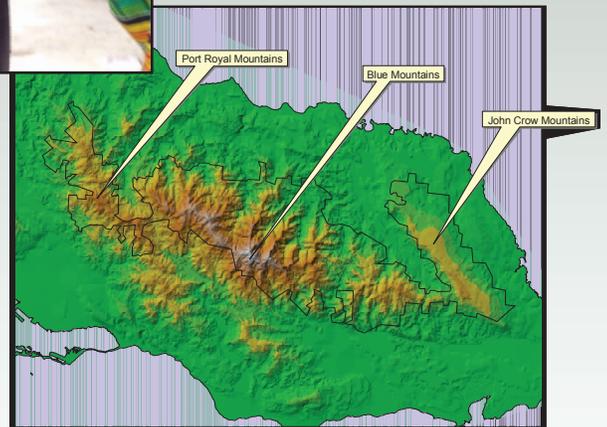


Blue and John Crow Mountains National Park Management Plan



2011-2016

**BLUE AND JOHN CROW
MOUNTAINS
NATIONAL PARK
JAMAICA**

**MANAGEMENT PLAN
(2011 - 2016)**

December, 2011

© Published by the Jamaica Conservation and Development Trust (JCDDT)
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The preparation of this document including community and other stakeholder consultations was made possible with funding from the Environmental Foundation of Jamaica.

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Plate 1: Blue Mountain Range (Source: JCDT)

FOREWORD

The Blue and John Crow Mountains National Park (BJCMNP) covers an area of 48,000 hectares and was designated under the Natural Resources Conservation Authority (NRCA) Act on 26 February 1993. The park has been managed by the Jamaica Conservation and Development Trust, a non-governmental organization since 1996. The BJCMNP forms an integral part of Jamaica's National System of Protected Areas which will contribute to the protection of Jamaica's biological diversity.

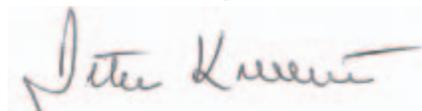
The BJCMNP protects one of Jamaica's finest and largest natural and cultural heritage sites. It contains the largest continuous block of natural, closed broadleaf forest remaining in the island, providing critical habitats for native, endemic and migratory species as well as the Blue Mountain Peak which at 2,256 metres, is the highest point in the island. In recognition of its international significance, the site was nominated by Jamaica in 2009, as a United Nations Educational Scientific and Cultural Organisation (UNESCO) World Heritage Site.

This Management Plan has been prepared in accordance with the NRCA Act of 1991 and provides for the protection and conservation of the national park and Forest Reserve designated in the 1950's under the Forest Act 1937. It outlines the management objectives and programmes to ensure that the natural, social and cultural values of the area receive an adequate level of protection.

The management of the BJCMNP contributes not only to fulfilling obligations under international conventions, such as the World Heritage Convention and the Convention on Biological Diversity, but to the achievement of Vision 2030 – Jamaica's National Development Plan Goal 4: "Jamaica has a Healthy Natural Environment". This goal includes three national outcomes, namely the sustainable management and use of the environmental and natural resources; hazard risk reduction and adaptation to climate change and sustainable rural and urban development. The programmes outlined in the Plan are key mechanisms to ensuring that these outcomes are realized.

The management of this National Park and Forest Reserve has been an example of an integrated approach by government and non-government entities to planning, financing, monitoring and programme implementation. The partnership between the Natural Resources Conservation Authority/National Environment and Planning Agency, Forestry Department, Jamaica National Heritage Trust and the non-governmental organisation – Jamaica Conservation and Development Trust, has also resulted in the improved management of one of the island's premier natural and cultural heritage sites.

The Plan will provide the management framework for the BJCMNP over the next five years. The National Environment and Planning Agency looks forward to the benefits that will accrue from the implementation of the Plan, particularly the sustainable management of natural and heritage resources for the benefit of present and future generations of Jamaicans.



Chief Executive Officer
National Environment and Planning Agency

PREFACE

The Blue and John Crow Mountains National Park (BJCMNP) located in eastern Jamaica is 486.5 sq. km and includes the largest contiguous block of closed broadleaf forest (one-third of all that remains) in Jamaica. The wide variation in geology, altitude and climate within the property has resulted in a highly diverse flora and fauna in a variety of forest, stream and other ecosystems. The BJCMNP is recognised as a globally important site for the conservation of plant biodiversity. About 33% of Jamaica's endemic flowering plants occur in these mountain ranges, with 33% of the endemic flowering plants in the National Park being restricted in their entire global range to this area. The BJCMNP has been identified as a critical component of the Caribbean Biodiversity Hotspot with its main mountain ranges cited as two of the key biodiversity areas within the Hotspot which are 'wholly irreplaceable on a global scale' for their globally threatened endemic species.

The rugged and precipitous nature of the mountain ranges, cascading waterfalls, thick forest and wide variety of plants and animals provided all the resources that enabled the Windward Maroons to develop their unique culture and defend their freedom. As the resting place of the Maroon freedom fighters, the BJCMNP is a sacred natural site, its bulk and height providing a natural memorial to the Maroon ancestors and an inspiration for the overcoming spirit. The descendants of this strong, proud people maintain their heritage within the BJCMNP's Community Buffer Zone in the Rio Grande and Buff Bay Valleys.

The BJCMNP is managed as an IUCN Category II protected area, to conserve its natural, cultural and recreational values. It is managed by a non-government organisation, the Jamaica Conservation and Development Trust (JCDT) under delegation from the NRCA through the National Environment and Planning Agency (NEPA) and a collaborative management agreement with NEPA, the Forestry Department and most recently, the Jamaica National Heritage Trust.

The JCDT is honoured to manage this magnificent property, and particularly so, since despite the challenges, the site has received the highest management effectiveness (METT) score amongst natural protected areas in Jamaica (UNDP, 2010). A management plan is essential for effective management as it enhances focus on key objectives and targets, guides monitoring and evaluation and hence provides for adaptive management. Part I of this Management Plan describes the physical, biological, social and cultural features of the BJCM, the threats to the values being protected and the root causes of these threats. Part II describes the strategies for conserving the biodiversity, ecosystems and cultural heritage of the BJCMNP and its Community Buffer Zone.

The JCDT looks forward to working with its co-management partners and all stakeholders to improve conservation of the BJCMNP under this new Management Plan 2011 – 2016.



Acting Park Manager,
Jamaica Conservation and Development Trust

ACKNOWLEDGEMENTS

The preparation of the Blue and John Crow Mountains National Park Management Plan 2011 – 2016 was made possible by funding from the Environmental Foundation of Jamaica and the Caribbean Natural Resources Institute (Action Research Learning Group Strength to Strength Project). The production of the document would not have been possible without the contribution of knowledge and experience, time and talent of the management and staff of the Jamaica Conservation and Development Trust (JCDT), delegated manager of the Blue and John Crow Mountains National Park (BJCMNP).

The JCDT gratefully acknowledges the input of:-

1. all the members of the Park's Co-Management Committee – representing the following organizations:-
 - National Environment and Planning Agency
 - Forestry Department
 - Jamaica Conservation and Development Trust
2. Thera Edwards, Roderick Ebanks and Adonna Jardine-Comrie for their significant research and documentation in the preparation of the BJCMNP United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Site (WHS) nomination dossier, which has been used in the preparation of this Management Plan.

The JCDT thanks the almost 300 individuals from various agencies, organizations and communities who participated in the working groups, community meetings and public consultations. Special thanks to all the persons who reviewed the final draft and made comments that will make this document more accurate and useful.



Plate 2: Volunteer Work-day at Holywell (Source: JCDT)

LIST OF ACRONYMS

ACIJ	-	African Caribbean Institute of Jamaica
BJCM	-	Blue and John Crow Mountains
BJCMNP	-	Blue and John Crow Mountains National Park
BM	-	Blue Mountains
BMST	-	Blue Mountains Sustainable Tourism
BOD	-	Biological Oxygen Demand
BPFA	-	Bowden Pen Farmer's Association
CANARI	-	Caribbean Natural Resources Institute
CBO	-	Community-based Organisation
CDC	-	Community Development Committee
CIB	-	Coffee Industry Board
CIDA	-	Canadian International Development Agency
CIDCO	-	Coffee Industry Development Company
CoC	-	Chief of Corps
CHO	-	Cultural Heritage Officer
CSO	-	Conservation Science Officer
CTMC	-	Charles Town Maroon Council
DAC	-	Development Area Committee
ECOO	-	Education and Community Outreach Officer
EFJ	-	Environmental Foundation of Jamaica
EMS	-	Environmental Management System
EU	-	European Union
FD	-	Forestry Department
FIDCO	-	Forest Industries Development Company
GIS	-	Geographical Information System
GOJ	-	Government of Jamaica
IDB	-	Inter-American Development Bank
IOJ	-	Institute of Jamaica
ISCF	-	Island Special Constabulary Force
IUCN	-	International Union for the Conservation of Nature
JAS	-	Jamaica Agricultural Society
JCDC	-	Jamaica Cultural Development Commission
JCDT	-	Jamaica Conservation and Development Trust
JCF	-	Jamaica Constabulary Force
JCM	-	John Crow Mountains
JDF	-	Jamaica Defence Force
JHTA	-	Jamaica Hotel and Tourist Association
JNHT	-	Jamaica National Heritage Trust
JNPTF	-	Jamaica National Parks Trust Fund
JTB	-	Jamaica Tourist Board
KDZ	-	Kids Discovery Zone

LIST OF ACRONYMS continued

LAC	-	Local Advisory Committee
MIND	-	Management Institute for National Development
MTMC	-	Moore Town Maroon Council
NAI	-	National Association of Interpreters
NGO	-	Non-Government Organisation
NEPA	-	National Environment and Planning Agency
NFMCP	-	National Forest Management and Conservation Plan
NHMJ	-	Natural History Museum of Jamaica
NP	-	National Park
NRCA	-	Natural Resources Conservation Authority
NWC	-	National Water Commission
PIOJ	-	Planning Institute of Jamaica
PARC	-	Protected Areas Resource Conservation Project
PRM	-	Port Royal Mountains
PATH	-	Poverty Alleviation through Tourism and Heritage
REA	-	Rapid Ecological Assessment
RADA	-	Rural Agricultural Development Agency
RTO	-	Recreation and Tourism Officer
SDC	-	Social Development Commission
STAC	-	Scientific and Technical Advisory Committee
SNS	-	Sacred Natural Sites
TNC	-	The Nature Conservancy
UNESCO	-	United Nations Education and Scientific Council
USAID	-	United States Agency for International Development
UTECH	-	University of Technology (Jamaica)
UWA	-	Underground Water Authority
UWI	-	University of the West Indies
WHS	-	World Heritage Site
WTO	-	World Tourism Organisation

BJCMNP MANAGEMENT PLAN

EXECUTIVE SUMMARY

The Blue and John Crow Mountains National Park (BJCMNP) is Jamaica's first and only National Park. It was designated in February, 1993 through the Natural Resources Conservation (BJCMNP) Order and is also a Forest Reserve gazetted initially under the 1927 "Afforestation Law" and later in December, 1950 under the Forest Act of 1937. The National Park was established out of local and international concern for biodiversity and other natural resources, as it was recognized that destruction of the area's unique ecosystems was taking place at an alarming pace. The BJCMNP represents one of our nation's most prominent natural areas as it protects the largest contiguous area of natural (closed broadleaf) forest, and the only montane forest on shale, in the island. Culturally, the BJCMNP is significant as its forested mountains and springs played a key role in the establishment of the Windward Maroons, providing a refuge that sustained them through their conflicts with both the Spanish and British colonists, to their success in establishing the first Maroon free nation. In recognition of the site's natural and cultural heritage which is believed to be of outstanding universal value, the BJMCNP has been nominated by the people of Jamaica, as a UNESCO World Heritage Site.

The sustained management of the BJCMNP is critical to the survival of much of Jamaica's natural heritage, and for the socio-economic development of the nation. Without its rainforests, the island's capital and main urban population centre - Kingston along with the rest of eastern Jamaica, would be faced with a water crisis as the provision of water is but one of the essential ecosystem services which the BJCMNP performs. This floristically remarkable area represents one of the last few remaining habitats for threatened endemic animals like the Jamaican Coney (*Geocapromys brownii*), the Yellow Boa (*Epicrates subflavus*), the Giant Swallowtail Butterfly (*Pterourus homerus*) and the Jamaican Blackbird (*Nesopsar nigerrimus*). The majestic mountains are the last resting place of the Maroon freedom fighters who established the first Maroon society and culture in the post 1492 world. Few tangible remains linger, except at Nanny Town, originally a Taino sacred hill site and later the capital of the Windward Maroons, now just an archaeological site deep in the forests and rugged terrain of the Blue Mountains. The rich oral and intangible heritage of the Maroons however, has been retained by the Maroon communities who now live outside the boundaries of the BJCMNP, within its Community Buffer Zone.

A close review of the threats faced by the BJCMNP's natural heritage indicates that deforestation for agriculture and the growth of invasive species head the list. Further analysis of these problems indicates the following as essential strategies for the abatement of these threats:

- a) increased enforcement of environmental legislation, particularly related to boundary encroachment,
- b) adoption of more environmentally sustainable livelihoods by resource users, and
- c) rehabilitation of degraded forest penetrating the core natural areas.

With respect to the cultural heritage of the Maroons, loss of intangible heritage through assimilation of popular and religious beliefs and practices and reduced transfer of indigenous knowledge to younger Maroons was beginning to have a negative impact. However, this is being addressed with heightened internal and external awareness about the importance of Maroon heritage, and steps are being taken to record and revitalize the heritage. Sustained action in these areas is necessary for the continued existence of the forest ecosystems and the Maroon heritage of the Blue and John Crow Mountains.

In addition to supporting the achievement of Goal 4 of the National Vision 2030, the sustained and effective management of the BJCMNP contributes to the meeting of Jamaica's international obligations under several conventions including the:-

1. Convention on Biological Diversity
2. Convention to Combat Desertification
3. United Nations Framework Convention on Climate Change
4. Convention concerning the Protection of the World Cultural and Natural Heritage.

The management of the BJCMNP has been delegated to the Jamaica Conservation and Development Trust (JCDT) by the Natural Resources Conservation Authority (NRCA) through the National Environment and Planning Agency (NEPA). As the site is also a Forest Reserve, a collaborative management (co-management) agreement has been signed by the NRCA, JCDT and the Forestry Department (FD). In light of the added focus of cultural heritage conservation, the Jamaica National Heritage Trust (JNHT) will sign the agreement and join the team of co-management partners for the BJCMNP.

This Management Plan for the BJCMNP is for a five-year period (2011 – 2016). Its main purpose is to guide the management of the National Park around its three main areas of focus: i) the conservation of plants and other wildlife species, ii) the conservation of its intangible Maroon heritage and iii) the provision of natural and cultural heritage-based recreational opportunities. It will be implemented on a budget of estimated recurrent expenditure averaging JA\$49 million or US\$568,209 per year. Capital and project expenditure is estimated at an average of JA\$23.6 million or US\$273,953 per year (see Chapter 12). Actual expenditure depends on the sourcing of sufficient funding from the NRCA, Jamaica National Parks Trust Fund (JNPTF), donor agencies and fundraising. The plan will be reviewed and evaluated every two years and a full revision done after five years.

The management plan was prepared between 2009 – 2011 using a participatory process that involved 280 stakeholders through four thematic workshops with institutional stakeholders and technical experts, twelve buffer zone community consultations, review of the draft plan in a workshop, followed by editing and submission of the final draft to NEPA and FD to obtain comments for the final document. The process and content of the Plan were guided by several documents including publications of the International Union for the Conservation of Nature (IUCN) and the NRCA Draft Guidelines (NRCA, 1988). The management prescriptions incorporate lessons learned from past management experience (inclusive a detailed assessment of implementation of the previous management plan for the period 2005 – 2009) along with inputs from community,

government, academic and other technical stakeholders. Successful implementation requires the resources of the BJCMNP's co-management partners and other stakeholders.

BJCMNP Over-arching Goal

The over-arching goal of preserving the area as a national park is to protect the remaining core area of natural (closed broadleaf) forest for its biological diversity, intangible cultural heritage and the maintenance of ecosystem services including water supply and recreational opportunities. This overarching goal will be achieved through strategies aimed at meeting seven goals and implemented under seven programmes. These programmes are described in detail in Part II of the Plan. The programmes are:

- **Conservation of Natural Heritage**
- **Conservation of Cultural Heritage**
- **Enforcement and Compliance**
- **Education and Public Involvement**
- **Recreation and Tourism**
- **Monitoring and Evaluation**
- **Governance and Administration**

It should be noted that:-

1. Activities under the Conservation Programmes include research aimed at improving management effectiveness, however Park management does not anticipate being able to support all the research needed, hence a research prospectus has been prepared to promote research in areas where the management planning process has highlighted a gap in knowledge. In light of the nomination of the site as a UNESCO World Heritage Site for both cultural and natural heritage, the 2011 – 2016 Management Plan includes a chapter providing guidance on conservation of the Maroon heritage within the BJCMNP and its Community Buffer Zone. Most of the funds for conservation of cultural heritage will come at least during this period, from projects.
2. The issue of sustainable livelihoods is dealt with under both the Education & Public Involvement, and the Recreation & Tourism Programmes.
3. The Monitoring and Evaluation Programme will focus on monitoring of threats and outcomes, and each Management Programme has its own monitoring and assessment system.
4. The budget, financing and self-sufficiency are dealt with in the Governance & Administration Programme and the Recreation & Tourism Programme.

The seven BJCMNP Management Programmes for 2011 – 2016 are summarized below with their respective goals and an outline of the strategic approaches and key activities. A summary costing (including administrative overheads) has been provided below. The details of the strategies and activities including justification for these approaches are laid out in Part II of this Plan. Chapter 4 describes zoning of the National Park and the following chapters explain each of the above-mentioned Programmes in detail, with a tabular summary of key programme components at the end.

NATURAL HERITAGE CONSERVATION PROGRAMME
Goal 1: To maintain and enhance the remaining area of closed broadleaf forest and component species of plants and animals that exist in the BJCMNP.

STRATEGIC APPROACH	KEY ACTIVITIES	COST
Enforcement of national park and forest legislation and environmental education can be considered as components of conservation or natural resource management, but this programme speaks to activities that are more directly related to the resources rather than the resource users. This programme is focused on practical, 'on-the-ground' conservation action as identified through research. To date, research and best practice in protected area management indicate that maintenance of natural habitats and rehabilitation of degraded areas are the best approaches as this protects both the ecosystems and the species within. As research identifies more specific approaches, these will be implemented.	<ol style="list-style-type: none"> 1. Implementation of suitable rehabilitation practices such as planting native fast-growing trees (mainly non-lumber), and the removal of targeted invasive species in priority zones. 2. Propagation of native species for use in forest rehabilitation. 3. Maintenance and promotion of a research prospectus to universities and researchers. Facilitating researchers and liaising with them to encourage training, ensure proper monitoring of research and the delivery of research documentation. 4. Implementation of conservation measures (as identified through research) for threatened biodiversity focusing on forests, streams, birds, epiphytes, the Jamaican Coney, Yellow Boa and Giant Swallowtail Butterfly. <p>Monitoring:- see Goal 5</p>	<p>5 Year Budget (2011 – 2015)</p> <p>Recurrent: J\$23 million (US\$269,775)</p> <p>Capital: J\$32.5 million (US\$377,907)</p> <p>Budget (2011)</p> <p>Recurrent: J\$4,000,814 (US\$46,521)</p> <p>Capital: J\$2,800,000 (US\$32,558)</p> <p>Includes M&E Prog. costs</p>

CULTURAL HERITAGE CONSERVATION PROGRAMME
Goal 2: To maintain and enhance the appreciation for and practice of the Maroon heritage associated with the Blue and John Crow Mountains.

STRATEGIC APPROACH	KEY ACTIVITIES	COST
Work with the Maroon Councils, Jamaica National Heritage Trust and other organizations to:- <ol style="list-style-type: none"> 1. Facilitate the conservation of the tangible cultural heritage e.g. trails, Nanny Town site 2. Facilitate the conservation of the intangible cultural heritage through development and implementation of appropriate strategies including the Blue Mountains Sustainable Tourism Programme 3. Promotion of awareness and appreciation of the oral and intangible Maroon heritage through festivals, education and tourism 4. Promotion and facilitation of 	<ol style="list-style-type: none"> 1. Develop guidelines for conservation of natural and cultural heritage on trails 2. Assist in refining guidelines for work at archaeological sites in the BJCMNP 3. Assist in preparation and implementation of plans for trail development and use. 4. Monitor trails during enforcement patrols 5. Meetings for planning and monitoring of strategies 6. Blue Mountains Sustainable Tourism Programme 7. Education Programmes for schools and Interpretive Programmes associated with tourism 8. Promotion of research through the research prospectus and linkages with relevant organizations 	<p>5 Year Budget (2011 – 2015)</p> <p>Recurrent: in Conservation, Education & Recreation</p> <p>Capital: J\$9.6 million (US\$111,628)</p> <p>Budget (2011)</p> <p>Recurrent: As above</p> <p>Capital: J\$2,800,000 (US\$32,558)</p>

research that will aid in the conservation of cultural heritage	9. Facilitation of research 10. Use of information from research to guide conservation Monitoring: See Conservation Indicators	
ENFORCEMENT AND COMPLIANCE PROGRAMME		
Goal 3: To stop encroachment of the BJCMNP boundary and destruction of forest and wildlife within.		
STRATEGIC APPROACH	KEY ACTIVITIES	COST
Enforcement and compliance of environmental legislation is often regarded as the most important, yet most deficient area of resource management. Park management will seek to improve this situation using the following approaches: 1. Strengthen the Park's Enforcement and Compliance Programme by increasing the level of presence of enforcement officers. 2. Use technology (e.g. digital photography and GIS) to better detect and monitor breaches of environmental legislation. 3. Take action to stop and deter illegal activities and resolve boundary and other resource use conflicts. 4. Use an interpretive and collaborative approach. 5. Address disaster prevention and emergency management issues.	1. Increase the effective number of Park enforcement officers to 15 by employing more National Park Rangers and obtaining assistance from other agencies and community members. 2. Roster National Park Rangers for systematic and strategic patrols and field presence 3. Organise regular joint patrols between the FD, NEPA, ISCF and JCDT. 4. Raise the level of awareness of legislation, particularly amongst local stakeholders. 5. Assist the lead agency FD in resolving boundary discrepancies and re-establishing and marking critical boundary points. 6. Improve readiness to address disasters and emergencies. Monitoring:- Photo-monitoring geo-referenced sites and aerial/satellite imagery of forests.	5 Year Budget (2011 – 2015) Recurrent: J\$78.8 million (US\$916,121) Capital: J\$6.1 million (US\$70,930) Budget (2011) Recurrent: J\$11.6 million (US\$135,213) Capital: JA\$3.5 million (US\$40,698) Community components covered under Education
EDUCATION AND PUBLIC INVOLVEMENT PROGRAMME		
Goal 4: To raise public support for conservation of the BJCMNP's natural and cultural heritage and improve resource management and the sustainability of livelihoods, particularly in Buffer Zone communities.		
STRATEGIC APPROACH	KEY ACTIVITIES	COST
Education is geared at empowering and mobilising individuals and communities to participate in environmental management and sustainable livelihoods. The National Park's Education Programme is aimed at increasing public involvement by targeting: 1. Buffer zone communities:- - youth.	1. Employ community members, wherever possible and involve as many of them as possible in park management activities. 2. Facilitate capacity building including training, working through existing community-based organizations, in order to promote sustainable livelihoods and environmental management 3. Public and community awareness	5 Year Budget (2011 – 2015) Recurrent: J\$38.7 million (US\$450,121) Capital: J\$24 million (US\$279,070)

<ul style="list-style-type: none"> - working with existing CBOs for environmental action - students and teachers - community members generally. <p>2. The general public through public awareness programmes, using the media.</p> <p>3. Visitors to the park's recreation areas through Interpretive Programmes.</p>	<p>raising programmes, using a variety of media to reach different target groups.</p> <p>4. Implement interpretive programme at Holywell and the National Park's other recreation areas.</p> <p>5. Implement buffer zone community school programme to engage successive generations in caring for natural resources.</p> <p>Monitoring:- Using questionnaires and photo-monitoring e.g. of community projects.</p>	<p>Budget (2011)</p> <p>Recurrent: J\$6.5 million (US\$75,421)</p> <p>Capital: J\$5.9 million (US\$68,605)</p>
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RECREATION AND TOURISM PROGRAMME

Goal 5: To provide recreational opportunities for local and international visitors, using ecotourism principles, in order to generate income and support for the BJCMNP.

