2004 US Virgin Islands Reef Check Surveys

Jennifer Messineo

and

Jason Vasques

Division of Fish and Wildlife
Department of Planning and Natural Resources
U. S. Virgin Islands

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INTRODUCTION

The Division of Fish and Wildlife operates a grant to assess recreational fisheries habitat in the US Virgin Islands. As part of that project DFW utilized the Reef Check protocol to survey habitat, invertebrates, and fish assemblages at three sites around St. Thomas, US Virgin Islands. The Reef Check program is a global volunteer program designed to provide public education and raise awareness of the status of the world's reefs through the biological monitoring of key reef species. The Reef Check program provides a broad assessment of reefs which may be repeated annually for monitoring purposes. For more information on the Reef Check program see Hodgson, *et al.* (2003) or the Reef Check website at http://www.reefcheck.org. The data collected in this study was sent to the Reef Check Foundation for inclusion in their world database.

METHODS AND SITE SELECTION

Great Bay- On 11 September 2004, two transects were surveyed in Great Bay, St. Thomas. The Great Bay transects were previously surveyed by Vasques (2003) and Volson (2001). Volson (2001) however, used a slightly different survey method. This site was selected not only because it had been surveyed in the past but also because it is a nearshore reef that may be influenced by anthropogenic impacts. The site lies within the St. James Marine Reserve and therefore, fishing activities are restricted. The only fishing activities allowed are the capture of bait ad fishing by the use of hook and line, however, a permit must be obtained to fish. Volson's (2001) transects 19 and 20 ran parallel to a linear reef. The transects were found by using coordinates reported in Volson (2001) and finding the concrete blocks with PVC pipes left by that study. Transect 19 was at a depth of 6.5 m and transect 20 was at a depth of 8.5 m. Appendix 1 is the site description and coordinates for transects 19 and 20 (from Volson 2001) as provided for Reef Check.

Grass Cay- On 25 September 2004, two transects were completed at one site off Grass Cay, to the northeast of St. Thomas. This is an offshore cay with no human residential population and is probably little affected by development and industry on St. Thomas. There is however, commercial fishing and recreational diving around the cay (see Appendix 2 for the site description and coordinates). The reef at Grass Cay is a linear reef that is protected from north swells and has limited protection from southeast swells. The deep transect was at a depth of 16.2 m while the shallow transect ran parallel to the deep transect at a depth of 8.2 m. The shallow transect began at a mooring anchor (coordinates provided in Appendix 2) and followed a heading of approximately 120°. Both transects followed a contour parallel to the linear reef. The deep transect was located ~210° from the mooring at a depth of 16.2 m and also followed a heading of approximately 120°.

Coculus Rocks- On 25 September 2004, one transect was completed at Coculus Rocks, a small rocky outcrop colonized by coral in Benner Bay on the southeast end of St. Thomas. This site has not been surveyed before under this project, but appears to have been surveyed, due to the presence of underwater stakes and submerged floats, by another agency. This transect utilized

the already present markers. This transect began on the easternmost submerged point and ran west along the northern side following the underwater markers. This site lies within the Cas Cay/ Mangrove Lagoon Marine Reserve and therefore, fishing activities are prohibited except the capture of bait. The site is exposed to south and southeast swells. The reef at Coculus Rocks is shallow and only one transect could be completed. It was at a depth of 6.4 m (coordinates and site description provided in Appendix 3).

Survey methods- At all sites the Reef Check protocol was used (see Hodgson, *et al.*, 2003 for Reef Check methods). This protocol was slightly modified to better fit the US Virgin Islands needs. Modifications included a higher species resolution in the substrate surveys and the addition of key species of fish and invertebrates that are important to the USVI. During substrate surveys organisms were identified to the lowest taxa possible. In the case of the *Montastraea* complex, only two distinctions were made; *M. annularis* and *M. cavernosa*. *M. annularis* may include *M. annularis*, *M. franksi*, and *M. faveolata*. Additional key fishes included; angelfishes, queen triggerfish, hamlets, and species level identification of all grouper with size estimates for grouper. Two transects were conducted at each site, except Coculus Rocks, as explained above.

