
Caribbean Conservation Association
One Caribbean, One Vision



NATIONAL CONSERVATION
COMMISSION

Folkestone Marine
Reserve, St. James
Barbados

Centre for Resource
Management and
Environmental
Studies



University of the
West Indies
Barbados

Funded by



Community-based Coral Reef Monitoring and Management

Report of the Community Reef Watchers Workshop



June 2008

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1 BACKGROUND

The context and background to the Community-based Coral Reef Monitoring and Management project are outlined in the project flyer (Appendix 8.1). The project seeks to build capacity at the community level to support identification and analysis of the problems facing coral reefs within the reserve and the development and implementation of community-level strategies to combat the existing impacts. This will be accomplished by one component of the project that involves the establishment of the Community Reef Watchers Programme. The aim of this programme is to give the local communities the opportunity to move beyond awareness and play an active role in reef research and conservation at the Folkestone Marine Reserve. It will also provide available information on the status of reefs in the Reserve and also aid in the establishment of a coral reef database for the Reserve. The workshop for the Reef Watchers Programme took place at the Folkestone Park and Marine Reserve from the 10th to 11th June 2008 from 9:30am until 4:00pm. Workshop participants included divers from the HighTide Watersports, Barbados American Divers Association and CERMES (Appendix 8.2). Participants were provided with a workshop folder containing the project flyer, the agenda (Appendix 8.3), workshop evaluation form (Appendix 8.4) and the Reef Watchers Instruction Manual.

2 WELCOME AND INTRODUCTION

Ms. Katherine Blackman, the project's coordinator from CERMES gave a brief introduction to the participants and then introduced them to Mrs. Andree Griffith, Acting Executive Director of the Caribbean Conservation Association and the trainer Ms. Renata Goodridge, Marine Technician from CERMES.

Afterwards Mrs. Griffith introduced the participants to the Community-based Coral Reef Monitoring and Management project and stated that it is a way of bringing local communities such as fishers, schools and dive operators together. She made reference to the previous workshop held in May that focused on the Junior Coral Reef Ambassador Programme of which selected primary and secondary schools were involved. She stated that she hopes the participants can use the information at the workshop on a day to day basis and for their own education and development.



Figure 2.1: Introduction of participants

Renata asked the participants to introduce themselves and each one expressed their interest in coral reef monitoring (Figure 2.1). She was glad that everyone wanted to make a difference in relation to coral reef conservation. The participants were informed that they would be conducting the Bajan version of Reef Check¹ called Reef Watchers. The importance

¹ The Reef Check Foundation is an international non-profit organization dedicated to conservation of reefs. Reef Check goals are to: educate the public about the value of reef ecosystems and the current crisis affecting marine life; to create a global network of volunteer teams trained in Reef Check's scientific methods who regularly monitor and report on reef health; to facilitate collaboration that produces ecologically sound and economically sustainable solutions; and to stimulate local community action to protect remaining pristine reefs and rehabilitate damaged reefs worldwide. <http://reefcheck.org/default.php>

of HighTide Watersports' participation in the workshop as they lie within the Reserve was emphasized. Seven reef sites within the Reserve will be utilized for the programme. These include Bellairs North and South Fringing Reefs, Fisherman's Bank Reef, Dottin's Bank Reef, Sandy Lane Bank Reef, Sandy Lane Fringing Reef and Sandy Lane Patch Reef. Hopefully the reefs outside the Reserve will also be surveyed to make a comparison between reefs directly outside and those inside the Reserve. A protocol was prepared in order for the participants to conduct the monitoring. Two reefs (North Bellairs Fringing Reef and Sandy Lane Bank Reef) would be surveyed during the workshop's practical sessions. The remaining reefs will be surveyed later in the year.

3 IN CLASS THEORY SESSION

3.1 Introduction to the Reef Watchers Instruction manual

Renata discussed the importance of the Reef Watchers Programme and thoroughly explained the details of the monitoring programme that was outlined in the Reef Watchers Instruction Manual (Figure 3.1.). The goals of the Reef Watchers Programme were highlighted and she indicated that the programme will inform the participants of the status of the reefs found on their doorstep. Renata stated that she was happy that the workshop included a good mixture of people, including both experienced and novice divers.



Figure 3.1: Renata reviewing the underwater guides with the participants

Participants were informed that data will be collected as a survey site description, and that they will also measure benthic cover, invertebrates and fish. Renata indicated that for fringing reefs the optimum part to measure is on top of the spur while on the bank reefs, one should run transects parallel to shore. There will be 5 teams of 2 or 3 people each required to complete the survey. Each team must conduct fish and invertebrate counts and also benthic cover (flora and fauna). The first day's practical session would be conducted on the fringing reef at North Bellairs.

3.2 Introduction to field data sheets

The site data sheet was reviewed with the participants. Renata indicated that it was important to take water temperature and also air temperature to recognize any trends between them. The 'river' on the sheet referred to the Holetown Hole and its supporting gully system. The reefs can be surveyed after the Hole breaks in efforts to also monitor its impact on the reefs. Aquarium fishing still occurs in Barbados and since only one person practises this, it is said to be not much of a threat, most especially in a marine reserve where there is a no fishing policy. The site sheet listed other various threats that may be observed in the area e.g. harvest of invertebrates for food or curios sales, sewage pollution by boats, industries, catching live food fish trade. None of these impacts should occur in a marine reserve. It was noted that people have been spotted spearfishing on the bank reefs and some of the participants agreed that it occurs. Renata indicated that this is an illegal practice and people think the bank reefs are not part of the Reserve but it is and this is a mindset that we need to change. Renata enquired about the rights regarding spearfishing in the Reserve from the Park Naturalist, Mr. Patrick Williams. He stated that it is against the law to have a spear gun in the Reserve. Fishermen are allowed to catch bait but this has not

yet been passed by law. There also has been no documentation of spearfishing. Renata indicated that we have no idea about what spearfishers are taking from the reefs. It was mentioned that one can get information from the baiters as they do not agree with the spearfishing practice.

