Shell Beach Protected Area Management Plan

2015 – 2019

Volume 1, FINAL – DECEMBER 15, 2014

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Organization of Plan: The management plan is presented in Volume 1. The management plan is supported by Appendices, presented in Volume 2.

Management Plan Approval Page

The Board of Directors of the Protected Areas Commission have approved this management plan for implementation in the Shell Beach Protected Area, Guyana.

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Signature

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Date

Acronyms and Abbreviations

ABS	Access and Benefit Sharing
ADF	Amerindian Development Fund
ATV	All-Terrain Vehicle
CDC	Community Development Council
GFC	Guyana Forestry Commission
GGMC	Guyana Geology and Mines Commission
GL&SC	Guyana Lands and Surveys Commission
GMTCS	Guyana Marine Turtle Conservation Society
GPAS	Guyana National Protected Areas System
GPS	Global Positioning System
ha	Hectares
IBA	Important Bird Area
IPR	Intellectual Property Rights
IUCN	International Union for Conservation of Nature
KfW	German Development Bank
kms	kilometers
km²	square kilometer
m	Meters
M&E	Monitoring and Evaluation
MoNRE	Ministry of Natural Resources and the Environment
MPA	Marine Protected Area
MRPA	Managed Resource Protected Area
PA	Protected Area
PAC	Protected Areas Commission
SBPA	Shell Beach Protected Area
UNDP	United Nations Development Programme

Executive Summary

Shell Beach was designated a protected area with the passage of the Protected Areas Act of 2011. The designation of Shell Beach was preceded by extensive delineation and consultation process between 2009 and 2010 (GMTCS, 2011). This management plan, which was prepared over a nine month period in 2014, builds on the delineation process to strengthen relationships and develop a strategic plan for the next five years that is participatory and inclusive of various stakeholder views and needs.

The Shell Beach Protected Area (SBPA) is located in the northwest part of Guyana, in Region 1, stretching over 120 kilometers (kms) (75 miles) of beach and mudflats. It covers an approximate area of 123,055 hectares (304,075 acres). It is bound, running southeast to the northwest, by the Moruca, Barabara, Biara, Baramani, and Waini rivers and is bound to the northeast by the Atlantic Ocean. It also includes an approximate area 16 kms long and 1.6 kms wide on the left bank of the Waini River extending from the northwest boundary of the Three Brothers village to the Waini mouth. It is categorized as an IUCN Category VI - Managed Resource Protected Area.

SBPA and its surroundings are rich in biodiversity with relatively intact and productive ecosystems. There are 11 Amerindian villages that adjoin or are within the Shell Beach Protected Area, which includes 13 satellite communities. These communities have traditionally relied on natural resources for their livelihoods. Fishing, crabbing, hunting, manicole palm and timber harvesting are common among communities.

The vision, goals, objectives, management programmes, and outputs were determined through an extensive consultation process at critical milestones in the preparation of this management plan. The vision is that "SBPA is an area in which all stakeholders protect and use natural resources wisely for the benefit of present and future generations".

The management plan is presented in Volume 1 and is supported by Appendices in Volume 2. The management plan, which is for a period of five years, meets the SBPA vision and goals by pursuing five core management programmes: 1) Operations and adaptive management; 2) Land use and sustainable natural resource management; 3) Benefits sharing and livelihood development; 4) Education, awareness, and outreach; and 5) Capacity building.

The development of this management plan would not have been possible without the funding from the German Development Bank (KfW) and the enthusiasm, participation, feedback, and support of communities, various national stakeholders, Shell Beach management planning team, and the staff of the Environmental Protection Agency (EPA) and the Protected Areas Commission (PAC). As we look forward to implementing this management plan over the next five years, we will continue to forge relationships and work with stakeholders to strengthen management of the SBPA.

1   Management Plan Introduction

1.1 Management Plan Purpose

The purpose of the Shell Beach Protected Area (SBPA) management plan is to provide strategic direction to the Protected Areas Commission (PAC), in relation to SBPA, for operations, management programme planning, implementation, monitoring, and evaluation over the next five years. It also serves as a public relations document for key stakeholders and donors by clearly laying out the management framework and priorities.

1.2 Management Planning Process

This management plan has been developed accordance with the Protected Areas Act 2011 and was developed in consultation with all communities within and adjacent to the SBPA and national stakeholders. Six stakeholder consultations were held, which included a pre-initial stakeholder meeting in August 2013; an initial workshop in March 2014; a technical workshop in May 2014; a second workshop in July 2014; and a final meeting in October 2014. In addition, consultations were conducted in 16 Amerindian communities associated with the SBPA between August 11 and 23, 2014, so that the SBMPT could better understand community concerns and expectations, validate the information contained in the draft management plan, and gather community input on management programmes. Consultation reports were prepared for each meeting. Stakeholders engaged in the consultations and photographs are presented in **Appendix 7 and 8**.

These stakeholder consultations provided several opportunities to present and review draft versions of management plan.

In addition, an exchange visit was organized to Region 9 for a few community representatives from the SBPA area. The purpose of the exchange visit was to learn from the Kanuku Mountain Community Representative Group about their experiences with the Kanuku Mountain Protected Area management planning process. This also provided an opportunity to get insights into various livelihood and tourism initiatives developed and operated by the North Rupununi District Development Board, Iwokrama, Surama village, and Yupukari village.

Previously created community resource maps were also updated by communities during the July 2014 stakeholder workshop. The updated information was collected, spatially referenced, and resource use maps digitally updated (**Appendix 9**).

As required by the Protected Areas Act 2011, a notice inviting the public to review the final draft management plan was issued in the official Gazette on November 1, 2014 with a deadline of December 5, 2014 set for receiving comment. The documents were made available in all communities, including satellite communities, for community review. They were also made available for review on the Ministry of Natural Resources and Environment (MoNRE) website and

at the PAC office. A public meeting was held on November 14, 2014 to present the final draft of the management plan. Comments received were considered in preparation of the final management plan.

2 Shell Beach Protected Area (SBPA)

2.1 SBPA Establishment

Shell Beach was identified as one of the five priority areas for establishment of protected areas in Guyana and was designated a protected area with the passage of the Protected Areas Act in 2011. The designation was preceded by an extensive delineation and consultation process between 2009 and 2010 (GMTCS, 2011). This management plan, which was prepared over a nine month period in 2014, builds on the delineation process to strengthen relationships and develop a strategic plan for the next five years that is participatory and inclusive of various stakeholder views and needs.

Guyana currently has five protected areas. Kaieteur National Park, established in 1929, and Shell Beach Protected Area and Kanuku Mountain Protected Area, both established in 2011, are managed by the PAC. Iwokrama Rainforest Reserve is managed by an international Board of Trustees. Collectively these four, which form part of Guyana's National Protected Areas System (GPAS), cover 5.4 percent of Guyana's land area. Kanashen Conservation Area is owned and managed by the Wai Wai community, which brings the total area under protection to 8.7 percent. Figure 1 shows the various protected areas in Guyana.

SBPA falls within IUCN Category VI – Managed Resource Protected Area (MRPA), as are the other protected areas under the GPAS. A MRPA serves to address both conservation goals and socio, cultural, and economic goals of communities and resource users (IUCN, 2008). Therefore, SBPA will be managed to support conservation of biodiversity, sustainable resource use, and livelihoods development.