STRATEGIC APPROACH	KEY ACTIVITIES	COST
<p>A national park is designated as such partly to provide recreational opportunities to present and future generations, and, therefore, the areas zoned for recreational use must be managed in a manner that is not damaging to the park's resources.</p> <p>In addition, recreational use by resident and non-resident visitors will be geared towards garnering support for park management by:-</p> <ol style="list-style-type: none"> 1. Income generation - directly through entry and user fees, concessions, merchandise etc., 2. Voluntary donations in cash or kind 3. Provision of educational opportunities 4. Employment and income generating opportunities for local community members, thus encouraging their support for park management and conservation of the resources they depend on for their livelihoods. 	<ol style="list-style-type: none"> 1. Implement the Blue Mountains Sustainable Tourism Programme designed to market the National Park's recreation areas along with local attractions and accommodations through tours and packages, using a system that will generate support for the National Park's conservation and sustainable development of its Community Buffer Zone. 2. Improve business planning, development and management, inclusive marketing, of the Park's recreational areas and related Buffer Zone opportunities. 3. Provide quality interpretive opportunities and materials, including signs and exhibits for each recreational area in targeted Buffer Zone communities. 4. Increase visitor spend by providing opportunities for purchase of products and services. <p>Monitoring:- Income/Expenditure statements, visitor statistics and questionnaires, community research.</p>	<p>5 Year Budget (2011 – 2015)</p> <p>Recurrent: J\$54.2 million (US\$631,041)</p> <p>Capital: J\$51.9 million (US\$603,488)</p> <p>Budget (2011)</p> <p>Recurrent: J\$9.4 million (US\$109,464)</p> <p>Capital: J\$6.21 million (US\$72,209)</p> <p>Some aspects Cultural Heritage Conservation covered here</p>

MONITORING AND EVALUATION PROGRAMME

Goal 5: To track and record both the threats and the changes to ecosystem health so that it is possible to assess whether or not the BJCMNP is achieving its overarching conservation goal.

STRATEGIC APPROACH	KEY ACTIVITIES	COST
Tracking both of the threats posed to the ecosystems of the park	1. Gathering information from Rangers' observations regarding threats.	All costs included within

<p>(Threats/Ranger based monitoring), and the changes occurring in the ecosystems themselves (Outcomes monitoring) are the two most important aspects of monitoring for management effectiveness in the BJCMNP. Outcomes monitoring will focus on the Park's conservation biodiversity targets as indicators of ecosystem health.</p>	<ol style="list-style-type: none"> 2. Monitoring of forest area and encroachment using permanent photo-points, remote sensing and helicopter reconnaissance. 3. Monitoring the quality of freshwater, using bio-monitoring techniques 4. Monitoring the distribution of birds. 5. Monitoring the populations of key threatened species. 	<p>Conservation and Enforcement & Compliance Programmes</p>
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GOVERNANCE AND ADMINISTRATION PROGRAMME

Goal 6: To provide efficient, effective and sustained management that will allow the BJCMNP to meet its overarching and other goals.

STRATEGIC APPROACH	KEY ACTIVITIES	COST
<p>Governance from policy through to operations is necessary for the management of any activity or resources, particularly in the case of natural and cultural heritage, which have multiple stakeholders. As such, collaboration, and the involvement of stakeholders is a critical component in the management of the BJCMNP. In addition, appropriate and functioning administrative systems must be in place. This programme will seek to ensure the efficient and effective management of the park and to engender support to ensure a sustained approach to park management.</p>	<ol style="list-style-type: none"> 1. Coordinate management at the policy level through establishment of a Park Advisory Committee comprising of key public, private sector and community stakeholders who will meet twice a year. 2. Coordinate management at the operations level through regular meetings of the Co-Management Committee (management partners as per relevant agreements). 3. Seek short and long-term funding for park management through grant funding, government subvention, donations, sponsorship and income generation through opportunities provided by the Recreation and Tourism Programme and other ventures. 4. Provide supervision, project management, financial management and administrative support for the park's programmes. 5. Ensure adaptive management through monitoring and evaluation of all programmes. <p>Monitoring:- level of stakeholder involvement, funding, forest and wildlife status.</p>	<p>5 Year Budget (2011 – 2015)</p> <p>Recurrent: J\$53.5 million (US\$622,815)</p> <p>Capital: J\$4.2 million (US\$48,837)</p> <p>Budget (2011)</p> <p>Recurrent: J\$9.1 million (US\$106,163)</p> <p>Capital: J\$100,000 (US\$1,163)</p> <p>N.B.: Annual Prog. cost about 30% Progs. Total</p>

Total Recurrent Expenditure	Five-Year Budget (2011-2015) J\$248 million (US\$2.9 million)	Budget (2011) J\$40.6 million (US\$472,782)
Total Capital Expenditure	J\$121 million (US\$1.4 million)	J\$18.5 million (US\$215,232)
TOTAL	J\$369 million (US\$4.3 million)	J\$59 million (US\$688,014)

N.B.: US\$/JA\$Exchange Rate used for calculations in Oct, 2010 (86:1)

**BLUE AND JOHN CROW MOUNTAINS
NATIONAL PARK**

MANAGEMENT PLAN
(2011 □ 2016)

PART I

BACKGROUND TO THE PLAN

Chapter 1

Introduction

Vision Statement

A national park that is:

*native rainforest and home to thriving populations
of endemic species, and
majestic mountain memorial to the Maroon Freedom Fighters
managed through active programmes that conserve
natural habitats and intangible heritage by*

- *restoring degraded areas,*
- *reducing and mitigating against threats,*
- *facilitating the provision of essential ecosystem services, and*
- *promoting the revitalization of Maroon traditions,*

*whilst providing quality income-generating, recreational and educational
experiences for Jamaicans and foreigners, alike.*

This Management Plan for the Blue and John Crow Mountains National Park is a five-year plan designed to guide management activities over the period 2011 to 2016. It was prepared over an 18 month period between 2009 and 2011 by the Jamaica Conservation and Development Trust (JCDDT), with funding mainly from the Environmental Foundation of Jamaica (EFJ). The planning process was guided by the National Park's Co-management Committee - Forestry Department (FD), National Environment and Planning Agency (NEPA) and the Jamaica Conservation and Development Trust (JCDDT). In addition, publications from the International Union for the Conservation of Nature (IUCN) and draft NRCA guidelines directed the planning process, the format and the content of the Plan.

In developing this Management Plan, a participatory approach was employed, not only to take advantage of the wealth of knowledge among the various stakeholders, but also to garner their support in implementing the management activities proposed. The process benefited from the input of a wide cross-section of stakeholders ranging from rural buffer zone community members to scientific experts. Almost 300 participants shared their

ideas through twelve community consultations, four major consultative workshops, discussions with several specialists, and a final draft presentation and review workshop.

The IUCN guidelines for protected area management planning (Thomas and Middleton, 2003) provide a simple definition for a Management Plan, “a document which sets out the management approach and goals, together with a framework for decision making, to apply in the protected area over a given period of time”. These guidelines further note that “Management Plans should be succinct documents that identify the key features or values of the protected area, clearly establish the management objectives to be met and indicate the actions to be implemented”.

The purpose of BJCMNP Management Plan is to guide the management of the National Park around its main areas of focus – the conservation of biodiversity, associated cultural resources and ecosystem health, and the provision of natural and cultural heritage-based recreational opportunities by all its co-management partners. In light of the need for as much financial self-sufficiency as possible, this Management Plan addresses this issue for each Programme, particularly Recreation and Tourism and Governance and Administration. Whilst the Management Plan lays out a clear framework of the vision, mission, goals and programmes, the strategies and activities are not set in stone, but maintain a level of flexibility in order to adapt to changing conditions and our ever increasing knowledge base.

Goal

To maintain and enhance the remaining area of closed broadleaf forest, component species of plants and animals and associated cultural heritage, existing in the Blue and John Crow Mountains.

Mission Statement

To collaboratively manage the national park for its natural, cultural and recreational values, by striking the right balance between biodiversity conservation and socio-economic development, for the ultimate well-being of the people of Jamaica.

1.1 Management History

In 1728, Governor, Sir Nicholas Lawes brought the first coffee seedlings to Jamaica from Hispaniola. Excellent coffee was found to be produced in the Blue Mountains where the high elevation and associated mist led to a long growing season resulting in beans with superb flavor. By the late 1700s, the Government began awarding land grant patents for Crown Lands in the Blue Mountains in order to grow coffee. For example, Colonel William Whitfield in 1776 was awarded a patent to grow coffee high in the Blue Mountains, creating the Whitfield Hall estate. By the mid 19th century concern was raised about denudation of the mountains and the likely impact on water supply.

The protection of the BJCM was initiated following Hooper's 1885 'Report upon Forests of Jamaica' which recommended that "the first and most important work to be done is reservation of the highlands of the Blue Mountains". He proposed not to take any new tenants nor allow existing tenants to clear additional land to "protect the springs from drying up and regulate the flow of the Portland rivers". Further, Hooper stated, "at all hazards, the main ridge should be preserved from all cutting and any proprietor holding such land should be invited to relinquish it". In response, Law 37 of 1889, The Mountain and River Reserves Law was enacted to exchange and purchase patents and another piece of legislation (Law 5 of 1871) was used to forfeit lands to her Majesty, on which outstanding taxes and quit-rents had not been paid. By 1923, most of the land proposed for the Reserve was back in Government's possession, and in 1927, the Afforestation Law was passed which gazetted formerly patented properties in St. Andrew, St. Thomas, St. Mary and Portland, as forest reserves (JCDT, 2009).



Plate 3: Map showing proposed extent of the BJCM forest reserve (pink); green shading shows Grand Ridge of the Blue Mountains (courtesy Jamaica Archives)

The Forest Act was passed in 1937 establishing the Forestry Branch under the Lands Department, and the BJCM forest reserves were put under its control. The Forestry Department (FD) was established within the Ministry of Agriculture in 1942, with the mandate to manage the island's forest reserves and plantations. This included reforestation, boundary surveys, construction of roads and buildings, silvicultural research and biophysical inventories. The FD also established a number of recreation areas including Holywell and Clydesdale.

In 1979, the Forest Industries Development Company (FIDCO) was established with the mandate to develop industrial forestry particularly Caribbean Pine plantations and harvesting. With FIDCO's establishment came a splitting of the forestry sector and as a result, the activities of the FD were severely disrupted and became very limited in the 1980s. FIDCO's activities centered on pine plantations, but much of these were destroyed by Hurricane Gilbert in 1988. FIDCO ended its operations in 1999.

Box 1.1: BJCMNP Management History at a Glance

1885 *Hooper's Report upon Forests of Jamaica*
 1889 *Government begins to reclaim lands for Blue Mountains Forest Reserve*
 1927 *Afforestation Law protects major portions of the Blue Mountains as Forest Reserve*
 1937 *Passage of Forest Act*
 1942 *Formation of Forest Department*
 1950 *Declaration: Blue Mountain Forest Reserve*
 1979 *Establishment of FIDCO*
 1989 *Launch of PARC project*
 1990 *Launch of BJCMNP project*
 1991 *Promulgation of the NRCA Act*
 1993 *BJCMNP gazetted*
 1997 *End of PARC Project (Phase II)*
 1996 *Promulgation of Forest Act*
 1996 *First Delegation Agreement (NRCA/JCDT)*
 1999 *FIDCO ends operations*
 2000 *Co-Management Agreement*
 2002 *Second Delegation Agreement*
 2004/5 *Preparation: 2005-2010 Management Plan*
 2009/11 *Preparation: 2011 – 2016 Management Plan*

The CIDA-funded Trees for Tomorrow project which started in 1992 significantly strengthened the FD, at all levels. A new Forest Act was promulgated in 1996 and the National Forest Management and Conservation Plan produced in 2001. The new Act clearly stated the department's role in biodiversity conservation and provided for greater involvement of stakeholders in forest management. In 2008, the Forestry Department became an Executive Agency.

With the documentation of the threat to Jamaica's few remaining areas of natural habitat in the Country Environmental Profile (1987), the USAID/GOJ funded Protected Areas Resources Conservation (PARC) project was launched in 1989. Phase I

involved the establishment of the Montego Bay Marine Park and the Blue and John Crow Mountains National Park. Activities spanned five years, with the Planning Institute of Jamaica (PIOJ), NRCA and JCDT collaborating on the initiative, which included:

1. preparation and enactment of park legislation,
2. preparation of a protected areas system plan, and
3. establishment of the Jamaica National Parks Trust Fund through a debt for nature swap. This was to assist in financing the parks.

The BJCMNP project was launched in 1990 and this site became the first actively managed terrestrial national park in Jamaica, gazetted in February, 1993. It served to sensitize the Jamaican public about conservation and sustainable use of natural resources and provided the foundation for a national parks and protected areas system in Jamaica - an environmental management tool that aims to protect the best and most representative areas of the island's natural heritage. Under the criteria for site selection in the National System Plan (JCDT, 1992), the BJCMNP was selected due to its: (i) high ecological value, (ii) high socio- economic value, and (iii) high level of community interest. The management feasibility of the area was however, thought to be very difficult.

1.2 Role of the BJCMNP in the National Protected Areas System

Jamaica is in the process of developing a Protected Area Master Plan to meet its Biodiversity Convention commitments. This process is being led by NEPA using a participatory process to involve key stakeholders, particularly other government agencies with responsibility for protected areas in Jamaica e.g. FD and the Jamaica National Heritage Trust (JNHT). The Policy for Jamaica's System of Protected Areas (GOJ, 1997) cites six goals of the system. These are:

- i) economic development,
- ii) environmental conservation,
- iii) sustainable resource use,
- iv) recreation and public education,
- v) public participation and local responsibility, and
- vi) financial sustainability.

The BJCMNP is an important component of this Protected Areas System, playing a pioneering role in management of protected areas in Jamaica and currently (being the most actively managed) makes perhaps, the most significant contribution towards implementing System goals. Further, and most importantly for System management, many lessons can be learned from the experience of managing the BJCMNP and JCDT has numerous documents and personnel that can share this knowledge.

The BJCMNP falls under Category II of the IUCN's protected area management categories - national park, defined as a protected area that is managed mainly for biodiversity conservation, ecosystem protection and recreation. It is one of the nation's most prominent natural areas, with major biodiversity, cultural, environmental and tourism values. Approximately one third of the island's remaining natural habitat is in the BJCMNP including unique ecosystems, hence it is of critical importance to the National System of Protected Areas. The BJCMNP is representative of montane rain forest and contains vegetation associations important for biodiversity and watershed protection (aquifer recharge, soil erosion control, flood protection). Approximately one-half of the island's ferns are found in the BJCMNP and 40% of the flowering plants are endemic to the area. The National Park provides critical habitats for rare, endangered, endemic species such as the Jamaican Coney or Hutia (*Geocapromys brownii*), Jamaican

Blackbird (*Nesopsar nigerrimus*), Black-billed Streamertail Hummingbird (*Trochilus scitulus*), Ring-tailed Pigeon (*Columba caribaea*), Jamaican Boa (*Epicrates subflavus*), *Eleutherodactylous* frogs, the Giant Swallowtail Butterfly (*Pterourus homerus*) and numerous land snails.

The BJCMNP possesses scenic and recreational qualities including undeveloped waterfalls, panoramic views of tropical mist forests, trails, camping grounds and accommodation that are important both to Jamaicans and tourists for recreation and enjoyment of the nation's natural heritage. It provides the ecological basis for a number of industries including tourism, agriculture and forestry.

The most prominent cultural heritage feature of the BJCMNP is intangible, being the direct association of the site with the archetypal example of Grande Maroonage exhibited by the Windward Maroons who formed the first free Maroon state in the post-1492 world. The traditions and beliefs of the Windward Maroons are still alive today, maintained by three Maroon communities around the BJCMNP in Moore Town, Charles Town and Scots Hall. The former two are considered to be located within the BJCMNP's Buffer Zone and the Maroon Heritage of Moore Town was recognised by UNESCO in 2005 as a "Masterpiece of the Oral and Intangible Heritage of Humanity". This heritage includes language, music, dance, constitutional and religious traditions and a reverence for the BJCM as the final resting place of their ancestors who sacrificed their lives for freedom. The tangible heritage of the Windward Maroons located within the BJCMNP includes sites such as Nanny Town and trails such as the Cunha Cunha Pass. Within the BJCMNP's Buffer Zone, there are historic houses and coffee works and the military hill station - Newcastle. Such sites form the key cultural resource features of the BJCM area and are important for the preservation of our natural and cultural heritage.

Given the ecological integrity of the BJCMNP, the property is a major centre for field research for both locals and foreigners, and provides an excellent opportunity for environmental, ecological and cultural heritage education for schools and communities.

1.3 Policy and Legislative Basis of the Management Plan

Jamaica is a party to the United Nations Convention on Biological Diversity which under Article 8 requires contracting parties to ensure in-situ conservation of their biodiversity through a system of protected areas amongst other activities. Jamaica's Policy for the National System of Protected Areas defines a protected area as:

"an area of land or water that is managed for the protection and maintenance of its ecological systems, biodiversity and/or specific natural, cultural or aesthetic resources" (GOJ, 1997).

According to the International Union for the Conservation of Nature (IUCN) guidelines for applying protected area management categories a protected area is: "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley 2008, 8).

Jamaica's Policy for a System of Protected Areas (GOJ, 1997) states that a national park's purpose is "... biodiversity and ecological protection, tourism, recreation, scientific research and education".

IUCN Category II protected areas, often referred to as 'national parks', are defined as: "large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities" (Dudley 2008, 8).

The Blue and John Crow Mountains National Park was designated in February, 1993 through the Natural Resources Conservation (BJCMNP) Order, under the NRCA Act, 1991. Section 5 of the NRCA Act allows the Authority to designate national parks, protected areas and marine parks and Section 38 provides for the making of regulations to guide management of these areas.

The Natural Resources (National Parks) Regulations of 1993 set the framework for the protection and legal use of the BJCMNP by describing offences and punishment for contravention of these, the provision of permits for research and commercial activities and the roles of the Park Manager, National Park Rangers and Advisory Council. Section 27 provides for zoning of a national park and Section 28 requires the preparation of a management plan. The National Policy for the System of Protected Areas (GOJ, 1997) states that such plans should be prepared for every protected area and the NRCA has developed draft guidelines.¹ The Natural Resources Conservation (BJCMNP) (User Fees) Regulations of 2003 establishes user fees for entry to the Park's recreation areas and trails and for camping. The Natural Resources (National Parks) (Amendment) Regulations of 2003 provide for charging of fees for commercial activities within national parks. The Forest Act of 1996 and Forest Regulations of 2001 are also used in managing the BJCMNP as it is a gazetted Forest Reserve. Other legislation such as the Wild Life Protection Act (1945) and its relevant amendments, orders and regulations are pertinent to management of the Park. Appendix 3 provides a review of these regulations and other relevant legislation and Appendices 15 – 17 provide copies of the BJCMNP Order and Regulations. Chapter 7 highlights issues regarding the enforcement of the legislation.

(GOJ, 1997) articulates the principle of collaboration between organizations, with respect to management of protected areas; and the NRCA Act, 1991, Section 6 allows the NRCA to delegate any of its functions (other than the power to make regulations) to another party. It is within this legislative and policy framework, combined with the limited resources in any one agency and the interest and concern of civil society that non-government organizations (NGOs) have become involved in protected area management.

The JCDT is a non-government organisation and a registered charity, established in 1988. It played a lead role in the implementation of the Protected Areas Resource Conservation (PARC) project (a GOJ/USAID effort) which established protected areas and a protected

¹ *NRCA Guidelines related to Management, Operations and Financial Plans Development and Design, Manual Number 1 Draft, 1998.*

areas framework in Jamaica between 1989 and 1995. Since its establishment, the JCDT has maintained and strengthened its interest in the management of the Blue and John Crow Mountains National Park (BJCMNP) and in 1996 signed a delegation agreement with the NRCA for management of the Park, with a new ten year agreement signed in September, 2002. Under the delegation agreement, a management plan must be prepared every five years and submitted to the NRCA for approval. The 2005 – 2010 Management Plan was approved in 2005 and this Plan should be approved in 2011.

1.4 Collaborative Management

The BJCMNP was established on the boundaries of the Blue Mountains and other forest reserves, at a time when the Forest Act, 1937 was more geared towards watershed management and production forestry than towards conservation. In 1996, a new Forest Act was promulgated that speaks to the issue of biodiversity conservation and the participation of civil society in the management of forest resources.

A collaborative management agreement was signed in 2000 by the FD, NRCA and JCDT. This agreement seeks to guide operational management of the park by identifying different roles and responsibilities for the various organizations involved. A Co-management Committee with representatives from each of the co-management parties meets three times a year to coordinate and implement the management activities of the Park. Since 2009, work has been in progress to update and renew the Co-management Agreement, and it should be signed in 2011. The JNHT will be signing this Agreement and joining in co-management of the BJCMNP particularly for conservation of the property's cultural heritage.

Further, BJCMNP management seeks involvement from stakeholders, particularly local ones through participatory planning and involvement in its programmes and projects.

1.5 Previous Management Plans and Justification for the Current Plan

In 1992, under the PARC Project, the first management plan was prepared for the BJCMNP for the 1993 to 1996 period. Whilst a variety of plans for different aspects of park management were prepared subsequent to this (BJCMNP Development Plan 1998 – 2000 and BJCMNP Site Conservation Plan, 2001), a completely updated and thorough management plan was not prepared until the 2005 - 2010 Management Plan. During its preparation, it was found that many of the strategic actions proposed in 1992 and attempted, were effective in achieving their intended goals, hence several of the approaches were included. However, few if any *measurable* objectives and monitoring programmes were identified from which success could be judged, and the 2005 - 2010 Management Plan sought to rectify this situation. This 2011 - 2016 Management Plan continues in the same vein of adaptive management, taking lessons learned from the assessment of implementation of the 2005 – 2010 Management Plan over the last five

years (Otuokon, 2010c), to improve on strategies for the next period. This assessment was made possible by the clear objectives and setting of annual workplans and targets.

Funding continues to be a critical issue impacting the implementation and maintenance of necessary management activities e.g. enforcement patrols and community outreach. This has been a challenge to management of the BJCMNP since initial PARC Project funding ceased. Achieving financial sustainability is, therefore paramount to the success of the present Management Plan. Based on international experience however, it cannot be expected that the BJCMNP's programmes themselves will be self sustaining but rather there is a need for dedicated, reliable funding from government supported by funding from foundations, private sector, and the property's own income generating activities.

