurements taken at the perimeter of the reef, and depths 25 ft from the perimeter indicate that minimal scour has occurred at the newly deployed reef. Refer to Table 20.

Table 20. Summary of Kyle's Crossbar Depth measurements.

Direction	Distance from reef high point to the perimeter (ft)	Perimeter Depth (ft)	Depth at 25 ft from perimeter (ft)
North	88	63	63
East	73	62	63
South	23	63	63
West	47	63	63

5.6.3 Biological Survey Results

During this post-deployment monitoring survey in September 2012, twenty (21) fish species were identified and photographed, just seven (7) weeks post-deployment. Most notable sport/food fish species included: greater amberjack, gray, yellowtail, and lane snappers, goliath grouper, and two individuals of juvenile snowy grouper (rare at this shallow depth). Also notable were three species of baitfish, thousands of silversides, and hundreds of round scad and blue runners in schools swimming rapidly all around and above the reef. A large (10”) red lionfish was also observed hiding in the dark recesses of the overhanging concrete piling cut-off sections. The photographs in Figure 19 show the general condition of Kyle’s Crossbar Reef and some of the species observed during the monitoring dive.



Figure 19. Kyle’s Crossbar Artificial Reef photos from 2012.

Species identified in the photographs shown above, clockwise from the upper-left photograph are (1) round scad and blue runners, (2) lionfish, (3) silversides, and (4) goliath grouper and silversides.

The most notable attached benthic organisms consisted of slight algae slime and small barnacles that seemed to cover every exposed surface. These findings are the early beginnings of the food chain. Table 21 lists the fish species census, including the relative abundance, and size class (adult, intermediate, and juvenile) while Table 22 lists the benthic species observed during the monitoring dive.

Table 21. Kyle's Crossbar Artificial Reef Fish Species Census.

Family/Common Name	Species	2012		
		Abundance	Size	Comments
Apogonidae				
Twospot cardinalfish	<i>Apogon pseudomaculatus</i>	M	J & A	
Atherinidae				
Silversides	<i>Atherinidae</i>	A	A (1,000's)	
Carangidae				
Greater amberjack	<i>Seriola dumerili</i>	A	J & A	
Round scad	<i>Decapterus punctatus</i>	A	A	
Blue runner	<i>Caranx crysos</i>	A	A	
Dasyatidae				
Roughtail stingray	<i>Dasyatis centroura</i>	S	A	
Southern stingray	<i>Dasyatis americana</i>	S	A	
Echeneidae				
Common remora	<i>Remora remora</i>	F	A	
Ginglymostomatidae				
Nurse shark	<i>Ginglymostoma cirratum</i>	F(2)	A	
Labridae				
Pearly razorfish	<i>Xyrichtys novacula</i>	F	J & A	
Lutjanidae				
Gray snapper	<i>Lutjanus griseus</i>	M	J & A	
Lane snapper	<i>Lutjanus synagris</i>	M	J & A	
Yellowtail snapper	<i>Ocyurus chrysurus</i>	F	J & A	
Pomacentridae				
Sergeant Major	<i>Abudefduf saxatilis</i>	F	A	
Scorpaenidae				
Red Lionfish	<i>Pterois volitans</i>	S	A	10" in length
Serranidae				
Goliath grouper	<i>Epinephelus itajara</i>	F(8)	A	
Sand perch	<i>Diplectrum formosum</i>	F	A	
Snowy grouper	<i>Epinephelus niveatus</i>	F(2)	J	2 ½" & 3 1/2 " in length
Sphyraenidae				
Southern sennet	<i>Sphyraena picudilla</i>	A	A	
Tetraodontidae				
Bandtail puffer	<i>Sphoeroides spengleri</i>	F	A	
Sharpnose puffer	<i>Canthigaster rostrata</i>	F	A	
	Total	21		

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 22. Kyle' Crossbar Reef Benthic Species Census.

	Common Name	Scientific Name
Cnidarians	Sea Anemones	<i>Aptasia sp.</i>
Crustaceans	Caribbean Spiny Lobster	<i>Panulirus argus</i>
Mollusca	Rock snails	<i>Muricidae (Unidentified species)</i>
	Octopus - Caribbean Reef	<i>Octopus briareus</i>
Porifera	Encrusting Sponge	<i>Halisarca sp.</i>
Polychaeta	N/A	<i>Spirorbidae</i>

5.7 SIROTKIN DIAMOND PATCH - CENTRAL

- Location: Sirotkin Reef
- Materials: 5 Reefmaker “Florida Special” units (steel and concrete)
- Maximum Depth: 105 feet
- Reef High Point: 95 feet
- Year Created: 2005
- Monitoring Date: 09/05/2012
- Total Cost: \$3,975 (FWC 89% & Martin County 11%)

5.7.1 History of the Sirotkin Diamond Patch - Central

As part of a FWC grant Martin County received in 2005, sixty (60) Reefmaker “Florida Special” pyramid shaped artificial reef units made of concrete and steel were deployed around existing artificial sites, in addition to being placed as stand-alone reef sites. Fifteen (15) of the artificial reef units were deployed in three (3) groups of five (5) units each (North, Central, and South) within the Sirotkin Reef site on May 21, 2005. Charts showing the artificial reef’s location within the Sirotkin site, and the placement of the units at the reef location for the Diamond Patch are shown in Figure 20 and Figure 21.

The placement pattern shown in Figure 21 is roughly diamond-shaped with one central unit surrounded by the remaining four, spaced approximately 100 feet apart. Color coded zip ties were attached to the top of each unit during deployment to simplify identification of individual units during monitoring.