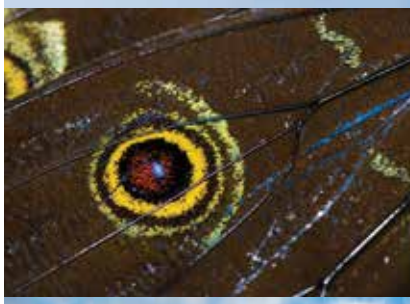
Kanuku Mountains Protected Area

Management Plan

Protected Areas Commission



KMPA Management Plan

2015-2019

Kanuku Mountains Protected Area - Management Plan 2015-2019

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EXECUTIVE SUMMARY

The Kanuku Mountains are located in the Rupununi region of southwestern Guyana, and were identified nationally as one of five priority sites for protection in 1999. These priority sites were selected to safeguard Guyana's heritage and natural patrimony. In 2011, part of Kanuku Mountains was declared as a National Protected Area. This followed the passage of the Protected Areas Act 2011, and extensive consultations with stakeholders, including the 21 communities adjacent to the area. The total size of the Kanuku Mountains Protected Area (KMPA) is 611,000 ha which represents 2.8% of Guyana's land surface.

The KMPA and its resources have long been used by the areas's indigenous people, whose traditional knowledge continues to be very important to the conservation of the area. There are however, several growing pressures on the biodiversity and ecology of the mountains. In keeping with the original intention for selecting the Kanuku Mountains as a site to safeguard Guyana's heritage and patrimony, this management plan has been developed with the following twenty-year vision in mind: "The KMPA demonstrates sustainable resource utilisation while ensuring the conservation of biodiversity and ecosystem services. It promotes collaboration with stakeholders for management and decision making, generates benefits which improve human well-being, and serves as a model to the world".

The realisation of the vision, goal and objectives of any protected area is based on the selection of the most appropriate management strategies and actions. Here, we use a logical framework approach to develop the management strategies. The KMPA is to be managed in accordance with the IUCN Protected Areas category VI, as a managed resource protected area. This means that the management aim is to meet local resource use needs from the PA while also ensuring ecosystem stability. In keeping with the PA Act, this plan has gone through a community and public review process and has received approval from the PAC Board.

The management structure of the KMPA comprises the Protected Areas Commission, which is governed by a Board, and a Site Level Committee. The Site Level Committee will function in an advisory capacity to support site-level activities, promote the interests of stakeholders and advise the Protected Areas Commission on the effective management of the KMPA. It is proposed that management plan implementation costs be covered through funding from Cooperative Government of Guyana subventions, funding from donor agencies, the Guyana Protected Areas Trust and funds generated by the KMPA itself.

The main purpose of this management plan is to provide a framework and a tool for the effective management of the KMPA by the PAC and other stakeholders. This plan is divided into two sections. The first section is the main part of the plan, where the area, its management framework, and the plan's implementation are summarised. This is intended to provide a brief overview of the management plan. The second part comprises appendices and contains in-depth detail on KMPA and its management strategies. A glossary, which helps to explain some of the terms used in this document, can be found in Appendix 1.

TABLE OF CONTENTS

ACRONYMS

CBD	Convention on Biological Diversity
CI-G	Conservation International-Guyana
CITES	Convention on International Trade in Endangered Species Flora &Fauna
CM	Community Monitoring
KCOCA	Kanashen Community Owned Conservation Area
CTPM	Conservation Target and Pressure Monitoring
EPA	Environmental Protection Agency
GFC	Guyana Forestry Commission
GGMC	Guyana Geology and Mines Commission
GL&SC	Guyana Lands and Surveys Commission
GIS	Geographic Information System
GPAS	Guyana Protected Areas System
GPAT	Guyana Protected Areas Trust
CRoG	Cooperative Republic of Guyana
GT&T	Guyana Telephone and Telegraph Company
IUCN	International Union for Conservation of Nature
KAP	Knowledge, Attitude and Perception
KfW	German Development Bank
KMCRG	Kanuku Mountains Community Representative Group
KMPA	Kanuku Mountains Protected Area
KNP	Kaieteur National Park
MoIPA	Ministry of Indigenous Peoples Affairs
MoP	Ministry of the Presidency
METT	Management Effectiveness Tracking Tool
MOU	Memorandum of Understanding
NBAP	National Biodiversity Action Plan
NGO	Non-governmental Organisation
NPAS	National Protected Areas System
NTFP	Non-Timber Forest Products
PA	Protected Area
PAC	Protected Areas Commission
PAO	Protected Areas Officer
RBM	Ranger-Based Monitoring
RDC	Regional Democratic Council
REDD	Reducing Emissions from Deforestation and Degradation
SBPA	Shell Beach Protected Area
SLA	Site Level Authority
SOP	Standard Operating Procedure
UNCLOS	United Nations Convention on the Law of the Sea
UNCCD	United Nations Convention to Combat Desertification
UNESCO	United Nations Education, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change

1. MANAGEMENT PLAN INTRODUCTION

1.1 KMPA Background

The Kanuku Mountains Protected Area is located in the Rupununi region (Region Nine (Upper Takutu, Upper Essequibo), of southwestern Guyana, which is the largest of the 10 administrative regions of the country The protected area is 611,000 ha in area with a perimeter of approximately 590km. It includes significant portions of the western Kanuku Mountains and almost the entire eastern range (see Fig.1). The area around the Kanuku Mountains is populated mainly by the indigenous Macushi and Wapishana people living in 21 communities. These communities interact with and use the resources of the protected area to sustain their mainly subsistence lifestyle. There is also a mix of Guyana people from the coast and Brazilians living throughout the region. The protected area comprises 99% forest and 1% savannah and is an important area for biodiversity.

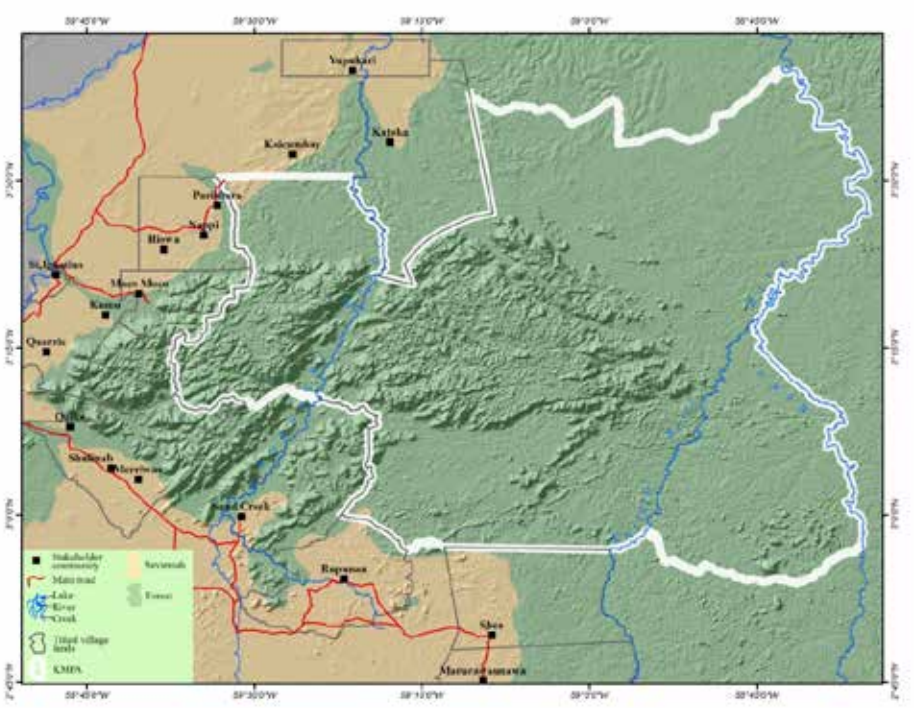

Fig. 1: Map of Kanuku Mountains Protected Area

The KMPA is managed in accordance with the IUCN category VI classification: A managed resource protected area. This means that the PA will be managed to provide natural products and services to meet local needs while also protecting natural ecosystems and maintaining ecosystem services. A unique element of this IUCN classification is that the sustainable use of natural resources is used as a means to achieve nature conservation, along with other more conventional methods such as resource protection. KMPA was assigned to category VI since it has a long history of local Amerindian communities carrying out sustainable small-scale livelihood activities with minimum impact on nature such as traditional fishing, gathering of timber and non-timber forest products, and subsistence hunting.

As a new protected area, and in keeping with the PA Act 2011, a management plan to enable the long-term effective management of the KMPA has been developed.

1.2 Plan purpose

The primary purpose of this management plan is to outline the principles and strategies for the development and management of the Kanuku Mountains Protected Area (KMPA) over the next five years. In addition, it will provide a framework for the implementation of these strategies, and for the participation and coordination of stakeholders, including local communities, government, PA partners and donors. The long-term sustainability of the management activities will be ensured through appropriate capacity building of staff and relevant stakeholders and sourcing long-term funds from the Protected Areas Trust Fund. This KMPA management plan is meant to be adaptive and progress will be monitored continuously throughout its implementation, and activities and strategies will be adapted where necessary. In addition, the plan will be thoroughly reviewed every five years and revised accordingly to guide KMPA's management for the subsequent five years.

1.3 Plan development

This plan was developed through a participatory process that used a series of national, regional and local workshops (for details see Appendix 2) to identify the vision, values and pressures of the KMPA, as well as management programmes, targets and strategies to manage and enhance the PA.

The first version of this plan was produced in 2009 with funding and technical support from KfW-Germany and Conservation International. This preliminary plan has been restructured and reviewed to incorporate a logical framework (log frame), a widely used conservation planning tool which brings together common areas according to park management responsibilities, and to ensure its adherence to the PA Act 2011. The process also involved reviewing the 2009 management programmes and strategies with community representatives in 2013 to ensure that that they are still relevant. In addition, the management programmes were restructured to align them across the NPAS and with the PAC's strategic plan (2015-2020).

This process resulted in the 10 original management programmes identified in 2009 being grouped together and streamlined under five common management areas to form the current programmes. Table 1 shows how the original programmes and management targets (see Appendix 3 for more detailed description of management targets) were incorporated into these new streamlined programme areas.

1.4 Guiding principles

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

- Management targets take precedence in all actions.
- Partnerships with stakeholders, particularly associated communities, are a key component of management plan implementation and KMPA decision making.
- 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.
- More detailed KMPA annual operational plans should be developed within the framework of the five-year management plan.

Table 1: Current management plan programmes and their relationship with programmes and management targets identified during the planning process in 2009.

No.	Programmes used in this plan	Programmes used in 2009 plan	Management Targets
1	Operations and adaptive management	1. Law enforcement and regulations 2. Infrastructure and communications 5. Research, surveys and monitoring 7. Co-management programme	Game and threatened species Riparian forest Research KMPA as a model PA
2	Sustainable land and natural resource use	8. Land tenure and land management 9. Land use planning/zoning	Sustainable use of natural resources Sustainable agriculture Sustainable commercial use of resources
3	Benefit sharing and livelihood development	6. Benefits and livelihoods	Income generation Benefit sharing
4	Education, awareness and outreach	3. Education and awareness 10. KMPA model	Awareness of KMPA Traditional knowledge and language
5	Capacity building	4. Capacity building	Capacity building for improved collaboration with communities for management and decision making

2. PROTECTED AREA INTRODUCTION

2.1 KMPA Establishment

The KMPA was first proposed as a potential Protected Area in 1999 as part of establishing a National Protected Areas System (NPAS) for Guyana - which was identified as a priority in the National Biodiversity Action Plan (NBAP). It was established to conserve its high biodiversity and its environmental services so that it can contribute to the social and economic security of present and future generations of local communities and people in the wider region.

As part of the implementation of the NBAP, the Cooperative Republic of Guyana appointed Conservation International-Guyana (CI-G) as the lead agency to facilitate the process for part of the Kanuku Mountains becoming a national protected area. In 2006, with funding support from the Government of Germany, through Kreditanstalt fur Wiederaufbau (KfW), the Guyana Protected Areas System (GPAS) Project was established, with activities focused on building and supporting a Protected Areas System in Guyana. As part of this project, in 2007, the delineation process (see Appendix 4 for description of process) for the area began and a participatory approach was used involving a core group of stakeholders that included representation from indigenous communities, state agencies responsible for resource use in and around the protected area (PA), local and national government bodies, as well as other regional and national groups and agencies not already included in the core group.

Fig 2: Map of existing Protected Areas in Guyana

Subsequently, the enactment of the Protected Areas Act in 2011 provided the legal mechanism for the recognition and declaration of the Kanuku Mountains Protected Area (KMPA) as one of Guyana's national protected areas (Fig.2). A more detailed description of the legal framework, as well as the international and national context of the PA, can be found in Appendices 5 and 6.

2.2 KMPA Description

KMPA comprises approximately 4% of Guyana's total forested area. The Rupunnuni, where the PA is located, is considered to be one of the most ecologically diverse areas in the country with healthy populations of many regionally and globally important species surviving in its forests, riverine and savannah areas. The region is home to 70% of all mammal species and 53% of all bird species known to occur in Guyana, as well as a large number of freshwater fish species. Approximately 1,577 plant species have been recorded in the region.

As such, the KMPA has a high biodiversity value, as well as being particularly important in terms of plant endemism. A number of flagship species, such as the harpy eagle, cock-of-the-rock, and jaguar, as well as other ecologically important species, including 11 of Guyana's 12 mammal species listed in the IUCN Red Data Book occur within the PA. Table 2, highlights the key values of the KMPA locally, nationally and internationally.

The Kanuku Mountains, experiences two wet seasons (May-August) and the Cashew rains (November- December) and two dry seasons, (September-October) and (January-April). The mountains are an important water tower, in that it straddles two significant watersheds; the Amazon and the Essequibo. In the west, the Takutu River drains into Brazil to first join the Rio Branco, before flowing into the Rio Negro and finally the Amazon River. The Rupunnuni, runs through the KMPA and the Kwitaro River, a tributary of the Rewa River, flows north along the eastern edge of the Kanuku Mountains, first join, and then flow into the Essequibo, Guyana's largest river.

Historically, pressures on Kanuku's biodiversity and other natural resources have been relatively minimal. However improved development and access in the region has led to a number of growing threats, including unsustainable wildlife hunting and trapping, over-fishing using gill nets and unregulated logging and mining. Further, improved infrastructure and a growing population, of both temporary and permanent residents will continue to put pressure on the resources of the Kanuku Mountains. A full detailed description of the ecological, physical and socio-economic attributes of the area and its pressures are provided in Appendix 7. Further the KMPA's Strengths, Weaknesses Opportunities and Threats (SWOT), identified in the 2014 review process can be found in Appendix 8.

Table 2: Key values of the Kanuku Mountains Protected Area to Guyana and the rest of the world

Natural values	**Socio-economic and cultural values**
• Pristine forest coverage • Endemic, endangered and high diversity of mammal species • Bird diversity and abundance • Fish diversity • River drainage into the Essequiibo • Aesthetic attraction	• Socio-economic *Wildlife harvesting* *Farming* *Non-timber forest products* *Research and education* *Alternative livelihoods (tourism)* • Cultural *Traditional practices, knowledge and belief* *Archaeological sites*

3. KMPA MANAGEMENT FRAMEWORK

3.1 KMPA 20-year Vision

"The KMPA demonstrates sustainable resource utilisation while ensuring the conservation of biodiversity and ecosystem services. It promotes collaboration with stakeholders for management and decision making, generates benefits which improve human well-being, and serves as a model to the world."

3.2 Management Programmes and Specific Goals

As stated previously (section 1.2) this plan follows a logical framework approach. The log frame outlines, for each of the five programmes, a long-term goal, objectives, general actions needed to meet the objectives, and milestones by which progress towards the goal can be measured. It also provides a monitoring and evaluation framework that will be used to check the effectiveness of management in the KMPA.

A breakdown of each management programme showing programme goals, their objectives and summarising their key activities, is found below. A detailed log frame for KMPA can be found in Appendix 9. However, for easier on-the-ground site level planning and management the log frame activities have been placed in a separate operational planning framework that can be found in Appendix 10.

Although it is recognised that each programme in itself will carry an education, awareness and outreach, as well as a capacity building component, these two areas are of great interest and importance to KMPA communities and are major management activities and as such, these have been regarded as individual management programmes. In doing so, it will help group required resources for each activity thus facilitating work planning and fundraising.

3.2.1 Operations and Adaptive Management

Goal: Ensuring the effective and adaptive management of KMPA, its biodiversity, ecological processes and its resources.

Objectives

- To establish appropriate management structures and systems for the effective management of KMPA.
- To promote management-relevant research and its use for evidence-based decision making.
- To establish an operational and effective law enforcement unit.
- To understand, promote and improve KMPA's role in climate change resilience, mitigation and adaptation.

Key Activities

Crucial to the effective management of a KMPA will be the establishment of necessary infrastructure, acquiring site-based staff and developing mechanisms to ensure the participation of stakeholders in the management of KMPA. Resource protection activities will include the development and implementation of a law enforcement programme as well as understanding the impacts of climate change on its resources. It is also under this programme that success towards achieving management plan goals and objectives will be measured and results used to adapt and change actions where necessary. A necessary adaptive management tool for this will be the development and implementation of ecological, threat, PA management effectiveness and ranger based monitoring and feedback systems. Lastly, through a greater understanding of management research priorities (see Appendix 11 for KMPA's list of research priorities) and KMPA's relationship with climate change, management will use best practices and science-based information to apply informed decision-making. Key climate change considerations underpinning all programmes in this management plan will also be identified and developed in this programme.

3.2.2 Land and Sustainable Natural Resource Use

> *Goal*: Ensuring the sustainable use of natural resources inside KMPA, while supporting the development and implementation of land use plans for local communities and KMPA

Objectives

- To develop a land use plan for inside KMPA in a participatory manner and in accordance with the Protected Areas Act 2011, and the Amerindian Act 2006.
- To secure community support for the sustainable use of resources inside the KMPA.
- To facilitate customary protection of village resources.

Key Activities

Communities surrounding KMPA depend heavily on its natural resources for their livelihoods. As such, developing land and sustainable resource use plans as well as identifying traditional rights for inside the KMPA is important and must be done in partnership with communities. Through land use planning, activities under this programme will also identify and preserve any archaeological sites. This programme also focuses on sustainability outside the protected area, as the PA is part of a larger ecosystem, and sustainable resource use outside the PA will positively affect biodiversity and resources inside the PA. Key activities will include support for land use and sustainable natural resource management (SNRM) in surrounding villages.

3.2.3 Benefit Sharing and Livelihood Development

> *Goal*: Enhancing and equitably sharing the direct benefits of KMPA and its resources for and with surrounding communities

Objectives

- To increase sustainable livelihood and income generating opportunities available to communities.
- To promote the equitable sharing of direct benefits from KMPA.

Key Activities

This programme aims to improve benefits to communities from KMPA by supporting existing livelihoods and examining options for new conservation-compatible livelihoods and income generating activities. By exploring best practice benefit-sharing models, activities under this programme will aim to improve the equitable sharing of benefits among communities.

3.2.4 Education, Awareness and Outreach

> *Goal*: Improving awareness of KMPA, its values, and management strategies, locally nationally and internationally

Objectives

- To increase awareness of the importance of KMPA's biodiversity, resources and management activities in youth and adults from local communities.
- To improve awareness of KMPA and its value both nationally and internationally.
- To ensure KMPA is recognised and supported as a globally important protected area.

Key Activities

This programme will involve the creation of thematic publications and awareness campaigns/events aimed at various target audiences such as communities, schools, tourists, the general public and international donors. Themes will focus on the PA's globally important biodiversity, ecosystem services and economic benefits, its importance in climate change mitigation and adaptation, the heritage that it preserves within its boundaries and the threats to all of these values. Lastly, KMPA management updates and lessons learnt will be disseminated appropriately, keeping local stakeholders informed about progress being made as well as showcasing KMPA internationally as a model protected area.

3.2.5 Capacity Building

> *Goal*: Building the capacity of key stakeholders for PA and resource management to achieve KMPA's vision and goals

Objectives

- To improve the capacity of PAC and site level staff for KMPA management.
- To improve the capacity of communities for KMPA management, land use and livelihood development.

Key Activities

In order for KMPA to be managed effectively, the capacity of its stakeholders needs to be built. Capacity needs were extracted from each of the above programmes to identify where capacity is required for this management plan. This programme focuses on the two main stakeholders: the PAC (including site level staff) and key stakeholder communities. Methods and specific training programmes/capacity needs for both target stakeholders will be identified as a primary component of this programme.

4. MANAGEMENT PLAN IMPLEMENTATION

4.1 Governance and Management Structures

Guyana's Protected Areas Act 2011 established the Protected Areas Commission (PAC), which falls under the Ministry of the Presidency (MoP), Department of Natural Resources and the Environment (DNRE). The PAC is charged with establishing, managing, maintaining, promoting and expanding the country's NPAS.

The PAC is governed by a Board that is responsible for overseeing the operations and approving the programmes and budget of the Commission. In addition, the site-level governance structure will also reflect the active involvement of local communities, central and local governments, private sector, non-governmental organizations, and other interest groups. It is proposed that a Site Level Committee (SLC) be established for the KMPA, comprising a maximum of fifteen members, with representatives from each of the following stakeholder groups: the Kanuku Mountains Community Representative Group (KMCRG) (x 2 representatives), Regional Democratic Council, PAC, Environmental Protection Agency (EPA), Ministry of Indigenous Peoples Affairs (MoIPA), Ministry of Agriculture (MoA) Guyana Forestry Commission (GFC), Guyana Geology and Mines Commission (GGMC), Guyana Lands and Surveys Commission (GLSC), Guyana Police Force (GPF), Guyana Defence Force, Conservation International, University of Guyana, and the Frankfurt Zoological Society (FZS). External experts may be called upon at meetings to provide background information to the committee if required. The primary functions of the SLC are to support management activities and to provide advice to the PAC to ensure the effective management of the Protected Area while promoting the interests of stakeholders.

Although a participatory approach involving stakeholders in decision making will be employed for managing the Protected Area, the implementation of this management plan will be carried out by a PAC employed Site Level Manager and field team (see figure 3 for governance and site level HR structure). The PAC will actively encourage and promote the recruitment of these site level positions from local communities.

4.2 Work Plans

The five-year operational plan based on the management plan's log frame (Appendix 10) will act as the framework for work and activity planning. This operational plan will guide the development of annual plans and budgets ensuring that all work plans are aligned with the management plan's programmes objectives and goals. Annual plans and budgets will be developed by the site level manager, the senior management team at the PAC with input from the site level committee.

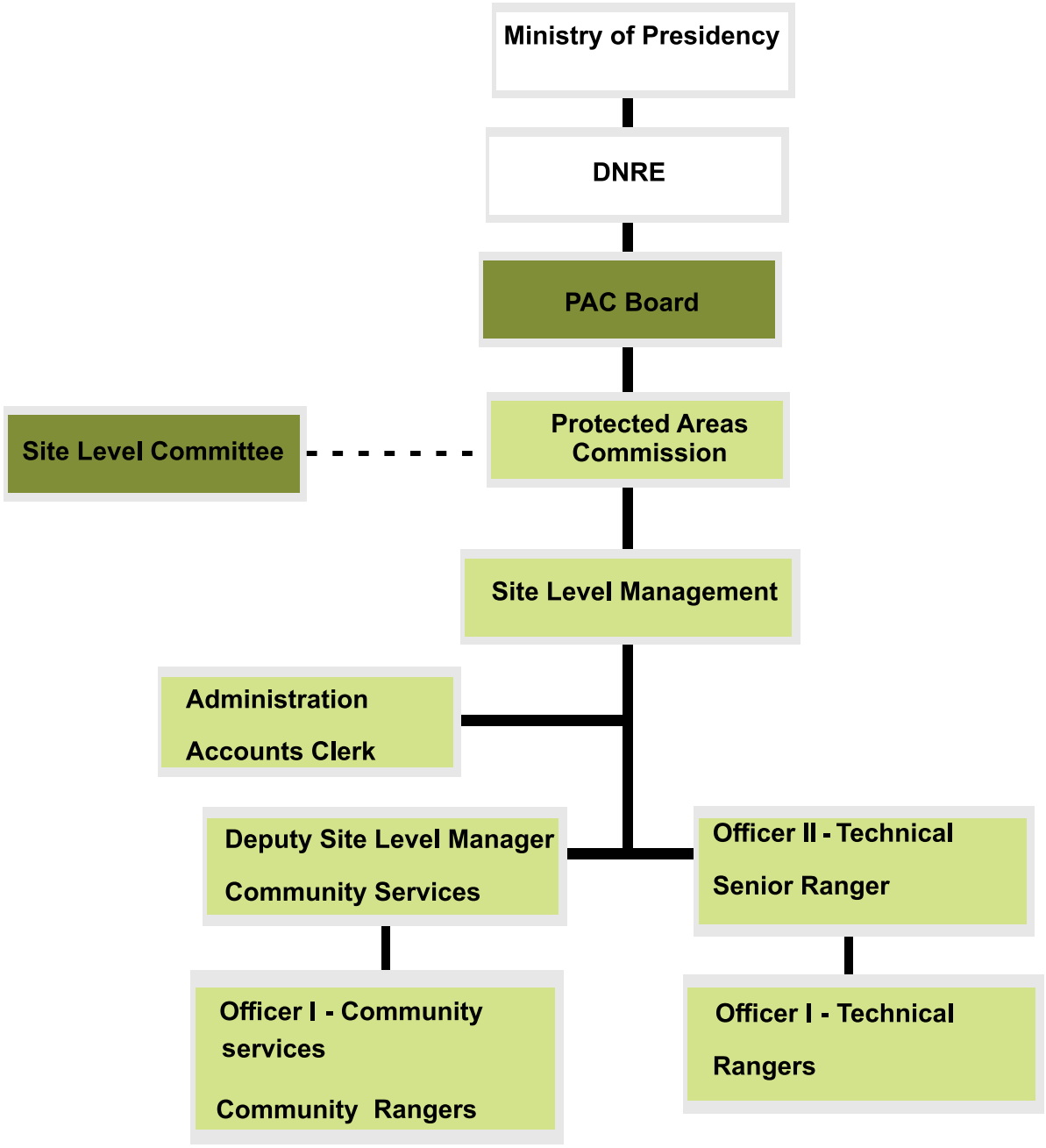

Fig.3 Organisational chart for governance and site level HR structure for KMPA.

4.3 Management Plan Monitoring/Evaluation

The KMPA management plan is designed to be dynamic, flexible and adaptive to changing information, management and community needs. The log frame provides indicators as a measure of success in achieving programme goals, objectives and outputs. The log frame also provides the framework for a monitoring and evaluation (M&E) plan (Appendix 12), where data collection methods as well as institutional responsibilities have been identified. The M&E plan comprises two components that;

i) determine whether KMPA management is achieving its goals and objectives and,

ii) monitor the progress of management plan implementation against foreseen outputs. This part of the M&E framework can be used in conjunction with staff performance appraisals; however, it should not be used as a sole measure of performance.