Planning is an essential part of management, as are monitoring and evaluation. Using the latter two activities, BJCMNP managers will be able to assess how well it is doing – are the goals, objectives and targets being met; which strategies are working and which are not; what are the challenges that must be addressed and the opportunities to be taken advantage of. Using this information (particularly if obtained using a participatory process that involves the stakeholders) BJCMNP managers can then revise or prepare completely new plans as necessary. When funds are limited, planning is particularly important, as it helps keep management focused on the priorities and helps to identify synergies which can reduce costs and increase benefits.

1.6 Management Planning Process for the 2011 - 2016 Plan

Preparation of the 2011 – 2016 BJCMNP Management Plan benefited heavily from the existence and implementation of the 2005 – 2010 Plan, and in particular, the detailed information available in the form of reports and other documents. This Plan is essentially an edited and updated version of the older Plan which was generally successfully implemented though with numerous financial and hence other resource challenges. The preparation of both this Plan and the 2005 – 2010 Plan were guided by international and national guidelines, in particular those from the International Union for the Conservation of Nature (IUCN) and the NRCA (see References and Bibliography). In addition to guidance from literature, JCDT is a member of the IUCN and personnel involved in the preparation of the National Park's Management Plans are active members of the IUCN World Commission on Protected Areas and have participated in relevant conferences and training workshops. Further, some of these personnel have participated in training courses on National Park management conducted by the US National Parks Service.

Funding was approved by the Environmental Foundation of Jamaica in 2008 under a BJCMNP Monitoring and Evaluation Programme Support Project. Additional funding was made available through a small grant from the Caribbean Natural Resources Institute Action Research Learning Group Project. The process began with the assessment of five years (2005 – 2009) of implementation of the 2005 – 2010 Plan, and two interns (undergraduate and graduate level) sponsored by the Jamaica Energy Partners played an important role in assisting JCDT staff with this process. JCDT conducted its own

Institutional Self Assessment and Strategic Planning in November and December, 2009, and this process (which also involved interviews with stakeholders) benefitted the whole management planning process. The completion of the UNESCO World Heritage Site Nomination Dossier for the National Park in 2009, provided useful information, particularly with respect to the strengthening of the Cultural Heritage components.

A summary of this evaluation was presented to stakeholders during workshops to obtain input into the new Plan. A report was prepared detailing the discussions and recommendations of the stakeholders (Otuokon 2011 and 2010b). A report was also prepared detailing the results of the assessment of five years of implementation of the 2005 – 2010 Management Plan (Otuokon, 2010c). All this information including from a literature review, was used to prepare a draft plan. Following a review of the Draft Management Plan by stakeholders at a workshop in early July, it was revised and sent to NEPA as the government agencies with ultimate authority for management of the site and to FD as a co-management partner. Comments from these agencies were also obtained during the previous consultations and all comments received were used for a final revision of the document which was then sent to NEPA for NRCA’s approval.

Table 1: Management Planning Process Summary

Major Planning Activities in the Development of the BJCMNP Management Plan 2011 - 2016	Time-frame
1. Literature Review (see References and Bibliography)	From July, 2009
2. Stakeholder Identification	From July, 2009
3. Evaluation of implementation of 2005 - 2010 Plan	July, 2009 – June, 2010
4. Twelve Buffer Zone Community workshops – Bangor Ridge, Cascade/Section, Sherwood Forest, Claverty Cottage (Portland), Woodford, Irish Town/Redlight, Mavis Bank (St. Andrew), Minto/Hagley Gap, Cedar Valley (St. Thomas), Millbank (Portland) and the Charles Town and Moore Town Maroon Councils (243 participants)	January - April, 2010
5. Four thematic workshops involving organizational stakeholders and specialists (35 participants from 18 organisations) addressing the following themes:- <ul style="list-style-type: none"> • Conservation Science • Education and Public Awareness • Recreation and Tourism • Enforcement and Compliance 	February - March, 2010
6. Meetings and consultations with conservation experts	February - July, 2010
7. Draft Management Plan Review Workshop – (37 participants from 22 organisations and 8 communities)	July, 2010
8. Editing	February – Oct, 2010
9. Draft Management Plan to NEPA and FD and chapter on Cultural Heritage Conservation to JNHT for comments.	October, 2010 February, 2011
10. Comments received.	Dec. 2010; May, 2011
11. Final Editing	Dec. 2010 – January, 2011; June – July, 2011

Chapter 2

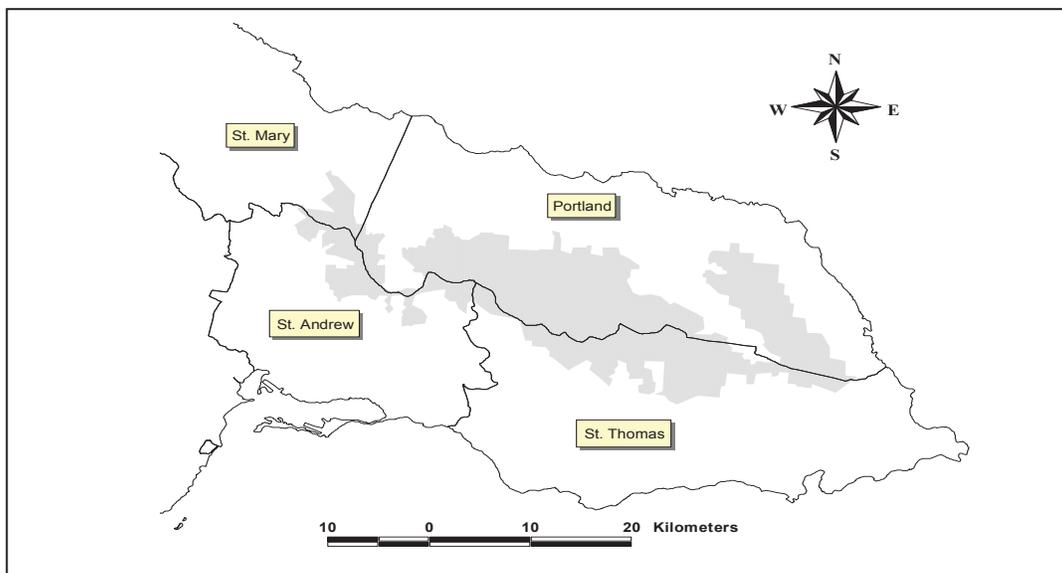
Physical Features and Biological Diversity of the BJCMNP

2.1. PHYSICAL FEATURES

2.1.1 Geographical Location and Size

Stretching over four parishes in eastern Jamaica, the Blue and John Crow Mountains National Park (BJCMNP) extends over a planimetric area of 486.5 km² (48,650ha) and represents 4.4% of Jamaica's land surface (Table 2.1 & Fig. 2.1)². A majority of 59.7% of this area is located in the parish of Portland, with 25.9% in St. Thomas, 10.8% in St. Andrew and 3.6% in St. Mary. The BJCMNP represents 35.6% of the area of Portland, 17.4% of St. Thomas, 11.8% of Kingston and St. Andrew and 2.9% of St. Mary. The topographic area (about 78,000 ha) exceeds the planimetric area by about 60%, indicating the mountainous nature of the BJCMNP which contains the highest point in Jamaica (2,256m) and the second highest peak in the Caribbean. The perimeter of the BJCMNP boundary is 984.6km and at its greatest east-west distance, it measures 58 km and 19 km at its greatest north-south distance. The Zonation Plan (Chapter 5) describes a buffer zone around the Preservation Zone and a 'Community' Buffer Zone which is not legally defined (as it is outside the BJCMNP boundary) but extends 1km from the boundary covering an area of 267 km² (26,711ha) incorporating 51 communities.

Figure 2.1: Location of the BJCMNP

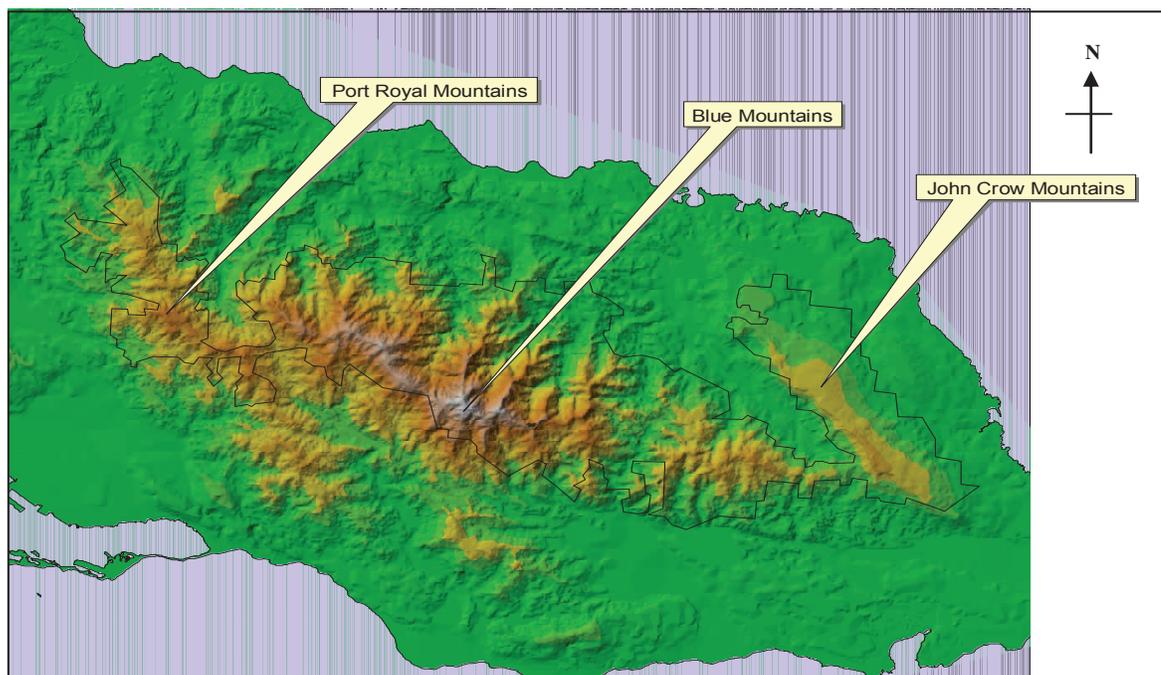


² The indicated size of the BJCMNP area is based on FD digital maps outlining forest reserves as the boundaries are congruent with the forest reserves in the Port Royal, Blue and John Crow Mountains.

2.1.2 The Mountain Ranges

The BJCMNP consists of three mountain ranges (Fig. 2.2), the northern and central sections of the Port Royal Mountains (PRM) (14.8% of the BJCMNP area) in the west, the Blue Mountains (BM) (65.7%) in the centre and the John Crow Mountains (JCM) in the east (19.5%). While both Port Royal and John Crow Mountains run mainly north to south, the Blue Mountains run mainly west to east. Along their major axis, the Port Royal Mountains extend about 20 km within the park area, the Blue Mountains about 39 km, and the John Crow Mountains about 21 km.

Figure 2.2: Mountain Ranges of the BJCMNP



From north to south, major peaks in the Port Royal Mountains are Mount Telegraph (ca. 1290 m), Mount Horeb (ca. 1490 m) and Catherine's Peak (1539 m). A paved road leading through Hardwar Gap in the PRM connects the north and south coast. Silver Hill Gap (ca. 1050 m) separates the Port Royal from the Blue Mountains.

The Blue Mountains rise steeply (sometimes in excess of 70° and frequently more than 50°) within 5 km of the coast and are characterized by steep-sided valleys with deeply gorged rivers. The Grand Ridge forms the backbone of the BM range, reaching the highest elevation in the country. The major peaks are Blue Mountain Peak, composed of Middle Peak (2256 m - the highest point in Jamaica); East Peak (2246 m); Sugar Loaf Peak (c. 2150 m); High Peak (2082 m); Mossman's Peak (2028 m) and Sir John's Peak (1927 m). (Figure 2.3).

The John Crow Mountains is a prominent cuesta or coastal ridge, formed by a strongly tilted limestone plateau, which rises gently from the east and dips towards the north-east. The mountains rise to an elevation of 1140 metres above sea-level (masl), with a scarp face on the western side, and an unusual landscape of sinkholes and outcrops. They are separated from the BM by the Rio Grande Valley, and both ranges converge at Corn Puss Gap (640 m) at the boundaries of the parishes of Portland and St. Thomas.

2.1.3 Altitude Profile

Along northern, south-eastern and eastern sections of the BJCMNP the altitude falls occasionally to about 150 m, while the central sections of the Blue Mountain Ridge lie above 1500 m; maximum altitude is – as indicated above – 2256 m (Fig. 2.3). The best represented altitudinal levels (Fig. 2.4a) are 600-700 m (12.5 % of planimetric area) and 700-800 m (10.8%). About 70% of the BJCMNP area is below 1000 m, and about 50% is below 800 m (Fig. 2.4b). Thus, the BJCMNP is much more than a high altitude protected area; it includes substantial areas at lower altitudes and is equally important for the conservation of forest ecosystems at lower and upper levels in eastern Jamaica.

Figure 2.3: Elevation Map of the BJCMNP

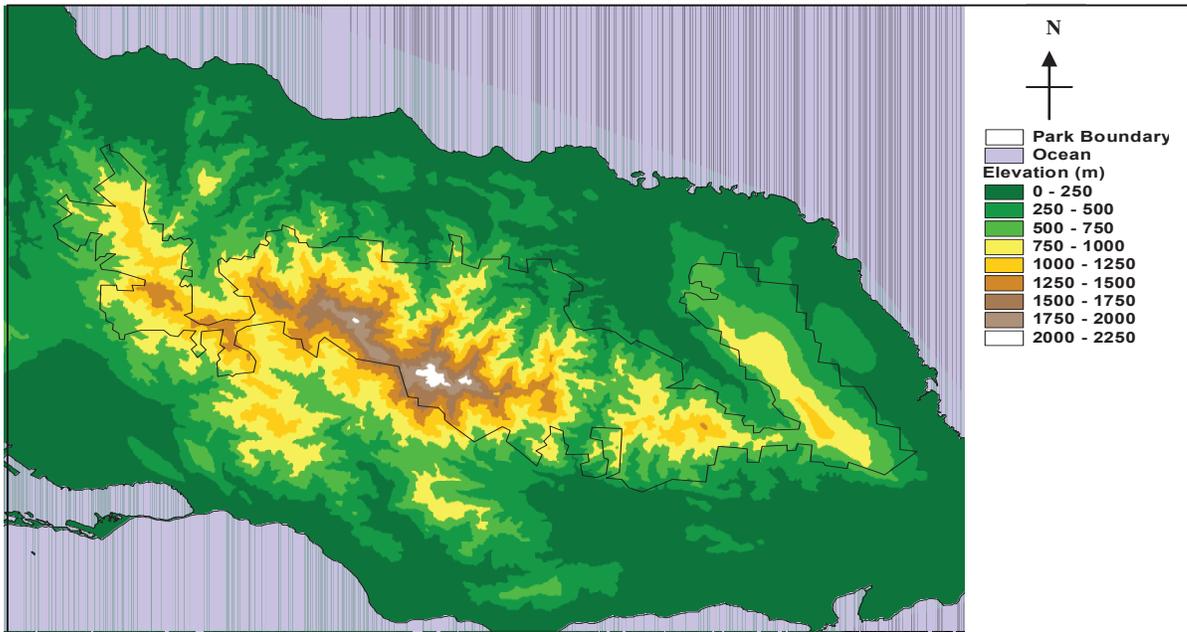


Figure 2.4a: Elevation Profile of the BJCMNP

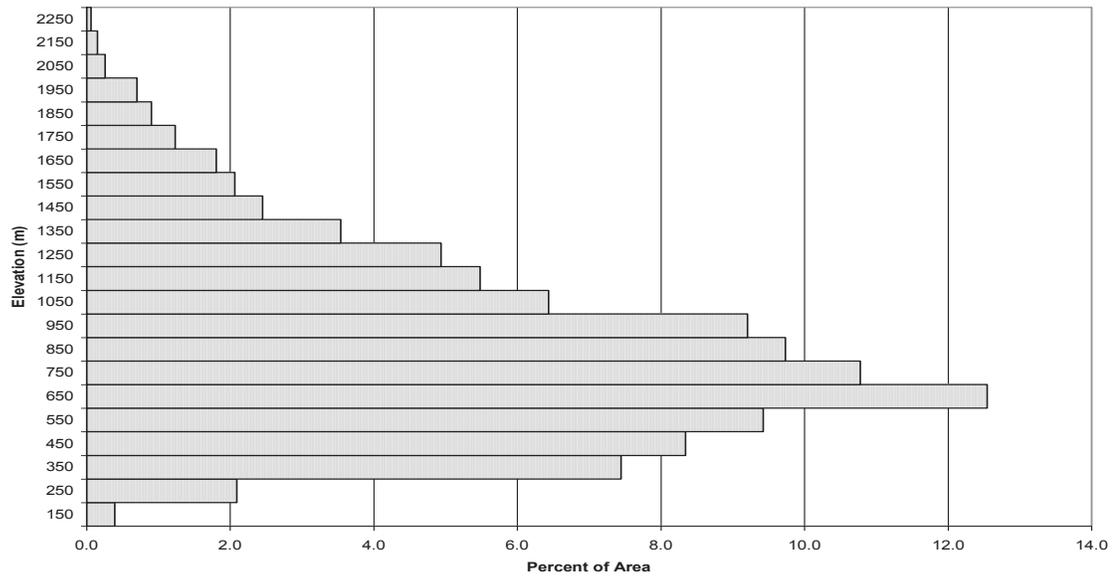
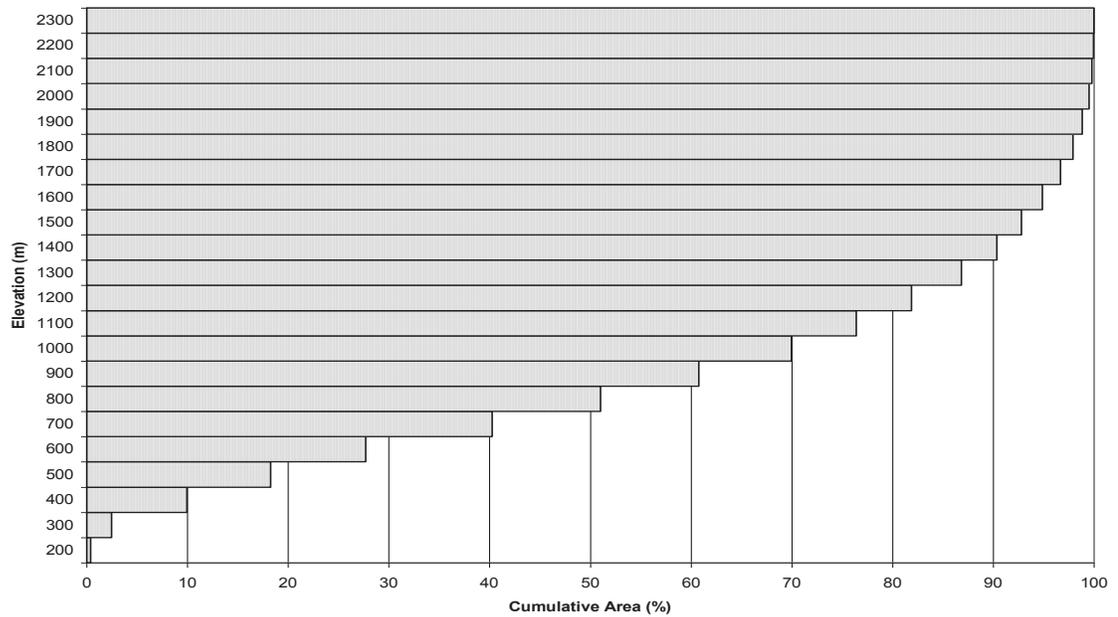


Figure 2.4b: Elevation Profile (cumulative) of the BJCMNP



2.1.4 Geology and Soils

The BJCMNP contains a unique geology that is critical to understanding the evolution of the Caribbean region. The rapid uplift of this area over the last 14 million years has created a spectacular and impenetrable landscape.

The BM and PRM have a complex geology which reflects a varied history of sedimentation, volcanism, plutonism, and metamorphic activity. The rocks found in and

around the Blue Mountains record a 100 million year history of the development of the Caribbean Tectonic Plate, and are the oldest geological formations in Jamaica. Eastern Jamaica can be divided into four regions: the John Crow Mountains Belt, the Blue Mountains Block, the Wagwater Belt, and St. Thomas Shelf; with the BJCMNP including parts of the first three.

The oldest rocks are found in the Blue Mountain Inlier (an inlier is an area of older rocks surrounded by younger rocks) in the Blue Mountain Block. The BM Inlier is dominated by cretaceous, volcanic and igneous rocks, with minor sedimentary (limestone) and metamorphic units. Metamorphic rocks are found in a thin belt along the southern margin of the Grand Ridge of the Blue Mountains. These rocks include blueschists (their name due to the presence of the blue mineral glaucophane) which formed at very high pressures (that is, great depths within the Earth) but relatively low temperatures, and serpentinites that represent metamorphosed material derived from the Earth's mantle. The ages of these rocks are still unknown. In the south-eastern part of the Blue Mountains is a succession of basaltic pillow lavas, the term 'pillow' coming from the pillow-like form of the lavas, and indicating eruption under water. These are Cretaceous rocks (about 90 million years old). The north-eastern part of the Blue Mountains is represented by a succession of lavas and associated sedimentary rocks. The lavas were erupted in shallow water and on land and have a chemistry indicating formation within an island arc setting, much like the modern-day volcanoes of the Lesser Antilles. The associated sedimentary rocks include conglomerates, sandstones and shales, and limestones. Two limestones of particular importance are present, called the Back Rio Grande and Rio Grande limestones. These yield abundant fossils of rudist bivalves (an extinct type of tropical clam), including the bizarre *Barrettia monilifera* (the Blue Mountains were the first location in the Greater Antilles where such fossils were found and hence recognised as the Type Locality).

To the east and west of the Blue Mountain Block lie the John Crow Mountain Belt and the Wagwater Belt (including the Port Royal Mountains), containing younger rocks than the Blue Mountain Inlier, deposited in narrow seaways formed by extension of the crust. The Wagwater Belt contains a 9,000 m thickness of conglomerates, sandstones, shales and lavas, deposited some 60 to 50 million years ago and has been largely uplifted. The rocks found in the John Crow Mountains consist of an older set of sandstones and shales, known as the Moore Town Shales, overlain by younger limestones (part of the White Limestone Group). The shales give rise to steep slopes on the north-east slopes of the Rio Grande Valley that contrasts with the karstic topography characteristic of the White Limestone in the John Crow Mountains.

The massif of the JCM is like much of the island (e.g. the Cockpit Country in the west) composed of hard, massive, white limestone formed during the late Eocene (40-35 million years BP). Unlike the sharp peaks of the BM, the erosion of limestone on the JCM has left a summit with a slightly tilted plateau. This has formed an unusual rugged landscape of sinkholes and stark, steep, rocky knolls. Fossils are plentiful in these formations and are mostly composed of corals, benthic mollusks and foraminifera. There are numerous deep caves created in this type of landscape, many of which are

unexplored. The Rio Grande Valley consists of sedimentary rocks which are a sequence of marine sandstones and shale overlain by limestone deposits formed in the Paleocene (56 M years BP).