The SBPA is unique and is representative of Guyana's diverse ecosystems. At SBPA, both the terrestrial and marine components are important. The area serves as an important nesting ground for marine turtles and is also home to the biggest contiguous area comprising of productive mangrove forests. Salm *et. al.*, (2000) note that coastal ecosystems include both land and water and should be managed together. Therefore strategies need to be developed that address both terrestrial and marine components. Even though SBPA contains a significant marine component, it is not considered a Marine Protected Area (MPA) since the marine boundaries are not legally defined. Legal marine boundary definition is a requisite for a protected area to be considered a MPA (Day *et. al.*, 2012). The boundary for the SBPA follows the Atlantic coast line.

Figure 1: Location of Protected Areas in Guyana.
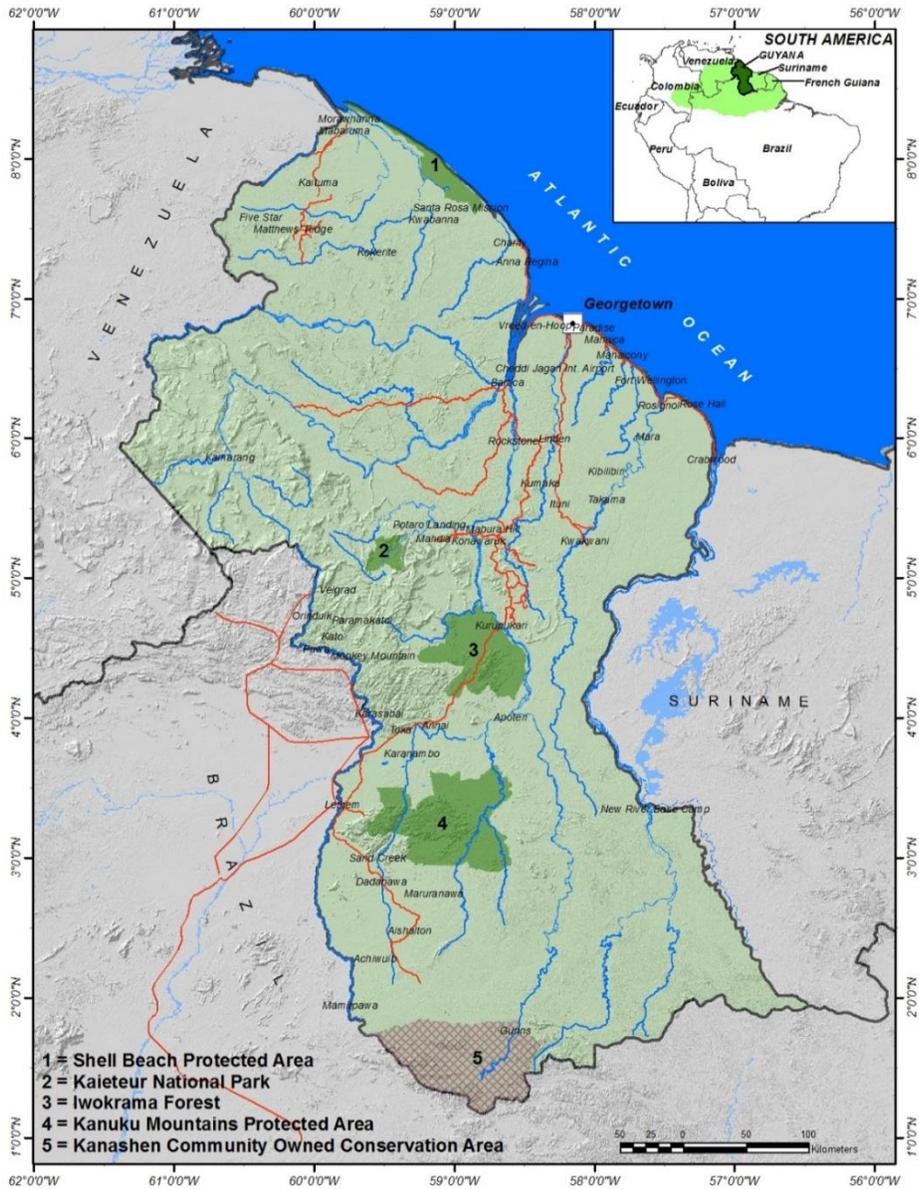
Figure 2: Map Showing Boundary of Shell Beach Protected Area
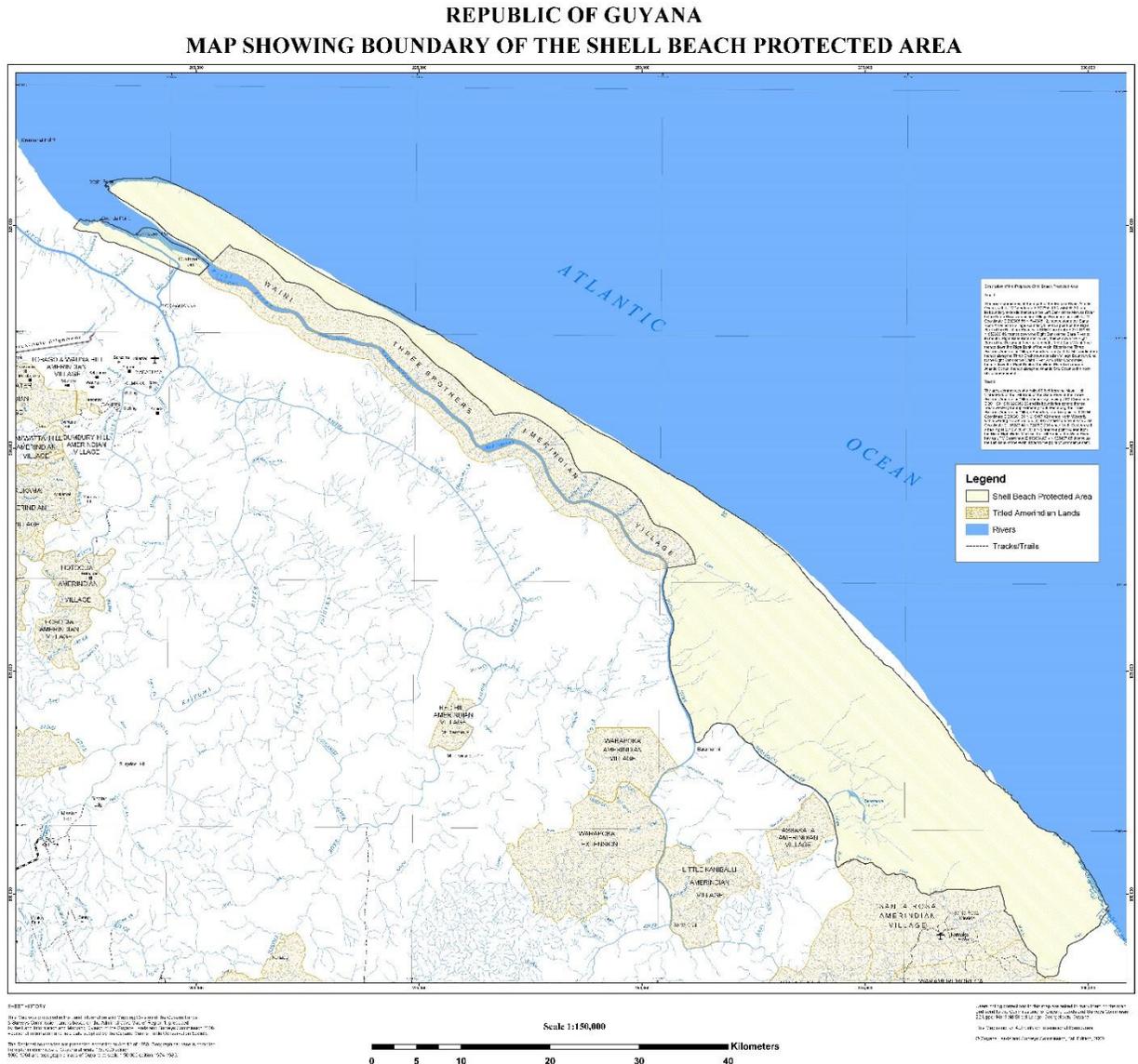
2.2 Description of Place and Biodiversity