Renata reviewed the benthic data sheet and explained the various codes for substrate types e.g. hard coral, soft coral, nutrient indicator algae. Clarification was made about the definition of a rock and thus Renata referred to the underwater guide to distinguish the differences between the various substrate types.

While referring to the invertebrate data sheet, Renata mentioned that the West Indian sea egg (*Tripneustes ventricosus*) is included as it is an important fishery on the island and it should be monitored. The flamingo tongue (*Cyphoma gibbosum*) is usually seen and it is known to eat soft corals and sea fans, destroying some colonies. The long-spined urchin (*Diadema antillarum*) is another important invertebrate to survey as it suffered a population crash in the 1980s. The presence of these urchins is a good indicator of the health of a reef particularly as they keep the reef clean of macro algae. Macro algae appear when the level of nitrates in the water is high. Renata made reference to the summer of 2004 when there was an outbreak at Sandy Lane: an algal bloom occurred due to the runoff from the herbicides used on the Sandy Lane Golf course. Lobsters (*Palinuridae*) are also important; particularly the berried lobsters are protected by law. Photographs are important to remind oneself of the data gathering methods used. Rare animals observed must also be noted on the data sheets.

Regarding fish counts, one should allow the fish to settle again after the tape has been placed, before taking counts as they are sensitive to movements and will swim away from the site. Renata indicated that the participants will be doing 4 transects per site and each team will be assigned a transect. The participants were shown how to enter the raw data into the electronic data sheets to produce graphs. It was mentioned that conch, surgeon fish and blue tangs should be added to list. However the addition of conch was later dismissed.

3.3 Coral reef and associated species slide show

At the end, David Gill conducted a species identification exercise that allowed participants to familiarize themselves with the marine species that they would observe while underwater. He told the participants to imagine that they are underwater and to identify the fish that they saw as they passed by. From the exercise participants were able to identify grunts, moray eels, and tangs. He also showed them jacks, wrasses, barracudas, damsel fish and goatfish. However these will not be counted for the survey. It is difficult to count the exact number of fish when they swim in schools e.g. grunts and tangs. It was recommended to estimate the amounts observed. The hawksbill turtle can be written under rare animals and participants must take note of any characteristics. For example if the turtle has an obvious tail, it would be identified as a male hawksbill turtle.

Snappers have a triangular face and a long nose bridge. The mahogany snapper has a black dot that easily identifies it. The yellow tail snapper looks similar to the goatfish but the yellow tails are free swimming while the goatfish have barbells and are bottom dwelling. The butterflyfish were noted to look similar to angel fish. However, they are much smaller than angelfish. There are two more common species: four-eye butterflyfish and the banded butterflyfish. The parrotfish are recognised because of their beak-like mouth, which is used to peck at coral. David indicated that they will remember the differences between the species once they begin to survey the reefs and actually see the fish *in situ*.

In the other photos, participants attempted to identify the types of substrate that may be seen. Participants were shown photos of finger coral, fire coral, anemones, pencil coral, gorgonians and sponges. A photo of garbage on the reef was shown and Renata indicated

that one should save the reef while they can and remove any garbage or trash found, but not at the expense of their transect work or their bottom time.

It was mentioned that the Triton seashell and the Nassau grouper be removed from the list of invertebrates and fish respectively. Groupers/coney and hinds would be added to the fish data sheet.

The data sheets were then updated based on the recommendations (Appendix 8.5-8.8).

4 PRACTICAL SESSION –DAY 1

After the in-theory session, the participants engaged in the practical or “dry run” session whereby Renata Goodridge and David Gill demonstrated to them the methods used to monitor fish, invertebrates and substrate types (Figure 4.1). The participants were divided into three teams to each conduct one transect at North Bellairs Fringing Reef. A 1m long piece of PVC pipe was used for the fish and invertebrate transects.

Participants were equipped with the underwater guides to assist them with the identification of marine species usually found in the area. Each team was provided with a clipboard and the data sheets printed on all weather copier paper. During the exercise Renata and David were at sea to guide the participants. The survey was conducted in less than 2 hours. At the end of the survey, Renata gathered the raw data sheets from the participants as soon as the surveys were completed, emphasizing how important it is to keep the raw data sheets.



Figure 4.1: Practical session on first day [A: laying down transect tape; B: demonstrating line transect for substrate; C: conducting belt substrate for invertebrates; D: belt transect for fish counts; E: divers taking to the sea and F: conducting belt transect for fish counts at North Bellairs.]

5 PRACTICAL SESSION –DAY 2

In the morning participants met at HighTide Watersports² to begin the surveying at the Sandy Lane Bank Reef site (just north of the CZMU dive buoy). Three teams were used for this survey as well (Figure 5.1).

