Final Report
Marine Protected Area Monitoring and Co-Management Capacity Building

Funded by:

Organization of
American States

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Submitted by:

ERIC
Environmental Research Institute Charlotteville, Tobago W.I.

Prepared by:
Aljoscha Wothke
Chief Executive Director
M.Phil.Bio.
PADI MSDT 900821
PMP 1627362

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Abbreviations:

BHC TT	**B**ritish **H**igh **C**ommission, **T**rinidad and **T**obago
ERIC	**E**nvironmental **R**esearch **I**nstitute **C**harlotteville
FCO	**F**oreign & **C**ommonwealth **O**ffice
GEF	**G**lobal **E**nvironment **F**acility
OAS	**O**rganisation of **A**merican **S**tates
SGP	**S**mall **G**rants **P**rogramme
THA	**T**obago **H**ouse of **A**ssembly
UNDP	**U**nited **N**ations **D**evelopment **P**rogramme

1. Executive Summary

The General Secretariat of the Organisation of American States made a grant available (US$5,000) to the Environmental Research Institute Charlotteville (ERIC) to implement a project titled: “Marine Protected Area Monitoring and Co-Management Capacity Building between January 2015 and April 2015.

This Final report details the delivery of all six project activities:

- Marine monitoring for eight sampling events (sites)
- NE Tobago stakeholder workshop
- One media story supplied to newspapers
- Case study brochure, unformatted contents and pictures
- Final report at hand

The project has been implemented in time, according to budget and all deliverables were met; ERIC fulfilled all of its in-kind obligations under the agreement.

2. Background

In January 2015 the General Secretariat of the Organisation of American States, agreed to make a grant of funds (US$5,000) to ERIC to increase the availability of environmental baseline data as well as organisational capacity of local CBOs to contribute to the co-management of the planned Marine Protected Area in NE Tobago.

The continuous sampling and analysis of marine environmental data in the planned Marine Protected Area in NE Tobago will for the first time provide coherent data that will support co-management of the site and be available to all stakeholders; research will include climate change related environmental factors such as temperature at various depths, sea water acidity, reef biodiversity and coral health.

The continuous strengthening of Community Based Organisations is essential for successful co-management of natural resources. This project will continue the efforts of previous interventions funded by UNDP, GEF, SGP, British High Commission (Trinidad and Tobago) and other donors to build the capacity of the Parlatuvier Village Council, North East Sea Turtles and the Speyside Eco Marine Park Rangers through a series of mentoring activities related to leadership, team building and project evaluation.

3. Technical Report

3.1. Project Implementation Overview

	Project Output	Project Activity	Status as of 13.04.2015
1	Draft report	Submission of project activities progress	Submitted on Thursday, 09th April 2015
2	Marine monitoring data taken using 30 dives (each site will require 4 dives), totalling 8 sampling events while under training by ERIC staff	At least four community participants further trained in taking Reef Check Data; 8 marine biological data sampling events in NE Tobago conducted, data gathered analysed and published.	Five community participants further trained in taking Reef Check Data; Six marine biological data sampling events in NE Tobago conducted, data gathered and analysed. Two reconnaissance dives conducted. A total of 36 dives were used.
3	One NE Tobago stakeholder workshop	Planning and hosting of a NE Tobago stakeholder workshop	Stakeholder workshop conducted
4	One final report	Preparation and submission of one progress and one final report	At hand
5	One media story published	Composing and distributing one media story	At hand
6	Case study brochure	Case study brochure, unformatted contents and pictures	At hand

3.2. Project Implementation Details

Output 2: Marine monitoring data taken using 30 dives (each site will require 4 dives), totalling 8 sampling events while under training by ERIC staff

Activity 2: *"At least 4 community participants further trained in taking Reef Check Data; 8 marine biological data sampling events in NE Tobago conducted, data gathered analysed and published"*

Delivered:

Eight dive events were conducted.

- Thursday, 19 February 2015, Landslide (1) and Booby Island (2)
- Sunday, 08 March 2015, St. Giles Bay (3)
- Saturday, 11th April 2015 Sanger Rock (4), Pirate's Bay (5) and Hermitage (6); all sites in NE Tobago.

Little Tobago and Goat Island were scheduled for surveys, however due to extremely strong currents, the plan was aborted. As a result, the remaining two dive events were used as reconnaissance dives to scope two potential Reef Check sites. These reconnaissance dives took place on Sunday, 12 April 2015 at Grover Point (7) and Old Rope Bay (8) as seen in the map below. Six dives were used for these two dive events.

In total, eight dive events using 36 dives were delivered instead of 30 dives.

Five community participants were further training in data collection and input. See Annex 3 for the participants' attendance.

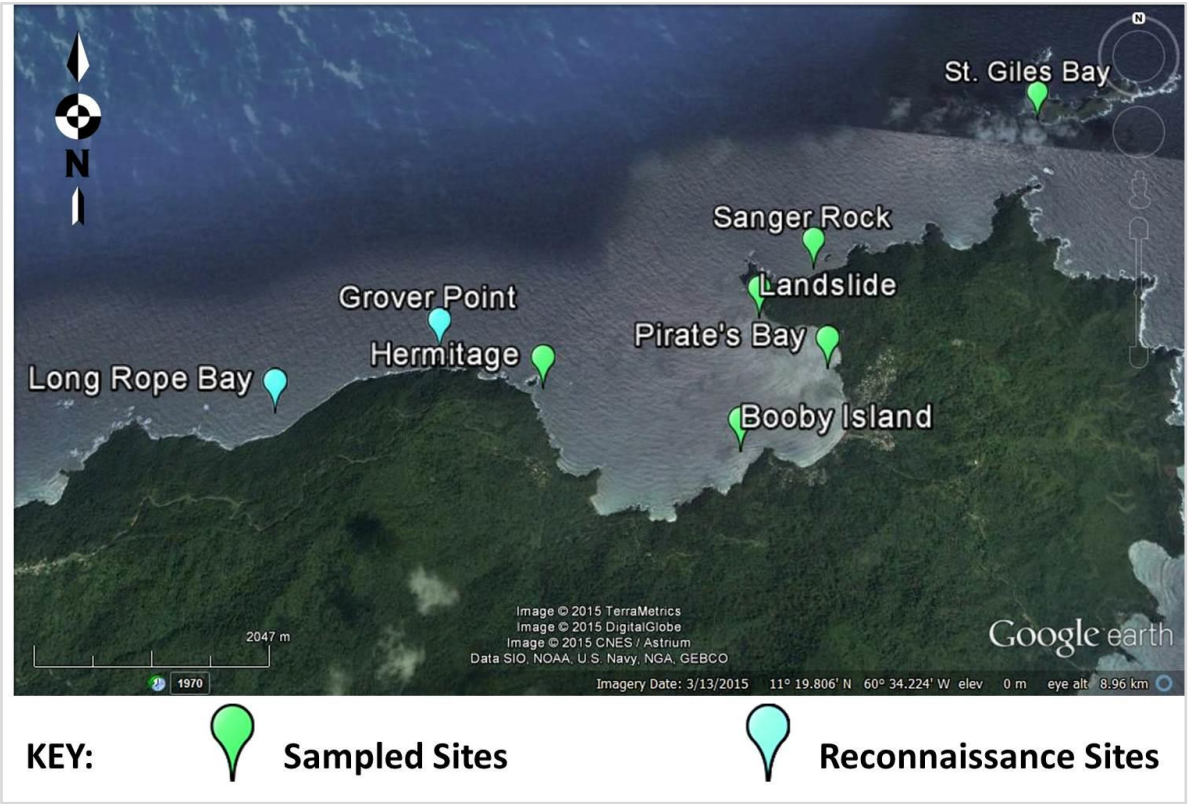

Figure 1: Sites surveyed in NE Tobago

Reef Survey Methodology

The research dives were conducted at sites that were previously established under funding from the British High Commission of Trinidad and Tobago. A 100m transect was run along the reef. The transects were run in a generally NE-SW direction. A transect was further subdivided into four segments, each measuring 20m; 5m apart from each other as seen in Figure 2.

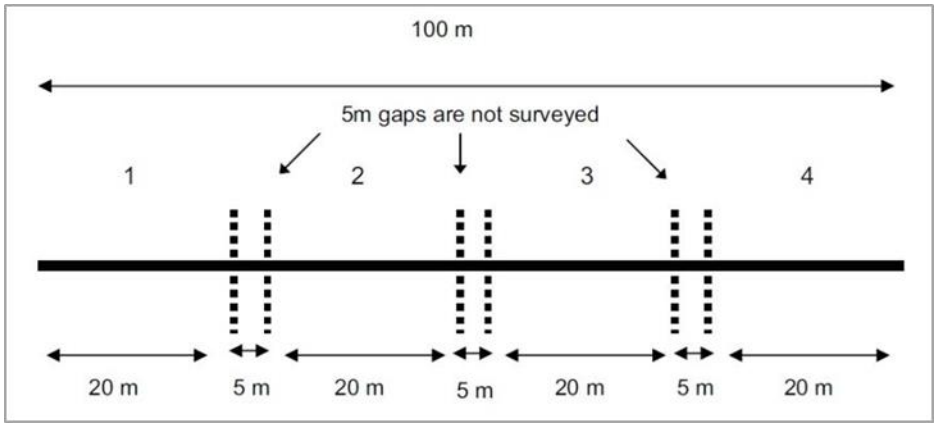

Figure 2: Set up of the surveying transects of 20m segments separated by 5m gaps (Hodgson *et al.* 2006, 16)

All trainees are certified Reef Check Eco Divers, having obtained certification in January 2015 under the UNDP GEF SGP funding. The trainees were split into two teams, each responsible for collecting different sets of data. One team conducted population counts of fish indicator species (see Table 1). The other team recorded population counts of invertebrate indicator species (see Table 1) as well as negative impacts on the reef. These impacts included hard coral damage and disease as well as the presence of debris in the form of fishing nets and lines and garbage. Each team also collected substrate data for two segments

Table 1: Indicator species assessed in Reef Check surveys

INDICATOR SPECIES	IMPACT INDICATOR
FISH	
Butterflyfish	Overfishing and Aquarium Collection
Grunts/ Margates	Overfishing
Snapper	Overfishing
Parrotfish (>20cm)	Overfishing
Moral Eel (all species)	Overfishing
Grouper (>30cm) and Nassau Grouper	Overfishing
Lionfish	Invasive
INVERTEBRATE	
Banded Coral Shrimp	Aquarium Collection
Long-Spined Black Sea Urchin	Overfishing
Pencil Urchin	Curio Trade
Sea Egg/ Collector Urchin	Overfishing
Triton	Curio Trade
Flamingo Tongue	Aquarium Collection
Gorgonian	Linked to Flamingo Tongue and disease
Lobster	Overfishing

Reconnaissance Method

The following criteria were being surveyed for in site selection:

- Depths between 6m and 12m at low tide
- 100m area of consistent depth
- Representativeness of the coral reef
- Substantial area of live coral
- Ease of data collection under strong currents and wave action

When a potential area was found, one diver swam to the surface to obtain visual landmarks for later discussion and marking with GPS co-ordinates. At the end of the dive, a discussion between the team scientists ensued to determine appropriateness.

The dive was also used as an opportunity to review fish species and substrate identification with the trainees.

Findings

Summary of Findings

Indicator fish species were generally low in numbers at the survey sites. Grunts were the most prevalent species followed by Parrotfishes over 20cm in length. Groupers over 30cm in length and Lionfish were absent.

Most of the indicator invertebrates were absent with the exception of Gorgonians and Flamingo Tongues. Lobsters were seen at two transect sites.

Negative impacts on hard corals were observed at all survey sites except at Hermitage and Pirate's Bay in the form of bleaching, disease as well as signs of mild parrotfish predation. Disease was observed on a few colonies of *Montastraea* and *Acropora*; two sensitive and endangered species of coral.

Table 2: Average % of disease present per segment of the Reef Check Segments

Disease	Average % Disease					
	Landslide	Booby Island	St. Giles Bay	Sanger Rock	Pirate's Bay	Hermitage
White Band Disease	6.25	5	0	0	0	0
White Plague Disease	2.5	0	0	1.75	0	0
Black Band Disease	0	0	0	0	0	0
Aspergillosis	10.75	10	0	0	0	0

Rock seemingly comprised most of substrate present at the coral reef, with hard corals covering an average of 15% - 20% of the substrate.