There are two distinct groups of soils within the BJCMNP and this is reflective of the fundamental difference in underlying geography between the ranges. BM and PRM soils are derived from the metamorphic and igneous rocks that constitute the range, except for the limestone outcrops and vegetation types are strongly correlated with soil type (Grubb and Tanner, 1976). BM soils are generally highly porous and subject to heavy leaching, resulting in a low nutrient content (especially Nitrogen & Phosphorus), and low pH. As is characteristic of forest soils, decomposition of organic matter is slow in the BM forest, especially at higher altitudes and soils on steep slopes are highly susceptible to erosion. Mainly eutric regosol soil types are found at the higher altitudes in the BM and in the western parts, cambisols derived from shale are predominant. Lithosols derived from metamorphic, igneous rocks and shale are found over the eastern and northern slopes and the lower reaches contain dystric regosols and cambisols. On the eastern slopes of the John Crow Peak in the Blue Mountains, Grubb and Tanner identified and described for the first time an unusual humic soil together with a distinct forest type associated with it, which they called Mor Ridge. This soil-type was found to be very rare and confined only to knolls at the western end of the range.

The bedrock limestone of the JCM is often at or just below the surface. Soils are shallow and stony, forming pockets between outcrops of rock. Deeper soils, usually in the form of sticky clay, are found in hollows and on ridge tops and there is only a thin litter layer above the humus enriched stratum. The soil types of the JCM are all derived from either limestone or calcareous shale. On the eastern slopes there are eutric cambisols and chromic vertisols. The western escarpment soils are well drained, shallow, yellow brown loams and on the summit plateau, soils are rendzinas and eutric cambisols which are well drained shallow loams under a thin humic layer.

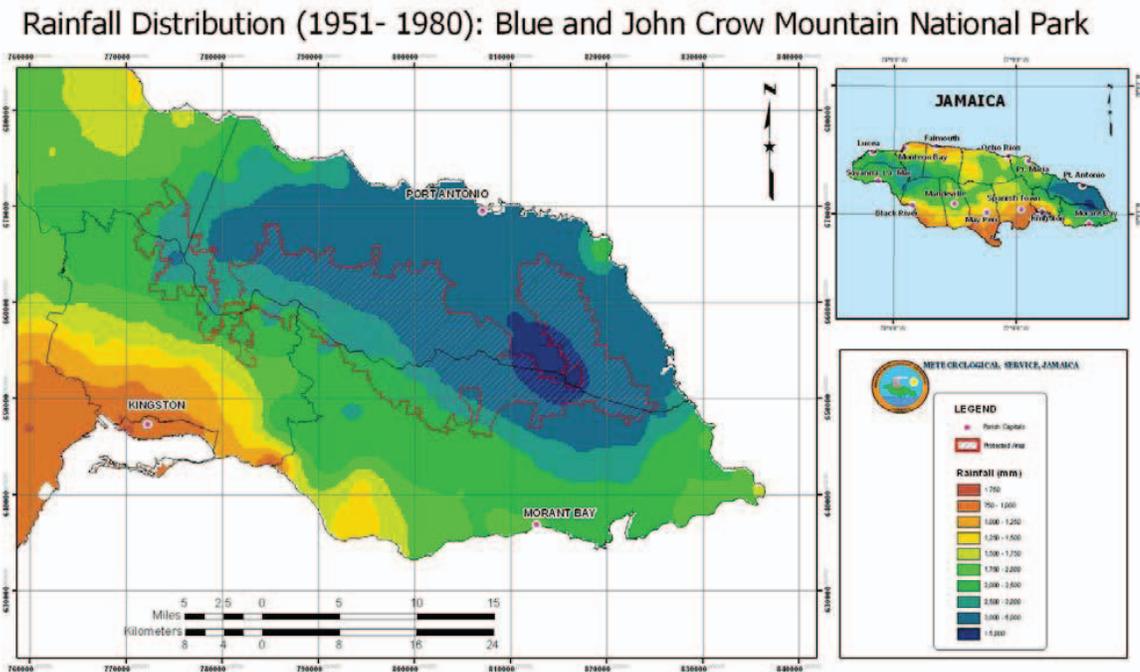
2.1.5 Climate

The copious rainfall in the BJCMNP is an important climatic factor that influences the ecology of the area. Most of the Park lies within the parish of Portland which receives the highest amounts of rainfall in the island and hence the number of rain days in the Park is always high.

The mountains of the BJCMNP govern the climate in the eastern parishes. The north-east trade winds are the prevailing moisture laden winds that rise in the Atlantic Ocean and blow in a south-westerly direction to reach the coastal areas of Portland. These winds sweep inland and rise up the northern slopes of the BJCM causing precipitation as the air cools, resulting in the northern slopes and the wind corridor of the Rio Grande Valley being the wettest parts of eastern Jamaica. As the rain clouds pass over the Grand Ridge from north to south, they lose much of their moisture content in a marked rain shadow effect, and so the southern side of the Grand Ridge receives less precipitation (Fig. 2.5).

The southern slopes receive about 2,600 mm of rain annually, while the northern slopes typically receive 3,300 mm of rain. Blue Mountain Peak receives 4,300 mm of rain annually and is often shrouded in a dense mist. There are two rainy seasons per year in the months of May and October, but rainfall is very variable throughout the year and between years. Frequent rain and thunderstorms exert a profound influence on the BJCMNP in the form of floods and landslides, especially given the steep terrain of the mountains. Prior to 2000, hurricanes were infrequent, usually passing by the island, however global climate change has shifted this trend. Between 2004 and 2008 there were several hurricanes and major tropical storms which impacted Jamaica, with Hurricanes Ivan ('04) and Dean ('07) and Tropical Storm Gustav ('08) being particularly severe. Much of the damage was to rinate forest, recreational areas and coffee plantations where there are gaps in cover. There was also significant damage to roads (from breakaways caused by landslides) and also to buildings, particularly roofs.

Figure 2.5: Isohyetal Map of eastern Jamaica (BJCMNP rainfall)
 - prepared using 20 year rainfall records (Source: Metereological Office of Jamaica)



Although the vast majority of precipitation falls as rain, the higher elevations of the BJCMNP are often covered in a blanket of mist - over 70% of daylight hours on the northern slopes and about 30% of daylight hours on the southern slopes. This mist increases the humidity and cuts incident light to about one quarter of the normal levels. This condition slows evapo-transpiration rates and photosynthesis in the vegetation thereby affecting the physiology of the plants and the entire forest ecosystem.



Plate 4: Mist rolling in over the mountain at Holywell (Source: JCDT)

Mean monthly temperature in the park lies between 18.5 and 20.5°C. As a general rule, temperatures decrease by 0.6°C for every 100 m ascended in the BJCMNP. The highest recorded temperature in Middle Peak (the highest point in the park) between 1890 and 1900 is 24°C and the lowest record is 0.7°C.

2.1.6 Hydrology

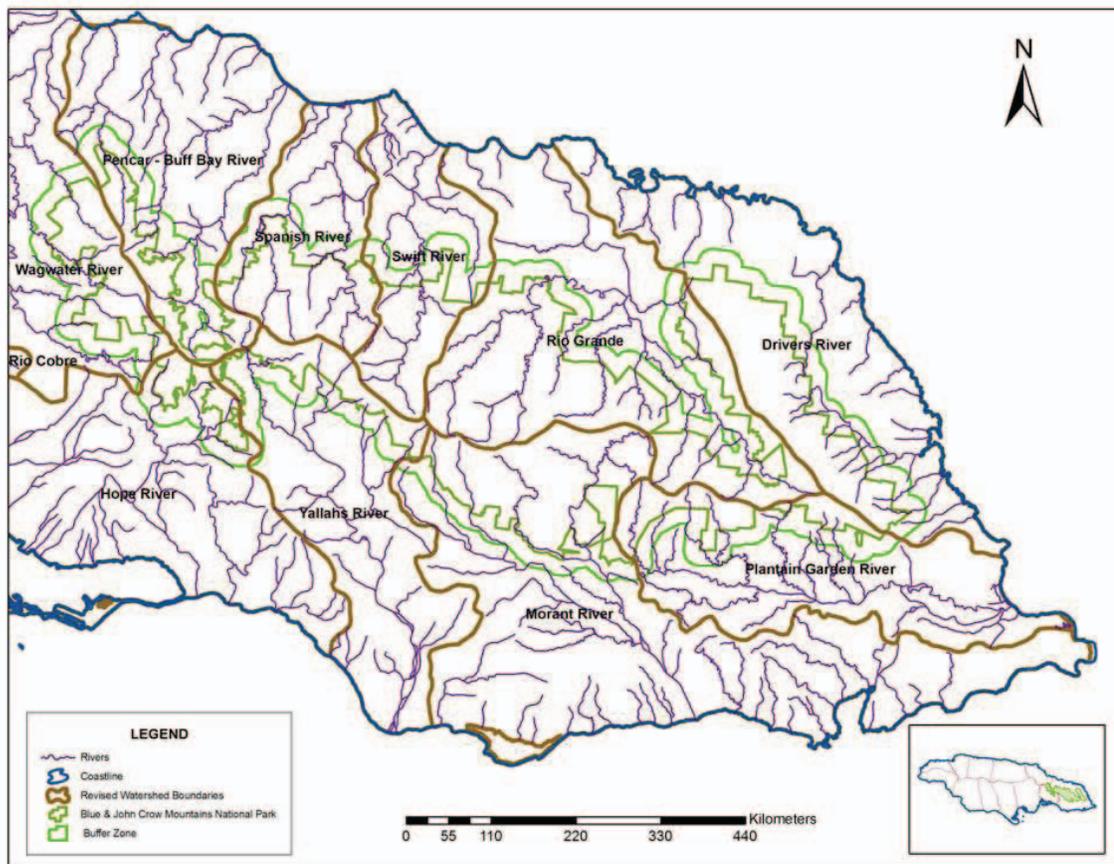
The headwaters of 10 watershed management units originate from within the boundaries of the Park - the Wagwater River, Pencar-Buff Bay River, Spanish River, Swift River, Rio Grande, Drivers River, Plantain Garden River, Morant River, Yallahs River and Hope River as shown below in Figure 2.6.

These basins occupy an area of 2,187 km² constituting 20% of the land area of Jamaica and drain a series of steep, narrow ridges – the John Crow Mountain ridge, the Blue Mountain ridge and the Port Royal Mountains ridge. The rivers flow off these ridges to the north, south and east, through steep narrow valleys, traversing 20 to 30 km to the sea. The Blue Mountain and Port Royal Mountains ridges are made of low permeability rocks of volcanic and volcanoclastic origin, occupying about 64% (1,400 km²) of the basins and characterised as aquiclude. These rocks are near totally framed by limestones (aquifers and aquicludes), occupying 23% (496 km²) of the basins and permeable river valley and coastal alluviums (aquifers) constituting a further 13% (291km²).

The NE Trade Winds produce orographic rainfall over the basins which range from 2,000 to 6,250mm/year on the NE facing slopes of the Blue Mountain ridge and 2,500 to 1000mm/year on the SW facing slopes, in its rain-shadow. Some 33% (2,967 million cubic metres (Mm³/yr) of the rainfall on those sections occupied by aquiclude converts to surface runoff in rivers, whereas about 5% (441 Mm³/yr) has been accounted for as groundwater discharge via coastal and submarine springs. River flows are characterized

by very high flows in the rainy season (September/November and May/June) and very low flows in the dry season (December to April). The reliable (dry season) surface water yield of the Blue Mountain basins has been estimated to be 413 Mm³/yr, only 14% of the average annual surface water runoff. The natural ability of the limestone aquifers to store water underground in spaces within its geological fabric results in about 343 Mm³/yr (53%) of its average annual groundwater runoff being available for utilization during the dry season, a significantly higher proportion when compared to surface water runoff.

Figure 2.6: Major Rivers and Watershed Management Units of the BJCMNP
(Source: WRA)



The surface waters and ground waters of the Blue Mountain basins are suitable sources for all conventional water uses. The surface waters and ground waters are both classified as calcium bicarbonate type, the surface waters having a lower mineral content (Total Dissolved Solids < 150mg/l) than the ground waters (Total Dissolved Solids – 300mg/l). The surface waters are characterised by high rainfall induced turbidity, whereas the ground waters are affected to a much lesser extent.

North-flowing streams are perennial and drain more rapidly than those arising on the southern slopes of the BM. There are numerous waterfalls in the BJCMNP, especially in the upper reaches of north-draining rivers and these are replaced in the lower reaches by a cascade of alternating still pools and rapids. The Swift River, typical of northern BM

rivers with most of it running through forested area, is low in minerals such as sodium and magnesium and has a resulting low conductivity and alkalinity, but high pH and high nitrate content at the headwaters. In contrast, high levels of alkalinity, hardness, calcium, magnesium and bicarbonate have been recorded in the Yallahs River - a river typical of southern BM rivers flowing beyond intact forest catchments. In the Yallahs River conductivity, sodium, magnesium and chloride all increase downstream and high levels of nitrate are found beyond the forested catchments, linked to agricultural pollution.

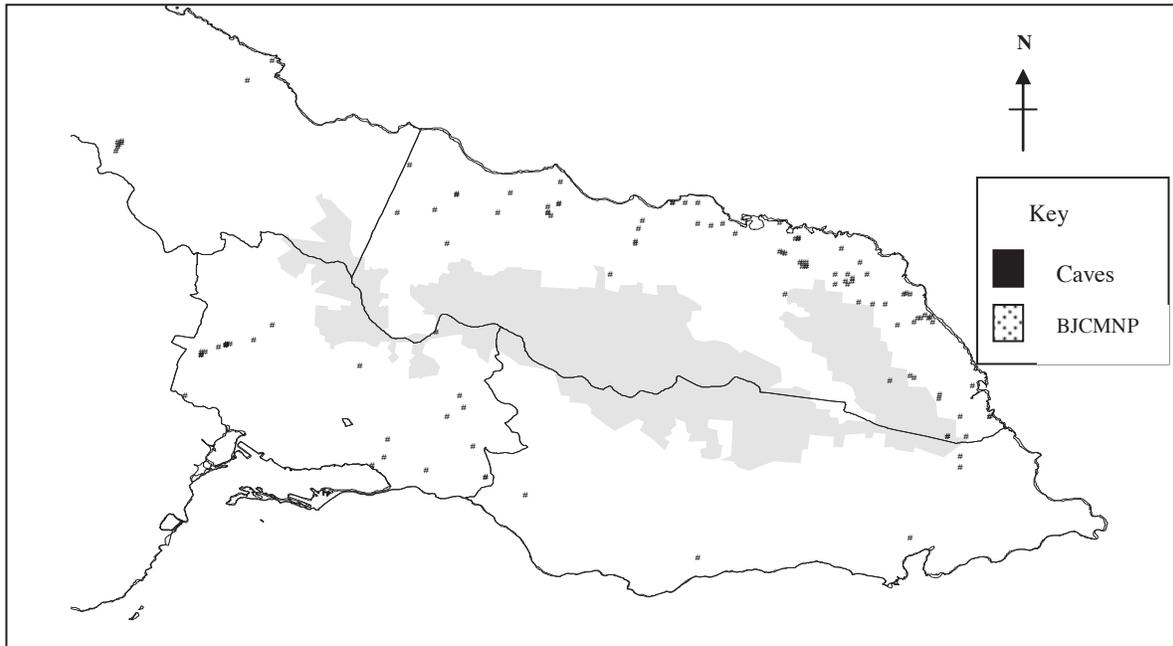
Domestic (including tourism) and agricultural water demands within the Blue Mountain basins have been estimated at a total 66 Mm³/yr for the year 2000, growing to 77Mm³ /yr by 2020. With 647 Mm³/yr of surface and groundwater available, clearly there is more than enough water to fully satisfy the present and projected demands. The availability of such a large water reserve of over 570 Mm³/yr has prompted the conceptualization of a 'Blue Mountain Scheme' to divert surplus water from the north flowing rivers, by pipeline and tunnel through the Blue Mountain ridge into Kingston. The Yallahs pipeline which brings water from the Yallahs River in St. Thomas into the Mona Reservoir in Kingston may be seen as implementation of the first phase of the Blue Mountain Water Supply and Hydro-power Scheme.

There are several hydrological features of importance to the economy and cultural heritage of the Blue Mountains. Most of the waterfalls within the Park are not mapped, generally inaccessible, and best viewed from a helicopter. However, within the BJCMNP's Buffer Zone and further afield are several more easily accessible. Those closer to the coast such as Somerset and Reach are already well-developed tourism attractions. Others such as Quao and Nanny Falls in the Upper Rio Grande Valley are of cultural heritage significance because of their use in battles where the Maroons escaped by disappearing behind these waterfalls. The community of Cascade, Portland is said to have been named because of its numerous waterfalls, including Cascade Falls which is 1,330 metres above sea level, and is Jamaica's second highest waterfall. There are numerous springs (including hot springs) within and outside the Park, most famous of which are the Bath Hot Springs in St. Thomas. The Rio Grande River is the one of the longest rivers in Jamaica and is used for rafting as a tourist attraction.

2.1.7 Caves

Over 1,000 caves and larger sinkholes have been identified in Jamaica. Most of these underground systems are situated in limestone. Consequently, caves are virtually absent in the PRM and BM (Fig. 2.7). A series of caves occur along the Park's eastern periphery in the JCM such as Nonsuch Caves (a tourist attraction) and Fox's Cave (less known attraction); however, few are situated within the Park and they are all small. Possibly in the future, more caves will be discovered in the hard-to-access interior parts of the JCM.

Figure 2.7: Caves in Eastern Jamaica (Source JCDT)



2.2 BIOLOGICAL DIVERSITY

2.2.1 Terrestrial Ecosystems

The BJCMNP contains a variety of different ecosystems that support a rich floristic diversity. This is a result of the different substrate types, soils, high and variable rainfall patterns, and high altitude in the mountain environment, making the flora correspondingly different as they are influenced by these factors. Tanner (1986) found a 41% endemism in his research plots in the BM, whilst in other parts of the BJCMNP, such as in the upper reaches and on the summit of the John Crow Mountains, 50% of the plant species are endemic (Muchoney et. al. 1994). The BJCMNP is a critical habitat for threatened and endangered trees. Of the 324 taxa of trees in Jamaica listed as threatened or endangered by the IUCN, 106 of these can be found in the nominated property.

Various classifications have been developed over the years for the different plant communities found in the BJCMNP (Shreve 1914, Asprey & Robins 1953, Grubb & Tanner 1976, and Muchoney et al. 1994). Table 2.2 provides an overview of the natural communities following Muchoney et. al. (1994). The variety of forest types can generally be divided into lower and upper montane forest over shale and limestone in the Blue and John Crow Mountains, respectively, with rainfall, temperature and altitude being the most influential factors. The transition from lower to upper montane forest occurs at around 1000 m altitude in the BM and around 600 m in the JCM. Montane is often considered to refer to the soil type and hence the forest in the JCM may be considered wet limestone forest rather than montane. The natural vegetation of the upper slopes and mountain tops

consists of thickets and scrubs; small areas of montane summit savanna occur on a few peaks in the BM. It is important to note that the forests of the Blue Mountains represent the only high altitude rainforest on volcanic soils in Jamaica.

A wide variety of modified (disturbed) and anthropogenic ecosystems can be distinguished. These include modified lower and upper montane forests, ruinate woodlands with pronounced exotic components, anthropogenic swards, plantations and a few residential areas.

Table 2.1: Natural Communities as Identified in the Rapid Ecological Assessment

Substrate	Limestone (mainly JCM)	Shale (mainly PRM and BM)
Lower montane forest	Typical	Typical Gully Transitional
Upper montane forest	Typical Edaphic variant BM variant	Typical Typical variant Selaginella variant Mor Ridge
Formations on upper slopes and mountain tops	Upper montane thicket	High altitude scrub Montane summit savanna
Sparsely vegetated formations	Cliffs and landslides Dominated by seed plants and ferns Dominated by lichens and bryophytes Rock rubble	

2.2.1.1 Blue Mountains Forests and Flora

The forests of the BM are unique to the island as other mountain ranges in Jamaica do not attain such high altitudes and are usually composed of limestone rather than volcanic rock. The flora of the Blue and Port Royal Mountains is quite well known, as many botanists have worked in the area. There are however, still large unexplored areas of the northern slopes and it is likely that new species may be found, especially as bryophytes and lichens are poorly known. Over 500 species of flowering plants have been collected from the BM and PRM. About 40% of the higher plants are endemic and many rare and endangered species persist, especially those locally endemic to the BM (Muchoney et. al. 1994). Excellent photographs of much of the flora of these two ranges can be found in Iremonger's book on Plants in the Blue Mountains.

Iremonger (1993) reported that 275 vascular plant species and 14 varieties of the more than 600 species of flowering plants in the BJCMNP are endemic to Jamaica. In addition, it was discovered that of the many endemic species, approximately 33% of the flowering plants were restricted in their entire global range to specific forest communities in the BJCMNP. Genera which are well represented by endemic species in the flora of the park are *Pilea* (12 spp.), *Lepanthes* (12 spp.), *Psychotria* (12 spp.) and *Eugenia* (11 spp.).



Plate 5: Bromeliads in a Tree at Holywell (Source: JCDT)

The BJCMNP is believed to house about 50% of the 530 ferns known from Jamaica. Tree ferns are a spectacular feature of the mountains and 15 of the 21 species found in the island are endemic to BM. Eighteen species of filmy ferns are found especially at higher altitudes and 41 of the 51 epiphytic ferns in Jamaica of genus *Grammitis* are present.



Plate 6: Tree Ferns at Mount Horeb (Source: JCDT)

Slope Vegetation. The northern slopes of the BM are still largely forested but the drier and sunnier southern slopes which were cleared for coffee in the past now bear subsistence farming, leaving only small patches of disturbed forest, except within the boundary of the BJCMNP. The northern (windward) slopes of the BM receive higher

rainfall and the ravines are rich in epiphytes - mosses, liverworts, ferns and lianas. Typical trees are Alligator wood (*Guarea glabra*), Soapwood (*Clethra occidentalis*), Mountain bullet (*Bumelia montana*), and Dovewood (*Alchornea latifolia*) which are widely spaced and quite large, with a dense herbaceous layer of ferns and scattered shrubs dominated by the Melastome and coffee families underneath.

Little pristine forest remains on the southern slopes outside the National Park. Southern slope vegetation growing on the driest areas of the leeward side include trees that are generally denser and of lesser diameter (Soapwood, Mountain bilberry (*Vaccinium meridionale*), Fiddlewood (*Litharexylum caudatum*), Juniper (*Juniperus lucayana*), Dovewood and Winterberry (*Ilex macfadyenii*) over a fairly dense shrub layer. The herb layer is dominated by flowering plants like the orchid *Spiranthes speciosa* and scattered ferns and lianas which are abundant. The herb layer also includes dense thickets of Climbing bamboo (*Chusquea abietifolia*) and there are less epiphytes than on the northern slopes. Trees such as Rodwood (*Eugenia monticola* and *E. virgultosa*) and Burn nose (*Daphnopsis cumingii*) are apparently restricted to the southern slopes.