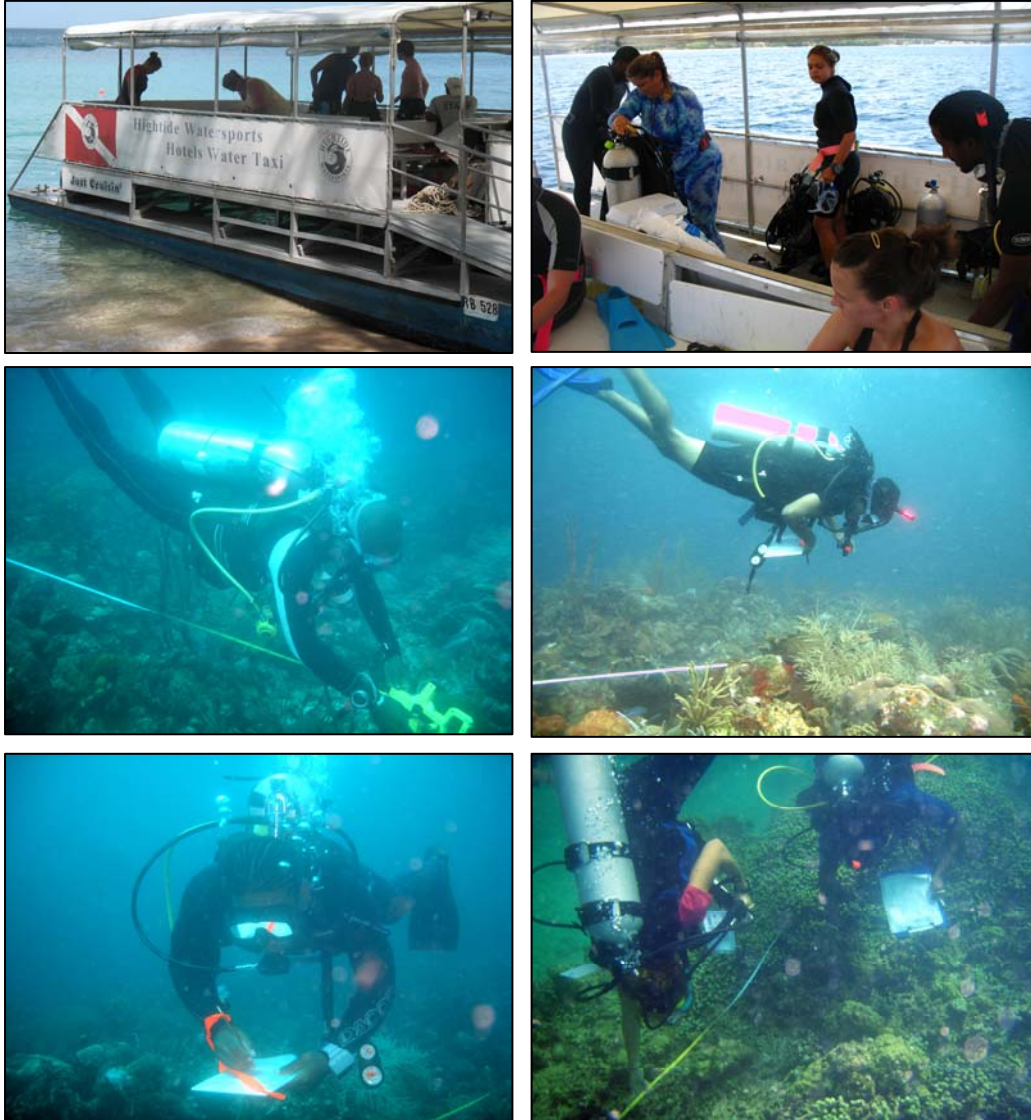


Figure 5.1: Practical session on second day [A: divers preparing for dive trip to Sandy lane bank reef; B: preparing for dive at Sandy Lane on boat; C: setting the measuring tape for the transect; D: preparing to conduct transect; E: noting observations and F: team conducting line transect for substrate]

² HighTide Watersports is located at the Coral Reef Club relatively near to the Folkestone Park and Marine Reserve Office. To find out more information about this operation visit: <http://www.diveHighTide.com/>

After the survey participants reviewed the underwater photos taken of the various species observed e.g. red hinds, tunicates, scorpion fish, feather duster, barrel sponge; and other features noted about the reefs such as bite marks from grazers and signs of coral bleaching (Figure 5.2).



Figure 5.2: Marine organisms and characteristics observed during practical session [A: bleaching coral; B: feather duster, C: fish bites from a grazer; D: barrel sponge; E: sponge; F: hard coral on Sandy Lane bank reef]

Few questions/comments were made about the survey. E.g. what was the significance of looking for certain fish? Renata indicated that for example the butterfly fish are grazers and therefore a significant species on the reef, as they can help to reduce macro algae. The aim is to have people collect data on species that are eye catching and obvious. It was suggested that perhaps tangs should be removed from the data sheet as they are too many to count. However, Renata stated that the tangs are an important species to the West coast

of the island. If the species declined, there would be a greater abundance of macro algae. She also made reference to arrow crabs which are difficult to observe and therefore not included on the list. The data sheet uses species that the average person can see. Lobsters are also important to the reefs even though they are not present, this data must be collected.

6 DATA ENTRY SESSION

During the second session each team was given their raw data sheets back so they could enter the data on the Reef Watchers' Excel data sheets. Graphs were produced indicating the mean fish and invertebrate abundance and also the living and non-living substrate cover on the reefs.



Figure 6.1: Teams 1, 2 and 3 entering data (respectively)

6.1 Summary of preliminary results

At the North Bellairs Fringing Reef site, hard coral represented 30% of the living cover while rock represented 35% of non-living cover (rock has turf algae on it). Haemulidae was the highest mean fish abundance while the pencil urchin was the highest mean abundance of invertebrates. Banded coral shrimp, sea eggs and flamingo tongue snails were not observed at this site.

At the Sandy Lane Bank Reef site, hard coral represented 25% of the living cover while rock represented 12% of the non-living cover. Parrotfish were the highest mean fish abundance and unlike the North Bellairs site, groupers/coneys and hinds were observed. Gorgonians represented the highest mean abundance of invertebrates. Diadema, sea eggs, flamingo tongue snails and lobsters were not observed at the site.

Incidences of impacts for both sites include coral damage from boats and unidentified impacts (Appendix 8.9).

7 FOLLOW UP AND EVALUATION

The Reef Watchers programme is a huge selling point for HighTide as they can incorporate their diving tourists into the monitoring, thus increasing awareness both locally and globally.

How often should we conduct surveys?

It is best to do one survey in the dry season and one in the wet season. Four transects at each reef site would be ideal.

- *How will the programme be promoted?*

It was mentioned that the notice was too short for media to attend. However, information about it can be shared through the CERMES connections newsletter and ReefComm (Community-based Coral Reef Monitoring and Management's newsletter).

