

Table 11. Traffic Barge - 4 Reefmakers Benthic Species Census.

	Common Name	Scientific Name
Cnidarians	Algae Hydroids	<i>Thyroscyphus ramosus.</i>
Crustaceans	Volcano Barnacle	<i>Tetraclita stalactifera</i>
Porifera	N/A	<i>Batzella spp.</i>

5.3 UPSIDE-DOWN BARGE - 4 REEFMAKERS

- Location: Donaldson Reef
- Materials: Barge (Steel) & 4 concrete and steel Reefmaker units
- Maximum Depth: 65 ft (barge), 67 ft (Reefmaker unit)
- Reef High Point: 62 ft (barge), 57 ft (Reefmaker unit)
- Year Created: Reefmaker units deployed in 2005
- Monitoring Date: 09/08/2012
- Total Cost: \$3,180 (FWC 89% & Martin County 11%)

5.3.1 History of the Upside-Down Barge - 4 Reefmakers

The “Upside-Down Barge” derived its name because it landed “upside-down” when it was deployed. Based on the Martin County archives it was established that the Upside-Down Barge was deployed as an Artificial Reef in the Donaldson Permitted Area sometime between 1980 and 1986. It remains upside-down in 65 feet of water, located in the most northern of the four Reefmaker barge sites within the Site, and approximately 1 nm north of the Traffic Barge site.

In 2005, the site was augmented when Martin County deployed four Reefmaker “Florida Special” artificial reef units north, south, east and west of the Upside-Down Barge site. Similar to the other barge/reef maker sites, colored zip ties were attached to the top of each reef unit to help with identifying and photo documenting the individual units during monitoring efforts. The following color code was used: blue - reef unit to north, red - reef unit to west, green - reef unit to east, yellow - reef unit to south.

A chart showing the location of the barge and the Reefmaker units surrounding the barge is shown in Figure 11. A chart showing the placement of the units around the Upside-Down Barge location is shown in Figure 12.