RESULTS AND DISCUSSION

Great Bay- Tables 1 and 2 list the results of the substrate surveys conducted in Great Bay at Volson's (2001) transects 19 and 20. Sand was most prevalent in transect 19 while most of transect 20 was rock/dead coral. Hard coral only accounted for 9% of transect 19 and 23% of transect 20. In each transect, the most prominent corals were *Montastraea annularis* and *Porites astreoides* (Table 2). The last segment of transect 19 contained one coral colony that showed signs of bleaching. Coral bleaching also occurred in each of the four segments of transect 20. However, less than 10% of each colony in each segment was bleached. In addition, one coral colony showed anchor damage in the last segment of transect 20. Great Bay is the site of a large hotel with numerous water activities; therefore, there is a high potential for coral damage by tourist activities.

The densities of key indicator species are presented in Table 3 for fish and invertebrates. The most abundant fish for transects 19 and 20 were hamlets and snapper, respectively. One grouper was observed in transect 19: a red hind with TL 20 cm. Four grouper were observed in transect 20: two *Epinephelus guttatus* (25 and 50 cm TL), one *Cephalopholis fulva* (20 cm TL) and one *C. cruentatus* (25 cm TL). Gorgonians dominated most of the invertebrate counts along both transects. Due to diver error, pencil urchins were misidentified. Thus a conservative estimate of pencil urchin abundance was used based on previous years (Vasques 2003) and on other divers' observations.

Grass Cay- The results of the substrate transects at Grass Cay are presented in Tables 4 and 5. Within the transects there was a considerable amount of live coral cover with *Montastraea annularis* being the most prominent (Table 5). Hard coral coverage for both transects was 50% of the possible 160 point counts. The shallow transect showed limited signs of bleaching with 1-3% of the corals in three of the four 20 m survey segments exhibited bleaching. All four survey

segments of the deep transect showed minimal bleaching; from less than 1% to 2% of the colonies in each segment. Black band disease was observed on one colony of *Montastraea annularis* in the deep transect. Only one colony was damaged by means other than bleaching; however, the mode of damage was not obvious. This area has a small mooring field and experiences moderate use by recreational divers and dive operations. The site has a potential to be damaged by anchors and/or careless divers.

The results of key indicator species surveys for fish and invertebrates are presented in Table 6. The most abundant fish across the shallow transect were parrotfish. Snapper were the most abundant across the deep transect. Two grouper were encountered in the deep transect. Both were red hind approximately 15 and 20 cm TL. Again, pencil urchins were misidentified due to diver error and were subsequently removed from the analysis in Table 6.

Coculus Rocks- Tables 7 and 8 summarize the results of the substrate survey at Coculus Rocks. Hard corals accounted for 40% of the point counts; however, no single coral species was especially dominant. Nearly 30% of the entire transect was rock. Two colonies displayed signs of bleaching, one in the each of the last two 20 m transect segments. In both cases, approximately 25% of each colony was bleached. A small amount of coral damage of unknown origin was observed in the last segment. Ecotours sometimes use Coculus Rocks as a snorkel site. This may increase the potential for damage.

Table 9 presents the densities of key indicator species surveys for fish and invertebrates. Parrotfish were the most abundant fish within the transect. No grouper were observed. The invertebrate count was dominated by gorgonians.

The substrate codes used throughout the tables can be found in Appendix 4.

LITERATURE CITED

Hodgson, G., Maun, L., and Shuman, C. 2003. Reef Check Survey Manual for Coral Reefs of the Indo Pacific, Hawaii, Atlantic/Caribbean, Red Sea and Arabian Gulf. Reef Check, Institute of the Environment, University of California Los Angeles, CA. 33p.

Vasques, J. 2003. 2003 U.S. Virgin Islands Reef Check Surveys. Division of Fish and Wildlife, Department of Planning and Natural Resources, USVI. 7 pp.

Volson, B. 2001. Benthic Habitat Assessment Project. Division of Fish and Wildlife, Department of Planning and Natural Resources, USVI. Final Report F-7. 115 pp.

Table 1. 2004 substrate composition for Great Bay transects 19 and 20 using Reef Check categories, mean count of each category over four 20 m segments and mean percent coverage per 20 m segment.

