

5 Nearshore Mitigation Reef Site B

Monitoring Dates: May 22, 2006

Location: approximately 1,000 feet offshore of the Buttonwood Condominium just north of Tiger Shores (Virginia Forest Beach), Martin County, Florida

GPS Coordinates: N27 13.553 / W80 10.647 (center of the reebsite)

Crewmembers: Dr. Lee Harris, Kerry Dillon, Mark Cloer

5.1 History of Mitigation Reef B:

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 B was constructed on 7/28, 8/2, 8/10, 8/28 & 9/5/2000 with five total barge loads of the following materials:

- 115 concrete piles from 20 – 40 ft. long each
- 20 concrete pilecaps approx. 30 ft. x 4 ft. x 5 ft. each
- 15 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 B is approximately 1000 feet offshore of the beach, with water depths to natural bottom 16 – 24 ft. deep. The shallowest spot to the top of the reef components was measured as 7 feet in 2004. In 2006 the shallowest spot located was 8 feet.

5.2 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.

5.3 Fish Species & Abundance Findings:

The fish species census is shown in Table 5 for Mitigation Reef B.

Table 5. Mitigation Reef B Fish Census

Species	2004	2006	Juvenile or Adult
Porkfish	10's	10's	J & A
Barracuda	1	1	A
Atlantic Spadefish	2	10's	A
Sheepshead	4	5	A
Gray Triggerfish	7	1	A
Fry (unidentified species)	100's	100's	J
Blue Runners	100's	3	A
White Spotted Soapfish	0	1	A
Lane Snapper	1	2	A
Spanish Grunt	0	2	A
Unidentified (Looks like baby barracuda)	0	1	J (3" long)
Stripped Croaker	10's	0	--
Grey snapper	10's	0	--
French Angelfish (Intermediate phase)	1	1	--
Spottail pinfish	10's	0	--
Common Snook	10's	0	--
Lane Snapper	1	0	--
Black Margate	5	0	--
Doctorfish	10's	0	--
Sailors Choice	10's	0	--
Southern Flounder	1	0	--
Porcupinefish	1	0	--
Goliath Grouper	1	0	--
Spotted Moray Eel	1	0	--

In the 2006 monitoring 17 fish species were identified as compared to 20 for 2004. Also the federal species of concern (Striped Croaker) that was identified at this site in 2004 was still present in 2006. This species is of special concern because of its limited habitat Florida range. The only known breeding population in North America is in Brevard, Indian River, & St. Lucie counties (Gilmore 1992). This species is dependent on the nearshore rock alga reefs for most of its lifespan.

5.4 Benthic Species Identification

On May 22, 2006 divers spent 25 minutes on Mitigation Reef B photographing benthic invertebrates and macroalgae. Benthic species listed in Table 6 were identified using the roving diver technique on May 22, 2006.

Table 6. Mitigation Reef B Benthic Species Census

Benthic Species Identified	Common Name	Abundance
Green Algae		
<i>Bryopsis pennata</i>		Abundant
Red Algae		
<i>Gracilaria mammillaris</i>		Many
<i>Gelidium americanum</i>		Abundant
<i>Bryothamnion triquetrum</i>		Few
Sponges		
<i>Pseudaxinella lunaecharta</i>	Orange sticky sponge	Abundant
Encrusting sponges		Abundant
Unidentified yellow sponge		Few
Cnidarians		
<i>Aglaophenia latecarinata</i>	Feather plume hydroid	Abundant
<i>Leptogorgia hebes</i>	Regal sea fan	Abundant
<i>Leptogorgia virgulata</i>	Yellow sea whip	Abundant
<i>Phyllangia americana</i>	Hidden cup coral	Few
<i>Carijoa riisei</i>	White telesto	Many
Solitary anemome		Few
Mat anemone		Single
Worms		
Tubeworms		Few
Gastropods		
<i>Terebra salleana</i>	Eastern augers	Many
Bryozoans		
<i>Bugula turrata</i>	Fan bryozoan	Single
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

5.5 Mitigation Reef B Summary

Site B is the middle one of the three nearshore reef sites, and is located north of Site C. In the summer of 2000, Site B had the same number of bargeloads and almost as much material deployed as Site C.

During the 5 deployments at this site the contractor did a better job of keeping the 5 deployments closer to the set buoys, therefore a tighter grouping was obtained. This allowed for closer clusters of materials to occur. When diving this site a diver can swim from one cluster to another with minimal difficulty. The gaps of flat sand seafloor are shorter than at site C just to the south. The clusters of materials appeared to have stayed together in an

interlocking matrix. Some movement has occurred due to the hurricanes, but overall the reefsite is intact and providing a good habitat for marine life to thrive. As was seen in the other sites, some horizontal pilings are almost completely buried in the sand/shell substrate. Although not providing much profile they still serve to stabilize the seafloor in the immediate area around the reefsite.

In 2006 the total number of fish species documented was 17, which is down from 20 in 2004. The total benthic coverage has increased between 2004 and 2006 as can be seen on the digital videodocumentation images. One substantial change in the benthic species diversification at this site has occurred. The invasive exotic green algae species *Caulerpa Brachypus* that was seen drifting and attached to the substrates in 2004, was not seen in 2006. Recent findings (Feb. 2007) from Harbor Brach Foundation scientists have confirmed sightings of this invasive exotic alga species in Martin Counties waters in deeper waters 70 – 80 ft. and approx. 7 miles to the southeast of site B. It is widely believed that the hurricanes of 2004/2005 temporarily displaced the species from Martin County waters but it now appears to be spreading into the area again from the southern SE Florida counties.