- *When will the next dive be scheduled?*

Community Reef Watchers Workshop

It was suggested by Edwin, one of the dive operators from HighTide that June is the optimal time to conduct the survey, as it is the low season for the company. Thursday was suggested as a tentative date to survey the Dottin's reef and Fisherman bank reef sites.

- *Source of funding*

Regarding funding it was suggested that companies such as Carters should be tackled to provide tapes, snorkelling mask and any other required materials for the reef survey.

Renata indicated that she will be the repository for the raw data sheets. She informed them that the slate material will be purchased so that the Reef Watchers can create their own slates for re-use.

- *Post-activity*

It was recommended that a poster be created indicating the status of the reefs within the Reserve after all seven reefs are surveyed. This can be presented to the Folkestone Marine Reserve office to be displayed to students.

Results of the workshop evaluation showed that all participants agreed that both objectives of the workshop were achieved. All agreed that the workshop was well organised and well facilitated. They would recommend their colleagues to attend a workshop similar to this one and that they also enjoyed participating in the workshop. When asked what the participants liked most about the workshop they all replied that the field work in which they learnt about the benthic, fish and invertebrates.

8 APPENDICES

Appendix 8.1: Project flyer

Community-based Coral Reef Monitoring and Management Project

What is it?

This is a project developed by the Caribbean Conservation Association to strengthen the participation and capacity of stakeholders to improve management of coral reef biodiversity and related resources at Folkestone Marine Reserve.

What are the objectives?

- To improve information and resource sharing among managers, scientists, communities and youths for increased participation in decision-making regarding coral reef management.
- To build capacity of youths for advocacy, and incorporate coral reef biodiversity conservation and management into the primary schools curricula.
- To strengthen community and stakeholder management planning and monitor coral reefs and associated biodiversity.
- To assist in mobilizing financial resources for conservation and management of coral reefs in the long-term.



Who is involved?

- Local communities of the Folkestone area (e.g. schools, fisher folks)
- Government
- Local NGOs
- Private sector
- International organisations (UNDP GEF/SGP)



What will be some of the project's highlights?

- Establishing a Junior Coral Reef Ambassador Programme
- Developing the Folkestone Marine Reserve Summer Programme
- Providing coral reef related resources
- Providing schools with the People and Corals pack
- Training in MPA: Management Effectiveness
- Initiating community coral reef monitoring
- Establishing the Folkestone community forum/e-group
<http://groups.yahoo.com/group/folkestonemarinecommunity/>

Join the e-group for more info!



For more information, please contact:

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Mr. John Nicholls, Folkestone park manager: folkestonemarine@yahoo.com

Ms. Katherine Blackman, CERMES: katherine.blackman@cavehiil.uwi.edu

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Community Reef Watchers Workshop

Appendix 8.2: Participants list

| Community-based Coral Reef Monitoring and Management | | | |
|--|----------------------------------|---------------|--|
| Workshop: | Community Reef Watchers Workshop | Meeting Date: | June 10 th -11 th , 2008 |
| Facilitator: | Renata Goodridge | Place/Room: | Folkestone Marine Reserve |

| Name | Affiliation | Phone | E-Mail |
|--------------------|---------------------------|---------|-------------------------------------|
| Tom Fountain | BADASS | 4245551 | fountain@sunbeach.net |
| Sue Fountain | BADASS | 4245551 | fountain@sunbeach.net |
| Tanya Staskiewicz | CERMES | 2544826 | tanyastaski@yahoo.com |
| Damien Catlyn | CERMES alumnus | 2437160 | dcatlyn@gmail.com |
| Simron Browne | HighTide water sports | 2400987 | hypaboss_17@hotmail.com |
| Ariella Wiener | HighTide water sports | 2305270 | Arzparz@hotmail.com |
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| Kim Symock | CERMES | 2637779 | kimtexas1026@gmail.com |
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| Katherine Blackman | CERMES | 4174827 | katherine.blackman@cavehill.uwi.edu |

Appendix 8.3: The Workshop Agenda

The Community-based Coral Reef Monitoring and Management project
presents

COMMUNITY REEF WATCHERS



Aim: To build capacity of dive operators that will allow for them to play an active role in reef conservation and to contribute to on-going efforts to safeguard the reefs around the Folkestone Marine Reserve.

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AGENDA

Community Reef Watchers Workshop

Folkestone Marine Reserve

June 10th 2008- June 11th 2008

9:30 a.m. – 4:00 p.m.



Day One

9:30 a.m. – 9:35 a.m. Introduction

9:35 a.m. - 10:35 a.m. Coral Reef Monitoring (Theory session)

10:35 a.m. – 10:50 BREAK

10:15 a.m. - 12:30p.m. Coral Reef Monitoring (Practical session)

12:30 p.m. - 1:30 p.m. LUNCH

1:30 p.m. – 4:00 p.m. Coral Reef Monitoring (Practical session)

Day Two

9:30 a.m. – 11:00 a.m. Shallow reef survey (North Bellairs)

11:00 a.m. – 11:30 am BREAK

11:30 a.m. – 1:30 a.m. Deep reef survey (Sandy Lane Bank)

1:30 p.m. - 2:30 p.m. LUNCH

2:30 p.m. – 3:30 p.m. Data entry and Analysis

3:30 p.m. – 4:00 p.m. Follow up & workshop evaluation

Appendix 8.4: The Workshop Evaluation form

Community-based Coral Reef Monitoring and Management

**Participant Evaluation of the "Coral Reef Monitoring" Workshop
2008**

Directions: Please rate how much you agree or disagree with each of the statements listed below.

The **objectives** of this workshop were to build the capacity of divers to monitor the reefs within the Folkestone Marine Reserve using the Reef Check Methodology in efforts to play an active role in reef conservation and to initiate the establishment of a coral reef monitoring database for the reserve.