Grand Ridge Vegetation. Grand Ridge vegetation is generally lower in stature than those on slopes. These forests on or near to the Grand Ridge are typically dominated by Soapwood, Mountain yacca (*Podocarpus urbanii*), Beetwood (*Cyrilla racemiflora*) and Headache bush (*Hedyosmum arborescens*). Common shrubs are from the coffee family and include *Palicourea alpine* and *Psychotria corymbosa*. Lianas are less common than on slopes although climbing bamboo is a common feature. A unique forest type - Mor Ridge Forest (Grubb & Tanner, 1976) comprises some of the Grand Ridge vegetation. Mor Ridge Forest is characterized by a deep layer of acidic humus (to 50 cm) and one of the most conspicuous features is the presence of bromeliads (usually epiphytic in trees) at ground level. The small endangered tree *Laplacea villosa* is restricted to this forest type.

High Altitude Forest. Above 1,800 m, the vegetation is more stunted and species poor. Some species such as *Eugenia alpine* and *Clethra alexandra* are restricted to these high altitudes. Above 2,000 m in the region of BM Peak, the forest is known as Elfin Forest due to the stunted and gnarled appearance of the trees. Trees get up to only 3 to 6 m in height and only 1.5 to 2 m on the highest peaks. These forests lack a shrub layer and beneath the canopy, herbs such as *Lobelia martagon* and *Odontocline laciniata* which are endemic to high altitude forests occur. The short stature of the forest is likely due to the low temperature, limited exposure to sunlight and low nutrient content of the soils. These forests experience high rainfall and are rich in epiphytes including hanging mosses, ferns and tiny orchids, many of which are restricted to these high altitudes. Lichen flora is also a distinct feature of these forests, with moss forming cushions on rocks. Above this elevation is an extremely rare community of natural grassland comprised of Tussock grass *Danthonia domingensis* that is restricted to near the summit of Sir Johns Peak and High Peak.



Plate 7: *Psychotria corymbosa* at Holywell. (Source: JCDT)

2.2.1.2 Port Royal Mountains Forests and Flora

On the Port Royal Mountains (PRM), forest only remains above the altitudinal limit of 1200 m. Forests are similar to BM forests and share the same wet - dry distinction between forests of the windward (Mt. Horeb) and leeward (southern slopes of Catherine's Peak) slopes.

2.2.1.3 John Crow Mountains Forests and Flora

These forests are exposed to the highest levels of rainfall in the island and are characterized by rich fern and bryophyte flora particularly due to the high rainfall, high humidity and shade from the canopy. The lower reaches of this mountain range support the only remaining lower montane forest in Jamaica. Trees reach a canopy height of 24-28 m with emergents getting up to 40 m. The canopy is dominated by Santa Maria (*Calophyllum calaba*) due to other more useful species being cut. Other common trees are Popnut (*Omphalea triandra*), Breadnut (*Brosimum alicastrum*), Mutton wood (*Turpinia occidentalis*), Galipee (*Dendropanax arboreus*), Water mahoe (*Hernandia catalpifolia*), Slug wood (*Beilschmiedia pendula*), Soapwood, Rodwood, Long thatch palm (*Calyptronoma occidentalis*), members of the coffee family and tree ferns.

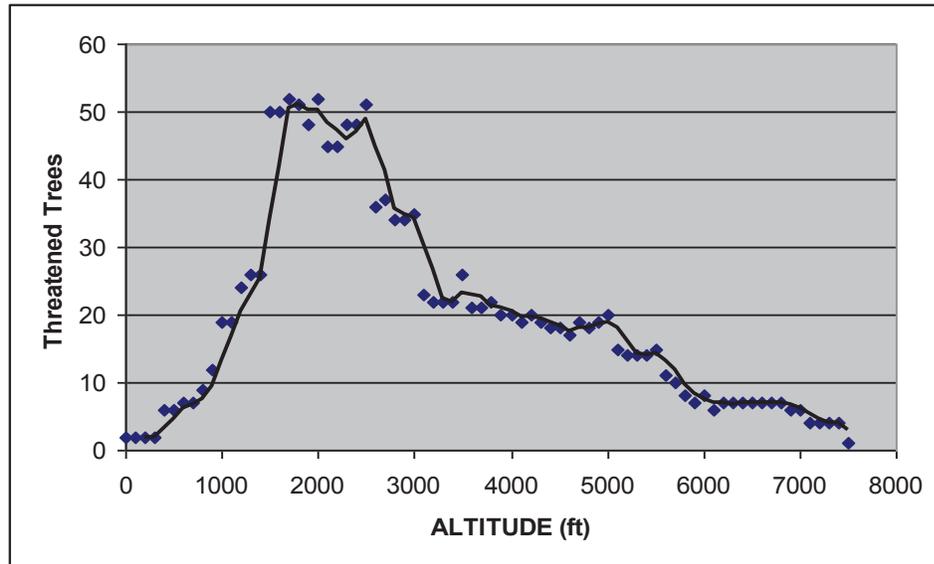
The native forests of the JCM support a high proportion of flowering plants with limited geographical range. Portland has the highest number of flowering plant local endemics of all the parishes in the island and the JCM is refuge for all 47 flowering plant species that are endemic to Portland. Orchids, bromeliads, ferns and bryophytes abound in these forests and trees have structural adaptations like buttress roots due to the high rainfall and shallow soil.

Current species lists for the BJCMNP cannot be considered to be exhaustive, since there are locations within the park that have not yet been explored or where the exploration was preliminary. This includes the northern slopes of the Blue Mountains and vast areas of the John Crow Mountains. In addition, the aquatic plant communities have not been surveyed, so the potential exists for the discovery of many more endemic and ‘new to science’ species of terrestrial and freshwater plants.

2.2.1.4 Conservation Status of Plant Species

Jamaican plants are highly threatened and endemic species even more so than non-endemic species (Kelly, 1988). The IUCN Red List contains 324 taxa of threatened and near-threatened trees occurring in Jamaica. Of these, 106 taxa find refuge within the forests of the park. Threatened trees can be found at all altitudes of the park, with the largest number occurring at mid-altitudes (see Fig. 2.8). Chai and Tanner (2010) found that, “The conservation value of the remaining lowland forest is high because of its high endemism (18% of species in our plots) and beta diversity”. The most important factors endangering plant species are habitat degradation and conversion. Unsustainable harvesting and the spread of alien invasive species are additional threats.

Figure 2.8: Threatened Tree Species in Eastern Jamaica, by Altitude. (*Tree species according to IUCN Red List; altitudinal distribution according to Adams*)



Chai et. al. (2009) report that the net deforestation rate within the Park declined by 68% to 0.26% yr⁻¹ in the 1992 – 2002 time interval after National Park designation in 1993, compared to a rate of 0.80% yr⁻¹ in the 1983 - 1992 period. Forest Department comparison of photos from a JCDT/JDF helicopter monitoring trip in 2009 found no differences in forest cover when compared with satellite imagery from 2002. Funds are to be sought to conduct a study comparing the 2002 – 2012 time interval in order to see if there has been a further decline in the deforestation rate, from the increased level of Park management activity.

2.2.2 Terrestrial Fauna

2.2.2.1 Invertebrates

With only a few exceptions, the diversity of the invertebrate fauna of the BJCMNP has been very poorly studied so far. This is reflected in new studies finding numerous species not yet known to science. Rosenberg is reported to have discovered more than 100 undescribed species including snails, millipedes, grasshoppers, earthworms, crabs, isopods and dipluran insects in a 2004 study. Three endemic species of *Sesarma* crabs occur within the BJCMNP. For most of the described species little is known except one or very few localities of occurrence. In addition, the literature on the park's invertebrates is widely scattered across a highly specialized scientific literature that is very difficult to access from within Jamaica. This is an area requiring taxonomic research, and has been listed in the BJCMNP's Research Prospectus.

Land Snails. A total of 561 species of land snails with 505 endemics have been recorded from Jamaica. This means that the island has one of the world's most diverse terrestrial mollusk populations. This extraordinary level of diversity for an island of only 11,500 km² is impressive. Still, about 36 of the snail species collected in an ongoing land snail study have not been identified to date, and more will surely come to light as we continue sorting micro-snails from litter samples. Nine out of 15 species of snails found on Blue Mountain Peak, the highest point in Jamaica, are un-described. At least three



Plate 8: Land snail shell of unknown species (Source: JCDT)

members of the snail family – Punctidae - occur at high altitude in Jamaica; the family has not previously been reported from the island.

Insects. The BJCMNP is home to a huge variety of insects belonging to a wide range of families. Some of the more familiar species include peenywallies and click beetles (Elatedae), blinkies and fireflies (Lampyridae). Forty five of 48 firefly species are endemic to Jamaica but there has been no specific study conducted within the BJCMNP. Dragonflies (Order Odonata), Caddisflies (Order Trichoptera) and Mayflies (Order Ephemeroptera) are common along rivers and streams and their larvae are the main macro-invertebrates counted in the BJCMNP's fresh-water monitoring. Butterflies are the best-studied group of terrestrial invertebrates in Jamaica.

Moths. Similar to the snails, Jamaica's moth fauna is extremely diverse containing probably over 1,000 species of which about 40% are endemic to the island. Matthew Barnes collected several thousands specimens representing about 500 species of moths at a single location in the southern Blue Mountains near Mavis Bank (Stoneleigh Plantation) between 1988 and 1989. Eric Garraway from the University of the West Indies and his postgraduate students collected several hundred species at various localities close to the periphery of the BJCMNP.

Butterflies. There are 119 species of butterflies in Jamaica, with 19 species and 12 subspecies endemic to the island. A number of butterflies, both endemic and non-native are present in the BJCMNP. The area is of particular importance for the following endemic species: *Atlantea pantoni*, *Greta diaphane*, *Leptotes perkinsae*, *Calisto zangis* and *Eurema adamsi*. Most of these can be found in the virgin forests of the John Crow Mountains between 300 and 600 metres. However, a number of species both endemic and non-native are common in the mist forests and elfin woodlands of the Blue Mountains between 900 - 1500 meters. In the most extreme part of the habitat, that is, 1200 – 2100 meters in the Blue Mountains, three species of butterfly are likely to be encountered: *Vanessa cardui*, *Calisto zangis* and below 1800 meters, *Eurema adamsi*. The latter two are endemic to the island. Also, the BJCMNP forms one of two remaining habitats for the Giant Swallowtail Butterfly (*Pterorous homerus*) formerly *Papilio homerus*. Just outside the BJCMNP's boundary, there is a population of the endemic Jamaican Kite Swallowtail (*Eurytides marcellinus*).

Threats. No specific information is available concerning threats to invertebrate species, except the Giant Swallowtail Butterfly (*P. homerus*). Once inhabiting seven of the 14 parishes in the island, this species now only survives in two isolated and diminishing populations in the country – the Cockpit Country and the JCM (Emmel & Garraway, 1990). This magnificent Jamaican endemic is the largest butterfly in the Americas and has been chosen as the feature animal on the logo of the BJCMNP. It has a bold black and yellow coloration, with huge spatulate tails and wing tips that span an impressive 15 cm. This species is restricted to virgin forest on mountain slopes and along mountain streams at low elevations (150 - 600 m) (Emmel & Garraway, 1990), emphasizing the need to protect the threatened low-land areas of the park and to work with local communities within the BJCMNP's Buffer Zone.

The Giant Swallowtail is threatened by commercial collecting and destruction of rain forest habitat, with their survival also being dependent on the abundance of the endemic water mahoe (*Hernandia catalpifolia*), as adult females lay eggs only on this species of tree. Deforestation causes increased mortality in the egg and larval stages due to the butterfly's vulnerability to parasitic attacks in open areas.

The Giant Swallowtail Butterfly is protected under the Wild Life Protection Act (1945) – having been added to the Act's schedule in 1988. It is listed as 'Endangered' on IUCN's Red List (1994), meaning that the animal faces a very high risk of extinction in the wild, in the near future. It is also a Convention on International Trade in Endangered Species



Plate 9: Giant Swallowtail Butterfly (P. homerus) at Bowden Pen (Source: JCDT)

of Wild Flora and Fauna (CITES) Appendix I species, which means that it is threatened with extinction and that trade may be a causal factor in its decline. Its trade is subject to particularly strict regulations and only authorized in exceptional cases. In the 1980s, prices for a specimen ranged from US\$400 - \$1500. Despite significant reduction in this trade, partly due to the Education and Enforcement Programmes of the Park, hunting of the Giant Swallowtail still occurs, with reports coming in as recently as 2004.

Emmel & Garraway (1990) reported that the remaining localities of the Giant Swallowtail comprise an area of about only 10 km². However, over the last six years (2005 – 2010) there have been an increasing number of sightings by National Park staff and community members, but there have been no reports published using data from this period. The Bowden Pen Farmers' Association in the Upper Rio Grande Valley, have been very alert with respect to possible hunting, and have been using the Water mahoe in their reforestation programmes. In 2009, National Park Rangers were able to report to Garraway of a previously unknown population in another part of the Blue Mountains. Despite this the conservation status of the Giant Swallowtail is still of concern.

Scolytid and Platypodid Beetles. The most recent reviews recorded 62 species of *Scolytidae* (Bark beetles) and seven species of *Platypodidae* (Ambrosia beetles) from Jamaica and included all known records from the island (Bright, 1972). Nearly 40% (26 species) were described as new to science. The number of endemic species was tentatively given as 31. However, the discussion of regional and global distribution was extremely difficult since these beetles are very poorly known elsewhere in the Caribbean and Central America. A large majority (25) of the 31 endemic species has only been taken at the type locality. Nine species were exclusively collected at Hardwar Gap alone and the total number of island endemics occurring in the Blue Mountains amounted to 20.

Other invertebrates. Jamaica is a centre in the distribution of the small phylum Onychophora. Due to its wet climate, the BJCMNP provides an excellent habitat for these unique animals. The Onychophora (velvet worms or walking worms) are a small phylum of about 70 species of interesting and ancient animals. They are shy creatures that are able to hide in very tight crevices and so they are rarely seen. Onychophorans are of great interest to biologists, as they appear to be related to both annelids and arthropods, and give an idea of what the ancestors of the arthropods may have been like.



Plate 10: Velvet Worm (Peripatus sp.) found near BM Peak Trail (Source: JCDT)

Crabs have not been well studied, however three endemic species of *Sesarma* crab are known to occur in the BJCMNP. Jamaica has a total of 9 endemic species of land crabs, which are unique in their exceptional adaptations to terrestrial life. The crabs in the Park like other Jamaican land crabs exhibit the only active brood-care for larvae and juveniles known in crabs worldwide.

2.2.2.2 Amphibians

Jamaica has 23 species of native frogs, all of which are endemic to the island. Frogs are the only amphibians native to Jamaica and they are distributed in two major centres across the island – the Cockpit Country and the BJCM. The BJCMNP supports 11 of the

23 endemic frogs (Table 2.2). Five of these frogs are endemic to the park: *Eleutherodactylus andrewsi*, *E. orcutti*, *E. pentasyringos*, *E. alticola* and *E. nubicola*.

Frogs in the park are distributed along an altitudinal gradient, with *E. glaucoreius*, *E. gossei* and *E. pantone* occurring at lower altitudes (760-1220 m), *E. andrewsi*, *E. jamaicensis*, *E. nubicola*, *E. orcutti*, *Osteopilus brunneus* and *Hyla wilderi* occurring in mid-altitude forests (910-1830 m) and *E. alticola* occurring only above 1680 m in the BM. Highest diversity is reached within the Blue Mountain range of the park. Several species of *Eleutherodactylus* frogs show distinct morphological patterns between the Blue and John Crow Mountain range.

Table 2.2: Amphibians Recorded in the BJCMNP

FROGS				
Scientific Name	Family	Distribution	Status	Distribution in Jamaica
<i>Eleutherodactylus alticola</i>	Leptodactylidae	endemic	Critically Endangered	Known from few populations in the upper regions of the Blue Mountains
<i>Eleutherodactylus andrewsi</i>	Leptodactylidae	endemic	Endangered	Restricted to Blue and John Crow Mountains
<i>Eleutherodactylus glaucoreius</i>	Leptodactylidae	endemic	Near Threatened	eastern Jamaica
<i>Eleutherodactylus gossei</i>	Leptodactylidae	endemic	Least Concern	islandwide
<i>Eleutherodactylus jamaicensis</i>	Leptodactylidae	endemic	Endangered	islandwide
<i>Eleutherodactylus nubicola</i>	Leptodactylidae	endemic	Endangered	Restricted to higher elevations of the Blue Mountains
<i>Eleutherodactylus orcutti</i>	Leptodactylidae	endemic	Critically Endangered	Restricted to streams in Blue Mountains; has greatly declined since 1985, may be extinct.
<i>Eleutherodactylus pantoni</i>	Leptodactylidae	endemic	Near Threatened	islandwide
<i>Eleutherodactylus pentasyringos</i>	Leptodactylidae	endemic	Vulnerable	Restricted to Portland and St. Thomas to the north of the Blue and John Crow Mountains
<i>Hyla wilderi</i>	Hylidae	endemic	Endangered	islandwide
<i>Osteopilus brunneus</i>	Hylidae	endemic	Least Concern	islandwide

Threats. A recently completed global assessment of amphibian conservation status reports a gloomy picture for the Jamaican frogs. Only four of the 23 native frogs are considered safe, while two are near threatened and the vast majority of 17 threatened (including seven critically endangered). Seven, including all local endemics of the 11 frogs known from the BJCMNP are considered threatened and an additional two near-threatened. Several reasons have contributed to this alarming situation:

- ▶ Many of the *Eleutherodactylus* frogs have very limited geographical ranges and are thus at special risk of extinction,
- ▶ Many of these frogs are very sensitive to habitat destruction, being replaced by introduced competitors in converted areas, and
- ▶ *E. orcutti* has suffered a massive contraction of its range over recent decades for unknown reasons and may be extinct. Similar trends have been observed in other stream-adapted frogs at high altitudes in the Caribbean.

Globally amphibians are apparently becoming extinct at rapid rates, some due to infection by a chytrid fungus, however it is not known if that fungus is affecting Jamaican populations, but a study is to be done at the UWI starting in 2010.

2.2.2.3 Reptiles

Lizards. Most of Jamaica's 24 lizard species can be found in the BJCMNP (Table 2.3). The species - *Anolis reconditus* is restricted to the Blue and Port Royal Mountains above altitudes of 1100 m, in the vicinity of Hardwar Gap and the headwaters of the Buff Bay River. Another species belonging to the genus *Sphaerodactylus* is also apparently restricted to the Blue and Port Royal Mountains, in forests above the army camp at New Castle.

Giant Galliwasp are lizards restricted to the Neotropics. They are rarely seen, skink-like lizards with snout to vent lengths (SVL) of greater than 200 mm. Four species of the genus *Celestus* collectively known as West Indian Giant Galliwasp, occur or used to occur in Jamaica and Hispaniola. *C. occiduus* is endemic to Jamaica and these Giant Galliwasp are impressive lizards, worthy of conservation resources as a unique group of animals. Most have extremely limited ranges and an apparent predisposition for extinction. It is not known whether they exist within the BJCMNP.

The distribution as well as the taxonomy of many Jamaican lizards is at present poorly known. There appears to be distinct morphological features of some BM and JCM lizards, which on genetic analysis, may reveal themselves to be subspecies or separate species. Habitat partitioning is well known in lizards especially *Anolis*, but they partition differently at higher altitudes.

Threats. Giant Galliwasp often have significance in the cultures of indigenous people who often fear the lizards and consider them venomous. Lynn and Grant (1940) described how Jamaicans regarded galliwasp: '*They are greatly feared by the natives*

and are the subject of many yarns and fables.' Currently, a widely held belief in Jamaica is that galliwasp are venomous and that if a bite occurs and the galliwasp reaches water first, the person dies but if the person reaches water first, the galliwasp dies.

Table 2.3: Reptiles Recorded in the BJCMNP

Scientific Name	Family	Distribution	Status	Distribution in Jamaica
TURTLES				
<i>Trachemys terrapin</i>	Hylidae	WI	rare	Scattered localities throughout Jamaica.
LIZARDS				
<i>Aristelliger praesignis</i>	Gekkonidae	WI	common	Islandwide at lower elevations.
<i>Sphaerodactylus argus</i>	Gekkonidae	neotropic	common	Islandwide
<i>Sphaerodactylus goniorhynchus</i>	Gekkonidae	endemic	common	Islandwide; may comprise undescribed threatened species in Blue Mountains.
<i>Sphaerodactylus oxyrhinus</i>	Gekkonidae	endemic	rare	Two subspecies with restricted ranges in western and eastern Jamaica, respectively.
<i>Anolis garmani</i>	Iguanidae	endemic	common	Islandwide
<i>Anolis grahami</i>	Iguanidae	endemic	common	Islandwide
<i>Anolis lineatopus</i>	Iguanidae	endemic	common	Islandwide
<i>Anolis opalinus</i>	Iguanidae	endemic	common	Islandwide
<i>Anolis reconditus</i>	Iguanidae	endemic	vulnerable	Restricted to sections of the Blue Mountains.
<i>Celestus cruscus</i>	Anguidae	WI	common	Islandwide
SNAKES				
<i>Typhlops jamaicensis</i>	Typhlopidae	endemic	common	Islandwide
<i>Epicrates subflavus</i>	Boidae	endemic	vulnerable	Scattered localities in various sections of Jamaica.
<i>Arrhyton callilaemus</i>	Colubridae	endemic	common	Islandwide at lower elevations.
<i>Arrhyton polylepis</i>	Colubridae	endemic	vulnerable	Scattered localities in eastern Jamaica.

Snakes. Four of the island's six extant snake species - all endemic to the island - can be found in the national park - *Epicrates subflavus* (Jamaican Boa or Yellow Snake), *Arrhyton callilaemus*, *Arrhyton polylepis*, and *Typhlops jamaicensis*). The Jamaican Boa is the most threatened and most impressive of these species. This mostly nocturnal

creature preys on birds and their eggs, small mammals such as rats and mongooses and occurs in low densities even in its larger populations. Although this boa can attain a large size of over 3m in length, the animal is seldom seen, making it difficult to assess its population. The possibly extinct Black Racer (*Alsophis ater*) was recorded in the past within areas that include the present park. *Tropidophis haetianus* (Dwarf Boa or Water Snake) is a non-endemic snake found in the Park.



Plate 11: Jamaican Boa or Yellow Snake (Epicrates subflavus) (Source: NHMJ – IOJ)

Yellow Snakes are known to depend on low altitude forest of elevations, less than 900m. This emphasizes the need to protect the remaining forests in these threatened lower altitudinal areas. In the BJCMNP, there are scattered reports of boas especially in the eastern BM, the north-eastern slopes of the Back Rio Grande catchment and the south-eastern slopes of the Plantain Garden River catchment. In the JCM, boas are reported from the Rio Grande Valley.

Threats. The Jamaican Boa is listed in the IUCN Red List as ‘Vulnerable’ and the current distribution of this species suggests that habitat fragmentation may be causing declines in population numbers. While boas appear to be adaptable to non-natural forest areas, they depend on large tracts of forest to maintain a viable breeding population. There have been reports of boas being hunted for their skin and meat and although this may not be on a large scale, many Jamaicans share a morbid fear of snakes and the misbelief that they are poisonous, causing the animal to be often killed on sight. Other sources of snake mortality include predation by dogs, cats and mongooses.

