Mission Report

NOAA/NOS/NCCOS/CCMA/Biogeography Team

October 30 – November 10, 2006

Characterization and monitoring of reef fish populations within and around Buck Island Reef National Monument, USVI:
A cooperative investigation between NOAA, the National Park Service, and the Virgin Islands Department of Planning and Natural Resources

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National Ocean Service
National Centers for Coastal Ocean Science
Center for Coastal Monitoring and Assessment
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Silver Spring, MD 20910

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Mission Purpose:

The intent of this field mission was to continue ongoing efforts: (1) to spatially characterize the distribution, abundance and size of both reef fishes and conch within and around the waters of Buck Island Reef National Monument (BUIS) and the East End Marine Park (EEMP) of St. Croix, (2) to correlate this information to *in-situ* data collected on associated habitat parameters, (3) to use this information to establish the knowledge base necessary for enacting management decisions in a spatial setting and to establish the efficacy of those management decisions.

Information collected thus far is being extensively utilized by NOAA, NPS, DPNR and others. Examples include NPS' use of NOAA-produced habitat maps in monitoring efforts; The Ocean Conservancy's use of maps and fish data in efforts to assist EEMP with zonation designations within the Park; USGS/University of Miami's and NOVA Southeastern University's use of habitat maps for cryptic fish inventories. Information is also used to develop protocols for NPS, detailing how, where, and when to monitor nearshore fish assemblages, and by NOAA Coral Reef Watch to characterize and monitor the spatial extent of coral bleaching and recovery within U.S. Caribbean coral reef ecosystems. The data collected will aid NPS managers in understanding and making informed decisions regarding the resources of the South Florida / Caribbean Network.

Operational Accomplishments:

- 124 sites were surveyed within the study area (Figure 1), and information on fish distribution, abundance and size (Table 1), benthic habitat composition (Table 2), bleaching, and conch abundance and distribution was collected. The project team consisted of 3 NPS and 7 NOAA scientific divers. NPS and NOAA dive logs were maintained.

- Two NPS boats were used each day of the mission.

- Air and Nitrox (32 %) tanks were used during this mission.