SBPA is located in the northwest part of Guyana, in Region 1, stretching over 120 kilometers (kms) (75 miles) of beach and mudflats. The area gets its name from the presence of beach composed of fragmented mollusks, bivalved, and univalved shells. Mudflats are present in front of the shells, mangroves are found inland of the shells, and swamp forests inland of the mangroves (Charles *et. al.*, 2004).

The area commences at the mouth of the Moruca River, Atlantic Ocean, and its boundary extends thereafter up the left bank of the Moruca River to the Santa Rosa Amerindian village boundary

line, then along the Santa Rosa Amerindian village boundary line to the right bank of the Barabara River and down the right bank of the Biara River to its mouth. The boundary then follows the right bank of Baramani River and to its mouth, then the right bank of the Waini River to the Three Brothers Amerindian village boundary line. It then follows along the Three Brothers Amerindian village boundary line to the right bank of the Waini River to its mouth at the Atlantic Ocean, and thereafter along the Atlantic Sea coast to the point of commencement at the mouth of Moruca River (Figure 2). It also includes an area approximately 16 kms long and 1.6 kms wide on the left bank of the Waini River extending from the northwest boundary of the Three Brothers Amerindian Village to the Waini mouth. The Protected Area covers an approximate area of 123,055 hectares (ha) (1,203 square kilometers (Km^2); 304,074 acres).

The SBPA is relatively flat with elevation ranging from less than 1 meter (m) to 25 m (GFA Consulting Group, 2009).

SBPA and its surroundings are rich in biodiversity with relatively intact and productive ecosystems. Land cover includes the largest and most intact mangrove forests (both coastal and riverine) in Guyana, mixed swamp forests, open swamps (herbaceous, typha, and salt water swamps), mixed agriculture, coconut palms, sandy beaches, and open water (GFA Consulting Group, 2009). There are also seasonally flooded Ite (Mauritius) palm savannahs (Charles *et. al.,* 2004). Table 1 provides the proportion of the land cover types.

Table 1: Land Cover Types

Land Cover Type	Area (km^2)	Percentage
Mangrove Forest	156.7	13.02
Mixed Swamp Forest	665.1	55.28
Herbaceous Swamp	275.2	22.87
Typha Swamp	46.3	3.85
Halophytic Swamp	53.2	4.42
Mixed Agriculture	1.9	0.16
Coconut Palms	0.7	0.06
Sandy Beaches	2.5	0.21
Open Water	1.5	0.13
Total Area	1203.1	100

(GFA Consulting Group, 2009; Updated land cover types based on official SBPA boundary provided by GL&SC, 2014).

The recent land cover of the area has also been partly influenced by a fire in 1998 that burned for months on the Waini Peninsula affecting mangroves and mixed swamp forest. Dry conditions

influenced by El Nino are considered to be the primary reason for the fire. Two extensive forested areas were completely burned – the northern Almond Beach burn and the Kamwatta burn. A second fire period of less intensity in 2001 affected the open swamp areas of the southeastern part of the SBPA (GFA Consulting Group, 2009).

The nearshore waters are considered highly productive due to the nutrient influx from the estuary of the Essequibo in the southeast and the larger Orinoco Delta in the northwest. The vast mangrove forests also serve as nurseries for a variety of fish species. Fifty nine species of fish have been recorded in the Shell Beach area (GMTCS, 2011).

The area has been renowned for its marine turtle nesting sites. Four species of the world's endangered marine turtles: the Leatherback *(Dermochelys coriacea)*, Hawksbill *(Eretmochelys imbricata)*, Olive Ridley *(Lepidochelys olivacea)*, and Green turtle *(Chelonia mydas)* typically nest annually between February and August. In addition to marine turtles, it is also home to endangered West Indian Manatees *(Trichechus manatus)*, tapirs *(Tapirus terrestris),* deer *(Mazama americana),* jaguars *(Panthera onca),* and several species of primates. The ecological surveys conducted in the Shell Beach area identified 28 reptilian, 13 amphibian, 27 mammalian, and 27 macro-invertebrate species (Kalamandeen and DaSilva, 2005). There is also a rich diversity of birds with over 200 recorded species of coastal and migratory birds (Mendonca *et. al.*, 2006). As such, the area has been proposed as an Important Bird Area (IBA), a programme of the BirdLife International, which seeks to "identify, protect and manage a network of sites that are significant for long term viability of naturally-occurring bird populations" (BirdLife International, 2014).

GFA report (GFA Consulting Group, 2009) identifies over 50 plant species in different ecosystems within SBPA. Thirty Three plant species were identified by Kalamandeen and DaSilva (2005) and Prince, *et. al.*, (2004). Hollowell (2009) documented 118 species of plants (Table 12) in the Waini Peninsula of the Shell Beach area. Additionally, he compiled a preliminary list of 1,449 species of vascular plants for the Northwest District (Hollowell, 2009). Species lists are included in **Appendix 10**.

There are concerns over erosion of the beach at the SBPA and the potential impact it might have on turtle nesting. Natural forces such as wind, waves, and currents are constantly changing the coastline. Satellite data from 2007 show that in certain sections of the coastline there has been regression of up to 1,100 m from 1987. There is also sea water intrusion into the middle section of the SBPA (GFA Consulting Group, 2009). The report assumes that sea water intrusion has been intensified due to coastal erosion. Observations at Almond Beach by GMTCS and community members over the past few years and the Shell Beach Management Planning Team (SBMPT) in August 2014 indicate that the beach is eroding at a fast pace. Coastal beach erosion is also attributed to climate change and resulting sea level rise. However, it should be noted that

accretion and deccretion of beaches is also a natural process. **Appendix 10** provides a more detailed description of the physical and biological features of SBPA.

2.3 Description of Communities, Livelihoods, and Economic Activity

There are eight Amerindian titled communities and three Community Development Councils (CDC) adjacent to or within the Shell Beach Protected Area. Titled communities include Three Brother's, Warapoka, Santa Cruz (also sometimes referred to as Little Kanuballi), Kwebanna, Assakata, Santa Rosa, Waramuri, and Manawarin. CDCs include Almond Beach, Father's Beach, and Morawhanna. Santa Rosa is the largest Amerindian community in Guyana and has 11 satellite communities namely Cabora, Huridiah, Kamwatta, Santa Rosa and Islands (also sometimes referred to as Karie and Islands), Koko and Islands, Kumaka, Moracupha, Parakese Islands, Karaburi, Rincon, and Wallaba. Waramuri also has a satellite community, Haimaracabra. Additionally, Unity Grant, comprising of four families, located on the Waini River near Warapoka, is neither a titled community nor a CDC; it is also not tied to any titled community or CDC. All of these villages, including satellite communities, are considered as stakeholders due to their proximity and use of resources adjacent to or within the protected area. The total estimated population of the communities is 11,328 (**Appendix 11**).

