SOUTH COAST MARINE PARK

PROJECT

SAINT VINCENT & THE GRENADINES

FINAL REPORT

June, 2014

Prepared for:

The Organization of American States
Department of Sustainable Development
Washington, DC

Organization of American States

Prepared by:

Global Parks
Alexandria, Virginia

GLOBAL PARKS

July 2, 2014

Mr. Richard Huber
Chief of Section, Department of Sustainable Development
OAS
Washington, DC

Dear Mr. Huber,

In keeping with the Terms of Reference for the South Coast National Marine Park Project in Saint Vincent (PO#329127), please find enclosed final report. This report reflects the completion of the tasks outlined in the work plan submitted last November.

As you recall, the original Terms of Reference for this project were amended to accommodate Director Andrew Wilson's needs in light of recent funding support from the German funded Caribbean Aqua Terrestrial Solutions Project (CATS) for the proposed South Coast National Marine Park. Director Wilson's support for the amended tasks outlined in the work plan follows this page.

I am pleased to report on the progress made on the water quality testing for the South Coast National Park proposal. This will serve as the basis for sound political and biological support for the proposal.

Yours truly,

Todd Koenings

Todd Koenings
Executive Director

2nd July, 2014

Mr. Mel Turner
Director
Global Parks
3803 Sulgrave Drive
Alexandria
Virginia
USA 22309

Dear Mr.Turner,

The National Parks, Rivers and Beaches Authority (NPRBA) has endorsed the proposed South Coast Marine Park Project, St. Vincent and the Grenadines, Final Project Report (June 2014) compiled and completed by the NPRBA and Global Parks, to be correct and ready for submission to OAS.

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Kind regards,

Andrew Wilson

Mr. Andrew Wilson
Director of National Parks

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1. INTRODUCTION

As a component of the Organization of American States' (OAS) ReefFix Program, the South Coast National Marine Park project will gather and analyze the required background information to inform the Government of Saint Vincent and the Grenadines. The Government will use the background and baseline information as it considers the designation the existing South Coast Marine Conservation Area as a national marine park as part of its commitment to the Caribbean Challenge.

The work has four principle tasks:

Task 1.
Review the SVG Concept Note and SVG Operational Plan prepared by National Parks for implementing the German supported Caribbean Aqua Terrestrial Solutions (CATS) Project program and identify any gaps in data collection and need and recommend to SVG how those gaps can be filled.

Task 2.
With assistance from the Ministry of Wellness, Health and the Environment, assist in design and implementation of a water quality study of the proposed park with the intent to establish baseline information and enable follow-up monitoring.

Task 3.
Review potential governance models associated with the existing Fort Duvernette National Park to determine how the existing National Park, now managed by the National Trust, would be managed as part of, or in association, with the proposed, larger park.

Task 4.
Upon review with the Department of Marine Administration and other stakeholders, prepare a policy and process to deal with the removal of derelict boats from the proposed park.

Global Parks, a volunteer non-government organization of mostly retired American and Canadian protected area officials was selected to undertake the study. Derek Thompson, Global Parks' volunteer from Victoria, Canada conducted the study.

During this mission, Global Parks received considerable helpful and insightful assistance, advice and support from every member of the government with whom the Global Parks volunteer interacted. A significant number of people from a wide diversity of agencies gave freely of their time and resources and all demonstrated their enthusiasm and support for the national marine park proposal in many concrete ways. All of this is gratefully acknowledged.

2. REPORTS ON THE TASKS

TASK 1. IDENTIFY GAPS IN CATS PROGRAM

Work Objective

The objective of this task is to provide, to the Chief Fisheries Officer and the Director, National Parks, Rivers and Beaches Authority, an objective analysis and advice concerning the proposed Operations Plan of the Caribbean Aqua-Terrestrial Solutions (CATS) program prepared by the German Organization for Development and Cooperation (GIZ) for Saint Vincent and the Grenadines. The Operations Plan is intended to provide base information to assist the Government in determining if the existing designation of national marine conservation area should be changed to national marine park.

Work Undertaken

The first step undertaken by Global Parks was to review the program documentation and to meet with government senior managers and staff to understand the current legislative and policy context, including the existing knowledge of values and issues and the situation "on the ground" in the current South Coast Marine Conservation Area (NMCA). Secondly, an on-site visit to the area was undertaken to review all aspects of the proposal and program. Finally, meetings were held with representatives of some of the key stakeholders to gain insight into their perspectives and expectations. Based on the meetings and follow-up discussions, reports were prepared for consideration by senior officials.

Products

Initial Analysis Report
An initial analysis report was prepared and provided to senior managers and to their staff, on November 18, 2013. The initial analysis is reprinted here in full as Appendix 1.

In summary, the analysis indicated a number of key gaps in the proposed draft CATS Operations Plan. Critical concerns included:

- Need to ensure local focus and enduring legacy in staff and resources as well as useable products from this initiative;
- Government requires a staff position to coordinate the work of the various agencies in delivering the CATS program;
- All components of the program need to be thoroughly costed out.
- The work to define a boundary for the national marine park proposal and to complete a through resource analysis represent critical underpinnings of the entire initiative that are not yet comprehensively covered.

Following submission of the initial analysis, meetings were held with senior management and professional staff to review and discuss the material. Staff then collaborated with Global Parks to integrate their staff analysis, which was then provided to senior management for consideration.

As a result of that meeting, Global Parks provided, as a proposal for discussion, a set of objectives and principles to help guide the work of the National Parks, Rivers and Beaches Authority for the CATS program.

The (Global Parks' proposed) Objective:
By the end of 2015, a sustainable National Marine Park has been established on the South Coast of Saint Vincent. This park will enhance the tourist and local recreation experience, provide livelihoods and employment and restore and enhance damaged ecosystems and will be a model of all that is the best of the Caribbean.

The (Global Parks' proposed) Principles and Product Approaches for Success:

1. Local capacity, involvement and continuity in management of the proposed park;
2. Real engagement with local stakeholders, based on understanding of the values and potentials of the park in an effort to gain support for the proposed park;
3. Improved protection and management of the park watersheds to ensure ecological health of the proposal;
4. Active enforcement of enacted park regulations.

To realize these principles, the following practical products need to be developed:

1. New national marine parks legislation and a park proposal document including a clearly described and identified park boundary;
2. A high quality management plan that documents the values, confronts and deals with the real issues and the potentials of this area; a plan that has been built by local people based on their knowledge of the resources;
3. An integrated watershed management approach for adjacent uplands, built on practical solutions to pollution of the marine environment and improved regulation of private land development;
4. An information strategy that includes active approaches to engaging local people in the park planning process;
5. A locally adapted approach to practical provision of associated livelihoods based on the proposed park;
6. A park management approach delivered by informed and capable staff and an enforcement plan that requires active stakeholder commitment and engagement;

7. The development of 'short term' contract positions for local experts as opposed to external consultants.

Global Parks also contributed to the staff analysis of the CATS program conducted on November 26, 2013. This staff analysis is reproduced in Appendix II of this document.

Finally, based on all this background, Global Parks provided the following recommendations to the senior team on the potential priorities for work as the team prepared to meet with the CATS officials to finalize the Operating Plan.

1. Develop an accurate and replicable geo-referenced program to inventory, monitor and analyse the current and future state of the park environment and resources with specific focus on the benthic habitats and the marine water quality issues. A local consultant should immediately be hired to begin the organization of this work.

2. Develop and equip a small team of "term" staff, tasked to focus on essential aspects of the work to be undertaken by the external consultants during the development of the park proposal and management plan. Enforcement capacity also needs to be a part of this work since it is a priority concern of many stakeholders and because during this phase there is considerable potential for loss of key values and land and resources capability as a result of people "staking a claim" to certain critical assets (one example would be establishment of new anchorages and moorings in environmentally significant and fragile locations)

3. Contract for an experienced and locally based planning process facilitator to be available at critical times throughout the process.

4. Ensure that the (yet to be finalized) location for the National Park Operations Centre is suitable for long-term management needs. During the early phases of analysis and negotiation, do not rule out irrevocably any realistic option.

5. Undertake a proper detailed analysis of boundary options including a through land and resources tenure and status analysis.

6. Ensure that the Government has a single coordinator reporting to the Chief Fisheries Officer and the Director National Parks on this program of work. Such a position would be an ideal staff development opportunity as part of the intention to build capacity.

Current Status

Government senior managers are continuing their talks with the CATS Program on this package of recommendations. Global Parks is prepared to assist with this next stage by both assisting, if required, in negotiations with the CATS team and in undertaking further specific tasks including those above identified priorities.

TASK 2. DESIGN AND IMPLEMENT A WATER QUALITY STUDY

Work Objective

The objective of this task is to provide advice and funding support for government planning and action to undertake systematic water quality surveys throughout the proposed National Marine Park. This would require:

1. Research into any past water quality surveys and results in the waters of the present NMCA;
2. Development and approval of a methodology for a systematic and replicable marine water quality survey throughout the proposed national marine park;
3. Completion of the survey and analysis of the data;
4. Access to funds from Global Parks.

The work is intended to contribute to initiatives that would result in:

1. Reduced threat of physical damage to critical environmental values;
2. Demonstration of a positive management presence for the national government and, if possible;
3. Formation of an information base on which decisions will be taken that result in long term improvements to the environmental health of the future national marine park.

Background Context

As recently as December, 2013 the Prime Minister has committed in Parliament to the establishment of the national marine park by the end of 2014.

The existing NMCA has long been identified as containing significant natural ecosystems (coral beds, sea grass colonies, remnant mangroves) as well as habitat for significant marine species (sea horse). However, it is also subject to internal and external forces that have potential to significantly and negatively impact these natural values. These include:

1. Potential pollution resulting from run-off and drainage from land based activities (residential, commercial and agricultural) in the uplands and watersheds surrounding and draining into the bays of the NMCA;
2. Potential pollution from beach based recreation along the shores of the NMCA;
3. Potential physical damage resulting from location and development of extensive moorage facilities and docks within the waters of the NMCA;

4. Potential marine pollution resulting from dumping of sewage waste at the moorings and docks.

Previous reconnaissance studies have documented many of the natural values and the threats. However, no long term or systematic surveys have been undertaken to document either the current conditions or to develop a baseline from which to track conditions over time.

As part of the CATS Program, an improved systematic inventory will be undertaken to document the physical and biological characteristics of the marine and adjacent terrestrial environment including the location, characteristics and condition of significant phenomena.

To complement these marine and land based surveys it is also considered important to develop a systematic and replicable survey of the water quality throughout the marine waters.

Global Parks agreed to assist the National Parks, Rivers and Beaches Authority by providing advice and funding support for this endeavor.

Work Undertaken

In an effort to understand the current star of knowledge, meetings were held during the week of November 10 with Parks Authority staff and then with Ministry of Health, Wellness and Environment. A field reconnaissance was also undertaken in that week to examine the NMCA including the waters, beaches and uplands areas.

In the meetings, it was established that water quality in the NMCA is a concern for Parks Authority staff, both in terms of human health and environmental health. The existence of direct outfalls into the bays of the NMCA from various private and commercial developments was observed during the field examination as were other significant storm water outfalls that clearly gathered water from all of the agricultural and settlement lands surrounding the NMCA.

In the meetings with environment and health officials it was ascertained that a water quality sampling survey had taken place at a limited number (6) of recreational beaches in near shore locations in Indian Bay. This work was focused on human safety concerns and was discontinued in 2007. Much of the data can no longer be found. In subsequent meetings with health officials, it became apparent to the Global Parks representative that the water quality sampling that had taken place very likely demonstrated poor and continuously deteriorating water quality in those sites.

No systematic water quality sampling focused on environmental health issues appeared to have occurred in the past.

In an effort to provide advice and assistance on water quality survey, the Global Parks representative worked with Parks Authority staff and with Ministry of Health, Wellness and Environment to identify various international standards for water quality measurement and to develop a methodology.

Assistance was also provided for early work to gain support from the various authorities for National Parks to undertake the required work and to research the issue of resources available for in-country laboratory analysis.

