

4 Nearshore Mitigation Reef Site A

Monitoring Dates: May 21, June 30, and Dec. 27, 2006

Location: approximately 900 feet offshore; south of the Holiday Inn and Jensen Public Beach, Martin County, Florida

GPS Coordinates: **N27 14.412 / W80 11.098** (center of the reebsite)

Crewmembers: Lee Harris, Kerry Dillon, Laura Herren, Kathy Fitzpatrick, Seth Dillon, Mark Cloer

4.1 History of Mitigation Reef A:

This reef site was constructed during the summer of 2000. Materials utilized were from dismantled concrete and steel components from the old Evans Crary Bridge. Larger sections were placed in the Ernst permitted offshore reebsite in 60 to 70 feet of water, while smaller sections were utilized for the shallower nearshore mitigation reebsites.

Nearshore reef A was constructed on 8/2, 8/16, and 9/15/2000 with three total bargeloads of the following materials:

- 70 concrete piles from 20 – 40 ft. long each
- 16 concrete pilecaps approx. 30 ft. x 4 ft. x 5 ft. each
- 18 steel/concrete roadway sections approx. 40 ft. x 5 ft. x 4 ft. each

These materials were deployed from an unanchored barge using several temporary surface buoys to mark the areas for material deployment. Nearshore reebsite A is approximately 900 feet offshore of the beach, with water depths to natural bottom 14 – 22 ft. deep. The shallowest spot to the top of the reef components was measured as 6 feet, with the average water depth above reef components being 12 – 15 feet.

4.2 Reef Components Stability

It was observed that most all components are still close to the same position as when first deployed in the summer of 2000 and monitored in 2001 through 2004. This area is subject to seasonal and storm induced beach profile changes, with some covering and uncovering of the nearshore natural and artificial reefs. There has been some settlement (and/or burial) and scour around the bridge pieces. The scour provides habitat similar to that provided by similar scour around nearshore natural reefs in the area.

The individual pilings that were placed horizontally on the flat sandy bottom have been partially buried into the sand, due to either sinking of the unit in the sand or sand accretion (or a combination of both). Many of the components that stacked on top of each other appear to be stable, and are providing many overhangs and crevices, which provide excellent habitat for a variety of marine organisms. Some materials have shifted since last seen in 2004 due to major Hurricanes Frances & Jeanne in September 2004 and Hurricane Wilma in October 2005. Minimum depths recorded during this survey were 8 to 10 feet at the apex of several pilings that were stacked in an interlocking matrix of other pilings and concrete segments. In previous years the shallowest spot located was 6 feet. Around some of the larger clusters of materials scour has occurred, which was also observed in prior years. The seafloor substrate in this area is a mix of fine sand and shell fragments with some pockets of mud and silt in the depressions of the seafloor.

4.3 Fish Species & Abundance Findings:

The fish species census is shown in Table 3 for Mitigation Reef A.

Table 3. Mitigation Reef A Fish Census

Species	2004	2006	Juvenile or Adult
Barracuda	1	10's	J (1-1.5 ft. long)
Porkfish	10's	10's	A & J
Sailors Choice	>10	0	A
Grey snapper	10's	7	A
Beaugregory	2	1	A
Spottail pinfish	10's	10's	A & J
Blue runner	100's	0	A
Common Snook	8	3	A
Atlantic Spadefish	10's	10's	A & J
Doctorfish	1	0	A
Black Margate	10's	10's	A & J
Red Porgy	3	0	A
Dwarf Goatfish	1	0	A 4"
Highhat	1	4	J
Gray Angelfish	1	0	A
Lane Snapper	1	0	A
Gag Grouper	2	1	J (5 lbs)
French Angelfish Intermediate	2	0	J/A
Cardinalfish	4	0	J
Spotted Moray Eel	1	0	A
Blue Angelfish	1	2	A
Fry(unidentified species)	100's	10's	½" – ¾" long
Spiny Lobster	0	8	from 2 – 5 lbs
Goliath Grouper	0	1	A
King Mackerel	0	1	A
Stripped Croaker	0	5	A
Southern Flounder	0	2	A
Sheepshead	0	3	A
Scorpionfish	0	2	A
Cubby	0	2	J
Tomtates	0	10's	J
Hairy Blenny	0	2	A