1. The first objective of this workshop (*to build the capacity of divers to monitor the reefs within the Folkestone Marine Reserve using the Reef Check Methodology in efforts to play an active role in reef conservation*) was fully achieved.

strongly agree
 agree
 neither agree nor disagree
 disagree
 strongly disagree
 I don't know

2. The second objective of this workshop (initiate the establishment of a coral reef monitoring database) was fully achieved.

strongly agree
 agree
 neither agree nor disagree
 disagree
 strongly disagree
 I don't know

3. The workshop was well organised.

strongly agree
 agree
 neither agree nor disagree
 disagree
 strongly disagree
 I don't know

4. The workshop was well facilitated.

strongly agree
 agree
 neither agree nor disagree
 disagree
 strongly disagree
 I don't know

5. I would recommend my colleagues to attend a workshop similar to this one.

strongly agree
 agree
 neither agree nor disagree
 disagree
 strongly disagree

Community Reef Watchers Workshop

Community-based Coral Reef Monitoring and Management

I don't know

6. I enjoyed participating in this workshop.

strongly agree

agree

neither agree nor disagree

disagree

strongly disagree

I don't know

7. The things I liked most about this workshop were: (list/write)

8. The things I liked least about this workshop were: (list/write)

9. If I had to recommend that some changes be made on the workshop, they would be:
(list/write)

10. Other thoughts, comments, or suggestions?

Appendix 8.5: Data sheets [updated]-Site description

| | | | | | |
|---|-----------------------|---------------------------------|--------------------------------|--|-----------------|
| Site name: _____ | | | | | |
| BASIC INFORMATION | | | | | |
| Country: | _____ | Parish: | _____ | City/Town: | _____ |
| Date: | _____ | Time: | Start of survey _____ | End of survey | _____ |
| Latitude (deg. min. sec.): | _____ | Longitude (deg. min. sec.): | _____ | | |
| From chart or by GPS? (If GPS, indicate units): | _____ | Chart: | _____ | GPS: | _____ |
| | | | | GPS units: | _____ |
| Orientation of transect: | | | | | |
| | N-S: _____ | E-W: _____ | NE-SW: _____ | SE-NW: _____ | |
| Temperature (°C): | Air: _____ | surface: _____ | at 3m: _____ | at 10m: _____ | |
| Distance | from shore (m): _____ | from nearest river (km): | _____ | | |
| River mouth width: | <10 m _____ | 11-50 m _____ | | | |
| Distance to nearest population center (km): | _____ | Population size (x1000): | _____ | | |
| Weather: | sunny: _____ | cloudy: _____ | raining: _____ | | |
| Visibility (m) : | _____ | | | | |
| Why was this site selected: | _____ | Is this best reef in the area? | Yes: _____ | No: _____ | |
| IMPACTS: | | | | | |
| Is this site sheltered?: | Always: _____ | Sometimes: _____ | Exposed: _____ | | |
| Major coral damaging storms | Yes: _____ | No: _____ | If yes, when was last storm: | _____ | |
| Overall anthropogenic impact | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| Is siltation a problem | Never: _____ | Occasionally: _____ | Often: _____ | Always: _____ | |
| Aquarium fishing | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| Harvest inverts for food | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| Harvest inverts for curio sales | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| Tourist diving/snorkeling: | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| Sewage pollution (outfall or boat) | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| Industrial pollution | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| Commercial fishing (fish caught to sell for food) | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| Live food fish trade | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| Artisinal/recreational (personal consumption) | None: _____ | Low: _____ | Med: _____ | High: _____ | |
| How many yachts are typically present within 1km of this site | None: _____ | Few (1-2): _____ | Med (3-5): _____ | Many (>5): _____ | |
| Other impacts: | _____ | | | | |
| PROTECTION: | | | | | |
| Any protection (legal or other) at this site? | Yes: _____ | No: _____ | 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 are banned: | Spearfishing _____ | Commercial fishing _____ | Recreational fishing _____ | Invertebrate or shell collecting _____ | Anchoring _____ |
| | Diving _____ | Other (please specify) _____ | | | |
| Other comments | _____ | | | | |
| TEAM INFORMATION | | | | | |
| Submitted by | _____ | Team Leader: | _____ | | |
| | | Team Scientist: | _____ | | |
| | | Team Members: | _____ | | |

Appendix 8.7: Data sheets [updated]-Fish data sheet

| | | | | |
|---|---|--------|--------|--------|
| Site Name: _____ Depth: _____ Date: _____ | Island: _____ Team Leader: _____ Time: _____ | | | |
| <h2 style="margin: 0;"><u>Fish</u></h2> <p><i>Data recorded by:</i></p> | | | | |
| | T1 | T2 | T3 | T4 |
| | 0-20m | 20-40m | 40-60m | 60-80m |
| Butterflyfish (Chaetodontidae) | | | | |
| Grunts/Margates (Haemulidae) | | | | |
| Snapper (Lutjanidae) | | | | |
| Parrotfish (Scaridae) | | | | |
| Moray Eel | | | | |
| Blue tangs/Surgeonfish | | | | |
| Groupers/coneys/hinds | | | | |
| | | | | |
| Rare animals sighted (type/#) | | | | |
| Comments: | | | | |