2.2.2.4 Birds

The montane rain forests of the BJCMNP provide one of the most important habitats and refuges for both Jamaican and migratory birds of the island. The BJCMNP is the largest contiguous tract of remaining forest in the island, covering a large range of habitat types

and altitudinal zones. All of Jamaica's 28 endemic species of birds can be found in the Park and indeed, most of the island's 256 species of indigenous land birds occur in the Park. Common endemic birds of the Park include the Crested Quail Dove (*Geotrygon versicolor*) – also known as Mountain Witch, White-eyed Thrush (*Turdus jamaicensis*), Jamaican Becard (*Pachyramphus niger*), Jamaican Tody (*Todus todus*), Jamaican Woodpecker (*Melanerpes radiolatus*), Red-billed Streamertail (*Trochilus polytmus*), Jamaican Vireo (*Vireo modestus*) and Blue Mountain Vireo (*Vireo osburni*). A common resident often heard at Holywell is the Rufous-throated Solitaire (*Myadestes genibarbis*).

Insectivores are common, with fewer frugivores at higher altitudes as species diversity becomes low in the Elfin Forests of the highest peaks. The lower montane forests of the BM, especially the northern slopes, are the chief remaining habitat for the island's most threatened bird - the Jamaican Blackbird or Wild-pine Sergeant (*Nesopsar nigerrimus*). This species is known to occupy primary forest habitats where there is an abundance of bromeliads and other epiphytes, in which these birds forage for insects. The JCM supports some of the greatest bird diversity found in Jamaica. This area supports populations of larger frugivores and omnivores, like the endemic Yellow-billed Parrot (*Amazona collaria*), Black-billed Parrot (*Amazona agilis*), Jamaican Crow (*Corvus jamaicensis*) and the Jamaican Owl (*Pseudoscops grammicus*). The JCM is the principal habitat for the Black-billed Streamertail (*Trochilus scitulus*), recently confirmed as a distinct species from the more common Red-billed Streamertail.

Eight of the 28 Jamaican endemics are thought to be decreasing in population numbers - the Ring-tailed Pigeon (*Patagioenas caribaea*), Crested Quail Dove, Yellow-billed Parrot, Black-billed Parrot, Jamaican Mango (*Anthracothorax mango*), Rufous-tailed Flycatcher (*Myiarchus validus*), White-eyed Thrush and Jamaican Blackbird (Haynes *et al.*, 1989). At least two species and two sub-species of endemics have become extinct in the last 150 years. These are the Jamaican Macaw, the Jamaican Pauraque, the Jamaican Black-capped Petrel and the Jamaican Uniform Crake.

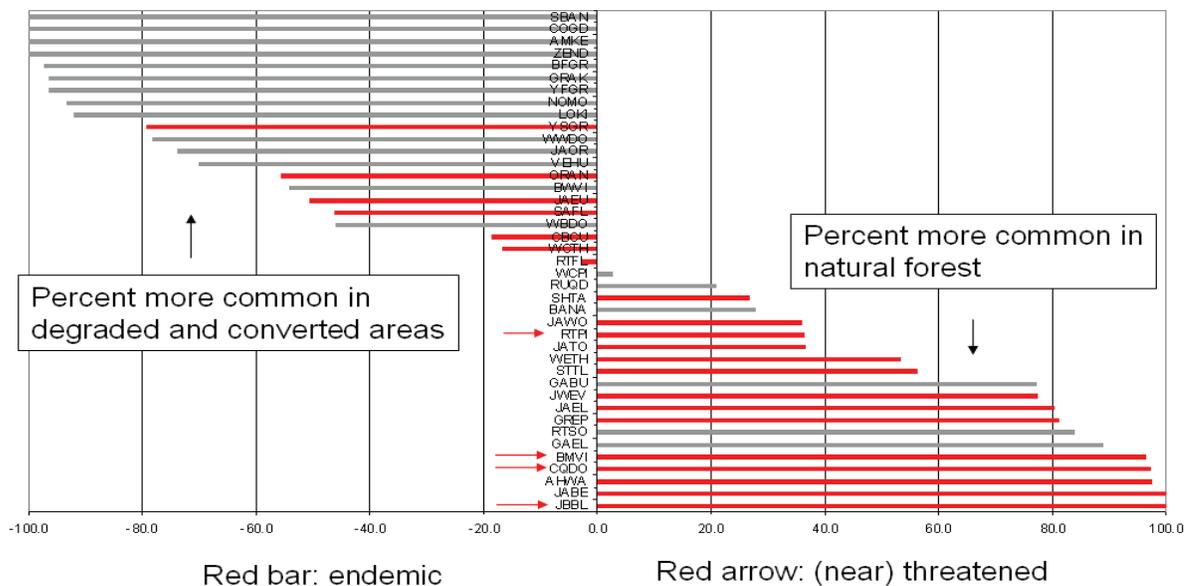


Plate 12: Jamaican Tody (*Todus todus*) (Source: JCDT)

The Blue and John Crow Mountain National Park serves as a permanent or winter home to 220 migrant and resident bird species. Thus the area is an important habitat for resident birds and has been identified as the second most important bird area in the island (Bird Life, Jamaica, 2003). It is also the largest intact wintering habitat blocks for migratory birds in the insular Caribbean (Haynes et al, 1989).

Birds of the BJCMNP have been found to be sensitive to forest conversion, degradation and destruction (Mundle, 1997 & Vogel, 2004). Analysis of bird distribution in the park (Fig. 2.9) shows that most endemic and threatened birds thrive best in natural rainforest. Less were seen in ruinate areas and coffee habitats were found to have the most different bird composition (which included dry forest birds) when compared with natural forests (Fig. 2.9 and Vogel, 2004). Mundle (1997) found that coffee habitats had significantly fewer species and individuals than all other habitats. In ruinate areas, birds typical of open dry habitats were observed. Many birds e.g. Jamaican Blackbird, Jamaican Becard and Crested Quail Dove are dependent on natural forest for their survival.

Figure 2.9: Comparison of Bird Composition in Natural Forest versus Degraded and Converted Areas (based on JCDT's bird counts)



Threats. Habitat destruction, especially in the form of conversion to agriculture and plantation forestry, is among the most serious threats faced by birds of the Park. Other threats include hunting and pesticide abuse (Experts workshop, 1999). All birds in Jamaica are protected under the Wild Life Protection Act except those in the 2nd Schedule including the parasitic Shiny Cowbird (*Molothrus bonariensis*), domestic chickens and game birds which can be hunted only in the prescribed season and according to annually prescribed amounts. The game birds found in the Park are the Mourning Dove (*Zenaida macroura*), White-winged Dove (*Zenaida asiatica*), Pea Dove (*Zenaida aurita*) and White-crowned Pigeon or Bald-pate (*Columba leucocephala*) however hunting is not permitted within the Park. Birds like the Jamaican Blackbird, the Ring-tailed Pigeon, the Blue Mountain Vireo and the Jamaican Elaenia (*Myiopagis cotta*) have small populations

that are on the decline and contracting ranges. Development pressure from ecotourism, coffee and lumber extraction could cause local extinction of some of these species (Mundle, 1997).

Migrant Birds. Approximately 40 terrestrial bird species (mainly new world warblers) are regular winter residents in Jamaica. Others may use Jamaica as a stop en route to wintering grounds in South America. Common migrants are: the Black-throated Blue Warbler (*Dendroica caerulescens*), the American Redstart (*Setophaga ruticilla*), the Black and White Warbler (*Mniotilta varia*), Oven bird (*Seiurus aurocapillus*) and the Common Yellowthroat (*Geothlypis rostrata*). Swainson's warbler (*Lymnotheros swainsonii*) though no longer common can still be found in the Park. A few species migrate from South America during summer to breed in Jamaica and return to South America in the winter. Some areas of the park, especially in the region of Mount Horeb and Morce's Gap are very well studied but less is known about the central and eastern regions of the BM, as well as altitudes below 1000 m (Vogel, 2004). This is being addressed to a limited extent by the BJCMNP's Bird Monitoring Programme which in 2004/5 expanded the areas being monitored. In addition there is current relevant research being conducted for Ph.D. thesis at the University of the West Indies.

2.2.2.5 Mammals

Jamaican Hutia (Coney) The Jamaican Hutia or Coney (*Geocapromys brownii*) is endemic to the island and is the only remaining non-volant terrestrial mammal. The species is protected under the Wild Life Protection Act (1945) and its status is listed as 'Vulnerable' according to the IUCN Red List. This means that the animal is facing a high risk of extinction in the wild in the medium-term future. Hutias inhabit solution cavities in sedimentary limestone as well as holes formed by roots, hollow trees and crevices in rock-fall areas. The animal is nocturnal and about the size of a rabbit, hence the local name 'mountain rabbit'.

Formerly distributed throughout the island, the Hutia has become increasingly restricted in its range over the last few decades, with significant population declines reported in some areas and extinction in others. It has been recorded in most parts of the JCM and there have been scattered sightings in the BM range (elevation 600 - 1800+ m) and especially the Cunha Cunha Pass Trail.

Threats The Hutia or Coney is threatened by deforestation and encroachment, hunting pressure and predation from introduced animals especially dogs, rats and mongooses. Coneys have been hunted as a source of protein since the arrival of the Arawaks and hunting pressure remains intense, resulting in the loss of several hundred individuals each year (Oliver & Wilkins, 1988). The tradition of hunting coneys is very prevalent in the JCM. They have become scarce in all of the more accessible areas and are believed to be most abundant in the less accessible forests above 750 m.

Hunting has also increased in the Rio Grande Valley, with one of the main markets being returning residents who purchase coney meat for J\$500 per coney. The method of catching coneys in this area is also very disturbing as there are reports of coney holes being destroyed with sledge hammers. Human encroachment, agriculture and deforestation are also contributing factors in the coney's decline (Oliver & Wilkins, 1998). The most recent population assessment conducted (Oliver, 1982) suggests that the coney persists in most of the places one would expect it to; due to its innate inconspicuousness, adaptability and the availability of limestone hole systems.



Plate 13: Jamaican Hutia or Coney (*Geocapromys brownii*). (Source: NHMJ – IOJ)

Bats Jamaica has 21 species of extant bat and Genoways et al., 2005 identifies four endemic species and five endemic sub-species. The distribution of bats in the park is poorly known, however Genoways et al., 2005 notes that both the Jamaican Brown Bat (*Eptesicus lynni*) and Leach's Long-tongued Bat (*Monophyllus redmani redmani*) have been recorded from the Blue Mountains. Whilst bats dwell in caves, crevices, sinkholes, trees and even houses, large roosting colonies are most commonly known from caves. Given the rarity of caves in the BJCMNP, large roosting colonies are likely to be absent.

Threats Bats in Jamaica are commonly known as rat-bats and are viewed with a level of fear, due to the association with vampires and other mysterious creatures. Whilst this fear may not result in the direct killing of bats, people will try to prevent them from roosting in houses or other buildings, or trees near to homes.

Genoways et al., 2005 lists the protection of certain caves from commercial development, and preservation of large areas of native vegetation including the Blue and John Crow Mountains as being important for the conservation of bats in Jamaica. Bat guano is highly

valuable as a natural fertiliser, and roosting bats may be disturbed by the collection of this material from caves.

2.2.3 Aquatic Ecosystems

The numerous streams and rivers of the BJCMNP form an important habitat for a variety of freshwater plants and animals, and are an important breeding ground and habitat for the larval stages of many animals. The endemic frog *Eleuthrodactylus orcutti* makes its home in the rivers of both mountain ranges, and is the only aquatic member of the genus in Jamaica. The benthos is dominated by aquatic insects of the orders Ephemeroptera (Mayflies) and Trichoptera (Caddis flies). One species of shrimp (*Jonga serrei*) and one of a gastropod mollusk locally known as Bussu (*Neritina punctulata*) are restricted to rivers in Portland, including within the BJCMNP.



Plate 14: Black Janga (*Atya lanipes*) in the Rio Grande Valley (Source: TNC)

Wet and dry seasons greatly influence the distribution, abundance and diversity of the benthic fauna, and several species of invertebrates reach their maximum numbers during the dry season. Due to low nutrient content combined with shading from riparian vegetation and therefore minimum exposure to carry out photosynthesis, the freshwater flora is generally poor, with 2 species of epipelagic diatoms, and algae dominated by *Cladophora* sp.

Nutrient enrichment from agri-chemical runoff causes changes in the composition and numbers of aquatic flora and fauna. When this occurs, there is an initial decrease in density due to oxygen depletion, but eventually an explosion in numbers of animals and a low diversity of species occurs. Assessment of stream monitoring data collected from 12 sites mainly just inside the BJCMNP boundary between 2005 and 2009 indicate good and improving stream habitat within the BJCMNP.

2.3 ALIEN INVASIVE SPECIES

Species that are not native to a location are usually called ‘alien’ or ‘exotic’ species. They may be introduced into new areas deliberately or accidentally e.g. on feet or fur of animals, dispersal of seeds by birds etc. Some alien species are unable to establish themselves in the new environment, whilst others become established and thrive. Of those that become established, some do not appear to affect local or native species negatively, whilst others ‘invade’ or out-compete native species for food and other resources. In the case of many invasive plants, they grow faster and spread more rapidly than native species, literally smothering seedlings and preventing seeds from sprouting.

Invasive species are regarded as the second most critical threat to the park’s ecosystem (Experts workshop, 1999 & Site Conservation Plan, 2000). Invasive plants include: Wild Coffee or Mock Orange (*Pittosporum undulatum*), *P. viridiflorum*, Molasses or Wynne grass (*Melinis minutiflora*), *Gleichenia bifida* (fern), Ginger Lily (*Hedychium gardnerianum*), and Red bush (*Polygonum chinense*). The Cinchona Botanical Garden has been a source for the spread of exotic plants, in addition to the use of some tree species for reforestation.

P. undulatum is the most threatening alien invasive plant species and must be controlled within the context of a national park. The objective of any control programme should be to minimize the negative effects of an invasive weed, at a minimum cost and maximum benefit in terms of potential use (Experts’ workshop, 1999). The distribution of this invasive species in the Blue Mountains is fast expanding and leading to the competitive exclusion of many native species. A strong negative correlation has been found between the dominance of *Pittosporum* and the density and diversity of native tree seedlings strongly suggesting that *Pittosporum* is causing or contributing to a major decline in the seedling layer native flora (Healey & Hall, 1994).

Molasses or Wynne grass is a primary colonizing grass that spreads quickly and reclaims large areas of formerly forested lands. This alien invasive is a serious fire hazard as it dries quickly after a short growing season and ignites easily.

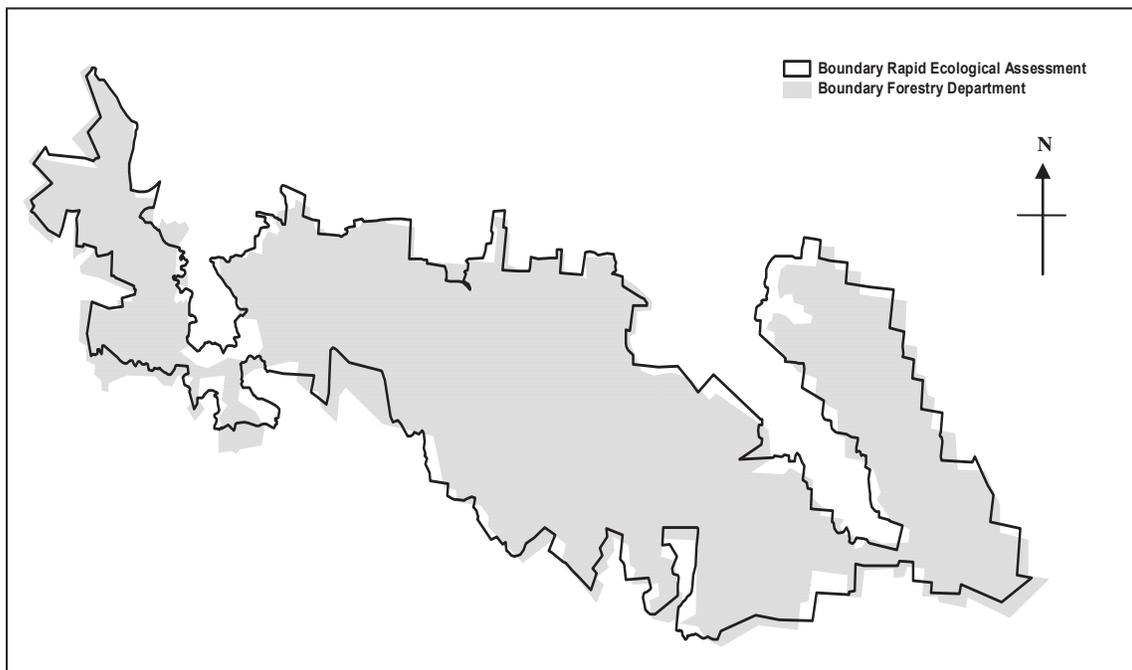
The BJCMNP since 2004 has been implementing an Alien Invasives Control Programme, with a particular focus on *Pittosporum*.

Little information is available on the occurrence of exotic animals in the Park. Feral pigs (*Sus scrofa*) have been reported from both the BM and JCM and are hunted by a small number of persons from local communities living in BJCMNP’s Buffer Zone. The introduced mongoose (*Herpestes auropunctatus*) and Marine Toad (*Bufo marinus*) are present as well, but their occurrence across BJCMNP habitats has not been documented. The white-tailed deer (*Odocoileus virginianus*) has been reported by farmers in the lower Rio Grande Valley and communities below those considered to be the BJCMNP’s Buffer Zone e.g. Swift River, Paradise, Shrewsbury, and Content. Research shows that these animals at present pose more of a threat to small scale agriculture rather than to the forests of the BJCMNP (Chai, 2003).

2.4 PRESENT DISTRIBUTION OF NATURAL FORESTS, MODIFIED FORESTS AND ANTHROPOGENIC HABITATS

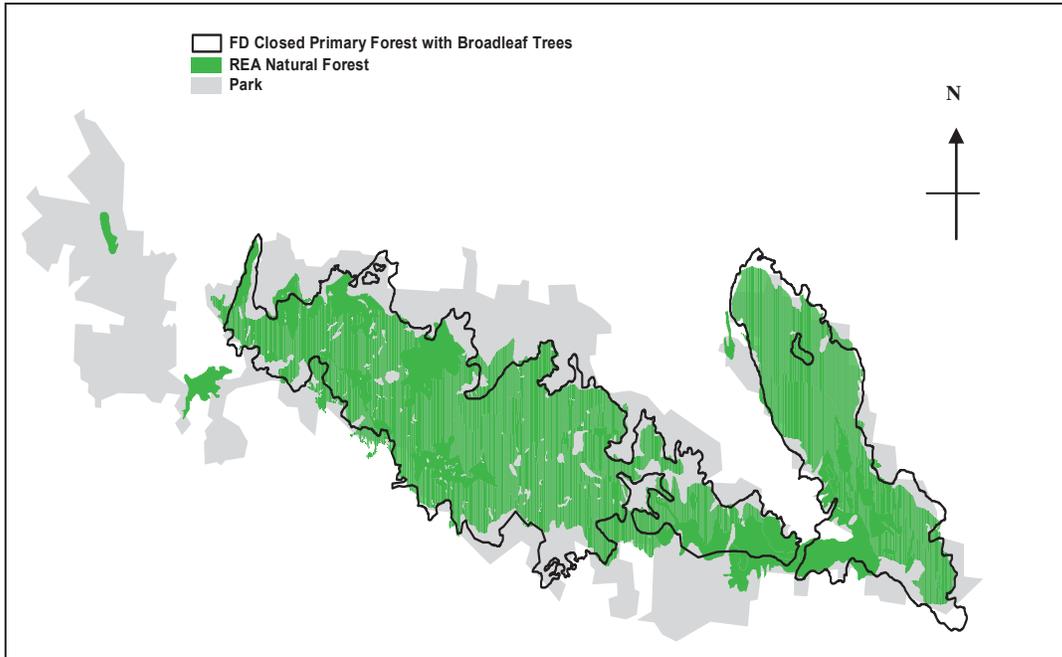
In 1992, a Rapid Ecological Assessment (REA) of the BJCMNP was conducted by TNC in collaboration with the former Conservation Data Centre-Jamaica and the Jamaica Agricultural Development Foundation Research Programme. Major habitats and land use were mapped based on satellite imagery, aerial photographs, and ground truthing. Forest cover and land use have been mapped by the Forestry Department based on Landsat imagery acquired in 1996 and 1998, aerial photography and ground reconnaissance. The two assessments delineated the National Park/Forest reserve boundary slightly differently (Fig. 2.10), the present document will use the Forestry Department's delineation.

Figure 2.10: BJCMNP Boundary (Source:)



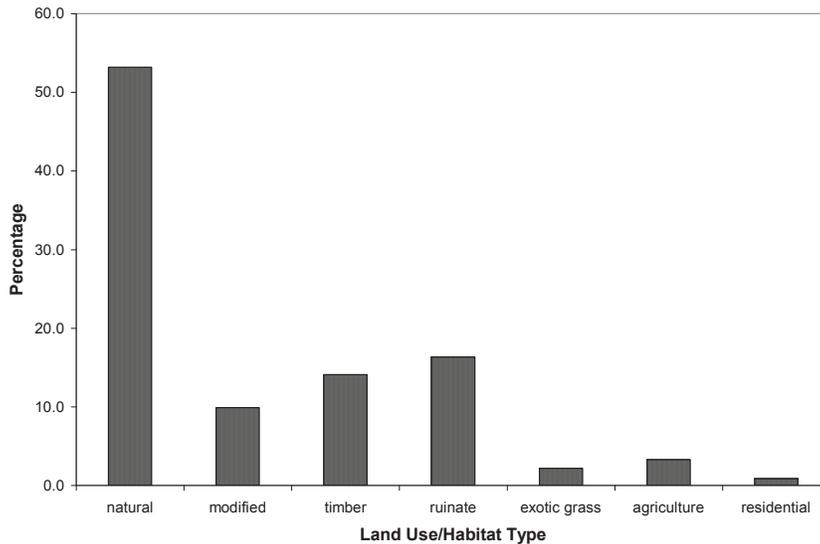
The two assessments also used somewhat different land use/habitat type classifications however, they agree fairly well in their assessment of high quality forest (Fig. 2.11 below). This category is named “Natural Forest” in the REA and “Closed Primary Forest with Broadleaf Trees” by the Forestry Department. Since the REA was carried out to support Park management, this Plan will use the REA land use categories outlined in Table 2.2.

Figure 2.11: High Quality Forest Identified by REA (Source:)



Several categories of heavily degraded and secondary woodlands with a strong exotic component are here summarized as “Ruinat Woodlands”. Fig 2.12 indicates the percent distribution of the land use/habitat types across the BJC MNP area. Slightly over one half (53.2%) of the park area has retained natural forest and about 10% modified forest; timber plantations account for 14%; ruinate woodlands cover 16% of the total area, while agriculture, exotic grass and residential sections cover each below 4%.