By assessing progress towards achieving goals, objectives, and outputs, KMPA management will be able to integrate this information into annual operational plans and activities, and adapt their interventions to allow for more effective and efficient implementation of this management plan.

Ultimately, the implementation of an M&E plan will provide managers and key stakeholders with up-to-date information on the progress and results of KMPA management interventions. An annual review of M&E results will be summarised in KMPA annual reports, and M&E activities will subsequently be incorporated into future work plans. A baseline Management Effectiveness Tracking Tool (METT) for KMPA has been carried out and results are presented in Appendix 12d.

4.4 Finances

General headquarters and site management costs for KMPA are outlined below. However, a detailed capital and activity based costing for implementing this five year management plan is a key output for year one. Currently, funds for the management of KMPA come from government subventions and third party donor funds.

4.4.1 PA management costs

Table 5a and Table 5b show the estimated capital and recurrent costs respectively (see Appendix 13 for more detail). For effective implementation of this plan, capital investment for infrastructure development and equipment procurement, as well as recurrent costs associated with human resources, administration, travel, and infrastructure maintenance will be required.

These figures are broad estimates only and are meant to serve as a guide for management plan implementation fundraising only. More detailed and accurate management plan implementation costing will be conducted in line with annual operational plans.

Table 3a: Capital cost estimates for PA management

	Amount (GY$)					
Infrastructure	**2015**	**2016**	**2017**	**2018**	**2019**	**Total (G$)**
	-	94,000,000	25,000,000	5,000,000	5,000,000	129,000,000
Transportation	1,500,000	11,000,000	3,500,000	7,000,000	-	23,000,000
Office Equipment	580,000	3,430,000	700,000	600,000	-	5,310,000
Communication Equipment	-	7,846,000	2,500,000	-	-	10,346,000
Field Equipment	-	1,400,000	800,000	-	-	2,200,000
Power Generation	-	6,750,000	2,250,000	-	-	9,000,000
Total GY$	**2,080,000**	**124,426,000**	**34,750,000**	**12,600,000**	**5,000,000**	**178,856,000**
Approx. US$ 1US$ =GY$ 200	**10,400**	**622,130**	**173,750**	**63,000**	**25,000**	**894,280**

Table 3b Recurrent cost estimates for this 5-year KMPA management plan

	Amount (GY$)					Total (G$)
	2015	**2016**	**2017**	**2018**	**2019**	
Human Resource	2,754,000	5,508,000	10,206,000	10,206,000	10,206,000	38,880,000
Services	240,000	940,000	1,540,000	1,540,000	1,540,000	5,800,000
Office and Meetings	1,900,000	2,650,000	3,775,000	2,275,000	2,275,000	12,875,000
Travel	765,000	945,000	1,020,000	1,140,000	1,140,000	5,010,000
Contractual	-	-	-	-	-	-
Infrastructure & Equipment Depreciation, Maintenance	416,000	13,718,667	18,543,267	20,563,267	21,063,267	74,304,467
Total GY$	**6,075,000**	**23,761,667**	**35,084,267**	**35,724,267**	**36,224,267**	**136,869,467**
pprox 1US=GY$ 200	**30,375**	**118,835**	**175,421**	**178,621**	**181,121**	**684,347**

LIST OF APPENDICES

APPENDICES

Protected
Areas
Commission

KMPA
Management Plan

2015-2019

TABLE OF CONTENTS

APPENDIX 1

A1. Glossary

adaptive management - an approach for improving management systems by learning from prior management actions

best practice - procedures that are accepted as being correct or most effective

biodiversity - the variety of life in the world, or in a particular place

capacity building - providing a person or group of people with the resources (training, equipment, infrastructure) to be able to function in a particular environment

capital costs - fixed, one-time expenses covering the purchase and construction of equipment and buildings

climate change mitigation - efforts to reduce or prevent the production of green house gases (eg. using solar energy, changing agricultural practices)

conservation - the act of preserving or protecting something or some place

delineation process - the process of deciding the location of a boundary or border

donor agencies - governments or institutions which make money available to attain an identifiable goal

eco-tourism - tourism directed towards uniting conservation, communities and sustainable travel

ecological - related to the relationship of living things to each other and their surroundings

ecological communities - groups of interacting species living in the same place

ecosystem - a community of interacting living things and their surroundings

ecosystem services - the benefits provided by ecosystems (nature) that make life possible and worth living (eg. providing water)

encroachment - gradually moving into an area

endangered - seriously at risk of disappearing forever, becoming extinct

endemic, endemism - native, or found only in a certain area (eg. endemic to the Kanukus - found only in the Kanukus)

environmental - relating to a persons surroundings, usually refers to the natural world

hydrological	-	relating to the properties, distribution and circulation of water on earth and in the atmosphere
implementers	-	people who are doing, or are responsible for doing, a job or task
infrastructure	-	physical structures and facilities needed for operating (eg. building, roads, power supplies)
intrinsic	-	belonging naturally, relating to the essential nature of a thing
logical framework (logframe)	-	a tool used to plan, monitor and evaluate management actions
management strategy	-	a plan of action to achieve an overall aim
microhabitat	-	a habitat that is small in size and different from the surrounding more extensive habitat
natural resources	-	materials such as forests, water, fertile land that occurs in nature and can be used for economic gain
participatory approach	-	involving the participation of many different stakeholders as part of planning discussions
protected area	-	places which receive protection because of their recognised natural, ecological and/or cultural value
recurrent costs	-	the costs of maintaining and operating a given programme or operation
riparian	-	relating to wetlands adjacent to rivers and streams
riverine	-	situated on a river or riverbank
species	-	a group of the same type of living organisms (trees, mammals etc.)
stakeholder	-	a person with an interest or a concern in something
sustainable, sustainability	-	harvesting or using a resource so that the resource is not depleted or permanently damaged
utilisation	-	the act of using something

APPENDIX 2

A2. Planning workshops: core participants and timelines for KMPA management plan development

A2.1 Core Participants

NAME	ORGANISATION
Abraham, Michael	Guyana Geology and Mines Commission
Alexander, Eustace	Conservation International Guyana
Alfred, John	Kanuku Mountains Community Representative Group
Andrews, Eugene	Kanuku Mountains Community Representative Group
Antone, Vitus	Conservation International Guyana
Bernard, Curtis	Conservation International Guyana
Casimero, Douglas	Ministry of Amerindian Affairs
Cumberbatch, Ronald	Ministry of Amerindian Affairs
Davis, Odacy	Conservation International Guyana
Demetro, Andrew	Conservation International Guyana
Duncan, Christopher	Ministry of Amerindian Affairs
Fernandes, Damian	GFA Consulting Group
Fredericks, Alan	Kanuku Mountains Community Representative Group
Fredericks, Patricia	Conservation International Guyana
George, James	Kanuku Mountains Community Representative Group
Gomes, Margaret	Conservation International Guyana
Gomes, Patrick	Kanuku Mountains Community Representative Group
Griffith, Abraham	Kanuku Mountains Community Representative Group
Harilal, Chuvika	Environmental Protection Agency
Herman, Laurentino	Kanuku Mountains Community Representative Group
Johnson, Lawrence	Kanuku Mountains Community Representative Group
Khan, Tasreef	Guyana Forestry Commission
Kissoon, Ian	Environmental Protection Agency
Livan, Karen	Guyana Geology and Mines Commission
Lucas, Clarindo	Regional Democratic Council
McRae-Munroe, Suzanne	Conservation International Guyana
Melville, Shirley	Regional Democratic Council
Michael, Desmond	Kanuku Mountains Community Representative Group
Miller, Wayne	Guyana Lands and Surveys Commission
Morales, Miguel	Conservation International
Rogers, Issac	Kanuku Mountains Community Representative Group

NAME	ORGANISATION
Singh, Claire	Regional Democratic Council
Singh, Shoma	Ministry of Amerindian Affairs
Sukhai, Pauline	Ministry of Amerindian Affairs
Timmerman, Colin	Guyana Forestry Commission
Victoriano, Nathalie	Conservation International Guyana
Watson, Eulene	Guyana Geology and Mines Commission
Welle, Ben ter	GFA Consulting Group

A2.2 Planning Workshops and Timelines

Phases	**Description**	**Location**	**Timeline**
Drafting and Review Phase	Initial Stakeholders' Workshop	Lethem, Region 9	April 21 to 23, 2008
	Technical Workshop	Georgetown	May 19 to 23, 2008
	Second Stakeholders' Workshop	Lethem, Region 9	September 08 to 11, 2008
	Community Workshops	Kanuku Communities, Region 9	October 06 to November 17, 2008
	Regional Workshop	Lethem, Region 9	November 24 to 25, 2008
	Third Stakeholders' Workshop	Lethem, Region 9	January 21-23, 2009
Updating Phase	Community Review and Updating Workshop	Lethem, Region 9	November 19-20, 2013
Community and Public Review Phase	Community Review Workshop and Commencement of Community and Public Review Process	Lethem, Region 9	December 09, 2014
	Public Review Meeting	Georgetown	January 13, 2015
	Deadline for Submission of Comments	-	January 27, 2015

APPENDIX 3

A3. KMPA Management Targets

A3.1. Management Targets

Management targets are key features of an area that PA managers focus on in order to achieve the goals of the protected area. These can be conservation targets, representing biological entities or natural processes and/or thematic targets, representing non-biological entities. KMPA targets were identified by stakeholders during the management plan workshops. Once identified, and in order to facilitate management and planning for KMPA, the targets were grouped into logical areas, herein referred to as management programmes. Targets within each management programme require similar activities and resources, and are aligned with the PAC's strategic plan. For example, KMPA targets such as sustainable resource use, sustainable agriculture and land titles and extensions would require similar sets of activities such as, engaging with communities, resource and land use planning/mapping, and building skills for sustainable use of resources. They may also require similar resources in terms of staffing skill requirements or funds for field trips. Therefore such targets would be grouped under one management programme; in this case a sustainable land and resource use programme. In this plan, five management programmes were identified for the KMPA.

Below is a brief description of the conservation and thematic targets identified in this management plan. It also presents an analysis of the main pressures that affect these targets.

A3.1.1 Target 1: Game and Threatened Species

This conservation target includes several terrestrial and aquatic species that are locally hunted (mainly subsistence hunting) and/or threatened. Recent reports suggest that a number of fish species have already been depleted from the rivers due to over fishing and that there is a marked reduction in the abundance and distribution of several game species (*pers. communication*).

Table A3 – Game and threatened species of interest for the management of the KMPA.

Common or Local Name	Scientific Name	Global Status*	National Status**
Red-brocket deer	*Mazama americana*	DD	DD
Collared peccary	*Pecari tajacu*	LC	VU
Tapir	*Tapirus terrestris*	VU	VU
Paca/Labba	*Cuniculus paca*	LC	LC
Giant river turtle	*Podocnemis expansa*	LR	LR
Small river turtles	-	-	-
Tortoises	-	-	-
Giant arapaima	*Arapaima gigas*	DD	DD
Giant armadillo	*Priodontes maximus*	VU	VU
Giant anteater	*Myrmecophaga tridactyla*	VU	NT
Giant river otter	*Pteronura brasiliensis*	EN	EN

Jaguar	*Panthera onca*	NT	NT
Puma	*Puma concolor*	LC	LC
Harpy eagle	*Harpia harpyja*	NT	NT

* The IUCN List of Threatened Species: DD= data deficient; LR= lower risk; LC= least concern; VU= vulnerable; NT= near threatened; EN= endangered
** EPA LIST

Main Pressures:

- Over exploitation of some game species by over-hunting and/or using non-sustainable hunting methods, and hunting of endangered species.
- Inadequate implementation of national wildlife legislation.
- Poor capacity for appropirate law enforcement and monitoring.
- Habitat destruction due to fires and removal of forest.
- Inaccurate determination of quotas for trade species.
- Culling of some species as a result of competition with ranchers, farmers and/or fishermen.

A3.1.2 Target 2: Rivers, Riparian Forest and Water Quality

The Kanuku Mountains and its surrounding area have experienced relatively few impacts from anthropogenic pressures. An exception however, are the fresh water ecosystems where the water quality of the major navigable rivers (Rupununi, Kwitaro and Rewa) is being negatively affected by human traffic, habitat destruction and runoff from agricultural lands, brick-making and small-scale mining activities. In addition, the establishment of small farms to grow subsistence crops is negatively impacting riparian forests.

Main Pressures:

- Over-fishing and poisoning of waterways that support fish populations.
- Burning of riparian forest and clearing of land.
- Water polluting activities such as vehicle washing and brick making
- Inadequate enforcement of rules and regulations.
- Mining along riverbanks

A3.1.3 Target 3: Sustainable Use of Natural Resources

A major aim of the KMPA is to ensure the sustainable use of natural resources. The resources of the mountains are important to the livelihood of the surrounding communities and are of great national, and, in some instances, global interest. Currently, there is very little understanding of the rate of use of most of the natural resources in the area.

Main pressures:

- Communities lack sustainable options for resource use.
- Insufficient knowledge on resource use and extraction rates.
- Lack of appropriate resource use agreements.
- Abuse of traditional use rights.
- Absence of baseline data (e.g. water quality and habitat conversion).
- Poor feedback mechanisms between research report authors and communities.

A3.1.4 Target 4: Sustainable Agriculture

Agriculture is extremely important to the communities in the areas surrounding the KMPA. An opportunity exists for the production of food and other materials to supply markets in Lethem and quite possibly further. The improvement of agriculture has the potential to greatly benefit the communities while at the same time assist in the conservation of the resources of the KMPA.

Main pressures:

- Low agricultural productivity and diversity.
- Poor infrastructure and appropriate equipment.
- Insufficient technical expertise/skills.
- Poor access to markets.

A3.1.5 Target 5: Income Generation

A major driver of the destruction and unsustainable use of the resources of the KMPA is the need within the communities to generate income, particularly as they adopt a more cash-based culture. Income generation is also a driver behind the migration of youths away from the communities as they seek employment. Improving income generation from the sustainable use of resources can reduce the dependence of communities on the unsustainable use of the KMPA's natural resources.

Main pressures:

- Limited job opportunities.
- Insufficient technical skills/expertise.
- Lack of knowledge of potential alternative livelihoods.

A3.1.6 Target 6: Benefit-sharing

If direct benefits such as job opportunities and access to resources are not being accrued and shared equitably among stakeholders of the KMPA, management of the site will be extremely difficult and ineffective. Improving benefits will hold especially true for local stakeholders who depend largely on the area for sustenance.

Main Pressures:

- Differences between communities in access to direct benefits.
- Differences in skills and capacity, across different communities.
- Lack of experience with and knowledge of community benefit sharing mechanisms.

A3.1.7 Target 7: Management Relevant Research in the KMPA

Research into the biological, social, economic and other aspects of the KMPA and surrounding communities will increase knowledge of the area and improve its management. Research can also serve as an income-generating activity for the PA and communities through fees and field assistants.

Main Pressures:

- Difficult and expensive to carry out research in Protected Areas.
- Insufficient knowledge regarding research needs.
- Lack of adequate funding for research.

A3.1.8 Target 8: Capacity Building for Improved Collaborative Management & Decision-making

The capacity within the communities and other stakeholders for collaborative management is limited. With collaborative management as an important issue for the KMPA, addressing this lack of capacity is necessary to ensure the success of the PA and enhance its usefulness as a model for protected area creation and management.

Main Pressures:

- Communication barriers between stakeholders.
- Retention of trained, skilled local stakeholders.

A3.1.9 Target 9: Awareness of the Values and Management of KMPA

For stakeholder support and involvement in the KMPA process and as a first approach to the enforcement of rules of the KMPA, efforts to raise the awareness of all stakeholders are important. Education and awareness are also important for the promotion of the KMPA as a model protected area.

Main Pressures:

- Low priority given to awareness of the KMPA.
- Higher priority given to other national interests such as hydro-electricity, mining.

A3.1.10 Target 10: Preservation of Traditional Knowledge and Language

The traditional ways of life of the indigenous populations of the Kanukus have ensured the sustainable use of the resources of the area. This knowledge will greatly enhance the effectiveness of the management of the KMPA.

Main Pressures:

- Unwillingness of communities to continue traditional lifestyle and practices.

A3.1.11 Target 11: Land Title and Extensions

Land titles, extensions, and general land and resource rights are paramount issues for the indigenous communities. These issues can impact the management of the KMPA and hence are an important target for the management of the PA.

Main Pressures:

- Land declared part of KMPA will affect size and location of title extensions.
- Title extensions into the PA will reduce its size and affect achievement of conservation objectives.
- Development of some activities in the future may not be compatible with the values of the PA.

A3.1.12 Target 12: Sustainable Commercial Use of Resources by Communities

The KMPA will target the sustainable commercial use of the resources of the area for the benefit of the community. This is in addition to the guaranteed traditional rights that are assured to the communities through the Amerindian Act 2006.

Main Pressures:

- Cultural change leading to unsustainable practices (e.g. use of guns, seines, power saws) and to the depletion and degradation of natural resources.
- Emergence of a monetary culture can lead to social issues and possibly the undervaluing of resources.

A3.1.13 Target 13: Commercial Use of Resources by External Interests

Sustainable commercial use of the resources of the KMPA is also seen as important for the management of the KMPA especially as a means of providing benefits to wider stakeholder groups and providing for the financial sustainability of the PA.

Main Pressures:

- Unsustainable harvesting and use of resources.
- Undervaluing of resources and lack of proper benefit sharing.
- Lack of sufficient legislation.
- Poor monitoring and enforcement of existing legislation.
- Lack of understanding related to the potential emergence of social issues, monetary culture and undervaluing of resources.

A3.1.14 Target 14: KMPA as a Model Protected Area

The process through which the KMPA was developed and is intended to be managed is new to Guyana and could be used to serve as a model for the creation and management of other protected areas in Guyana and the world at large.

Main Pressures:

- Insufficient political and local support.
- Lack of sustained funding.
- Other, sometimes conflicting, national priorities (security, petroleum).
- Collaborative management new to Guyana, and lack of national expertise.
- Lack of awareness (locally, nationally, and internationally).
- Insufficient international support/commitment to the process

APPENDIX 4

A4. KMPA Boundary

A4.1. Boundary Delineation Process

A4.1.1 Summary

Conservation International-Guyana was appointed by the GoG as the Lead Agency to steer the boundary delineation process as a first step towards the establishment of the Kanuku Mountains Protected Area. In 2007, the German Development Bank, KfW, through the Guyana Protected Area System Project (with EPA as the coordinating agency) approved a sub-project entitled "Delineating the boundaries of the proposed Kanuku Mountains Protected Area (KMPA) using community participatory approaches and GIS tools".

The project commenced with an initial meeting that focused on establishing guidelines for the delineation process. The project was then implemented in three phases.

Table A4.1 – Phases of the KMPA boundary delineation process.

Phase 1	Phase 2	Phase 3
- Initial stakeholder workshop - Data collection - Data update - KMCRG meetings and capacity building	- Technical workshop - Second stakeholder workshop -KMCRG visits to communities - Community consultations - Regional stakeholder consultations - Third stakeholder workshop	- Production of map and report -Submission to GoG -Feedback to stakeholders

From conception to delineation of the boundaries, the process was innovative and participatory, with participation from a core group of stakeholders, regional and state entities, non-governmental organizations and representatives of 18 communities. The process was facilitated by Conservation International-Guyana and incorporated input and feedback from all stakeholders engaged.

The successful completion of the Kanuku Mountains Protected Area Delineation Process brought the establishment of the mountains as a protected area closer to reality. Following the delineation process, the final delineation report and map showing proposed boundaries were submitted to the Government for review and approval. The area was subsequently declared a national protected area under the Protected Areas Act 2011.

In addition to the agreed boundary, it was recommended by the stakeholders that consideration be given to the expansion of the protected area in the future. These expansions can include: extensions east to the Essequibo River, north to the boundaries of Apoteri, Rewa and Crash Water communities, and southwest close to the boundaries of Shea, Maruranau and Awarwanau communities.

Table A4.2 – Outline of the KMPA boundary delineation process.

Activity	Major Actions/Outcomes
Initial Planning Workshop	Inclusion of participants from the core group of stakeholders. Identification of information gaps and data needs. Outline of framework for the process and methodology to be used for the delineation of the boundaries.
Data Revision and Update	Updating of Community Resource Evaluation (CRE) data originally collected in 2001-2002. Collection of necessary data from all relevant agencies.
Technical Workshop	Data and decisions from the initial workshop utilised by core group of stakeholders to create eight options for the boundary.
2nd Stakeholders' Workshop.	Options refined by technical team and two potential options selected.
Community Consultations	The two options were discussed with the 18 communities involved in the process for their feedback and input for modification.
Regional Stakeholders Workshop	The two options were discussed with a wider cross-section of stakeholders, again including the communities.
3rd Stakeholders' Workshop	Feedback from communities and regional stakeholders was used by the core group of stakeholders to refine and finalize the boundary.
Submission of Report and Map	Report with maps showing the agreed delineated boundary for the KMPA was submitted to the Government of Guyana.
Feedback	Report and maps submitted to all stakeholders.

A4.1.2 Stakeholder engagement

Stakeholder engagement is important for the successful implementation of a protected area system, with stakeholders included from the conception stage of the process (NPAS Strategy, 2002). For the Kanuku Mountains Protected Area, a core group of stakeholders were identified to guide and implement the boundary delineation process, and included the following groups: the Kanuku Mountains Community Representative Group (KMCRG), the Guyana Forestry Commission (GFC), the Guyana Geology and Mines Commission (GGMC), the Guyana Lands and Surveys Commission (GL&SC), the Ministry of Amerindian Affairs (MoAA), the Environmental Protection Agency (EPA), the Regional Democratic Council (RDC) of Region Nine, and Conservation International-Guyana. This group reflects representation from indigenous communities, state agencies responsible for resource use in and around the PA, non-governmental organisations, and local and national government bodies. Besides the core group of stakeholders, the communities, and other regional and national groups and agencies provided input for the process.

A4.1.3 The Kanuku Mountains Community Representative Group (KMCRG)

This Group was established in 2006 and comprises leaders of the eleven main Kanuku Mountains villages (with satellite communities being grouped with their main villages). The KMCRG forms a part of the core stakeholder group and represents the communities involved in the participatory management of the KMPA. Capacity building is crucial for effective involvement and contribution to the protected area process and, to this end, the Lead Agency conducted capacity building sessions with the KMCRG with the aim of enhancing the ability of the representatives to fulfil their role in the process.

A4.2 KMPA Boundary Description

The delineation process resulted in an area of approximately 611,000 ha in size (11% of Region 9 and 2.8% of the total area of Guyana) with a perimeter of approximately 590 km, and includes most of the highest portions of the western Kanukus and almost the entire eastern range.

The KMPA boundary commences at a point on the boundary of Nappi Village at coordinates 03° 30' 16" N and 59° 33' 25" W and proceeds south to the common boundary of the villages of Nappi and Moco Moco,

thence south along the boundary of Moco Moco to the common boundary of the villages of Moco Moco and St. Ignatius,

thence south along the boundary of St. Ignatius to the common boundary of the villages of St. Ignatius and Shulinab,

thence east along the boundary of Shulinab to a point at coordinates 03° 10' 12" N and 59° 31' 01" W,

thence east to a point in the source of an unnamed creek at coordinates 03°10' 13" N and 59°30' 34" W,

thence down the creek to its mouth at the Moriwau River,

thence along the left bank of the Moriwau River to its mouth at the Rupununi River,

thence north along the boundary of the village of Sand Creek to the common boundary of the villages of Sand Creek and Rupunau,

thence east along the boundary of the village of Rupunau to a point at coordinates 02° 56' 45" N and 59° 16' 18" W along the Kamawariwau River,

thence up the Kamawariwau River to the mouth of an unnamed creek at coordinates 02° 57' 44" N and 59° 14' 10" W,

thence up the unnamed creek to a point at its source at coordinates 02° 57' 15" N and 59° 13' 23" W,

thence east to a point on the boundary of the village of Shea at coordinates 02° 57' 06" N and 59° 12' 59" W,

thence east along the boundary of the village of Shea to a point at coordinates 02° 56' 52" N and 58°58' 07" W on the Kwitaro River,

thence north-east along the left bank of the Kwitaro River to a point at coordinates 02°58' 46" N and 58°54' 54" W,

thence east to the mouth of an unnamed creek on the right bank of the Kwitaro River at coordinates 02°58' 46" N and 58°54' 53" W,

thence up the unnamed creek to the mouth of another unnamed creek at coordinates 02° 54' 52" N and 58° 50' 22" W,

thence up the unnamed creek to a point at its source at coordinates 02° 54' 41" N and 58° 47' 49" W,

thence east to a point at the source of an unnamed creek at 02° 54' 47" N and 58°47' 19" W,

thence down the unnamed creek to its mouth on the left bank of the Rewa River,

thence down the left bank of the Rewa River to the mouth of an unnamed creek at coordinates 03° 40' 04" N and 58° 42' 44" W,

thence up the unnamed creek to the mouth of another unnamed creek at coordinates 03° 37' 33" N and 58° 45' 32" W,

thence up the unnamed creek to a point at its source at coordinates 03° 34' 14" N and 58° 49' 20" W,

thence southwest to a point at the source of another unnamed creek at coordinates 03° 33' 52" N and 58° 49' 52" W,

thence down the unnamed creek to its mouth,

thence southwest to a point at the source of another unnamed creek at coordinates 03° 34' 24" N and 58° 53' 04" W,

thence down the unnamed creek to its mouth on the right bank of another unnamed creek,

thence down the unnamed creek to the mouth of an unnamed creek at coordinates 03° 37' 19" N and 58° 57' 54" W,

thence down the unnamed creek to the mouth of another unnamed creek at coordinates 03° 35' 02" N and 59° 01' 26" W,

thence up the unnamed creek to a point at its source at coordinates 03° 36' 40" N and 59° 03' 24" W,

thence southwest to a point in the source of another unnamed creek at coordinates 03° 36' 14" N and 59° 04' 35" W,

thence down the unnamed creek to the boundary of the village of Katoka,

thence south and west along the boundary of Katoka to a point on the Rupununi River at coordinates 03° 30' 23" N and 59° 21' 07" W,

thence west along a surveyed line to a point at coordinates 03° 30' 25" N and 59° 29' 57" W,

thence west to the point of origin.

