

Shallow Coral Cap Fish and Benthic Community Structure Cruise - September 10-13, 2010

Mission Purpose:

Understanding potential fishing impacts has been identified as a priority management issue in the sanctuary. To address this, FGBNMS, NCCOS and other partners are developing a sampling strategy to assess baseline fish and benthic invertebrate populations at East and West Flower Garden Banks and implement an experimental fishing closure on one of the banks. This mission is the first of three coral cap scuba survey data collections to support the experimental closure. Acoustic surveys will also be conducted to provide broad-scale estimates of fish density throughout the sanctuary.

This work will complement surveys in the deeper parts of the coral cap (110'-150') that will also be conducted by technical diving scuba teams. This portion was not conducted in 2010 due to implications from DWH, but plans are in place to gather data in this depth zone during FY11. An ROV will be used to gather fish and benthic data at depths greater than 150'.

Operational Accomplishments:

- 75 100m² surveys were conducted on both banks; 45 on East Bank and 30 on West Bank (Figures 1a and b).
- All dives commenced off the R/V Manta. All deployments went smoothly and finished in 4 days.
- Dives were conducted using Nitrox 32%.
- Dives ranged in depth between 60 and 110'.
- Acoustic data were gathered to estimate fish density over both coral caps and over ROV transects that were conducted in May 2010 (Figures 2a and b).

Summary of Surveys

Fish Transects

Fish species abundance, size and distribution were characterized using the belt transect survey method (http://ccma.nos.noaa.gov/ecosystems/coralreef/reef_fish/protocols.html) at 75 sites.

The data are summarized below:

- ❖ One *Manta birostris* was observed on East Bank and biomass was removed from biomass estimate; all other metrics include *M. birostris*
- ❖ In general, it appeared that density, biomass and species richness were higher at West Bank compared to East Bank.



- ❖ 181 individuals of large groupers from the genera *Cephalopholis*, *Dermatolepis*, *Epinephelus*, *Mycteroperca* were observed at 60 of 75 survey sites. These taxa were present predominantly over high relief habitats.
- ❖ 208 individuals of dog (*Lutjanus jocu*) and grey (*L. griseus*) were observed and nearly 75% were observed on West Bank. We may have observed pre-spawning aggregation behavior by the dog snapper.

Location	Relief	Number of surveys	Density/100 m ²		Biomass (g)/100 m ²		# species/100 m ²		Shannon's Diversity	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE
East Bank	Low	7	377.6	171.6	39504.7	21058.7	20.7	2.8	2.05	0.21
	High	38	283.9	52.6	23353.2	3492.6	21.2	0.5	2.06	0.06
	Overall	45	298.5	51.2	25865.7	4341.4	21.1	0.6	2.06	0.06
West Bank	Low	3	495.0	292.7	40362.3	22075.5	26.3	1.3	2.05	0.48
	High	27	461.6	105.5	51349.6	12598.3	25.3	0.7	1.95	0.10
	Overall	30	464.9	97.9	50250.9	11480.5	25.4	0.6	1.96	0.10
FGB All	Low	10	412.8	140.6	39762.0	15474.4	22.4	2.1	2.05	0.19
	High	65	357.7	54.2	34982.5	5820.7	22.9	0.5	2.02	0.05
	Overall	75	365.1	50.3	35619.8	5414.2	22.8	0.5	2.02	0.05

Habitat

Benthic composition data were collected at 75 sites and some information summarized below. Detailed methods can be found at:

http://ccma.nos.noaa.gov/ecosystems/coralreef/reef_fish/protocols.html

- ❖ Coral cover according to relief strata seemed appropriate on East Bank; however, coral cover in low relief habitats on West Bank appears high. Only 3 samples were taken with high variability and some of the sites seemed to be in a transition between high and low relief.
- ❖ Moderate bleaching was observed throughout the sanctuary:
 - 57 of 75 (76%) stations exhibited signs of bleaching but on average only 5% of coral cover
 - 8 of 26 coral species identified in transects displayed no signs of bleaching. Of those that did, most of the cover was not bleached. The most impacted species were *Madracis decactis*, *Montastraea annularis* and *M. cavernosa*.