Almond Beach, Father's Beach, and Unity Grant communities as well as some families of Kamwatta community are situated within the SBPA. None of the communities or settlement within the SBPA are titled.

Amerindian communities comprise a mix of the Arawak, Carib, and Warau tribes. The names reflect the three language families. Historically, of the three language families, the Arawak is considered to be the most extensive and predominant. They were mostly agriculturalists with matrilineal societies and complex social structures. The Carib were considered to be a powerful warrior tribe by early European colonizers who fished, farmed and hunted game. The numbers of Caribs were greatly reduced by the time the British occupied Guyana and some had settled into farming. The Warau were boat builders. The Waraus had their own language but also spoke both Carib and Arawak (MRG, 2005).

Currently and historically, these communities have utilized natural resources found in the area. Fishing, crabbing, hunting, manicole palm and timber harvesting are common among communities. Communities also engage in farming, mostly for subsistence to meet household needs but farm products may also be sold to others within the community. Lack of easy access to markets prevent farmers from engaging in commercial scale farming activities. Some commercial farming, such as the coconut plantations on Almond Beach, is also carried out. Manicole palm harvesting takes place along the Waini River, on AMCAR concessions, some of which currently fall within the SBPA. Manicole palm is also harvested by communities outside of

the AMCAR concessions. These activities provide livelihood opportunities for local communities. Research needs to be conducted to determine the intensity of commercial operations and whether they are in keeping with objectives of the Protected Area. It is noted that Amerindian and non-Amerindian fisherpersons collect turtle eggs from the coast to be sold commercially, but this practice is said to have declined considerably as a result of education and awareness activities conducted by GMTCS. **Appendix 11** provides a list of communities and livelihood activities as noted in the 2011 delineation report (GMTCS, 2011) and updated during the management planning process in 2014 (SBMPT, 2014). Previously created community resource map was also updated with community input and spatially referenced (**Appendix 9**).

In order to meet the vision, goals, and objectives of the protected area, the PAC, through its management programmes, will support training and various community development and livelihood activities, including resource uses by communities at levels that are considered to be sustainable.

Tourism is limited in the region due to accessibility and lack of tourism infrastructure and packages. Santa Rosa has numerous facilities that could support tourism. Some stakeholder communities have facilities, such as multipurpose buildings funded through the past GPAS Phase 1 grants, that could potentially support tourist accommodations, however many of them require maintenance and are currently under-utilized. Limited tourism activities takes place at Almond Beach between March and July each year during the turtle nesting season.

Fisherpersons from Charity and Pomeroon, which are communities not in the immediate vicinity of the SBPA, also utilize the area between Corkwood Creek and the mouth of the Moruca River for fishing. Fishing and transportation vessels also utilize the Waini River and its mouth.

There is currently no gold or diamond mining concessions within the boundaries of SBPA, but residents of Mabaruma and Morawhanna report cases of water pollution by small scale mining activities upriver of Aruka River, which affect water quality for human use and biodiversity. There is also a potential establishment of a wharf for the Reunion Manganese Company on the Waini River.

According to the Petroleum Division of the Guyana Geology and Mines Commission (GGMC) (Lynch, 2014), licenses have been issued to ESSO, Anadarko, CGX, and REPSOL. The licenses are approximately 160 kms (100 miles), 210 kms (130 miles), 97 kms (60 miles), and 160 kms (100 miles), respectively, offshore north to northeast from the SBPA. It is noted that petroleum exploration activities on the beaches of Guyana have been discouraged and any effects of offshore exploration actions are considered to be minimal and transient and the operational periods can be regulated. The major exploration activities that have impacts are seismic and drilling. Some licencees are completing preliminary exploration exercises and are expected to start major exploration work within the next few years (Lynch, 2014).

Appendix 11 provides a more detailed description of the socio, cultural, and economic aspects of communities surrounding the SBPA.

3 SBPA Management Framework

3.1 Vision and Goals

The *vision*, over the next 20 years, is that

> "SBPA is an area in which all stakeholders protect and use natural resources
> wisely for the benefit of present and future generations."

The above adopted vision statement is the product of stakeholder discussions and ideas on what is considered to be key elements for the SBPA. Stakeholders envisioned that SBPA "protects cultural and biological diversity for future generations and strengthen climate resilience by working with local and international communities while sustainably managing the natural resources that allows for economic wellbeing and opportunities for local communities".

The *core values* that guide the management of protected areas generally and SBPA will be defined in the strategic plan for the Protected Areas Commission.

This management plan has been prepared for a period of five years beginning in 2015 and ending in 2019. The plan will help drive strategic goals and management programming towards achieving the vision for the SBPA.

The overarching *goals* for Shell Beach Protected Area are to:

1.   Protect and conserve biodiversity, including the largest contiguous remaining mangrove and coastal swamp forest with marine turtle nesting beaches in Guyana;
2.   Sustain and maintain the rich cultural heritage of SBPA associated Amerindian communities; and
3.   Promote sustainable livelihoods opportunities within local communities.

3.2 Management Targets

Management targets are features of an area that management uses to focus the selection of management strategies and actions. Targets can be comprised of conservation targets and thematic targets. Conservation targets are the biological entities or natural processes of the PA that can be species (or groups of species), habitats/ecosystems, or ecological processes. They are a small subset that represents the full suite of biodiversity or natural processes management intends to conserve or manage for the achievement of the management goals. It is assumed that

the management of conservation targets will ensure the conservation of all native biodiversity and natural processes within the protected area.

Thematic targets on the other hand, are non-biological topics (themes) also used to identify and select management strategies. Several thematic targets that reflect the interest of stakeholders were identified to help focus and develop the management strategies for the protected area.

Table 2: Conservation and Thematic Targets

Targets	Themes
Conservation Targets	1. Game and threatened species
	2. Marine turtles
	3. Mangrove forests
	4. Beach
Thematic Targets	1. Sustainable use of natural resources
	2. Management relevant research and monitoring
	3. Law enforcement
	4. Education and awareness about SBPA
	5. Conservation of Amerindian culture and knowledge
	6. Sustainable livelihoods
	7. Community benefits sharing
	8. Capacity building

3.3 Management Programmes

The proposed interventions to pursue these strategies, over the next five years, are grouped into management programmes. These programmes are further elaborated using a logical framework (**Appendix 1**). The logical framework is a widely used analytical and management tool for project planning, designing, implementing, monitoring, and evaluating (Jensen, 2012; SIDA, 2004). Each programme consists of a goal and one or more objectives that provide the general direction of the programme as well as the outputs that will support the accomplishment of the programme goal. The programmes are consistent with and complement other conservation related national policies and plans **(Appendix 12).**

The management programmes for this management plan are:

1. Operations and Adaptive Management;
2. Land Use and Sustainable Natural Resource Management;
3. Livelihood Development and Benefit Sharing;
4. Education, Awareness, and Outreach; and
5. Capacity Building.