The pH values taken at Sanger Rock, Pirate's Bay and Hermitage were within range of normal pH for seawater. Temperature remained consistent at 26°C throughout the water column, with only slightly higher temperatures at the surface.

Table 3: Summary of major observations from Reef Check Surveys

	LANDSLIDE	BOOBY ISLAND	ST. GILES BAY[1]	SANGER ROCK	PIRATE'S BAY[2]	HERMITAGE
Depth (m)	10 12	6 - 8	6 - 9	10 – 12	8 - 10	10 - 13
Average Water Temperature (°C)	26	26	26	26	26	26
pH	No reading	No reading	No reading	8.41	8.33	8.31
			FISH			
Most abundant	Grunt	Grunt	Grunt	Butterflyfish	Grunt Parrotfish	Parrotfish
Least abundant	Snapper	Snapper	Moray Eel	Moray Eel	Butterflyfish Snapper	Grunt Snapper
Absent indicators	Grouper Nassau Grouper Moray Eel Lionfish	Grouper Nassau Grouper Moray Eel Lionfish	Grouper Nassau Grouper Lionfish	Grouper Nassau Grouper Lionfish	Grouper Nassau Grouper Moray Eel Lionfish	Grouper Nassau Grouper Moray Eel Lionfish
			INVERTEBRATES			
Most abundant	Gorgonian	Gorgonian	Gorgonian	Gorgonian	Gorgonian	Gorgonian
Least abundant	Flamingo Tongue	Flamingo Tongue	Lobster	Flamingo Tongue	Lobster	Flamingo Tongue
Absent indicators	Banded Coral Shrimp Long Spined Black Sea Urchin Pencil Urchin Collector Urchin Triton Lobster	Banded Coral Shrimp Long Spined Black Sea Urchin Pencil Urchin Collector Urchin Triton Lobster	Banded Coral Shrimp Long Spined Black Sea Urchin Pencil Urchin Collector Urchin Triton	Banded Coral Shrimp Long Spined Black Sea Urchin Pencil Urchin Collector Urchin Triton Lobster	Banded Coral Shrimp Long Spined Black Sea Urchin Pencil Urchin Collector Urchin Triton	Banded Coral Shrimp Long Spined Black Sea Urchin Pencil Urchin Collector Urchin Triton Lobster
			SUBSTRATE			
Predominant substrate	Rock	Rock	Hard Coral	Rock	Rock	Rock
% Hard coral	20	20	19	20	15	18
Coral Bleaching	Present	Present	Present	Absent	Absent	Absent
Coral Disease	White Band White Plague Aspergillosis	White Band Aspergillosis	None	White Plague	None	None

[1] Incomplete substrate dataset
[2] Incomplete invertebrates and negative impacts dataset

Main Findings

At Landslide which is located at depths ranging between 10m – 12m, the most abundant fish species recorded were Grunts, with an average of five individuals at each transect segment. Parrotfish greater than 20cm in length was the second most abundant group followed by Butterflyfish. A lone Snapper was sighted. No Grouper species over 30cm in length and Moray Eels were found in the transect belt.

Of the invertebrate species listed in Table 1, only Flamingo Tongue and its associated Gorgonians were seen. On average, seven Flamingo Tongues were present in each segment of the transect belt. There was an average of 124 Gorgonians per segment.

Coral damage was seen in two segments in the form of anchor damage as well as possible parrotfish predation. An abandoned fish pot was also seen in one of the segments. Bleaching was present in every segment of which an average of 7% of the hard coral population was bleached, per segment. Of the bleached coral colonies present in the segments, an average of 13% of each of the affected corals was bleached in each segment.

Coral disease was observed in a single segment of the transect belt. White Band disease, a disease found in *Acropora* corals was seen affecting approximately 25% of a coral. White Plague disease which is found in boulder-type hard corals affected a very small area. Aspergillosis was observed affecting a large area of a Sea Fan which is a type of Gorgonian.

The data collected from the substrate composition showed that rock and sand accounted for at least 70% of each segment of the transect, whereas hard coral made up 20% of each 20m segment.

At Booby Island's transect which was situated at depths ranging between 6m – 8m, Grunts were the most abundant with an average of six Grunts per segment being recorded. Butterflyfish and Parrotfish were the second and third most abundant respectively. One Snapper was seen in the first segment. Similar to Landslide, no Grouper species over 30cm in length and Moray Eels were found in the transect belt.

An average of 13 Flamingo Tongues and 128 Gorgonians per segment were recorded. These were the only invertebrates seen in the transect area.

No coral damage was observed. Bleaching was noticed in 2 segments within the transect belt. Between these two segments, approximately 8% of the hard coral population was bleached. Of the corals that were bleached, approximately 13% of its surface was bleached.

White Band disease and Aspergillosis were observed in the first segment.

Rock accounted for 64% of the substrate recorded per segment in the survey whereas hard coral comprised 20% of the data. Zoanthids, sand and gorgonians made up the remainder of the substrate.

The transect at St. Giles Bay was placed at depths ranging between 6m – 9m. Grunts were the most abundant, with an average of two individuals found per segment. At least one Parrotfish was found at every segment. Butterflyfish and a single Moray Eel were also recorded in the survey. No groupers greater than 30cm in length or snappers were seen in the survey.

One Spiny Lobster was recorded. An average of nine Flamingo Tongues and 129 Gorgonians were seen in each segment.

The only negative impact observed was a small area of bleached hard coral in a single segment. Approximately 2% of all the hard corals observed in that segment were bleached. Approximately 5% of the affected coral was bleached.

Hard coral was the most abundant substrate recorded, comprising 23% of the substrate. Rock and Zoanthids comprised 22% and 21% of the substrate respectively. Unlike the other sites, Sponges were prevalent, comprising 14% of the substrate.

At Sanger Rock with transect depth ranging between 10m – 12m, the most abundant fish species recorded were Butterflyfish, with an average of five individuals at each transect segment. Grunts were the second most abundant species followed by Parrotfish. A Moray Eel was sighted. No Grouper species over 30cm in length were found in the transect belt.

Of the invertebrate species surveyed, only Flamingo Tongues and its associated Gorgonians were seen. On average, seven flamingo tongues and 89 Gorgonians per segment were recorded.

Coral damage was observed in a single segment in the form of possible parrotfish predation. No bleaching was present however, coral disease was observed. White plague was observed in segments 2 and 3, affecting 2% and 5% of the non-*Acropora* coral populations respectively.

The data collected from the substrate composition showed that rock accounted for at least 53% of each segment, whereas hard coral made up 20% of each 20m segment. Recently killed coral was observed in the substrate survey, accounting for 3% of the total substrate.

At the transect in Pirate's Bay whose depth ranged between 8m – 10m, the indicator fish species were largely absent from the transects. A total of four Grunts and Parrotfishes each were found in the entire transect whereas a single Butterflyfish and Snapper were each present. No Grouper species over 30cm in length and Moray Eels were found.

An average of one Flamingo Tongue and 134 Gorgonians per segment were recorded. One Lobster was noted.

No coral damage, bleaching or diseases were observed.

Unfortunately, invertebrate and negative impacts data for half of the transect was missing due to the loss of the recorder's slate. Therefore, it can be assumed that the Gorgonian and Flamingo Tongue population is much higher. It is unknown whether coral damage, bleaching or disease was present in the missing area. The substrate data set is however complete.

Rock accounted for 43% of the substrate recorded per segment in the survey whereas hard coral comprised 15% of the data. Zoanthids, sand and gorgonians accounted for the remainder of the substrate. Nutrient indicator algae was also present along the transect, comprising of 1% of the substrate surveyed.

The transect at Hermitage was placed at an average depth ranging between 10m – 13m. Parrotfish were the most abundant, with an average of 2 individuals found per segment followed by Butterflyfish. At least one Grunt and Snapper each was found at every segment. No Groupers greater than 30cm in length or Moray Eels were seen in the survey.

An average of two (2) Flamingo Tongues and 174 Gorgonians were seen in each segment.

The only negative impact observed was a small area of parrotfish predation in the first segment. No bleaching or diseases were observed.

Rock was the most abundant substrate recorded, comprising 56% of the substrate. Hard coral and Zoanthids each comprised of 18% of the recorded substrate.

Analysis

Low numbers of indicator fish present within the transect belt may be a result of disturbance from the divers since several species are shy. The indicator species may be present outside of the survey area or possibly uncommon to the geographic area. Often at the end of the survey, a few of the indicator species were found entering the study area.

Grouper and Parrotfish were counted using a size criterion as seen in Table 1. Many individuals that were present within the transect belt were below the size criteria assigned by Reef Check and therefore could not be counted.

Butterflyfish were more prevalent at transect sites in Sanger Rock, Hermitage and Pirate's Bay. These along with Parrotfish are important corallivores and herbivores since they keep algae growth in check. Without herbivorous fish, algae will smother and kill corals if they are allowed to overgrow.

Lionfish was absent from all six survey sites. However, they were recorded in previous surveys. Hence, it is known that they are present in another area of the reefs. Their population size is unknown however.

The high population of Gorgonians, especially at Pirate's Bay can hide smaller fishes as well as other invertebrates unless thorough care was taken to look. Flamingo Tongue which is a predator of the Gorgonian grow to no more than one inch in length and can be easily missed especially when it is fully or partially retracted into its shell.

It is difficult to determine whether the indicator fish and invertebrates have been impacted upon as a result of overfishing and overharvesting from a few surveys over a small area. Baseline or historical data is lacking. This emphasises the need for more surveys as well as in-depth case studies spanning over a larger area, to adequately assess the possible impacts upon these species.

Bleaching and disease were not widespread at the sites. The White Plague disease observed was found on encrusting *Montastraea* (Star Coral), a sensitive and endangered species of coral. White Plague has been affecting several Caribbean countries for several years. Research is ongoing to determine whether the White Plague is caused by either a virus or bacteria.

White Band disease is restricted to *Acropora* corals which are branching species of corals commonly known as Staghorn and Elkhorn. The corals like *Montastraea* are sensitive and endangered. The disease is caused by bacterial infection and is contagious, often spread by some corallivorous species of snails.

One type of Gorgonian known as the Sea Fan was rarely found in the reefs monitored. At least one individual both at Landslide and Booby Island had Aspergillosis – a disease caused by a fungus.

While the substrate composition was seemingly dominated by non-living components (rock and sand), the reefs have a substantial soft coral population which is characteristic of Caribbean coral reefs. The point intercept method is utilised by Reef Check for recording substrate; the substrate present at every 0.5m along the transect line is logged. A major disadvantage of this method is that it does not provide a true image of the reef's substrate.

Gorgonians are not recorded as part of the substrate, unless its main body falls directly under the recording mark. If this happens it is classified as "Other", since it was previously recorded in the invertebrate survey. The soft corals recorded in the substrate survey are Zoanthids.

A small area of nutrient indicator alga was recorded at Pirate's Bay. There may be a healthy herbivorous fish population present at the sites, resulting in its low presence or runoff from land may not be sufficient enough to encourage proliferation of the nutrient algae. However, its absence in the recorded data does not mean that it is absent from the reef. The Reef Check method may have caused it to be skipped over, or it may be found in another area of the reef.

Deducing the cause for recently killed corals found at Sanger Rock and Booby Island is beyond the scope of this reef survey.

The pH of seawater is within the range of 7.5 and 8.4. The pH at Sanger Rock, Pirate's Bay and Hermitage are within this normal range. These levels must be monitored consistently to determine if the pH ranges are fluctuating. Seawater is resistant to pH change due to its high concentration of salts. A change in this parameter is a red flag. At present, there is increasing concern of possible ocean acidification due to increasing levels of carbon dioxide in the seas, which is potentially detrimental to corals, snails and some species of fishes.

Caution must also be applied to the use of pH values since there may be several causes to changing pH including temperature, depth from which water was sampled as well as the chemical composition of the water such as excess runoff from land after a period of heavy or prolonged rainfall.

For all sites, the water temperature remained consistent throughout the water column at a temperature of 26°C. Changing temperatures throughout the water column is highly unlikely at the depths of the survey unless there are strong undercurrents or prolonged periods of extremely high sea surface temperatures.

Monitoring of temperature changes is important since extremely high and extremely low temperature can cause stress and consequently bleaching of corals.