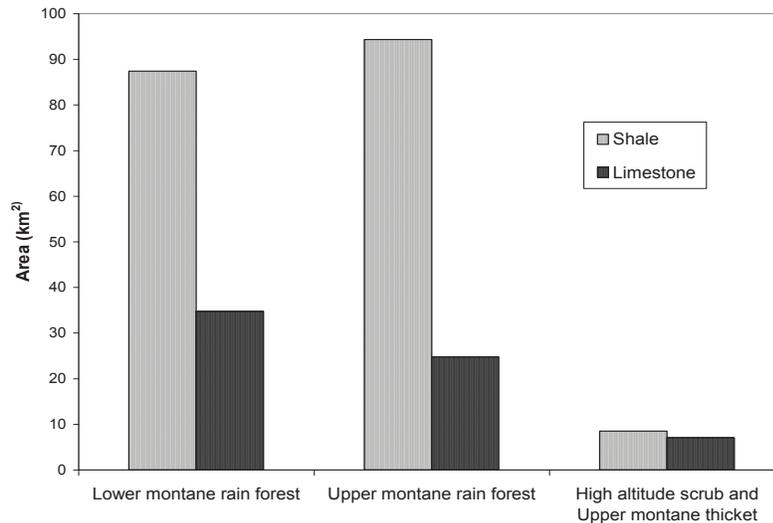
Figure 2.12: Percentage Distribution of Land Use/Habitat Types in the BJC MNP



Among natural forest types (Fig. 2.13), lower and upper montane forest extend over similar areas, and both cover much larger areas over shale (mainly BM) than limestone (mainly JCM). The natural vegetation close to the summit - high altitude scrub (BM) and montane thicket (JCM) - extend over a few square kilometers only, reflecting the small area of the mountain tops. Three unique and highly specialized habitat types expand over extremely limited areas:

- ▶ Upper montane forest over limestone in the BM, restricted to a small area on John Crow Peak
- ▶ Montane summit savanna - natural grassland confined to a small area to the north side of High Peak
- ▶ Mor Ridge Forest - sub-type of upper montane forest occurring in scattered small patches in BM and JCM

Figure 2.13: Area Covered by Natural Forest Over Shale and Limestone



The proportion of remaining natural forest is closely linked to altitude (Fig. 2.14a and 2.14b below). In the lowest sections of the BJCMNP, less than 10% of the area has retained natural vegetation. At middle altitude, about 50% of the area has remained natural, and above 80% at higher elevations. However, since the area of the BJCMNP is most extensive at mid altitude (Figure 2.14a), the absolute area of remaining natural forest peaks at this level (Fig. 2.14b). Overall, a large percentage of the lower montane forest has disappeared, while much of the upper montane forest and most of the summit vegetation remains intact.

Figure 2.14a: Land Use/Habitat Type by Altitude - Percentage of Area Covered
 (The exotic category combines ruinate woodlands and exotic grasslands.)

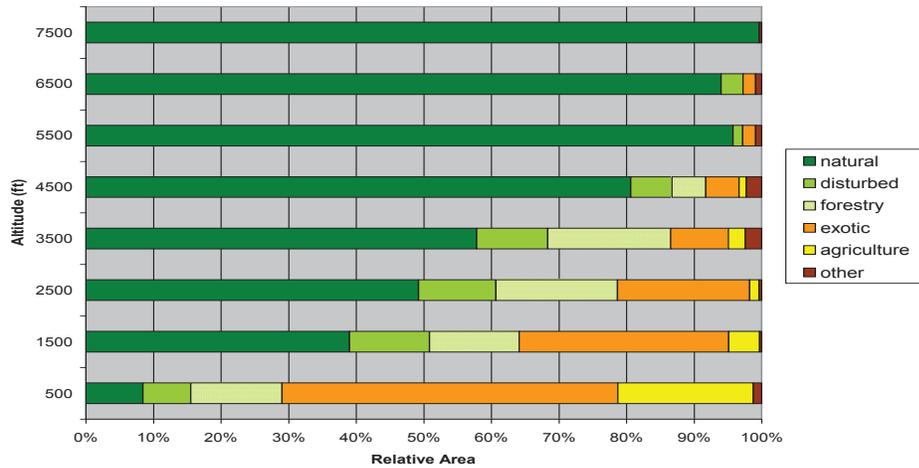
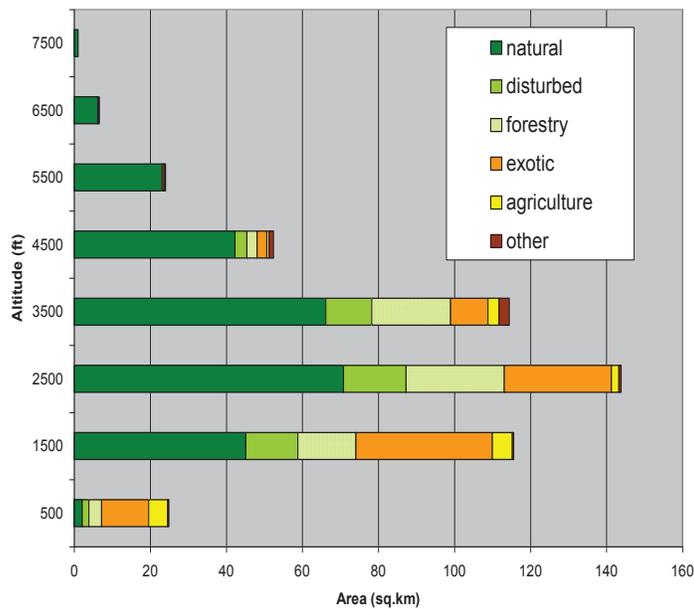


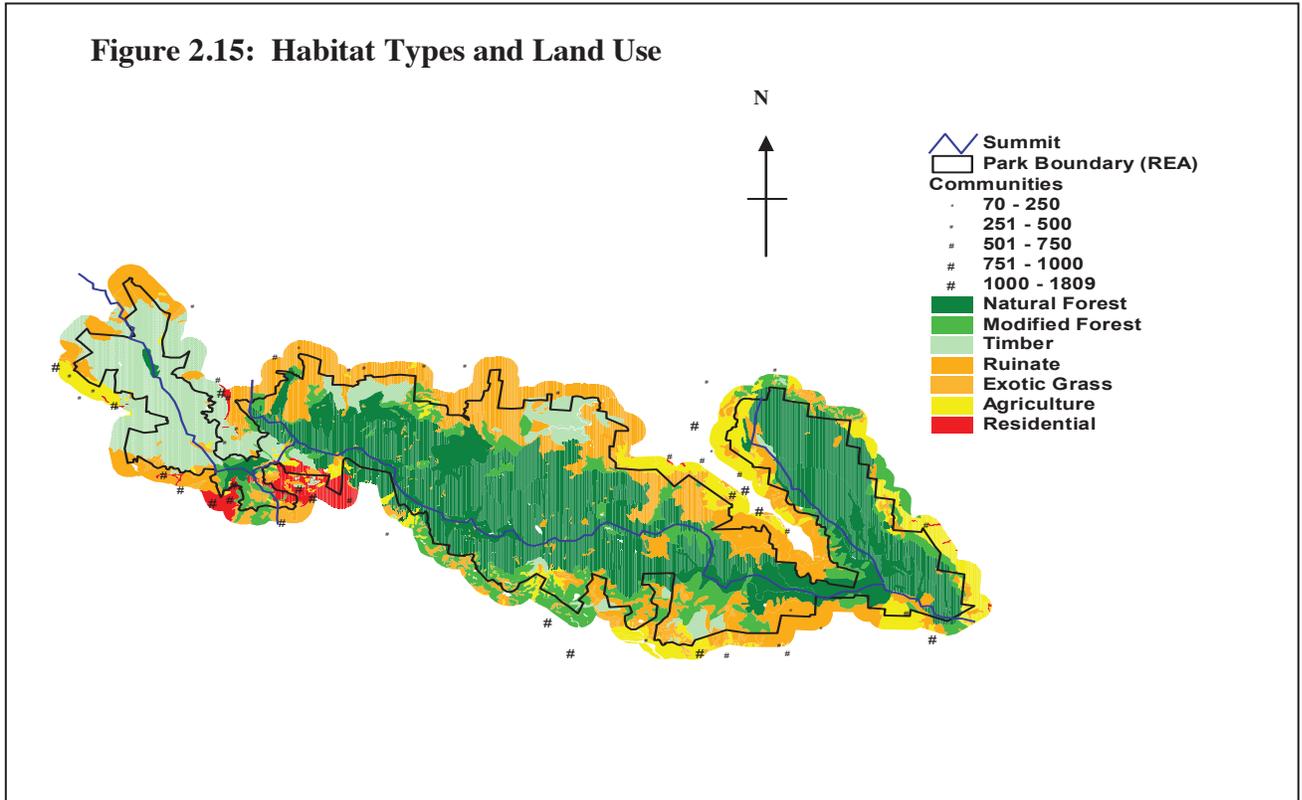
Figure 2.14b: Land Use/Habitat Type by Altitude - Area Covered in km²



The altitudinal pattern of the proportion of remaining natural forest reflects the main pattern of human impact: the encroachment of human activities from lower to higher altitudes. Disturbed and anthropogenic habitats strongly dominate along the periphery of the park, while the natural forests form a relative compact core of well preserved forest across the interior and upper sections of BM and JCM (Fig. 2.15). Most of the remaining natural forest of these mountains is located within the BJCMNP.

Human encroachment in the PRM has advanced across almost the entire mountain chain, and only a small section of well-preserved forest remains at Mount Telegraph. Coffee plantations and commercial forestry is the predominant land use/habitat type.

Figure 2.15: Habitat Types and Land Use



Chapter 3

Human Influence, Socio-Economic Issues and Cultural Resources of the BJCMNP

3.1 PAST AND PRESENT LAND USE INFLUENCE ON THE NATURAL ECOSYSTEMS OF THE BJCM

3.1.1 History

The virtually impenetrable forest, deep valleys and rugged terrain of these mountains have played an important role in the history of Jamaica. The Taino were the first people of Jamaica arriving in mid-500 AD. They are usually described as fishers and farmers living mainly in villages along or near the coastal plains, however archaeological research indicates there were groups who lived in the hills. The Spanish arrived in Jamaica in 1494 and established their first settlement on the island at Nuevo Seville on the north coast in what is now the parish of St. Ann. They began to enslave the Taino found in the plains, and those who did not escape to the hills and mountains were quickly decimated by disease and over-work. In 1513 therefore, the Spanish began to bring Africans into the island as slaves to replace the indigenous population as plantation labour. Rather than remain as slaves, many of these Africans took refuge with the Taino in the rugged interior of the island. These escaped slaves of Taino and African origin became known as Maroons from the Spanish ‘cimarron’ meaning fugitives or runaways, but literally ‘living on mountaintops’ as ‘cima’ means top or summit in Spanish. Some time around 1640, a group of the Maroons travelled further east and settled in the Blue and John Crow Mountains and the surrounding foothills and plains of the parish now known as Portland.

British rule began with the invasion of Penn and Venables in 1655 and eventual defeat of the Spanish. As a British colony, slavery continued and grew even worse with the plantation owners and managers finding it cheaper to work slaves to death and replace them with new slaves from Africa. This resulted in a constant stream of new Africans into the island and a constant stream of runaway slaves deserting the plantations to join the Maroon enclaves in the mountains. In 1710, the English fearful because of the low ratio of white to African (1:10) began to offer incentives to attract additional white settlers to Jamaica, and particularly to Portland. Records of these settlers indicate the land was occupied by the Maroons with large plantations and several towns including their ‘capital’ Great Negro Town (later renamed Nanny Town in honour of the role of their spiritual leader in defeating the English) in the Blue Mountains. By 1720, the incursion of these white settlers into their territory, led to war breaking out between the Maroons and the English. War raged non-stop for twelve years between 1728 and 1740 when the English finally sued for peace and signed a Peace Treaty with the Maroons. The treaty

upheld Maroon rights to lands in the BJCM and civil autonomy, but required that they assist the British by returning runaway slaves. After the treaty was signed the Maroons were able to begin a more stable and permanent existence and so for the first time two Maroon towns were recognised in Portland – New Nanny Town (now called Moore Town) and later a second called Crawford Town.

By 1770, the British had fortified the island from foreign attack with several forts, including one at Morant Bay. They also grew increasingly concerned about the possibility of rebellion from within the growing black population of both slaves and “free coloureds” with numerous uprisings being led by Chief Tacky and other African-born slaves. Arising from this concern, a military presence was established in 1795 by the English at Cornwall Barracks, only three miles from New Nanny Town.

With the Haitian Revolution in 1791, thousands of French emigres – both white and coloured fled to neighbouring islands, including Jamaica. Many of these persons became planters and merchants in the eastern parishes of the island, some establishing the first coffee plantations in the hills of St. Andrew and Portland.

By the mid-eighteenth century, production of sugar from sugar-cane was at its peak and the British were doing exceptionally well, financially. However, the discovery of sugar-beets as a cheap source for sugar in Europe along with other changes in the world economy resulted in the decline of “King Sugar” in the Caribbean. A decline in the demand for sugar from the Caribbean resulted in a decline in the demand for slaves. The abolitionist lobby in England eventually succeeded in abolishing the slave trade in 1807 and slavery in 1834. An apprenticeship period was however enforced from 1834 – 1838 supposedly to assist the freed slaves in learning how to live in freedom and work for wages, but in reality to assist the plantation owners to make major financial adjustments. Despite the abolition of the British Slave Trade, slaves and indentured labourers from Africa still arrived in Jamaica up to 1865, particularly in the eastern parishes of St. Mary and St. Thomas. Interestingly, it is reported that these parishes show the highest retention of African culture.

As most of the flat, arable land in the plains was occupied by large plantations, the freed slaves, not wishing to remain as labourers on the plantations (since the conditions were not much better than under slavery), settled in the mountainous interior of the island. In much of the parishes of St. Andrew and St. Thomas, the ex-slaves settled for the steepest and most infertile lands as most of the better mountain land was already occupied by large coffee plantations.

The eastern county of Surrey, in which the BJCMNP is located, was the home of three national heroes: Nanny of the Maroons who led the Windward Maroons to many successful battles with the English soldiers, George William Gordon, a coloured representative in the House of Assembly and Paul Bogle, a black Minister of Religion. Gordon and Bogle were hung for their involvement in the Morant Bay Rebellion of 1865.

The ensuing years saw continued struggles and the slow rise of coloured and black Jamaicans in the various governing institutions. The two World Wars between 1914 and 1945 involved numerous Jamaicans who enlisted in the British Army and learned a great deal from their travels and exposure abroad. Many of the soldiers who fought in these wars were rewarded with land in the Blue Mountains – particularly in the Rio Grande Valley, on their return to Jamaica.

The period between the start of the World Wars and the late 1940s was fraught with strikes and civil unrest as the mainly black labourers in the docks, railway, sugar and banana estates etc. protested poor working conditions and increased wages. These struggles brought leaders to the fore through the formation of the trade unions – the National Workers Union and the Bustamante Industrial Trade Union, led by Norman Washington Manley and Alexander Bustamante respectively. Out of these trade unions arose two political parties – the Peoples National Party and the Jamaica Labour Party, with the same leadership.

In 1962, Jamaica gained its independence and on August 6th, the Union Jack was lowered and the black, green and gold Jamaican flag was flown for the first time, symbolising the hope and possibilities within the cultural and natural resources of the island:

“the sun shineth, the land is green and the people are strong and creative”

There are no historical sites listed by the Jamaica National Heritage Trust (JNHT) within the Park’s boundaries except for Nanny Town, which is now essentially an archaeological site. Within the Buffer Zone however, there are numerous sites and areas of heritage significance, particularly with respect to both Maroon and traditional African Jamaican village culture. Examples are Moore Town (New Nanny Town), Nanny Falls and the Cunha Cunha Pass Trail. A small section of the latter actually passes through the BJCMNP and there are a number of springs and resting spots that were used by the ancestors of local communities making their journeys to and from market. JNHT is currently conducting activities towards protecting some of these sites under the JNHT Act, 1985.

3.1.2 Pre-Columbian Period

Pre-Columbian times saw relatively little change in the ecosystems of the island. In fact, the name *Jamaica* is derived from the Taino word *Xaymaca*, meaning ‘land of wood and water’. The effect of the Taino population on the natural ecosystems was relatively small-scale and involved hunting, clearing small land areas for cultivation and the introduction of exotic species. Whilst research has shown that the Taino were not restricted to coastal locations, their impact in the BJCMNP was most likely limited to use of the some sites such as Nanny Town as sacred hill sites for worship. Archeological excavations at Nanny Town in the 1990s found three layers representing occupation by the English between 1734 and 1735, the Maroons dating at least as far back as 1655 and the Taino prior to that.

3.1.3 Large-scale Deforestation, Monoculture Plantations and Subsistence Farming

Columbus arrived in 1494 to see the island under its original dense forest cover, except for scattered clearings in areas occupied by the Taino. With the arrival of the Spanish, followed by the English, the plantation system fuelled by slavery, dominated the landscape. This era saw huge expanses of land cleared for monoculture plantations, especially sugarcane. This resulted in the loss of most of Jamaica's lowland forest and changed the landscape, forever.

Many of the land use practices seen today have been shaped by the social structure of the 17th and early 18th centuries. From 1838 to 1881, the population of emancipated slaves grew from 311,000 to 553,000 - an almost two-fold increase in population size over a period of only 40 years. The demand for land consequently increased and some of the larger estates were split up into small allotments which were rented to tenants. This continued a situation similar to slavery, where the plantocracy owned the land and the peasantry farmed it, with the personal interest that comes with farming one's own land being absent. The resulting demand for land as well as the practice of cultivating out-of-the-way areas for fear of crop theft led to unsuitable lands on steep slopes being cleared for cultivation. Further the practice of shifting cultivation was prevalent because the land on the steep mountain slopes was infertile and crops declined after two or three years. Much of the land in low lying areas was still owned by the affluent and the small farmers had to travel quite some distance from their homes to their farmed grounds, resulting in this route in-between home and field being cleared for easier passage. This lack of ownership and constant movement is a likely cause of the indifferent attitude towards land husbandry that is evident today. Lack of land tenure continues to be an issue today, and with the high value of Blue Mountain Coffee, much of the land in the BM considered suitable for farming (actually only for agro-forestry) is owned or leased from government by large-scale farmers. Thus most small-scale farmers are farming cash crops e.g. carrots, thyme and escallion on slopes that are too steep and soils that are too shallow.

3.1.4 Slash and Burn Agriculture

The BJCM has a long history of subsistence farming including slash and burn agriculture. Traditionally, slash and burn agriculture was thought to provide an easy method of subsistence farming that required minimum labour and enriched the land with ash. It is estimated that on average, over a period of 5 years, over eight acres of forest is cleared and farmed up a hillside. This practice has however, devastated the forests of the BJCM and continues to do so, with conversion to agriculture being the most critical threat to the BJCMNP. Trees are cut down and burnt, soil erosion removes the topsoil and the area loses fertility within 2-3 years. New areas are then burnt, often with the fire burning a much larger area than required, and the old areas are abandoned as there is no long-term investment made due to lack of ownership. These abandoned areas are so badly damaged that natural succession to native forest is blocked for decades and the problem is heightened by aggressively colonizing grasses and ferns, some of which are invasive.

These colonizers make the area vulnerable to repeated wildfires and erosion as they dry quickly after the growing season and are easily ignited. In the present day, this very damaging cycle has been perpetuated into higher elevations and steeper slopes resulting in the whole countryside being denuded of its original forest.

As land is degraded outside the BJCMNP, and with very limited demarcation of the boundary, the temptation to encroach into the protected area is significant. Further, as land is burnt outside the BJCMNP, wind is liable to result in areas within the boundary catching fire. Slash and burn agriculture whilst it may not be practiced anymore within the BJCMNP, is still practiced on land immediately adjacent and is therefore a serious threat to its ecosystems.

3.1.5 Windward Maroons

The BJCM with their rugged terrain provided inaccessible mountain hideouts for the Maroons of eastern Jamaica, thus aiding them in their defeat of the English. The wide variety of resources within the BJCM provided the natural heritage which helped form the cultural heritage of the Maroons, providing for the majority of their needs. Several Maroon trails and sites such as Nanny Town remain as cultural features that helped to shape the landscape of the mountains. The Cunha Cunha Pass and Sambo Hill Trails are among some of the more popular Maroon trails used as cultural attractions today. Nanny Town, within the boundary of the BJCMNP has had significant archaeological studies conducted by researchers from the University of the West Indies.

Whilst the Windward Maroons no longer occupy land within the boundary of the BJCMNP, based on written accounts describing their way of life including at Nanny Town, there appeared to have been large plantations (JCDT, 2009) located in what is now the BJCMNP. Satellite imagery indicates that much of the land within the Park in that area is rinate forest, indicating forest disturbance, likely for agriculture which was abandoned many years ago. Based on the 1740 Peace Treaty, the Windward Maroons communally own and govern over 2,000ha of land within the Rio Grande Valley and a smaller area within the Buff Bay Valley. The latter is definitely not within the Park boundary and discussions with Colonel Sterling, Moore Town indicate that Maroon land there is also outside the Park boundary. Thus with respect to land use impact on the natural ecosystems within the BJCMNP past and present, there is a need for forest rehabilitation in areas that may have formerly been occupied by Maroons prior to 1740 (and/or English settlers before or after that) and it would be useful to assess and clarify the boundary between Maroon land and the BJCMNP.

3.1.6 Coffee

In 1728, coffee was introduced to Jamaica from Martinique and because of its altitude and climate the slopes of the BM were found to be an ideal place for growing high quality coffee. Today, coffee is the principal large-scale crop in the BM, with an estimated 12,000 acres of land under coffee in the eastern region (St. Andrew, St.

Thomas and Portland). Coffee growing has resulted in large-scale encroachment of the national park. Further, large areas of the original Forest Reserve were cleared for Caribbean Pine and then coffee growing under leases through FIDCO and CIDCO.

Shade coffee is seldom practiced due to the perceived threat of leaf spot disease and the view that shade from the mist is sufficient. Blue Mountain coffee is the most expensive coffee on the international market. The majority is sold to Japan, with very little being available for the remainder of the market. The high price commanded by Blue Mountain coffee is resulting in the clearing of more land for this crop. Some farmers clear all the trees from the land before planting coffee, although they may plant some banana and plantain as short-term crops, whilst the coffee plants are young. This practice of removing all other trees, and growing coffee as a mono-crop increases soil erosion, and results in a habitat that is not conducive to native wildlife, particularly birds.

Coffee pulp is often disposed of carelessly, sometimes getting into rivers and causing eutrophication. Nutrient rich effluent from processing factories also results in eutrophication of rivers outside the BJCMNP boundary. The fertilizers used are usually inorganic, and result in eutrophication, as they leach readily from the soil. Chicken manure is sometimes used however, if not properly applied, it can create an odour which causes a fly nuisance. Pesticides used (e.g. thiodan) accumulate in the fatty tissue of animals and have been found in shrimp and river sediment. The Coffee Industry Board has prepared and disseminated guidelines for environmentally sustainable coffee farming.

3.1.7 Forestry/FIDCO

In the 19th and 20th centuries, the government of the day became concerned about the state of Jamaica's forests and tried various forest protection programmes including reforestation, forest legislation, forest reserves and the establishment of a Forest and Soil Conservation Department in the Ministry of Agriculture in 1942. Many of the lands owned by private individuals, particularly on steep slopes were reclaimed by the government through forfeiture of taxes and reforestation activities implemented.

One of the most devastating occurrences for the closed broadleaf forests of the BJCM took place between 1979 and 1988, with the establishment of commercial forest plantations by FIDCO. Under this company, hundreds of acres of natural forest were cleared and replaced mainly with Caribbean Pine. FIDCO also made many access roads into the forests that still provide access routes for extractive and other destructive purposes. Whilst the basis of this national venture that sought to reduce reliance on imported lumber was worthy, the selection of species was unfortunate, and the approach to planting and harvesting were not environmentally sustainable, however this was not realized at the time. The demise of the company has resulted in acres of land with mature Pine in need of harvesting and more environmentally appropriate reforestation

The Forestry Department has reforested hundreds of acres of deforested and degraded land within the BJCM with Cedar, Eucalyptus, Blue Mahoe, Caribbean Pine and other species.

