

5.5 RALPH EVINRUDE REEF

- Location: Donaldson Reef
- Materials: Concrete (chunks, roof beams, roadway slabs, box culverts)
- Maximum Depth: 60 feet
- Reef High Point: 48 feet
- Year Created: 2011
- Monitoring Date: 09/09/2012
- Total Cost: \$72,000 (FWC 75% & Martin County 25%)

5.5.1 History of the Ralph Evinrude Reef

Ralph Evinrude was a respected resident of Martin County and supported many projects of the artificial reef program, including the USS Rankin Navy ship, which was scuttled in 1985 as the largest Artificial Reef to date in Martin County. He was the former CEO of the Evinrude Corporation, which introduced the world to outboard engines for motorboats in the 1920's. He and his famous actress wife, Frances Langford, moved to Jensen Beach in the 1950's. Over the decades, they provided major financial support to many civic organizations, including the Florida Oceanographic Society, Martin Memorial Hospital, and the former Jensen Beach Campus of Florida Institute of Technology. The materials utilized to build the Evinrude Reef were concrete and steel debris from the Ralph Evinrude Science Building on the former site of the Jensen Beach campus. A chart showing the location of the Ralph Evinrude Reef is shown in Figure 16.

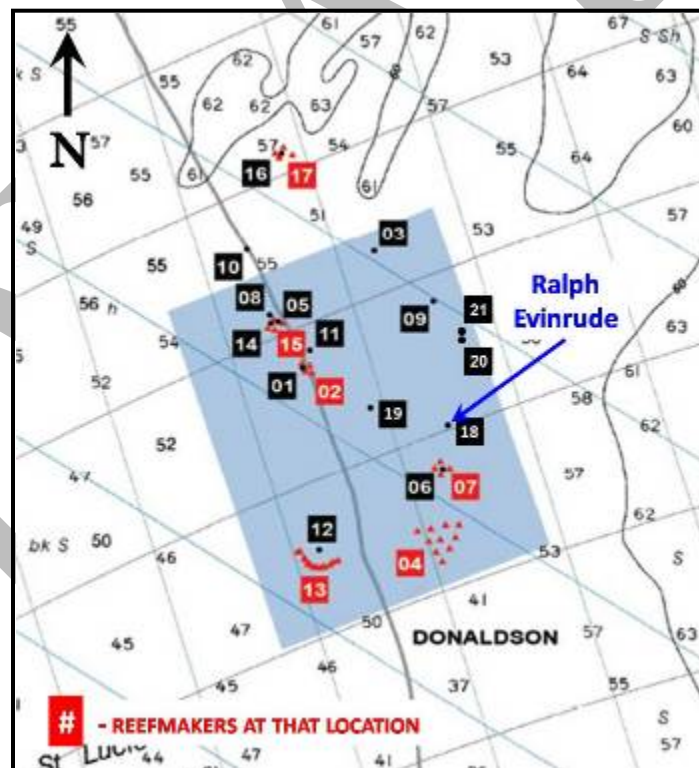


Figure 16. Chart of the Donaldson Reef site showing the Ralph Evinrude Reef location.

5.5.2 Structural Summary

This reef is comprised of many different sizes and shapes of concrete and steel components. When the contractor dismantled the Ralph Evinrude Science building, he demonstrated caution while removing the large roof concrete trusses without breaking them. These trusses are still mostly intact on the reef as documented in Figure 17, (upper left) which shows the end of one of the trusses covered in benthic growth while a school of tomtates take refuge beneath.

Similar to the Lee Harris reef configuration, the Evinrude reef appears very stable due of the interlocking and complex arrangement of mixed shapes and sizes of the materials used to create this reef. It is anticipated that the components will perform well resisting wave forces from significant storm events. On other artificial reefs at this depth range and with similar level of complexity, very little movement has occurred as documented from past monitoring efforts, even during the Category 2 and 3 hurricanes that passed through the Martin County waters in 2004 and 2005. Depth measurements taken during the monitoring dive show that minimal scouring has occurred at this artificial reef site (refer to Table 17).

Table 17. Summary of Depth measurements at the Ralph Evinrude Reef.

Direction	Distance from reef high point to the perimeter (ft)	Perimeter Depth (ft)	Depth at 25 ft from perimeter (ft)
North	30	58	59
East	28	58	58
South	23	58	58
West	50	60	60

5.5.3 Biological Survey Results

Similar to the Lee Harris reef, both in complexity, depth and age, the Ralph Evinrude Reef had many finfish species identified during this first annual monitoring effort. In our experience, it is rare to find greater than twenty (20) species after twelve months. We observed thirty three (33) fish species, and one species of marine reptile (loggerhead turtle). Of the 33 fish species, eleven (11) are considered important recreational and food value species, including three species of snapper and one grouper species. In addition, a large school of common snook (approximately 70 adults) were present on the reef. Hopefully, this is a positive indication and trend for future monitoring events. The photographs in Figure 17 show the general condition of the Ralph Evinrude Reef observed during the monitoring dive.