A single survey provides merely a snapshot of the reefs' condition. Long-term monitoring as well as surveys in multiple sites within the reefs is required before a conclusion of the possible impacts on the reef can be made. The data collected from these surveys will be used in combination with data collected from previous and future surveys to create a database in which ongoing trends can be observed.

Summary of Reconnaissance Dives

The first dive to Grover Point located west of Hermitage, yielded one potential area, at an approximate depth of 10m. The area contained a fairly substantial area of soft and hard coral cover. Further swimming was done to determine if 100m of consistent depth varying between 9m to 11m was present. Unfortunately, this criterion was not obtained.

The surface water conditions were generally calm. However, the surface conditions closer to the site were slightly choppy with somewhat strong surface currents. There was surge present at the potential site which had the potential to become significantly stronger should water conditions become rougher. As a result, Grover Point was ruled out as a Reef Check site.

The second dive took place at Old Rope Bay which is located west of Grover Point. Two potential areas were noted at approximate depths of 8m and 10m. The composition of the reef was similar to Grover Point. The first potential area has a relatively flatter terrain than the second area. Both sites yielded a potential of 100m of consistent depth.

Surge was present; however it seemed to be less than at Grover Point. Surface conditions were not as choppy as at Grover Point, though there is the potential for strong surface currents.

After deliberation, it was determined that the first area of an approximate depth of 8m was most suited for Reef Check due to its somewhat flatter terrain and shallower depth. GPS coordinates for this site are 11°19'27.72"N 60°35'53.58"W. A marker was not laid at the site, to allow for greater flexibility in surveying multiple areas of the reef.

The subsequent pictures show some of the activities of the research dives.

Figure 3: Trainees preparing to dive

Figure 4: Trainee collecting data at St. Giles Bay

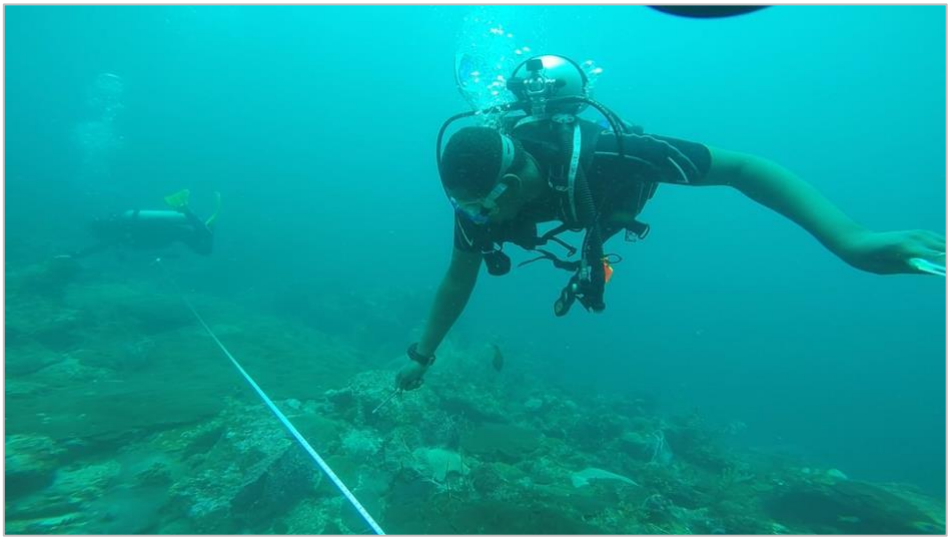

Figure 5: Trainee collecting data at Sanger Rock

Figure 6: Trainees collecting data at Pirate's Bay

Figure 7: Reconnaissance at Grover Point

Figure 8: Reconnaissance at Old Rope Bay

Output 3: One NE Tobago stakeholder workshop

Activity 3: *"Planning and hosting of a NE Tobago stakeholder workshop"*

Delivered:

The MPA Co-management trainees planned and hosted a forum on the "Conservation of the Marine Natural Resources of NE Tobago", which was held on Thursday 26th March 2015 at the Speyside Community Centre.

Preparation

The trainees were formally introduced to the stakeholder workshop during a capacity building exercise on Sunday, 08th February 2015 upon the conclusion of two mentoring sessions that were funded by the BHC TT. The topics discussed at the mentoring sessions were presentation design and email etiquette. These served as a prelude to the preparation of the stakeholder forum. The trainees were informed of the basis, requirements and the budget for the forum following which planning began.

Twelve working days were spent preparing for the forum in which the trainees decided upon the theme of the forum, the format for presentations, the invitees, preparations and expenditure as well as the responsibilities of each participating member. Of these twelve days, meetings were held with ERIC on two occasions to update, discuss and attain advice.

With the guidance of an ERIC facilitator, the participants received guidance and advice on budgeting; format for the presentation; invitees for the forum as well as possible resources that could be utilised.

Forum

Members representing various stakeholder groups such as NE Tobago village councils, NGOs, businesses, dive operators, THA divisions as well as the UNDP GEF programme attended the forum (See Table 3). Annex 1 contains the registration sheet of the participants. Additionally, a local artisan was present in which he displayed some of his handcrafted items.

Table 2: List of participants attending the forum

Participant	Position	Participating Agency
Sabrine Schroedl	Dive Operator	Speyside Inn
Gina Selchon	Dive Operator	Speyside Inn
Bennington Nedd	Vice President	L'Anse Fourmi Village Council
Kerron Eastman	Vice President	Charlotteville Village Council
Renee Gift	Director	Environment Tobago
Kamlyn Melville-Pantin	Forester 1	Department of Natural Resources and Environment
Rupert McKenna	President	Speyside Eco Marine Park Rangers
Joanna Moses-Wothke	CEO	Asclepius Green
Kimron Eastman	Treasurer	North East Sea Turtles
Nkosi Kerr	Member	L'Anse Fourmi Village Council
Sihon Chance	Member	L'Anse Fourmi Village Council
Lanya Fanovich	Biological Consultant	Environmental Research Institute Charlotteville
Welldon Mapp	Public Relations Officer	North East Sea Turtles
Susan Suchit	Member	Speyside Eco Marine Park Rangers
Chelsea Osmond	Member	Parlatuvier Village Council
Kirlan Blake	Member	Parlatuvier Village Council
Mikaela Stewart	Student	Speyside High School
Aljoscha Wothke	Director	Environmental Research Institute Charlotteville
Darlington Chance	President	Bloody Bay Tour Guide Association
Mary-Ann Brathwaite-Lawrence	Member of Steering Committee	Small Grants Programme Global Environment UNDP/ Office of Chief Secretary of Tobago House of Assembly

The forum was opened with a prayer and a greeting in which introductions were made. A background for the purpose of the forum was also provided. Joanna Moses-Wothke of Asclepius Green (www.asclepiusgreen.com), a sister organisation of ERIC, assisted in facilitating the progress of the agenda.

Following a brief icebreaker, the participants were divided into three groups for roundtable discussions with two of the trainees. During this session, the trainees used their experiences and special concerns about the marine natural resources of NE Tobago to engage the

participants. The topics discussed included bait fish population, seabird monitoring, state of the coral reefs and marine turtle conservation.

The roundtable session was important since this was the first time that the trainees who had been trained in biological monitoring were able to share and network with important stakeholders. It was an opportunity for the trainees to place themselves in the public eye as a team of individuals with the potential to be MPA co-managers.

At the end of the roundtable discussion, an open discussion was held with all the participants. Concerns on the need for sustainable management and the need for co-management were addressed.

Summary Minutes of Stakeholder Discussion

- Lack of implementation and enforcement of relevant legislation was deemed as an obstacle in sustainable management.
- The lack of law enforcement was especially complained about by those involved in marine turtle conservation in which poachers are frequently encountered.
- Increasing public awareness to ensure that the communities are adequately informed is vital.
- To increase public awareness, effective communication strategies must be developed.
- It was acknowledged that while legislation invites change, it is a slow process.
- To begin the process of change the participants must begin taking responsibility and making a commitment as a united body and provide assistance to the trainees to secure the interest of all relevant stakeholders and to sustainably manage the resources of NE Tobago.
- The attendees were keen on education and outreach. SEMPR and NEST both remain committed to continuing their school outreach programmes.
- NEST offered to provide assistance to the L'Anse Fourmi Village Council in training and outreach in marine turtle conservation
- A suggestion was made that summer vacation programmes for children can be utilised for possible outreach and turtle tagging can be introduced to the children.
- The Forestry Division of the THA's Department of Natural Resources and the Environment (DNRE) affirmed support in assisting with outreach in the schools.
- The representative of the UNDP GEF programme vouched for UNDP's willingness to further assist the ERIC initiative.
- The participants suggested that the THA should be formally informed about the interest that is being generated in conserving NE Tobago's natural resources and that discussion has begun among community members.

At the end of the discussion, the participants were invited to a light lunch of fish broth.

Post-mortem

A post mortem was conducted with the trainees to discuss the outcome of the forum, the difficulties that were encountered and improvements that can be made for similar future events.

Challenges

- The trainees admitted that hosting the forum was a challenge. There was nervousness at the prospect of having to lead a discussion.
- Once the discussions began speaking became easier, especially in the smaller group setting.
- There were mixed feelings concerning the participation of the attendees in which some believed that the reception towards the trainees was somewhat lacking.
- It was admitted that team effort in the planning phase was an issue.

Recommendations

- The team needs to continue sticking together.
- Communication and commitment need to improve.
- A better understanding of planning roles and personal limitations is required in order to ensure successful execution of duties.
- The need for a dry-run before conducting any major presentation is important.
- Overall, it was felt that the forum was a success and that a good impression was left on the attendees.
- Since discussions have begun between the trainees and various interest groups, it was important to maintain dialogue to ensure that everything vouched for at the inaugural forum is not forgotten.

Other observations

- There was a need to ensure that all project requirements were thoroughly broken down to reduce misunderstandings and miscommunications between the facilitator and the trainees.
- The trainees needed further mentoring on etiquette for addressing invitees at registration, during forum sessions and during the breaks

The subsequent pictures show the proceedings of the forum.

Figure 9: Cross-section of participants at the forum

Figure 10: Participants and trainees engaged in roundtable discussion

Figure 11: Participants and trainees engaged in roundtable discussion

Figure 12: Participants and trainees engaged in roundtable discussion

Figure 13: Participants and trainees addressing issues in conservation and planning the way forward

Figure 14: Participants and trainees addressing issues in conservation and planning the way forward

Output 5: One media story published

Activity 5: *"Composing and distributing one media story"*

Delivered:

A media story has been composed for release. Please see Annex 8 for the article.

Output 6: Case study brochure

Activity 6: *"Case study brochure, unformatted contents and pictures"*

Delivered:

A description of ERIC's work and unformatted pictures are attached to Annex 9.

4. Lessons Learnt

	Lesson Learnt	Recommendation
1	Clear and concise communication of details with the trainees is necessary to avoid confusion	Present clear breakdown of requirements and budget according to the preferred learning style of the trainees
2	There is a tendency of underestimating time efforts	Need to plan with team to allocate realistic time frames
3	Identifying substrate types as well as the difference between coral bleaching and disease as well as recently killed corals can potentially cause misinterpretation of the status of the reef health.	A review of the identification of the different substrate types is necessary. Pictures of the substrates found in local coral reefs instead of those provided in the Reef Check training package should be utilised.
4	The loss of a slate with data prevents adequate analysis of the data at hand	Installing an attachment on the BCD for the slate to prevent potential loss. Slates will be immediately collected at the end of the dive by the team scientist and stowed. The name of the team member will also be written on the slate.
5	Metric markings on an imperial tape can become confusing for collecting substrate data. The recorder can easily lose their position and therefore lose count, resulting in loss of data or incorrect data	Acquisition of a metric measuring tape. Using outstanding markings as well as numbering the markings on the imperial tape to keep track of recordings.

5. Financial Report

The budget was used as proposed without any variations.