	Transect 19		Transect 20	
Substrate category*	**Mean count ± SD**	**Mean % coverage ± SD**	**Mean count ± SD**	**Mean % coverage ± SD**
Hard coral	3.75 ± 0.50	9.4 ± 0.01	9 ± 1.83	22.5 ± 0.05
Soft coral	0.25 ± 0.50	0.60 ± 0.01	1.25 ± 1.89	3.1 ± 0.05
Recently killed coral	0 ± 0.0	0 ± 0.0	0 ± 0.0	0 ± 0.0
Nutrient indicator algae	1.0 ± 1.41	2.5 ± 0.04	1.25 ± 0.96	3.1 ± 0.02
Sponges	0 ± 0	0 ± 0.0	0 ± 0.0	0 ± 0.0
Rock (dead coral)	11.0 ± 5.94	27.5 ± 0.15	13.75 ± 4.11	34.4 ± 0.10
Rubble	3.75 ± 3.86	9.4 ± 0.10	8.25 ± 1.26	20.6 ± 0.03
Sand	20.25 ± 7.18	50.6 ± 0.18	6.25 ± 4.27	15.6 ± 0.11
Silt/clay	0 ± 0.0	0 ± 0.0	0 ± 0.0	0 ± 0.0
Other	0 ± 0.0	0 ± 0.0	0 ± 0.0	0 ± 0.0

*Substrate categories are according to the Reef Check protocol, see http://www.reefcheck.org for the survey manual and details. Higher resolution data was also collected (see Table 2).

Table 2. 2004 substrate composition to species level for Great Bay in transects 19 and 20 (based on four 20 m segments).

	Transect 19		Transect 20	
Category*	Count	Percent of transect	Count	Percent of transect
AC				
AP				
AGAG	2	1	3	2
AGTE				
CN				
DCA	42	27	54	35
DC				
DIST				
DL				
DS	1	1	2	1
ERY	1	1	2	1
EF				
GV				
MILALC	1	1		
MA	3	2	8	5
MC	1	1	1	1
MYLA				
NIA	4	3	5	3
OT				
PA	3	2	6	4
PP	1	1	5	3
PSEUDO				
RKC				
RC			14	9
RB	15	9	33	21
SD	80	51	25	16
SR	1	1		
SS	2	1	3	2
SI				
SC			2	1
SP	1	1	7	4
HC				

* Substrate codes are listed in Appendix IV

Table 3. 2004 mean density per 20 m segment of key species at Great Bay transects 19 and 20

	Transect 19	Transect 20
Fish	**Mean no./(20m segment) ± SD**	**Mean no./(20m segment) ± SD**
Butterfly fish	0 ± 0.0	1.75 ± 1.71
Grunts and Margates	0.25 ± 0.5	4.25 ± 2.22
Snapper	0.5 ± 0.58	7.0 ± 5.94
Nassau grouper	0 ± 0.0	0 ± 0.0
Grouper	0.25 ± 0.5†	1 ± 8.2*
Hamlets	0.75 ± 0.5	3.25 ± 2.75
Parrotfish	0.25 ± 0.5	2.0 ± 2.45
Angelfish	0.25 ± 0.5	2.5 ± 4.36
Queen triggerfish	0 ± 0.0	0 ± 0.0
Moray eel	0.25 ± 0.5	0 ± 0.0
Invertebrates		
Banded coral shrimp	0. ± 0.0	1 ± 0.82
Diadema urchin	0.5 ± 0.58	2.25 ± 0.96
Pencil urchin	0.5 ± 1.0	0.75 ± 1.50
Triton shell	0 ± 0.0	0 ± 0.0
Flamingo tongue	0. ± 0.0	0 ± 0.0
Gorgonian	19.5 ± 4.51	7.5 ± 11.12
Sea egg (Tripneustes)	0 ± 0.0	0 ± 0.0
Lobster	0 ± 0.0	0 ± 0.0

† Grouper were *Epinephelus guttatus*

* Grouper were *Epinephelus guttatus* and *Cephalopholis fulva*

Table 4. 2004 substrate composition for Grass Cay shallow and deep transects using Reef Check categories mean count of each category over four 20 m segments and mean percent coverage per 20 m segment.