4.4 Benthic Species Identification

On December 27, 2006 divers spent 75 minutes on Mitigation Reef A photographing benthic invertebrates and macroalgae. Sabellariid wormrock reef was photographed on Mitigation Reef A on June 30, 2006, and at that time, there appeared to be several well-established colonies. Wormrock was absent from the site on December 27, 2006. One individual of *Oculina diffusa* was impacted by monofilament fishing line. Benthic species listed in Table 4 were identified using the roving diver technique on December 27, 2006. Representative benthic species from Mitigation Reef A are shown in Figure 3.

Table 4. Mitigation Reef A Benthic Species Census

Benthic Species Identified	Common Name	Abundance
Green Algae		
<i>Caulerpa mexicana</i>		Abundant
<i>Bryopsis pennata</i>		Abundant
<i>Codium</i> spp.		Single
Red Algae		
<i>Gracilaria mammillaris</i>		Many
<i>Gelidium americanum</i>		Abundant
<i>Bryothamnion triquetrum</i>		Few
<i>Botryocladia occidentalis</i>		Few
Brown Algae		
<i>Dictyota</i> spp.	Y-branched alga	Few
<i>Padina</i> spp.	Scroll alga	Few
Sponges		
<i>Pseudaxinella lunaecharta</i>	Orange sticky sponge	Abundant
Unidentified orange sponge		Abundant
Encrusting sponges		Abundant
Yellow encrusting sponge		Many
Cnidarians		
<i>Aglaophenia latecarinata</i>		Feather plume hydroid
<i>Leptogorgia hebes</i>	Regal sea fan	Abundant
<i>Leptogorgia virgulata</i>	Yellow sea whip	Few
<i>Carijoa riisei</i>	White telesto	Many
<i>Oculina diffusa</i>	Ivory bush coral	Many
<i>Phyllangia americana</i>	Hidden cup coral	Few
Worms		
Tubeworms		Few
<i>Phragmatopoma</i> spp.	Sabellariid wormrock	Many
Tunicates		
<i>Eudistoma obscuratum</i>	Black condominium tunicate	Many
<i>Ascidia niger</i>	Black solitary tunicate	Many
Globular tunicates (<i>Styela</i> spp. – like)	Solitary tunicates	Abundant
White colonial tunicate		Many
Sea Urchins		
<i>Arbacia punctulata</i>	Purple urchin	Few
<i>Echinometra lucunter</i>	Rock-boring urchin	Few