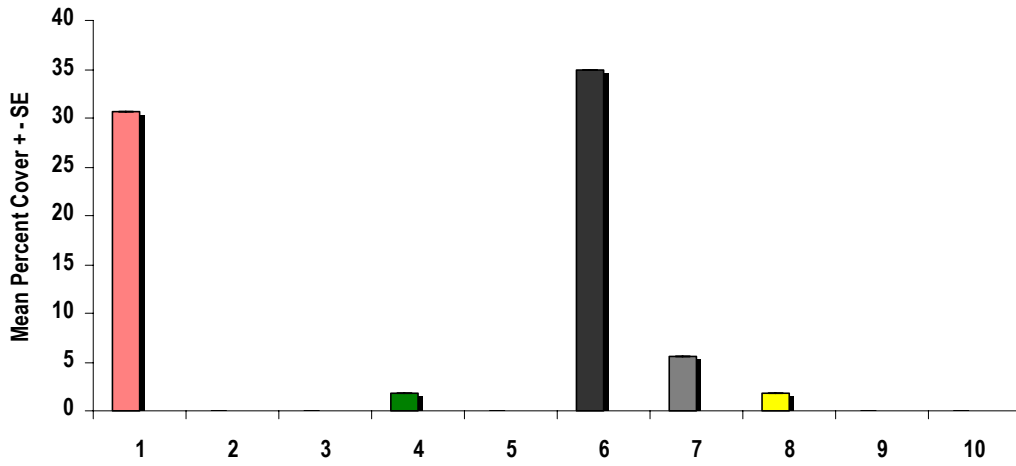
Appendix 8.8: Data sheets [updated]-Invertebrate data sheet

| | | | | |
|---|---|--------------------|---------------|---------------|
| Site Name: _____ | | Island: _____ | | |
| Depth: _____ | | Team Leader: _____ | | |
| Date: _____ | | Time: _____ | | |
| Data recorded by: _____ | | | | |
| | T1 | T2 | T3 | T4 |
| <u>Invertebrates</u> | 0-20m | 20-40m | 40-60m | 60-80m |
| Banded coral shrimp (<i>Stenopus hispidus</i>) | | | | |
| <i>Diadema</i> urchins | | | | |
| Pencil urchin (<i>Eucidaris</i> spp.) | | | | |
| Sea egg (<i>Tripneustes</i> sp.) | | | | |
| Flamingo tongue (<i>Cyphoma gibbosum</i>) | | | | |
| Gorgonian (sea fan, sea whip) | | | | |
| Lobster (Palinuridae) | | | | |
| <u>Impacts: Coral Disease/ Bleaching/Trash/Other</u> | | | | |
| | <i>0 = none, 1 = low, 2 = medium and 3 = high</i> | | | |
| | 0-20m | 20-40m | 40-60m | 60-80m |
| Coral damage: Boat/Anchor | | | | |
| Coral damage: Dynamite | | | | |
| Coral damage: Other | | | | |
| Trash: Fish nets | | | | |
| Trash: General | | | | |
| Bleaching (% of coral population) | | | | |
| Bleaching (% of colony) | | | | |
| Coral Disease (% of coral affected if yes) | | | | |
| Rare animals sighted (type/#) | | | | |
| Comments: | | | | |

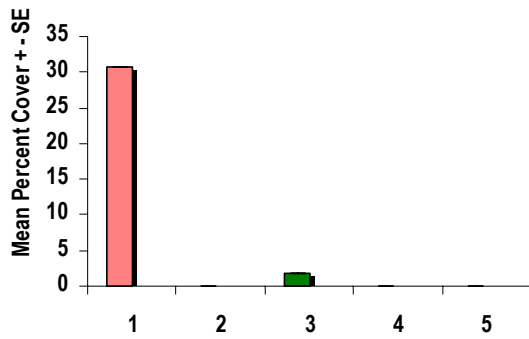
Appendix 8.9: Preliminary results

Mean Percent cover of Substrate for North Bellairs, 10 ft, 10th June

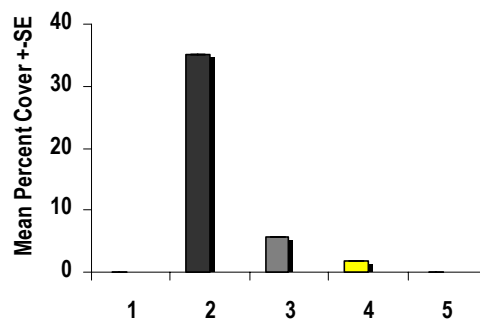
Mean Percent Cover Of Substrate For North Bellairs, 10 ft, 10th June