	Shallow Transect (Depth = 8.2m)		Deep Transect (Depth = 16.2m)	
Substrate category*	**Mean count ± SD**	**Mean % coverage ± SD**	**Mean count ± SD**	**Mean % coverage ± SD**
Hard coral	20 ± 4.16	50 ± 0.10	19.75 ± 3.3	49.4 ± 0.08
Soft coral	1.75 ± 2.22	4.4 ± 0.06	2.25 ± 1.26	5.6 ± 0.03
Recently killed coral	0 ± 0.0	0 ± 0.0	0 ± 0.0	0 ± 0.0
Nutrient indicator algae	2 ± 0.82	5 ± 0.02	0.75 ± 0.5	1.9 ± 0.01
Sponges	0.5 ± 0.58	1.3 ± 0.01	0.5 ± 0.58	1.3 ± 0.01
Rock (dead coral)	8.25 ± 1.71	20.6 ± 0.04	7.25 ± 1.71	18.1 ± 0.04
Rubble	0.5 ± 0.58	1.3 ± 0.01	2.25 ±1.71	5.6 ± 0.04
Sand	7 ± 1.83	17.5 ± 0.05	7.25 ± 1.89	18.1 ± 0.05
Silt/clay	0 ± 0.0	0 ± 0.0	0 ± 0.0	0 ± 0.0
Other	0 ± 0.0	0 ± 0.0	0 ± 0.0	0 ± 0.0

*Substrate categories are according to the Reef Check protocol, see http://www.reefcheck.org for the survey manual and details. Higher resolution data was also collected (see Table 5).

Table 5. 2004 substrate composition to species level for Grass Cay shallow and deep transects (based on four 20 m segments).

Shallow transect				
Category*	**Count**	**Percent of transect**	**Count**	**Percent of transect**
AC	7	4	1	1
AP				
AGAG	2	1	4	3
AGTE	4	3		
CN	1	1		
DCA	23	14.4	24	15
DC	1	1	2	1
DIST				
DL	1	1		
DS	1	1	3	2
ERY	1	1	1	1
EF	1	1		
GV	4	3	4	3
MILALC	2	1	1	1
MA	40	25	51	32
MC			4	3
MYLA	1	1		
NIA	8	5	3	2
OT				
PA	8	5	5	3
PP	8	5	5	3
PSEUDO	1	1	2	1
RKC				
RC	3	2	5	3
RB	2	1	9	6
SD	28	18	29	18
SR	1	1	1	1
SS	2	1	1	1
SI				
SC	1	1	2	1
SP	2	1	2	1
HC			1	1

* Substrate codes are listed in Appendix IV

Table 6. 2004 density of key species at Grass Cay transects

	Shallow transect	Deep transect
Fish	**Mean no./(20m segment) ± SD**	**Mean no./(20 m segment) ± SD**
Butterfly fish	0 ± 0.0	0.75 ± 0.96
Grunts and Margates	0.75 ± 0.96	1.25 ± 2.50
Snapper	0.25 ± 0.5	5.5 ± 10.34
Nassau grouper	0 ± 0.0	0 ± 0.0
Grouper	0 ± 0.0	0.5 ± 1.0[†]
Hamlets	0.5 ± 0.58	1.75 ± 1.26
Parrotfish	1 ± 0.82	0.5 ± 0.58
Queen Triggerfish	0 ± 0.0	0 ± 0.0
Angelfish	0 ± 0.0	0 ± 0.0
Moray eel	0 ± 0	0 ± 0.0
Invertebrates		
Banded coral shrimp	0 ± 0.0	0 ± 0.0
Diadema urchin	0 ± 0.0	0 ± 0.0
Pencil urchin*	N/A	N/A
Triton shell	0 ± 0.0	0.25 ± 0.5
Flamingo tongue	0.25 ± 0.5	0 ± 0.0
Gorgonian	23.25 ± 9.88	39 ± 5.23
Sea egg (Tripneustes)	0 ± 0.0	0 ± 0.0
Lobster	0 ± 0.0	0 ± 0.0

[†] Grouper were *Epinephelus guttatus*

*Due to diver error pencil urchins were not included at this site

Table 7. 2004 substrate composition for Coculus Rocks transect using Reef Check categories mean count of each category over four 20 m segments and mean percent coverage per 20 m segment.

Shallow (Depth = 6.4m)		
Substrate category	**Mean count ± SD**	**Mean % coverage ± SD**
Hard coral	16 ± 2.58	40 ± 0.06
Soft coral	2.75 ± 0.96	6.9 ± 0.02
Recently killed coral	0 ± 0.0	0 ± 0.0
Nutrient indicator algae	2.25 ± 1.5	5.6 ± 0.04
Sponges	1.25 ± 0.96	3.1 ± 0.02
Rock (dead coral)	11.75 ± 3.3	29.4 ± 0.08
Rubble	2.25 ± 1.5	5.6 ± 0.04
Sand	3.75 ± 1.5	9.4 ± 0.04
Silt/clay	0 ± 0.0	0 ± 0.0
Other	0 ± 0.0	0 ± 0.0

*Substrate categories are according to the Reef Check protocol, see http://www.reefcheck.org for the survey manual and details. Higher resolution data was also collected (see Table 8).