There are, in fact, at least three government institutions with some responsibility. The Ministry of Health, Wellness and Environment has direct legislative authority for issues relative to water and waste disposal. The National Bureau of Standards sets all standards for any work such as water quality monitoring. The Fisheries Department has direct jurisdiction in the NMCA and a laboratory with some capacity for analysis of any water samples work and was interested in upgrading its facilities and capabilities. The Central Water Services Authority has concern for water and health and a laboratory with capacity for analysis of the human health related factors (i.e. total coli forms, enumeration of faecal coliforms and E.coli, for example).

During the early meetings it became apparent that one of the concerns from all government parties related to lack of funds to undertake analysis of any water quality samples. Global Parks made a commitment (See Appendix III for Letter of Understanding) to provide limited financial support intended to "kick-start" the analysis with particular focus on Heterotrophic plate count, enumeration of total coliforms, enumeration of faecal coliforms and E.coli, all using membrane filtration, pH, organoleptic determination and salinity. These monies are available subject to the Parks Authority undertaking the first sampling and analysis work and then preparing a report on the results.

Work Ongoing

The Parks Authority staff concluded an agreement with all of the responsible agencies and initiated the first sampling in the last week of January, 2014. Subsequent testing occurred in the following months and a report was prepared on the results of the testing. The report is contained in Appendix IV.

TASK 3. REVIEW POTENTIAL FORT DUVERNETTE OPTIONS

Due to an illness in the senior management of the Saint Vincent National Trust when the Global Parks' representative was in Saint Vincent, it was not possible to complete this task.

That said, it is clear that there is significant interest on the part of both the National Trust and the National Parks Authority in finding models to work closely together for mutual interest. The Trust has much interest in the natural history of the islands as well as the human history. In addition, it has extensive contacts, including a number of residents

living within and immediately adjacent to the national marine park proposal and considerable credibility within the community as a whole that would benefit carrying forward the proposed national marine park and its eventual management. The work of the Trust in developing practical financial and volunteer models on its various sites will also be particularly helpful for the National Parks Authority.

Fort Duvernette is a significant cultural site and a site of considerable natural interest both on land and in the surrounding waters. The inclusion of this site and its management in a cooperative understanding between the National Trust and the Parks Authority is well justified.

TASK 4. PREPARE POLICY and PROCESS on DERELICT BOATS

Work Objective

The objective of Task 4 was to provide advice that would lead to government commitment and action to deal with abandoned vessels and existing wrecks, including removal of all those wrecks currently located in the Blue Lagoon potion of the existing South Coast National Marine Conservation Area (NMCA). This area is an essential component of the national marine park proposal. Wreck removal would result in:

1. A reduction in marine pollution;
2. A reduced threat of physical damage to critical environmental values;
3. A demonstration of a positive management presence for the national government and, if possible;
4. The potential to create an artificial reef to serve as an attraction for tourist use

Work Undertaken

The first step was to become familiarized with the physical environment, the various stakeholders and the status of resource knowledge in the NMCA. Review of the limited existing technical studies was undertaken prior to arrival and followed immediately on arrival in St Vincent by an on-site inspection led by the field director of the National Parks, Rivers and Beaches Authority.

Canash Bay and, in particular Blue Lagoon, is a key component of the proposed national marine Park characterised by sheltered waters and critical reef and sea grass environments as well as remnant mangrove vegetation. The upland fronting directly onto the Bay contains a mixture of commercial tourism developments (marinas and hotels) as well as commercial (fish processing), institutional (Coast Guard base), developed residential sites and a limited amount of undeveloped land.

Blue Lagoon is an important mooring area for a diversity of private and commercial recreation and tourist boats. The situation is largely self-regulated and, as a result, there are a number of abandoned and wrecked boats located in the lagoon along the shoreline

and on the beach. The environmental impacts of this unregulated activity have not been formally documented but the potential and actual impacts are quite apparent ranging from the aesthetic to more serious concerns about marine dumping and physical damage to remnant reef features.

During and after the on-site familiarization work, a series of informal meetings were held with a cross-sectional representation of commercial tourism stakeholders. All raised concerns about environmental protection and enforcement in the bays of the NMCA. Particular reference was made to marine pollution as well as to the consequences of uncontrolled mooring and abandonment of vessels. In addition, a meeting of senior officials from all agencies with a jurisdictional interest in the area was convened by the Director Wilson of National Park, Rivers and Shorelines Authority. The purpose was to discuss the situation and develop a strategic plan of action. (The CATS programme had made budgetary provision for assistance in wreck removal. More important, the Prime Minister had indicated on the day of the meeting that an "answer to the problem of abandoned boats and wrecks in Canash Bay is required this week")

At the meeting with the senior officials, the representative of Global Parks provided some background observations on experience in Canada and volunteered to assist the Director of the National Marine Authority and the Director of National Parks to consolidate strategy recommendations and contract language for use by the directors in their work with the Prime Minister. This became the basis for a later statement in Parliament by the Prime Minister committing his Government to a specific timetable to clean up the current wrecks. (see Appendix V)

Products

In particular, Global Parks provided the following policy and process recommendations to assist the senior officials.

1. **Preparation of process and timetable**: A set of actions, including a timetable, was identified along with principles and responsibilities for wreck removal (Appendix VI).

2. **Provision of contract advice**: A Request for Proposals approach to the removal contract was recommended whereby the expectations and general timetable would be provided by Government to prospective bidders but the approach to be used would not be proscribed by the government. A package of contract policy documents and a "demonstration" contract proposal call was prepared and provided by Global Parks. (Appendix VII)

Current Status

The Prime Minister's statement in Parliament clearly commits the government to the removal of the wrecks by 2014 and to establishment of a national marine park by 2015.

APPENDICIES

APPENDIX 1

Initial Analysis and Recommendations of the CATS Program

This note is intended to provide some initial commentary and insight about the proposed CATS Operational Plan and what further services Global Parks might provide to assist in implementing the plan.

The following table has been developed to help analysis of the planned proposal.

Strategic Issues	Included in CATS Plan	Comments
Legal Framework • Legislation & Regulations • Boundaries	Yes Not Clear	Upland and marine boundaries: Current boundaries and land status/ownership need review & clarification
Public Information & Support • General issues • Livelihoods work • Understanding of role and contributions	Yes Yes Not Clear	A study of contribution to the SVG economy needed
Resource & Environment • Improved inventory	Yes on marine habitats & water quality but other aspects needed also	Greater clarity and specifics required. Add beaches and shoreline. Need data storage & analysis equipment
Resource Management actions. • Wreck removal • Solid & Liquid waste • Habitat Improvement	Yes on Wreck removal & future moorings plan. Partially dealt with. No	Add docks, wharves and on-shore storage. Detailed plan required Detailed plan required Need enforcement plan
Management Plan & Zoning	Yes	Will require careful coordination with all the other work.

Sustainable Financial Planning	Yes	
Operations facilities, Equipment & Capacity Building	Yes	Critical concern about the Operations Building location Capacity Building should include equipment & services for data storage and analysis

This comparison confirms that most of the strategically important management and planning issue have been included in the proposed Plan. There are, however, some important additional issues or clarifications that need attention.

1. This work represents a very significant additional responsibility for a small team of professionals who are already very busy. The intended creation of a Coordination Team will help, but experience with such initiatives elsewhere indicates that establishing at least a single position as "organisation and administrative coordinator" would greatly assist in the successful delivery of this work plan and also provides a potential staff development opportunity.
2. The work on legal frameworks does need a specific piece on the boundary. Not only is the current marine and terrestrial boundary of the current NMCA unclear but also the decision on a future national park boundary is an essential piece that needs to be addressed. As part of such work, a detailed land status is needed to clarify marine tenures (e.g. moorings, docks and wharves) as well as all uplands.
3. On public information and support, it would seem to be potentially valuable for developing and advancing a proposal for a new national park, to have an explicit study of the contribution to the economy that such a change in designation would have, from the marine tourism sector generally and in this particular area specifically.
4. The proposed work on inventory of resource and environmental values and conditions and on future monitoring needs greater specificity and clarity as to both the issue to be addressed and a process. A plan should be developed to outline the specific components and focus of the work. This would include specifying what is being inventoried (e.g. coral reefs, sea grass beds, mangrove potential, shoreline condition, all sewer and water outfalls, general water quality, etc), the approach to be taken (e.g. contracting a coordinator, organizing inventory process and working with "volunteers" to undertake specific activity) and of the requirements (equipment and personnel) for both current and future data storage, management, analysis and uses of the data.
5. Resource management actions contain good proposals but need to be linked to the inventory and analysis work too. For example it is unclear as to how will habitat be improved. A more detailed and comprehensive plan is required (e.g. the liquid waste

management ideas presented here are not the only actions that might be funded) and an enforcement plan will need to be developed as part of the implementation for the management plan.

6. Will also need enforcement plan.
7. A critical component operations plan is that a suitable headquarters office needs to be located with water access and space for equipment storage. There is considerable risk in purchasing materials and making a fast decision about locating in unsuitable quarters.
8. It is not clear to this review whether basic recreation facilities such as toilets, litter and garbage, signage, parking and so on have been included in this package.
9. Capacity building seems very inclusive on the human development side but does need consideration of some of the government needs for the data storage and analysis components identified in 4 above.

Potential volunteer work by Global Parks

There are a number of items that Global Parks could help with. These are those pieces of work that are fundamentally parks related and that do not require a specific and high profile time line. One example of an ideal Global Parks service would seem to be the provision of certain capacity development services and training sessions. There are a number of others of course.

Another approach could be to formally contract certain services from people on the Global Parks list, for those services where there are requirements for specific near term and timely service, and where an international perspective as well as parks planning and management services would be useful to have. An example might be the development and description of the park boundary and advice on the legislative needs.

It is also important to clarify with the CATS program what they are prepared to do on the habitat monitoring and the water quality surveying and how they would work with National Parks to enable the local community and consultants to be engaged.

Finally, it would seem to be timely now to discuss the complete list of projects and consider which might best be delivered by contracted consultants and which by Global Parks.

Appendix II

Staff Analysis and Program Proposals, November 26, 2013

Specific Proposals for addition or adjustment to the Operational Plan (Budget in $US)

3.1.1 **Activity:** Assessment of national legal and organizational frameworks and national strategies and guidelines for MPA management.
Target: Recommendations for the improvement of an effective legal and organizational national MPA frameworks are available.

Recommended Amendments
Specific Activities

1. Overarching review down to specifics
2. Finalize park boundaries and GPS coordinates
3. Land / marine status review (Moorings, tenures, docks and fisheries closures)
4. Examine watershed legislations and make recommendations in order to reduce land-based pollution.

Suggested Budget: 15K

3.1.2 **Activity:** Development of an appropriate legal framework for the establishment and sustainable (financial) management of MPAs
Target:

1. ToR for consultancy developed
2. STE recruited
3. Previous studies reviewed
4. Existing legislation reviewed
5. Proposed new legislation drafted
6. Validation by stakeholders

Recommended Amendments
Specific Activities
Develop legislation which protects the marine environment from marine based pollution (specifically holding tanks & dumping of solid waste) and land based pollution (watershed legislation). Develop regulations which will enable generate income from yachts / boats entering the park (moorings, waste levy etc).