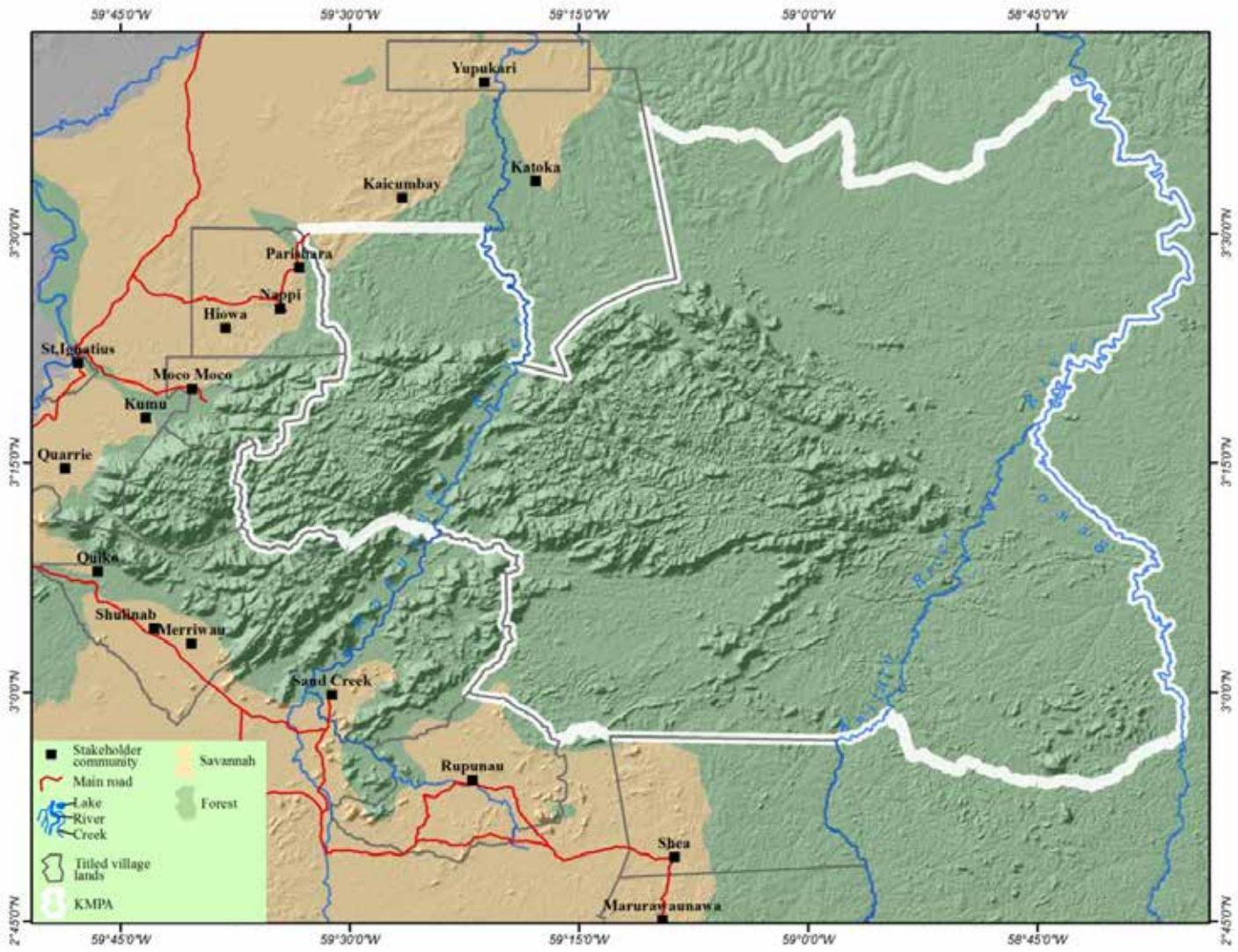

Figure A4 – Map of the final KMPA boundary

APPENDIX 5

A5. Legal and Institutional Framework

A5.1 National Legal Context

Guyana's commitment to sustainable development is enshrined in the 1980 Constitution of the country in Articles 2:25 and 2:36 (NPAS Strategy, 2002).

Article 2:25 – Every citizen has a duty to participate in activities to improve the environment and protect the health of the nation.

Article 2:36 – In the interest of the present and future generations the state will protect rational use of its flora and fauna and will take all appropriate measures to conserve and improve the environment.

Other present legal instruments governing the use of natural resources, which have implications for the establishment, and management of protected areas are as follows:

The Environmental Protection Act 1996: The Environmental Protection Act is the main legislative vehicle for coordinating environmental management activities of all persons, organizations and agencies in Guyana. It recognises and bestows responsibilities to the Environmental Protection Agency (EPA) in various areas of environmental management including monitoring, public awareness, enforcement and conservation of natural resources (NPAS Strategy, 2002).

Protected Areas Act 2011: The Protected Areas Act is the main legislative instrument that provides for the protection and conservation of Guyana's natural heritage and natural capital and the creation, financing and management of a national system of protected areas. It also seeks to provide for the maintenance of ecosystem services that are of national and global importance - including climate regulation, the establishment of a protected areas commission, the establishment and management of a national protected areas trust fund, and public participation in protected areas management and conservation.

Amerindian Act 2006: This Act provides the recognition and protection of the collective rights of Amerindian communities, the granting of land to Amerindian communities and the promotion of good governance in order to manage, regulate and encourage the sustainable use, protection and conservation of community lands and their resources.

Forestry Act 2007: This Act repeals and replaces the Guyana Forestry Commission Act 1979, re-establishes the Guyana Forestry Commission, and provides for incidental matters. The object of the Commission as stated in this Act is to encourage the development and growth of forestry in Guyana on a sustainable basis. The Act also makes provisions for portions of the State Forest to be designated as protected areas.

Mining Act 1982: This Act makes provision for prospecting and regulation of mining of metals, minerals and precious stones.

Species Protection Regulations 1999: These Regulations provide protection against over-exploitation, through importation and exportation, of particular species of prescribed flora and fauna. Currently, there is no official wildlife policy, however, Guyana is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This Convention seeks to protect endangered species from over-exploitation by tightly controlling trade in live or dead animal or animal parts through a system of permits.

Wildlife Management and Conservation Regulations 2013: These Regulations provide for the management and conservation of wildlife, the regulation of the capturing, gathering, collecting, hunting, killing or taking of wildlife, for any purpose and use, including but not limited to bushmeat, scientific research, and medicines; and to make appropriate arrangements for the classification of wildlife areas in Guyana.

Land Use Policy: A Draft National Land Use Policy is in existence and provides the policy context for all land uses, including conservation land uses.

National Land Use Plan 2013: The primary objective of the National Land Use Plan is to provide a strategic framework to guide land development in Guyana. The plan also seeks to provide a spatial element to development planning by showing what the current situation is, where resources are located, where potential exists and what linkages may be necessary to develop those resources.

National Biodiversity Action Plan (NBAP): The GoG adopted its first National Biodiversity Action Plan (NBAP I) in 1999, reviewed it in 2005, and developed its second NBAP in 2007 (NBAP II). The third National Biodiversity Strategy and Action Plan (2012) has also been completed. The NBSAP is the strategic framework for biodiversity management in Guyana. These documents outline several programme areas, one of which is the establishment of a National Protected Areas System in Guyana.

Low Carbon Development Strategy (LCDS): In 2009, the Government of Guyana set out a vision to forge a new low carbon economy in Guyana. The vision was translated into a national low carbon development strategy, which aims to achieve two goals. These are to transform Guyana's economy to deliver greater economic and social development for the people of Guyana by following a low carbon development path; and to provide a model for the world on how climate change can be addressed through low carbon development in developing countries.

Fisheries Act 2002: This Act puts in place the legal framework for effective fisheries management and development. It includes a number of new provisions, such as: authorizing the Minister to promote the development and management of fisheries to ensure the optimum utilization of fisheries resources, mandating the Chief Fisheries Officer to prepare and keep under review a plan for the management and development of fisheries in consultation with fishermen and stakeholders. It also provides for the creation of a Fisheries Advisory Board.

National Development Strategy 2001 to 2010: This document outlines Guyana's principal environmental policy objectives, which are to improve living standards by focusing on environmental health, to ensure the availability of a natural resource base to allow for future economic growth, and to broaden quality of life through the preservation of unique habitats, natural treasures, biodiversity, and cultural heritage.

Water and Sewerage Act 2002: This Act provides for the ownership, management, control, protection, and conservation of water resources. It provides for safe water and sewerage services, their regulation and all connected matters and incidents.

A5.2 International Legal Context

Guyana is signatory to several Conventions related to the environment such as the United Nations Convention on Biological Diversity (CBD) (1994), United Nations Framework Convention on Climate Change (UNFCCC) (1992); United Nations Convention on the Law of the Sea (UNCLOS) (1982); Vienna Convention for the Protection of the Ozone Layer (1985), as amended by the Montreal Protocol of 1987; United Nations Convention to Combat Desertification (UNCCD) in those countries experiencing serious drought/desertification, particularly Africa (1994); and, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1973). These Conventions require that Guyana effectively manage and use its environment sustainably in a way that will ensure continued use and benefits for future generations. Guyana is yet to sign on to the Ramsar Convention on Wetlands, however, parts of the Iwokrama rainforest and the North Rupununi wetlands have been identified as proposed Ramsar sites (NRAMP, 2007).

Article 8 (in situ conservation) of the CBD states that, "Each contracting Party shall as far as possible establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity". These measures include development of guidelines for selection, management and sustainability of protected areas and their surrounds.

Target 11 of the Aichi Biodiversity Targets, which form part of the CBD's Strategic Plan for Biodiversity 2011-2020 states that "By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved." This is to be done "through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes".

A5.3 Institutional Context

The EPA is responsible for the implementation of programmes for the protection and sustainable use of the country's natural resources. The institutional responsibilities of this Agency includes: (i) implementation of systems for the effective management of the natural environment ensuring conservation, (ii) protection and sustainable natural resources use, (iii) co-ordination of environmental management activities of all persons, organisations and agencies, (iv) prevention or control of environmental pollution, (v) promotion of public participation in the process of integrating environmental concerns in development planning, and (vi) to co-ordinate a national environmental education and public awareness programme. With respect to protected areas, the EPA has established a Protected Areas Unit and a Secretariat to assist the Agency in fulfilling its mandate (NPAS Strategy, 2002).

Through the work of the EPA, the Protected Areas Act (2011) was passed by the National Assembly and the Protected Areas Commission, a new entity, was subsequently established. The PAC is a body corporate responsible for establishing, managing, maintaining, promoting and expanding the NPAS in Guyana. Under this mandate, the PAC is tasked with monitoring and regulating activities and the use of resources within protected areas (PAs); preparing, developing and effectively implementing management plans; providing support and advice to Amerindian Villages; and promoting public involvement in these processes.

The Guyana Forestry Commission, Guyana Lands and Surveys Commission, and the Guyana Geology and Mines Commission are the institutions legally empowered by the State to monitor and regulate the use of state forest; state lands; and minerals, metals and precious stones, respectively. The Amerindian Act 2006 enables all titled community lands, inclusive of community-owned conservation areas, and the resources therein to be managed and governed by the communities. The Wildlife Management Authority and a Wildlife Scientific Authority are responsible for setting quotas, closed seasons, providing licences to exporters and generally regulating the wildlife trade in the country.

A5.4 Current Management of the KMPA and Surrounding Communities

The Kanuku Mountains have been protected by the indigenous people of the area who demonstrate an intrinsic connection with the place they refer to as their "Mountains of Life". The KMPA is virtually intact today due to the sustainable utilisation of the resources it holds. While this might be so, there are increasing pressures on the mountains and the existence of these resources. As such the PAC has now been given the mandate to formally protect and manage the KMPA. In response to pressures outside the Protected Area neighbouring communities have already been engaged in developing natural resource management plans[1] in order to guarantee continued future use of the resources in the area, and through assistance provided by the European Union, have developed Village Resource Development Plans to enable proper management of resources within their village lands.

For years Conservation International - Guyana has also been working in collaboration with communities and other stakeholders in pioneering a number of initiatives that have the potential to contribute to sustainable utilisation and management of natural resources in and around the Protected Area. These initiatives include: (i) supporting the Nappi Balata Artisans; (ii) establishing a Community Tourism Enterprise Development Project[2] that aimed to create opportunities for economic development through fostering the development of community-led nature-based tourism as a contribution to conservation of natural and cultural resources; (iii) establishing community/school conservation clubs that focus on building the capacity of children, youth and interested residents in biodiversity conservation and environmental management; (iv) establishing community-led Village Resource Development Planning in villages surrounding the KMPA that produced development plans for all the titled villages (with the exception of St. Ignatius); and (v) establishing the Rupununi Low Carbon Livelihoods Project[3] which is currently on-going and aims at fostering sustainable development in the region built around community-based tourism and agriculture enterprises.

The GoG, through the EPA, and the German Government, through the German Development Bank (KfW), have also supported local projects under Phase I of the Guyana Protected Area System (GPAS) Project by providing grants to communities in and around protected areas, or areas proposed for protection. This initiative, which funded a number of livelihood projects in several communities around the Kanukus aimed to contribute to the long-term success of the NPAS.

[1]South and South Central Districts Toshao Council, Region 9: Community Natural Resource Management Plan Project.
[2]Community Tourism Enterprise Development in the Rupununi – Project Report: Conservation International Guyana, 2008.
[3]Officially: Leveraging Natural Capital in Guyana's Rupununi (ATN/ME-13229-GY)

APPENDIX 6

A6. Regional and National Context

A6.1 Regional Context

The Guiana Shield is recognised as a globally important area for biodiversity with high species richness and high levels of endemism (NPAS Strategy, 2002). This region has approximately 85% of its forests intact, representing the highest percentage of undisturbed tropical habitats in the world; contributes 20% of the global freshwater; and has the lowest human population density of any moist region on earth (Conservation International, 2006).

Figure A6.1 – Map of Guyana within the Guiana Shield.

Guyana is one of the few countries in the world that has retained almost intact forest cover with a very low deforestation rate. Its tropical rain forests, of which 80% are considered to be intact, cover approximately 170,000 km², and are some of the most intact forests of the Guiana Region (Montambault and Missa, 2002). These forests range from lowland to montane and support viable populations of endemic and endangered species (NPAS Strategy, 2002). This rich biological heritage is pivotal to the regulation of climate, hydrological processes, and the provision of other essential ecosystem functions that are of regional and global importance.

The KMPA sustains (i) high vertebrate diversity, (ii) healthy populations of many species that are threatened in other parts of the world, (iii) an extensive range of habitats, from low lying swamp forests to cloud forests on mountain tops, and (iv) a plant community with high species richness values (Montambault and Missa, 2002). In addition, the area is still largely inhabited by indigenous communities whose knowledge and skills are indispensable to the proper conservation of the region, and are a great asset to world culture.

In South America, there are an estimated 465 protected areas, with almost 50% being located in Brazil. Currently Guyana has five legally designated protected areas - The Iwokrama Rain Forest (Iwokrama), Kaieteur National Park (KNP), Kanuku Mountains, Shell Beach and Kanashen Community-Owned Conservation Area (COCA).

A6.2 National Context

In support of the establishment of a protected area system in Guyana, the GoG had identified five priority areas for intervention - Kanuku Mountains, Shell Beach, Mount Roraima, Orinduik Falls, and an area in southern Guyana. Kanuku Mountains and Shell Beach areas were considered as pilot sites where the lessons learnt in their establishment and management will inform the establishment of the other proposed protected areas. Prior to the passage of the Protected Areas Act 2011 and the establishment of the National Protected Areas System, the GoG had also created a Protected Areas Secretariat and Protected Areas Unit within the EPA, which were responsible for moving the protected areas process forward.

With funding support from the Government of Germany through the German Development Bank (KfW), the implementation agency, EPA, with support from the GFA Consulting Group – Hamburg, successfully completed Phase I and Phase II of the Guyana Protected Areas System (GPAS) Project. The GPAS Project financed activities of the following nature: (i) infrastructural development of the Protected Areas Commission and Kaieteur National Park, ii) procurement of equipment for the functioning of the PAC, iii) development of a management plan for the Shell Beach Protected Area and Kanuku Mountains Protected Area, iv) establishment and support for community-based sub-projects, v) measurement and demarcation of borderlines of conservation zones (see Appendix 4 for KMPA), vi) and capitalization of the National Protected Areas Trust Fund as a sustainable and long-term financing mechanism for GPAS. Discussions are also currently ongoing to further extend their support through a Phase III of the GPAS Project.

With the passage of the Protected Areas Act 2011, the establishment of the Protected Areas Commission, and the declaration of the Kanuku Mountains and Shell Beach Protected Areas, Guyana now has a National Protected Areas System that covers approximately 8.5% of the total land area of the country.

A6.2.1 Iwokrama Rainforest Reserve (Iwokrama)

In May 1996 the GoG enacted the Iwokrama International Centre for Rainforest Conservation and Development Act. Under this legislation 371,000 ha of forest in central Guyana was set aside for research to demonstrate that forests can be managed sustainably to provide ecological, social, and economical benefits. The forest is divided into two almost equal portions with one portion managed as a wilderness preserve and the other as a sustainable utilization area. Iwokrama Forest is home to over 1,500 species of higher plants, 200 species of mammals, 500 species of birds, 420 species of fishes and 120 species of reptiles and amphibians.

A6.2.2 Kaieteur National Park (KNP)

Kaieteur National Park was established as a protected area in 1929 by the British Colonial government under the National Parks Act and now covers an area of approximately 62,700 ha after being extended in 1999. Kaieteur Falls, located in the National Park, is one of the most striking places in Guyana with a sheer drop of over 700 ft. It is regularly included on lists of the World's Greatest Waterfalls and is the number one tourist attraction in the interior of Guyana. The Pakaraima Mountains, in which the KNP is situated, have high levels of endemism and are home to a number of threatened and endangered species of birds and mammals.

A6.2.3 Shell Beach Protected Area (SBPA)

Shell Beach Protected Area was declared as a national protected area in 2011 following the enactment of the Protected Areas Act 2011. The SBPA is located along the Atlantic Coastline of northwestern Guyana and extends for approximately 120 kilometres. The area is an aggregate of several beaches including Tiger Beach, Almond Beach and Father's Beach. Shell Beach is an annual nesting site for four species of endangered marine turtles. The area also encompasses an important ecosystem that includes mangrove forests, inland swamp forests and savannahs; and is home to an array of species. The bird diversity is one of the richest in Guyana.

A6.2.4 Kanashen Community Owned Conservation Area (KCOCA)

The community of Kanashen in 2007 declared the entire 625,000 ha of its lands in southern Guyana as a protected area under the Amerindian Act 2006. The community also at that time declared their intention to have their community owned conservation area form part of the national system of protected areas and has since submitted an application to the Protected Areas Commission. The area houses healthy populations of several species of importance nationally, regionally, and globally, and is strategically located connecting to a large network of protected areas in the Brazilian Amazon.

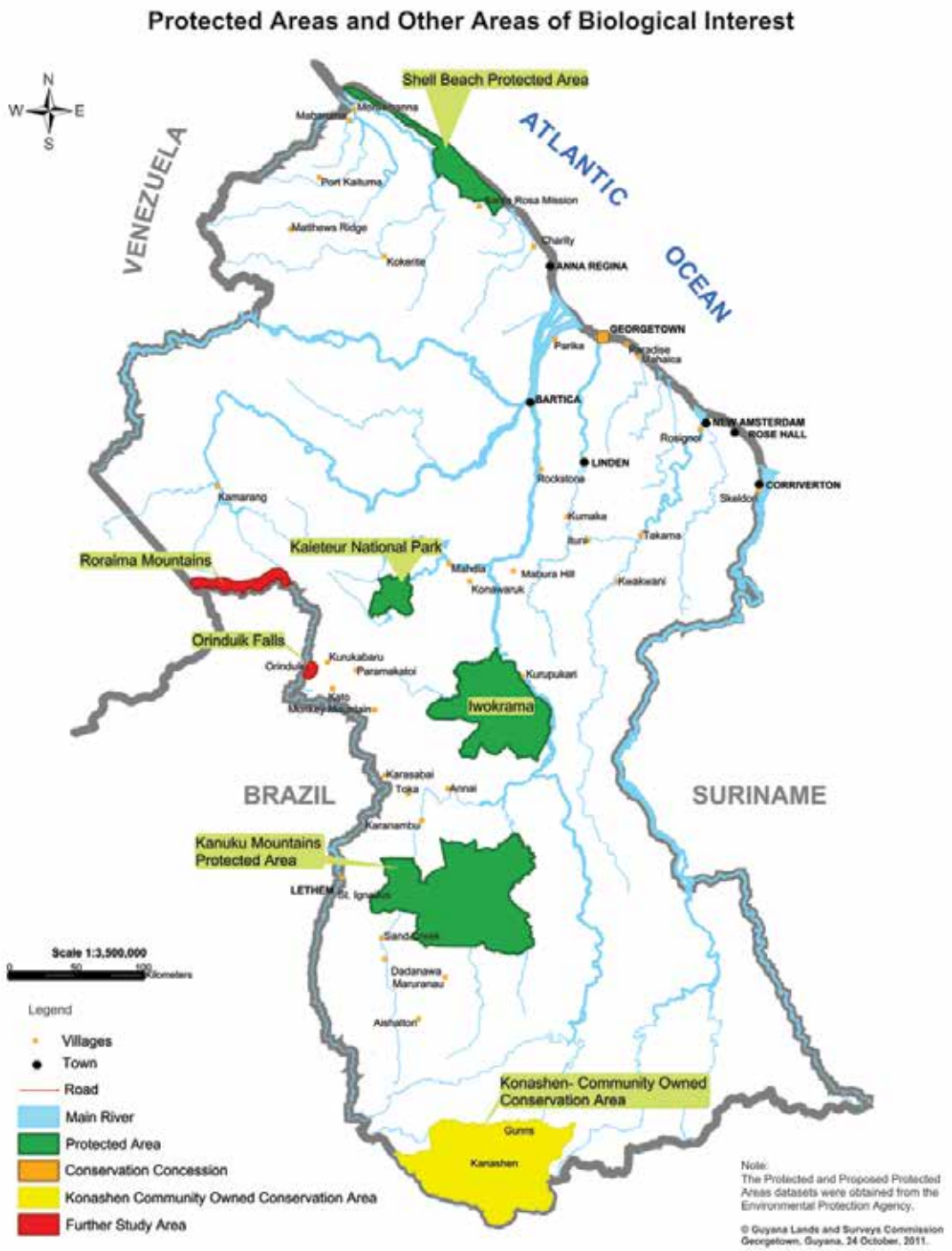

Figure A6.2 – Map of existing protected areas of Guyana

APPENDIX 7

A7. Detailed Site Description and Pressures

A7.1 Location

Guyana, part of South America's Guiana Shield, can be found on the northwestern edge of the continent between north latitudes 1° 10‘ and 8° 32‘ and west longitudes 59° 30‘ and 61° 20‘ and is contiguous with Suriname, Venezuela, Brazil and the Atlantic Ocean. The Guiana Shield, an expanse of more than 30 million hectares of intact tropical forest, represents the largest block of undisturbed forest on earth. This vast area includes parts of Venezuela and Brazil as well as all of Suriname, French Guiana and Guyana (Guianas Regional Programme Report, 2006).

The Kanuku Mountains are located in the southwestern region of Guyana, one of the most ecologically diverse areas of the country. The mountains are approximately 100 km east to west and 50 km north to south and are divided by the Rupununi River into western and eastern ranges, referred to as the Western and Eastern Kanukus. Guyana is divided into ten Administrative Regions with the Kanuku Mountains being part of Region Nine (Upper Takutu - Upper Essequibo).

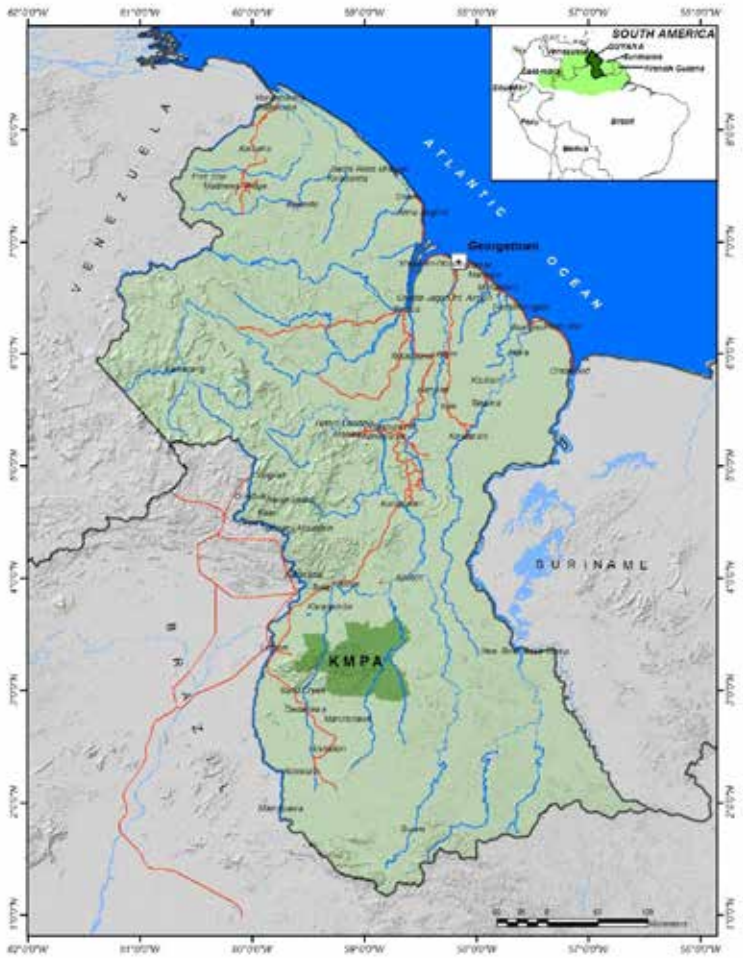

Figure A7.1 – Map showing location of KMPA within Guyana.

The Kanuku Mountains Protected Area (KMPA) covers approximately 611,000 hectares, which is equivalent to 11% of Region Nine and 2.8% of the total area of Guyana. The perimeter of the KMPA is approximately 590 km. The mountains are flanked by indigenous communities, some of which have common boundaries with the protected area. The settlement of Lethem, which is the administrative centre of Region Nine, is located some 24 km away.

A7.2 Physical Characteristics

A7.2.1 Climate

Unlike most parts of the country, which have mainly two wet seasons (mid-April to mid-August and mid-November to mid-January) and two dry seasons, the southern region, which includes the Kanuku Mountains, experiences a single wet season (May – August) and a long dry season (September – April). Average annual rainfall in the southern region (1,500-2,000 mm) is significantly less than the rest of the country (2,500 – 5,000 mm) with the heaviest rains falling in May. During the dry season rainfall is sometimes caused by thunderstorms, especially in the month of December (Montambault, 2002). Sunshine amounts to 45% of total daytime with longer periods of sunshine during the dry season. The average daily temperature ranges between 25.9°C and 27.5°C. Fairly high evapotranspiration rates, estimated between three and 10 ml per day, occur primarily during the dry season fuelled by relatively low humidity and constant strong winds (Agriconsulting, 1993).