Table 3: Budget as per proposal

Activity 1: Reef Health Data Sampling and Capacity Building	Unit	#	Unit Cost [US$]	Subtotal [US$]	ReefFIX [US$]	In - Kind [US$]
Reef Check Dives	Person Dive	32	$40	$1,280	$1,280	
Eco Diver Stipends	Dive Days	32	$40	$1,280	$600	$680
Data Entry and Analysis	Day	3	$100	$300		$300
Data Publication	Day	1	$500	$500		$500
ERIC Training Fees	Day	6	$500	$3,000	$1,500	$1,500
Subtotal Activity 1				**$6,360**	**$3,380**	**$2,980**
Activity 2: Community Outreach Workshop	**Unit**	**#**	**Unit Cost [US$]**	**Subtotal [US$]**	**ReefFIX [US$]**	**In - Kind [US$]**
ERIC Training Fees	Day	3	$500	$1,500	$500	$1,000
Venue	Day	1	$120	$120	$120	
Catering	Pax	20	$20	$400	$400	
Presentation Material	Mix	1	$200	$200		$200
Community Facilitator Stipends	Day	15	$40	$600	$600	
Subtotal Activity 2		40	$40	**$2,820**	**$1,620**	**$1,200**
Activity 3: Administration, Reporting	**Unit**		**Unit Cost [US$]**	**Subtotal [US$]**	**ReefFIX [US$]**	**In - Kind [US$]**
Final Report	Day	1	$500	$500		$500
Media Story	Day	1	$500	$500		$500
Liaison with ReefFix	Day	2	$500	$1,000		$1,000
Telecommunication / month	Month	4	$20	$80		$80
Office Usage / month	Month	4	$100	$400		$400
Subtotal Activity 3				**$2,480.00**	**$0.00**	**$2,480.00**
Totals				**$11,660.00**	**$5,000.00**	**$6,660.00**

Table 4: Expenditure to date

Activity 1: Reef Health Data Sampling and Capacity Building	Unit	#	Unit Cost [US$]	Subtotal [US$]	ReefFIX [US$]	In - Kind [US$]
Reef Check Dives	Person Dive	32	$40	$1,280	$1,280	
Eco Diver Stipends	Dive Days	32	$40	$1,280	$600	$680
Data Entry and Analysis	Day	3	$100	$300		$300
Data Publication	Day	1	$500	$500		$500
ERIC Training Fees	Day	6	$500	$3,000	$1,500	$1,500
Subtotal Activity 1				**$6,360**	**$3,380**	**$2,980**

Activity 1: Reef Health Data Sampling and Capacity Building	**Unit**	**#**	**Unit Cost [US$]**	**Subtotal [US$]**	**ReefFIX [US$]**	**In - Kind [US$]**
Activity 2: Community Outreach Workshop	**Unit**	**#**	**Unit Cost [US$]**	**Subtotal [US$]**	**ReefFIX [US$]**	**In - Kind [US$]**
ERIC Training Fees	Day	3	$500	$1,500	$500	$1,000
Venue	Day	1	$120	$120	$120	
Catering	Pax	20	$20	$400	$400	
Presentation Material	Mix	1	$200	$200		$200
Community Facilitator Stipends	Day	15	$40	$600	$600	
Subtotal Activity 2		40	$40	**$2,820**	**$1,620**	**$1,200**
Activity 3: Administration, Reporting	**Unit**		**Unit Cost [US$]**	**Subtotal [US$]**	**ReefFIX [US$]**	**In - Kind [US$]**
Final Report	Day	1	$500	$500		$500
Media Story	Day	1	$500	$500		$500
Liaison with ReefFix	Day	2	$500	$1,000		$1,000
Telecommunication / month	Month	4	$20	$80		$80
Office Usage / month	Month	4	$100	$400		$400
Subtotal Activity 3				**$2,480.00**	**$0.00**	**$2,480.00**
Totals				**$11,660.00**	**$5,000.00**	**$6,660.00**

6. Annex 1: Registration Sheet for Stakeholder Workshop

REGISTRATION FOR FORUM ON THE CONSERVATION OF THE MARINE NATURAL RESOURCES OF NE TOBAGO

No.	NAME	POSITION	ORGANISATION	PHONE NUMBER	EMAIL ADDRESS
1	Sabrine Schroedl	Manager	Speyside Inn	761-6628	speyside@extradivers.info
2	Sina Selchow	Trainee	-"- -"-		
3	Jennifer Hall [illegible]	V.C. President	L'ANSE FOURMI	790-1605	
4	Kamon Eastman	V. President	Charlotteville Village Council	716-8841	Kemoneastman@gmail.co.
5	Renée Gift	Director	Environment Tobago	771-4044	rjgift@gmail.com
6	KAMLYN MELVILLE-PANTIN	FORESTER 1	DNRE / FORESTRY	391-3751	kaymel2002@yahoo.co.uk
7	RUPERT M^cKENNA	RP	SCAPR	762-2202	rupert.mckenna43@[illegible]
8	JOHANNA MOSES-WOTHKE	CEO	ASCLEPIUS GREEN	4979705	j.moses-wothke@asclepiusgreen[illegible]
9.	Kimron Eastman	Treasurer	North east Sea Turtles	338-3481	Kimronx27@gmail.com
10	NKOSI KERR	Member	L'Anse Fourmi VC	320-0213	Mrjeremiah[illegible]@gmail.com
11	SIMON CHANCE	MEMBER	L'ANSE FOURMI VC	294-9233	
12	LANYA FANOVICH	BIOLOGICAL + TRAINING CONSULTANT	ERIC	758-0283	[illegible]@gmail.com

REGISTRATION FOR FORUM ON THE CONSERVATION OF THE MARINE NATURAL RESOURCES OF NE TOBAGO

No.	NAME	POSITION	ORGANISATION	PHONE NUMBER	EMAIL ADDRESS
13	WELLDON MAPP	P.R.O	NEST	3428473	Josel mapp@gmail
14	SUSAN SUCHIT	SEMP	SEMPR	768-7987	
15	CHELSEA OSMOND	[illegible]	PVC	391-9110	
16	KERLAN BLAKE	[illegible]	PVC	285-2221	
17	Mickela Stewart	SPEYSIDE HIGH	STUDENT	660-4611	
18	ALJOSCHA WOTHKE	DIRECTOR	ERIC	788-3550	
19	DARLINGTON CHANCE	President	B. Bay, Man Ridge Ty.	318-8034	
20	MARYANN LEONCE BRATHWAITE	CEC member THA	SEC. UNDP-THA	461-1025	

7. Annex 2: Agenda for Stakeholder Workshop

Organization of American States

Marine Protected Area Co-management Capacity Building

in

NE Tobago

OAS REEF MONITORING AND TRAINING DIVES

Date	Dive Site	A. Wothke	K. Blake	L. Fanovich	S. Suchit	R. Mc Kenna	K. Eastman	J. Bock	W. Mapp
19.02.15	LANDSLIDE	—	KB *	LF *	Susan Suchit *	[illegible] *	[signature] *	[signature] *	—
19.02.15	BOOBY ISLAND	—	KB *	LF *	Susan Suchit *	[signature] *	[signature] *	[signature] *	—
08.03.15	ST. GILES BAY	AW *	KB *	LF *	—	—	—	—	[signature] *
11.04.15	SANGER ROCK	AW *	KB *	LF *	—	—	[signature] *	—	— *
11.04.15	PIRATE'S BAY	AW *	KB *	LF *	—	—	[signature] *	—	—
11.04.15	HERMITAGE	AW *	KB *	LF *	—	—	[signature] *	—	—
12.04.15	GROVER POINT	AW *	—	LF *	—	[signature] *	[signature] *	—	—
12.04.15	OLD ROPE BAY	AW *	—	LF *	—	[signature] *	[signature] *	—	—

1

Environmental Research Institute Charlotteville Tobago, c/o Shark Shacks, Campbellton, Charlotteville Tobago.
Email: info@eric-tobago.org, Phone:1-868-788-3550. Website: www.eric-tobago.org

9. Annex 4: Marine Biological Data

SITE: LANDSLIDE AVERAGE DEPTH: 10m – 12m

DATE			11.08.14				26.12.14[3]			19.02.15[4]			
INVERTEBRATES			S1	S2	S3	S4	S1	S2	S3	S1	S2	S3	S4
FAMILY	*SCIENTIFIC NAME*	COMMON NAME											
Stenopodidae	*Stenopus hispidus*	Banded Coral Shrimp	0	0	2	0	0	0	0	0	0	0	0
Diadematidae	*Diadema* spp.	Urchin	0	0	0	0	0	0	0	0	0	0	0
Cidaridae	*Eucidaris* spp.	Pencil Urchin	0	0	0	0	0	0	0	0	0	0	0
Toxopneustidae	*Tripneustes* sp.	Collector Urchin	0	0	0	0	0	0	0	0	0	0	0
Ranellidae	*Charonia variegata*	Variegated Triton	0	0	0	0	0	0	0	0	0	0	0
Strombidae		Conches	0	0	0	0	0	0	0	0	0	0	0
Ovulidae	*Cyphoma gibbosum*	Flamingo Tongue	0	0	0	0	1	0	0	11	3	11	2
		Gorgonian	>100	>100	>100	>40	180	140	125	149	116	179	50
Palinuridae		Lobster	0	0	0	0	0	0	0	0	0	0	0
FISH								0					0
Chaetodontidae		Butterflyfish	0	0	0	0	0	0	0	4	2	0	2
Haemulidae		Grunts/ Margates	0	0	4	20	1	0	2	4	7	6	4
Lutjanidae		Snapper	0	0	0	0	0	0	0	0	1	0	0
Scaridae		Parrotfish (>20cm)	0	0	1	0	0	0	0	4	6	3	0
Muraenidae		Moray Eel	0	0	0	0	0	0	0	0	0	0	0
Serranidae	*Epinephalus striatus*	Nassau Grouper (>30cm)	0	0	0	0	0	0	0	0	0	0	0
		Other Groupers (>30cm)	0	0	0	0	0	0	0	0	0	0	0
Scorpaenidae	*Pterois volitans*	Lionfish	0	0	0	0	0	0	0	0	0	0	0

[3] Unable to complete fourth transect due to low air
[4] OAS Funded Dive

SITE: BOOBY ISLAND AVERAGE DEPTH: 6m – 8m

DATE			16.08.14				17.01.15				19.02.15[5]			
INVERTEBRATES			S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
FAMILY	*SCIENTIFIC NAME*	COMMON NAME												
Stenopodidae	*Stenopus hispidus*	Banded Coral Shrimp	1	0	0	0	0	0	0	0	0	0	0	0
Diadematidae	*Diadema* spp.	Urchin	0	0	0	0	0	0	0	0	0	0	0	0
Cidaridae	*Eucidaris* spp.	Pencil Urchin	0	0	0	0	0	0	0	0	0	0	0	0
Toxopneustidae	*Tripneustes* sp.	Collector Urchin	0	0	0	0	0	0	0	0	0	0	0	0
Ranellidae	*Charonia variegata*	Variegated Triton	0	0	0	0	0	0	0	0	0	0	0	0
Strombidae		Conches	0	0	0	0	0	0	0	0	0	0	0	0
Ovulidae	*Cyphoma gibbosum*	Flamingo Tongue	0	0	0	0	1	0	1	0	13	11	11	18
		Gorgonian	36	35	>40	>40	59	30	107	76	158	112	128	112
Palinuridae		Lobster	0	0	0	0	0	0	0	0	0	0	0	0
FISH														0
Chaetodontidae		Butterflyfish	0	0	0	0	0	2	2	0	14	1	4	0
Haemulidae		Grunts/ Margates	1	0	0	0	0	1	3	0	14	3	2	3
Lutjanidae		Snapper	0	0	0	0	0	0	0	0	1	0	0	0
Scaridae		Parrotfish (>20cm)	0	0	0	0	0	0	0	0	3	2	2	2
Muraenidae		Moray Eel	0	0	0	0	0	0	0	0	0	0	0	0
Serranidae	*Epinephalus striatus*	Nassau Grouper (>30cm)	0	0	0	0	0	0	0	0	0	0	0	0
		Other Groupers (>30cm)	0	0	0	0	0	0	0	0	0	0	0	0
Scorpaenidae	*Pterois volitans*	Lionfish	0	0	0	0	0	0	0	0	0	0	0	0