Suggested Budget: 20K

2.4.1 **Activity:** Support the preparation/ consolidation of the SCMCA management plan using Participatory and Co-Management Methodologies
Target: SCMCA management plan is developed/ consolidated/ updated and validated

Recommended Amendments

Specific Activities

1. Compile all relevant reports / studies
2. Identify key habitats and locations of rare/endangered species as well as general habitat conditions, employing professional and local volunteers
3. Assign quality rating to various habitats
4. Identify land based pollution points
5. Identify any ecological (breeding season) shifts due to climate change
6. Make recommendations to compensate for any known shifts in ecology (fishing season / closure dates)
7. Zone (including mooring & other recreational activities) according to ecological significance and quality rating
8. Consult with stakeholders in relation to zoning
9. Finalize Management Plan
10. Implement Management Plan

Suggested Budget: $200K (this requires a long term locally engaged team)

1.2.1 **Activity:** Development of, and implementation of a communication and outreach strategy and plan

Target:

1. ToR for consultancy developed
2. STE recruited
3. Short-term C&O strategy developed
4. Implementation of short-term C&O

Recommended Amendments

Specific Activities

1. Cut short term consultant /expert
2. Create 2 year contract for a local expert -person / 'Communication and outreach officer' position
3. Align communication strategy with community education and action on solid waste mgt (Targeting Styrofoam).
4. Provide overview of stakeholder feedback
5. Provide overview of actions being undertaken by stakeholders to reduce marine pollution
6. Rent vehicle for term of contract (2 year period)

Suggested budget: 80K

2.1.1 **Activity:** SCMCA environmental and resources assessment **(Should be moved to Management Plan)**

Recommended Amendments

Target:

1. Consolidation of all data, old and new
2. Accurate and up to date software and hardware (to enable effective information sharing)
3. Staff trained in use of hardware.

Specific Activities

1. Cut short term consultant
2. Local expert to pull together historical information and to work closely with stakeholders.
3. Develop an accurate map of habitats across SCMCA and key features.
4. Pull together all available water quality information in conjunction with the institute of environment.
5. Continue water quality monitoring.
6. Assess and assign quality ratings to habitats
7. Identify locations of rare and endemic species
8. Identify threats / impacts (pollution & physical)
9. Identify potential mitigations

Suggested budget: Cost for activity included under 2.4.1

2.3.1 **Activity:** Identify and support the development and integration of alternative livelihood (AL) options into SCMCA management
Target: Sustainable AL options developed and integrated into SCMCA management

Recommended Amendments

Specific Activities Possible additional options include but not limited to;

1. Creation of a lion fish and other food market
2. Mangrove and upland re vegetation project close to SCMP (Honey production / eco tourism)
3. Water sensitive urban design projects & waste projects

Suggested Budget: 40K

2.3.2 **Activity:** Assessment of the potential for aquaculture development (marine and freshwater) elsewhere in SVG (depending on and in combination with results from AL assessment) survey)

Recommended Amendments

Aquaculture is highly problematic in or close to conservation zones due to high nutrient loads; a nutrient reduction plan must be in place prior to this activity being developed. If adequate measures are not developed to address this issue the National Parks Authority believes that this activity should be cut from the plan.

2.3.3 **Activity:** Support to the Establishing and Management of a Designated Mooring Area in the SCMCA **(Should be moved to Management Plan)**

Recommended Amendments

Specific Activities

1. Engage Global Parks to undertake mooring assessment (where to allow and where restrict mooring)
2. This work will coincide with the habitat mapping and zoning.

Suggested Budget: Cost for activity included under 2.4.1

4.1.1 **Activity:** Assessment of sustainable SCMCA financial management strategies and practices

Recommended Amendments

Specific Additional Activities

1. Assess what studies have already been completed in the Caribbean?
2. Conduct an economic review of SCMCA contribution to the economy.
3. Introduce levy system to generate revenue (Moorings, yacht waste, tourist levy)
4. No fees for locals
5. Increase the number of artificial reefs in the SCMCA / this will increase tourist numbers and revenue
6. Consider engaging Global Parks for this work

Suggested Budget: 10K

5.1.1 Activity: Conduct assessments of capacity needs and develop capacity building plans specific to MMA managers at all levels

Recommended Amendments

1. Conduct workshop with office and field staff to identify gaps
2. Create new positions / contracts to fill gaps
3. Enforcement Officer / Pollution Officer / Communications Officer
4. Consider engaging Global Parks for this work

Suggested Budget: 10K

Recommended Amendments

5.3.1 Activity: Capacity building in integrating aspects of land-based sources of pollution (LBS) into SCMCA management. **Amend to;** 'Reduce land- based sources of pollution entering the SCMCA'.

Specific Activities

1. Intercept and divert storm water to strategic locations established with riparian vegetation.
2. Utilize biological filters in order to reduce nutrient levels, sedimentation and pollutants found in storm water.
3. Retrofit existing storm water infrastructure in order to reduce storm water impacts on the SCMCA.
4. Create short-term contract for a 'storm water pollution reduction officer.'

Suggested Budget: 150K

5.3.2 Activity: Capacity building/ (re-) introduction of Reef Check methodology to SCMCA Management

Suggested budget: 20K

5.3.3 Activity: Capacity building in coastal fishery monitoring for SCMCA management

Recommended Amendments

Specific activity

1. Create lion fish market / Sustainable livelihoods.
2. Create a field based fishery monitoring / enforcement position

Suggested budget: 50K

5.4.1 Activity: Support the removal of derelict boats for MP

Recommended Amendments

Specific activity

1. Create artificial reefs with derelict vessels where possible.
2. Aim to improve the community's livelihood and increase stakeholder support for MP through establishment of artificial reefs.
3. Increase in ecotourism

Suggested Budget: 100K

5.4.2 Activity: Support the Development and Implementation of Certification Standards of Liquid and Solid Waste management with hotels and restaurants, yachts, beaches, marinas, dive operators, water taxi operators, vendors, fishers, recreationists

Technically and financially (PPP) support private sector enterprises along the MP in establishment of waste management systems (leave as activity 5.4.2)

Recommended Amendments

Specific activity

1. Document drains and pollution points
2. Leverage funding to secure private sector funding for water quality outcomes
3. Pilot different approaches to storm water mgt
4. Assess river health feeding into SCMCA
5. Document pollution
6. Develop enforcement program / field based enforcement officer

Suggested budget: 80K

Appendix III

Letter of Understanding between Global Parks and National Parks, Rivers and Beaches Authority on the topic of Water Quality measurement at the proposed South Coast National Marine Park.

As part of the studies intended to assist in the establishment of the potential South Coast National Marine Park, Global Parks and the National Parks, Rivers and Beaches Authority have identified that there is a concern about the state of the marine environment and potential risks to human health for those recreating in the waters of the park proposal. Both parties agree that there is need for timely and accurate marine water quality information both along the shoreline and in the deeper ocean of the marine component of the proposed park.

Water quality in the proposed park is of concern for the following reasons:

Potential Impacts

1. Potential human health concerns for beach users, swimmers, recreational divers and snorkelers due to potential high coliform and enterococci levels.
2. Potential environment and habitat deterioration with particular focus on coral beds, sea grass, endemic sea horse habitat and general fish impacts due to possible high pH, nitrate, phosphate, BOD, turbidity and algal growth concerns.

Potential Sources of Pollution

1. Watershed use and development with ineffective waste water disposal and consequent flows into streams and storm water channels that empty into the proposed park.
2. Shoreline development with insufficient wastewater disposal and potential direct flows or seepage directly into the marine environment of the proposed park.
3. Vessels that while at anchor, moored or docked in the bays of the proposed park, dispose of their wastes directly into the waters of the area.

Proposed Water Quality Measurement Program

The National Parks Rivers and Shorelines Authority is working in cooperation with the Ministry of Health Wellness and the Environment, the National Bureau of Standards, the Chief Fisheries Officer and the Central Water Service Authority, to develop an agreed-to program to collect and analyse water quality data on the above noted human and environmental health measures in key locations within the proposed park.

Analysis will include Heterotrophic plate count, enumeration of total coliforms, enumeration of faecal coliforms and E.coli, all using membrane filtration, pH, organoleptic determination and salinity. The information collected and analysed will be presented in a report format.

The Agreement
Global Parks will reimburse, on presentation of a report on the water quality and an invoice, the National Parks Authority a sum of up to EC$12,000

The report is to be presented to Global Parks in draft form by March 1, 2014

Signed…….. Andrew Wilson
Director. SVG National Parks

Signed…….. Mel Turner
Director, Global Parks

Appendix IV

Follow-up Report on Water Quality Testing

NATIONAL PARKS RIVERS AND BEACHES AUTHORITY AND GLOBAL PARKS

FOLLOW-UP REPORT ON WATER QUALITY TESTING AT THE PROPOSED SOUTH COAST MARINE PARK

21 MAY, 2014

ST. VINCENT AND THE GRENADINES

FOLLOW-UP REPORT ON WATER QUALITY MONITORING AT THE SOUTH COAST MARINE CONSERVATION AREA, ST. VINCENT AND THE GRENADINES

1. BACKGROUND

There has long been concern that the waters in and around the SCMCA of Saint Vincent & the Grenadines (SVG) are polluted to such an extent that there are risks to human and environmental health. A systematic program of water quality monitoring is intended to demonstrate whether indeed the marine area is polluted and, if so, to show how certain human activities, such as littering and improper solid and liquid waste disposal methods, have and continue to impact the marine environment in a number of ways. There are consequences for human health as well as for the natural environment. It can also show in combination with weather events such as flooding how poor water quality can result in increased human and ecosystem vulnerability. Water quality testing is currently being conducted, at the South Coast Marine Conservation Area (SCMCA) to identify the quality of water from point sources of pollution added to the effects of Climate Change. This monitoring programme builds on a study conducted by White (2012) to determine chemical and biological water content at the SCMCA its effect on the ecosystem. The increase in storm water runoff in periods of heavy rainfall reduces the quality of coastal recreational waters. Warm air temperature can also raise the sea surface temperature which is harmful to aquatic organisms and warmer waters also permit the migration of non-invasive species to move to suitable cold water areas.

The National Parks, Rivers and Beaches Authority (NPRBA) Water Quality Programme was established in December 2013, with initial funding support from Global Parks in the amount of EC$12,000. This financial support assisted with commencement of this project, in particular, water quality lab fees for January and part of February, 2014 and field supplies and materials including a large ice box, cooler bags, extendable rod, travel bags, beach shoes, disposable gloves, GPS unit, flash drive, hip waders, clipboards, pencils and sharpeners. (Appendix 1)

The water quality monitoring programme commenced in December 2013 where two scoping activities were conducted to identify possible sample stations along the South Coast with criteria based on water quality hazards primarily land-based sources of pollution flow to the recreational beaches along the SCMCA. These exercises were completed with the assistance of representatives from the Ministry of Health, Well and the Environment, the Fisheries Division, the Forestry Division, the SVG Coast Guard and National Parks, Rivers and Beaches Authority (NPRBA) who lent their expertise on site.

The SCMCA water quality sampling commenced on 22 & 23 January 2014 with the participation of several key stakeholder agencies including Ministry of Health, Fisheries Division, Forestry Division, SVG Coast Guard, CWSA, Bureau of Standards and NPRBA. These agencies now form the water quality team. Thirty-three (33) samples were collected on the 22 and 23 for the month of January for both recreational waters and

rivers/streams. Due to lab expenses for analyzing thirty-three samples, a reduced total number of 24 samples excluding river samples are now being collected twice each month.

The parameters used for testing water quality include:

- Nitrates
- Phosphates
- Iron
- Faecal Coliform
- Total Coliform
- PH
- Salinity
- Turbidity
- Temperature

These parameters were selected based on potential health outcomes in which hazards may be experienced by recreational water users. The chemicals parameters such as PH, Iron, Nitrates, and phosphates seek to identify the chemical concentration levels in the recreational waters at the SCMCA as a result of domestic, industrial and agricultural pollution. PH defines the ability for water to dissolve minerals from soil and rocks. Acid and alkaline water above the guideline values may result in skin and eye irritation. Dangers of other chemical pollutants such as Iron, Nitrates, Turbidity and Phosphates that are above the normal guideline values will depend on the area, type of chemical pollutant, the frequency and extent of the pollution. Generally, higher than normal levels of chemical concentration can indicate a level of toxicity that may be harmful when ingested or absorbed through the skin or when in contact with eyes.

Microbial parameters such as Faecal and Total Coliform are used to indicate a range of pathogenic microorganisms from possibly human or animal source. Higher than normal microbiological levels can pose health hazards for recreational users as well as marine organisms once in contact. These health hazards include gastroenteritis, ear infections, respiratory infections and hepatitis just to name a few particularly in elderly, infants and children. The ecosystem including reefs, corals, seabed and other marine life are also affected by runoff which reduces their survival rate.