3.3.1 Operation and Adaptive Management

> *Goal:* **Ensure the effective and adaptive management of the SBPA, its biodiversity and its resources**

Establishing appropriate administrative and adaptive management systems along with physical infrastructure is crucial to the effective management of a PA. These systems include establishing appropriate administrative structures and human resource (**Table 8; Appendix 5 and 6**), conducting management relevant research **(Section 5)**, implementing adaptive management systems (**Appendix 4**), conserving and monitoring species at risk, implementing effective law enforcement systems, and ensuring better communications and information sharing within PAC and among stakeholders. The logical framework that outlines the management programmes and outputs are provided in **Appendix 1**; the monitoring and evaluation (M&E) framework, which helps to assess the operational and programme performance and provide the basis for adaptive management, is provided in **Appendix 2**; and the 5-Yr Operational Plan, which outlines broadly the major activities and timeline needed to accomplish the output tasks, is provided in **Appendix 3**.

The objectives of this management programme includes:

1. To manage SBPA using appropriate and effective management structures and systems;
2. To promote management relevant research and its use for evidence-based decision making;
3. To conserve and monitor species at risk;
4. To establish an effective system for law enforcement and monitoring of illegal activities; and
5. To establish a system for effective communication and information exchange between PAC and stakeholders.

The outputs or deliverables in order to accomplish the objectives of this management programme include the following.

Table 3: Outputs for Operations and Adaptive Management

Item	Outputs/Deliverables
	Management Structures and Systems
1.	Appropriate financial and administrative systems for managing PA in place
2.	Site level human resource (HR) needs met
3.	PA management infrastructure and equipment needs met
4.	Monitoring, evaluation and feedback systems developed and implemented
	Research

Item	Outputs/Deliverables
5.	Research priorities identified and actively promoted nationally and internationally
6.	Research database and system established to improve feedback to management and access to information for stakeholders
7.	Partnerships with local and international research, conservation, and educational institutions formalized
8.	Feasibility and model for international recognition of SBPA by an international body understood and appropriate action taken (e.g UNESCO designation as a World Heritage Site, Biosphere reserve)
	Conserve and Monitor Species at Risk
9.	Plans for conservation and monitoring of species at risk developed and implemented
	Law Enforcement and Monitoring
10.	Law enforcement and monitoring plan developed and implemented
11.	Effective implementation of regulations in partnership with other law enforcement agencies and institutions
12.	Law enforcement and monitoring feedback system established
	Communications
13.	Internal communications protocol developed and accepted for use among PAC management, and SBPA staff at headquarters and in the field staff
14.	External communications protocol developed and accepted for use among PAC, agencies, and communities in order to facilitate efficiency, collaboration, and information exchange
15.	PAC and agencies implementing communication protocol

3.3.2 Land Use and Sustainable Natural Resource Management

Goal: **Sustainably manage land and natural resource use within the SBPA and in adjacent lands**

One of the major concerns for community stakeholders is the need for assurances that their traditional resource use activities will not be hindered as a result of the Protected Area and the management plan. SBPA is considered a Managed Resource Protected Area. Therefore, while keeping conservation values in mind, sustainable resource uses will be permitted in identified areas as per community consultations, resource mapping exercises, and research. As part of the research leading to zoning and permitted activities, greater clarity will need to be provided in relation to what is sustainable. Therefore, understanding what constitutes sustainable use, both in the context of subsistence use as well as approved commercial activity, will also need to be determined. The Protected Areas Act, Part VI, Section 73, permits the Commissioner to enter into

agreements with communities as necessary to support sustainable resource use by communities within the SBPA.

The objective for this management programme includes:

1. To ensure stakeholders use and manage land and resources in a manner that is compatible with the goals of the SBPA.

The outputs or deliverables in order to accomplish the objectives of this management programme include the following.

Table 4: Outputs for Land Use and Sustainable Natural Resource Management

Item	Outputs/Deliverables
	Land and Resource Use
1.	Community use of land and resources understood
2.	Resource use, conservation, and zoning plan developed
3.	Strategy for sustainable community use of the SBPA and its resources developed through a participatory process and implemented
3.	Community land and resource use plans (CLRUP) developed and effectively implemented by communities with support of PAC

3.3.3 Improving Benefit Sharing and Livelihood Development

Goal: **Improve benefits to communities through livelihood development and equitable benefit sharing mechanisms**

An important need for communities is the development of alternate livelihoods and building of capacity so that they may forego any of the activities that may be contrary to the conservation goals of the SBPA. Providing employment opportunities, supporting alternate livelihood options, identifying and developing tourism potential, and providing training to improve planning and business capacity were identified as some of the necessary measures. Several livelihood and infrastructure projects were initiated benefiting several villages under the previous GPAS Phase 1 grants (Pitamber and Spitzer, 2013). In addition, there are several livelihood initiatives identified by communities for funding under the Amerindian Development Fund (ADF), which may also be used as a basis for supporting livelihood activities by this management plan. Livelihood project options and funding criteria will be discussed with communities prior to requests for proposals. In promoting livelihood projects and activities, PAC will work to ensure an open and inclusive process to maximize sharing of benefits.

The objectives for this management programme include:

1. To increase conservation compatible sustainable livelihood and income generating opportunities for SBPA adjacent communities; and
2. To promote equitable sharing of benefits from SBPA among all communities adjacent to SBPA and their members.

The outputs or deliverables in order to accomplish the objectives of this management programme include the following.

Table 5: Outputs for Benefit Sharing and Livelihood Development

Item	Outputs/Deliverables
	Sustainable Livelihoods and Income Generation
1.	Local communities engaged in temporary or permanent employment with SBPA
2.	Relevant livelihood and income generating opportunities are identified and initiatives supported
2.	Livelihood projects feedback systems developed and lessons learnt disseminated
	Benefit Sharing
3.	Protocol for respecting and addressing benefit sharing as a result of Amerindian intellectual property rights (IPR) and traditional knowledge sharing developed
4.	Opportunities for inclusion of all adjacent villages in SBPA related opportunities and initiatives promoted
5.	Opportunities for inclusion of community members as beneficiaries in SBPA related opportunities and initiatives promoted

3.3.4 Education, Awareness, and Outreach

Goal: **Promote and raise awareness so as to ensure a shared vision and understanding of the value of SBPA and its resources by key stakeholders for its long-term protection and sustainable development**

The need for education, awareness, and outreach was expressed during the many consultations with communities and other stakeholders. It has been noted by communities that there is a lack of awareness of Guyana's National Protected Areas System, SBPA, the Protected Areas Act and other regulations. In addition to addressing concerns raised by communities, it also necessary to ensure stakeholders are aware of their responsibility with regard to safeguarding the SBPA and using natural resources in a sustainable manner within and outside of the SBPA.

Education, awareness, and outreach programmes will target local, regional, national, and international audiences, both individuals and groups, adults and youth, with interests and

influence in the region and whose actions and activities could compromise or benefit SBPA's vision, goals, and objectives.

The objectives for this management programme include:

1. To raise local and regional awareness of SBPA, its values and benefits in order to increase support for its conservation and sustainable development goals; and
2. To increase national and international awareness and support for conserving SBPA's biodiversity and ecosystems.

The outputs or deliverables in order to accomplish the objectives of this management programme include the following.