[5] OAS Funded Dive

SITE: ST. GILES BAY AVERAGE DEPTH: 6m – 9m

DATE			06.12.14				08.03.15[6]			
INVERTEBRATES			S1	S2	S3	S4	S1	S2	S3	S4
FAMILY	*SCIENTIFIC NAME*	COMMON NAME								
Stenopodidae	*Stenopus hispidus*	Banded Coral Shrimp	0	0	0	0	0	0	0	0
Diadematidae	*Diadema* spp.	Urchin	0	0	0	0	0	0	0	0
Cidaridae	*Eucidaris* spp.	Pencil Urchin	0	0	0	0	0	0	0	0
Toxopneustidae	*Tripneustes* sp.	Collector Urchin	0	0	0	0	0	0	0	0
Ranellidae	*Charonia variegata*	Variegated Triton	0	0	0	0	0	0	0	0
Strombidae		Conches	0	0	0	0	0	0	0	0
Ovulidae	*Cyphoma gibbosum*	Flamingo Tongue	0	1	0	0	3	19	9	3
		Gorgonian	137	160	129	152	139	127	129	121
Palinuridae		Lobster	0	0	0	0	0	0	1	0
FISH										0
Chaetodontidae		Butterflyfish	0	0	1	1	0	1	1	0
Haemulidae		Grunts/ Margates	0	0	1	2	1	4	2	0
Lutjanidae		Snapper	0	0	0	0	0	0	0	0
Scaridae		Parrotfish (>20cm)	0	0	0	0	3	1	0	1
Muraenidae		Moray Eel	0	0	1	0	0	0	1	0
Serranidae	*Epinephalus striatus*	Nassau Grouper (>30cm)	0	0	0	0	0	0	0	0
		Other Groupers (>30cm)	0	0	0	0	0	0	0	0
Scorpaenidae	*Pterois volitans*	Lionfish	0	0	0	0	0	0	0	0

[6] OAS Funded Dive

SITE: SANGER ROCK AVERAGE DEPTH: 10m – 12m

DATE			26.12.14				11.04.15[7]			
INVERTEBRATES			S1	S2	S3	S4	S1	S2	S3	S4
FAMILY	*SCIENTIFIC NAME*	COMMON NAME								
Stenopodidae	*Stenopus hispidus*	Banded Coral Shrimp	0	0	0	0	0	0	0	0
Diadematidae	*Diadema* spp.	Urchin	0	0	0	0	0	0	0	0
Cidaridae	*Eucidaris* spp.	Pencil Urchin	0	0	0	0	0	0	0	0
Toxopneustidae	*Tripneustes* sp.	Collector Urchin	0	0	0	0	0	0	0	0
Ranellidae	*Charonia variegata*	Variegated Triton	0	0	0	0	0	0	0	0
Strombidae		Conches	0	0	0	0	0	0	0	0
Ovulidae	*Cyphoma gibbosum*	Flamingo Tongue	1	0	0	0	7	12	5	5
		Gorgonian	110	70	75	85	102	84	90	80
Palinuridae		Lobster	0	0	0	0	0	0	1	0
FISH										0
Chaetodontidae		Butterflyfish	0	2	5	0	5	2	3	6
Haemulidae		Grunts/ Margates	0	0	5	2	2	2	2	7
Lutjanidae		Snapper	0	0	0	0	3	0	2	2
Scaridae		Parrotfish (>20cm)	0	0	0	0	5	0	1	3
Muraenidae		Moray Eel	0	0	0	0	0	0	0	1
Serranidae	*Epinephalus striatus*	Nassau Grouper (>30cm)	0	0	0	0	0	0	0	0
		Other Groupers (>30cm)	0	0	0	0	0	0	0	0
Scorpaenidae	*Pterois volitans*	Lionfish	0	0	0	0	0	0	0	0

[7] OAS Funded Dive

SITE: PIRATE'S BAY AVERAGE DEPTH: 8m- 10m

DATE			20.08.14				20.01.15				11.04.15[8]			
INVERTEBRATES			S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
FAMILY	*SCIENTIFIC NAME*	COMMON NAME												
Stenopodidae	*Stenopus hispidus*	Banded Coral Shrimp	1	0	0	0	0	1	0	0	0	0	0	0
Diadematidae	*Diadema* spp.	Urchin	0	0	0	0	0	0	0	0	0	0	0	0
Cidaridae	*Eucidaris* spp.	Pencil Urchin	0	0	0	0	0	0	0	0	0	0	0	0
Toxopneustidae	*Tripneustes* sp.	Collector Urchin	0	0	0	0	0	0	0	0	0	0	0	0
Ranellidae	*Charonia variegata*	Variegated Triton	0	0	0	0	0	0	0	0	0	0	0	0
Strombidae		Conches	0	0	0	0	0	0	0	0	0	0	0	0
Ovulidae	*Cyphoma gibbosum*	Flamingo Tongue	0	0	0	0	6	5	7	4	0	0	0	3
		Gorgonian	>100	>100	>100	>100	360	337	155	78	160	137	116	123
Palinuridae		Lobster	0	0	0	0	1	0	0	0	0	1	1	0
FISH														0
Chaetodontidae		Butterflyfish	0	0	0	0	0	0	0	0	0	0	1	0
Haemulidae		Grunts/ Margates	1	0	1	2	0	1	3	1	0	2	1	1
Lutjanidae		Snapper	0	0	0	0	1	0	0	1	1	0	0	0
Scaridae		Parrotfish (>20cm)	0	0	0	1	0	1	2	1	1	1	0	2
Muraenidae		Moray Eel	0	0	1	0	0	0	0	0	0	0	0	1
Serranidae	*Epinephalus striatus*	Nassau Grouper (>30cm)	0	0	0	0	0	0	0	0	0	0	0	0
		Other Groupers (>30cm)	0	0	0	0	0	0	0	0	0	0	0	0
Scorpaenidae	*Pterois volitans*	Lionfish	1	0	0	1	0	0	2	0	0	0	0	0

[8] OAS Funded Dive; incomplete data for invertebrates since slate was lost at the end of the survey

SITE: HERMITAGE DEPTH: 10m – 13m

DATE			20.08.14				11.04.15[9]			
INVERTEBRATES			S1	S2	S3	S4	S1	S2	S3	S4
FAMILY	*SCIENTIFIC NAME*	COMMON NAME								
Stenopodidae	*Stenopus hispidus*	Banded Coral Shrimp	0	0	0	1	0	0	0	0
Diadematidae	*Diadema* spp.	Urchin	0	0	0	0	0	0	0	0
Cidaridae	*Eucidaris* spp.	Pencil Urchin	0	0	0	0	0	0	0	0
Toxopneustidae	*Tripneustes* sp.	Collector Urchin	0	0	0	0	0	0	0	0
Ranellidae	*Charonia variegata*	Variegated Triton	0	0	0	0	0	0	0	0
Strombidae		Conches	0	0	0	0	0	0	0	0
Ovulidae	*Cyphoma gibbosum*	Flamingo Tongue	0	0	0	0	6	0	1	0
		Gorgonian	>40	2	5	27	271	220	173	32
Palinuridae		Lobster	0	0	0	0	0	0	1	0
FISH										0
Chaetodontidae		Butterflyfish	0	0	0	0	3	2	1	2
Haemulidae		Grunts/ Margates	0	2	0	0	1	3	1	0
Lutjanidae		Snapper	0	0	0	0	0	5	0	0
Scaridae		Parrotfish (>20cm)	0	1	2	0	3	2	3	1
Muraenidae		Moral Eel	0	0	0	0	0	0	0	0
Serranidae	*Epinephalus striatus*	Nassau Grouper (>30cm)	0	0	0	0	0	0	0	0
		Other Groupers (>30cm)	0	0	0	0	0	0	0	0
Scorpaenidae	*Pterois volitans*	Lionfish	0	0	0	0	0	0	0	0

[9] OAS Funded Dive

10.Annex 5: Substrate Composition Data

LANDSLIDE – 19.02.2015								BOOBY ISLAND – 19.02.2015							
SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 4		SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 4	
0m-19.5m		*25m-44.5m*		*50m-69.5m*		*75m – 94.5m*		*0m-19.5m*		*25m-44.5m*		*50m-69.5m*		*75m – 94.5m*	
0.0	SD	**25.0**	SD	**50.0**	RC	**75.0**	HC	**0.0**	HC	**25.0**	HC	**50.0**	SC	**75.0**	SC
0.5	HC	**25.5**	RC	**50.5**	SD	**75.5**	RC	**0.5**	HC	**25.5**	RC	**50.5**	SD	**75.5**	RC
1.0	HC	**26.0**	RC	**51.0**	SD	**76.0**	RC	**1.0**	HC	**26.0**	RC	**51.0**	RKC	**76.0**	SC
1.5	SD	**26.5**	SD	**51.5**	RC	**76.5**	RC	**1.5**	RC	**26.5**	SC	**51.5**	HC	**76.5**	RC
2.0	HC	**27.0**	RC	**52.0**	SD	**77.0**	SD	**2.0**	HC	**27.0**	RC	**52.0**	RC	**77.0**	SD
2.5	SD	**27.5**	SC	**52.5**	RC	**77.5**	HC	**2.5**	RC	**27.5**	RC	**52.5**	SD	**77.5**	SD
3.0	SD	**28.0**	SD	**53.0**	SD	**78.0**	RC	**3.0**	RC	**28.0**	RC	**53.0**	HC	**78.0**	SD
3.5	SD	**28.5**	RC	**53.5**	SD	**78.5**	RC	**3.5**	RC	**28.5**	RC	**53.5**	RC	**78.5**	SD
4.0	RC	**29.0**	SD	**54.0**	RC	**79.0**	SD	**4.0**	RC	**29.0**	RC	**54.0**	HC	**79.0**	SD
4.5	RC	**29.5**	SD	**54.5**	RC	**79.5**	RC	**4.5**	RC	**29.5**	RC	**54.5**	HC	**79.5**	RC
5.0	RC	**30.0**	SC	**55.0**	RC	**80.0**	RC	**5.0**	RC	**30.0**	HC	**55.0**	HC	**80.0**	RC
5.5	RC	**30.5**	RC	**55.5**	HC	**80.5**	SD	**5.5**	SC	**30.5**	RC	**55.5**	HC	**80.5**	RC
6.0	HC	**31.0**	SD	**56.0**	HC	**81.0**	SD	**6.0**	RC	**31.0**	RC	**56.0**	HC	**81.0**	RC
6.5	SC	**31.5**	RC	**56.5**	RC	**81.5**	RC	**6.5**	RC	**31.5**	RC	**56.5**	HC	**81.5**	RC
7.0	SD	**32.0**	SC	**57.0**	RC	**82.0**	RC	**7.0**	RC	**32.0**	RC	**57.0**	SD	**82.0**	HC
7.5	HC	**32.5**	RC	**57.5**	RC	**82.5**	RC	**7.5**	RC	**32.5**	RC	**57.5**	RC	**82.5**	RC
8.0	SD	**33.0**	SC	**58.0**	SD	**83.0**	RC	**8.0**	RC	**33.0**	RC	**58.0**	RC	**83.0**	RC
8.5	SC	**33.5**	RC	**58.5**	SD	**83.5**	SD	**8.5**	RC	**33.5**	RC	**58.5**	RC	**83.5**	RC
9.0	SC	**34.0**	SD	**59.0**	RC	**84.0**	RC	**9.0**	RC	**34.0**	RC	**59.0**	RC	**84.0**	RC
9.5	HC	**34.5**	RC	**59.5**	RC	**84.5**	RC	**9.5**	RC	**34.5**	RC	**59.5**	RC	**84.5**	RC
10.0	RC	**35.0**	RC	**60.0**	HC	**85.0**	OT	**10.0**	SC	**35.0**	RC	**60.0**	RC	**85.0**	RC
10.5	SD	**35.5**	SC	**60.5**	RC	**85.5**	RC	**10.5**	SC	**35.5**	RC	**60.5**	RC	**85.5**	RC
11.0	RC	**36.0**	HC	**61.0**	SD	**86.0**	RC	**11.0**	RC	**36.0**	RC	**61.0**	RC	**86.0**	RC
11.5	SC	**36.5**	SD	**61.5**	RC	**86.5**	SD	**11.5**	RC	**36.5**	RC	**61.5**	HC	**86.5**	RC
12.0	SD	**37.0**	RC	**62.0**	HC	**87.0**	SD	**12.0**	RC	**37.0**	HC	**62.0**	HC	**87.0**	RC
12.5	SD	**37.5**	SD	**62.5**	RC	**87.5**	SD	**12.5**	RC	**37.5**	RC	**62.5**	HC	**87.5**	SD
13.0	SD	**38.0**	HC	**63.0**	SD	**88.0**	RC	**13.0**	RC	**38.0**	RC	**63.0**	HC	**88.0**	RC
13.5	RC	**38.5**	SD	**63.5**	RC	**88.5**	HC	**13.5**	RC	**38.5**	RC	**63.5**	RC	**88.5**	RC
14.0	HC	**39.0**	SD	**64.0**	HC	**89.0**	SP	**14.0**	HC	**39.0**	RC	**64.0**	SC	**89.0**	RC
14.5	HC	**39.5**	HC	**64.5**	SD	**89.5**	SD	**14.5**	RC	**39.5**	RC	**64.5**	SC	**89.5**	OT
15.0	RC	**40.0**	HC	**65.0**	RC	**90.0**	HC	**15.0**	HC	**40.0**	RC	**65.0**	RC	**90.0**	RC
15.5	RC	**40.5**	SD	**65.5**	HC	**90.5**	RC	**15.5**	RC	**40.5**	HC	**65.5**	RC	**90.5**	RC
16.0	HC	**41.0**	SD	**66.0**	RC	**91.0**	RC	**16.0**	RC	**41.0**	HC	**66.0**	RC	**91.0**	SC
16.5	RC	**41.5**	SD	**66.5**	RC	**91.5**	SD	**16.5**	RC	**41.5**	HC	**66.5**	RC	**91.5**	RC
17.0	SC	**42.0**	SD	**67.0**	HC	**92.0**	SD	**17.0**	RC	**42.0**	HC	**67.0**	RC	**92.0**	HC
17.5	HC	**42.5**	SD	**67.5**	HC	**92.5**	SD	**17.5**	RC	**42.5**	HC	**67.5**	SC	**92.5**	SC
18.0	SC	**43.0**	HC	**68.0**	HC	**93.0**	SD	**18.0**	HC	**43.0**	RC	**68.0**	HC	**93.0**	RC
18.5	HC	**43.5**	HC	**68.5**	HC	**93.5**	SP	**18.5**	RC	**43.5**	SC	**68.5**	RC	**93.5**	RC
19.0	SD	**44.0**	SD	**69.0**	RC	**94.0**	RC	**19.0**	RC	**44.0**	SC	**69.0**	HC	**94.0**	RC
19.5	RC	**44.5**	HC	**69.5**	SC	**94.5**	SD	**19.5**	RC	**44.5**	HC	**69.5**	RC	**94.5**	SD