A7.2.2 Hydrological Systems

The area is drained to the north by the Takutu River in the west and by the Rupununi River in the east. The Takutu receives waters from the Saurab and Moco Moco creeks (which drain the waters of the western Kanukus) and the Ireng River (which drains the waters of the northern savannahs), before draining into the Rio Branco in Brazil, which joins the Amazon Basin. The Rupununi collects the waters of the Crabwood and Mapari creeks, draining the eastern Kanukus, before draining into the Essequibo, Guyana's largest river. The Kwitaro River, a tributary of the Rewa River, flows north along the eastern edge of the Kanuku Mountains (Agriconsulting, 1993; Montambault and Missa, 2002). During the height of the rainy season the rivers flood their banks, inundating the savannahs. Towards the end of the rainy season much of the surface floodwater rapidly disperses. During the dry season, most small creeks dry out, sometimes completely, and the lower river water levels expose rocks and rapids, making them very difficult to navigate. Ponds and lakes usually take several months to dry out during the dry season due to the clayey soils that limit drainage (Montambault, 2002).

A7.2.3 Geology

Underlying northeastern South America is the Guiana Shield, which occupies a broad area between the Atlantic Ocean and the Amazon River. The Guiana Shield is an ancient Pre-Cambrian landmass consisting of a variety of formations of sedimentary and igneous origin that were metamorphosed and folded. Of these Pre-cambrian formations, the Kanuku Mountains consist of the more resistant metamorphic rock while the more fragile granites form the surrounding savannahs (Montambault and Missa, 2002). Gold, Muscovite, Mica, Monazite, and Iron-ore are some of the different minerals that can be found in and around the Kanuku Mountains (GGMC, 2007).

A7.2.4 Topography

Guyana can be divided into four topographic regions: (i) Low Coastal Plain; (ii) Sandy Rolling Land; (iii) Highland/ Pakaraima region; and (iv) Pre-Cambrian Lowland. The Low Coastal Plain is a narrow band ranging from 15 to 65 km wide. The Sandy Rolling Land is primarily made up of forests over white sand. The Highland/Pakaraima region in the mid-western section of Guyana is characterized by large rock formations that form the Pakaraima Mountain range. The Kanuku Mountains, and indeed the whole of Region Nine, are found in the Pre-Cambrian Lowland region, which is considered a continuation of the Amazon rainforest system. It is divided into rainforest landscape and savannah landscape. (NPAS Strategy, 2002; Agriconsulting, 1993).

The Kanuku Mountains are separated into the Western and Eastern Kanukus by the north-south course of the Rupununi River. The slopes of the mountains are largely covered by closed-canopy forests and are surrounded by the Rupununi savannahs. These savannahs at 120-150 m elevation are ecologically connected to Brazil's Rio Branco savannah. Eastward, the mountains join the vast intact tropical forest expanse of the Guiana Shield. The highest peak on the western range is approximately 1,067 masl with minor peaks over 900 masl compared to the eastern range with its highest peak at 900 masl and an average of only 450 masl (Montambault and Missa, 2002).

A7.2.5 Soils

Several soil types, mostly infertile, can be found in the region (Montambault and Missa, 2002). The Kanuku Mountains consist of a widespread series of sands and laterised clays, mainly alluvial in origin. A dissected cap of laterite is exposed on many of the hilltops and sides of valleys and mountains (GGMC, 2007). Most of these soils lack important nutrients like potassium, phosphorous, sodium, magnesium and calcium and are classified as being poorly suitable or unsuitable for agriculture. A small percentage of the area consists of soils that are considered suitable for intensive agriculture with minor fertilization. These soils are predominantly located at the foothills of the mountains (KMPA Delineation Report, 2007).

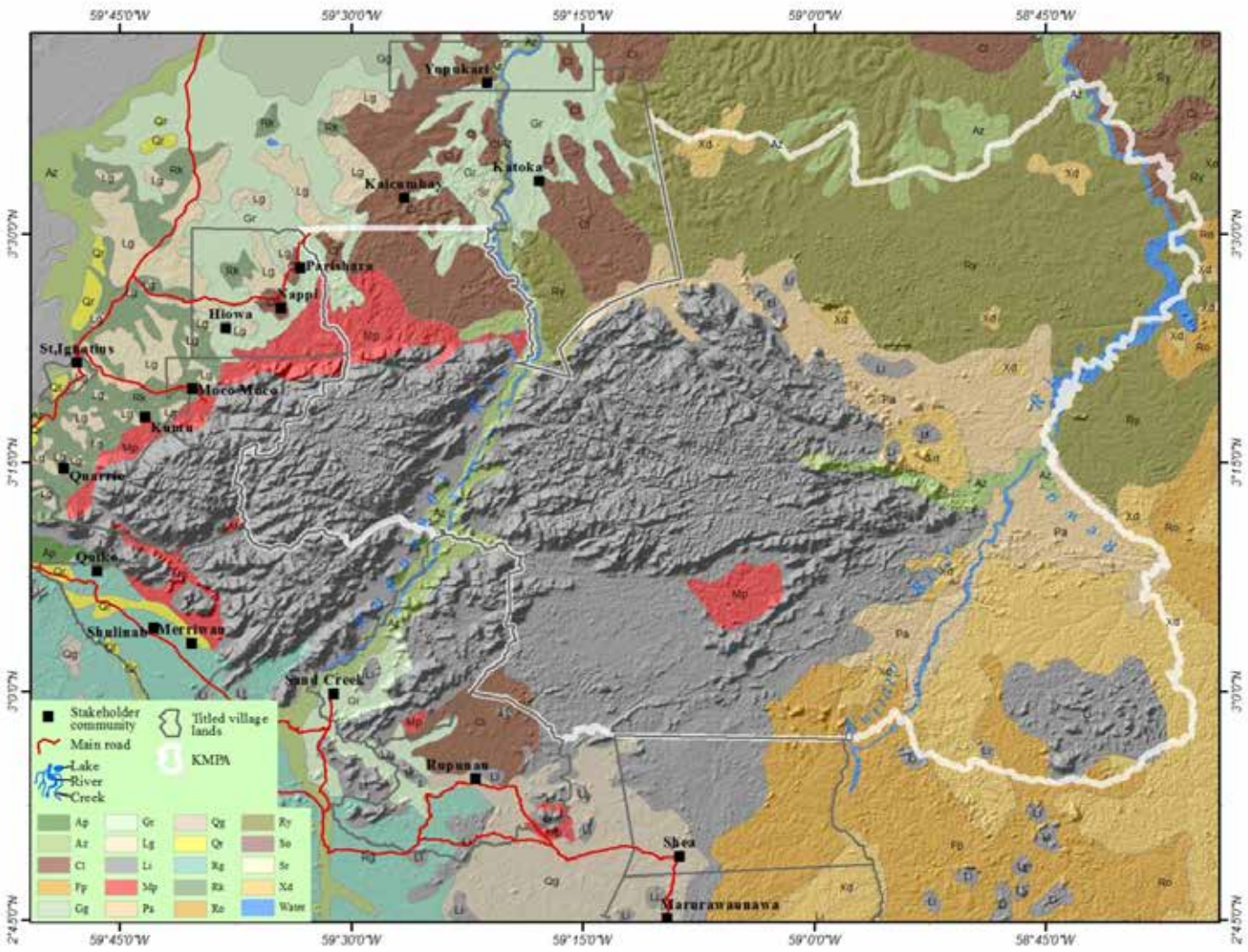

Figure A7.2 – Soils of the KMPA[4].

[4]Extracted from Map of The Reconnaissance Soil Survey of Southwest British Guiana (Braun, E.G. and Suggett, G.R., 1964)

Table A7.2 – Major soils of the KMPA.[5]

Symbol	Soil Type	Land Capability Class	% Area
Li	Variable stony and immature shallow and mainly excessively drained (Lithosols)	IV – Non-Agricultural Land (Very severe limitations for general agricultural use.)	46.2
Ry	Brown, deep, well drained, loamy sands to sandy clay loams (Regosol), Brown Quartz sand phase and Red-yellow Latosols	IIIf – Poor Agricultural Land with fertilization possibilities (Mainly severe fertilization limitations for general agricultural use.)	19.1
Pa	Brown, deep, well drained and some grey poorly drained sandy and clay loam (Red-yellow Latosols; Low Humic Gleys)	IIIf – Poor Agricultural Land with fertilization possibilities (Mainly severe fertilization limitations for general agricultural use.)	10.4
Xd	Brown red and yellow, deep, occasionally shallow, well drained clay (Red-yellow Latosol and Lithosols)	III – Poor Agricultural Land (Severe limitations for general agricultural use.)	9.6
Az	Brown and grey, deep, frequently heavily mottled poor and very poorly drained clay and silty clay soils (Low Humic Gley, Alluvials and Ground Water Laterites)	IIIf – Poor Agricultural Land with fertilization possibilities (Mainly severe fertilization limitations for general agricultural use.)	3.6
Cl	Red and yellow, shallow and deep, well and moderately well drained concretionary gravelly clays (Red-yellow Latosol, Gravelly Phase; Regosol, Laterite Phase)	IIIf – Poor Agricultural Land with fertilization possibilities (Mainly severe fertilization limitations for general agricultural use.)	3.3
Mp	Dark brown, deep, well drained, sandy loam and clay soils, or red deep well and moderately well drained clay loam soils (Reddish-brown Lateritic Soils)	I-II – Good to Moderate Agricultural Land (No to moderate limitations for general agricultural use.)	2.8
Fp	Brown. Red and yellow, deep moderately well drained clay and loam soils (Ground Water Laterite Truncated Phase; Red-yellow Latosol)	IIIf – Poor Agricultural Land with fertilization possibilities (Mainly severe fertilization limitations for general agricultural use.)	2.8
Gr	Light grey, often heavily mottled, deep, poor and poorly drained clays and loams (north) or grey, brown and olive, deep, imperfect and poorly drained sandy loam and clay soils (south) (Ground Water Laterites and Low Humic Gleys)	III – Poor Agricultural Land (Severe limitations for general agricultural use.)	0.8

[5] Derived from Map of The Reconnaissance Soil Survey of Southwest British Guiana and Map for the Land Capability Classification of Southwest British Guiana (Braun, E.G. and Suggett, G.R., 1964)

A7.3 Biodiversity

The Kanuku Mountains and the associated savannahs are relatively intact and extremely rich in biological diversity. Approximately 70% (155 species) of mammal, 53% (419 species) of bird, and 26% (1,577 species) of plant species recorded in Guyana are found here (Montambault and Missa, 2002). It is of note that the KMPA has the second highest bat diversity (89 species) of any protected area in the world (Lim and Norman, 2002), and that of the 25 bird species considered to be endemic to the Guiana Shield, 17 are found in the Kanukus.

The high overall biodiversity of the region is supported by an unusually diverse array of habitats, which range from savannah, gallery forests, and semi-deciduous forests in the lowlands, to lowland and montane evergreen forests (Parker et al., 1993) in the foot hills and mountains. The Kanuku Mountains are also remarkable for harbouring healthy populations of many species that are listed on the IUCN red list of threatened species. These include, but are not limited to, the Giant River Otter (Pteronura brasiliensis), Harpy Eagle (Harpia harpyja), Jaguar (Panthera onca), Giant Anteater (Myrmecophaga tridactyla), Giant Armadillo (Pridontes maximus), Lowland Tapir (Tapirus terrestris), Giant River Turtle (Podocnemis expansa), Black Caiman (Melanosuchus niger), and Arapaima (Arapaima gigas) – the largest Neotropical freshwater fish (Montambault and Missa, 2002).

A7.3.1 Fauna

Table A7.3 – Number of faunal species found in the Kanuku Mountains and Guyana.

Faunal Groups	Guyana	Kanuku Mountains	Comments
Mammals	[6]225	155	
Birds	[7]786	419	
Reptiles	[8]153	23	
Amphibians	119	20	
Fish	[9]690	113	Surveys in the Kanuku Mountains were done right after the rainy season.

Mammals

The Kanukus are home to 155 species of mammals, of which 132 have been recorded in the Western range and 89 in the Eastern range. These figures represent about 70% of the total current mammal species count for Guyana. Bats comprise over half (57%) of the mammal species found in the Kanuku Mountains and fill an important role in the ecosystem as seed dispersers, flower pollinators, and insect-population controllers. Eighty-nine bat species were documented for this area making it the second highest number of bat species reported for any protected area in the world (Montambault and Missa, 2002).

In addition five globally threatened mammal species, the Lowland Tapir (*Tapirus terrestris*), Bush Dog (*Speothos venaticus*), Giant Armadillo (*Priodontes maximus*), Giant Anteater (*Myrmecophaga tridactyla*) and Giant River Otter (*Pteronura brasiliensis*), are living in the protected area.

All six species of felids (*Panthera. onca, Felis concolor, F. jaguarundi, Leopardus pardalis, L.wiedi, L. tigrina*) and all eight species of primates (*Saguinus midas, Saimiri sciureus, Cebus apella, C. olivaceus, Pithecia pithecia, Chiropotes santanas, Alouatta seniculus*, and *Ateles paniscus*) known to occur in Guyana can also be found in the area (Sanderson and Ignacio, 2002).

[6] Checklist of mammals of Guyana (Engstrom and Lim, 2000).

[7] A field checklist of the Birds of Guyana (Braun et al., 2000).

[8] Preliminary checklist of the Herpetofauna of Guyana (Reynolds et al., 2001).

[9] Biological Diversity of Guianan Fresh and Brackish Water Fishes (Lasso, 2002)

Birds

Research shows that the Kanuku Mountains are home to approximately 419 species of bird, which represents 53% of all the species recorded for Guyana. Thirty-nine species are considered uncommon in the Neotropics with two rare species existing in the PA - the Harpy Eagle (*Harpia harpyja*) and the Orange-breasted Falcon (*Falco deiroleucus*). Further, 17 of the 25 bird species known to be endemic to the Guiana Shield occur in the KMPA (Montambault and Missa, 2002). The Red Siskin (*Carduelis cucullata*), a globally endangered bird, lives in habitats just outside of the protected area.

Herpetofauna

The herpetofauna of the Kanuku Mountains region is poorly known. Previous surveys conducted in the area show that at least 25 species of reptiles and 20 species of amphibians are present. These figures do not reflect the total species count for these groups in the area but suggest that the populations are healthy (Montambault and Missa, 2002). Amongst the species of reptiles identified are the endangered Black Caiman (*Melanosuchus niger*), Big-headed Amazon River Turtle (*Peltocephalus dumerilianus*), and South American River Turtle (*Podocnemis expansa*).

Fish

Although fish surveys in the Kanukus have been limited, Mol (2002), in his survey, cited 115 species during the early weeks of the dry season when the water level in the rivers and creeks was low. This number included 45 large-sized fishes used primarily for food, e.g. the Arapaima (*Arapaima gigas*) and the Arowana (*Osteoglossum bicirrhosum*). Large areas of the Rupununi savannahs are flooded each year in the rainy season, and, in certain years, the savannahs connect with the Amazon River (via the Rio Branco) and the Essequibo River basin (via the Rupununi River) mixing the fish populations. A more extensive collecting effort in the Iwokrama Rainforest yielded 408 fish species, with 345 of these species in the Essequibo River drainage (basin) (Mol, 2002). The Rupununi, Rewa and Kwitaro Rivers are all part of the Essequibo River system, thus it is likely that additional sampling efforts could increase the number of species. It is predicted that approximately 300 species of fish exist in this area (Mol, 2002).

Invertebrates

Very little is known about invertebrates in this area, scientific data however show that there are an abundance of Scarabaeinae beetles comprising 26 species (Parker et al., 1993).

A7.3.2 Vegetation

Two primary ecological units exist in the Rupununi region, savannah and mixed forest. The KMPA is comprised of approximately 99% forest and less than one percent savannah vegetation. The major forest types occurring in the area are: (i) mixed forest with some areas of swamp/marsh forests, (ii) deciduous forests, and (iii) liana forests. The more diverse mixed forest type has been divided into gallery forest, hill forest and cloud forest, each with its own distinct and numerous microhabitats (KMPA Delineation Report, 2007).

The Kanuku Mountains and surrounding areas are known to contain 1,577 plant species, representing 26.3% of Guyana's known flora. The most common species found include: *Carapa guianensis, Catostemma fragans, Sagotia racemosa,* and *Eshweilera, Pouteria, Licania, Aspidosperma* and *Rinorea spp.* (Montambault and Missa, 2002).

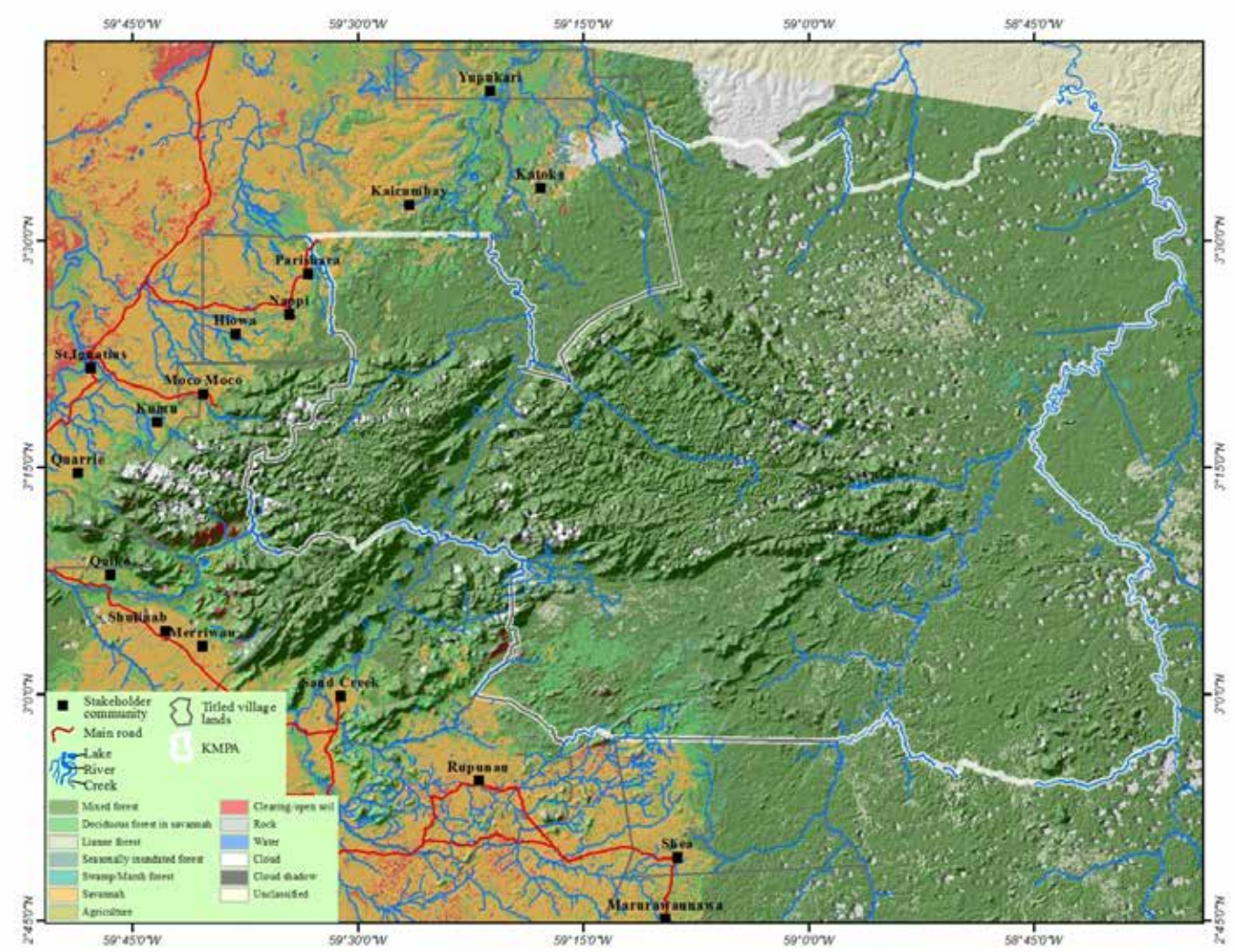

Figure A7.3 – Map of land cover and vegetation of the KMPA.

Table A7.4 – Percentages of land cover in the KMPA.

Land Cover Type	% Cover
Mixed Forest	63.8
Mixed Forest along rivers	16.5
Mixed Forest on Dissected Terrain	8.9
Liana Forests	5.9
Deciduous Forest in Savannah	2.7
Swamp/Marsh Forest	0.8
Rock	0.5
Savannah	0.4
Agriculture	0.2
Seasonally Inundated Forests	0.1
Forest Clearing	0.1

A7.4 Social, Economic and Cultural Context

A7.4.1 Social context

There are approximately 16,000 residents in about 60 Amerindian communities located in Region Nine. Twenty-one of these communities are within close proximity of the Kanuku Mountains and depend on its resources for their livelihood. Three of the nine main Amerindian groups present in Guyana exist in Region Nine. Two of these groups (Macushi and Wapishana) are known to populate areas around the Kanukus. The Macushi people are of Carib descent and occupy areas on the northern side of the Mountains, while the Wapishana, an Arawak people, are located mainly on the southern side of the Mountains. Some communities, however, have mixed populations of Macushi and Wapishana as well as small pockets of other ethnic groups.

Lethem, linking Guyana to Brazil, via the Takutu Bridge, is the largest settlement in the Region and is located within close proximity (~20km) of the Kanuku Mountains. It comprises a mixed population that includes coastlanders, Amerindians, and recently a high influx of Brazilian immigrants. Two Brazilian communities Bonfim and Normandie are located across the border and serve as centres for commercial activities and links to the other developed states of Brazil.

While the Amerindian communities are the main users of the resources in the Kanukus, there are several other groups, especially from Lethem, with resource-use interests. Combined, these stakeholders can be divided into four main groups: (i) community-based resource users, (ii) tourism operators, (iii) institutional stakeholders, and (iv) private sector enterprises. Resource use activities include but are not limited to agriculture, tourism, and timber and wildlife extraction.

A7.4.2 Economic context

Economic opportunities in the communities surrounding the area are mainly subsistence agriculture, wildlife trapping for the pet trade, logging, and artisanal gold and diamond mining. (Montambault and Missa, 2002). There are no timber concessions in the protected area, however, there is evidence of timber extraction on adjacent lands. The communities practise a largely subsistence lifestyle based on farming, hunting, fishing, and gathering. There are very few opportunities within the communities for employment and the generation of economic wealth, even as the communities move to adopt a more monetary-based existence.

Balata latex harvesting from trees of *Manilkara sp.* was a major activity in this Region, but with the introduction of similar synthetic materials to the international market, has subsequently declined. (Montambault and Missa, 2002).

A7.4.3 Cultural context

The people of the Region display and practise a mosaic of cultures that include Macushi, Wapishana, Wai-Wai, Western, Brazilian and Coastland influences. Many aspects of the indigenous culture of the people of the Kanukus remain intact but are under great threat. Traditional methods of farming, fishing, gathering, and hunting are still used to some extent, and traditional languages remain partly intact in all the communities, though better in some than others. Many persons in the Region also speak Portuguese, but may not be able to read and write the language.

A7.5 Land/Resource Tenure and Access

Under the legislation governing land tenure, four categories occur in Region Nine, namely: Private Lands, State Land/Leased Land, State Forest, and Amerindian Titled Land. Private Lands comprise small plots around houses in Lethem. The 611,000 hectares of land in the KMPA are entirely State Land. Other portions of State Lands are leased to ranching operations; these ranches extend over large portions of the savannahs (Agriconsulting, 1993). No Titled Amerindian Land falls within the boundaries of the PA. The eleven main villages surrounding the KMPA are holders of titles to their communal lands and some of these communities are in the process of seeking extensions to their titled lands.

On the eastern border of the PA is state forest, and at least two State Forest Exploratory Permits (SFEP) have been issued in an area between the Rewa and Essequibo Rivers. There are no current mining or forestry concessions in the PA, however interest has been expressed in mining and mineral explorations. Two areas in the southwest, outside of the PA, were also identified for exploration of iron ore by the Guyana Geology and Mines Commission (GGMC) (KMPA Delineation Report, 2007).

Guyana Lands and Surveys Commission (GLSC) and the Guyana Forestry Commission (GFC) have jurisdiction over State Land and State Forest, respectively. Titled Amerindian Lands are governed and managed by Village Councils. Communities also have legal user rights for resources in State Lands and Forest Lands. According to provisions made in the Amerindian Act, 2006, indigenous people can traditionally hunt, fish, gather, farm, and extract minerals on state and other lands.

A7.6 Infrastructure and Services

Besides a few strips of paved roads in Lethem, all other carriageways in this Region consist mainly of laterite or clay, making traversing difficult during the rainy season. The major road corridor that links Lethem to Georgetown passes near the KMPA (approximately 15 km at the nearest point) and through the savannahs. The Takutu Bridge, connecting Guyana and Brazil, with plans to pave the road from Lethem to Linden, are infrastructural works that could impact considerably on the KMPA. Air services are frequent to the Region, with multiple scheduled flights to Lethem every day. Other airstrips that can facilitate small aircraft are located on community lands and ranches. In addition to the regular commercial flights, tour operators, the military and medical service providers use chartered and other flights.

Landline telephone services, cellular phone services, Internet, and satellite television can be accessed in Lethem and a few nearby communities. Two of the communities, Yupukari and Shulinab, have access to telephone services through the Remote Wireless Phone Booth System offered by the Guyana Telephone and Telegraph Company (GT&T). Nappi, St. Ignatius, Parikwarunawa and Quiko, which is a satellite community of Shulinab, currently benefit from cellular phone services. Most of the villages, particularly those further away from Lethem, depend on radio systems for communication. All of the communities have at least one radio set. Yupukari and Shulinab currently have access to the internet through satellite.

A7.7 KMPA Direct Pressures

A7.7.1 Unsustainable wildlife hunting and trapping

Unsustainable wildlife hunting and trapping has led to a decrease in the populations of some species. This is a grave concern for the future of biodiversity in the Kanuku Mountains. In the PA, many large mammals, such as Agoutis (*Dasyprocta spp.*), Brocket Deer (*Mazama spp.*) and Peccaries (*Tayassu* and *Pecari spp.*), are hunted for food (Montambault and Missa, 2002). Although little information is available on the impacts of wildlife trade on the population of traded species, it is observed that there have been less frequent sightings of some species that were once abundant. The changing patterns in the use of resources, that is, moving away from the use of traditional methods and practices, are additional sources of pressure. Human-wildlife conflicts, especially with jaguars, pumas and other large carnivores occasionally lead to the culling of these animals to protect cattle and, in some cases, human life.

A7.7.2 Unsustainable fishing practices

Fishing is one of the major sources of income for some communities and fish are an important part of local culture and diet. The intensity of use of the fishing resource is however increasing in response to increasing human populations in the villages, and has led to the depletion of some fish stocks in areas close to the villages, where most villagers fish. In recent times there has also been an increase in the illegal harvest of fish by Brazilians who cross with vehicles into Guyana and harvest resources in large quantities. Additionally, while most traditional methods of resource extraction are sustainable, frequent poisoning of small creeks and ponds can lead to severe depletion of fish and other aquatic life stocks.