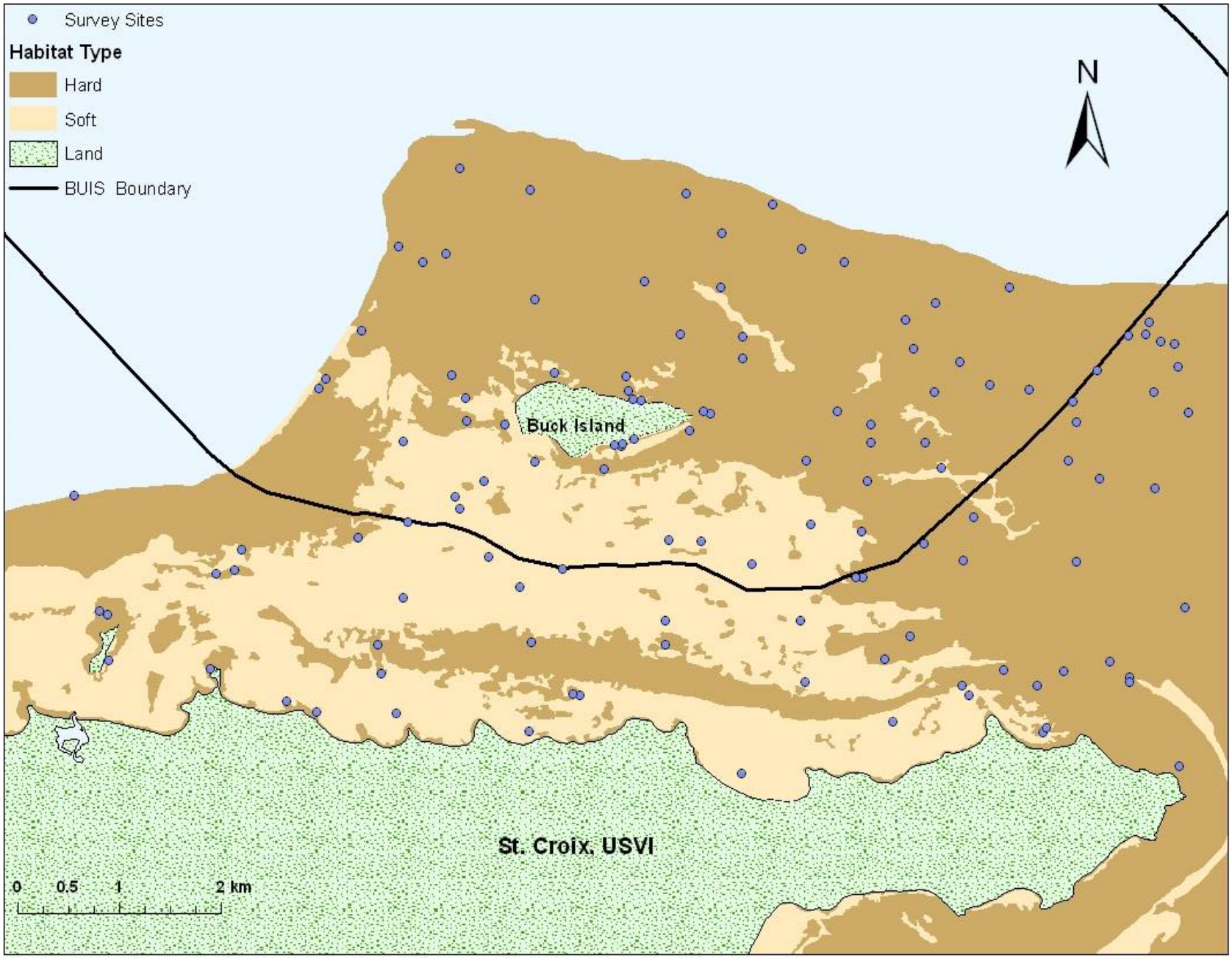


Figure 1. Map of Buck Island Reef National Monument detailing the benthic composition and selected survey points sampled during the October - November 2006 mission.

Summary of Surveys:

Fish

- Fish species abundance, size and distribution were characterized using the belt transect survey method (http://biogeo.nos.noaa.gov/projects/reef_fish/protocols.shtml) at 124 sites. The data are summarized in table 1.

Table 1. Fish abundance, richness and biomass (all per 100m^2). Data are from the Oct – Nov 2006 St. Croix mission.

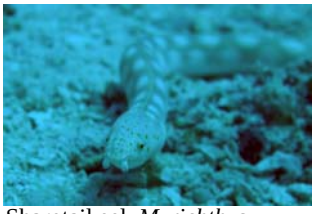
Location	Habitat Type	Number of Surveys	# indiv / 100m^2		Biomass (g) / 100m^2		# species /100m^2		Mean Diversity*	
			Mean	(± SE)	Mean	(± SE)	Mean	(± SE)	Mean	(± SE)
Inside	Hard	51	214.45	14.37	5597.88	949.29	18.1	0.6	1.95	0.05
	Soft	10	72.70	39.08	2604.46	1755.39	5.7	1.0	1.00	0.19
	OVERALL	**61**	**181.78**	**10.59**	**4907.94**	**655.38**	**15.21**	**0.38**	**1.73**	**0.04**
Outside	Hard	42	223.17	23.36	3738.72	458.83	18.1	0.8	2.00	0.06
	Soft	21	87.52	23.14	3618.57	1484.38	6.8	1.3	1.05	0.16
	OVERALL	**63**	**159.34**	**15.06**	**3682.19**	**350.56**	**12.76**	**0.52**	**1.56**	**0.04**
Both	Hard	93	218.23	9.00	4791.91	390.87	18.07	0.32	1.97	0.05
	Soft	31	82.99	14.81	3308.48	879.52	6.44	0.70	1.04	0.17
	OVERALL	**124**	**169.97**	**6.24**	**4262.51**	**311.86**	**13.92**	**0.27**	**1.64**	**0.03**