ST. GILES BAY – 08.03.2015[10]								SANGER ROCK – 11.04.2015							
SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 4		SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 4	
0m-19.5m		*25m-44.5m*		*50m-69.5m*		*75m – 94.5m*		*0m-19.5m*		*25m-44.5m*		*50m-69.5m*		*75m – 94.5m*	
0.0	SD	**25.0**	HC	**50.0**	OT	**75.0**	SC	**0.0**	SD	**25.0**	RKC	**50.0**	RC	**75.0**	RC
0.5	HC	**25.5**	HC	**50.5**	HC	**75.5**	RC	**0.5**	SC	**25.5**	RKC	**50.5**	RC	**75.5**	RC
1.0	SC	**26.0**	SP	**51.0**	SP	**76.0**	RC	**1.0**	HC	**26.0**	SD	**51.0**	RC	**76.0**	RC
1.5	SC	**26.5**	HC	**51.5**	HC	**76.5**	RC	**1.5**	HC	**26.5**	SD	**51.5**	RC	**76.5**	RC
2.0	HC	**27.0**	OT	**52.0**	SP	**77.0**	RC	**2.0**	SC	**27.0**	RC	**52.0**	RC	**77.0**	RC
2.5	HC	**27.5**	SC	**52.5**	SC	**77.5**	SD	**2.5**	SP	**27.5**	RC	**52.5**	RC	**77.5**	RC
3.0	SP	**28.0**	OT	**53.0**	SP	**78.0**	RC	**3.0**	SD	**28.0**	OT	**53.0**	HC	**78.0**	RC
3.5	HC	**28.5**	SC	**53.5**	HC	**78.5**	RC	**3.5**	RC	**28.5**	HC	**53.5**	RC	**78.5**	RC
4.0	HC	**29.0**	SC	**54.0**	HC	**79.0**	RC	**4.0**	HC	**29.0**	HC	**54.0**	RC	**79.0**	RC
4.5	HC	**29.5**	SC	**54.5**		**79.5**	RC	**4.5**	HC	**29.5**	HC	**54.5**	RC	**79.5**	RC
5.0	HC	**30.0**	SC	**55.0**		**80.0**	RC	**5.0**	HC	**30.0**	HC	**55.0**	RC	**80.0**	RC
5.5	HC	**30.5**	SC	**55.5**		**80.5**	HC	**5.5**	HC	**30.5**	RC	**55.5**	HC	**80.5**	RC
6.0	SP	**31.0**	OT	**56.0**		**81.0**	SD	**6.0**	HC	**31.0**	OT	**56.0**	RC	**81.0**	RC
6.5	OT	**31.5**	SC	**56.5**		**81.5**	RC	**6.5**	SC	**31.5**	HC	**56.5**	RC	**81.5**	RC
7.0	SP	**32.0**	SC	**57.0**		**82.0**	RC	**7.0**	SC	**32.0**	HC	**57.0**	RC	**82.0**	RC
7.5	SP	**32.5**	HC	**57.5**		**82.5**	SC	**7.5**	HC	**32.5**	HC	**57.5**	RC	**82.5**	RC
8.0	HC	**33.0**	HC	**58.0**		**83.0**	RC	**8.0**	SD	**33.0**	RC	**58.0**	RC	**83.0**	RC
8.5	OT	**33.5**	NIA	**58.5**		**83.5**	RC	**8.5**	HC	**33.5**	HC	**58.5**	RC	**83.5**	RC
9.0	OT	**34.0**	SC	**59.0**		**84.0**	RC	**9.0**	HC	**34.0**	HC	**59.0**	RC	**84.0**	RC
9.5	OT	**34.5**	HC	**59.5**		**84.5**	SC	**9.5**	SD	**34.5**	SD	**59.5**	RC	**84.5**	RC
10.0	SP	**35.0**	SC	**60.0**		**85.0**	RC	**10.0**	RC	**35.0**	SC	**60.0**	RC	**85.0**	RC
10.5	OT	**35.5**	SP	**60.5**		**85.5**	RC	**10.5**	HC	**35.5**	SC	**60.5**	RC	**85.5**	RC
11.0	HC	**36.0**	HC	**61.0**		**86.0**	RC	**11.0**	SC	**36.0**	SC	**61.0**	RC	**86.0**	RC
11.5	HC	**36.5**	SC	**61.5**		**86.5**	RC	**11.5**	SC	**36.5**	HC	**61.5**	RC	**86.5**	RC
12.0	OT	**37.0**	SP	**62.0**		**87.0**	RC	**12.0**	SC	**37.0**	HC	**62.0**	RC	**87.0**	RC
12.5	SC	**37.5**	SD	**62.5**		**87.5**	RC	**12.5**	SC	**37.5**	SC	**62.5**	RC	**87.5**	RC
13.0	SD	**38.0**	HC	**63.0**		**88.0**	RC	**13.0**	OT	**38.0**	HC	**63.0**	RC	**88.0**	RC
13.5	SD	**38.5**	SP	**63.5**		**88.5**	SC	**13.5**	SC	**38.5**	HC	**63.5**	RC	**88.5**	RC
14.0	SP	**39.0**	SP	**64.0**		**89.0**	SD	**14.0**	SD	**39.0**	SC	**64.0**	RC	**89.0**	RC
14.5	SP	**39.5**	SP	**64.5**		**89.5**	SD	**14.5**	RC	**39.5**	NIA	**64.5**	RC	**89.5**	RC
15.0	OT	**40.0**	HC	**65.0**		**90.0**	SC	**15.0**	SD	**40.0**	RC	**65.0**	RC	**90.0**	RC
15.5	HC	**40.5**	OT	**65.5**		**90.5**	SD	**15.5**	HC	**40.5**	OT	**65.5**	RC	**90.5**	HC
16.0	SC	**41.0**	SC	**66.0**		**91.0**	RC	**16.0**	HC	**41.0**	SC	**66.0**	HC	**91.0**	SD
16.5	SC	**41.5**	SP	**66.5**		**91.5**	SP	**16.5**	RKC	**41.5**	SC	**66.5**	RC	**91.5**	RC
17.0	SC	**42.0**	SC	**67.0**		**92.0**	RC	**17.0**	RKC	**42.0**	SD	**67.0**	RC	**92.0**	RC
17.5	SD	**42.5**	SP	**67.5**		**92.5**	RC	**17.5**	RKC	**42.5**	SC	**67.5**	RC	**92.5**	RC
18.0	HC	**43.0**	HC	**68.0**		**93.0**	SC	**18.0**	RC	**43.0**	SD	**68.0**	RC	**93.0**	RC
18.5	HC	**43.5**	HC	**68.5**		**93.5**	SD	**18.5**	SD	**43.5**	RC	**68.5**	SC	**93.5**	RC
19.0	HC	**44.0**	OT	**69.0**		**94.0**	RC	**19.0**	HC	**44.0**	RC	**69.0**	RC	**94.0**	RC
19.5	OT	**44.5**	NIA	**69.5**		**94.5**	RC	**19.5**	HC	**44.5**	SC	**69.5**	RC	**94.5**	RC

[10] Substrate was not completed in the St. Giles Bay Segment 3 due to low air.