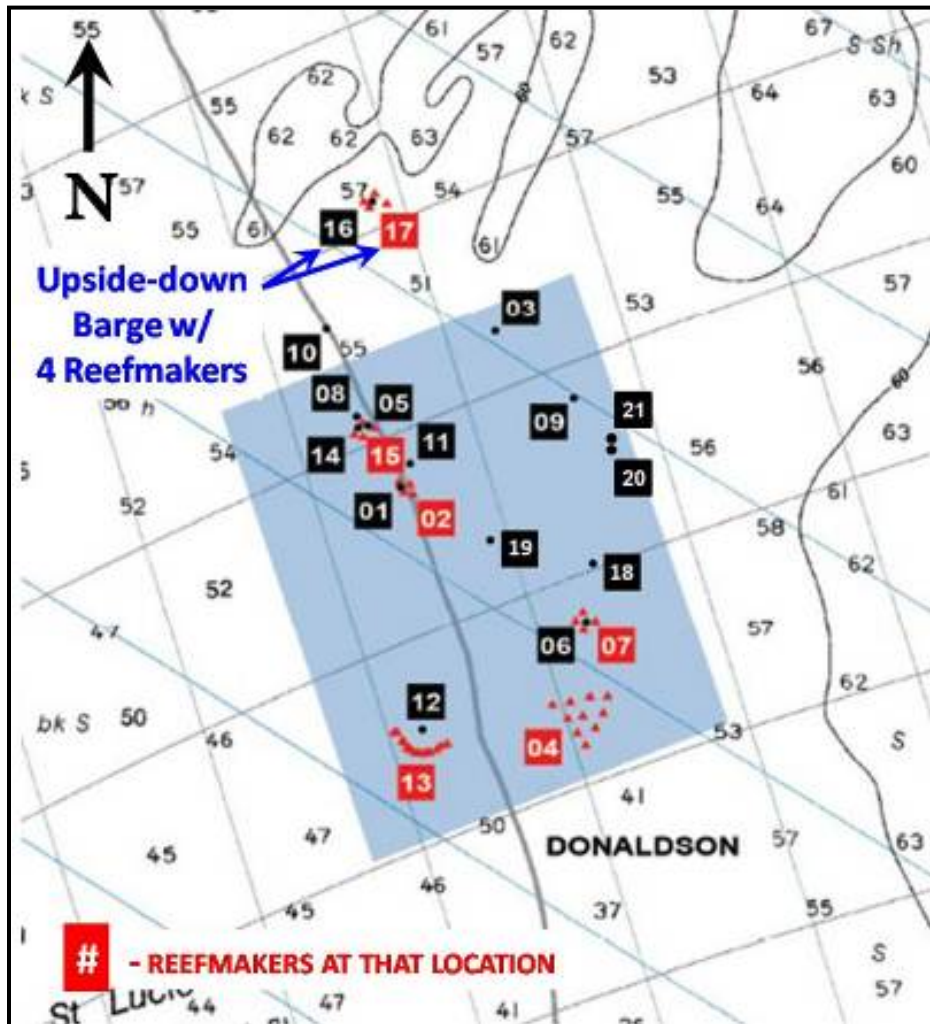


Figure 11. Chart of the Donaldson Reef site showing the Upside-Down Barge and Reefmakers location.

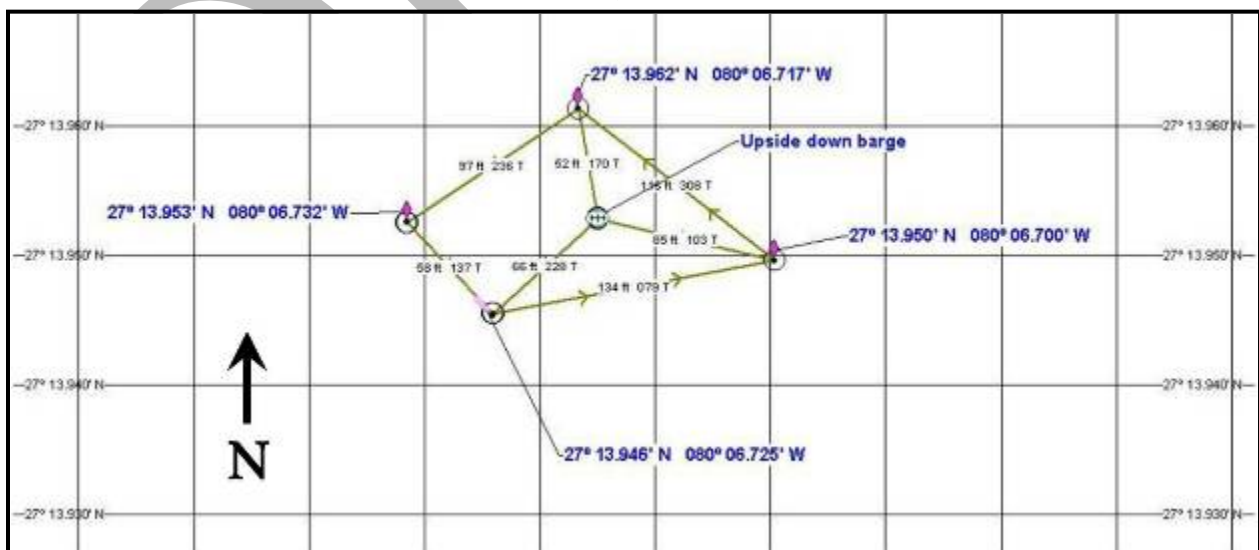


Figure 12. Chart view of the Upside-Down Barge and 4 Reefmaker units.

5.3.2 Structural Summary

Overall, the four-Reefmaker units at this site are intact and good condition. Similar to the Cement Barge and Traffic Barge, this site is considered shallow, with evidence of erosion and corrosion degradation not encountered at the deeper sites. Given the proximity to the shoreline, sediment transfer is expected, both seasonally and during significant storm events.

Although the impacts of sediment movement have resulted in erosion of the steel side sections closest to the seafloor, both the concrete base and solid concrete framework are the main structural components of each Reefmaker unit. Over time, it is likely that most, if not all, of the steel will be lost to corrosive and erosive forces, but the concrete framework of the Reefmaker will likely remain for many decades to come, providing good habitat for many benthic and fish species to thrive. The photographs in Figure 13 show the general condition of the Reefmaker units surrounding the Upside-Down Barge site observed during the monitoring dive. Some settling has occurred around the concrete base of the units, likely caused by seasonal occurrences prevalent with shifting sediments in the area.



Figure 13. Upside-Down Barge Reefmaker units 2012 photographs.

5.3.3 Biological Survey Results

Of the twenty seven (27) fish species identified during our survey, five (5) are noteworthy, including four common sport fish species; greater amberjack, lane snapper, gray snapper, and common snook. Unfortunately, five (5) Lionfish were also observed. Refer to Table 12 for the fish species census.