Location	Relief	Number of surveys	% coral cover/100 m ²		% macroalgae cover/100 m ²		% sponge cover/100m ²		% fire coral cover/100m ²	
			Mean	SE	Mean	SE	Mean	SE	Mean	SE
East Bank	Low	7	12.5	5.2	72.7	7.7	2.1	0.5	2.14	0.74
	High	38	60.6	2.6	31.1	2.3	0.6	0.1	0.65	0.18
	Overall	45	53.1	3.5	37.6	3.2	0.8	0.1	0.88	0.20
West Bank	Low	3	39.5	11.6	34.1	4.6	2.2	1.6	3.46	1.20
	High	27	50.5	3.3	38.9	3.6	1.7	0.5	0.68	0.22
	Overall	30	49.4	3.2	38.4	3.2	1.7	0.5	0.96	0.27
FGB All	Low	10	20.6	6.2	61.2	8.0	2.2	0.5	2.53	0.63
	High	65	56.4	2.1	34.3	2.1	1.0	0.2	0.66	0.14
	Overall	75	51.6	2.5	37.9	2.3	1.2	0.2	0.91	0.16

Figure 1a. Scuba surveys-East Bank

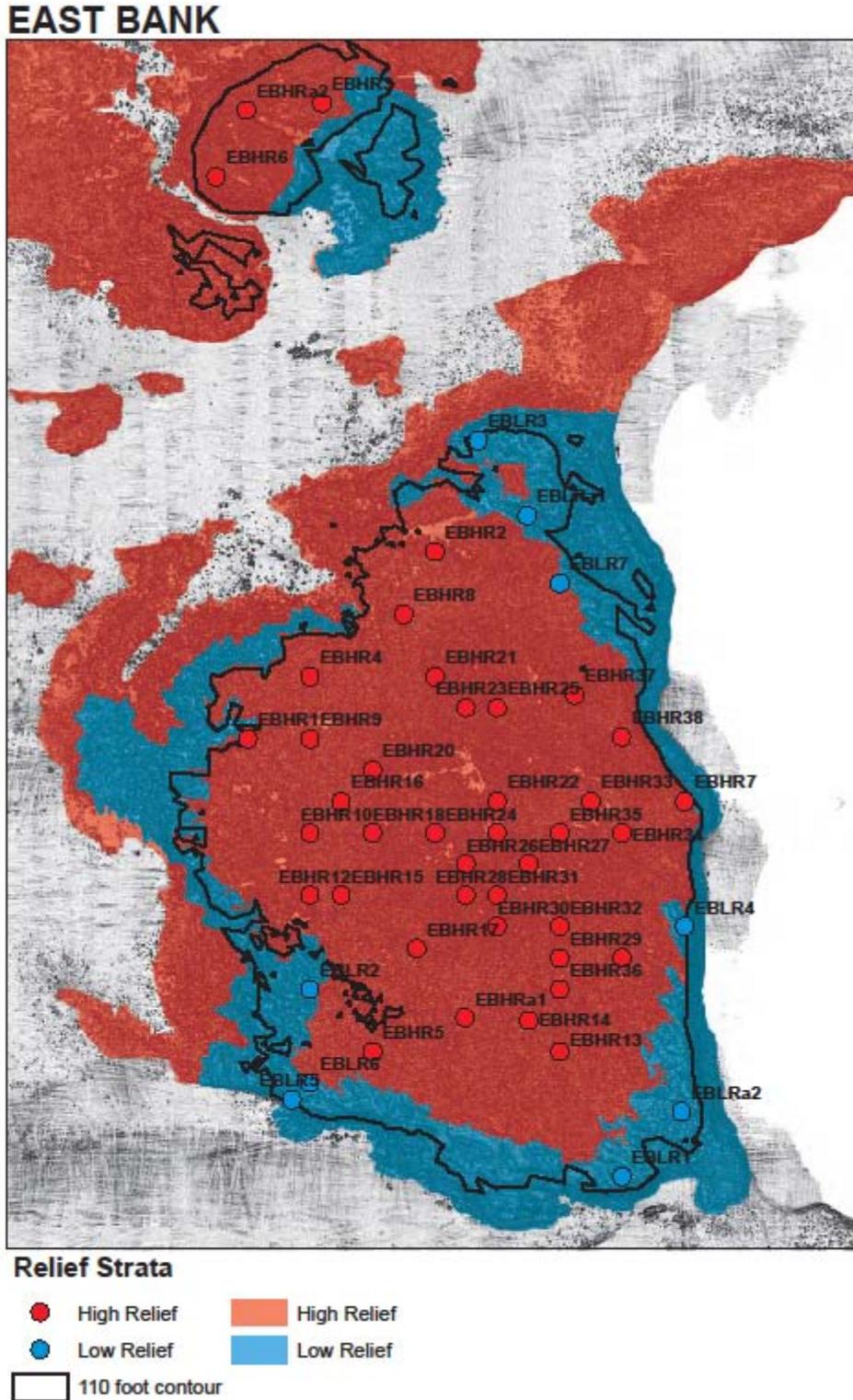


Figure 2a. Proposed and actual acoustic data collection on East Bank. Boxes with dots indicate ship tracklines of acoustic data collection.