Figure 17. Ralph Evinrude Artificial Reef photos from 2012.

Species identified in the photographs shown above, clockwise from the upper-left photograph are (1) large school of tomtates, (2) tomtates, (3) loggerhead turtle, sheepshead, porkfish, remora, and tomtates, and (4) sheepshead, porkfish, and tomtates.

The benthic diversity for this newly deployed artificial reef was also impressive with sixteen (16) different species observed and attached to the concrete substrate, as well as inhabiting the many voids and crevices. Numerous sea cucumbers, urchins, and arrow crabs were seen foraging about the structure where tunicates, encrusting sponges, and anemones covered a majority of the exposed substrate. Table 18 lists the fish and marine reptile species/taxa, their relative abundance and size class (adult, intermediate, and juvenile) observed and Table 19 lists the benthic species observed during the monitoring dive.

Table 18. Ralph Evinrude Artificial Reef Fish Species Census.

Family/Common Name	Species	2012	
		Abundance	Size
Acanthuridae			
Ocean Surgeonfish	<i>Acanthurus bahianus</i>	F	J & J/A
Apogonidae			
Twospot cardinalfish	<i>Apogon pseudomaculatus</i>	F	A
Aulostomidae			
Trumpetfish	<i>Aulostomus maculatus</i>	S	A
Balistidae			
Gray Triggerfish	<i>Balistes capricus</i>	F	A
Carangidae			
Greater amberjack	<i>Seriola dumerilli</i>	M	J/A
Centropomidae			
Common snook	<i>Centropomus undecimalis</i>	M(70)	A
Chaetodontidae			
Reef butterflyfish	<i>Chaetodon sedentarius</i>	F	J/A

Family/Common Name	Species	2012	
		Abundance	Size
Cheloniidae			
Loggerhead sea turtle	<i>Caretta caretta</i>	F(2)	A
Dasyatidae			
Southern Stingray	<i>Dasyatis americana</i>	F(4)	A
Echeneidae			
Common remora	<i>Remora remora</i>	F(2)	A
Ginglymostomatidae			
Nurse shark	<i>Ginglymostoma cirratum</i>	S	A
Haemulidae			
Tomtate	<i>Haemulon aurolineatum</i>	A	J & A
Cottonwick	<i>Haemulon melanurum</i>	F	J/A
Porkfish	<i>Anisotremus virginicus</i>	M	J & A
Labridae			
Spanish hogfish	<i>Bodianus rufus</i>	F	J & J/A
Lutjanidae			
Gray snapper	<i>Lutjanus griseus</i>	M	J & A
Lane snapper	<i>Lutjanus synagris</i>	M	J & A
Mutton snapper	<i>Lutjanus analis</i>	F(2)	A
Muraenidae			
Spotted moray eel	<i>Gymnothorax moringa</i>	S	A
Pomacanthidae			
Blue angelfish	<i>Holacanthus bermudensis</i>	S	A
Pomacentridae			
Cocoa damselfish	<i>Stegastes variabilis</i>	S	A
Yellowtail reeffish	<i>Chromis enchrysurus</i>	M	J & A
Beaugregory	<i>Pomacentrus leucostictus</i>	F	J & A
Sciaenidae			
Cubbyu	<i>Equetus umbrosus</i>	F	J
Rachycentridae			
Cobia	<i>Rachycentron canadum</i>	F(4)	A
Scombridae			
Spanish mackerel	<i>Scomberomorus maculatus</i>	S	A
Scorpaenidae			
Red Lionfish	<i>Pterois volitans</i>	S	J/A
Serranidae			
Belted sandfish	<i>Serranus subligarius</i>	M	J & A
Black sea bass	<i>Centropristis striata</i>	A	J & A
Scamp	<i>Mycteroperca phenax</i>	F	J/A
Sparidae			
Pigfish	<i>Orthopristis chrysoptera</i>	M	A
Sheepshead	<i>Archosargus probatocephalus</i>	M	J & A
Sphyraenidae			
Southern sennet	<i>Sphyraena picudilla</i>	A	A
Tetraodontidae			
Bandtail puffer	<i>Sphoeroides spengleri</i>	F	J & A
	Total	34	

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 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.