The standards, methodology and procedures for the SCMCA recreational water quality sampling were adapted from the draft Operations Manual of the Environmental Management Division of the Ministry of Health, Wellness and the Environment in St. Vincent and the Grenadines in collaboration with Pan American Health Organisation (2004) and the Caribbean Environmental Health Institute (CEHI) standards for recreational Water Quality testing. The St. Vincent and the Grenadines (SVG) Central Water and Sewerage Authority (CWSA) (designated Laboratory) was selected to conduct water testing for both biological and chemical parameters for duration of one year. The NPRBA is also guided by the CWSA Laboratory Manual and Procedures for water quality sampling

2. THE IMPACT OF POLLUTION ON THE MARINE ENVIRONMENT

One well known contributing factor to the degradation of the marine environment is that of pollution entering the coastal waters of the SCMCA primarily land-based point and non-point sources of pollution. In different areas of the SCMCA a number of sources are contributing to the level of pollution which may vary from time to time. Being that the area is highly saturated and populated evidence of marine stresses are ever present. The recreational waters at the SCMCA are mainly polluted by sewer outflows, agricultural and urban runoff, solid waste from nearby communities, beach litter, industrial discharges and liquid waste from vessels. Detergent and washing liquids from residents and hoteliers affect the quality of the marine waters. Beach litter is also of concern at the SCMCA and is derived primarily from rivers, storm water runoff and waste discarded by visitors.

Weather patterns in the form of rainfall play a critical role in coastal pollution as storm water runoff from drains along with sewer outflows; solid waste and animal waste pollute the recreational waters for a short period of time.

Many commercial industries and homes contribute to coastal pollution (**Figure 3).** Evidence of waste water drains in the vicinity of businesses, hotels and restaurants were identified as point sources of pollution. Three (3) rivers/streams that were identified as major sources of pollution, present a challenge as this source of pollution transports sediments and microbial loads which may be affected by rainfall and can be problematic and hazardous to health. When there is a discharge of effluents from urban communities, recreational water users are exposed thus increasing various health risks to the users such as infections etc. The effect of waste water discharge results in a vast amount of nutrients being dispersed into coastal areas coupled with sea current and temperatures that not only affect recreational water users but coral reefs, fisheries and tourism.

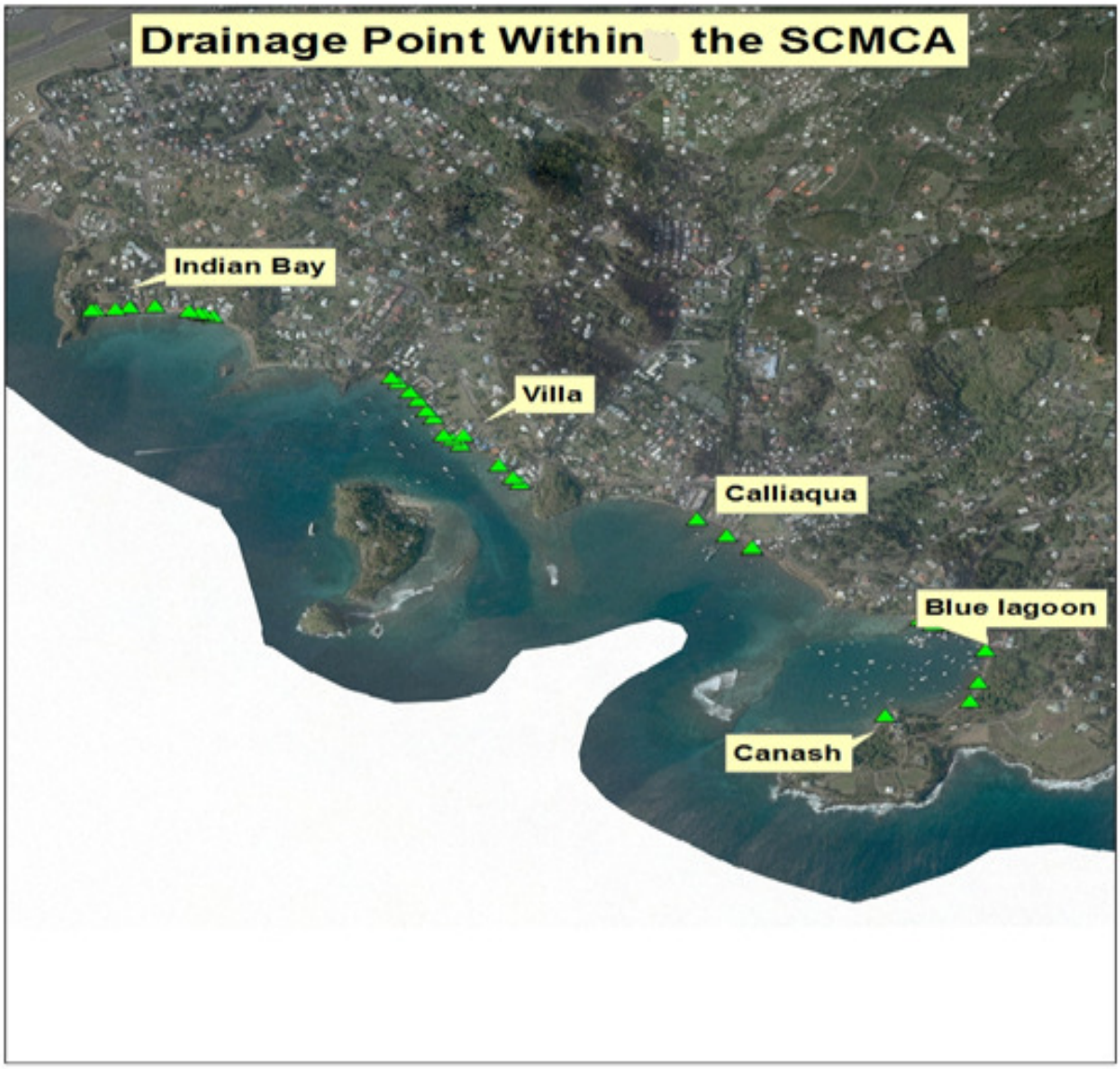

Figure 3: Map of the South Coast showing some sources of land-based pollution outfalls

3. METHODOLOGY

A total number of 24 samples are currently being collected both nearshore and offshore twice per month particularly every 2nd and 4th Mondays per month. Based on the availability of the CWSA laboratory staff and lab requirements, Mondays have been selected as the sampling day since biological tests must be incubated directly after sampling on a week day except on Fridays as lab staff is not available on weekends. Samples therefore collected on Fridays or later would not be possible. For the months of February and March, 24 samples were collected twice per month from total number of 16 nearshore points ranging from Johnson's Point at White Sands Bay to Indian Bay and eight offshore points within the boundary of the SCMCA. A total number of 3 samples

are currently being collected from the Indian Bay, Villa and Calliaqua Bay, and another seven samples are currently being collected along Blue Lagoon/Canash Bay, all at waist height from the break-water mark **(Figure 1)**. A total number of 8 offshore samples are being collected at approximately 200m from shoreline, which was determined based on the recreational proximity for swimmers and divers, from the shoreline along the South Coast Marine Conservation area **(Figure 2)**.

A total number of 24 sterilised clear glass sample bottles (250 ml) provided by the Central Water and Sewerage Authority are used to collect water samples at waist height for nearshore sampling and within hand reach for offshore sampling. Each bottle is numbered consecutively from 1 to 24 and sample number, location, temperature, time and observation are recorded on each sample day. Samples bottles are stored on ice in large ice boxes until completion of sampling of the SCMCA and delivery to the laboratory on each sample day. Cooler bags are used to transport bottles from ice box to sample station and back for both nearshore and offshore sampling.

Each nearshore and offshore points was identified using both GPS coordinates and various landmarks were used for ease of referencing. Mapping of both nearshore and offshore points were completed by the Forestry Division using coordinates, Google Earth imagery and ArcGIS**.** All water quality data is stored and managed by the NPRBA.

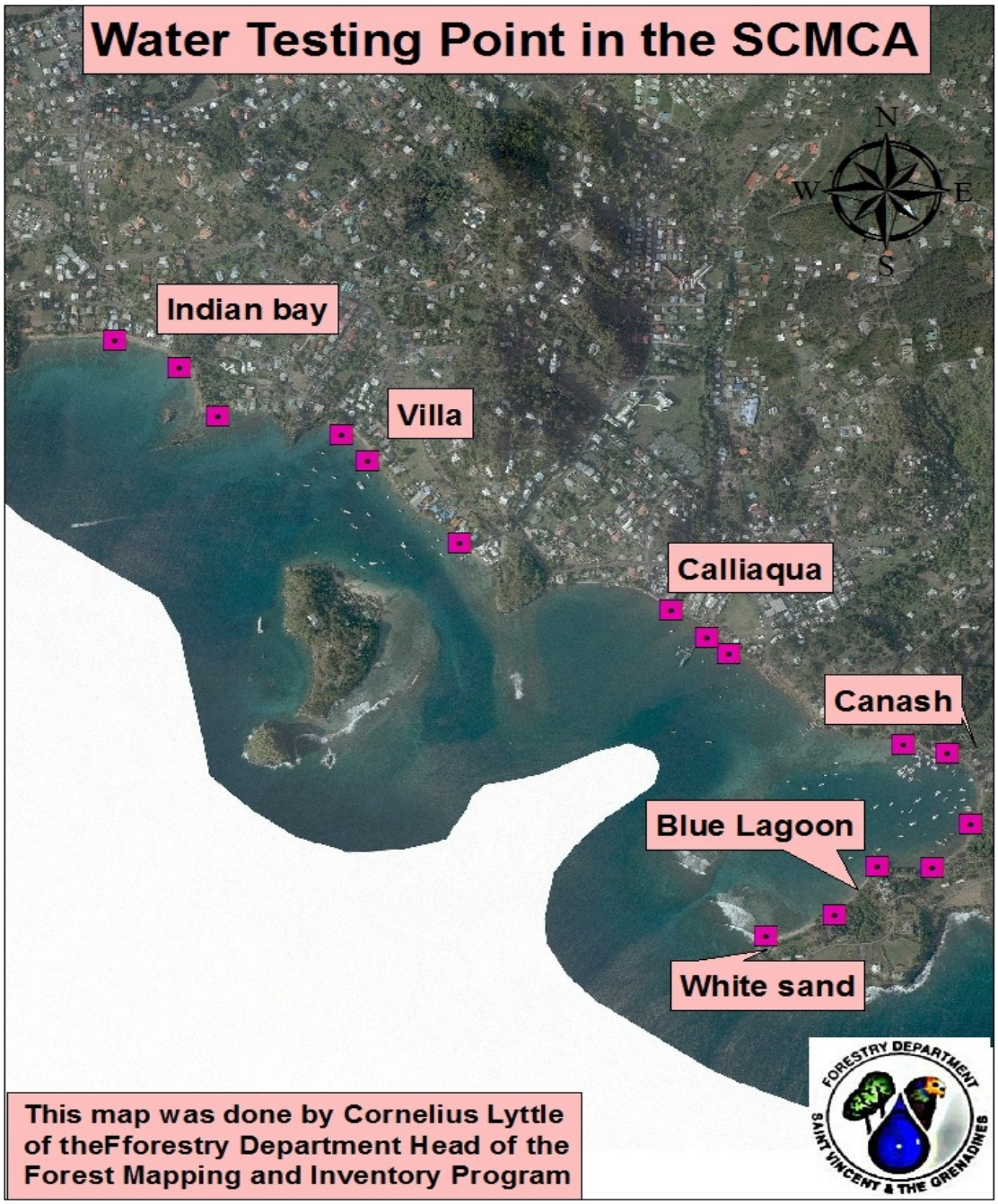

Figure 1: Sixteen nearshore water quality sample points at the SCMCA collected at waist height