A7.7.3 Unsustainable logging

In communities around the KMPA gathering is still the primary source of building materials, as very few villagers can afford to purchase sawn lumber for building, or zinc or other imported materials for roofing. Whether round wood or sawn boards are used, the forest is still the only source for timber. Population growth and demand on the resources from outside of the communities are contributing to increasing pressure on the timber resource within the mountains (CRE Report, 2002). There are no current timber concessions in the KMPA however some communities adjacent to the mountains extract timber from within their titled lands for commercial purposes.

A7.7.4 Forest clearance and land encroachment

The actual physical location of villages, now firmly established in the savannahs around central services such as schools and health posts, has significantly influenced the pattern of farming in the communities. Most lands are continuously replanted, leading to poor production of crops, giving rise to the need for new farms which may be located in the KMPA, or the diversion away from farming to the use of other resources like fishing (CRE Report, 2002).

The situation with ranches is not very different; few pasture improvement techniques have been introduced and as a result, alternative land for grazing is sought after. Fire is used as a management tool in the savannah to improve the growth and palatability of grasses and herbs, however some riverine and forested vegetation close to the savannahs is also frequently burned, destroying critical habitats in the process.

A7.7.5 Mining

The commercial exploitation of mineral resources in the KMPA is not allowed, however there have been expressions of interest in the mineral and hydrocarbon potential of the area. Mining in the Kanuku Mountains will result in pollution in the form of siltation, heavy metals and noise, increased infrastructure development, and associated habitat destruction and degradation. This will negatively impact the ability of the KMPA to achieve its goals (Montambault and Missa, 2002). Mining operations outside of the existing boundaries in the headwaters of the Rewa and Kwitaro Rivers are already negatively impacting water quality and ecosystem health.

A7.8 KMPA Regional Pressures

A7.8.1 Infrastructure development

The construction of the Brazil-Guyana Bridge across the Takutu River and the pending improvement of the Lethem to Linden road corridor will undoubtedly result in increased access to the region and as a consequence, potentially increase resource exploitation. The increased presence in the area of people from varying socio-cultural backgrounds can result in changes in the social structure of village life and have wide-reaching effects on resource use in the Kanukus.

A7.8.2 Immigration and colonization movements

Other socio-economic issues such as unemployment and migration are contributing to the pressures on the KMPA. The lack of employment opportunities in the region leaves little or no alternatives for local community members but to rely on the resource base for both subsistence and cash needs. This is exacerbated by the current transitioning of communities to more cash-based livelihoods. Unemployment also contributes to migration of people, especially youths, from the communities. The migration of youths from the villages is placing pressure on the maintenance of the traditional family and village structure. Youths who migrate do not learn the traditional ways of life and living, and can lose the connection with the land causing them to be less supportive of the traditional use of resources (CRE Report, 2002). In recent years, there has been a high influx of Brazilian immigrants to the region. This phenomenon will contribute to increased population, loss of cultural cohesion, and increased demand for resources in the Kanuku Mountains.

A7.8.3 Improperly managed tourism

While tourism is a viable option for income generation for the communities and the management of the PA, improperly managed tourist access to the area can lead to significant destruction and disturbance of habitats and cultural sites. Although not a significant pressure at the moment, this management plan recognises that this has the potential to increase in the future.

A7.8.4 Hydroelectric dams

The establishment of reservoirs for hydropower generation can impact the PA. Developmental activities of this nature can give rise to habitat disturbance and ecosystem imbalance owing to the creation of large, flooded areas and changes in the natural flow patterns of waterways.

A7.8.5 Climate change

While the establishment of a protected area is a positive step towards mitigation of climate change, it is recognized that climate change has the potential to place pressure on the achievement of the goals of the KMPA. Changes have already been noted with the area experiencing shorter, more intense rainy seasons and hotter temperatures during the dry seasons. This phenomenon, if prolonged, can lead to changes in water quality, loss of biodiversity, low crop productivity and consequently a greater demand for land and other resources from the KMPA (CRE Report, 2002).

APPENDIX 8

A8. SWOT analysis

Strengths • High biodiversity and variety of habitats for many species, and an abundance of natural resources. • Occurrence of species endemic to Guyana and the Kanukus. • High reproductive rate for some species. • Pristine state of watershed and forest, and healthy populations of species. • Large percentage of land within the PA is inaccessible due to the topography of the area, which lends to low use and healthy ecosystems. • Limited habitat destruction in the PA. • Two watersheds (Amazon and Essequibo) and their associated wildlife assemblages, meet in the PA. • Several water sources with high water quality exist in the PA. Water quality maintained by the seasonal cycle. • Occurrence of cultural features and sacred sites. • Standing forests/carbon credits.	**Weaknesses** • Some species are mobile, have migratory seasons, and are vulnerable during breeding seasons. • Size of the watershed, and inaccessibility of area makes it difficult to manage, monitor and enforce rules. • Dredge mines can be easily established along banks. • Insufficient knowledge on resource use and extraction rates. • Absence of baseline data (e.g. water quality, habitat conversion, etc.). • Lack of human, technical and financial resources for management and law enforcement. • Limited job opportunities. • Limited or no infrastructure, tools and equipment. • Insufficient availability of products in marketable quantities, poor access to markets. • Insufficient knowledge about research needs. • Undervaluing of resources and lack of proper benefit-sharing mechanisms. • Lack of awareness (locally, nationally and internationally).
Opportunities • National legislation on protected areas in place. • National-level institution with responsibility for protected areas established. • Approved benefit-sharing policy and regulations in place at the national level. • Some existing legislation, international conventions, and village rules in place that target the harvest and protection of a few species, and guides the use of some resources.	**Threats** • Poor knowledge and implementation of existing national legislation. • Current over-hunting of some species, with the introduction of destructive non-traditional hunting methods. • Hunting of endangered species for food (subsistence hunting). • Over-fishing and poisoning of waterways contributing to species loss. • Habitat destruction and land degradation due to fires, removal of forest and disturbance from tourism activities. • Abuse of traditional use rights leading to resource depletion and degradation. • Increased human population can affect resource use and accessibility.

Opportunities (cont'd)	Threats (cont'd)
• Existing interest in tourism and conservation, as well as funding availability for species protection and conservation. • Interest in research within KMPA and increase of local researchers within communities. • Funding available through Protected Areas Trust Fund donors such as KfW and CI-G • Increased access to funding opportunities (UNESCO, Biosphere Reserve). • Lessons learned would help to improve conservation and management of other areas in Guyana. • Greater sense of community ownership and involvement in KMPA. • Increased awareness of protected areas management and support for the protected area at the community level. • Increased access to income and benefits e.g. PA funding, capacity building. • Development of activities relevant to the PA can contribute to national development.	• Culling of some species due to competition with ranchers, farmers and/or fishermen (perceived as nuisance species). • Burning of riparian forest and clearing of land for agriculture, brick-making, mining and forestry. • Pollution of water due to activities occurring along the banks of rivers (washing of vehicles, brick-making). • Mining, especially along river banks. • Downstream flow of activities occurring outside of the KMPA. • Communities adjacent to the PA leasing land for agriculture, forestry and mining activities can affect the functioning of the PA. • Low agricultural productivity and diversity. • Increased loss of traditional knowledge and language, and cultural change can lead to unsustainable practices (guns, seines, power saws). • Emergence of a monetary culture and new practices can lead to potential additional negative social issues and environmental impacts such as the undervaluing of resources. • Lack of intellectual property rights protection & benefit-sharing mechanisms. • Lack of adequate and sustained funding. • Communication barriers, including lack of information sharing, and language in research reports often too technical. • Land title extensions will reduce the size of the PA and negatively affect achievement of conservation objectives. • Changes in community administration may affect continuity of the PA management. • Other, sometimes conflicting, national priorities (security, petroleum). • Collaborative management new to Guyana, and lack of national and local capacity and expertise.

- Strengths: characteristics of the organisation and its operation that give it an advantage over others.
- Weaknesses: characteristics that place the organisation and its operation at a disadvantage relative to others.
- Opportunities: elements that the organisation could exploit to its advantage.
- Threats: elements in the environment that could cause trouble for the organisation and its operations.

APPENDIX 9

A9. KMPA Logical Framework

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumption
Programme 1: Operations and Adaptive Management				
Goal	**1. To ensure the effective and adaptive management of KMPA, its biodiversity, ecological processes and its resources**	An annual 5% increase in overall METT Scores A stable or positive trend in key game and endangered species' populations from baseline survey, as per species specific monitoring plan A reduction in the % of high threats and increase in "*not applicable*" threats (pressures outlined in METT that are not relevant to the PA)	METT Analysis Conservation Target and Pressure Monitoring (CTPM) annual reports METT Analysis	There remains political and community support for PA management Pressures are tractable
Objectives/ Outcomes	1.1 To manage KMPA using appropriate and effective management structures and systems	An increase of 25% in METT planning, process, outputs and outcome sub categories between baseline (yr1) and yr 5.	METT Analysis	Sufficient funds are available for staff salaries Suitably qualified staff are available Staff turnover remains low

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumption
	1.2 To promote management relevant research and its use for evidence-based decision making	100% of urgent management research needs from research priority list developed in yr 1, carried out or ongoing by 2019 50% of all recommendations/ key findings used for management purposes	Research Database Annual operational plans and reports	Knowledge and best practice is feasible and appropriate for KMPA context
	1.3 To establish an operational and effective KMPA law enforcement unit	100% of operational plan being achieved by yr 3 An annual reduction from baseline in the no., type and extent of illegal activities occurring in the KMPA	Patrol monitoring reports Patrol monitoring reports	There remains support for PA Act, conservation and collaboration by relevant authorities Pressures are tractable There remains a low turnover of ranger staff
	1.4 To improve, promote and understand KMPA's role in climate change resilience, mitigation and adaptation	National Climate Change policies consider the role and importance of the NPAS	National Policies	No national climate change policies are developed

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumption
Outputs / Deliverables	1.1.1 Site level HR needs met and financial needs assessed	50% of staffing needs met by end of yr 2, 100% met by yr 5	Gap between HR list and staffing requirements outlined in PAC strategy document	Government budget allows sufficient number of staff to be hired and trained appropriately
		100% of critical costs met	Gap between budget available versus critical expenditure met	
	1.1.2 Cooperative management and decision making mechanisms established	Site level advisory committee (SLC) established and 1 meeting held per year	Meeting minutes	All stakeholders on SLC are available at once
		2 meetings between KMPA management, PAC HQ staff and SLC per year	Meeting minutes	
	1.1.3 PA management infrastructure and equipment needs met	30% of infrastructure and equipment needs met by end of yr 3; 75% by end yr 5	Infrastructure and equip. needs assessment	Sufficient 3rd party funds are secured
	1.1.4 A conservation target and pressure monitoring (CTPM) programme established and implemented	4 M&E systems and databases (Ranger-based monitoring, community benefits, CTPM, KMPA outputs) developed by yr 3	Annual reports	
	1.1.5 Appropriate administrative and adaptive management systems for managing PA in place	5 annual operation plans, budgets and reports submitted	Plan and reports	
		5 adaptive management meetings held	Meeting minutes	

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumption
	1.2.1 Research priorities identified and actively promoted nationally and internationally	100% of urgent management research needs from priority list being carried out or ongoing 10 international institutions receiving KMPA res. priority list Database functional by end of yr 2	Research database Emails sent	National and international research institutions are willing to collaborate
	1.2.2 Research database and system established to improve feedback to management and access to information for stakeholders	Annual research reports being submitted	PAC records	
	1.2.3 Partnerships with local and international research and educational institutions formalised	2 MoUs for carrying out research in KMPA by end of yr 3 and 5 by end of yr 5rrying out research in KMPA by the end of yr 3 and 5 by end of yr 5	Site records	

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumption
	1.3.1 Law enforcement programme developed and supported by local authorities	1 document on PA law enforcement plan, policy and use regulations developed and agreed by 18 communities and appropriate law enforcement agencies by end of yr 2	PAC_ Kanuku output database	Communities accept Protected areas Act, 2011
		100% of hired rangers patrolling by end of yr 5	RBM reports	There remains a low turnover of rangers
		100% of operational activities being carried out by year 5		
		100% of rangers equipped	Store issue list	
		100% of charges by PAC resulting in appropriate punishments/action by relevant authorities	Court records, law enforcement database	
	1.3.2 Ranger based monitoring programme developed	1 database developed and regular (monthly/annually) reports provide by end of yr 2	Reports	

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumption
	1.4.1 Knowledge of the role of KMPA in climate change increased in stakeholders	Increased knowledge of KMPA's role in climate change in stakeholders from baseline (yr 1) to end of yr 5	KAP survey	
	1.4.2 Tools for montitoring climate change developed	Trends in climate change indicators avilable by yr 5	Annual monitoring reports	
	1.4.3 KMPA climate change adaptation plan developed	1 plan available by yr 3	Technical document	

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumptions
Programme 2: Land Use and Sustainable Natural Resource Management				
Goal	**2. To ensure the sustainable use of natural resources inside KMPA while supporting the development and implementation of land and sustainable resource use plans in local communities**	Levels of resource use not exceeding recommended sustainability levels as per recommendations	CTPM reports	Sustainable levels for the use of individual resources can be determined
Outcomes/ Objectives	2.1 To develop a land use plan for inside KMPA participatively and in accordance with the PA Act and Amerindian Act	1 plan developed by year 3 and agreed by 21 communities	Site records	There is illegal and unsustainable resource use occurring in KMPA
	2.2 To secure community support for the sustainable use of resources inside the KMPA	A reduction in the no., type and extent of illegal activities occurring in KMPA	Patrol reports	
		An improved KAP (Knowledge, Attitude and Practice) score from baseline to year 5 (in PA adjacent communities)	KAP survey	
	2.3 To facilitate customary protection of village resources	A reduction in the no., type and extent of illegal activities occurring in adjacent villages	Community Monitoring records (CM)	Communities are willing to engage in customary protection of their resources

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumptions
Outputs/ Deliverables	2.1.1 Land use plan for KMPA developed	Land use plan agreed between PAC and 21 communities by year 3	PAC_Kanuku outputs database Site records	Communities recognise and support the PA Act
	2.2.1 PA resource use agreements developed in participation with communities	21 agreements (1 per village)	PAC _Kanuku Outputs Database	Communities willing to engage in SNRM activities
	2.2.2 Good relations with communities fostered	An increase in positive attitudes and perceptions of the PA from baseline to year 5 among adjacent communities	KAP surveys	Communities willing to participate in surveys
	2.3.1 The development of land use plans in villages surrounding KMPA supported	Requests for land use planning/resource use and/or implementing those plans are supported by PAC in selected communities	Site records	Requests are approved by PAC
	2.3.2 The development and compliance of resource use-related village rules in communities supported	21 'resource use-related village rules' being implemented		Communities are willing and capacitated to engage in identified opportunities

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumptions
Programme 3: Benefit Sharing and Livelihood Development				
Goal	**3.To enhance and equitably share the direct benefits of KMPA and its resources for and to surrounding communities**	Annual increase in the number of livelihoods derived from KMPA between yr 1 and yr 5 The number of households and villages participating in income generation and livelihood development activities doubled form baseline to year 5	KMPA records Survey, community records	Communities willing and capacitated to engage in identified opportunities
Outcomes/ Objectives	3.1.To increase sustainable livelihood and income generation opportunities available to communities 3.2. To promote the equitable sharing of benefits from KMPA	An increase in total income generated from PAC supported livelihood initiatives between baseline and year 5 A reduction in the number of livelihood initiatives that use KMPA's resources unsustainably An increase from baseline in the number of households and villages participating in income generation and livelihood development activities	Livelihood group records Survey, livelihood group records Survey	Communities willing and capacitated to engage in identified opportunities Communities willing to participate in survey

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumptions
Outputs/ Deliverables	3.1.1 Local communities engaged in temporary and permanent employment from KMPA	AT least 60% of KMPA personnel employed by PAC are from local communities	Staff lists Site records	Communities have required skills and a desire to work for the PA
	3.1.2 Sustainable livelihood opportunities derived from KMPA resources and products developed and supported	3 sustainable livelihoods derived from KMPA are established or enhanced by yr 5 Annual increase in income generated by each PAC supported livelihood initiative from baseline (yr 1 of PAC intervention) to yr 5	Livelihood group reports Annual reports	Communities seek PAC support for livelihood proposals or are willing to engage in new or improved initiatives
	3.2.1 Feasible and best practice benefit sharing models examined and trialled	An increase in the number of households per village, the number of villages and the number of females participating in income generation and livelihood development activities from baseline to year 5	Survey, community records	All villages and females are willing and capacitated to engage in identified opportunities Gender equality is inherent within the cultural context of communities

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumptions
Programme 4: Education, Awareness and Outreach				
Goal	**4. To improve awareness and support of the KMPA, its values and management strategies, locally, nationally and internationally**	Increased knowledge attitudes and perceptions in local and national audiences from baseline (yr 1) to end of yr 5	Surveys	Communities and national cultural perceptions and attitudes can be changed
		An annual increase in the proportion of Guyana's international tourists visiting KMPA	KMPA visitor registration and Ministry of Tourism	International visitor numbers to Guyana are available
		An annual increase in funds available for KMPA management between yr 1 and yr 5	PAC annual budgets and funding sources	
Outcomes/ Objectives	4.1. To increase awareness of the importance of KMPA's biodiversity, resources and management activities in youth and adults from local communities	An increase in KAP scores between baseline and year 5	KAP surveys	Communities willing to participate in surveys
	4.2. To improve awareness of KMPA and its value both nationally and internationally	1 positive national and international media segment on KMPA	Media archives	
	4.3. To ensure KMPA is recognised and supported as a globally important protected area	International listing (e.g. Biosphere reserve) A reduction in the gap between funds needed and funds available for its management between baseline and year 5.	UNESCO listings	KMPA and Guyana meet requirements of international listings

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumptions
Outputs/ Deliverables	4.1.1 Knowledge of KMPA's values, biodiversity and ecosystems and their conservation promoted among school children	An increase in KAP scores between baseline (yr of establishment) and yr 5 in school children where PAC established school nature clubs	KAP survey	Willingness of schools and communities to participate in survey
	4.1.2 Knowledge and awareness of KMPA's values, and the importance of sustainable use and the management strategies employed by KMPA, improved in communities	An increase in KAP scores between yr 1 and yr 5 in communities	KAP survey	
	4.2.1 KMPA promoted by using various media outlets	2 social media platforms developed by yr 2	Media Archives	International and national media are interested in Guyana's protected areas
		1 documentary developed on KMPA by year 5	Media Archives	
		1 positive article a year in international/ national newspapers and/ or TV	Media Archives	
	4.2.2 Visitor experiences improved	2 tourist related booklets by yr 4	PAC_Kanuku output database	
		1 summary booklet of KMPA investment priorities developed by end of year 1 and ready for dissemination		
	4.2.3 Lessons learnt, information and management outputs from KMPA shared	2 Scientific publications, 3 presentations, 2 documents	PAC_Kanuku output database	

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumptions
	4.3.1 International recognition and listing opportunities for KMPA assessed and identified	1 recommendation report	PAC_Kanuku output database	Biosphere reserve listing is a feasible option for KMPA
	4.3.2 Third party funds raised	An increase in the % of PA budget generated from 3rd party funds from baseline to year 5	PAC budgets	

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumptions
Programme 5: Capacity Building				
Goal	**5. To build the capacity of key stakeholders for PA and resource management to achieve KMPA's vision and goals**	An increase in 25%+ in METT scores between baseline and year 5	METT Assessment	Political and community will for KMPA conservation as well as availability of funds
Outcomes/ Objectives	5.1.To improve the capacity of PAC and site level staff for KMPA management	An improvement in capacity scores for all staff from baseline yr. 1 to yr 5.	Capacity assessments	There are clearly defined ToRs for each position
		An improvement in staff performance scores between baseline, mid term and yr 5	Performance appraisals	
	5.2. To improve the capacity of communities for KMPA management, land use and livelihood development	An increase in the number of people, and villages generating income from baselines to year 5	Surveys	
		21 land and resource use plans being implemented	Community records	Communities keeping records of activities and their outputs

Structure	Intervention	Objectively Verifiable Indicators of Achievement	Source and Means of Verification	Assumptions
Outputs/ Deliverables	5.1.1 A PA staff training and capacity needs assessment conducted and implemented	1 training and capacity building plan developed and revised annually for relevant staff 100% of all staff 'urgent' capacity building needs met within first year of employment	Training and capacity assessments Annual reports	Communities willing to engage in income generation activities
	5.1.2 Rangers trained in monitoring and law enforcement systems	100% of rangers participating in law enforcement and monitoring operational plans	Patrol records	
	5.2.1 A capacity building plan for KMCRG members for participation in KMPA collaborative management and decision making developed and implemented	An increase in scores for perceived capacity before and after training	Workshop evaluations	Community willing to sustainably use land and resources in their villages
	5. 2.2 Community capacity built for income generation and livelihood development	An increase in the number of livelihoods associated with KMPA between baseline and year 5	Community/KMPA records	Communities willing to keep records
	5.2.3 Capacity built for effective land management in villages	Trends in resource status in villages stable or increasing as per community monitoring (CM) plan Annual decrease in number, type and extent of illegal activities in villages		Communities engaged in monitoring

APPENDIX 10

A10. Five Year Operational Plan

Programme 1: Operations and Adaptive Management					
Key Activities	**Time frame (Year)**				
Objective 1.1: To manage KMPA using appropriate and effective management structures and systems	**1**	**2**	**3**	**4**	**5**
Output 1.1.1 Site level HR needs met and financial needs assessed					
1.1.1.1 Hire staff as per PAC staffing structure and site level requirements					
1.1.1.2 Carry out management plan costing and secure funds					
Output 1.1.2 Cooperative management and decision making mechanisms established					
1.1.2.1. Identify cooperative management and decision making model for KMPA and establish committee in a participatory manner					
1.1.2.2 Hold regular meetings					
Output 1.1.3 PA management infrastructure and equipment needs met					
1.1.3.1 Carry out infrastructure and equipment needs and cost assessment, and develop site plan					
1.1.3.2 Implement site infrastructure plan and maintain existing infrastructure					
1.1.3.3 Procure and maintain appropriate equipment					
Output 1.1.4 A conservation target and pressure monitoring programme established and implemented					
1.1.4.1 Develop and implement conservation threat and pressure monitoring protocols					
1.1.4.2 Develop and implement feedback and reporting systems					
Output 1.1.5 Appropriate administrative and adaptive management systems for managing PA in place					
1.1.5.1 Conduct appropriate planning, budgeting and reporting using frameworks (log frame, M&E, operational plans)					
1.1.5.2 Develop and implement PA management effectiveness monitoring					
Objective 1.2: To promote management relevant research and its use for evidence-based decision making	1	2	3	4	5
Output 1.2.1 Research priorities identified and actively promoted nationally and internationally					

1.2.1.1 Develop research priorities and disseminate list to relevant institutions					
Output 1.2.2 Research database and system established to improve feedback to management and access to information for stakeholders					
1.2.2.1 Develop administrative systems for researchers and databases to monitor ongoing activities					
1.2.2.2 Make research information and research findings accessible to stakeholders					
Output 1.2.3 Partnerships with local and international research and educational institutions formalised					
1.2.3.1 Ensure research agreements and/or MoUs signed					
Objective 1.3: To establish an operational and effective KMPA law enforcement unit	**1**	**2**	**3**	**4**	**5**
Output 1.3.1 Law enforcement programme developed and supported by local authorities					
1.3.1.1 Develop a law enforcement operational plan					
1.3.1.2 Implement law enforcement operational plan					
Output 1.3.2 Ranger based monitoring programme developed					
1.3.2.1 Develop patrol and law enforcement monitoring protocols					
1.3.2.2 Develop patrol and enforcement feedback system					
Objective 1.4: To understand, improve and promote KMPA's role in climate change resilience, mitigation and adaptation	**1**	**2**	**3**	**4**	**5**
Output 1.4.1 Knowledge of the role of KMPA in climate change increased in stakeholders					
1.4.1.1 Investigate the role of KMPA in climate change resilience					
1.4.1.2 Investigate the impact of climate change on KMPA's ecosystem services					
1.4.1.3 Promote awarenes on KMPA's role in climate change among stakeholders					
Output 1.4.2 Tools for montitoring climate change developed					
1.4.2.1 Implement climate monitoring tools					
1.4.2.2 Investigate indicator species for climate change monitoring					
Output 1.4.3 KMPA climate change adaptation plan developed					
1.4.3.1 Develop threat managment plans for KMPA					
1.4.3.2 Develop KMPA climate change adaptation plan					
Programme 2: Land Use and Sustainable Natural Resource Management					
Objective 2.1: To develop a land use plan for inside KMPA participatively and in accordance with PA Act and Amerindian Act	**1**	**2**	**3**	**4**	**5**
Output 2.1.1 Land use plan for KMPA developed					
2.1.1.1 Understand current land use by key stakeholders					
2.1.1.2 Engage with key stakeholders to develop land use plan for the PA					

Objective 2.2: To secure community support for the sustainable use of resources inside the KMPA	**1**	**2**	**3**	**4**	**5**
Output 2.2.1 PA resource use agreements developed in participation with communities					
2.2.1.1 Engage in community discussion about current and potential resource use					
2.2.1.2 Formalise resource use agreements					
Output 2.2.2 Good relations with communities fostered					
2.2.2.1 Support community led events					
2.2.2.2 Support KMCRG activities					
Objective 2.3: To facilitate customary protection of village resources	**1**	**2**	**3**	**4**	**5**
Output 2.3.1 The development of land use plans in villages surrounding KMPA supported					
2.3.1.1 Understand current village land use plans					
2.3.1.2 Support requests for assistance where feasible					
Output 2.3.2 The development and compliance of resource use-related village rules in communities supported					
2.3.2.1 Facilitate the development of resource use rules					
2.3.2.2 Support community resource protection and monitoring					
Programme 3: Benefit Sharing and Livelihood Development					
Objective 3.1: To increase sustainable livelihood and income generating opportunities available to communities	**1**	**2**	**3**	**4**	**5**
Output 3.1.1 Local communities engaged in temporary and permanent employment in KMPA					
3.1.1.1 Advertise KMPA positions or services required locally					
Output 3.1.2 Sustainable livelihood opportunities derived from KMPA resources and products developed and supported					
3.1.2.1 Establish pilot livelihood initiatives directly related to KMPA					
3.1.2.2 Increase benefits accrued from existing sustainable livelihoods in communities					
Objective 3.2: To promote the equitable sharing of benefits from KMPA	**1**	**2**	**3**	**4**	**5**
Output 3.2.1: Feasible and best practice benefit sharing models examined and trialled					
3.2.1.1 Carry out a review of benefit-sharing models					
3.2.1.2 Write recommendation document for feasible benefit sharing models in KMPA					