Table 12. Upside-Down Barge - 4 Reefmakers Fish Species Census.

Family/Common Name	Species	2012	
		Abundance	Size
Carangidae			
Atlantic bumper	<i>Chloroscombrus chrysurus</i>	A	A
Greater amberjack	<i>Seriola dumerili</i>	F	J/A & J
Round scad	<i>Decapterus punctatus</i>	A	J & A
Centropomidae			
Common snook	<i>Centropomus undecimalis</i>	F	J/A & A
Chaetodontidae			
Reef butterflyfish	<i>Chaetodon sedentarius</i>	F(3)	A
Spotfin butterflyfish	<i>Chaetodon ocellatus</i>	F	A
Clupeidae			
Fry	<i>Unidentified species</i>	A	J
Ephippidae			
Atlantic spadefish	<i>Chaetodipterus faber</i>	M	A
Haemulidae			
Tomtate	<i>Haemulon aurolineatum</i>	M	J & A
Porkfish	<i>Anisotremus virginicus</i>	M	J & A
Labridae			
Slippery dick	<i>Halichoeres bivittatus</i>	M	J
Labrisomidae			
Hairy blenny	<i>Labrisomus nuchipinnis</i>	F	A
Lutjanidae			
Gray snapper	<i>Lutjanus griseus</i>	F	J/A & A
Lane snapper	<i>Lutjanus synagris</i>	F	J/A
Ogcocephalidae			
Shortnose batfish	<i>Ogcocephalus nasutus</i>	S	A
Pomacentridae			
Yellowtail reeffish	<i>Chromis enchrysurus</i>	F	J
Beaugregory	<i>Pomacentrus leucostictus</i>	F	J
Sergeant Major	<i>Abudefduf saxatilis</i>	F	A
Sciaenidae			
Cubbyu	<i>Equetus umbrosus</i>	M	J & A
High hat	<i>Equetus acuminatus</i>	F	J
Scorpaenidae			
Red Lionfish	<i>Pterois volitans</i>	F(5)	J & A
Spotted scorpionfish	<i>Scorpaena plumeiri</i>	F	A
Serranidae			
Belted sandfish	<i>Serranus subligarius</i>	M	J & A
Black sea bass	<i>Centropristis striata</i>	F	J & A
Whitespotted soapfish	<i>Rypticus maculatus</i>	F	A
Sparidae			
Sheepshead porgy	<i>Calamus penna</i>	F	A
Tetraodontidae			
Bandtail puffer	<i>Sphoeroides spengleri</i>	F	J
	Total	27	

Abundance Key: S=single, F=few (2-10), M=many (11-100), A=abundant (>100)

Size Key: A=adult, J=juvenile, A/J=intermediate

As documented in Figure 13, benthic growth on the units is quite extensive. Most of the steel bars are covered with an assortment of benthic marine growth, including gorgonians, tunicates, bryozoans, crustaceans and others. At least fifteen (15) different benthic species were identified on the Reefmaker units. Since this reef is located in shallow waters, more sunlight reaches the units allowing for photosynthesis to occur, which results in a complex benthic community to survive on both the steel and concrete components. The deeper sites also support benthic marine growth, but in lesser diversity and concentrations. Figure 13 lists the benthic species identified.

Table 13. Upside-Down Barge - 4 Reefmakers Benthic Species Census.

	Common Name	Scientific Name
Echinoderms	Rock Boring Urchin	<i>Echinometra lucunter</i>
	3 Rowed Sea Cucumber	<i>Isostichopus badiionotus</i>
Cnidarians	Sea Anemones	<i>Aptasia sp.</i>
	Algae Hydroids	<i>Thyroscyphus ramosus</i>
	Hydroids	Unidentified species
	N/A	<i>Pterogorgia citrina</i>
Ascidians	Overgrowing Tunicates	<i>Didemnidae</i>
	Giant Tunicates	<i>Polycarpa spongiabilis</i>
Crustaceans	Yellowline Arrow Crab	<i>Stenorhynchus seticornis</i>
Mollusca	Rock Snails	<i>Muricidae</i> (Unidentified species)
Ectoprocta	Encrusting Bryozoans	Unidentified Species
Porifera	Star Encrusting Sponge	<i>Halisarca sp.</i>
	N/A	<i>Verongula rigida</i>
	N/A	<i>Aiolocroia crassa</i>
	N/A	<i>Scopalina ruetzleri</i>