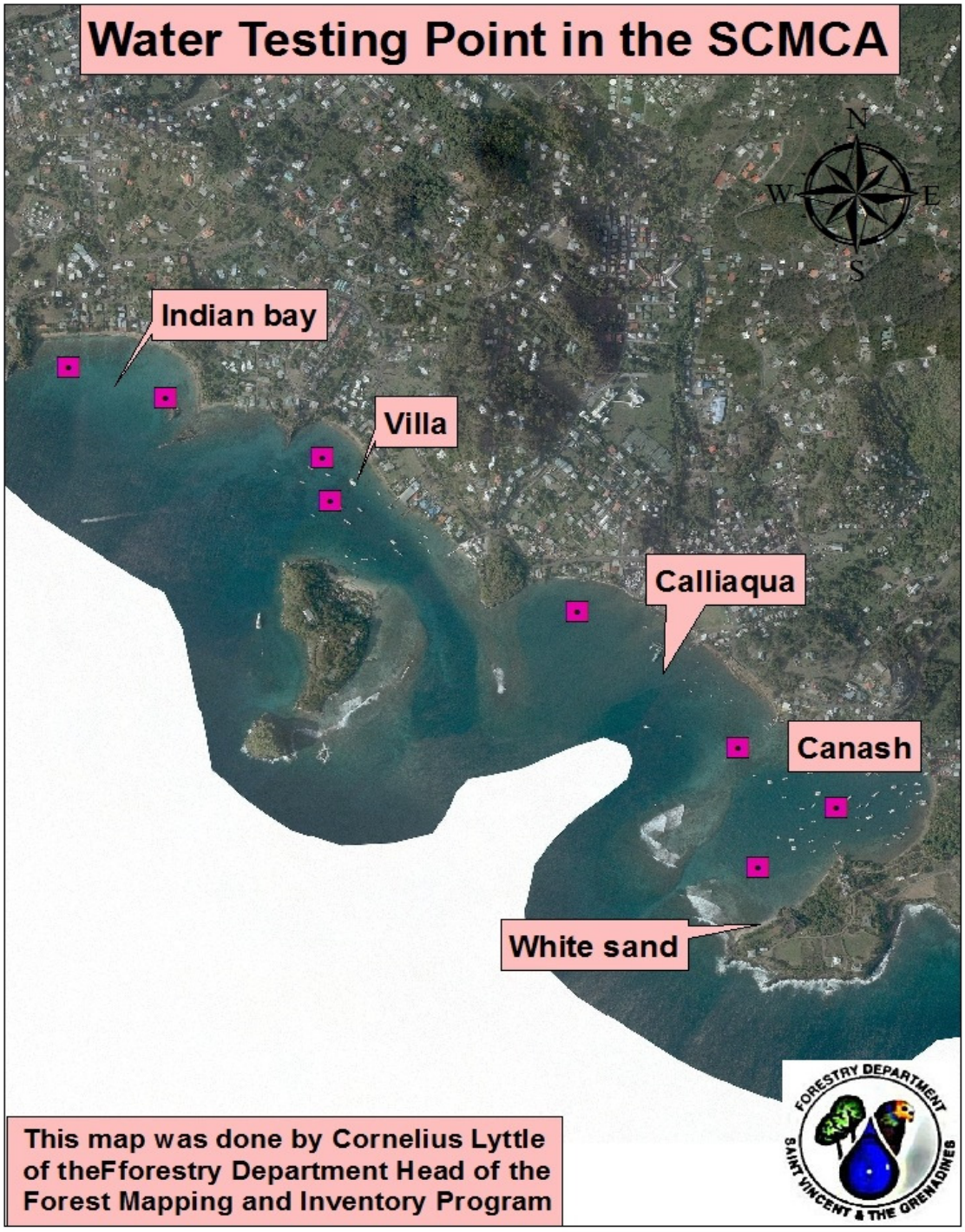

Figure 2: Eight offshore water quality sample points at the SCMCA at approximately 200m from shoreline

4. FINDINGS

Biological parameters were analysed **(Figures 4-6)** and also presented in a table form **(Appendix 2)** and a short summary findings for each area at the SCMCA is presented below:

Sampling Areas	Main Findings
Blue Lagoon/Canash	Microbiological counts were over the guideline limits on the 22 & 23.01.14 as a result of heavy rainfall and a trough system that affected the country in December 24 2013, but readings were significantly reduced for February since rainfall was reduced. Offshore tests showed mostly normal levels of microbiological counts but mooring that is present at the marina at Canash has somewhat influenced offshore microbiological results. - Nitrates and iron were at most times within normal limits with some areas showing higher than normal levels of phosphates as a result of outflows from commercial businesses on the coast.
Calliaqua Bay	- Microbiological counts were over the guideline values on the 22 & 23.01.14 and 10.02.14, for both nearshore and offshore sampling. Again, similarly to Blue Lagoon/ Canash/White Sands, heavy rainfall from the December 24, 2013 trough system was responsible for high levels of microbiological counts. There was spike in the readings for 10 February but was later reduced in February and March 2014. - Nitrates and iron were generally within normal limits with some areas showing higher than normal levels of phosphates from coastal industries.
Villa Bay	- Microbiological indicators show counts that were over the guideline values on the 22 & 23.01.14 and 10.02.14, as a result of heavy rainfall in December 2013, and possibly nearshore mooring but were reduced for the months following. Offshore samples were within acceptable limits at most times. - Nitrates and iron were generally within normal limits with some areas showing higher than normal levels of phosphates. High levels of phosphates are an indication of commercial and domestic waste such as washing detergents and since this area is highly populated with tourism related industries, this type of pollution is present.
Indian Bay	- Microbiological indicators show counts that were over the guideline values on the 22 & 23.01.14 for both nearshore and offshore samples taken as a result of heavy rainfall in

	December 2013. Counts for the 10 & 24.02.14 and 10 & 24.03.14 were within guideline values. - Nitrates and iron were generally within normal limits with some areas showing higher than normal levels of phosphates. Compared with Villa Bay, phosphates levels at Indian Bay were significantly lower. This can be attributed to the fact that fewer tourism related industries are located along this bay.

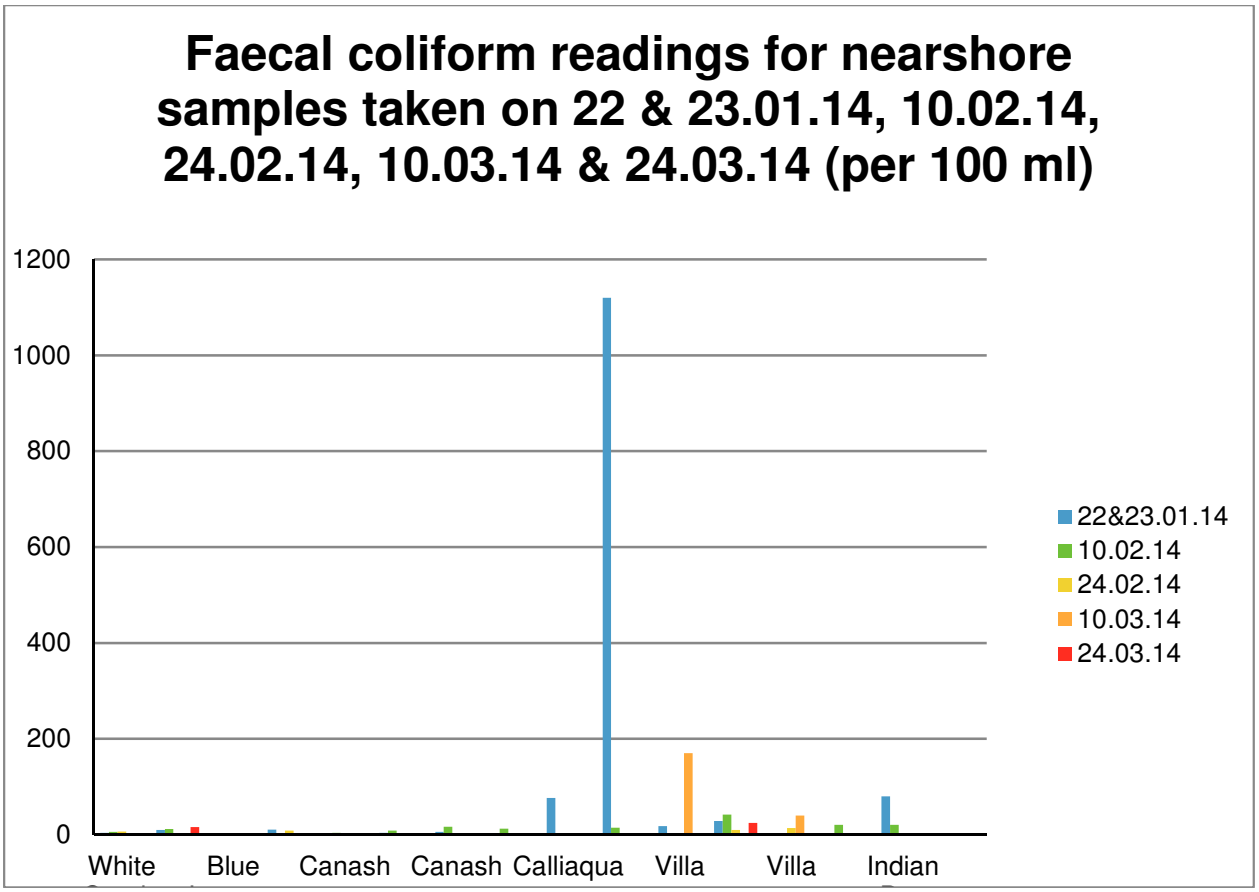

Figure 4: Comparison of nearshore results for Faecal Coliform for the months January – March 2014

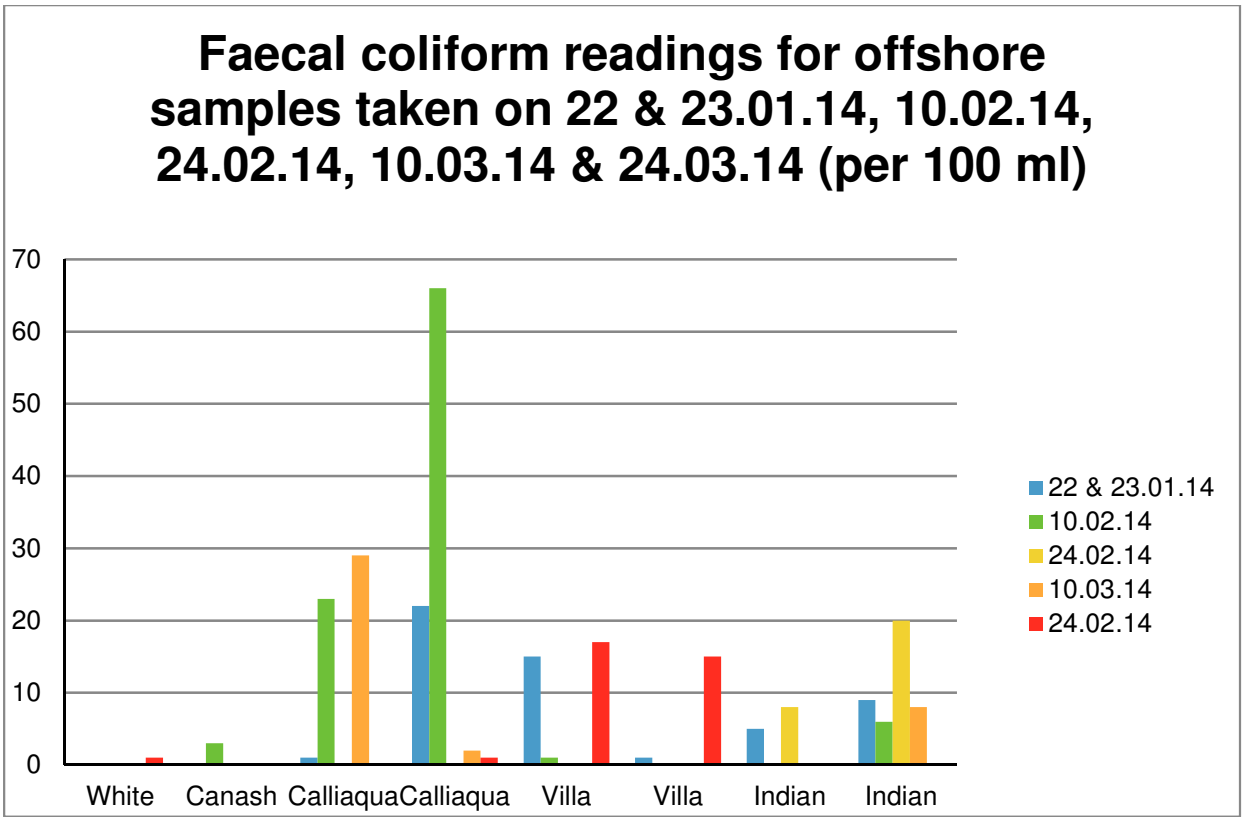

Figure 5: Comparison of offshore results for Faecal Coliform for the months January – March 2014