*Shannon Diversity Index

Redspotted hawkfish, *Amblycirrhitus pinos*

Spotted scorpionfish, *Scorpaena plumieri*

Longfin damelfish, *Stegastes diencaeus*



Sharptail eel, *Myrichthys breviceps*

Habitat

- Benthic composition data were collected at 124 sites for characterization. Detailed methodology can be found at http://biogeo.nos.noaa.gov/projects/reef_fish/protocols.shtml. Hard bottom benthic composition data are summarized in table 2. Data for only hard bottom sites are provided due to the lack of corals, gorgonians and sponges on soft bottom sites.

Table 2. Average percent cover of habitat types for 93 hardbottom sites for Oct – Nov 2006 St. Croix mission.

Location	Number of Surveys	% Coral / 100m^2		% Macroalgae / 100m^2		% Turf-crustose/100m^2		% Gorgonian / 100m^2		% Sponge / 100m^2	
		Mean	(± SE)	Mean	(± SE)	Mean	(± SE)	Mean	(± SE)	Mean	(± SE)
Inside	51	3.45	0.78	16.16	2.80	21.91	3.87	2.86	0.51	1.44	0.36
Outside	42	1.34	0.33	12.22	1.57	40.11	5.43	0.50	0.12	1.52	0.26
Both	**93**	**2.54**	**0.31**	**14.45**	**1.19**	**29.80**	**2.26**	**1.84**	**0.19**	**1.48**	**0.17**

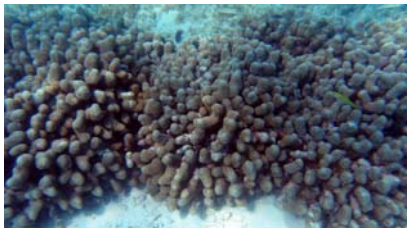
Conch

- A total of 32 conch, *Strombus gigas*, were observed during hard and soft-site transects on this mission. Of the 32 conch observed, 16 immature and 9 mature conch were recorded inside BUIS. Outside BUIS, 5 immature and 2 mature conch were recorded.

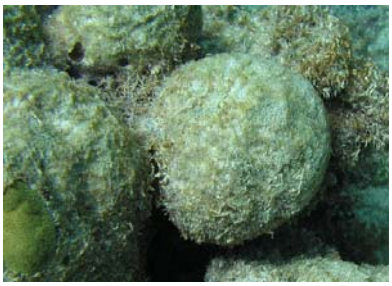
Events of Note:

- Two fish were recorded in transects for the first time during the October 2006 mission:
    - Saucereye porgy, *Calamus calamus*
    - Scrawled cowfish, *Acanthostracion quadricornis*

- A large colony of finger coral, *Porites porites*, was seen on the north shore of Buck Island.



- Divers observed a thick coating of some type of algae (cyanobacteria suggested) over most of the algae and turf algae in Buck Lagoon.



- There were some clusters of milk conch (*Strombus costatus*) along a transect on one of the dives. Egg masses were visible on several of those conch.

- During this mission, divers were joined by a pod of dolphins on three different dives and an individual dolphin during another dive. The individual dolphin has been seen a couple of times over the past few missions, inquisitive and sometimes playful, and has become a reoccurring dive buddy.

- Divers participated in Halloween during this mission. Halloween fell on the 2nd day of the mission.

Logistics of Note:

- The required number of sites was completed despite the rough seas and uncooperative weather.
- The boat and diver assignments were more complex during this mission than previous missions. Two divers participated in the full two weeks of the mission, while the other divers participated for one week.
- One of the NPS research boats was out of commission for one day and the park ranger boat was used in its place.
- As with previous missions, divers assisted in the release of hawksbill (*Eretmochelys imbricata*) and green (*Chelonia mydas*) sea turtle hatchlings from the NPS boat.