Table 6: Outputs for Education, Awareness, and Outreach

Item	Outputs/Deliverables
	Local and Regional Awareness
1.	Education, awareness, and outreach for adults implemented
2.	Education, awareness and outreach for natural resource sector and law enforcement agencies implemented
4.	Education, awareness, and outreach for local youth implemented
	National and International Awareness and Support
4.	SBPA promoted using various media (e.g. Facebook, website, signage, radio, TV, etc.)
5.	Public Relations (PR) materials developed targeting donor and tourism audiences
6.	SBPA lessons learned and management outputs shared

3.3.5 Capacity Building

Goal: **Increase capacity of staff and communities to achieve SBPA vision and goals**

Capacity building is necessary to improve management of the SBPA. Not all staff come with required knowledge and training. Trained staff will be able to better understand and perform their roles and responsibilities thereby contributing to the vision, goals, and objectives of the SBPA. Therefore, understanding individual capacities and skills on a regular basis and providing targeted training will help build confidence and skills, and support individual professional and career goals.

Similarly, building capacity of communities to more effectively participate in SBPA related activities will ensure a more inclusive approach to planning and implementing management programmes. Increasing capacities to manage and sustain livelihood activities and make wise use

of land and natural resources will not only support self-reliance and sustainability, it will also help to more effectively meet SBPA vision, goals, and objectives.

The objectives of this management programme are:

1. To increase staff capacity to support SBPA management; and
2. To increase community capacity to effectively participate in and benefit from SBPA and its goals.

The outputs or deliverables in order to accomplish the objectives of this management programme include the following.

Table 7: Outputs for Capacity Building

Item	Outputs/Deliverables
	Staff Capacity
1.	Staff training and capacity needs assessed and plan developed
2.	Staff training and capacity needs plan implemented
	Community Capacity
3.	Build capacity for sustainable livelihood and income generation plan development, implementation, and management
4.	Build capacity for community participation in SBPA related management activities
5.	Build capacity of communities in sustainable land and resource use

4 Management Plan Implementation

4.1 Guiding Principles

The following principles guide the implementation of this management plan and are fundamental to management of SBPA:

- Management targets take precedence in all actions;
- Conservation and resource use decisions will be based on science;
- Partnerships and collaboration with stakeholders, particularly associated communities, are a key component of the management plan implementation;
- Management will consider biodiversity conservation as well as impacts, benefits, and relationships with communities in all protected area related decisions;
- Management systems will be responsive and adaptive to changing circumstances and knowledge;
- SBPA annual operations plans should be developed through close consultation with the management plan.

4.2 Governance and Management Structure

The governance system for the SBPA will comprise the PAC, which is governed by and is accountable to a Board of Directors. However, governance will be participatory where local communities, central and local governments, private sector, and non-governmental organizations will be engaged and consulted in matters that affect the ecological, social, cultural, and economic well-being of the area and rights of stakeholders. As noted in Figure 4, there will also be a mechanism for community stakeholders to engage and communicate with SBPA staff and the Commissioner to provide input or address any issues.

Figure 3: Organizational Structure

Administrative Staff
Wardens/Rangers
Site Level Manager
SBPA Officer

Mechanism for
Community /Stakeholder
Engagement and Input

Protected Areas
Commissioner

PAC Board of
Directors

Ministry of Natural
Resource and the
Environment
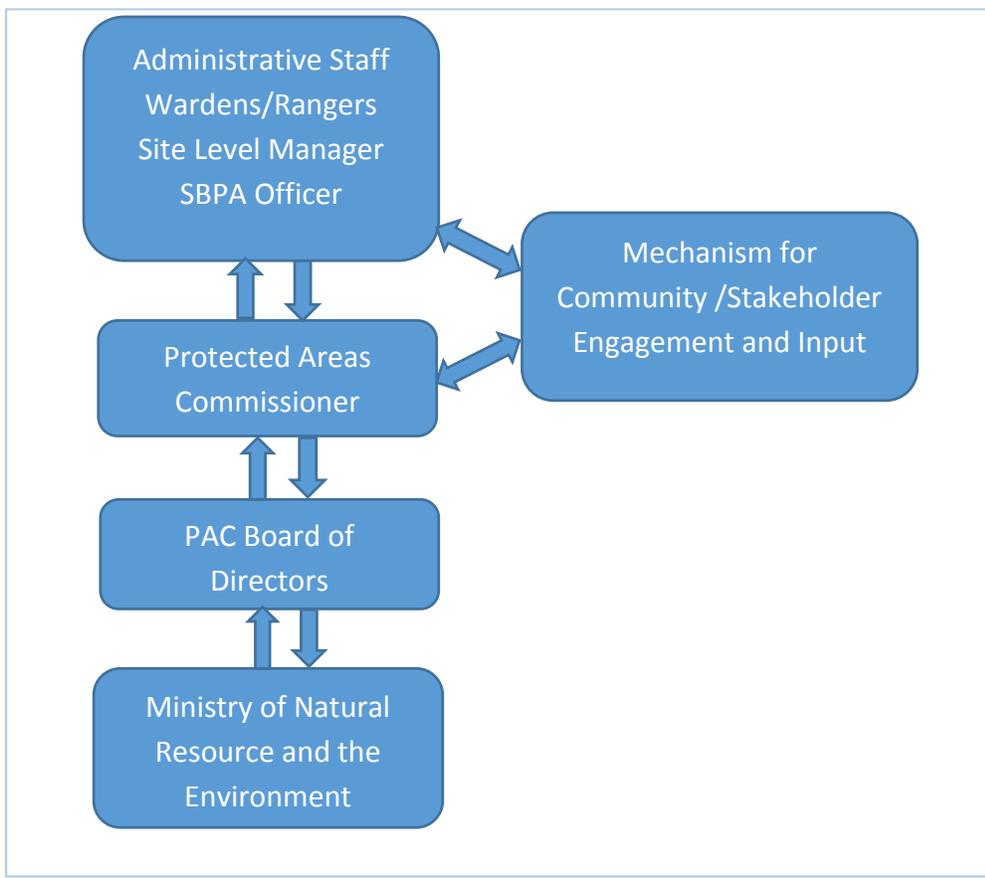
4.2.1 Staffing

It is expected that there will be one SBPA officer, one site level manager, six wardens/rangers, and two support staff. A SBPA officer, who will be located at the PAC headquarters in Georgetown, will be responsible for the overall planning and implementing the management

plan. The PAC will recruit a site level manager to lead the implementation of the management plan and manage the day-to-day operations at the site level. The PAC and SBPA officer will oversee the work of the site level manager. Wardens and rangers will be recruited to patrol and monitor the SBPA. Two support staff will provide administrative support for the SBPA and management plan implementation.

Specialist persons or contractors with expertise in ecology, biology, sociology, anthropology, and communication, education, and outreach, will be hired, contracted, or engaged through partnerships with universities, research institutions, and consultancies as deemed necessary.

4.3 Operational Plan

The 5-Year Operational Plan (**Appendix 3**) outlines the management programmes based on the logical framework and major actions that need to be undertaken during implementation. Every year, a one-year operational plan and budget will prepared for the following year taking into consideration the management plan and management priorities, 5-Year Operational Plan, Logic Framework, and monitoring and evaluation results. The annual operational plan will provides the basis for budget and funding requests.

4.4 Monitoring, Evaluation and Updating

As noted in the Operations and Adaptive Management Programme, M&E is critical for proper management of protected areas and other development projects (UNDP, 2009; Hockings, et al., 2006). Figure 5, shows how M&E contributes to management planning, implementation, and improvement.