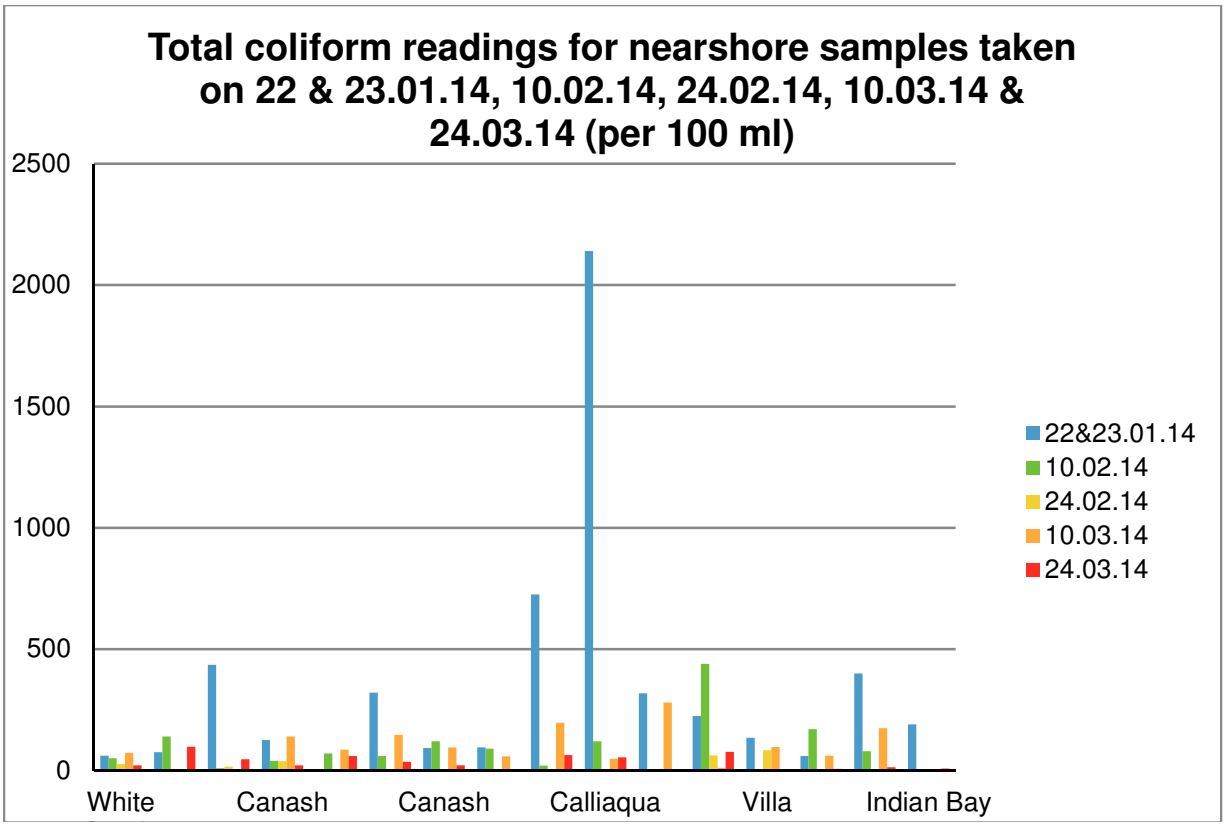

Figure 6: Comparison of nearshore results for Total Coliform for the months January – March 2014

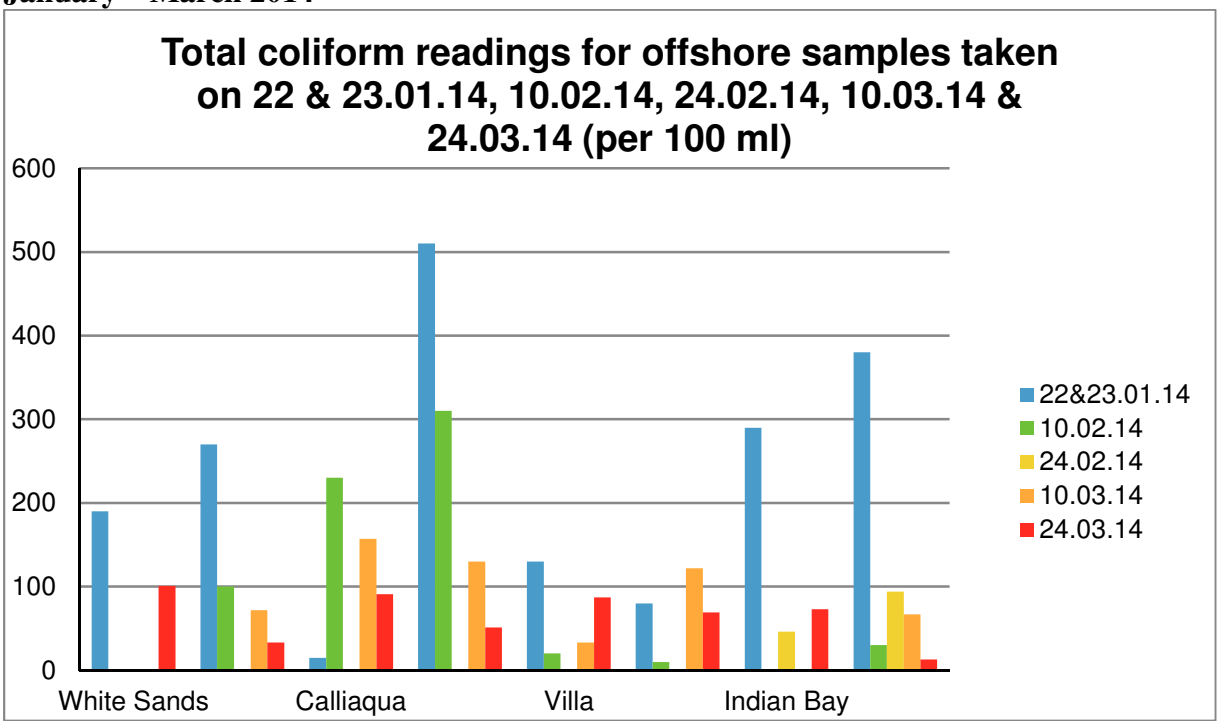

Figure 7: **Comparison of offshore results for Total Coliform for the months January – March 2014**

The Nature and Status of Pollution at the SCMCA

White Sands/Blue Lagoon/Canash

It has been discovered that the pollution type is mainly commercial and residential in this area based on some evidence of grey water from direct outfalls from tourism related establishments both on land and vessels mooring at the marina at Canash Bay. The quality of water is also compromised by litter from visitors and river/streams, sediments and derelict boats. Based on the results of water quality, this area is generally fair but is compromised when rain falls.

Calliaqua

The pollution type at Calliaqua is mainly commercial and residential with evidence of brown water from a major river in the area, grey water from direct outfalls from private and public businesses, solid waste from residents of the coastal community of Calliaqua, metal (vehicular) industries and sediments. The water quality is somewhat very poor based on biological readings especially during periods of heavy rainfall from run-off. Given that a major river passes through many communities before exiting at this bay, the quality and visibility of water is generally poor and is comprised by agricultural and farming practices along the river bank and improper solid and liquid waste disposal methods in rivers and drains.

Villa Bay

The pollution type at Villa Bay is mainly commercial with evidence of grey water from direct outfalls from hoteliers and vessels mooring in the coastal waters. The water quality can be characterized as poor as a result of higher than normal levels of phosphates at most times from effluents. Biological readings are generally fair but are higher during rainfall.

Indian Bay

The pollution type at the Indian Bay is mainly commercial based. Grey water is evident from direct outfalls from tourism related businesses. The water quality is generally fair but can become degraded when rain falls as a result of run-off.

5. RECOMMENDATIONS

The SCMCA water quality monitoring in now in its sixth month of sampling, testing and data analysis. More time is needed for more thorough analysis of results and dialogue with users of SCMCA to effectively determine the level of impact and threats to the marine environment and users. Climate Change plays a significant role in the variation of readings for some parameters, hence more time and observation of weather patterns is required to confirm results.

Some environmental issues that present themselves include improper solid and liquid waste disposal methods, bad agricultural and farming practices along the river beds and beach littering. Public education and awareness is important for persons engaged in these activities to improve their practices. Litter bins and beach signs can assist with improving solid waste and beach litter as well as beach cleanup campaigns. Community consultations should be conducted with hoteliers and residents to enhance waste water drainage systems and sewer systems to reduce the quantity of liquid and solid waste such as detergents, washing liquids and faecal matter from entering the marine environment.

Agricultural and domestic farmers should be educated on the toxicity of chemicals to humans and the marine environment especially after heavy rainfall events from improper agricultural practices. Education on animal rearing close to river banks is also necessary.

From time to time yachts can be seen docking in coastal waters along the SCMCA. Law enforcement measures should be enforced by the necessary authorities to ensure compliance for proper solid and liquid waste disposal.

A preventive risk management strategy from a management level is also effective as it that focuses on the identification and control of water quality hazards and their associated risks before users could be exposed. The best approach to protecting and managing the SCMCA and the control of pollution constitutes:

1. The inspection of septic tanks close to the beach & treatment of water before depositing into the sea
2. Re-vegetation of watersheds
3. Increase enforcement to reduce litter
4. Create natural flow of sediments to prevent pooling
5. Set up recycling depot of wastes: oil (motor & cooking), plastics, grey water, etc.
6. Create alternative livelihood in area

The effectiveness of these procedures, tools and actions can be verified or confirmed by monitoring results and the application of guideline values. The management and protection of recreational waters require the cooperation of all stakeholders

APPENDICES

Appendix 1

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Appendix 2

SCMCA RECREATIONAL WATER QUALITY RESULTS

Figure 1: Recommended limits for recreational water quality based on CEHI Standards

Parameters	Limit
Temperature	No numerical guideline value
Salinity	35 g/L or 3.5% (normal)
PH	5-10 units
Iron	1.5 mg/L
Nitrates	30 mg/L
Phosphates	0.1 mg/L
Turbidity	50 ntu
Faecal Coliform	200 CFU/ 100 ml
Total Coliform	200 CFU/250 mL

Table 1: Results for samples taken at the shoreline on 22nd and 23 January showing higher than normal levels of pollutants (highlighted in red) at the SCMCA

Sample No.	Location	Temperature	PH	Turbidity (NTU)	Salinity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
1	White Sands	27.8	8	1.38	35.48	1.2	0.37	0.03	61	4
2	Blue Lagoon	27.5	7.8	3.36	35.59	1.3	0.4	0.06	75	10
3	Blue	27	7.8	3.09	35.64	1.6	0.31	0.04	435	nil