Mean Percent Living Cover For North Bellairs, 10 ft, 10th June

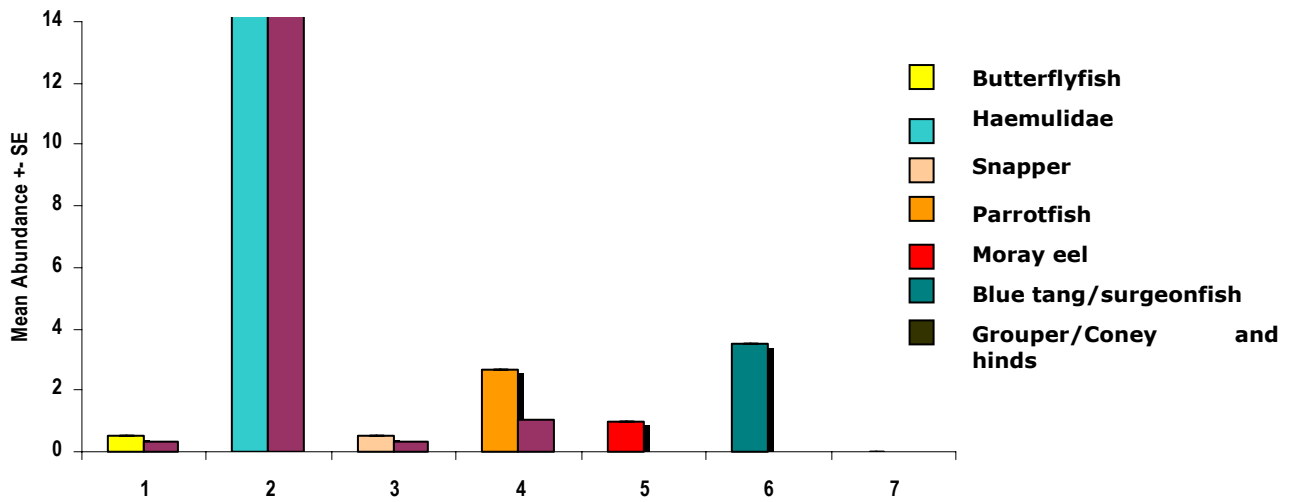


Mean Percent Non-Living Cover For North Bellairs, 10 ft, 10th June

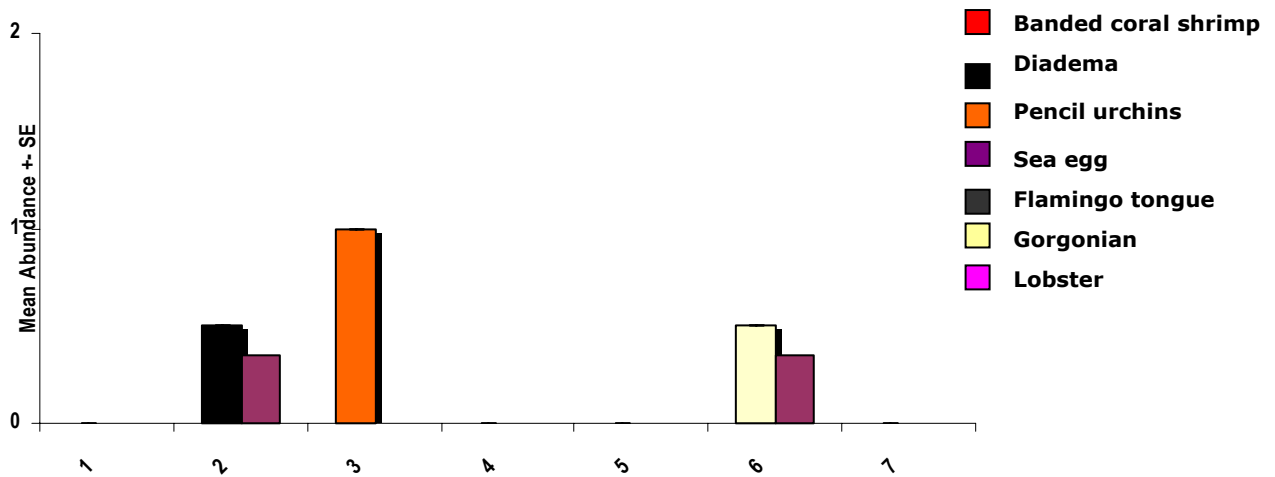


Fish and Invertebrate Graphs for North Bellairs, 10 ft, 10th June

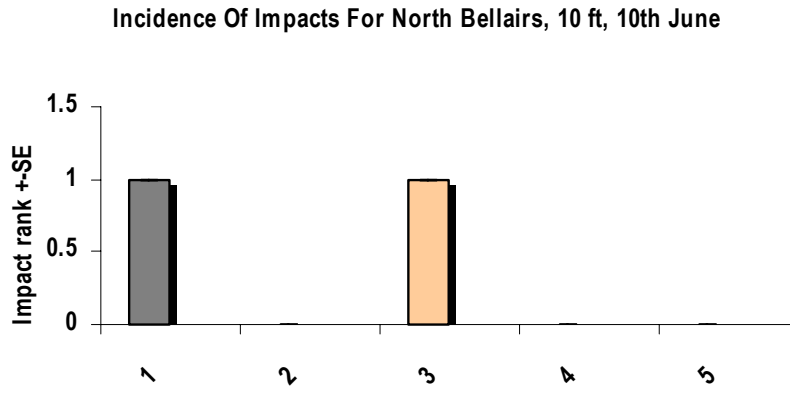
Mean Fish Abundance For North Bellairs, 10 ft, 10th June



Mean Abundance Of Invertebrates For North Bellairs, 10 ft, 10th June

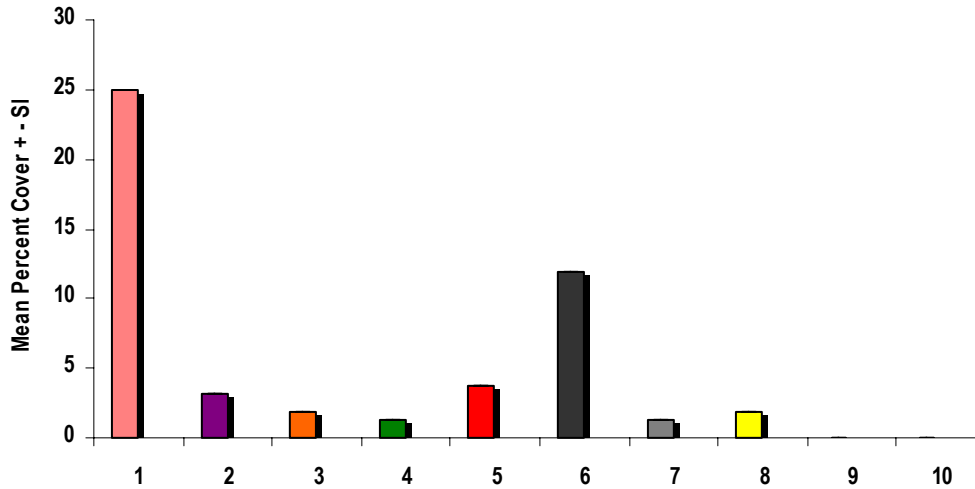


Impacts, Bleaching and Disease Graphs for North Bellairs, 10 ft, 10th June

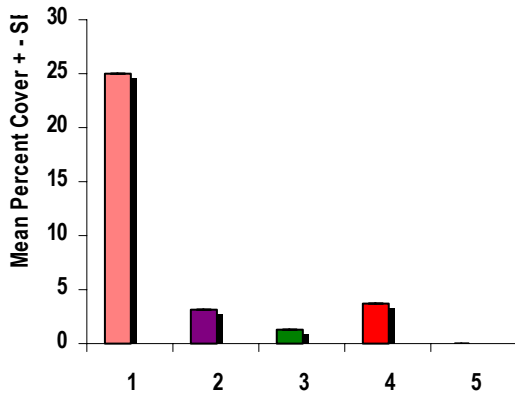


Mean Percent cover of Substrate for Sandy Lane Bank Reef

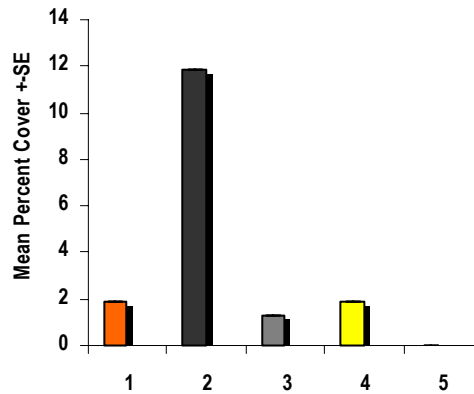
Mean Percent Cover Of Substrate For Sandy Lane Bank Reef, 66 feet, June 11, 2008