PIRATE'S BAY – 11.04.2015								HERMITAGE – 11.04.2015							
SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 4		SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 4	
0m-19.5m		*25m-44.5m*		*50m-69.5m*		*75m – 94.5m*		*0m-19.5m*		*25m-44.5m*		*50m-69.5m*		*75m – 94.5m*	
0.0	RC	**25.0**	RC	**50.0**	RC	**75.0**	SD	**0.0**	SC	**25.0**	SC	**50.0**	RC	**75.0**	RC
0.5	SD	**25.5**	RC	**50.5**	SD	**75.5**	RC	**0.5**	RC	**25.5**	SC	**50.5**	RC	**75.5**	RC
1.0	OT	**26.0**	HC	**51.0**	OT	**76.0**	OT	**1.0**	RC	**26.0**	SC	**51.0**	RC	**76.0**	HC
1.5	SD	**26.5**	RC	**51.5**	RC	**76.5**	RC	**1.5**	SC	**26.5**	SC	**51.5**	HC	**76.5**	SC
2.0	SC	**27.0**	RC	**52.0**	SC	**77.0**	RC	**2.0**	OT	**27.0**	HC	**52.0**	SC	**77.0**	RC
2.5	RC	**27.5**	RC	**52.5**	SC	**77.5**	OT	**2.5**	RC	**27.5**	RC	**52.5**	HC	**77.5**	RC
3.0	HC	**28.0**	RB	**53.0**	RB	**78.0**	NIA	**3.0**	RC	**28.0**	HC	**53.0**	RC	**78.0**	RC
3.5	OT	**28.5**	RC	**53.5**	HC	**78.5**	OT	**3.5**	SC	**28.5**	RC	**53.5**	RC	**78.5**	RC
4.0	RC	**29.0**	HC	**54.0**	HC	**79.0**	SD	**4.0**	SC	**29.0**	HC	**54.0**	RC	**79.0**	RC
4.5	RC	**29.5**	HC	**54.5**	RC	**79.5**	SD	**4.5**	RC	**29.5**	RC	**54.5**	RC	**79.5**	RC
5.0	RC	**30.0**	SD	**55.0**	SD	**80.0**	SD	**5.0**	RB	**30.0**	HC	**55.0**	RC	**80.0**	RC
5.5	RC	**30.5**	HC	**55.5**	SD	**80.5**	RC	**5.5**	SC	**30.5**	HC	**55.5**	RC	**80.5**	SC
6.0	RC	**31.0**	RC	**56.0**	OT	**81.0**	SD	**6.0**	SC	**31.0**	HC	**56.0**	RC	**81.0**	RC
6.5	RC	**31.5**	HC	**56.5**	HC	**81.5**	RB	**6.5**	SC	**31.5**	RC	**56.5**	RC	**81.5**	RC
7.0	SC	**32.0**	RC	**57.0**	RC	**82.0**	RC	**7.0**	HC	**32.0**	RC	**57.0**	RC	**82.0**	RC
7.5	RC	**32.5**	RC	**57.5**	HC	**82.5**	RB	**7.5**	RC	**32.5**	RC	**57.5**	RC	**82.5**	RC
8.0	RC	**33.0**	RC	**58.0**	OT	**83.0**	SD	**8.0**	OT	**33.0**	HC	**58.0**	HC	**83.0**	RC
8.5	RB	**33.5**	HC	**58.5**	RC	**83.5**	HC	**8.5**	SC	**33.5**	RC	**58.5**	RC	**83.5**	RC
9.0	RC	**34.0**	RC	**59.0**	RB	**84.0**	RC	**9.0**	SD	**34.0**	HC	**59.0**	RC	**84.0**	SC
9.5	RC	**34.5**	HC	**59.5**	OT	**84.5**	RC	**9.5**	OT	**34.5**	SC	**59.5**	RC	**84.5**	SC
10.0	RC	**35.0**	HC	**60.0**	RC	**85.0**	RC	**10.0**	OT	**35.0**	NIA	**60.0**	RC	**85.0**	RC
10.5	RC	**35.5**	RB	**60.5**	HC	**85.5**	RB	**10.5**	RC	**35.5**	RC	**60.5**	RC	**85.5**	HC
11.0	RC	**36.0**	HC	**61.0**	SC	**86.0**	SD	**11.0**	RC	**36.0**	OT	**61.0**	HC	**86.0**	RC
11.5	RB	**36.5**	HC	**61.5**	SC	**86.5**	SP	**11.5**	RC	**36.5**	OT	**61.5**	RC	**86.5**	HC
12.0	SC	**37.0**	SC	**62.0**	RC	**87.0**	RC	**12.0**	RC	**37.0**	SD	**62.0**	RC	**87.0**	HC
12.5	RC	**37.5**	SC	**62.5**	RC	**87.5**	HC	**12.5**	RC	**37.5**	HC	**62.5**	RC	**87.5**	RC
13.0	RC	**38.0**	SC	**63.0**	RB	**88.0**	SP	**13.0**	RC	**38.0**	SC	**63.0**	RC	**88.0**	SC
13.5	SD	**38.5**	RC	**63.5**	SC	**88.5**	SP	**13.5**	RC	**38.5**	SC	**63.5**	RC	**88.5**	RC
14.0	RC	**39.0**	RC	**64.0**	RB	**89.0**	RC	**14.0**	RC	**39.0**	SC	**64.0**	RC	**89.0**	HC
14.5	RC	**39.5**	RC	**64.5**	RB	**89.5**	RC	**14.5**	RC	**39.5**	HC	**64.5**	SC	**89.5**	RC
15.0	HC	**40.0**	SC	**65.0**	HC	**90.0**	OT	**15.0**	SC	**40.0**	RC	**65.0**	SC	**90.0**	RC
15.5	RC	**40.5**	HC	**65.5**	HC	**90.5**	RC	**15.5**	RB	**40.5**	RC	**65.5**	HC	**90.5**	RC
16.0	RC	**41.0**	RC	**66.0**	RB	**91.0**	SP	**16.0**	OT	**41.0**	HC	**66.0**	HC	**91.0**	RC
16.5	RC	**41.5**	RC	**66.5**	SD	**91.5**	RC	**16.5**	SC	**41.5**	SC	**66.5**	HC	**91.5**	RC
17.0	RC	**42.0**	SC	**67.0**	RB	**92.0**	RC	**17.0**	RC	**42.0**	RC	**67.0**	HC	**92.0**	HC
17.5	SC	**42.5**	RC	**67.5**	SD	**92.5**	HC	**17.5**	OT	**42.5**	RC	**67.5**	RC	**92.5**	HC
18.0	SC	**43.0**	SD	**68.0**	SD	**93.0**	RC	**18.0**	RC	**43.0**	RC	**68.0**	RC	**93.0**	HC
18.5	RC	**43.5**	HC	**68.5**	SC	**93.5**	RC	**18.5**	RC	**43.5**	RC	**68.5**	RC	**93.5**	RC
19.0	RC	**44.0**	SD	**69.0**	OT	**94.0**	SD	**19.0**	SD	**44.0**	RC	**69.0**	RC	**94.0**	RC
19.5	RC	**44.5**	RC	**69.5**	RC	**94.5**	OT	**19.5**	RC	**44.5**	SC	**69.5**	RC	**94.5**	RC

LANDSLIDE – 26.12.2014						OBEAH MAN POINT – 26.12.2014							
SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 4	
0m-19.5m		*25m-44.5m*		*50m-69.5m*		*0m-19.5m*		*25m-44.5m*		*50m-69.5m*		*75m – 94.5m*	
0.0	HC	**25.0**	SD	**50.0**	RC	**0.0**	HC	**25.0**	HC	**50.0**	HC	**75.0**	HC
0.5	HC	**25.5**	SC	**50.5**	RC	**0.5**	SD	**25.5**	RC	**50.5**	HC	**75.5**	HC
1.0	SD	**26.0**	SD	**51.0**	RC	**1.0**	RC	**26.0**	RC	**51.0**	RC	**76.0**	HC
1.5	SD	**26.5**	SD	**51.5**	HC	**1.5**	SC	**26.5**	SD	**51.5**	RC	**76.5**	HC
2.0	SD	**27.0**	HC	**52.0**	SD	**2.0**	HC	**27.0**	SD	**52.0**	RC	**77.0**	RC
2.5	SD	**27.5**	SC	**52.5**	SD	**2.5**	HC	**27.5**	RC	**52.5**	HC	**77.5**	HC
3.0	SC	**28.0**	SC	**53.0**	SC	**3.0**	HC	**28.0**	RC	**53.0**	SC	**78.0**	HC
3.5	SD	**28.5**	SD	**53.5**	HC	**3.5**	RC	**28.5**	RC	**53.5**	SC	**78.5**	SC
4.0	SD	**29.0**	SC	**54.0**	RC	**4.0**	SD	**29.0**	RC	**54.0**	RC	**79.0**	RC
4.5	SD	**29.5**	SC	**54.5**	SC	**4.5**	SD	**29.5**	HC	**54.5**	RC	**79.5**	RKC
5.0	HC	**30.0**	SC	**55.0**	SC	**5.0**	RC	**30.0**	SC	**55.0**	RC	**80.0**	SC
5.5	HC	**30.5**	SC	**55.5**	SC	**5.5**	SC	**30.5**	HC	**55.5**	RC	**80.5**	RC
6.0	RC	**31.0**	SD	**56.0**	HC	**6.0**	RC	**31.0**	HC	**56.0**	RC	**81.0**	HC
6.5	SC	**31.5**	SC	**56.5**	SD	**6.5**	SD	**31.5**	SC	**56.5**	SD	**81.5**	RKC
7.0	SD	**32.0**	SD	**57.0**	HC	**7.0**	SD	**32.0**	SC	**57.0**	SD	**82.0**	RC
7.5	SD	**32.5**	SC	**57.5**	SC	**7.5**	HC	**32.5**	SD	**57.5**	RC	**82.5**	RC
8.0	SD	**33.0**	SC	**58.0**	RC	**8.0**	HC	**33.0**	SD	**58.0**	RC	**83.0**	RC
8.5	SC	**33.5**	SD	**58.5**	SC	**8.5**	RC	**33.5**	SD	**58.5**	SD	**83.5**	RC
9.0	SD	**34.0**	SD	**59.0**	HC	**9.0**	RC	**34.0**	HC	**59.0**	HC	**84.0**	RC
9.5	SC	**34.5**	SD	**59.5**	SD	**9.5**	RC	**34.5**	SD	**59.5**	HC	**84.5**	RC
10.0	SD	**35.0**	RC	**60.0**	RC	**10.0**	HC	**35.0**	HC	**60.0**	HC	**85.0**	HC
10.5	SD	**35.5**	SC	**60.5**	HC	**10.5**	HC	**35.5**	HC	**60.5**	HC	**85.5**	HC
11.0	RC	**36.0**	SD	**61.0**	RC	**11.0**	RC	**36.0**	HC	**61.0**	HC	**86.0**	HC
11.5	RC	**36.5**	SD	**61.5**	RC	**11.5**	RC	**36.5**	HC	**61.5**	RC	**86.5**	RC
12.0	SD	**37.0**	SC	**62.0**	RC	**12.0**	HC	**37.0**	SD	**62.0**	RC	**87.0**	RC
12.5	SD	**37.5**	SD	**62.5**	SD	**12.5**	HC	**37.5**	SD	**62.5**	SD	**87.5**	RC
13.0	SC	**38.0**	SD	**63.0**	SD	**13.0**	HC	**38.0**	SD	**63.0**	RC	**88.0**	RC
13.5	SD	**38.5**	SC	**63.5**	SC	**13.5**	RC	**38.5**	HC	**63.5**	HC	**88.5**	HC
14.0	SD	**39.0**	SC	**64.0**	SD	**14.0**	RC	**39.0**	HC	**64.0**	HC	**89.0**	SC
14.5	SC	**39.5**	SC	**64.5**	SC	**14.5**	HC	**39.5**	SD	**64.5**	NIA	**89.5**	RC
15.0	RC	**40.0**	SD	**65.0**	RC	**15.0**	HC	**40.0**	SD	**65.0**	NIA	**90.0**	HC
15.5	SC	**40.5**	RC	**65.5**	HC	**15.5**	HC	**40.5**	HC	**65.5**	HC	**90.5**	HC
16.0	SD	**41.0**	RC	**66.0**	RC	**16.0**	RC	**41.0**	HC	**66.0**	HC	**91.0**	SC
16.5	SC	**41.5**	SD	**66.5**	HC	**16.5**	RC	**41.5**	HC	**66.5**	HC	**91.5**	RC
17.0	SC	**42.0**	SC	**67.0**	RC	**17.0**	SC	**42.0**	RC	**67.0**	HC	**92.0**	RC
17.5	RC	**42.5**	RC	**67.5**	RC	**17.5**	HC	**42.5**	HC	**67.5**	HC	**92.5**	RC
18.0	SD	**43.0**	RC	**68.0**	RC	**18.0**	HC	**43.0**	HC	**68.0**	RKC	**93.0**	RC
18.5	SD	**43.5**	SD	**68.5**	SD	**18.5**	RC	**43.5**	SD	**68.5**	RC	**93.5**	RC
19.0	SD	**44.0**		**69.0**	RC	**19.0**	HC	**44.0**	RC	**69.0**	HC	**94.0**	HC
19.5	SD	**44.5**		**69.5**	HC	**19.5**	HC	**44.5**	HC	**69.5**	HC	**94.5**	RC