Table 8. 2004 substrate composition to species level for Coculus Rocks transect (based on four 20 m segments).

Shallow transect		
Category*	**Count**	**Percent of transect**
AC		
AP		
AGAG	1	1
AGTE	1	1
CN		
DCA	12	8
DC		
DIST	3	2
DL		
DS	5	3
ERY	6	4
EF		
GV	3	2
MILALC	6	4
MA	5	3
MC	12	8
MYLA		
NIA	9	6
OT		
PA	8	5
PP	9	6
PSEUDO	1	1
RKC		
RC	35	22
RB	9	6
SD	15	9
SR	4	3
SS	9	6
SI		
SC	1	1
SP	5	3
HC	1	1

* Substrate codes are listed in Appendix IV

Table 9. 2004 density of key species at Coculus Rocks transect

Shallow transect	
Fish	**Mean no./(20m segment) ± SD**
Butterfly fish	0.25 ± 0.5
Grunts and Margates	0 ± 0.0
Snapper	0.25 ± 0.5
Nassau grouper	0 ± 0.0
Grouper	0 ± 0.0
Hamlets	0.5 ± 0.58
Parrotfish	1.25 ± 0.96
Queen Triggerfish	0 ± 0.0
Angelfish	0 ± 0.0
Moray eel	0 ± 0
Invertebrates	
Banded coral shrimp	0 ± 0.0
Diadema urchin	0.75 ± 0.96
Pencil urchin	0.75 ± 0.96
Triton shell	0 ± 0.0
Flamingo tongue	2.25 ± 2.63
Gorgonian	44.25 ± 5.56
Sea egg (Tripneustes)	0 ± 0.0
Lobster	0 ± 0.0

Appendix I

Reef Check
Site Description Sheet

Site name: Great Bay Transects 19 and 20

BASIC INFORMATION

Country: United States Virgin Islands State/Province: St. Thomas City/town:

Date: 11-Sep-04 Time: Start of survey: 12:30 End of survey: 13:45

Latitude (deg. min. sec): 18d 19.252'N Longitude (deg. min. sec): 64d 50.137'W N end of transect

From chart or by GPS? (If GPS, indicate units): chart ____ GPS __x__ GPS units: ____ddd mm.mmm_____

Orientation of transect: N-S ____ E-W __x__ NE-SW ____ SE-NW ____

Temperature (in degrees C): air: _____C surface: _____C at 3m: _____C at 10m: _____C

Distance from shore (m): 300 from nearest river (km): NA

River mouth width: <10 m _____ 11-50 m _____ 51-100 m _____ 101-500 m _____

Distance to nearest population center (km): <1km Population size (x1000): 2-3

Weather: sunny x cloudy _____ raining _____

Visibility (m) : 15-20

Why is this site selected: as comparisson to previous year Is this best reef in the area? Yes: x No : _____

IMPACTS:

Is this site:	Always sheltered: x	Sometimes: _____		Exposed: _____
Major coral damaging storms	Yes: x	No _____	If yes,	When was last storm: 1999

Overall anthropogenic impact	None: _____	Low: _____	Med: x	High: _____
Is siltation a problem	Never: _____	Occasionally: _____	Often: x	Always: _____
Blast fishing	None: x	Low: _____	Med: _____	High: _____
Poison fishing	None: x	Low: _____	Med: _____	High: _____
Aquarium fishing	None: x	Low: _____	Med: _____	High: _____
Harvest inverts for food	None: _____	Low: x	Med: _____	High: _____
Harvest inverts for curio sales	None: x	Low: _____	Med: _____	High: _____
Tourist diving/snorkeling:	None: _____	Low: _____	Med: _____	High: x
Sewage pollution (outfall or boat)	None: _____	Low: x	Med: _____	High: _____
Industrial pollution	None: x	Low: _____	Med: _____	High: _____
Commercial fishing (fish caught to sell for food)	None: _____	Low: x	Med: _____	High: _____
Live food fish trade	None: x	Low: _____	Med: _____	High: _____
Artisinal/recreational (personal consumption)	None: _____	Low: x	Med: _____	High: _____
How many yachts are typically present within 1km of this site	None: _____	Few (1-2): _____	Med (3-5): _____	Many (>5): x