	Lagoon									
4	Canash	27.9	7.7	3.35	35.61	1.6	0.3	0.06	125	11
5	Canash	26.8	8	2.32	35.64	1.6	0.25	0.04	3	nil
6	Canash	26.8	7.7	6.32	35.77	1.5	0.33	0.07	321	4
7	Canash	26.8	8	4.25	35.64	1.5	0.28	0.04	93	6
8	Calliaqua	29.1	7.7	6.12	34.94	1.6	0.21	0.1	95	nil
9	Calliaqua	28.92	7.8	22.3	34.82	2	0.36	0.61	726	77
10	Calliaqua	28.1	7.9	13.8	29.55	2.1	0.17	0.28	2140	1120

Table 2: Results for samples taken offshore showing higher than normal levels of pollutants (highlighted in red) at the SCMCA

Sample No.	Location	PH	Turbidity (NTU)	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
1	Indian bay	8.2	0.48	1.9	0.17	0.03	380	9
2	Indian bay	7.6	0.78	0.7	0.01	0.03	290	5
3	Villa	8	1.89	1.4	0.23	0.04	80	1
4	Villa	8.1	1.83	0.8	0.27	0.06	130	15
5	Calliaqua	8.1	1.41	0.7	0.13	0.05	510	22
6	Calliquia	7.9	0.88	1.1	0.26	0.15	15	1
7	Canash	7.6	5.84	1.6	0.55	0.26	270	nil

8	White Sands	8	0.74	1.1	0.25	0.02	190	nil
9	Arnos Vale	8.3	6.58	1.3	0.12	0.12	170	nil

Table 3: Results for samples taken at six rivers/streams showing higher than normal levels of pollutants (highlighted in red) at the SCMCA

Sample No.	Location	PH	Turbidity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
1	Arnos vale	7.8	1.84	1.3	0.31	0.27	130	nil
2	Arnos vale	7.9	2.08	1.7	0.49	0.25	860	200
3	Calliaqua	7.6	2.15	2.2	0.03	0.38	740	410
4	Calliaqua	7.9	0.95	19.4	0.65	1.91	490	20
5	Calliaqua	7.5	6.75	2.1	0.82	0.59	720	nil
6	Canash	7.6	20.3	2.5	0.51	0.75	1130	300

Table 4: Results for nearshore samples collected on 10.02.14

Sample No.	Location	Temperature	PH	Turbidity (NTU)	Salinity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
1	White Sands	27	8.20	8.01	34.91	1.50	0.13	0.26	50	6
2	Blue Lagoon	27	8.00	6.59	35.60	1.50	0.07	0.48	140	12
3	Blue Lagoon	27	8.10	6.56	34.69	1.20	0.50	0.07	10	NIL
4	Canash	28	8.20	7.03	35.68	1.50	0.06	0.14	40	2
5	Canash	27.2	8.20	4.03	35.56	1.60	0.05	0.18	70	4
6	Canash	27.5	8.20	11.20	35.49	1.70	0.19	0.10	60	9
7	Canash	27.5	8.00	18.80	35.71	1.00	0.12	0.07	120	17
8	Calliaqua	29	8.00	17.30	35.56	1.80	0.14	0.15	90	13
9	Calliaqua	28	8.10	12.20	34.55	1.60	0.28	0.30	20	NIL
10	Calliaqua	29	8.00	18.40	35.60	2.10	0.31	0.34	120	15
11	Villa	29	8.20	7.51	34.76	1.70	0.21	0.06	NIL	NIL
12	Villa	28	8.20	3.02	35.69	1.90	0.18	0.07	440	42
13	Villa	28	8.00	2.45	34.66	1.50	0.01	0.02	NIL	NIL
14	Indian Bay	28	8.10	2.54	35.78	1.60	0.02	0.04	170	21
15	Indian Bay	28	8.00	2.15	35.59	1.30	0.01	0.02	80	21
16	Indian	28.5	8.0	1.38	35.63	1.30	0.03	0.01	NIL	NIL

	Bay		0							

Table 5: Results for Offshore samples collected on 10.02.14

Sample No.	Location	Temperature	PH	Turbidity (NTU)	Salinity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
17	White Sands	28	8.20	5.08	35.41	1.40	NIL	0.03	NIL	NIL
18	Canash	27.5	8.20	2.02	35.37	1.30	NIL	0.02	100	3
19	Calliaqua	28	8.10	5.80	35.69	1.30	0.01	0.03	230	23
20	Calliaqua	28	8.20	1.57	35.31	1.30	0.01	0.02	310	66
21	Villa	27.5	8.10	2.11	35.76	1.70	0.02	0.01	20	1
22	Villa	28	8.20	5.63	35.49	1.60	0.01	0.01	10	NIL
23	Indian Bay	27.5	8.00	6.46	35.61	1.70	0.01	0.03	NIL	NIL
24	Indian Bay	28	8.10	2.37	34.99	1.50	NIL	0.03	30	6

Table 6: Results for nearshore samples collected on the 24.02.14

Sample No.	Location	Temperature	PH	Turbidity (NTU)	Salinity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
1	White Sands	26	8.1	2.42	35.36	1.3	0.01	0.01	27	7
2	Blue Lagoon	26	8	14.7	35.19	1.6	0.01	0.02	3	NIL
3	Blue Lagoon	25.5	8.2	2.07	35.17	1.5	0.01	0.06	16	1
4	Canash	27	8.1	4.41	35.31	1.3	NIL	0.03	38	9
5	Canash	25.5	7.9	2.13	35.41	1.6	NIL	0.01	NIL	NIL
6	Canash	26.5	8.1	2.74	35.22	1.2	0.01	0.05	NIL	NIL
7	Canash	26	8.2	2.79	35.46	1.3	0.01	0.08	NIL	NIL
8	Calliaqua	27	8	4.39	35.37	1.8	0.02	0.05	NIL	NIL
9	Calliaqua	26	8.1	10.5	35.41	1.6	0.15	0.3	4	NIL
10	Calliaqua	26	7.9	23.6	35.32	2.4	0.23	0.45	NIL	NIL
11	Villa	27.5	7.9	2.56	35.3	1.4	0.04	0.04	NIL	NIL
12	Villa	27	8.2	2.31	35.31	1.4	0.04	0.01	62	10
13	Villa	26.5	8	13.7	35.14	1.2	0.03	0.02	83	14
14	Indian Bay	27	8	2.08	35.18	1.4	0.04	NIL	NIL	NIL

15	Indian Bay	28	7.9	3.62	35.21	2.2	0.04	0.01	NIL	NIL
16	Indian Bay	27.5	7.9	1.4	35.33	2.5	0.02	0.01	5	NIL

Table 7: Results for Offshore samples collected on 24.02.14

Sample No.	Location	Temperature	PH	Turbidity (NTU)	Salinity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
17	White Sands	26.5	8	1.85	35.41	1.3	NIL	0.01	NIL	NIL
18	Canash	26								
19	Calliaqua	26	8.2	1.69	35.34	2.1	NIL	NIL	1	NIL
20	Calliaqua	26	8.1	1.58	35.36	1.5	0.01	NIL	NIL	NIL
21	Villa	26	8.2	0.54	35.4	1.4	0.01	0.02	NIL	NIL
22	Villa	26	8	0.77	35.46	1.3	0.04	0.01	NIL	NIL
23	Indian Bay	26	8	1.09	35.39	1.1	0.01	0.02	46	8
24	Indian Bay	26	8.2	0.39	35.33	1.7	0.01	NIL	94	20

Table 8: Results for nearshore samples collected on the 10.03.14

Sample No.	Location	Temperature	PH	Turbidity (NTU)	Salinity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
1	White Sands	26.00	8.20	2.85	35.14	1.80	0.02	0.01	73	0
2	Blue Lagoon	27.00	8.10	4.37	35.06	1.60	0.02	0.06	0	0

3	Blue Lagoon	26.50	8.20	7.47	34.99	1.80	0.03	0.04	0	0
4	Canash	28.00	8.00	7.25	35.18	1.80	0.05	0.04	140	0
5	Canash	27.00	8.00	2.42	35.08	1.60	0.05	0.01	86	0
6	Canash	28.00	8.10	8.01	35.10	2.50	0.08	0.79	147	0
7	Canash	27.00	8.20	3.50	35.06	1.60	0.01	0.02	95	0
8	Calliaqua	28.00	8.00	1.98	34.97	2.00	0.13	0.05	59	0
9	Calliaqua	28.00	8.00	12.50	34.30	2.20	0.20	0.59	197	0
10	Calliaqua	28.00	8.10	17.30	34.80	2.50	0.35	0.49	48	0
11	Villa	28.00	7.90	1.38	34.76	2.00	0.14	0.03	280	170
12	Villa	28.00	8.20	2.63	34.96	2.40	0.14	0.04	11	0
13	Villa	28.00	8.00	2.77	34.99	1.50	0.01	0.02	97	40
14	Indian Bay	28.00	8.20	1.28	35.98	1.70	0.02	0.02	61	0
15	Indian Bay	27.00	8.10	2.92	34.78	1.10	0.01	0.01	175	0
16	Indian Bay	29.00	8.00	1.02	35.03	1.50	0.01	0.02	0	0

Table 9: Results for Offshore samples collected on 10.03.14

Sample No.	Location	Temperature	PH	Turbidity (NTU)	Salinity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
17	White Sands	27.00	8.00	0.65	35.04	1.70	0.01	0.05	0	0
18	Canash	27.00	7.90	5.77	35.05	1.60	0.01	0.02	72	0
19	Calliaqua	27.00	8.00	0.72	34.70	1.40	0.03	0.02	157	29
20	Calliaqua	27.00	8.10	1.11	34.93	1.60	0.01	0.02	130	2
21	Villa	27.00	8.00	0.55	35.13	1.80	0.03	0.04	33	0
22	Villa	27.00	8.20	0.63	34.98	1.20	0.02	0.04	122	0
23	Indian Bay	27.50	8.00	0.71	34.88	1.60	0.01	0.04	0	0
24	Indian Bay	26.50	8.20	0.36	35.01	1.10	0.03	0.05	67	8

Table 10: Results for nearshore samples collected on 24.03.14

Sample No.	Location	Temperature	PH	Turbidity (NTU)	Salinity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
1	White Sands	26	8.10	0.93	32.58	1.50	1.12	0.03	22	0
2	Blue Lagoon	27	8.20	8.61	33.96	1.50	0.05	0.02	98	16
3	Blue Lagoon	26	8.00	5.47	28.43	2.00	0.07	0.06	46	0
4	Canash	28	8.10	10.10	33.27	2.50	0.48	0.10	21	0
5	Canash	26.5	8.00	5.61	34.42	3.90	0.15	0.06	60	0
6	Canash	27.5	8.10	19.40	30.14	3.30	0.06	0.49	36	0
7	Canash	27	8.20	8.76	32.18	2.40	0.10	0.11	22	0
8	Calliaqua	27	8.10	4.18	30.48	1.40	0.19	0.10	5	0
9	Calliaqua	27	8.00	16.80	35.34	2.80	0.35	0.89	63	0
10	Calliaqua	27	8.20	10.10	30.18	2.60	0.16	0.35	55	0
11	Villa	27	8.00	8.31	35.08	2.40	0.03	0.16	4	0
12	Villa	27.5	8.10	2.65	34.26	2.60	0.15	0.03	77	25
13	Villa	27	8.20	2.72	35.01	1.50	0.02	0.04	1	0
14	India	27	8.20	1.66	35.0	1.70	0.02	0.04	7	0

	n Bay				8					
15	India n Bay	27	8.10	3.05	34.46	1.40	0.02	0.02	13	0
16	India n Bay	27	8.20	1.92	35.24	1.60	0.01	0.02	8	0

Table 11: Results for offshore samples collected on 24.03.14

Sample No.	Location	Temperature	PH	Turbidity (NTU)	Salinity	Nitrates (mg/l)	Phosphates (mg/l)	Iron (mg/l)	Total Coliform per 100ml	Faecal Coliform per 100ml
17	White Sands	27	8.10	2.49	35.18	1.40	0.02	0.04	101	1
18	Canash	27	8.20	5.19	35.09	1.50	0.03	0.03	33	0
19	Calliaqua	27	8.10	1.63	35.23	1.60	0.02	0.04	91	0
20	Calliaqua	27	8.00	1.88	35.11	2.10	0.01	0.03	51	1
21	Villa	27	8.20	1.17	35.11	1.80	0.03	0.07	87	17
22	Villa	27	8.00	1.70	34.71	2.50	0.03	0.06	69	15
23	Indian Bay	27	8.10	2.99	35.16	2.70	0.07	0.08	73	0
24	Indian Bay	27	8.20	1.11	34.62	2.20	0.07	0.06	13	0

Appendix V

Statement of the Prime Minister on the Removal of Wrecks and Abandoned Boats in the South Coast Marine Conservation Area

December 03, 2013 Media Report on Prime Minister's statement in Parliament

Derelict boats to be removed from Canash beach by mid-2014 – PM

December 3, 2013

By Kenton X. Chance

Abandoned boats at Canash Bay. (IWN file photo)

The derelict, abandoned, and wrecked vessels at Careenage Harbour/Canash Bay are scheduled to be removed by June 30, 2014, Prime Minister and Minister of Maritime Affairs, Dr. Ralph Gonsalves has told Parliament.