4.5 Sustainability

The long-term sustainability of the management outcomes within the SBPA is dependent on several factors and includes institutional support, adequate funding, capacity, infrastructure, partnerships, education, and awareness. The PAC will work closely with the Ministry of Natural Resources and the Environment, donors, and other stakeholders to ensure the long-term sustainability of PACs interventions at SBPA.

Figure 4: Monitoring and Evaluation, and Adaptive Management Cycle
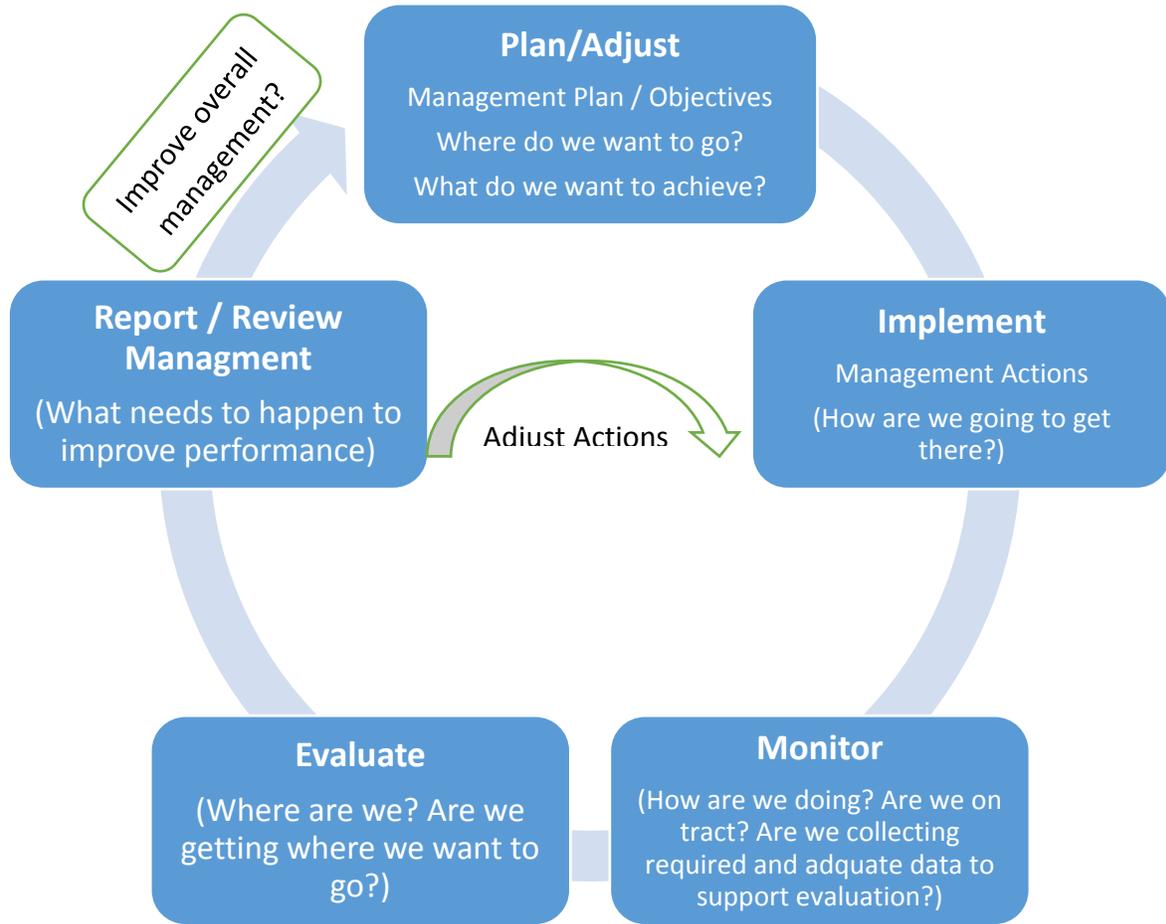
Modified from Stankey et al., (2005), Nyberg (1999), Parks and Wildlife Service Tasmania (2000).

4.6 Infrastructure needs

As a new protected area, there is currently no PAC managed infrastructure available within or at the periphery of the SBPA, except for a research and accommodation facility, managed by the GMTCS at Almond Beach. The following have been identified as the infrastructure needs to support the management of the SBPA in the first five years.

Table 8: Infrastructure Needs

Items	Main Admin Office (Santa Rosa)	Warden/ Ranger Station 2 (Almond Beach)	Warden/ Ranger Station 3	Warden/ Ranger Station 4	To be decided
Building and Infrastructure					

Items	Main Admin Office (Santa Rosa)	Warden/ Ranger Station 2 (Almond Beach)	Warden/ Ranger Station 3	Warden/ Ranger Station 4	To be decided
Administrative Office/ Site Manager housing	1				
Warden/ranger station[1]		1	1	1	
SBPA related signage					40
Trails and Bridges					6 kms
Transportation					
Vehicle – 4x4 pickup	2				
ATVs 4x4 (650cc)	1	1	1	1	
Boat and Engine (200hp)[2]	1	1			
Boat and Engine (75hp)[2]			1	1	
Office Equipment					
Computer	3	1	1	1	
Software	3	1	1	1	
Database software					1
UPS for computer	2	1	1	1	
Printer/Copier/Scanner (High capacity)	1				
Printer/Copier/Scanner (Low capacity)		1	1	1	
Networking equipment	1	1			
Desk	4	2	1	1	
Chair	4	2	2	2	
Other office furniture[3]	1	1	1	1	
First Aid Kit	1	1	1	1	
Communications					
Cell Phone	2	1	1	1	
Smartphones with monitoring app	1	1	1	1	
Internet (Satellite)	1	1			
Radio (complete with antenna) with mobile radio	1	1	1	1	
Mobile Radios					4
Satellite Phone	1	1	1	1	
Field Equipment					
GPS Receiver					6
Field laptop					2
Binocular					10

Items	Main Admin Office (Santa Rosa)	Warden/ Ranger Station 2 (Almond Beach)	Warden/ Ranger Station 3	Warden/ Ranger Station 4	To be decided
Ranger kit[4]					30
Handheld radio					8
Digital camera	1	1	1	1	
Power Generation					
Photovoltaic	1	1	1	1	
Generator	1	1	1	1	

[1] Possible locations for warden/ranger stations include Kumaka (Santa Rosa), Almond Beach, Luri Creek, and Father's Beach.

[2] Boats for patrolling, monitoring, research, and transportation of supplies and personnel

[3] Other office furniture such as cupboards, filing cabinets, etc)

[4] Warden/ranger kits include first aid kit, flashlight, emergency signal, etc.

4.7 Budget

This section outlines the capital and operational costs needed for implementation.

4.7.1 Capital Costs

Capital costs include costs for necessary infrastructure. It is proposed that the administrative office be located in Santa Rosa, which is a large community with easy access to communications, law enforcement, and other amenities. Three other warden/ranger stations are recommended – one located in Almond Beach, one in the vicinity of Three Brothers (Luri creek), and another in Father's Beach. From the four locations, all of the SBPA perimeter can be covered by water. Access to the interior of SBPA is limited as trails and roads do not exist. It may also be necessary to provide for staff housing infrastructure at Santa Rosa. Administrative office, warden stations, and housing will require furniture and equipment. In addition, equipment will be required for field work, transportation, communications, and power generation. Capital investments are spread over several years. Table 9 provides a summary of the capital costs. A detailed breakdown of capital costs is provided in **Appendix 4**.