Programme 4: Education, Awareness and Outreach					
Objective 4.1: To increase awareness of the importance of KMPA's biodiversity, resources and management activities in youth and adults from local communities	1	2	3	4	5
Output 4.1.1 Knowledge of KMPA's values, biodiversity and ecosystems and their conservation promoted among school children					
4.1.1.1 Develop materials for school groups (posters, brochures, books etc)					
4.1.1.2 Establish school nature groups					
Output 4.1.2 Knowledge and awareness of KMPA's values, the importance of sustainable use, and the management strategies employed by KMPA, improved in communities					
4.1.2.1 Publish materials for raising awareness and providing information about KMPAs management					
4.1.2.2 Publish materials for raising awareness and improving knowledge of KMPAs values and its resources in communities					
4.1.2.3 Run awareness events and sessions in communities					
Objective 4.2: To improve awareness of KMPA and its value both nationally and internationally	1	2	3	4	5
Output 4.2.1 KMPA promoted by using various media outlets					
4.2.1.1 Develop social media for KMPA					
4.2.1.2 Promote KMPA using media					
Output 4.2.2 Visitor experiences improved					
4.2.2.1 Develop tourist infrastructure and signage					
4.2.2.2 Develop publications targeting tourist audiences					
Output 4.2.3 Lessons learnt, information and management outputs from KMPA shared					
4.2.3.1 Write KMPA piece for PAC newsletter					
4.2.3.2 Disseminate scientific publications, relevant management documents and lessons learnt to a wide audience					
Objective 4.3: To ensure KMPA is recognised and supported as a globally important protected area	1	2	3	4	5
Output 4.3.1 International recognition and listing opportunities for KMPA assessed and identified					
4.3.1.1 Examine feasibility of WHS listing					
4.3.1.2 Examine feasibility of Biosphere Reserve listing					
Output 4.3.2 Third party funds raised					
4.3.2.1 Write funding proposals					

Programme 5: Capacity Building					
Objective 5.1: To improve the capacity of PAC and site level staff for KMPA management	1	2	3	4	5
Output 5.1.1 A PA staff training and capacity needs assessment conducted and implemented					
5.1.1.1 Train staff in administrative systems and procedures					
5.1.1.2 Train staff in skills identified in training and capacity needs plan					
Output 5.1.2 Rangers trained in monitoring and law enforcement systems					
5.1.2.1 Train rangers in monitoring data collection methods					
5.1.2.2 Train rangers in law enforcement					
Objective 5.2: To improve the capacity of communities for KMPA management, land use and livelihood development	1	2	3	4	5
Output 5.2.1 A capacity building plan for KMCRG members for participation in KMPA cooperative management and decision making developed and implemented					
5.2.1.1 Develop capacity building plan for KMCRG					
5.2.1.2 Implement capacity building plan for KMCRG					
Output 5.2.2. Community capacity built for income generation and livelihood development					
5.2.2.1 Build capacity for financial management and administration					
5.2.2.2 Build capacity for small business development					
5.2.2.3 Identify and build sustainable livelihood technical skills in communities					
Output 5.2.3. Capacity built for effective land management in villages					
5.2.3.1 Build capacity for community natural resource monitoring and protection					
5.3.3.2 Build capacity for land use planning and plan implementation					
5.3.3.3 Improve knowledge of sustainable levels of resources					

APPENDIX 11

A11. KMPA Management Relevant Research Priorities

Research needs and information required <u>urgently</u> by management in order to implement the KMPA management plan (will be actively promoted by the PAC)	
Theme	**Topic**
Resource use	An assessment of current KMPA resource use by communities
	Sustainable harvest rates for fish
Threats	Impact of mining on water quality and aquatic diversity
Socio-Economics	Socio-economic evaluation of KMPA resources to communities
	Assessment of direct economic benefits to communities
Land Use	Current KMPA land use and land use interests by stakeholders
Communities	Communities knowledge, attitudes and practices of KMPA
Tourism	An assessment of the tourism potential of KMPA
Biodiversity and Ecology	Biodiversity inventories
Research needs and information required <u>as soon as possible</u> by management in order to implement the GMP	
Governance, institutions and processes	An assessment of best practice benefit sharing models
	Feasibility of KMPA as a biosphere reserve
Resource Use	Sustainable harvest rates for game and endangered species
Threats	Impact of mining on aquatic diversity
Socio-Economics	An investigation into conservation compatible livelihoods and their applicability for KMPA communities
Communities	An assessment of the indirect benefits to communities derived from KMPA
Human-wildlife conflict	Human wildlife conflict between KMPA and communities
Other identified research topics	
Socio-economic	Undertake ethno-botanical surveys to determine the use of plants by people, including medicinal plants
Biodiversity and ecology	Investigate Jaguar ecology population trends
Biodiversity and ecology	Investigate Tapir ecology and population trends
Biodiversity and ecology	Investigate the use of Amphibians as indicators of water quality
Biodiversity and ecology	Complete species diversity inventory for KMPA
Biodiversity and ecology	Impact of different land use practices on soil properties
Ecosystem Services	Economic valuation of KMPA's ecosystem services
Climate change	KMPA as climate change monitoring tool

APPENDIX 12

A12. Monitoring Plan

a) KMPA Management Impact: Achieving KMPA MP Goals and Objectives

Baseline Codes: DD = Data Deficient DP = Data in progress
Institutional /department codes: PAC= Protected Areas Commission; SLM= Site level manager; P&M= Planning and Monitoring; E&R=Ecology and Research; CE=Community Engagement; PR&O= Public Relations and Outreach; F= Finance; HR=Human Resources

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution/Depart
Goals						
1. The effective and adaptive management of KMPA, its biodiversity, ecological processeses and its resources	METT Score	5% increase in overall METT score per annum	38%	METT Analysis	Annually	PAC_P&M; KMPA SLM
	Population trends of key species	Populations maintained or increasing as per CTPM plan	DD	as per CTPM plan	as per CTPM plan	KMPA SLM
	Threat levels as per METT	An annual reduction in the % high threats occurring and stable of increasing trend in the % of "not applicable" threats	0% High 50% NA	METT Analysis	Annually	PAC_P&M; KMPA SLM
2. Sustainable land and resource use inside and outside KMPA	Use levels	Use levels are equal or less then the defined sustainable use levels as per SNRM plans	DD	CTPM reports	as per CTPM plan	PAC_CE; KMPA SLM
3. Livelihood opportunities and equitable benefits shared enhanced	Income to communities	An increasing trend in economic benefits to communities from KMPA related activities	DD	Community benefit database	Annually	PAC_CE; KMPA SLM
	The number of households and villages participating in income generation and livelihood activities	No. of households and villages participating in income generation and livelihood activities doubled baseline/yr 5	DD	Community surveys/records	Baseline, end of 5 years	PAC_CE; KMPA SLM

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution/Depart
4. Improved awareness and support of the KMPA, locally, nationally and internationally	KAP Scores	An increase in Knowledge, Attitudes and Perception of KMPA between baseline and yr 5 in local communities	DD	KAP surveys	Baseline, end of 5 years	PAC_CE; KMPA SLM
	Number of visitors	An annual increase in the proportion of International and number of national visitors to Guyana to the PA	DD	Guest registration book/Ministry of tourism	Monthly	PAC_PR&O
	Donor funds available	An increase in PA funds available from Yr1 to Yr 5	GY$ 12,150,000	Donor agreements	Annually	PAC_F
5. Increase capacity in staff and communities for achieving KMPA vision and goals	METT Score	An 25% increase in overall METT scores between baseline and year 5	38%	METT Analysis	Annually	PAC_P&M; KMPA SLM
Attribute / Characteristic / Incentive….	**Indicator**	**Targets**	**Baseline**	**Method of data collection**	**Frequency**	**Responsible institution/Depart**
Objectives						
1. Effective and adaptive management of KMPA						
1.1 To manage KMPA using appropriate and effective management structures and systems	METT Sub scores	An increase in 25% for planning, processes, outputs and outcome METT subscores between yr 1 and yr 5	50%, 33% 33%, 42%	METT Analysis	Annually	PAC_P&M; KMPA SLM
1.2 To promote management relevant research and its use for evidence-based decision making	Conducted research priorities	100% of urgent research priorities carried out or ongoing by yr 5	0%	Research Database	Ongoing	PAC_E&R; KMPA_ SLM
	Percentage research recommendations/findings adopted by management	50% of all relevant recommendations/key findings used for management purposes	0%	Annual reports; management strategic documents	Ongoing	PAC_E&R; KMPA_ SLM
1.3 To establish an operational and effective KMPA law enforcement unit	Patrol area coverage, patrol hours	100% of patrol hours and area covered as per operational plan achieved	0%	Patrol monitoring records	Monthly	KMPA_SLM
	Number, type and extent of illegal activities	An annual reduction in number and extent of illegal activities inside KMPA	DD	Patrol monitoring records	Monthly	KMPA_SLM

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution/Depart
1.4 To improve, promote and understand KMPA's role in climate change resilience, mitigation and adaptation	National Policies	National policies on climate change take NPAS into account	DD	Governement documents	Ongoing	Government documents
2. Sustainable land and resource use inside and outside KMPA						
2.1 To develop a land use plan for inside KMPA participatively and in accordance with PA Act and Amerindian Act	Agreed plan	Plans agreed by 21 communities	0	Site records	Once off	PAC_CE; KMPA SLM
2.2 To secure community support for the sustainable use of resources inside the KMPA	The no. type and extent of pressures	An downward trend in the level of pressures	DD	CTPM reports	as per CTPM plan	PAC_CE; KMPA SLM
	KAP Scores	An increase in positive attitudes towards PA in communities between baseline and yr 5	DD	KAP surveys	Baseline, end of year 5	PAC_CE; KMPA SLM
2.3 To facilitate customary protection of village resources	Number, type and extent of illegal activities	An annual reduction in the no. type and extent of illegal activities in adjacent villages	DD	Community Monitoring (CM) reports	Annually	KMPA Communities
3. Improved livelihood opportunities and equitable benefit sharing mechanisms						
3.1 To increase sustainable livelihood and income generating opportunities available to communities	Income generated by livelihood opportunities	An annual increase in income generated by new livelihood opportunities	DD	Community financial records	Ongoing	KMPA_SLM; KMPA Communities
3.2 To promote the equitable sharing of benefits from KMPA	Number of villages/ households participating in or receiving benefits from PA	Double the number of beneficiary villages and households per village between baseline and year 5	DD	Community surveys	Baseline, end of 5 years	KMPA_SLM; KMPA Communities

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution/Depart
4. An increased awareness of KMPA nationally and internationally						
4.1 To increase awareness of the importance of KMPA's biodiversity, resources and management activities in youth and adults from local communities	KAP Scores	An increase in KAP scores of local and regional stakeholders between baseline and yr 5.	DD	KAP surveys	Baseline, end of 5 years	KMPA_SLM
4.2 To improve awareness of KMPA and its value both nationally and internationally	Number of visitors	An annual increase in the number of national and international visitors	DD	Visitor registration	Annually	PAC_PR&O
	No. of positive media articles	Media products on KMPA	0	Internet searches	Annually	PAC_ PR&O
4.3 To ensure KMPA is recognised and supported as a globally important protected area	International listing	1 international listing by yr 5	0	UNESCO	Once off	PAC_PR&O
	Funds needed versus funds available	A reduction in the gap between funds needed and funds available for KMPA management between yr 1 and yr 5	DP	PAC financial records	Baseline, end of 5 years	PAC_F
5. An increase capacity of staff and communities to achieve KMPA vision and goals						
5.1 To improve the capacity of PAC and site level staff for KMPA management.	Capacity scores	All staff with a score above 75% for skills capacity by year 5	DD	Training and Capacity Needs assessments	Baseline, mid term, 5 years	KMPA_SLM
	Performance scores/ appraisals	An increase in staff performance scores between baseline, mid term review and yr 5	DD	Performance reviews	Annually	KMPA_SLM
5.2 To improve the capacity of communities for KMPA management, land use and livelihood development	Number of people obtaining benefits from KMPA	An increase in the number of people generating income and other benefits from livelihood opportunities from baseline to yr 5.	DD	Community benefit database	Annually	KMPA_SLM
	Land use plans implemented	21 land use plans	0	CM records	Annually	KMPA_SLM; KMPA Communities

b) KMPA GMP Implementation Progress: Achieving GMP Outputs

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution
1. Operations and Adaptive Management Programme						
1.1 KMPA effectively managed using appropriate management structures and systems						
1.1.1a Site level HR needs met	Percentage of positions filled	50% of positions filled by yr 3; 100% by yr 5	0%	HR list	Ongoing	PAC_HR
1.1.1b.Site level financial needs met	Percentage of critical costs met	65% by year 3; 95% by yr 5	DP	Annual budgets	Annually	PAC_F
1.1.2 Cooperative management and decision making mechanisms established	No. of meetings with SLC	1 p.a	0	Meeting minutes	Annually	KMPA_SLM
	No. meetings with KMCRG	2 p.a	1	Meeting minutes	Annually	KMPA_SLM
1.1.3 Infrastructure established and equipment procured	Percentage needs met	75% of needs met by year 5	0	Infrastructure and equipment needs assessment	Annually	KMPA_SLM
1.1.4 Conservation target and pressure monitoring system established	No. datasheets; No. reports	Databases as per monitoring plan; 1 report each year	0	Annual reports	Ongoing	KMPA_SLM
1.1.5 Improve PA management administrative and adaptive management systems	No. Annual plans; No of annual reports	5 plans, 5 reports	0	PAC records	Annually	KMPA_SLM
	No. Databases	4 databases	0	Site records	Ongoing	KMPA_SLM
	No. feedback and management meetings for operational planning	5 meetings	0	Meeting Minutes	Ongoing	KMPA_SLM
1.2 Management relevant research promoted and used for evidence-based decision making						
1.2.1 Research priorities identified and actively promoted nationally and internationally	Percentage of urgent research priorities being carried out	100% by year 5	0%	Research database	Annually	PAC_E&R
	No. of institutions receiving annual priority list	10 per year	0	Emails sent	Annually	PAC_E&R

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution
1.2.2 Research database and system established to improve feedback to management and access to information for stakeholders	SOPs for research in KMPA	1 SoP	0	PAC_KMPA output database	Once off	PAC_E&R
	No. research annual reports	5	0	PAC records	Annually	PAC_E&R
	No. databases	1	0	Database	Once off	PAC_E&R
1.2.3 Partnerships with local and international research and educational institutions formalized	No. of institutions	5	0	MoUs on file	Ongoing	PAC_E&R, KMPA_SLM
1.3 KMPA's law enforcement and monitoring system established						
1.3.1 Law enforcement programme developed and supported by local authorities	Document	1 Plan	0	KMPA files	Once off	KMPA_SLM
	No. of patrol hours, area covered	100% as per operational plan	0%	Patrol monitoring records	Monthly	KMPA_SLM
	No. of ranger outposts	100% of site infrastructure plan	0%	Infrastructure and equipment assessments	Ongoing	KMPA_SLM
	Rangers equipped	100% of equipment needs	0%	Infrastructure and equipment assessments	Ongoing	KMPA_SLM
	No. of rangers hired	100% as per operational plan requirements	0%	Staff lists	Ongoing	KMPA_SLM
	PAC charges versus local authority action	100% of charges resulting in appropriate action by local authorities	0%	Court records, law enforcement database, agency reports	Annually	KMPA_SLM
1.3.2 Plan and feedback systems for monitoring illegal and managed activities, developed	Database	1 Database	0	Database	Once off	KMPA_SLM
	Patrol and law enforcement monitoring system developed	1 system/SoPs	0	Patrol monitoring records	Monthly	KMPA_SLM
	Patrol and law enforcement monitoring reports	1 report per month	0	Patrol monitoring records	Monthly	KMPA_SLM

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution
1.4 To understand, promote and improve KMPA's role in climate change resilience, mitigation and adaptation						
1.4.1 Knowledge of the role of KMPA in climate change increased in stakeholders	KAP score	An increase in scores between yr 1 and yr 5	DD	KAP survey	Baseline, end of yr 5	PAC_ER
1.4.2 Tools for montitoring climate change developed	Plan	1 Plan	0	PAC_database	Once off	PAC_ER
1.4.3 KMPA climate change adaptation plan developed	Plan	1 Plan	0	PAC_database	Once off	PAC_ER
2. Land Use and Sustainable Natural Resource Management Programme						
2.1 To develop a land use plan for inside KMPA participatively and in accordance with PAC and Amerindian Acts						
2.1.1 Agreed land use plan developed	1 plan agreed	21 communities signed document	0	KMPA files	Once off	KMPA_SLM
2.2 To secure community support for the sustainable use of resources inside the KMPA						
2.2.1 Resource use agreements developed in participation with communities	No. of signed agreements	21 communities	0	Community records	Annually	PAC_CE
2.2.2 Good relations with communities fostered	KAP score	An increase in attitudes and perceptions of PA from baseline to yr 5	DD	KAP survey	Baseline, end of yr 5	KMPA_SLM Communities
2.3 To facilitate customary protection of village resources						
2.3.1 Land use plan development in communities supported	Support requested versus support provided	100% of feasible requests supported	DD	Community benefit database	Ongoing	KMPA_SLM
2.3.2 Development and compliance of customary resource use agreements supported	Support requested versus support provided	100% of feasible requests supported	DD	Community benefit database	Ongoing	KMPA_SLM

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution
3. Benefit Sharing and Livelihood Development Programme						
3.1. To increase sustainable livelihood and income generation opportunities to communities						
3.1.1 Local communities engaged in temporary and permanent employment from KMPA	Percentage local people employed	60% of staff are local	NA	Site and community records	Baseline and yr 5	PAC_HR
	Percentage temporary contracts with local people/ businesses	70% of temporary contracts with local people/ businesses	NA	Site and community records	Baseline and yr 6	KMPA; KMPA communities
3.1.2 Sustainable livelihood opportunities derived from KMPA resources and products developed and supported	Income generated	An annual increase in the income being generated by each livelihood initiative	DD	Community records	Annually	KMPA; KMPA communities
3.2. To promote the equitable sharing of benefits from KMPA						
3.2.1 Best practice benefit sharing models examined and trialed	No. of households and villages deriving benefits	An increase in number of households and number of villages deriving benefits from KMPA between baseline and end of yr 5	DD	Community benefit database	Once off	PAC_CE

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution
4. Education, Awareness and Outreach Programme						
4.1 To increase awareness of the importance of KMPA, its values, resources and management activities in youth and adults from local communities						
4.1.1 Knowledge and awareness of KMPAs values, biodiversity and ecosystem conservation promoted among school children	Printed materials disseminated	1 brochure, 2 thematic posters, stickers and 1 school book developed by yr 5	0	PAC_KMPA output database	Ongoing	KMPA_SLM
	School nature clubs established	40% of local schools with established nature clubs	0%	School records	Ongoing	KMPA_SLM
4.1.2 Knowledge and awareness of KMPAs importance, the importance of sustainable use and management strategies used by KMPA improved in communities	Booklets	2 management information booklets developed and disseminated by yr 5	1	PAC_KMPA output database	Ongoing	KMPA_SLM
	Brochures	2 thematic brochures developed and disseminated by yr 5	0	PAC_KMPA output database	Ongoing	KMPA_SLM
4.2 To improve awareness of KMPA and its value both nationally and internationally						
4.2.1 KMPA promoted using various media (e.g. facebook, website, radio, TV, etc.).	Social media	1 website and 1 facebook page developed by year 3	0	Internet	Annually	PAC_PR&O
	Documentary	1 documentary produced by year 4	0	Film available	Once off	PAC_PR&O
4.2.2 Information materials and signs for tourism related audiences developed	Articles	5 positive articles about KMPA in national and/or international newspapers/radio/TV by year 5	1	Media Archives	Ongoing	PAC_PR&O
4.2.3 KMPA lessons learnt, information and outputs shared	Scientific publications	2 by yr 5	0	PAC_KMPA output database	Ongoing	PAC_PR&O
	Presentations	3 by yr 5	1	PAC_KMPA output database	Ongoing	PAC_PR&O
	Documents	2 by yr 5	0	PAC_KMPA output database	Ongoing	PAC_PR&O
4.3 To ensure KMPA is recognised and supported as a globally important PA						
4.3.1 KMPA listing options identified	Report	1 Report	0	PAC_KMPA Output database	Once off	PAC_PR&O

Attribute / Characteristic / Incentive….	Indicator	Targets	Baseline	Method of data collection	Frequency	Responsible institution
4.3.2 3 3rd party funds raised	GY$	An increase in 3rd party funds available - baseline to yr 5	GY$ 12,150,000	PAC financial records	Once off	PAC_F
5. Capacity Building Programme						
5.1. To increase staff capacity to support KMPA management						
5.1.1 Staff training and capacity needs assessment carried out and plan developed	Plan	1 training and capacity needs plan for KMPA staff per year	0	Training and capacity needs assessments	Annually	PAC_HR
5.1.2. Staff training and capacity building plan implemented	Percentage capacity needs met	100% of urgent priority capacity needs met for all staff within 1 yr of employment, and high priority needs within 2 years of employment	NA	Training and capacity needs assessment scores	Baseline, mid term, year 5	PAC_HR
5.1.3 Rangers trained in monitoring and law enforcement systems	Percentage of rangers	100% of rangers participating in law enforcement and monitoring operational plans	NA	Patrol Plan, CTMP	Annually	KMPA_SLM
5.2 To increase community capacity to effectively participate in and benefit from KMPA and its goals						
5.2.1 Capacity built in KMCRG members for cooperative management and decision making	Capacity assessment	An increase in perceived capacity before and after training workshops	NA	Workshop evaluations	Once off	PAC-CE
5.2.2 Community capacity for income generation built	No. of livelihoods	An annual increase in the number of livelihood types	DD	Community records	Annually	KMPA_SLM; PAC_CE
	Income generated	An annual increase in the income being generated by each livelihood initiative	DD	Community records	Annually	KMPA_SLM
5.2.3 Capacity built for effective land management in villages	Percentage communities with land use plans monitoring resource use and illegal use	100% of land use plans	0%	Community records	Ongoing	KMPA_SLM; KMPA Communities
	Resource status trends	A stable or increasing trend in resource status (as per CM plan)	DD	CM reports	Annually	KMPA_; KMPA communities
	No. type and extent of illegal activities	An annual decrease in the number, type and extent of illegal activities occurring in villages	DD	CM reports	Annually	KMPA_SLM KMPA communities

c) KMPA Baseline METT Assessment: THREATS

All relevant existing threats were considered either of high, medium or low significance. Threats ranked as high significance are those which are seriously degrading values; medium are those threats having some negative impact and those characterised as low are threats which are present but not seriously impacting values or N/A where the threat is not present or not applicable in the KMPA.

1. Residential and commercial development within a protected area
Threats from human settlements or other non-agricultural land uses with a substantial footprint

High	Medium	Low	N/A	
		X		1.1 Housing and settlement
			X	1.2 Commercial and industrial areas
		X		1.3 Tourism and recreation infrastructure

2. Agriculture and aquaculture within a protected area
Threats from farming and grazing as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture

High	Medium	Low	N/A	
		X		2.1 Annual and perennial non-timber crop cultivation
		X		2.1a Drug cultivation
			X	2.2 Wood and pulp plantations
		X		2.3 Livestock farming and grazing
			X	2.4 Marine and freshwater aquaculture

3. Energy production and mining within a protected area
Threats from production of non-biological resources

High	Medium	Low	N/A	
			X	3.1 Oil and gas drilling
		X		3.2 Mining and quarrying
			X	3.3 Energy generation, including from hydropower dams

4. Transportation and service corridors within a protected area
Threats from long narrow transport corridors and the vehicles that use them including associated wildlife mortality

High	Medium	Low	N/A	
		X		4.1 Roads and railroads (include road-killed animals)
			X	4.2 Utility and service lines (e.g. electricity cables, telephone lines,)
			X	4.3 Shipping lanes and canals

5. Biological resource use and harm within a protected area
Threats from consumptive use of "wild" biological resources including both deliberate and unintentional harvesting effects; also persecution or control of specific species (note this includes hunting and killing of animals)

High	Medium	Low	N/A	
		X		5.1 Hunting, killing and collecting terrestrial animals (including killing of animals as a result of human/wildlife conflict)
		X		5.2 Gathering terrestrial plants or plant products (non-timber)
		X		5.3 Logging and wood harvesting
	X			5.4 Fishing, killing and harvesting aquatic resources

6. Human intrusions and disturbance within a protected area

Threats from human activities that alter, destroy or disturb habitats and species associated with non- consumptive uses of biological resources

High	Medium	Low	N/A	
		X		6.1 Recreational activities and tourism
			X	6.2 War, civil unrest and military exercises
		X		6.3 Research, education and other work-related activities in protected areas
			X	6.4 Activities of protected area managers (e.g. construction or vehicle use, artificial watering points and dams)
			X	6.5 Deliberate vandalism, destructive activities or threats to protected area staff and visitors

7. Natural system modifications

Threats from other actions that convert or degrade habitat or change the way the ecosystem functions

High	Medium	Low	N/A	
		X		7.1 Fire and fire suppression (including arson)
			X	7.2 Dams, hydrological modification and water management/use
			X	7.3a Increased fragmentation within protected area
			X	7.3b Isolation from other natural habitat (e.g. deforestation, dams without effective aquatic wildlife passages)
		X		7.3c Other 'edge effects' on park values
		X		7.3d Loss of keystone species (e.g. top predators, pollinators etc)

8. Invasive and other problematic species and genes

Threats from terrestrial and aquatic non-native and native plants, animals, pathogens/microbes or genetic materials that have or are predicted to have harmful effects on biodiversity following introduction, spread and/or increase

High	Medium	Low	N/A	
			X	8.1 Invasive non-native/alien plants (weeds)
		X		8.1a Invasive non-native/alien animals
		X		8.1b Pathogens (non-native or native but creating new/increased problems)
		X		8.2 Introduced genetic material (e.g. genetically modified organisms)

9. Pollution entering or generated within protected area

Threats from introduction of exotic and/or excess materials or energy from point and non-point sources

High	Medium	Low	N/A	
			X	9.1 Household sewage and urban waste water
			X	9.1a Sewage and waste water from protected area facilities (e.g. toilets, hotels etc)
		X		9.2 Industrial, mining and military effluents and discharges (e.g. poor water quality discharge from dams, e.g. unnatural temperatures, de-oxygenated, other pollution)
			X	9.3 Agricultural and forestry effluents (e.g. excess fertilizers or pesticides)
			X	9.4 Garbage and solid waste
			X	9.5 Air-borne pollutants
			X	9.6 Excess energy (e.g. heat pollution, lights etc)

10. Geological events

Geological events may be part of natural disturbance regimes in many ecosystems. But they can be a threat if a species or habitat is damaged and has lost its resilience and is vulnerable to disturbance. Management capacity to respond to some of these changes may be limited.