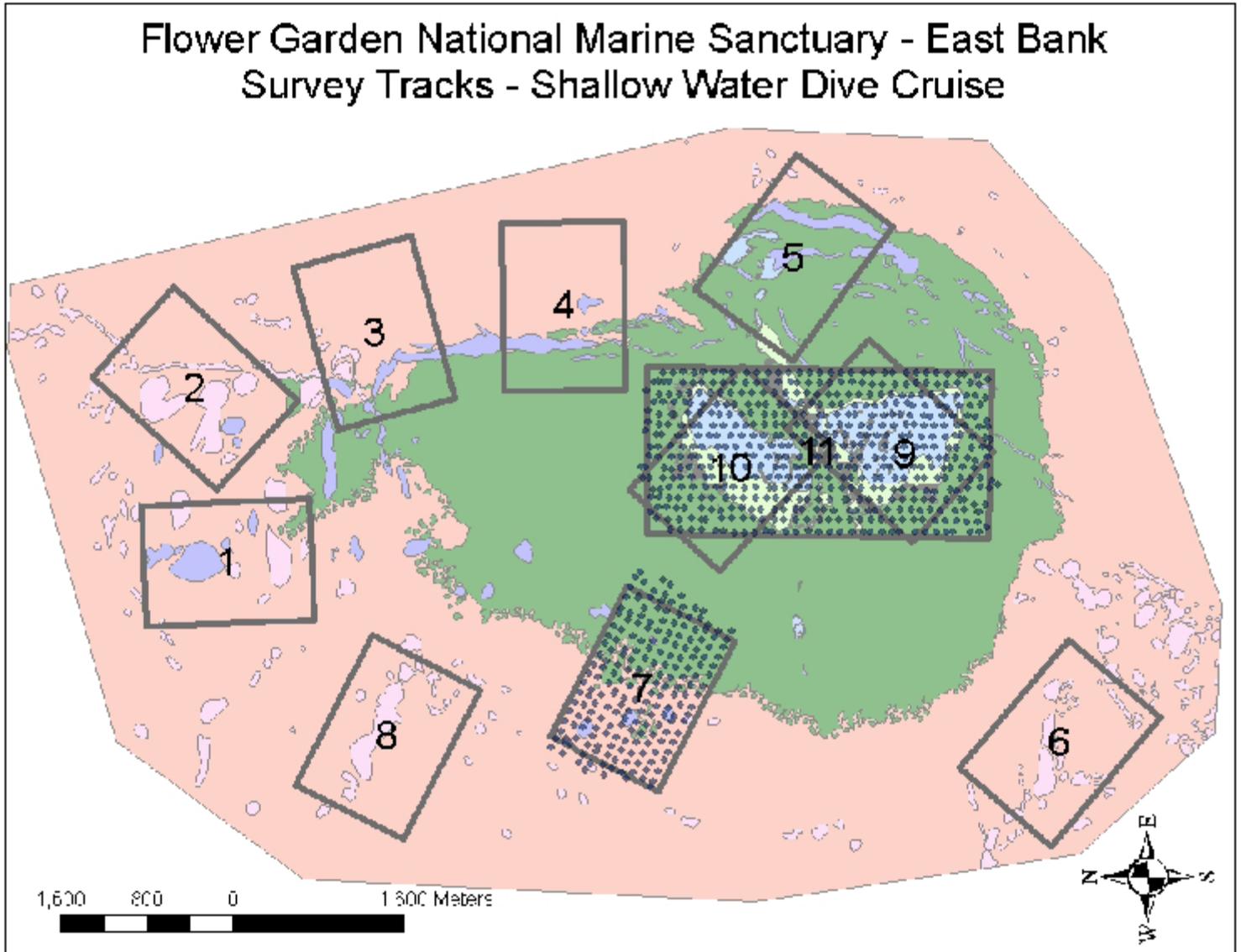
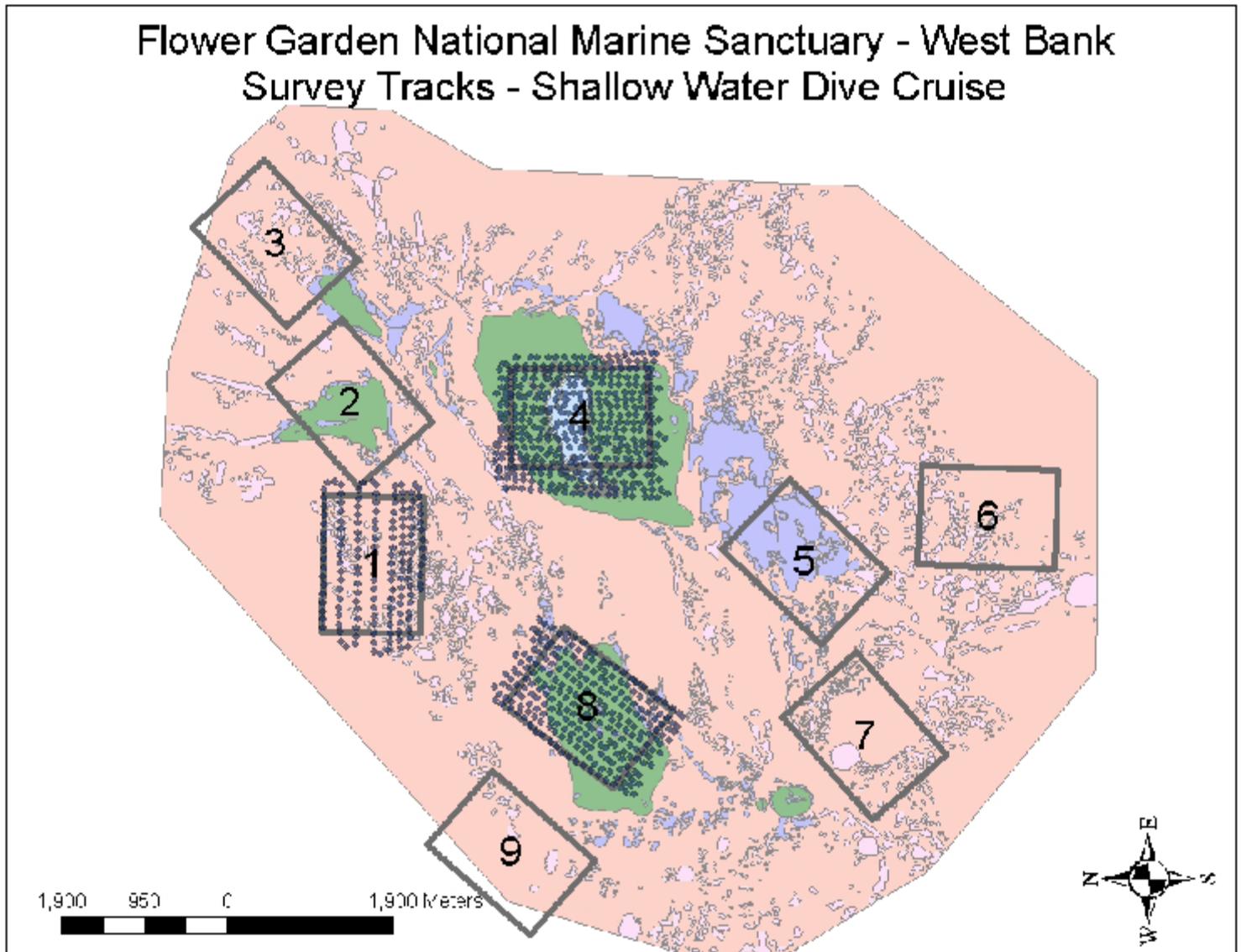


Figure 2b. Proposed and actual acoustic data collection on West Bank. Boxes with dots indicate ship tracklines of acoustic data collection.



Events of Note:

- ❖ Since the cruise finished up early the Manta was able to maneuver for a dive at the rig in the sanctuary and a dive at Stetson Bank on the way back to Galveston.
- ❖ Lionfish were spotted at Sonnier Bank the same week.

Cruise Diving Team:

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