The new deadline is one year later than the date by which David Robin, director of maritime affairs, told this writer in January, that the vessel would have been removed.

Responding in Parliament to a question from Opposition lawmaker, Sen. Linton Lewis, about the Government's plans to remove the boats, Gonsalves said there are 13 vessels which require attention and action and called on the owners to move them.

“I just want to put out a plea. For instance, nine of the vessels which are there, they are too close to the shore. I want to ask those persons who own those vessels, please, move them before we have to move them, because it may become unpleasant, and there is no need for that,” he said.

“There is no need for you to park your vessels there — your boats there. And some of them can easily be put elsewhere,” he said, as he called on the owners of the vessels to work with the authorities to relocate the vessel.

“The vessel owners have to be responsible in helping to deal with this particular kind of a problem,” he said while responding to a question about the situation from opposition senator, Dr. Linton Lewis.

“I am happy that this question has been raised, but I want to say to the Honourable Senator Lewis, it is a matter which has been occupying our attention and now it has come to the House, the public will have a better appreciation of some of the issues which are involved in this particular matter, which are important,” Gonsalves said.

“We can’t have derelict vehicles on land, and we can’t have derelict vessels in our harbours. It’s simple,” he said.

Two of them, the Carla Marina and the Blue Monsoon are wrecks, in accordance with the Shipping Act, two are derelicts and abandoned, and nine are anchored too close to the shore and require relocation, he told Parliament.

A property owner in the area told this writer in January that the “Carla Marina”, the largest and most prominent wreck at the beach, was brought there almost a decade ago, and the vessels remain there even after the situation was called to the attention of current and past ministers under the current Government, including former ministers of tourism, health, and the environment.

But Gonsalves said that the removal of the vessels will be undertaken, according to the Maritime Office, by June 30, 2014.

“I don’t need to go into any detail as to why it make take longer in some cases, depending on the type of vessel. Those who are familiar with the law know you have to give a notice period, and the notice varies in fact in the Port Authority Act and also in the Shipping Act and that has to be ironed out — that discrepancy,” he said.

A partly submerged yacht at Canash Bay. (IWN file photo)

He further said that a south coast marine conservation area, a marine park, will be soon to be established, and a Shipping Marine Pollution Bill brought to Parliament.

The marine conservation area will include the belt from Careenage Harbour/Canash Bay to Great Head Bay in Arnos Vale and the plan is to complete the park by 2015.

The establishment of the park will not only assist in dealing with the removal of current wrecks and derelict vessels, but will also provide on-site management to prevent and deal with any such recurrence, Gonsalves said.

The National Parks, Rivers and Beaches Authority and the Fisheries Division are coordinating the work, with support from the government of Germany, through the Caribbean Aqua-Terrestrial Solutions programme, he further told Parliament.

The Shipping Marine Pollution Bill, which is being prepared with assistance from the Commonwealth Secretariat, will support existing legislations and will provide the legal framework for the prevention of pollution by ships, involving the discharge of oil, noxious fluids, liquid substances, pollutants in packaged form, sewage, garbage, ozone depleting substances, and green house gases, Gonsalves said.

“This is of significance to the Careenage Harbour, which is a base for several yacht charter companies and other vessels.”

He said a national ocean policy and strategic plan is being developed with assistance from the Commonwealth Secretariat, and within the framework of the Organisation of Eastern Caribbean States (OECS) and that Commander Robin is playing an important role in that regard

Gonsalves said that the OECS and the wider Caribbean need to develop a lot more capacity to deal with vessels.

Appendix VI

Process and Timetable for Wreck Removal

Affected Agencies: National Marine Authority & Receiver of Wrecks, National Parks Rivers and Beaches Authority, Chief Fisheries Officer, Senior Coast Guard Officers, Chief Pilot, Ministry Health, Wellness & Environment.

Objective: To develop a process for expeditious, cost effective and environmentally sustainable resolution of the problems posed by wrecked and abandoned boats in the Canash Bay/Blue Lagoon area of the NMCA and to identify a pathway to anticipate and deal with longer-term concerns and issues.

Discussion of Principle Issues and Concerns

- There is need for immediate action to deal with five priority vessels but also to deal effectively with all others and to anticipate future issues;
- The current provisions for a 1 Year notice of intent to owners has proven to be impractical and needs to be brought into alignment with the 2 month provisions of the Port Authority Act;
- The Receiver of Wrecks is satisfied that ownership of the Carla Marina has been verified and sufficient notice provided under existing legislation. Ownership of 4 others appears easily verifiable; others yet to be traced.
- SVG Government is prepared to take immediate action to issue contract(s) for removal of the wrecks and to recover costs from owners later.
- Funds have been set aside in the CATS Implementation Plan for removal of wrecks in the NMCA and in the event that the CATS funds are utilized the Government will guarantee to German authorities that any funds recovered will be used directly to offset the CATS costs;
- Wreck access and removal must be accomplished in a manner that protects essential environment and habitat features of the NMCA (from direct damage or pollution) and ensures minimal (noise and other) disruption to adjacent property owners and commercial interests as well as to tourists and residents.
- There appears to be 3 companies potentially experienced and qualified to remove the Carla Marina by complete removal and salvage (estimated at XCD $12,000), by cut up on site and removal (by land or sea) of by partial cut up and cleaning on site with removal of rest: potentially as an artificial reef. A bid package needs to be prepared and can be immediately expedited under the CATS Program.
- While creation of an artificial reef may be desirable for reef and shore protection as well as creation of tourism opportunities in the NMCA, there are considerations of whether a desirable and practicable site exists that will not be damaging to other environmental considerations or present a potential navigation

hazard. These issues may not be resolvable in the desired timeframe but provision needs to be made to investigate this further;

- A number of longer term (existing and potential) issues need to be resolved as part of the management planning for the NMCA and potential future national park. These include future abandonments and wrecks, existing moorings issues, currently unsightly abandoned boats in marinas and other storage areas, numerous smaller beached boats and rotting hulls;
- A communications and outreach plan will be required in order to reach not only the potential owners of boats and adjacent properties but also other stakeholders.

Key Decisions
Phased of Removal of 14 existing wrecks & abandoned boats

Phase 1- Expeditious actions, to be completed by March 31, 2014

- Remove the Carla Marina & the beached lifeboat, by contract competitively tendered to three companies for bid/proposal;
- Amend legislation to provide for owner notification to bring into line with the two month timeline provision of the Port Authority Act ;
- Notify owners and relocate various small vessels.

Phase 2-Remaining actions

- Remove remaining boats (specifically, the sunken catamaran, floating hulk, broken mast yacht) and any others not relocated by March 31, 2014

Actions and Responsibilities for Implementation of the Key Decisions

- Amend the Legislation: Receiver of Wrecks in consultation;
- Prepare Contract Bid Documents: Director National Parks and staff/volunteers on behalf of the Receiver of Wrecks and in consultation.
- Clear contract authority and procedures with CATS: Director National Parks
- Research ownership of the 13 (other) vessels and assist the Receiver of Wrecks in providing notifications: Coast Guard
- Research the potential for and interest in creation of an Artificial Reef: Coast Guard in consultation with Chief Fisheries officer, Chief Pilot, National Parks, Ministry of Heath, Wellness and Environment and key stakeholders.
- Communications Planning; National Parks staff in consultation.

Appendix VII

Provision of Contract Advice for Wreck Removal

1. INTRODUCTION

The Request for Proposals (RFP) approach was based, in part, on Government of British Columbia policies and procedures, which were provided by Global Parks.

A Request for Proposals document usually includes the following sections:

- a cover page that identifies a ministry contact person; the closing date, time, and location; and any scheduled Proponents' Meeting(s);
- definitions of terms used in the document and an overview of administrative requirements;
- a brief description of the program or project for which vendors are being asked to submit a proposal (i.e., a summary of the requirement);
- a short description of the existing situation in the Ministry or program area issuing the RFP and information on how the completed project will impact the functioning of the ministry;
- the scope of and requirements for the project that is the subject of the RFP;
- mandatory evaluation criteria;
- desirable evaluation criteria;
- information on the expected proposal format, such as the structure and length of the document;
- An overview of the expected content for each proposal; and
- A copy of the terms and conditions that will be included in the contract with the successful proponent.

2. THE REQUEST FOR PROPOSAL PROCESS

A Request for Proposals process involves government presenting an overview of its perceived or expected requirements and asking for proposed solutions from interested vendors. The term RFP refers to both the RFP solicitation method and the RFP document, which is the tool for soliciting proposals. Proposals submitted in response to an RFP are evaluated using multiple criteria, such as price, qualifications and experience, and the proposed solution or approach.

Government uses the RFP solicitation method to compete contract opportunities when a ministry wants to review and implement different and new solutions to a problem, project, or business process. For example, an RFP may be issued when:

- a Ministry has a situation for which it is not sure of the best solution;
- a Ministry wishes to consider factors other than price in selection of a contractor;
- a Ministry would like to see what the experts suggest;
- the requirement is complex;
- a program is new and the Ministry would like ideas on how to deliver it; or
- a Ministry would like to see if there are alternatives to the way it usually acquires a product or service.
  An RFP can range from a single-step process for straightforward procurement opportunities to a multi-stage process for complex and significant opportunities. For certain low dollar requirements, a simple RFP can be issued, calling for short, simple responses. As requirements increase in complexity and cost, the RFP becomes more complex and asks proponents to provide more detail in their responses.

With an RFP, proposals are evaluated against multiple criteria such as price, qualifications and experience, and the proposed solution or approach. The best proposal will be awarded the contract and the best proposal may, or may not, have the lowest price. The terms *proposal* and *proponent* are used specifically with the RFP process. An RFP is most often used to acquire services, although there are occasions where Procurement and Supply Services (PSS) may use an RFP to acquire goods.

When government invites proposals, the term *proponent* is used to describe an individual, company, or society that submits, or intends to submit, a proposal. In government, the terms *vendor* and *supplier* are often used interchangeably with the term *proponent*. For the purposes of this guide:

- a vendor is any party (individual, business, or society) that is in the position of being able to sell goods or services to government;
- a supplier is a vendor who has been selected through a procurement process to supply government with goods or services; and
- a proponent is a vendor who submits a proposal in response to an RFP document.
  Each RFP will be unique. However, there are some common steps and decision points that are followed when moving from an identified need to the delivery of the required goods or services.
- These steps are generally as follows:

1. The Ministry identifies a need.

2. The Ministry may consult to assist with identifying and assessing procurement options.

3. Once the requirement is fully defined, the RFP document is drafted and evaluation criteria are determined.

4. The Ministry issues the RFP document.

5. A Proponents' Meeting is often held. This information session is open to all potential proponents and other interested parties.

6. The Ministry receives the proposals, which are evaluated by the evaluation committee.

7. The Ministry selects and notifies the successful proponent and then notifies the unsuccessful proponents.

8. A contract is negotiated and signed with the successful proponent.

9. Individual debriefing sessions may be held with unsuccessful proponents.

10. The service is performed or the goods are delivered.