High	Medium	Low	N/A	
			X	10.1 Volcanoes
			X	10.2 Earthquakes/Tsunamis
		X		10.3 Avalanches/ Landslides
		X		10.4 Erosion and siltation/ deposition (e.g. shoreline or riverbed changes)

11. Climate change and severe weather

Threats from long-term climatic changes that may be linked to global warming and other severe climatic/weather events outside of the natural range of variation

High	Medium	Low	N/A	
		X		11.1 Habitat shifting and alteration
	X			11.2 Droughts
			X	11.3 Temperature extremes

12. Specific cultural and social threats

High	Medium	Low	N/A	
	X			12.1 Loss of cultural links, traditional knowledge and/or management practices
			X	12.2 Natural deterioration of important cultural site values
			X	12.3 Destruction of cultural heritage buildings, gardens, sites etc.

d) KMPA Baseline METT Assessment

Issue	Criteria	Score	Next steps
1. Legal status Does the protected area have legal status? *Context*	The protected area is not gazetted	0	Presidential decree but without boundaries Map to be prepared
	The government has agreed that the protected area should be gazetted but the process has not yet begun	1	
	The protected area is in the process of being gazetted but the process is still incomplete	**2**	
	The protected area has been legally gazetted (or in the case of private reserves is owned by a trust or similar)	3	
2. Protected area regulations Are inappropriate land uses and activities (e.g. poaching) controlled? *Context*	There are no mechanisms for controlling inappropriate land use and activities in the protected area	0	Lack of inter-agency cooperation
	Mechanisms for controlling inappropriate land use and activities in the protected area exist but there are major problems in implementing them effectively	**1**	
	Mechanisms for controlling inappropriate land use and activities in the protected area exist but there are some problems in effectively implementing them	2	
	Mechanisms for controlling inappropriate land use and activities in the protected area exist and are being effectively implemented	3	
3. Law enforcement Can staff enforce protected area rules well enough? *Context*	The staff have no effective capacity/resources to enforce protected area legislation and regulations	**0**	There are currently no site level staff in place
	There are major deficiencies in staff capacity/resources to enforce protected area legislation and regulations (e.g. lack of skills, no patrol budget)	1	
	The staff have acceptable capacity/resources to enforce protected area legislation and regulations but some deficiencies remain	2	
	The staff have excellent capacity/resources to enforce protected area legislation and regulations	3	
4. Protected area objectives Have objectives been agreed? *Planning*	No firm objectives have been agreed for the protected area	0	
	The protected area has agreed objectives, but is not managed according to these objectives	1	
	The protected area has agreed objectives, but these are only partially implemented	**2**	
	The protected area has agreed objectives and is managed to meet these objectives	3	

5. Protected area design Does the protected area need enlarging, corridors etc to meet its objectives? *Planning*	Inadequacies in design mean achieving the protected areas major management objectives of the protected area is impossible	0	
	Inadequacies in design mean that achievement of major objectives are constrained to some extent	1	
	Design is not significantly constraining achievement of major objectives, but could be improved	**2**	
	Reserve design features are particularly aiding achievement of major objectives of the protected area	3	
6. Protected area boundary demarcation Is the boundary known and demarcated? *Context*	The boundary of the protected area is not known by the management authority or local residents/neighbouring land users	0	
	The boundary of the protected area is known by the management authority but is not known by local residents/neighbouring land users	1	
	The boundary of the protected area is known by both the management authority and local residents but is not appropriately demarcated	**2**	
	The boundary of the protected area is known by the management authority and local residents and is appropriately demarcated	3	
7. Management plan Is there a management plan and is it being implemented? *Planning*	There is no management plan for the protected area	0	
	A management plan is being prepared or has been prepared but is not being implemented	1	
	An approved management plan exists but it is only being partially implemented because of funding constraints or other problems	**2**	
	An approved management plan exists and is being implemented	3	
Additional points *Planning*	The planning process allows adequate opportunity for key stakeholders to influence the management plan	**+1**	
	There is an established schedule and process for periodic review and updating of the management plan	**+1**	
	The results of monitoring, research and evaluation are routinely incorporated into planning	+1	

8. Regular work plan Is there an annual work plan? *Planning/Outputs*	No regular work plan exists	0	
	A regular work plan exists but activities are not monitored against the plan's targets	1	
	A regular work plan exists and actions are monitored against the plan's targets, but many activities are not completed	**2**	
	A regular work plan exists, actions are monitored against the plan's targets and most or all prescribed activities are completed	3	
9. Resource inventory Do you have enough information to manage the area? *Context*	There is little or no information available on the critical habitats, species and cultural values of the protected area	0	
	Information on the critical habitats, species and cultural values of the protected area is not sufficient to support planning and decision making	**1**	
	Information on the critical habitats, species and cultural values of the protected area is sufficient for key areas of planning/decision making but the necessary survey work is not being maintained	2	
	Information concerning on the critical habitats, species and cultural values of the protected area is sufficient to support planning and decision making and is being maintained	3	
10. Research Is there a programme of management-orientated survey and research work? *Inputs*	There is no survey or research work taking place in the protected area	0	
	There is some *ad hoc* survey and research work	**1**	
	There is considerable survey and research work but it is not directed towards the needs of protected area management	2	
	There is a comprehensive, integrated programme of survey and research work, which is relevant to management needs	3	
11. Resource management Is the protected area adequately managed (e.g. for fire, invasive species, poaching)? *Process*	Requirements for active management of critical ecosystems, species and cultural values have not been assessed	**0**	
	Requirements for active management of critical ecosystems, species and cultural values are known but are not being addressed	1	
	Requirements for active management of critical ecosystems, species and cultural values are only being partially addressed	2	
	Requirements for active management of critical ecosystems, species and cultural values are being substantially or fully addressed	3	

12. Staff numbers Are there enough people employed to manage the protected area? *Inputs*	There are no staff	**0**	
	Staff numbers are inadequate for critical management activities	1	
	Staff numbers are below optimum level for critical management activities	2	
	Staff numbers are adequate for the management needs of the site	3	
13. Personnel management Are the staff managed well enough? *Process*	Problems with personnel management constrain the achievement of major management objectives	0	Not applicable-No staff
	Problems with personnel management partially constrain the achievement of major management objectives	1	
	Personnel management is adequate to the achievement of major management objectives but could be improved	2	
	Personnel management is excellent and aids the achievement major management objectives	3	
14. Staff training Is there enough training for staff? *Inputs/Process*	Staff are untrained	0	Not applicable-No staff
	Staff training and skills are low relative to the needs of the protected area	1	
	Staff training and skills are adequate, but could be further improved to fully achieve the objectives of management	2	
	Staff training and skills are in tune with the management needs of the protected area, and with anticipated future needs	3	
15. Current budget Is the current budget sufficient? *Inputs*	There is no budget for the protected area	0	
	The available budget is inadequate for basic management needs and presents a serious constraint to the capacity to manage	**1**	
	The available budget is acceptable, but could be further improved to fully achieve effective management	2	
	The available budget is sufficient and meets the full management needs of the protected area	3	

16. Security of budget Is the budget secure? *Inputs*	There is no secure budget for the protected area and management is wholly reliant on outside or year by year funding	**0**	
	There is very little secure budget and the protected area could not function adequately without outside funding	1	
	There is a reasonably secure core budget for the protected area but many innovations and initiatives are reliant on outside funding	2	
	There is a secure budget for the protected area and its management needs on a multi-year cycle	3	
17. Management of budget Is the budget managed to meet critical management needs? *Process*	Budget management is poor and significantly undermines effectiveness	0	
	Budget management is poor and constrains effectiveness	1	
	Budget management is adequate but could be improved	**2**	
	Budget management is excellent and aids effectiveness	3	
18. Equipment Is equipment adequately maintained? *Process*	There is little or no equipment and facilities	0	
	There is some equipment and facilities but these are wholly inadequate	**1**	
	There is equipment and facilities, but still some major gaps that constrain management	2	
	There is adequate equipment and facilities	3	
19. Maintenance of equipment Is equipment adequately maintained? *Process*	There is little or no maintenance of equipment and facilities	**0**	
	There is some *ad hoc* maintenance of equipment and facilities	1	
	There is maintenance of equipment and facilities, but there are some important gaps in maintenance	2	
	Equipment and facilities are well maintained	3	

20. Education and awareness programme Is there a planned education programme? *Process*	There is no education and awareness programme	0	
	There is a limited and *ad hoc* education and awareness programme, but no overall planning for this	1	
	There is a planned education and awareness programme but there are still serious gaps	**2**	
	There is a planned and effective education and awareness programme fully linked to the objectives and needs of the protected area	3	
21. State and commercial neighbours Is there co-operation with adjacent land users? *Process*	There is no contact between managers and neighbouring official or corporate land users	0	Not applicable
	There is limited contact between managers and neighbouring official or corporate land users	1	
	There is regular contact between managers and neighbouring official or corporate land users, but only limited co-operation	2	
	There is regular contact between managers and neighbouring official or corporate land users, and substantial co-operation on management	3	
22. Indigenous people Do indigenous and traditional peoples resident or regularly using the PA have input to management decisions? *Process*	Indigenous and traditional peoples have no input into decisions relating to the management of the protected area	0	
	Indigenous and traditional peoples have some input into discussions relating to management but no direct involvement in the resulting decisions	1	
	Indigenous and traditional peoples directly contribute to some decisions relating to management	**2**	
	Indigenous and traditional peoples directly participate in making decisions relating to management	3	
23. Local communities Do local communities resident or near the protected area have input to management decisions? *Process*	Local communities have no input into decisions relating to the management of the protected area	0	
	Local communities have some input into discussions relating to management but no direct involvement in the resulting decisions	**1**	
	Local communities directly contribute to some decisions relating to management	2	
	Local communities directly participate in making decisions relating to management	3	
Additional points *Outputs*	There is open communication and trust between local stakeholders and protected area managers	**+1 (0.5)**	
	Programmes to enhance local community welfare, while conserving protected area resources, are being implemented	**+1**	

24. Visitor facilities Are visitor facilities (for tourists, pilgrims etc) good enough? *Outputs*	There are no visitor facilities and services	**0**	
	Visitor facilities and services are inappropriate for current levels of visitation or are under construction	1	
	Visitor facilities and services are adequate for current levels of visitation but could be improved	2	
	Visitor facilities and services are excellent for current levels of visitation	3	
25. Commercial tourism Do commercial tour operators contribute to protected area management? *Process*	There is little or no contact between managers and tourism operators using the protected area	**0**	
	There is contact between managers and tourism operators but this is largely confined to administrative or regulatory matters	1	
	There is limited co-operation between managers and tourism operators to enhance visitor experiences and maintain protected area values	2	
	There is excellent co-operation between managers and tourism operators to enhance visitor experiences, protect values and resolve conflicts	3	
26. Fees If fees (tourism, fines) are applied, do they help protected area management? *Outputs*	Although fees are theoretically applied, they are not collected	0	Not applicable- no fees
	The fee is collected, but it goes straight to central government and is not returned to the protected area or its environs	1	
	The fee is collected, but is disbursed to the local authority rather than the protected area	2	
	There is a fee for visiting the protected area that helps to support this and/or other protected areas	3	
27. Condition assessment Is the protected area being managed consistent to its objectives? *Outcomes*	Important biodiversity, ecological and cultural values are being severely degraded	0	
	Some biodiversity, ecological and cultural values are being severely degraded	1	
	Some biodiversity, ecological and cultural values are being partially degraded but the most important values have not been significantly impacted	2	
	Biodiversity, ecological and cultural values are predominantly intact	**3**	
Additional points *Outputs*	There are active programmes for restoration of degraded areas within the protected area and/ or the protected area buffer zone	+1	

28. Access assessment Are the available management mechanisms working to control access or use? *Outcomes*	Protection systems (patrols, permits etc) are ineffective in controlling access or use of the reserve in accordance with designated objectives	0	Not applicable- no staff
	Protection systems are only partially effective in controlling access or use of the reserve in accordance with designated objectives	1	
	Protection systems are moderately effective in controlling access or use of the reserve in accordance with designated objectives	2	
	Protection systems are largely or wholly effective in controlling access or use of the reserve in accordance with designated objectives	3	
29. Economic benefit assessment Is the protected area providing economic benefits to local communities? *Outcomes*	The existence of the protected area has reduced the options for economic development of the local communities	0	
	The existence of the protected area has neither damaged nor benefited the local economy	1	
	There is some flow of economic benefits to local communities from the existence of the protected area but this is of minor significance to the regional economy	**2**	
	There is a significant or major flow of economic benefits to local communities from activities in and around the protected area (e.g. employment of locals, locally operated commercial tours etc)	3	
30. Monitoring and evaluation *Planning/Process*	There is no monitoring and evaluation in the protected area	0	
	There is some *ad hoc* monitoring and evaluation, but no overall strategy and/or no regular collection of results	**1**	
	There is an agreed and implemented monitoring and evaluation system but results are not systematically used for management	2	
	A good monitoring and evaluation system exists, is well implemented and used in adaptive management	3	
TOTAL SCORE		**35/92 (38%)**	

APPENDIX 13

A13. Detailed Estimates for Implementation of KMPA Management Costs

a) Capital Costs

			2015		2016		2017		2018		2019		
	Unit	Unit Cost	Amt	Cost	Amt	Cost	Amt	Cost	Amt	Cost	Amt	Cost	Total
Infrastructure				-		94,000,000		25,000,000		5,000,000		5,000,000	129,000,000
Administrative Office	Each	40,000,000		-	1	40,000,000		-		-		-	
Ranger Stations	Each	20,000,000		-	2	40,000,000	1	20,000,000		-		-	
Ranger Outposts	Each	3,000,000		-	3	9,000,000		-		-		-	
Trails and Bridges	km	1,000,000		-	5	5,000,000	5	5,000,000	5	5,000,000	5	5,000,000	
Transportation				1,500,000		11,000,000		3,500,000		7,000,000		-	23,000,000
Vehicle	Each	7,000,000		-	1	7,000,000		-	1	7,000,000		-	
Motorcycle	Each	1,500,000	1	1,500,000		-	1	1,500,000		-		-	
Boat and Engine	Each	2,000,000		-	2	4,000,000	1	2,000,000		-		-	
Office Equipment				580,000		3,430,000		700,000		600,000		-	5,310,000
Computers	Each	400,000	1	400,000	5	2,000,000	1	400,000	1	400,000		-	
Photocopier	Each	500,000		-	1	500,000		-		-		-	
Printer	Each	100,000	1	100,000	2	200,000	1	100,000		-		-	
Scanner	Each	30,000		-	1	30,000		-		-		-	
Networking	Each	100,000		-	1	100,000		-		-		-	
Desk	Each	60,000	1	60,000	5	300,000	1	60,000	1	60,000		-	
Seating	Each	20,000	1	20,000	10	200,000	2	40,000	2	40,000		-	
Misc	Each	100,000			1	100,000	1	100,000	1	100,000		-	
Communication Equipment				-		7,846,000		2,500,000		-		-	10,346,000
Telephone	Each	6,000		-	1	6,000		-		-		-	
Fax machine	Each	40,000		-	1	40,000		-		-		-	
Internet (Satellite)	Each	600,000		-	3	1,800,000		-		-		-	
Radio (complete with Antenna)	Each	1,000,000		-	3	3,000,000	1	1,000,000		-		-	
Mobile Radios	Each	750,000		-	4	3,000,000	2	1,500,000		-		-	
Field Equipment				-		1,400,000		800,000		-		-	2,200,000
GPS Recievers	Each	50,000		-	4	200,000	2	100,000		-		-	
Ranger Kits	Each	100,000		-	4	400,000	2	200,000		-		-	
Handheld Radios	Each	150,000		-	4	600,000	2	300,000		-		-	
Digital Camera	Each	100,000		-	2	200,000	2	200,000		-		-	
Power Generation				-		6,750,000		2,250,000		-		-	9,000,000
Photovoltaic	Each	2,000,000		-	3	6,000,000	1	2,000,000		-		-	
Generator	Each	250,000		-	3	750,000	1	250,000		-		-	
		TOTAL (G$)		2,080,000		124,426,000		34,750,000		12,600,000		5,000,000	178,856,000

b) Recurrent Costs

			2015		2016		2017		2018		2019		
	Unit	Unit Cost	Amt	Cost	Amt	Cost	Amt	Cost	Amt	Cost	Amt	Cost	Total
Human Resource				**2,754,000**		**5,508,000**		**10,206,000**		**10,206,000**		**10,206,000**	**38,880,000**
Salaries													
Site Level Manager (1)	Prsn/Mths	170,000	12	2,040,000	12	2,040,000	12	2,040,000	12	2,040,000	12	2,040,000	
Rangers (6)	Prsn/Mths	60,000		-	24	1,440,000	72	4,320,000	72	4,320,000	72	4,320,000	
Support Staff (2)	Prsn/Mths	50,000		-	12	600,000	24	1,200,000	24	1,200,000	24	1,200,000	
	Prsn/Mths			-		-		-		-		-	
	Prsn/Mths			-		-		-		-		-	
		Sub-Total		*2,040,000*		*4,080,000*		*7,560,000*		*7,560,000*		*7,560,000*	
Fringe Benefits (35% of Salaries)													
Site Level Manager (1)	Months	59,500	12	714,000	12	714,000	12	714,000	12	714,000	12	714,000	
Rangers (6)	Months	21,000	-	-	24	504,000	72	1,512,000	72	1,512,000	72	1,512,000	
Support Staff (2)	Months	17,500	-	-	12	210,000	24	420,000	24	420,000	24	420,000	
	Months	-	-	-	-	-	-	-	-	-	-	-	
	Months	-	-	-	-	-	-	-	-	-	-	-	
		Sub-Total		*714,000*		*1,428,000*		*2,646,000*		*2,646,000*		*2,646,000*	
Services				**240,000**		**940,000**		**1,540,000**		**1,540,000**		**1,540,000**	**5,800,000**
Telephone	Month	10,000	12	120,000	12	120,000	12	120,000	12	120,000	12	120,000	
Internet (Satellite)	Month	100,000		-	6	600,000	12	1,200,000	12	1,200,000	12	1,200,000	
Cleaning	Month	25,000		-		-		-		-		-	
Radio	Year	100,000		-	1	100,000	1	100,000	1	100,000	1	100,000	
Electricity	Month	10,000	12	120,000	12	120,000	12	120,000	12	120,000	12	120,000	
Office and Meetings				**1,900,000**		**2,650,000**		**3,775,000**		**2,275,000**		**2,275,000**	**12,875,000**
Stationery	Month	25,000	1	25,000	1	25,000	1	25,000	1	25,000	1	25,000	
Meetings	Each	75,000	25	1,875,000	35	2,625,000	50	3,750,000	30	2,250,000	30	2,250,000	
Travel				**765,000**		**945,000**		**1,020,000**		**1,140,000**		**1,140,000**	**5,010,000**
Fuel and Lubricants	Liters	300	150	45,000	750	225,000	1,000	300,000	1,400	420,000	1,400	420,000	
Air travel (local)	Trips	60,000	6	360,000	6	360,000	6	360,000	6	360,000	6	360,000	
Accommodation and Meals	Trips	20,000	18	360,000	18	360,000	18	360,000	18	360,000	18	360,000	
Contractual				**-**		**-**		**-**		**-**		**-**	**-**
Consultancies	Prsn/Mths	500,000		-		-		-		-		-	
Infras. & Equip. Maintenance				**416,000**		**13,718,667**		**18,543,267**		**20,563,267**		**21,063,267**	**74,304,467**
Infrastructure	Year			-		9,400,000		11,900,000		12,400,000		12,900,000	
Transportation Equipment	Year			300,000		2,500,000		3,200,000		4,600,000		4,600,000	
Office Equipment	Year			116,000		802,000		942,000		1,062,000		1,062,000	
Communication Equipment	Year			-		-		1,034,600		1,034,600		1,034,600	
Field Equipment	Year			-		466,667		733,333		733,333		733,333	
Power Generation Equipment	Year			-		550,000		733,333		733,333		733,333	
		TOTAL (G$)		**6,075,000**		**23,761,667**		**35,084,267**		**35,724,267**		**36,224,267**	**136,869,467**

APPENDIX 14

A14. Species Lists for the Kanuku Mountains Area

A.14.1 Fish

Acestrorhynchus falcirostris		*Characidium hasemani*	
Acestrorhynchus guianensis		*Characidium pellucidum*	
Aequidens tetramerus		*Characidium zebra*	
Ageneiosus inermis		*Charax gibbosus*	
Anablepsoides stagnatus		*Cichla ocellaris*	
Ancistrus hoplogenys		*Cichla temensis*	
Ancistrus sp.		*Colomesus asellus*	
Ancistrus sp. net		*Colossoma bidens*	
Anostomus ternetzi		*Corydoras blochi*	
Aphantorulus emarginatus		*Corydoras bondi bondi*	
Aphyocharax erythrurus		*Corydoras melanistius*	
Aphyodite grammica		*Crenicichla alta*	
Apistogramma cf. ortmanni		*Crenicichla johanna*	
Apistogramma steindachneri		*Crenicichla wallacei*	
Arapaima gigas		*Crenuchus spilurus*	
Astyanax bimaculatus		*Cteniloricaria platystoma*	
Astyanax cf. mutator		*Curimata cilliata*	
Astyanax guianensis		*Curimata cyprinoides*	
Astyanax polylepis		*Curimatala immaculata*	
Astyanax sp.		*Cynodon gibbus*	
Auchenipterus nuchalis		*Cyphocharax microcephala*	
Boulengerella lucia		*Cyphocharax spilurus*	
Brachychalcinus guianensis		*Doras carinatus*	
Brycon falcatus		*Eigenmannia microps*	
Bryconamericus hyphesson		*Electrophorus electricus*	
Bryconops affinis		*Erythrinus erythrinus*	
Bryconops caudomaculatus		*Exodon paradoxus*	
Bunocephalus amaurus		*Farlowella sp.*	
Caenotropus labyrinthicus		*Guianacara dacrya*	
Callichthys callichthys		*Gymnorhampichthys hypostomus*	
Carnegiella strigata		*Gymnotus carapo*	
Centromochlus reticulata		*Gymnotus coropinae*	
Chalceus macrolepidotus		*Hassar orestis*	
Characidium catenatum		*Helogenes marmaratus*	
Characidium crandellii		*Hemigrammus bellottii*	

Hemigrammus cf. boesemani		*Microschemobrycon geisleri*	
Hemigrammus guyanensis		*Moenkhausia aff. surinamensis*	
Hemigrammus ocellifer		*Moenkhausia cf. copei*	
Hemigrammus rodwayi		*Moenkhausia cf. cotinho*	
Hemiodopsis quadrimaculatus		*Moenkhausia collettii*	
Hemiodopsis sp. (cf. gracilis)		*Moenkhausia dichroura*	
Hemiodus unimaculatus		*Moenkhausia georgiae*	
Hemisorubim platyrhynchos		*Moenkhausia grandisquamis*	
Hoplerythrinus unitaeniatus		*Moenkhausia hemigrammoides*	
Hoplias aimara		*Moenkhausia intermedia*	
Hoplias malabaricus		*Moenkhausia oligolepis*	
Hypessobrycon minor		*Myleus rubripinnis*	
Hyphessobrycon cf. tenuis		*Nannostomus marginatus*	
Hyphessobrycon serpae		*Ochmacanthus sp.*	
Hyphessobrycon simulatus		*Osteoglossum bicirrhosum*	
Hypophthalmus edentatus		*Paradon bifasciatus*	
Hypoptopoma guianense		*Parodon guyanensis*	
Hypopygus lepturus		*Parotocinclus britskii*	
Hypostomus cf. hemiurus		*Paulicea sp.*	
Hypostomus cf. micropunctatus		*Phenacogaster sp.*	
Hypostomus cf. plecostomus		*Phractocephalus hemiliopterus*	
Hypostomus gymnorhynchus		*Pimelodella cristata*	
Hypostomus macushi		*Pimelodella geryi*	
Hypostomus taphorni		*Pimelodella macturki*	
Hypostomus ventromaculatus		*Pimelodella sp. 1* (narrow bar)	
Iguanodectes spilurus		*Pimelodella sp. 2* (broad bar)	
Imparfinis cf. hasemani		*Pimelodus albofasciatus*	
Jupiaba abramoides		*Plagioscion squamosissimus*	
Jupiaba pinnata		*Platydoras hancocki*	
Leporinus cf. granti		*Potamorrhaphis guianensis*	
Leporinus friderici		*Potamotrygon cf. motoro*	
Leporinus maculatus		*Potamotrygon histrix*	
Leporinus pellegrini		*Pristobrycon eiganmannii*	
Leptocharacidium omospilus		*Pristobrycon sp.*	
Limatulichthys griseus		*Prochilodus rubrotaeniatus*	
Lithoxis lithoides		*Pseudoplatystoma fasciatum*	
Loricaria sp.		*Pseudoplatystoma tigrinum*	
Mastiglanis asopos		*Pygocentrus nattereri*	
Megalechis sp.		*Pyrrhulina stoli*	
Microschemobrycon casiquiare		*Rhabdolichops sp.*	

Rhamdia quelen		*Spatulorcaria sp.*	
Rhamdia sp.		*Sternopygus macurus*	
Rinelorcaria sp. 1		*Sturisoma monopelte*	
Rinelorcaria sp. 2		*Tatia intermedia*	
Roeboides thurni		*Tetragonopterus chalceus*	
Satanaperca leucostictus		*Trachelyopterus galeatus*	
Schizodon fasciatum		*Trachycorystes trachycorystes*	
Serrasalmus humeralis		*Trachydoras sp.*	
Serrasalmus rhombeus		*Trichomycterus sp.* (brown speckled)	
Soruhim lima		*Vandellia cf. plazaii*	

Agouti paca		*Cormura brevirostris*	
Alouatta seniculus		*Cyclopes didactylus*	
Ametrida centurio		*Cydista aequinoctialis*	
Anaxagorea cf. brevipes		*Cynomops paranus*	
Anoura caudifer		*Cynomops planirostris*	
Apocynaceae sp. 1		*Dasyprocta aguti*	
Apocynaceae sp. 2		*Dasyprocta cristata*	
Apocynaceae sp. 3		*Dasypus kappleri*	
Artibeus amplus		*Dasypus novemcinctus*	
Artibeus cinereus		*Desmodus rotundus*	
Artibeus concolor		*Diaemus youngi*	
Artibeus glaucus		*Diclidurus scutatus*	
Artibeus glaucus bogotensis		*Didelphis imperfecta*	
Artibeus gnomus		*Didelphis marsupialis*	
Artibeus jamaicensis		*Duguetia calycina*	
Artibeus lituratus		*Duguetia cauliflora*	
Artibeus obscurus		*Duguetia pycnastera*	
Artibeus planirostris		*Duguetia sp.*	
Aspidosperma sp. 1		*Dusicyon thous*	
Aspidosperma sp. 2		*Echimys chrysurus*	
Ateles paniscus		*Eira barbara*	
Bactris sp.		*Eptesicus brasiliensis*	
Bradypus tridactylus		*Eptesicus furinalis*	
Caluromys lanatus		*Eumops auripendulus*	
Caluromys philander		*Eumops bonariensis*	
Carollia brevicauda		*Eumops glaucinus*	
Carollia perspicillata		*Eumops hansae*	
Cavia aperea		*Eumops maurus*	
Cebus apella		*Eumops perotis*	
Cebus olivaceus		*Eumops trumbulli*	
Chiroderma salvini		*Euroryzomys macconnelli*	
Chiroderma villosum		*Felis concolor*	
Chiropotes santanas		*Felis jaguarundi*	
Choeroniscus godmani		*Felis pardalis*	
Choloepus didactylus		*Felis tigrina*	
Chrotopterus auritus		*Felis wiedii*	
Clytostoma binatum		*Felis yagouaroundi*	
Coendou prehensilis		*Furipterus horrens*	