BOOBY ISLAND – 17.01.2015								PIRATE'S BAY – 20.01.15							
SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 4		SEGMENT 1		SEGMENT 2		SEGMENT 3		SEGMENT 4	
0m-19.5m		*25m-44.5m*		*50m-69.5m*		*75m – 94.5m*		*0m-19.5m*		*25m-44.5m*		*50m-69.5m*		*75m – 94.5m*	
0.0	RC	**25.0**	RC	**50.0**	RB	**75.0**	RC	**0.0**	RC	**25.0**	HC	**50.0**	HC	**75.0**	SD
0.5	RC	**25.5**	SC	**50.5**	SD	**75.5**	RC	**0.5**	RC	**25.5**	RC	**50.5**	SC	**75.5**	RC
1.0	RC	**26.0**	SD	**51.0**	RC	**76.0**	SD	**1.0**	RC	**26.0**	HC	**51.0**	HC	**76.0**	RC
1.5	RC	**26.5**	RC	**51.5**	HC	**76.5**	SD	**1.5**	RC	**26.5**	RC	**51.5**	OT	**76.5**	RB
2.0	HC	**27.0**	RC	**52.0**	RC	**77.0**	RC	**2.0**	SD	**27.0**	RC	**52.0**	HC	**77.0**	OT
2.5	RC	**27.5**	RB	**52.5**	HC	**77.5**	RC	**2.5**	RC	**27.5**	SD	**52.5**	SC	**77.5**	RC
3.0	RB	**28.0**	RC	**53.0**	HC	**78.0**	RC	**3.0**	RC	**28.0**	RC	**53.0**	HC	**78.0**	HC
3.5	RC	**28.5**	RC	**53.5**	RC	**78.5**	SD	**3.5**	RC	**28.5**	HC	**53.5**	SD	**78.5**	RC
4.0	SC	**29.0**	RC	**54.0**	RC	**79.0**	SD	**4.0**	RC	**29.0**	RC	**54.0**	RC	**79.0**	RC
4.5	SC	**29.5**	HC	**54.5**	SD	**79.5**	SD	**4.5**	HC	**29.5**	RC	**54.5**	SD	**79.5**	SD
5.0	HC	**30.0**	RC	**55.0**	RC	**80.0**	RB	**5.0**	HC	**30.0**	SD	**55.0**	HC	**80.0**	OT
5.5	RC	**30.5**	HC	**55.5**	RC	**80.5**	SD	**5.5**	RC	**30.5**	HC	**55.5**	SD	**80.5**	SD
6.0	RB	**31.0**	HC	**56.0**	RC	**81.0**	RC	**6.0**	RC	**31.0**	SC	**56.0**	SC	**81.0**	OT
6.5	RB	**31.5**	HC	**56.5**	HC	**81.5**	RB	**6.5**	SP	**31.5**	SD	**56.5**	RC	**81.5**	SP
7.0	RC	**32.0**	HC	**57.0**	HC	**82.0**	RC	**7.0**	RC	**32.0**	RC	**57.0**	SC	**82.0**	HC
7.5	RC	**32.5**	HC	**57.5**	HC	**82.5**	RC	**7.5**	RC	**32.5**	RC	**57.5**	RC	**82.5**	RC
8.0	RB	**33.0**	HC	**58.0**	SC	**83.0**	RB	**8.0**	RC	**33.0**	RC	**58.0**	RC	**83.0**	RC
8.5	RB	**33.5**	RC	**58.5**	HC	**83.5**	RB	**8.5**	RC	**33.5**	RC	**58.5**	SC	**83.5**	RC
9.0	SC	**34.0**	RC	**59.0**	RC	**84.0**	RB	**9.0**	SC	**34.0**	HC	**59.0**	SC	**84.0**	RC
9.5	SD	**34.5**	RC	**59.5**	RC	**84.5**	SD	**9.5**	RC	**34.5**	RC	**59.5**	SC	**84.5**	RC
10.0	SD	**35.0**	RB	**60.0**	SD	**85.0**	HC	**10.0**	RC	**35.0**	OT	**60.0**	RC	**85.0**	SC
10.5	RB	**35.5**	RC	**60.5**	SD	**85.5**	SD	**10.5**	RC	**35.5**	SC	**60.5**	RC	**85.5**	RC
11.0	RC	**36.0**	SD	**61.0**	SD	**86.0**	SD	**11.0**	RC	**36.0**	HC	**61.0**	HC	**86.0**	RC
11.5	SD	**36.5**	RC	**61.5**	SD	**86.5**	RC	**11.5**	RC	**36.5**	RC	**61.5**	RC	**86.5**	RC
12.0	RC	**37.0**	HC	**62.0**	HC	**87.0**	RC	**12.0**	OT	**37.0**	RC	**62.0**	SP	**87.0**	RC
12.5	RB	**37.5**	HC	**62.5**	SD	**87.5**	RB	**12.5**	RC	**37.5**	HC	**62.5**	HC	**87.5**	SD
13.0	RC	**38.0**	HC	**63.0**	RC	**88.0**	HC	**13.0**	HC	**38.0**	RC	**63.0**	RC	**88.0**	HC
13.5	RC	**38.5**	SC	**63.5**	RC	**88.5**	RC	**13.5**	SD	**38.5**	SC	**63.5**	RC	**88.5**	RC
14.0	RC	**39.0**	RC	**64.0**	SD	**89.0**	HC	**14.0**	RC	**39.0**	HC	**64.0**	RC	**89.0**	RC
14.5	RC	**39.5**	SD	**64.5**	RC	**89.5**	RC	**14.5**	RC	**39.5**	HC	**64.5**	HC	**89.5**	RB
15.0	RC	**40.0**	HC	**65.0**	SD	**90.0**	RC	**15.0**	RC	**40.0**	HC	**65.0**	HC	**90.0**	RC
15.5	RB	**40.5**	RC	**65.5**	SD	**90.5**	RC	**15.5**	RC	**40.5**	HC	**65.5**	HC	**90.5**	RC
16.0	RC	**41.0**	RC	**66.0**	RC	**91.0**	RC	**16.0**	RB	**41.0**	SC	**66.0**	RB	**91.0**	RC
16.5	HC	**41.5**	RC	**66.5**	RB	**91.5**	RC	**16.5**	RC	**41.5**	SC	**66.5**	RB	**91.5**	RC
17.0	HC	**42.0**	RC	**67.0**	RC	**92.0**	HC	**17.0**	HC	**42.0**	SD	**67.0**	RB	**92.0**	RC
17.5	RC	**42.5**	RC	**67.5**	RC	**92.5**	RC	**17.5**	RC	**42.5**	RC	**67.5**	RB	**92.5**	HC
18.0	RC	**43.0**	RC	**68.0**	RB	**93.0**	RC	**18.0**	RC	**43.0**	HC	**68.0**	OT	**93.0**	HC
18.5	SD	**43.5**	RB	**68.5**	RB	**93.5**	RB	**18.5**	RC	**43.5**	SC	**68.5**	HC	**93.5**	RC
19.0	SD	**44.0**	HC	**69.0**	SD	**94.0**	RB	**19.0**	RC	**44.0**	HC	**69.0**	SD	**94.0**	RC
19.5	RC	**44.5**	HC	**69.5**	RB	**94.5**	RC	**19.5**	HC	**44.5**	SD	**69.5**	RC	**94.5**	RC

SUBSTRATE CODES

CODE	SUBSTRATE
HC	Hard Coral
SC	Soft Coral
RKC	Recently Killed Coral
NIA	Nutrient Indicator Algae
SP	Sponge
RC	Rock
RB	Rubble
SD	Sand
SI	Silt/ Clay
OT	Other

11. Annex 6 – Temperature and pH Data[11]

SITE	LANDSLIDE	BOOBY ISLAND	ST. GILES BAY	SANGER ROCK	PIRATE'S BAY	HERMITAGE
AVERAGE DEPTH RANGE (m)	10 - 12	6 - 8	6 - 9	10 - 12	8 - 10	10 - 13
pH	0	0	0	8.41	8.33	8.31
DEPTH (m)	**TEMPERATURE (°C)**					
0	29	29	29	29	29	29
1	27	27	27	27	26	26
2	26	26	26	26	26	26
3	26	26	26	26	26	26
4	26	26	26	26	26	26
5	26	26	26	26	26	26
6	26	26	26	26	26	26
7	26	0	0	26	26	26
8	26	0	0	26	26	26
9	26	0	0	26	0	26
10	0	0	0	26	0	26
11	0	0	0	26	0	26

[11] Parameters in which the value "0" has been entered indicates no data was collected

12.Annex 7: Disease and Impacts Data

SITE	LANDSLIDE				BOOBY ISLAND				ST. GILES BAY				SANGER ROCK				PIRATE'S BAY				HERMITAGE			
	S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
DISEASE																								
Black Band	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White Band	0	0	25	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White Plague	0	0	1	0	0	0	0	0	0	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0
Aspergillosis	0	0	40	3	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BLEACHING																								
% Population	10	5	5	7	0	5	0	10	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
% Colony	7	10	15	21	0	10	0	15	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
CORAL DAMAGE																								
Boat/ Anchor	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dynamite	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	3	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0
TRASH																								
Fish nets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

13.Annex 8: Media Report Article

PRESS RELEASE

The Organisation of American States (OAS) provided a grant to the Environmental Research Institute Charlotteville (ERIC) to supplement its ongoing capacity-building of representatives from three community-based organisations in NE Tobago. The representatives are members of Speyside Eco Marine Park Rangers (SEMPR); North East Sea Turtles (NEST) and Parlatuvier Village Council (PVC). With the possibility of the establishment of a marine park in NE Tobago, spanning an area from Roxborough to Englishman's Bay, the trainees are undergoing training in various skills that will allow them to actively participate in co-management of the marine park.

With OAS' funding, the trainees hosted a stakeholder forum on Thursday 26th March 2015 to discuss the state and conservation of the natural marine resources of NE Tobago. The stakeholders in attendance included representatives from various NGOs, dive operators, the Forestry Division of DNRE, tour guides, fishermen, and heads of village councils as well as a member of the steering committee of the UNDP GEF SGP and the Office of the Chief Secretary of the THA

After an introduction, the trainees divided the participants into smaller groups for mini roundtable discussions. Combining their involvement in marine turtle conservation along with their experiences from their training particularly in reef surveys and seabird monitoring, as well as their practices as fishermen, they were able to raise issues that were close to their heart with the attending stakeholders. The roundtable discussions presented the trainees with the opportunity to present themselves to the public for the first time as a potential team to assist in co-management of a marine park, should it become established.

An open discussion ensued in which various challenges to conservation issues in NE Tobago were addressed. These issues included the lack of enforcement of relevant legislation, the lack of necessary manpower in NE Tobago as well as the need for increased public outreach using effective communication strategies. The participants were keen about the discussions and were encouraged by the interest and the initiative displayed by the trainees. It was agreed that since the first step of hosting this forum was taken, dialogue needs to be generated with all stakeholders in NE Tobago to begin taking steps to conserve their natural marine resources.

In addition to the forum, the grant was able to supplement ongoing reef surveys that were started with funding from the UNDP GEF SGP and the British High Commission of Trinidad and Tobago. With these dives, a database on the state of the coral reefs in NE Tobago can be built, thereby allowing for continuous assessment of the reef's health.

Figure 15: Participants and MPA Trainees engaged in discussion about conservation of NE Tobago's marine natural resources at the stakeholder forum

Figure 16: Reef data being recorded by a trainee

14.Annex 9: Case Study Brochure

In March 2014 the Global Environment Facility approved a funding proposal by the Government of Trinidad and Tobago to implement the project: “Improving Forest and Protected Area Management in Trinidad and Tobago”.

One of the six national areas is the planned Marine Protected Area in NE Tobago: “*The North-East Tobago Marine PA is covering an estimated 59,280 ha. This proposed PA hosts a significant proportion of Tobago’s coral reefs, including those at Man-o-war Bay and Speyside. These coral systems host a diverse ecosystem with representation from several globally threatened species”*.

Within the marine communities, the coral reefs are affected by both natural and anthropogenic factors including overfishing, habitat degradation, land-based pollution stresses and climate change induced events.

Furthermore, the GEF application highlights the importance of co-management for all PA’s in Trinidad and Tobago. The need and desire of NE Tobago communities to co-manage the proposed MPA was identified in supporting studies.

Since June 2014 the Environmental Research Institute Charlotteville (ERIC), Tobago implements projects to gather reef biodiversity and health data as well to build capacity of members of local environmental CBOs to co-manage their marine resources supported by the UNDP/GEF/SGP and the British High Commission in Trinidad.

In February 2015 the OAS provided a complimentary grant of US$ 5,000. to support a project titled: “Marine Protected Area Monitoring and Co-Management Capacity Building”.

In alliance with the ReefFix Objectives ERIC built the capacity of community members, representing three environmental CBOs in NE Tobago, to monitor reef health and engage stakeholders in idea exchange about the status and improvement of NE Tobago’s marine resources. Overall 36 research dives were conducted, data taken and analysed together with trainees and a participatory stakeholder forum regarding the conservation of the marine resources in NE Tobago was hosted.

The activities under the funding of the OAS were successfully completed in April 2015.

For more information on ERIC and interest in participating in Reef Check, please visit the website www.eric-tobago.org.

The subsequent pictures are available for use in the case study.

Figure 17: Participants and MPA Co-management trainees engaged in discussions on conserving the natural marine resources of NE Tobago at the stakeholder forum

Figure 18: Reef Check trainees together after a Reef Check training session (Picture courtesy Nikole Ordway of Reef Check Florida)

Figure 19: A MPA Co-management trainees recording data at St. Giles Bay

Figure 20: *Montastraea* corals and fishes at Hermitage's Reef Check site