Other impacts: Development from hotels / residence runoff

PROTECTION:

Any protection (legal or other) at this site?	Yes: x	No: _____	If yes, answer questions below	
Is protection enforced	Yes: _____	No: x		
What is the level of poaching in protected area?	None: _____	Low: x	Med: _____	High _____

Check which activities below are banned:

Spearfishing	x
Commercial fishing	x
Recreational fishing	x hook and line permitte
Invertebrate or shell collecting	x
Anchoring	_____
Diving	_____
Other (please specify)	_____

Other comments: hing is low in this bay due to its proximity to hotels but is moderate to high <1km away in same South end of transect 18d 19.263'N - 64d 50.186'W

TEAM INFORMATION

Submitted by: sques, Jason and Messineo, Jenni

Regional Coordinator:	Vasques, Jason
Team Leader:	Messineo, Jennifer
Team Scientist:	Vasques, Jason
Team Members:	Platenberg, Renata
	Sjoken, Ron

Appendix II.

Reef Check
Site Description Sheet

Site name: Grass Cay

BASIC INFORMATION

Country: United States Virgin Islands State/Province: St. Thomas City/town:

Date: 25-Sep-04 Time: Start of survey: 13:11 End of survey: 14:40

Latitude (deg. min. sec): 18d 21.451' N Longitude (deg. min. sec): 64d 49.865' W

From chart or by GPS? (If GPS, indicate units): chart ____ GPS __x__ GPS units: ____ddd mm.mmm____

Orientation of transect: N-S____ E-W__x__ NE-SW____ SE-NW____

Temperature (in degrees C): air: _____C surface: _____C at 3m: _____C at 10m: _____C

Distance from shore (m): 188 from nearest river (km): NA

River mouth width: <10 m _____ 11-50 m _____ 51-100 m _____ 101-500 m _____

Distance to nearest population center (km): 3.3 Population size (x1000): 3-5

Weather: sunny x _____ cloudy _____ raining _____

Visibility (m) : 30

Why is this site selected: to provide comparisson to MPA :Is this best reef in the area? Yes: x _____ No : _____

IMPACTS:

Is this site:	Always sheltered: x		Sometimes:				Exposed:		
Major coral damaging storms	Yes: x		No		If yes,		When was last storm:	1999	
Overall anthropogenic impact	None:		Low:		Med: x		High:		
Is siltation a problem	Never:		Occasionally: x		Often:		Always:		
Blast fishing	None: x		Low:		Med:		High:		
Poison fishing	None: x		Low:		Med:		High:		
Aquarium fishing	None: x		Low:		Med:		High:		
Harvest inverts for food	None:		Low:		Med:		High: x		
Harvest inverts for curio sales	None: x		Low:		Med:		High:		
Tourist diving/snorkeling:	None:		Low:		Med:		High: x		
Sewage pollution (outfall or boat)	None:		Low: x		Med:		High:		
Industrial pollution	None: x		Low:		Med:		High:		
Commercial fishing (fish caught to sell for food)	None:		Low:		Med: x		High:		
Live food fish trade	None:		Low:		Med: x		High:		
Artisinal/recreational (personal consumption)	None:		Low:		Med:		High: x		
How many yachts are typically present within 1km of this site	None:		Few (1-2):		Med (3-5):		Many (>5): x		

Other impacts: Development from residences on nearby cays

PROTECTION:

Any protection (legal or other) at this site?	Yes:	No: x	If yes, answer questions below	
Is protection enforced	Yes:	No:		
What is the level of poaching in protected area?	None:	Low:	Med:	High

Check which activities below are banned:

Spearfishing	
Commercial fishing	
Recreational fishing	
Invertebrate or shell collecting	
Anchoring	
Diving	
Other (please specify)	

Other comments: It is not know what level of runoff occurrs from developments on nearby cays or St. Thomas and St. John
transect start at base of mooring

TEAM INFORMATION

Submitted by: Messineo, Jennifer

Regional Coordinator: Vasques, Jason
Team Leader: Messineo, Jennifer
Team Scientist: Vasques, Jason
Team Members: Gordon, Shenell
Platenberg, Renata
Sjoken, Ron
Whiteman, Liz

Appendix III.