Galictis vittata		*Myrmecophaga tridactyla*	
Geonoma baculifera		*Nasua nasua*	
Geonoma sp.		*Natalus tumidirostris*	
Glossophaga longirostris		*Neacomys guianae*	
Glossophaga soricina		*Nectomys squamipes*	
Heteropsis flexuosa		*Neoplatymops mattogrossensis*	
Holochilus guianae		*Noctilio albiventris*	
Hydrochaeris hydrochaeris		*Noctilio leporinus*	
Hylaeamys sp.		*Nyctinomops laticaudata*	
Iriartella sp.		*Nyctinomops macrotis*	
Lasiurus blossovillei [borealis]		*Odocoileus virginiana*	
Lasiurus ega		*Oecomys bicolor*	
Leopardus pardalis		*Oligoryzomys fulvescens*	
Leopardus wiedi		*Panthera onca*	
Lionycteris spurrelli		*Peropteryx macrotis*	
Lonchophylla thomasi		*Philander opossum*	
Lophostoma silvicolum		*Philodendron sp.*	
Lutra longicaudis		*Phylloderma stenops*	
Macrophyllum macrophyllum		*Phyllostomus discolor*	
Makalata didelphoides		*Phyllostomus elongatus*	
Marmosa murina		*Phyllostomus hastatus*	
Marmosops parvidens		*Phyllostomus latifolius*	
Mazama americana		*Pithecia pithecia*	
Mazama gouazoubira		*Platyrrhinus brachycephalus*	
Mesechites trífida		*Platyrrhinus helleri*	
Mesomys hispidus		*Potos flavus*	
Mesophylla macconnelli		*Priodontes maximus*	
Micronycteris megalotis		*Procyon cancrivorus*	
Micronycteris minuta		*Proechimys cuvieri*	
Micronycteris sylvestris		*Proechimys sp.*	
Mimon crenulatum		*Promops nasutus*	
Molossops temminckii		*Pteronotus gymnonotus*	
Molossus coibensis		*Pteronotus parnellii*	
Molossus molossus		*Pteronura brasiliensis*	
Molossus rufus		*Rhinophylla pumilio*	
Montrichardia arborescens		*Rhipidomys nitela*	
Myoprocta acouchy		*Rhogeesa tumida*	
Myoprocta exilis		*Rhynchonycteris naso*	
Myotis albescens		*Ruellia sp.*	
Myotis nigricans		*Saccopteryx bilineata*	
Myotis riparius		*Saccopteryx canescens*	

Saccopteryx leptura		*Tayassu pecari*	
Saguinus midas		*Tayassu tajacu*	
Saimiri sciureus		*Thyroptera discifera*	
Schefflera morototoni		*Thyroptera tricolor*	
Sciurus aestuans		*Tonatia brasiliense*	
Sigmodon alstoni		*Tonatia saurophila*	
Speothos venaticus		*Trachops cirrhosus*	
Sturnira lilium		*Trinycteris nicefori*	
Sturnira tildae		*Unonopsis sp.*	
Tabernaemontana attenuata		*Uroderma bilobatum*	
Tabernaemontana sp.		*Uroderma magnirostrum*	
Tamandua tetradactyla		*Vampyressa bidens*	
Tapirira guianensis		*Vampyressa brocki*	
Tapirus terrestris		*Zygodontomys brevicauda*	

Actitis macularia		*Buteogallus meridionalis*	
Aeronautes montivagus		*Buteogallus urubitinga*	
Agamia agami		*Butorides striatus*	
Amazilia brevirostris		*Cacicus cela*	
Amazilia fimbriata		*Cacicus haemorrhous*	
Amazilia versicolor		*Cairina moschata*	
Amazona amazonica		*Campephilus melanoleucos*	
Amazona farinosa		*Campephilus rubricollis*	
Amazona ochrocephala		*Camptostoma obsoletum*	
Ammodramus humeralis		*Campylopterus largipennis*	
Anhinga anhinga		*Campylorhamphus procurvoides*	
Ara ararauna		*Campylorhynchus griseus*	
Ara chloropterus		*Cantorchilus leucotis*	
Ara macao		*Capito niger*	
Ara manilata		*Capsiempis flaveola*	
Aramides cajanea		*Caryothraustes canadensis*	
Aratinga pertinax		*Cathartes aura*	
Ardea cocoi		*Cathartes burrovianus*	
Ardeas alba		*Cathartes melambrotus*	
Arremon taciturnus		*Celeus elegans*	
Arundinicola leucocephala		*Celeus flavus*	
Atticora fasciata		*Celeus torquatus*	
Attila cinnamomeus		*Celeus undatus*	
Attila spadiceus		*Ceratopipra erythrocephala*	
Automolus infuscatus		*Cercomacra cinerascens*	
Automolus ochrolaemus		*Cercomacra nigrescens*	
Automolus rufipileatus		*Cercomacroides tyrannina*	
Basileuterus culicivorus		*Chaetura brachyuran*	
Basileuterus rivularis		*Chaetura chapmani*	
Brachygalba lugubris		*Chaetura cinereiventris*	
Brotogeris chrysopterus		*Chaetura spinicaudus*	
Bubulcus ibis		*Chelidoptera tenebrosa*	
Bucco capensis		*Chiroxiphia pareola*	
Bucco tamatia		*Chloroceryle aenea*	
Busarellus nigricollis		*Chloroceryle amazona*	
Buteo albicaudatus		*Chloroceryle americana*	
Buteo brachyurus		*Chloroceryle inda*	
Buteo nitida		*Chlorostilbon mellisugus*	

Chordeiles pusillus		*Dendrocolaptes picumnus*	
Ciccaba huhula		*Dendroica fusca*	
Claravis pretiosa		*Dendroica petechia*	
Cochlearius cochlearius		*Dendroica striata*	
Coereba flaveola		*Dendroplex picus*	
Colinus cristatus		*Deroptyus accipitrinus*	
Columba speciosa		*Discosura longicauda*	
Columbina passerina		*Dryocopus lineatus*	
Columbina talpacoti		*Egretta caerulea*	
Conirostrum speciosum		*Egretta thula*	
Conopias parvus		*Elaenia chiriquensis*	
Contopus borealis		*Elaenia flavogaster*	
Coragyps atratus		*Elaenia sp.*	
Corapipo gutturalis		*Elanoides forficatus*	
Corythopis torquata		*Epinecrophylla gutturalis*	
Cotinga cayana		*Euchripomis spodioptila*	
Cotinga cotinga		*Euphonia cayennensis*	
Crax alector		*Euphonia chlorotica*	
Crotophaga ani		*Euphonia chrysopasta*	
Crotophaga major		*Euphonia violacea*	
Crypturellus cinereus		*Eurypyga helias*	
Crypturellus erythropus		*Falco deiroleucus*	
Crypturellus soui		*Falco rufigularis*	
Crypturellus variegatus		*Falco sparverius*	
Cyanerpes caeruleus		*Florisuga mellivora*	
Cyanerpes sp.		*Formicarius analis*	
Cyanicterus cyanicterus		*Formicarius colma*	
Cyanocompsa cyanoides		*Frederickena viridis*	
Cyanocorax cayanus		*Furnarius leucopus*	
Cyclarhis gujanensis		*Galbula albirostris*	
Cymbilaimus lineatus		*Galbula dea*	
Cyphorhinus aradus		*Galbula galbula*	
Cypseloides cryptus		*Galbula sp.*	
Dacnis cayana		*Geotrygon montana*	
Dacnis lineata		*Geotrygon violacea*	
Daptrius ater		*Glaucidium hardyi*	
Deconychura stictolaema		*Glyphorynchus spirurus*	
Dendrexetastes rufigula		*Grallaria varia*	
Dendrocincla fuliginosa		*Granatellus pelzelni*	
Dendrocincla merula		*Gymnoderus foetidus*	
Dendrocolaptes certhia		*Gymnopithys rufigula*	

Harpagus bidentatus		*Lepidocolaptes albolineatus*	
Harpia harpyja		*Lepidocolaptes souleyetii*	
Heliomaster longirostris		*Lepidothrix serena*	
Heliornis fulica		*Leptodon cayanensis*	
Heliothryx auritus		*Leptotila rufaxilla*	
Hemithraupis flavicollis		*Leptotila verreauxi*	
Hemithraupis guira		*Leucopternis albicollis*	
Hemitriccus sp.		*Leucopternis melanops*	
Henicorhina leucosticta		*Lipaugus vociferans*	
Herpetotheres cachinnans		*Lophornis ornatus*	
Herpsilochmus stictocephalus		*Lophostrix cristata*	
Herpsilochmus sticturus		*Lophotriccus galeatus*	
Hirundinea ferruginea		*Lophotriccus vitiosus*	
Hirundo rustica		*Lurocalis semitorquatus*	
Hoploxypterus cayanus		*Malacoptila fusca*	
Hydropsalis climacocerca		*Megaceryle torquata*	
Hylexetastes perrotii		*Megarynchus pitangua*	
Hylocharis cyanus		*Megascops watsonii*	
Hylocharis sapphirina		*Melanerpes cruentatus*	
Hylopezus macularius		*Mesembrinibis cayennensis*	
Hylophilus (brunneiceps)		*Micrastur gilvicollis*	
Hylophilus pectoralis		*Micrastur mirandollei*	
Hylophilus thoracicus		*Micrastur ruficollis*	
Hylophylax naevia		*Micrastur semitorquatus*	
Hypocnemis cantator		*Microbates collaris*	
Hypocnemoides melanopogon		*Microcerculus bambla*	
Ibycter americanus		*Microrhopias quixensis*	
Icterus cayanensis		*Milvago chimachima*	
Icterus nigrogularis		*Mimus gilvus*	
Ictinia plumbea		*Mionectes macconnelli*	
Isleria guttata		*Mionectes oleagineus*	
Jabiru mycteria		*Molothrus oryzivora*	
Jacamerops aurea		*Momotus momota*	
Jacana jacana		*Monasa atra*	
Knipolegus poecilocercus		*Morphnus guianensis*	
Lamprospiza melanoleuca		*Mycteria americana*	
Lanio fulvus		*Myiarchus ferox*	
Laniocera hypopyrra		*Myiarchus tuberculifer*	
Laterallus viridis		*Myiarchus tyrannulus*	
Lathrotriccus euleri		*Myiobius barbatus*	
Legatus leucophaius		*Myiopagis caniceps*	

Myiopagis flavivertex		*Parula pitiayumi*	
Myiopagis gaimardii		*Patagioenas cayennensis*	
Myiornis ecaudatus		*Patagioenas plumbea*	
Myiozetetes cayanensis		*Patagioenas subvinacea*	
Myrmeciza longipes		*Penelope jacquacu*	
Myrmelastes leucostigma		*Penelope marail*	
Myrmoborus leucophrys		*Percnostola rufifrons*	
Myrmoderus ferruginea		*Perissocephalus tricolor*	
Myrmophylax atrothorax		*Phaeomyias murina*	
Myrmornis torquata		*Phaeoprogne tapera*	
Myrmothera campanisona		*Phaeothlypis rivularis*	
Myrmotherula axillaris		*Phaethornis (augusti)*	
Myrmotherula brachyura		*Phaethornis bourcieri*	
Myrmotherula longipennis		*Phaethornis ruber*	
Myrmotherula menetriesii		*Phaethornis superciliosus*	
Myrmotherula surinamensis		*Phaetusa simplex*	
Nasica longirostris		*Phalacrocorax brasilianus*	
Nemosia pileata		*Pheugopedius coraya*	
Neomorphus rufipennis		*Philydor (ruficaudatus)*	
Notharchus macrorhynchos		*Phoenicircus carnifex*	
Notharchus tectus		*Piaya cayana*	
Nyctibius aethereus		*Piaya melanogaster*	
Nyctibius grandis		*Piaya minuta*	
Nyctibius griseus		*Piculus flavigula*	
Nyctibius leucopterus		*Piculus rubiginosus*	
Nyctidromus albicollis		*Picumnus (spilogaster)*	
Nyctipolus nigrescens		*Picumnus exilis*	
Ochthornis littoralis		*Pilherodias pileatus*	
Ochthornis littoralis		*Pionites melanocephala*	
Odontophorus gujanensis		*Pionus fuscus*	
Onychorhynchus coronatus		*Pionus menstruus*	
Ornithion inerme		*Pipile cumanensis*	
Ortalis motmot		*Pipra pipra*	
Otus choliba		*Pipra serena*	
Oxyruncus cristatus		*Piprites chloris*	
Pachyramphus marginatus		*Piranga flava*	
Pachyramphus minor		*Piranga rubra*	
Pachyramphus polychopterus		*Pitangus sulphuratus*	
Pachysylvia muscicapinus		*Pithys albifrons*	
Pandion haliaetus		*Pitylus grossus*	
Paroaria gularis		*Platyrinchus coronatus*	

Platyrinchus platyrhynchos		*Sirystes sibilator*	
Platyrinchus saturatus		*Spizaetus ornatus*	
Polioptila guianensis		*Spizaetus tyrannus*	
Polioptila plumbea		*Spizastur melanoleucus*	
Polyborus plancus		*Stelgidopteryx ruficollis*	
Procnias albus		*Sterna superciliaris*	
Progne chalybea		*Streptoprocne zonaris*	
Progne tapera		*Sublegatus modestus*	
Psarocolius decumanus		*Synallaxis gujanensis*	
Psarocolius viridis		*Synallaxis macconnelli*	
Psophia crepitans		*Tachycineta albiventer*	
Pteroglossus aracari		*Tachyphonus cristatus*	
Pteroglossus viridis		*Tachyphonus luctuosus*	
Pulsatrix perspicillata		*Tachyphonus surinamus*	
Pygiptila stellaris		*Tangara chilensis*	
Pyrilia caica		*Tangara gyrola*	
Pyrocephalus rubinus		*Tangara mexicana*	
Pyrrhura picta		*Tangara punctata*	
Querula purpurata		*Tangara velia*	
Ramphastos tucanus		*Tapera naevia*	
Ramphastos vitellinus		*Taraba major*	
Ramphocaenus melanurus		*Terenotriccus erythrurus*	
Ramphocelus carbo		*Tersina viridis*	
Ramphotrigon megacephalum		*Thalurania furcata*	
Ramphotrigon ruficauda		*Thamnomanes ardesiacus*	
Rhytipterna simplex		*Thamnomanes caesius*	
Riparia riparia		*Thamnophilus amazonicus*	
Rostrhamus sociabilis		*Thamnophilus murinus*	
Rupicola rupicola		*Thamnophilus punctatus*	
Rupornis magnirostris		*Thraupis episcopus*	
Rynchops niger		*Thraupis palmarum*	
Sakesphorus canadensis		*Threnetes leucurus*	
Saltator grossus		*Tigrisoma fasciatum*	
Saltator maximus		*Tigrisoma lineatum*	
Sarcoramphus papa		*Tinamus major*	
Schiffornis olivacea		*Tinamus sp.*	
Sclateria naevia		*Tityra cayana*	
Sclerurus caudacutus		*Tityra sp.*	
Sclerurus mexicanus		*Todirostrum cinereum*	
Sclerurus rufigularis		*Todirostrum pictum*	
Selenidera piperivora		*Tolmomyias assimilis*	

Tolmomyias flaviventris		*Tyto alba*	
Tolmomyias poliocephalus		*Vanellus cayanus*	
Tolmomyias sulphurescens		*Vanellus chilensis*	
Topaza pella		*Veniliornis cassini*	
Tringa solitaria		*Vireo olivaceus*	
Troglodytes aedon		*Vireolanius leucotis*	
Trogon melanurus		*Volatinia jacarina*	
Trogon rufus		*Willisornis poecilinota*	
Trogon violaceus		*Xenops (tenuirostris)*	
Trogon viridis		*Xenops minutus*	
Tunchiornis ochraceiceps		*Xiphocolaptes promeropirhynchus*	
Turdus albicollis		*Xipholena punicea*	
Turdus fumigatus		*Xiphorhynchus guttatus*	
Turdus leucomelas		*Xiphorhynchus obsoletus*	
Turdus nudigenis		*Xiphorhynchus pardalotus*	
Tyranneutes virescens		*Zebrilus undulatus*	
Tyrannulus elatus		*Zenaida auriculata*	
Tyrannus melancholicus		*Zimmerius acer*	
Tyrannus savana			

Adenomera andreae		*Hypsiboas ornatissimus*	
Allobates femoralis		*Iguana iguana*	
Ameerega trivittata		*Imantodes cenchoa*	
Ameiva ameiva		*Kentropyx calcarata*	
Anolis planiceps		*Leposoma guianense*	
Anomaloglossus sp. nov.		*Leptodactylus guianensis*	
Atractus torquatus		*Leptodactylus knudseni*	
Boa constrictor		*Leptodactylus macrosternum*	
Bothriopsis bilineatus		*Leptodactylus myersi*	
Bothrops atrox		*Leptodactylus mystaceus*	
Bufo granulosus merianae		*Leptodactylus pentadactylus*	
Caiman crocodilus		*Leptodactylus rugosus*	
Cercosaura o. ocellata		*Lithodytes lineatus*	
Chatogekko amazonicus		*Mastigodryas boddaerti*	
Chelonoidis carbonaria		*Melanosuchus niger*	
Chelonoidis denticulata		*Neusticurus bicarinatus*	
Chelus fimbriatus		*Neusticurus rudis*	
Chironius fuscus		*Osteocephalus oophagus*	
Cnemidophorus lemniscatus		*Osteocephalus taurinus*	
Copeoglossum nigropunctatum		*Paleosuchus trigonatus*	
Corallus caninus		*Philodryas argentea*	
Corallus hortulans		*Phyllomedusa hypochondrialis*	
Dipsas catesbyi		*Pipa pipa*	
Dipsas variegata		*Plica umbra*	
Drymoluber dichrous		*Podocnemis unifilis*	
Eleutherodactylus sp.		*Rhaebo guttatus*	
Eleutherodactylus sp. "A"		*Rhinella marina*	
Epictia tenella		*Rhinella martyi*	
Erythrolamprus typhlus		*Scinax ruber*	
Gonatodes humeralis		*Siphlophis compressus*	
Hemidactylus mabouia		*Spilotes pullatus*	
Hyalinobatrachium cf. mondolfii		*Thecadactylus rapicauda*	
Hypsiboas boans		*Tropidurus hispidus*	
Hypsiboas crepitans		*Uranoscodon superciliosus*	
Hypsiboas multifasciatus			

Ateuchus pauki		*Eurysternus caribaeus*	
Ateuchus pygidialis		*Eurysternus velutinus*	
Ateuchus setulosus		*Hansreia affinis*	
Canthidium gerstaeckeri		*Ontherus suclator*	
Canthidium near guyanense		*Onthophagus clypeatus*	
Canthidium nitidum group		*Onthophagus haematopus group*	
Canthon bicolor		*Onthophagus onthochromus*	
Canthon triangularis		*Oxysternon festivum*	
Coprophanaeus dardanus		*Sulcophaneus faunus*	
Deltochilum gibbosum		*Sylvicanthon bridarollii*	
Dichotomius boreus		*Uroxys near micros*	
Dichotomius lucasi			

Adiantopsis radiata		*Carapa guianensis*	
Adiantum dolosum		*Caryocar sp.*	
Adiantum latifolium		*Cassipourea guianensis*	
Adiantum latifolium x serrato-dentatum		*Catostemma fragrans*	
Adiantum pulverulentum		*Cecropia peltata*	
Adiantum serrato-dentatum		*Cecropia sp.*	
Adiantum sp.		*Centropogon sp.*	
Aechmea bromeliifolia		*Cissus erosa*	
Akeetina sp.		*Clathrotropis brachypetala*	
Aldina sp.		*Clathrotropis macrocarpa*	
Alibertia latifolia		*Clavija sp.*	
Anacardium sp.		*Clitoria sp.*	
Anadenanthera peregrina		*Clusia sp.*	
Anaxagorea sp.		*Coccoloba sp.*	
Anemia ferruginea		*Combretaceae sp. 1*	
Aniba cf. guianensis		*Combretum laxum*	
Anthurium sp.		*Combretum sp.*	
Aphelandra sp.		*Connarus sp.*	
Apinagia sp.		*Cordia sp.*	
Arrabidaea cinerea		*Costus sp.*	
Arrabidaea grosourdyana		*Costus spiralis*	
Aspidosperma sp.		*Couepia sp.*	
Astrocaryum gynacanthum		*Coussapoa sp.*	
Attalea regia		*Croton sp.*	
Bactris sp.		*Cuervea kappleriana*	
Banisteriopsis martiniana		*Cuervea sp.*	
Bauhinia scala-simiae		*Dalechampia scandens*	
Bertholletia excelsa		*Dalechampia sp.*	
Bixa orellana		*Davilla sp.*	
Bombax nervosum		*Desmoncus sp.*	
Brocchinia sp.		*Dialium guianense*	
Bromelia sp.		*Dillenia sp.*	
Brownea sp.		*Dioclea guianensis*	
Buchenavia sp.		*Diodia sp.*	
Bulbostylis conifera		*Doliocarpus spraguei*	
Bulbostylis paradoxa		*Drymonia coccinea*	
Bursera sp.		*Duguetia sp.*	
Byttneria divaricata		*Eleocharis fistulosa*	
Calathea sp.		*Entada polyphylla*	
Calathea variegata		*Epiphyllum phyllanthus*	
Calyptranthes multiflora		*Erythroxylum sp.*	

Erythroxylum sp. 1		*Lecointea sp.*	
Erythroxylum sp. 2		*Lepidaploa gracilis*	
Eschweilera sp. 1		*Licania cf. lasseri*	
Eschweilera sp. 2		*Licania sp. 2*	
Eugenia sp.		*Licania sp.*	
Fabaceae sp. 1		*Licania sp. 1*	
Fabaceae sp. 2		*Licaria polyphylla*	
Fabaceae sp. 3		*Licaria polyphylla*	
Fabaceae sp. 4		*Lindsaea sp.*	
Fabaceae sp. 5		*Lonchocarpus sp.*	
Faramea capillipes		*Mabea montana*	
Faramea occidentalis		*Mabea sp.*	
Ficus sp. 1		*Machaerium inundatum*	
Ficus sp. 2		*Macrolobium acaciifolium*	
Fuirena sp.		*Manihot tristis*	
Genipa spruceana		*Maquira sp.*	
Geonoma sp.		*Marantaceae sp. 1*	
Geophyla sp.		*Marantaceae sp. 2*	
Guarea guidonia		*Margaritaria sp.*	
Guarea kunthiana		*Matayba adenanthera*	
Guarea sp.		*Matayba opaca*	
Guatteria sp.		*Matelea sp.*	
Guzmania sp.		*Maytenus guyanensis*	
Heisteria acuminata		*Meliaceae sp. 1*	
Helosis cayennensis		*Meliaceae sp. 2*	
Heterostemon mimosoides		*Meliaceae sp. 3*	
Hibiscus bifurcatus		*Miconia eugenioides*	
Hirtella racemosa		*Microgramma lycopodioides*	
Hirtella sp.		*Microgramma reptans*	
Homalium racemosum		*Mimosa microcephala*	
Huperzia cf. dichotoma		*Mora excelsa*	
Hylocereus scandens		*Mora sp.*	
Ichnanthus nemoralis		*Morinda tenuiflora*	
Ichthyothere terminalis		*Mouriri sp.*	
Inga ingoides		*Myrcia sp.*	
Inga laurina		*Myrtaceae sp.*	
Inga sp. 1		*Neurolepis angustifolia*	
Inga sp. 2		*Ocotea sp.*	
Iryanthera sp.		*Orchidaceae sp. 1*	
Ischnosiphon arouma		*Orchidaceae sp. 2*	
Jacaranda copaia		*Orchidaceae sp. 3*	
Jacaranda obtusifolia		*Orchidaceae sp. 4*	

Orchidaceae sp. 5		*Rinorea flavescens*	
Ossaea micrantha		*Rinorea lindeniana*	
Palicourea cf. crocea		*Rinorea riana*	
Panicum pilosum		*Rinorea sp.*	
Parkia sp.		*Rubiaceae sp.*	
Passiflora bomareifolia		*Sagotia cf. racemosa*	
Payparola sp.		*Sagotia racemosa*	
Pecluma pectinata		*Sapindaceae sp. 1*	
Peltogyne venosa		*Sapindaceae sp. 2*	
Pera glabrata		*Sapotaceae sp. 1*	
Phenakospermun guyannense		*Sapotaceae sp. 2*	
Piper hispidum		*Scleria cyperina*	
Piper hostmannianum		*Scleria latifolia*	
Piptocarpha sp.		*Scleria sp. 1*	
Pitcairnia bulbosa		*Selaginella sp.*	
Pleopeltis cf. percussa		*Siparuna sp.*	
Pleurothallis sp.		*Sloanea sp.*	
Plumeria sp.		*Solanum sp.*	
Pollalesta schomburgkii		*Sterculia sp.*	
Polypodiaceae sp.		*Strychnos sp.*	
Polypodium sp.		*Stylogine longifolia*	
Pouteria sp. 1		*Swartzia apiculata*	
Pouteria sp. 2		*Swartzia sp.*	
Pouteria sp. 3		*Tachigali sp.*	
Pouteria venosa		*Tapura guianensis*	
Pristimera nervosa		*Terminalia sp.*	
Prosthechea vespa		*Thelypteris sp.*	
Protium heptaphyllum		*Toulicia pulvinata*	
Protium sp.		*Tournefortia bicolor*	
Psidium persoonii		*Tournefortia sp.*	
Psidium sp.		*Tovomita sp.*	
Psychotria apoda		*Trattinickia sp.*	
Psychotria lindenii		*Trichilia schomburgkii subsp. schomburgkii*	
Psychotria sp.		*Trichilia sp.*	
Pterocarpus rohrii		*Trilepis kanukuensis*	
Renealmia floribunda		*Triplaris cf. weigeltiana*	
Rheedia sp.		*Virola sp.*	
Rhynchospora cephalotes		*Vismia sp.*	
Rhynchospora comata		*Vittaria sp.*	
Rhynchospora podosperma		*Wulffia baccata*	
Rhynchospora reptans		*Zapoteca formosa*	
Rhynchospora subplumosa		*Zygia cf. unifoliolata*	
Rhynchospora tenuis		*Zygia latifolia*	


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