Table 9: Estimated Capital Costs

	Amount (GY$)					
Item	2015	2016	2017	2018	2019	Total (GY$)
Infrastructure	66,125,000	25,750,000	27,375,000	2,375,000	2,375,000	**124,000,000**

	Amount (GY$)					
Item	**2015**	**2016**	**2017**	**2018**	**2019**	**Total (GY$)**
Transportation	5,450,000	12,450,000	3,800,000	3,800,000	7,000,000	**32,500,000**
Office Equipment and Furnishings	1,660,000	1,540,000	770,000	770,000	100,000	**4,840,000**
Communications Equipment	3,170,000	3,705,000	2,405,000	355,000	--	**9,635,000**
Field Equipment	1,720,000	1,580,000	1,300,000	840,000	900,000	**6,340,000**
Power Generation	560,000	5,280,000	2,780,000	2,500,000	--	**11,120,000**
Total	**78,685,000**	**50,305,000**	**38,430,000**	**10,640,000**	**10,375,000**	**188,435,000**

4.7.2 Operational Costs

Operational costs are recurring costs required for the administration of the management plan and to facilitate the day-to-day operation of SBPA and its facilities. Operating costs include fixed costs such as human resources and rent, and variable costs such as office expenses, travel, contracting, utilities, and maintenance. It is expected that office and housing space will be initially rented while permanent infrastructure is being built. Table 10 provides a summary of operational costs. A detailed breakdown of operational costs is provided in **Appendix 5**.

Table 10: Estimated Operational Costs

	Amount (GY$)					
Item	**2015**	**2016**	**2017**	**2018**	**2019**	**Total (GY$)**
Human Resources	7,830,000	11,340,000	14,256,000	14,256,000	14,256,000	**61,938,000**
Rent	1,440,000	8,40,000	--	--	--	**2,280,000**
Services	870,000	2,132,000	3,476,000	4,324,000	4,324,000	**15,126,000**
Office and Meetings	550,000	1,050,000	1,100,000	1,100,000	1,100,000	**4,900,000**
Travel	1,888,000	3,558,000	4,248,000	4,848,000	4,848,000	**19,390,000**
Contractual	--	--	--	--	--	**--**
Infrastructure and Equipment	9,036,833	15,696,333	20,244,333	21,878,000	23,835,500	**90,691,000**

	Amount (GY$)					
Item	**2015**	**2016**	**2017**	**2018**	**2019**	**Total (GY$)**
Maintenance and Depreciation						
Total	21,614,833	34,616,333	43,324,333	46,368,500	48,326,000	194,325,000

5   Research Needs and Priorities

Table 11 outlines the research needs and priority. Priority is based on urgency of research to support management, resource use, conservation, livelihood decisions, and programmes. The following suggests the research priority ranking:

- Urgent: Research commenced during Year 1 or Year 2
- High: Research to be commenced during Year 2 or Year 3
- Medium: Research to be commenced during Year 3 or Year 4
- Low: Research to be commenced within the 5 year period

Table 11: Research Needs and Priority

Needs	**Topic**	**Priority**
Biodiversity and Ecosystem		
Marine turtles	Data design and monitoring of marine turtles as per international standards	Urgent
	Data analysis and reporting on marine turtle population health, mortality, and poaching	Urgent
Beach dynamics	Study on beach erosion and dynamics	High
	Impact of beach erosion and dynamics on marine turtles	High
Key species inventory	Baseline inventory of key species	High
Ecosystems inventory	Baseline inventory of ecosystems	High
Fisheries	Marine fisheries and effects on turtles Effectiveness of no netting zone on turtle by-catch	High
Wildlife trade	Impact of wildlife trapping and trade on wildlife diversity, numbers, and conservation goals of the SBPA	High
Fires	Baseline study on impact of past fires on ecosystems and potential impact of future fires on SBPA	Medium
Rivers	Baseline study on the health of rivers	Low

Riparian zone	Baseline study on health of riparian zones	Low
Mangrove forest	Baseline study on health of mangrove forests	Low
Environmental		
Mining	Research on the impact and risks of mining activities and related pollution on health of aquatic systems, aquatic species, and on SBPA	High
Water quality	Baseine study on water quality of rivers flowing on the borders of the SBPA	Medium
Litter and solid waste	Research on the impacts of litter and other solid waste on the waters and species habitat adjacent to SBPA	Medium
Forestry	Research on the impact and risks of forestry operations and related pollution on health of aquatic systems, aquatic species, and on SBPA	Medium
Climate change	Risk of climate change on shorelines erosion, flooding, salination of wetlands, ecosystems of the SBPA, and species important for livelihoods	Medium
Hydrometerological	Gather past hydrometerological data and set up system to monitor future data	Medium
Oil exploration	Research on the impact and risks of oil exploration activities, pollution, and potential spills on SBPA shoreline, turtles, and other key marine and fresh water species	Medium
Tidal	Set up system to collect and understand tidal cycles	Low
Resource Use		
Amerindian resource use	Identify, survey, and conduct research on impact of traditional resource uses within and at the periphery of SBPA (e.g. manicole and morocut harvesting, illegal logging, turtle/wildlife trappings, and harvesting of shells)	Urgent
Outsider resource use	Identify, survey, and conduct research on impact of outsider resource uses within and at the periphery of SBPA (e.g. manicole and morocut harvesting, illegal logging, turtle/wildlife trappings, and harvesting of shells)	Urgent
Commercial resource use	Conduct research on commercial use of natural resources by external entities around SBPA in collaboration with other natural resource sector agencies	Urgent
Sustainable resource use	Determine sustainable levels of use and develop guidelines to enable management and use of resources wisely	High

CMRV lessons	Document lessons learned from other pilot studies and the applicability of a Community Monitoring, Reporting and Verification (CMRV) system for protecting biodiversity and resource use in stakeholder communities and the SBPA	High
Cultural Heritage		
Cultural heritage inventory	Conduct community inventory and mapping exercise to identify cultural aspects and places of importance and protection for Amerindian communities within and in areas surrounding the SBPA	High
Documenting traditional knowledge	Document traditional knowledge of Amerindian communities	Medium
Income Generation and Livelihood		
Tourism	Tourism potential and infrastructure needs	High
Livelihood activities	Opportunities for alternate livelihoods	High
Livelihood benefits	Assessment of benefits and income currently derived from SBPA (for comparison with post management plan implementation)	High
Income generation potential for PAC	Opportunities for income generation to support PAC and SBPA management	High

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7 Volume 2 Contents: Appendices

Please refer to Volume 2 for the Appendices

Appendix 1 – Logical Framework

Appendix 2 – Monitoring and Evaluation Framework

Appendix 3 – 5-Year Operational Plan

Appendix 4 – Detailed Estimation of Capital Costs

Appendix 5 – Detailed Estimation of Operations (Recurring) Costs

Appendix 6 – Agenda which Guided the Management Planning Process

Appendix 7 –Participants in the Development of the Management Plan

Appendix 8 – Photographs (Features, Pressures, Resource uses, Meetings)

Appendix 9 – Thematic maps

Appendix 10 – Physiographic and Biological Features

Appendix 11 – Socio-economic Context

Appendix 12 – Legal, Institutional Context and Roles of Organizations/Agencies