Mean Percent Living Cover For Sandy Lane Bank Reef, 66 feet, June 11, 2008



Mean Percent Non-Living Cover For Sandy Lane Bank Reef, 66 feet, June 11, 2008

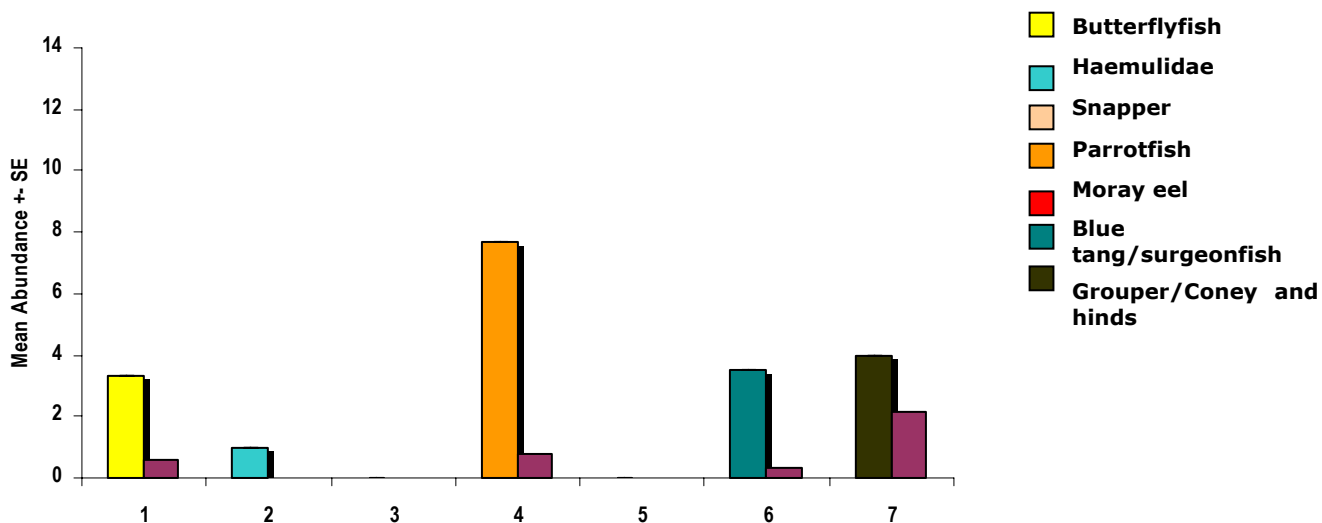


- HC
- SC
- NIA
- OT

- RKC
- RC
- RB
- SD
- SI

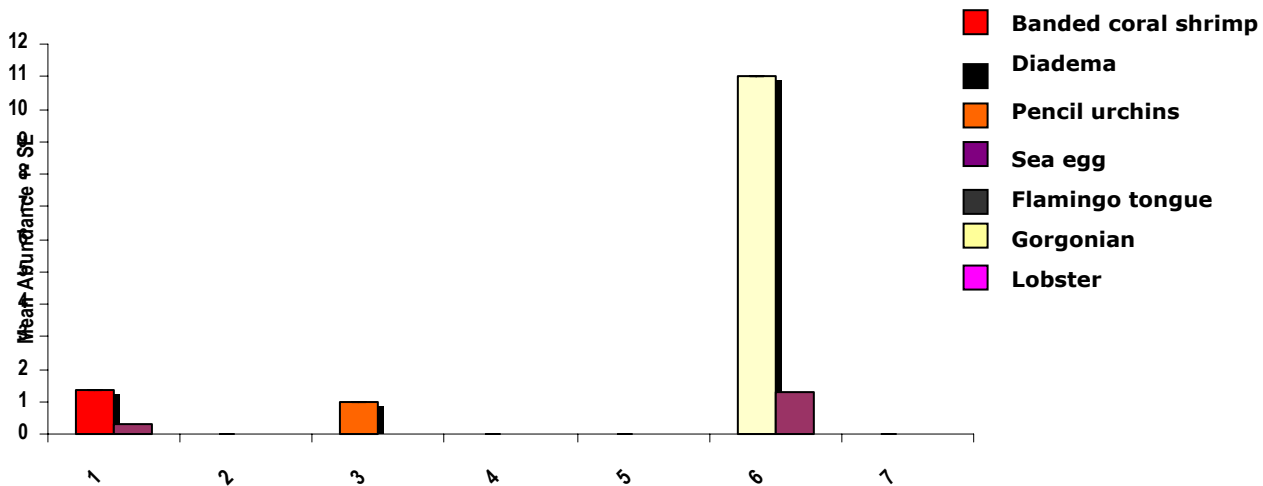
Fish and Invertebrate Graphs for Sandy Lane Bank Reef, 66 ft, 11th June

Mean Fish Abundance For Sandy Lane Bank Reef, 66 ft, 11th June



7-coney/hind

Mean Abundance Of Invertebrates For Sandy Lane Bank Reef, 66 ft, 11th June



Impacts, Bleaching and Disease Graphs for Sandy Lane Bank Reef, 66 ft, 11th June