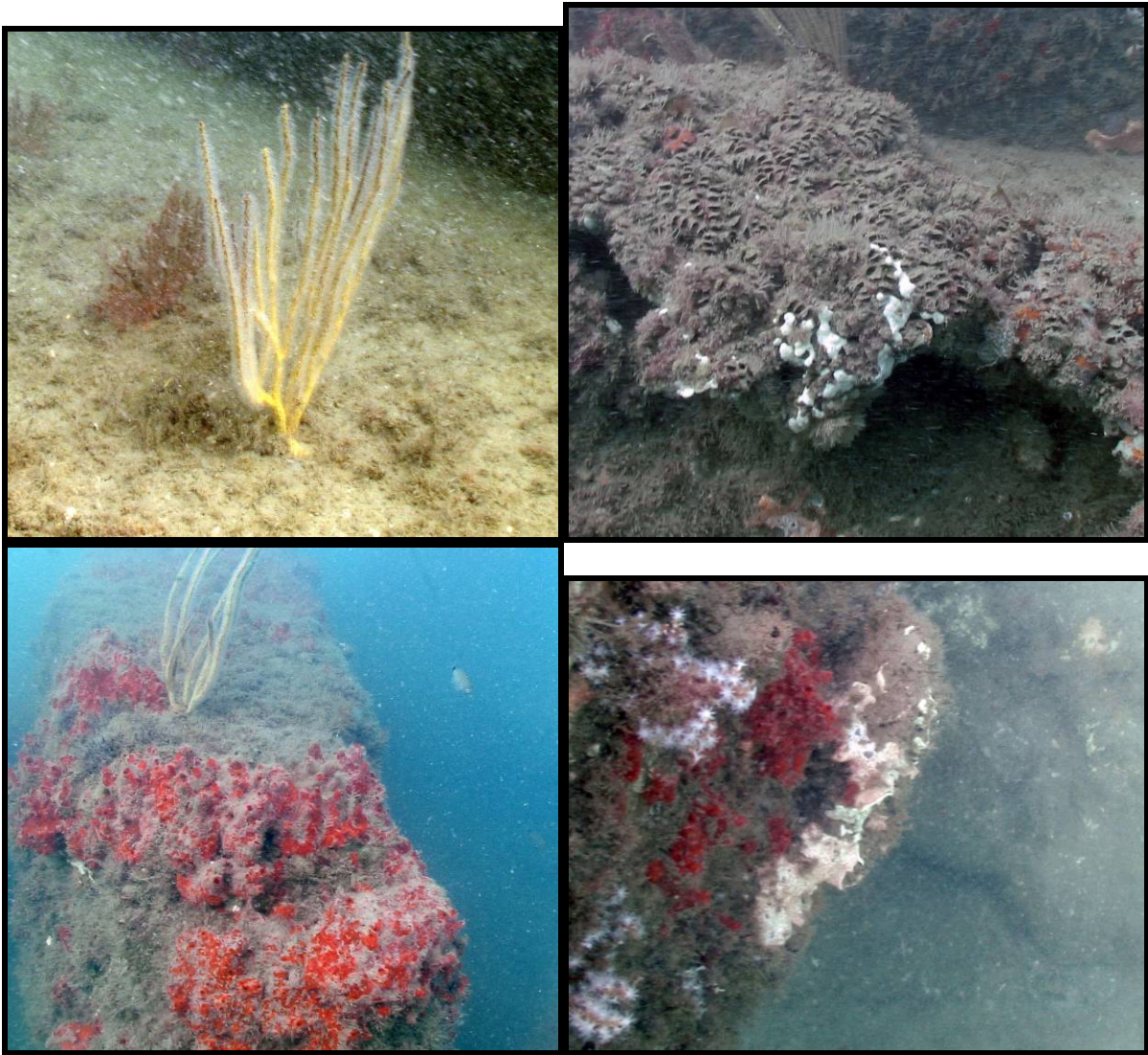


Figure 3. Representative benthic growth on Martin County Mitigation Reef A

a) upper left - yellow sea whip (*Leptogorgia virgulata*) and regal sea fans (*Leptogorgia hebes*), b) upper right - sabellariid wormrock reef (*Phragmatopoma* spp.) found in June 2006, c) lower left - yellow sea whip and unidentified orange sponge, and d) lower right - white telesto (*Carijoa riisei*).

4.5 Mitigation Reef A Summary

Site A is the northernmost of the nearshore reef sites, and is farthest from the St. Lucie Inlet. Site A had the fewest barge loads of materials; therefore the reef is smaller and less dense than the other two-nearshore reef sites. Observations at Site A in 2006 include 21 total fish species identified as opposed to 23 from 2004. Spiny lobster was identified in 2006 and had not been documented there before. Sport fishes seen in 2006 were up to 8 species, the most ever at this site in 6 years of data collection. Two federal protected species, goliath grouper and a species of special concern the stripped croaker were documented. Extensive worm reef has been observed during all spring and summer monitoring events. However, in December 2006 the absence of worm reef was noted.