Reef Check
Site Description Sheet

Site name: Coculus Rocks

BASIC INFORMATION

Country:	United States Virgin Islands	State/Province:	St. Thomas	City/town:	
Date:	25-Sep-04	Time: Start of survey:	11:30	End of survey:	12:45
Latitude (deg. min. sec):	18d 18.769' N	Longitude (deg. min. sec):	64d 51.627' W		
From chart or by GPS? (If GPS, indicate units):	chart____	GPS___x__	GPS units:	____ddd mm.mmm_____	
Orientation of transect:	N-S___x__ E-W_____	NE-SW_____	SE-NW_____		
Temperature (in degrees C):	air: _____C	surface: _____C	at 3m: _____C	at 10m: _____C	
Distance	from shore (m): 520	from nearest river (km):	2.2 = storm gut		
River mouth width:	<10 m x	11-50 m _____	51-100 m _____	101-500 m _____	
Distance to nearest population center (km):	1.07	Population size (x1000):	3-5		
Weather:	sunny x	cloudy _____	raining _____		
Visibility (m) :	20				
Why is this site selected:	is part of an MPA and other proj	Is this best reef in the area?	Yes: x	No : _____	

IMPACTS:

Is this site:	Always sheltered: _____	Sometimes: _____				Exposed: x	
Major coral damaging storms	Yes: x	No _____	If yes,	When was last storm: 1999			
Overall anthropogenic impact	None: _____	Low: _____	Med: _____	High: x			
Is siltation a problem	Never: _____	Occasionally: _____	Often: _____	Always: x			
Blast fishing	None: x	Low: _____	Med: _____	High: _____			
Poison fishing	None: x	Low: _____	Med: _____	High: _____			
Aquarium fishing	None: x	Low: _____	Med: _____	High: _____			
Harvest inverts for food	None: _____	Low: x	Med: _____	High: _____			
Harvest inverts for curio sales	None: x	Low: _____	Med: _____	High: _____			
Tourist diving/snorkeling:	None: _____	Low: _____	Med: _____	High: x			
Sewage pollution (outfall or boat)	None: _____	Low: _____	Med: x	High: _____			
Industrial pollution	None: _____	Low: _____	Med: _____	High: x			
Commercial fishing (fish caught to sell for food)	None: _____	Low: x	Med: _____	High: _____			
Live food fish trade	None: _____	Low: x	Med: _____	High: _____			
Artisinal/recreational (personal consumption)	None: _____	Low: x	Med: _____	High: _____			
How many yachts are typically present within 1km of this site	None: _____	Few (1-2): _____	Med (3-5): _____	Many (>5): x			

Other impacts: Development and nearby landfill

PROTECTION:

Any protection (legal or other) at this site?	Yes: x	No: _____	If yes, answer questions below	
Is protection enforced	Yes: _____	No: x		
What is the level of poaching in protected area?	None: _____	Low: x	Med: _____	High _____

Check which activities below are banned:

Spearfishing	x
Commercial fishing	x
Recreational fishing	x hook and line by permit
Invertebrate or shell collecting	x
Anchoring	
Diving	
Other (please specify)	

Other comments: only one transect was conducted because the reef is too small to hold transects at different depths

TEAM INFORMATION

Submitted by: Messineo, Jennifer

Regional Coordinator:	Vasques, Jason
Team Leader:	Messineo, Jennifer
Team Scientist:	Vasques, Jason
Team Members:	Gordon, Shenell
	Platenberg, Renata
	Sjoken, Ron
	Whiteman, Liz

Appendix IV. Substrate codes as used in tables 2, 5, and 8

Substrate Category	Substrate Code
Acropora cervicornis	AC
Acropora palmata	AP
Agaricia agaricites	AGAG
Agaricia tenuifolia	AGTE
Colpopyllia natans	CN
Dead coral and algae	DCA
Dendrogyra cylindrus	DC
Dichocoenia stokesii	DIST
Diploria labyrinthiformis	DL
Diploria strigosa	DS
Erythropodium caribaeorum	ERY
Eusmilia fastigiana	EF
Gorgonia ventalina	GV
Millepora alcicornis	MILALC
Montastraea annularis	MA
Montastraea cavernosa	MC
Mycetophyllia lamarckiana	MYLA
Nutrient indicator algae	NIA
Other	OT
Porites astreoides	PA
Porites porites	PP
Pseudopterogorgia spp.	PSEUDO
Recently killed coral	RKC
Rock	RC
Rubble	RB
Sand	SD
Siderastrea radians	SR
Siderastrea siderea	SS
Silt/clay	SI
Soft coral	SC
Sponge	SP
Unidentified hard coral	HC