3.1.8 National Park Land Ownership

The BJCMNP is on crown land, that is, land owned and controlled by the Government of Jamaica through the Commissioner of Lands. Forest Reserve land is a component of this, and the management of these lands is vested in the Forestry Department. However, there are a few portions leased to private individuals, mainly in the PRM. The system of leases within the BJCMNP is a complex issue involving many sub-leases and numerous parties. FIDCO leased land to the Coffee Industry Development Company (CIDCO), who in turn leased land to private individuals. In Portland, land was given to retired World Wars I and II soldiers. The Ministry of Land and Environment³, through the Forestry Department and the Commissioner of Lands is currently in the process of developing a national cadastre to resolve some of these issues of land tenure.

3.1.9 Infrastructure and Residential Areas

There are no residential areas within the BJCMNP, although because of the convoluted shape of the boundary, there are some areas that may appear to be within the Park but are actually just very close to the boundary. There is only one road that intersects the Park (at Hardwar Gap) - the Kingston to Buff Bay Road (Class B).

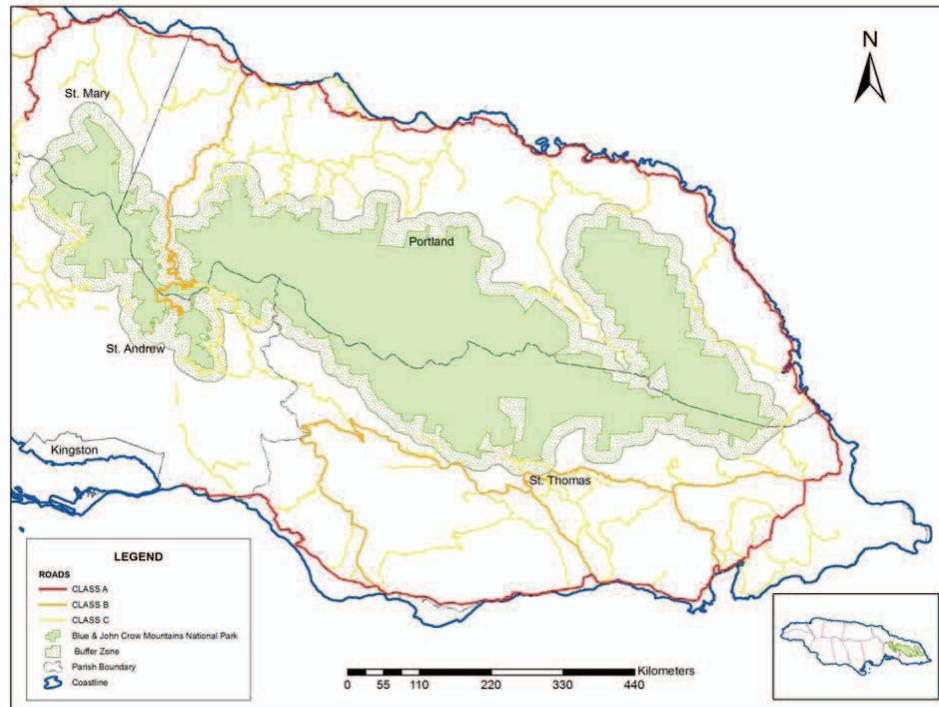
The Kingston to Buff Bay Road is plagued with land-slides and breakaways at various points and in various stages of repair. A major breakaway at Newcastle closed that section of the road for almost a year and several breakaways in the Section/Cascade area closed that section of the road for more than two years. At the time of writing it is passable but ideally using four wheel drive vehicles as one section has been abandoned.

and an unpaved coffee farm road is being used instead. There is a tertiary (Class C) road that cuts through the edge of the BJCMNP in the Cinchona/Clydesdale area and this is rough but generally drivable.

Many of the roads and bridges around the BJCMNP are in a state of disrepair, including the Yallahs River fording and bridge below Mavis Bank, St. Andrew and the Alligator Church Bridge in the Rio Grande Valley, Portland. The Upper Rio Grande Valley road runs alongside the Rio Grande and is generally very rough in most areas beyond the Alligator Church Bridge. There have been fallen bridges which have cut communities off for months and a major breakaway at “Friday” which has closed the road to Ginger House, Comfort Castle and Millbank for over a year. Whilst the BJCM area has steep slopes and is prone to high rainfall and soil erosion, especially in the areas comprised of shale, and this is made worse by deforestation, one of the main reason for poor road surfaces and breakaways is due to lack of maintenance. In these environments drains must be kept clear and run-off from paved surfaces must not be allowed to undermine the sub-structure of the roads. Unfortunately, there is no system of maintenance for these roads.

³ This Ministry no longer exists and the environmental portfolio has since been transferred to the Office of the Prime Minister.

Figure 3.1: Map showing Class A, B and C roads in and around the BJCMNP



Most residents in the communities within the BJCMNP’s Buffer Zone have electricity and piped water; telephone service is mainly through wireless providers. Great houses such as Craighton, St. Andrew and Whitfield Hall Estate, St. Thomas, remain as relics of the colonial era. Residential areas have spread along the major roads as the forest outside the Park has been made to retreat.

3.2 CONTRIBUTION OF THE NATURAL ENVIRONMENT TO ECONOMIC DEVELOPMENT

The eastern end of the island, particularly the northern slopes of the Blue Mountains, has a high rainfall level due to the prevailing north-east trade winds. This has made the parishes of Portland, St. Mary and much of St. Thomas lush and very suitable for agriculture – crops predominantly grown being sugar cane and bananas. However, with the removal of the EU preferential rate on bananas from the West Indies many banana plantations have reduced production. Coffee and cocoa are grown in the hills of these parishes and also of St. Andrew. Vegetables like carrots and peas, and herbs like escallion and thyme are commonly grown by small farmers in these hills and mountains.

The heavy rainfall and impervious rocks of volcanic origin have led to numerous rivers which are an important source of water supply, particularly for the burgeoning population of metropolitan Kingston and St. Andrew. In 1927, the Hermitage Dam was opened –

being fed by streams and tributaries of the Wag Water and other rivers, and the Mona Reservoir was built in the early 1940s, supplied by water from the Hope River and supplemented in the 1980s by water from the Yallahs River. The BJCMNP protects the watersheds of these and other water sources.

Tourism started in Jamaica in the 1860s with the start of the banana trade in 1866. Visitors would land in Kingston and while the boat travelled round the coast collecting bananas, the tourists travelled over the mountains to Port Antonio to stay until the boat arrived. The 400-room Titchfield Hotel in Port Antonio therefore, became Jamaica's first resort hotel. By the 1950s Port Antonio, with its beautiful white sand beaches in tranquil bays and coves had become a tourist mecca, with actor Errol Flynn making Navy Island his home; and rafting on the Rio Grande River becoming a must for the rich and famous visitors to Portland. Despite this, in 2009, only 1% of the 1.8 million stopover visitors to Jamaica reported Port Antonio as their intended resort area of stay. In 2004, the Port Antonio Marina was opened however in 2009 only 4 ships called with a total of 1,339 passengers. Whilst the proposed certified 'Green Destination' was not pursued, the parish is generally marketed as a nature destination.

There has been relatively little industrial or other heavy development in the east of the island, except in Kingston and St. Andrew, and most of this development has spread west into St. Catherine and Clarendon, rather than east. This general low level of development and the focus on coastal development for agriculture e.g. coconuts and bananas, and tourism, rather than development of the hinterland, due to the rugged terrain of the mountains has aided the conservation of natural forest in the east. The majority of Jamaica's natural or closed broad-leaf forest therefore, is located in the east of the island within the Blue and John Crow Mountains National Park, which had been declared a forest reserve in 1950 with the gazetting of the first Forest Act (with formal protection starting even earlier for large sections as described earlier). In addition, much of the land just outside the park boundary, particularly in the north and east is still under some kind of modified forest, with the Spanish and Swift watersheds in the north and the Plantain Garden and Morant watersheds in the east considered least threatened in the island.

3.2.1 Contribution of the BJCMNP to the Regional Economy

Approximately 24 people are employed to the BJCMNP with about 15 of these being from communities in the Buffer Zone. Of these, 12 are employed on a part-time basis in the BJCMNP's recreation areas whilst the other 3 are National Park Rangers. In addition to these persons under regular employ, the BJCMNP contracts a variety of services from local communities e.g. plumbing, electrical work, tour guiding, carpentry, catering and reforestation. There are two community members with a food concession since December 2009 and about two persons who sell fruit and sweets to visitors at Holywell. Several community members sell food and produce at the annual Misty Bliss fair. Except for the increase in numbers contracted from time to time for tour guiding (particularly school groups) and reforestation, these numbers have remained similar to those stated in the 2005 – 2010 Management Plan.

There is also a substantial contribution to the private sector through tour companies and guest houses that offer use of the BJCMNP's resources. Many of the tourists passing through the area stop at shops and attractions such as the café and restaurant in Irish Town and the coffee shop at Section, Portland. There is a boutique hotel – Strawberry Hill Resort and Spa in Irish Town, St. Andrew and numerous small guest-houses between Irish Town and Section. Forres Park is a small hotel in Mavis Bank and there are several small guest-houses including Whitfield Hall, from there up to Penlyne Castle. Most of these are used by hikers to the Blue Mountain Peak. Research and community-based tourism are growing areas, beginning to offer short-term employment to local guides and community members for accommodation, meals etc. Down the Buff Bay Valley there are a few visitor accommodations and attractions including a rest-stop and the Charles Town Maroon Museum. In the Rio Grande Valley, the Bowden Pen Farmers' Association operate Ambassabeth Cabins and offer tours of the Cunha Cunha Pass Trail and other sites.

The BJCMNP also supports certain activities on a small scale that although illegal, provide many people with a livelihood. These include hunting, timber and plant materials harvesting and farming. Activities like harvesting wicker should be investigated for eventual regulation to generate income for both Buffer Zone communities and BJCMNP management.

It is difficult to estimate exactly how many people benefit financially directly and indirectly from the BJCMNP, and by how much, but a rough estimate suggests that at least 30 families from the Buffer Zone benefit directly through cash income related directly to the BJCMNP, on a regular basis.

Use of the BJCMNP for recreation including user (entry fees), cabin rentals etc. generates on average JA\$3 million per annum (depending on weather), but all of this returns to management of the Park, specifically the recreation areas, which require about JA\$3 million per annum for operating costs plus about JA\$1.5million for the time of various management and supervisory level staff currently subsidized by JCDT and projects.

In a few areas within the BJCMNP, mainly within the PRM, the Forestry Department issues licenses for timber extraction, and this provides livelihood to persons within the Park's buffer zone and from further afield, as well as support for the FD.

Whilst the BJCMNP contributes little cash directly to the regional economy, it is extremely valuable to the regional economy via indirect contributions. The site provides essential ecosystem services such as the provision of drinking water to over 40% of the island, particularly the Kingston Metropolitan Area (about 1 million people) and the tourist resort of Port Antonio. This is in addition to water for agriculture and industry. Other services include: the provision of clean air, mitigation of global warming and protective forests that prevent and reduce flooding and soil erosion. Outdoor recreation e.g. hiking, is gaining interest with the promotion of healthy lifestyles and nature conservation. Recreational space has become increasingly important and there is growing use of the area by dirt bike and other RTV enthusiasts.

Pantin and Reid (2005) estimate a direct and indirect use value for the Buff Bay/Pencar watershed of between US\$82.5 million and US\$86.5 million in 2004 (Table 3.1). Excluding carbon storage, this value is estimated to be between US\$49.5 and US\$53.5 million/year. It should be noted that the Buff Bay/Pencar watershed is one of the smaller and less populated watersheds, in comparison to the Hope, Yallahs, Rio Grande or Wagwater for example. Extrapolating from the water supply value figures alone, the indirect use value for the BJCMNP must be at least US\$175 million.

Table 3.1: Direct and Indirect Use Values for the Buff Bay/Pencar watershed (Source Pantin and Reid, 2005)

Type of Value	US\$ million (2004 prices)
1. Direct Use Values:	
a. Coffee	13.5
b. Bananas	6.5
c. Timber	3.2
d. Agro-forestry	4.0
e. Recreation/Tourism	0.03
2. Indirect Use Values	
a. Water Supply	17.5-20.3
b. Water Quality	not estimated
c. Soil Conservation n.e.	not estimated
d. Bio-diversity Protection n.e.	not estimated
e. Carbon Storage	33.0
	82.5 – 86.5

3.3 CULTURAL HERITAGE

The cultural heritage of the BJCM is as rich and varied as its natural heritage. This heritage may be tangible e.g. the military hill station - Newcastle, historic coffee great houses and Maroon trails. Other components of cultural heritage may be intangible like dance, drumming, cuisine, language and beliefs.

Much of Jamaica's cultural heritage from coffee farming to the Maroons, is based on the natural resources of the forested mountains, for example:

- ▶ use of herbs harvested from the forest for healing;
- ▶ use of plant materials for baskets and toys;
- ▶ hunting wild hog to roast for meat;
- ▶ catching crayfish and bussu from rivers for soup;
- ▶ music and dance celebrating nature and the beauty of our surroundings; and
- ▶ growing and processing of plants for beverages and food.

Some of these are broad Afro-Jamaican heritage which whilst perhaps not as internationally significant as the Maroon heritage, is still of significant national value, and must be promoted and preserved to avoid its loss.

The close link between natural and cultural heritage can be highlighted to indicate the importance of conserving natural resources in order to ensure the sustainability of cultural and socio-economic practices. Further, the use of art and cultural activities is a practical medium for conveying social development objectives e.g. responsibility and caring for our environment – both its natural and cultural components. It has also been shown that there may be cultural beliefs and practices, particularly those associated with sacred natural sites, which may promote biodiversity conservation (John et.al. 2010).

The Maroon communities in Moore Town, in the Rio Grande Valley and Charles Town in the Buff Bay Valley, as well as other communities have been involved in various ways in park management activities, for example, one of the Local Advisory Committees was located in the Rio Grande Valley. Also, the BJCMNP has established an annual cultural event – Misty Bliss, which is held at Holywell to celebrate and raise awareness about the park and the importance of its cultural and natural heritage. Community members rent booths to sell traditional food, produce and craft whilst entertainment e.g. dance and drumming is provided by local and other cultural groups. The event is enjoyed by patrons from the local communities as well as persons from Kingston and further afield.

Under the BJCMNP's Community Education Programme, training for youth and others in craft and other aspects of cultural heritage, has been conducted to help keep these traditions alive and to develop opportunities for more sustainable livelihoods. Assistance to communities for the establishment of trails and guided tours to enjoy the cultural and natural heritage of the BJCMNP and its Buffer Zone has been another activity geared at generating benefits from the resources in ways that will encourage community members to support conservation.

There is a need for increased involvement and participation of all the communities around the BJCMNP in conserving the resources of the mountains. However, this will only be possible in the long term if ways can be found for them to use both the natural and cultural resources around the park in a sustainable manner in order to make a living and improve their quality of life.

The map and table below provide information about the main cultural heritage sites of the BJCMNP – most of which are Maroon. The sites within the BJCMNP boundary are all archaeological sites. Only Charles Town, Windsor, Seamans Valley, Moore Town, Cornwall Barracks and Comfort Castle remain living Maroon communities. The JNHT is in the process of protecting some of these sites under the JNHT Act, 1985.

Figure 3.2 – Map showing Cultural Sites of the BJCM

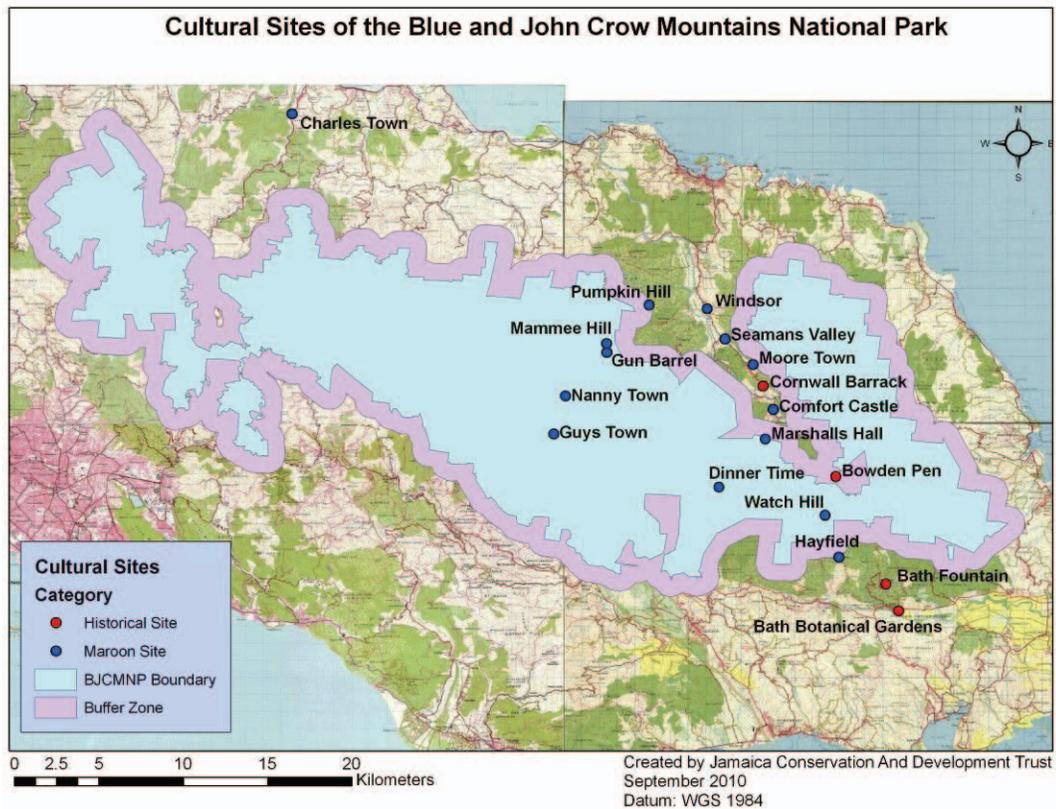


Table 3.2 – Description of the Cultural Sites of the BJCM

Site Name	Remarks
Bath Botanical Gardens	Bath Botanical Gardens is the second oldest botanical garden in existence in the Western Hemisphere, established in 1779. Many of the plants introduced to Jamaica were first planted in this garden. The gardens are much smaller today than when first established in 1779.
Bath Fountain	The Bath of St. Thomas the Apostle is the official name of the Bath Mineral Spring (or Bath Fountain). The spring was discovered by a runaway slave in the 1690s. When he found the warm waters of a pool deep in the forest healed ulcers on his legs that had plagued him for years, he braved his master’s wrath and returned to tell him about the marvelous discovery.
Bowden Pen	Bowden Pen is said to have been named after William Bowden. He was one of the 500 settlers who settled in island in St. Thomas in 1656.
Brownsfield	Brownsfield Maroon site is located on the Snake River near Alligator Church Bridge and sits high on a hill that overlooks the road skirting modern Brownsfield. The main features are remains of houses, with a few fragments of ceramics and green glass bottles on the surface.
Charles Town	Charles Town is the new settlement of Crawford Town. It is located several meters from the original town and located on the Buff Bay River close to the south shore.

Site Name	Remarks
Cornwall Barracks	Cornwall Barracks was designed to be a model for other barracks being constructed during that period. The barracks was completed in 1806 and consisted of a long house capable of holding 100 men, with separate accommodation for officers. It consisted of a guard house with four sentry boxes, a magazine, cook-house and bake-house. The windows were glass, the furniture made of pine and mahogany and the soldiers slept in hammocks.
Guy's Town	Guy's Town was named after their head man Guy or Gay. In 1733 a slave Sarra revealed that at Guy's Town, a defensive position near Nanny Town there was about 200 fighting men, well armed and a greater number of women and children. The men arm themselves with 'launces' and 'cutlashes' rather than guns. They never went to meet the parties unless to defend the paths which lead to their home. Guy's Town on Carrion Crown Hill was used by warriors to retreat for rearguard action or counter-attack, and which women and children could use for refuge. It was also a major agricultural production centre including both crops and livestock.
Hayfield	Hayfield was an unofficial settlement of the Maroons. The attitude of the Hayfield Maroons was important in the 1865 Morant Bay Rebellion when the government called out the Portland Maroons.
Marshall's Hall	Marshall's Hall also noted elsewhere as Marches Hall. The site is interesting because of its structural features and for the fact that Maroon oral tradition links the site to the modern Maroon capital town, Moore Town, historically considered to be "New Nanny Town". Surface finds consist of eighteen and nineteenth century European ceramics, house foundations and steps.
Moore Town	The Maroons of Nanny Town was first allotted 500 acres of land. Granny Nanny saw the need for more land and made a request to the British government in 1781. There was an allotment of 1,270 acres of land which was called Moretown. Due to misunderstanding and errors, the town name was recorded in the survey document as Muretown and later Moore Town.
Nanny Town	Nanny Town was named after a Maroon chieftess and now, National Hero. Accessible only by hunters' trails or by air. Historical references indicate that by the mid-eighteen century, the town was not only fully fledged, but also a stronghold of the freedom-fighting Maroons in the eastern part of the island. These Maroons were known as the "Windward Maroons."
Pumpkin Hill	According to oral tradition Queen Nanny was considering surrendering to the British. She heard a voice in her head tell her not yet, wait one more day. When she awoke the next morning, she found three pumpkin seeds in her apron pocket. The voice told her to plant them. She planted them on the side of a mountain now known as Pumpkin Hill, and in a very short time, the seeds grew to fruition with large pumpkins that saved the Maroons from starvation.
Seaman Valley	In 1728 when the British were fighting the windward maroons 200 seamen went to aid the militia and was massacred in this valley.
Mammee Hill	Mammee Hill possible use as a refuge site for Nanny Town and is characterized by Mammee tree groves. This suggests the early usage by the Tainos.

Site Name	Remarks
Comfort Castle, Dinner Time , Gun Barrel , Friendship, Windsor Watch Hill	These are other Maroon sites of significance mentioned in the various literature and oral tradition.

3.3.1 Maroon Heritage

As indicated above, the cultural heritage of the BJCM is rich and varied. Of particular significance however, is the intangible heritage of the Maroons of which that of Moore Town was declared by UNESCO in 2005 “a Masterpiece of the Oral and Intangible Heritage of Humanity”.

The BJCMNP, Jamaica UNESCO WHS Nomination Dossier quotes Carey, 1997 statement that the word Maroon “has been adapted by academics as a generic term to apply to groups of persons resisting plantation slavery in the Caribbean and the American continent”. In fact the term is now being applied to groups all over the world who resisted enslavement by the Europeans, by fleeing to hard to access wilderness areas. The Maroons of eastern Jamaica (Windward Maroons) are however considered the classical representation and prototype, having been the first example of Grand Maroonage, the first free Maroon state in the post 1492 world, and still enduring today.

The Windward Maroon nation was the first Jamaican Maroon band and the first Maroon nation in the western hemisphere. It was created by Amerindians who fled into the hills around Nuevo Sevilla on Jamaica’s north coast and was strengthened with the integration of Amerindian and Africans in the Seville region who fled Spanish estates immediately after the arrival of the first Africans on Jamaican soil in 1513. This band eventually migrated to the north eastern section of the island establishing its capital at “the Great Negro Town”– later to become Nanny Town - high in the BJCM, controlling all of what is today the parishes of St. Mary and Portland and much of what comprises the BJCM. Later known as the eastern or Windward Maroons to distinguish them from another powerful Maroon group – the Leeward Maroons which formed in the 1690’s and still exist today in the western end of Jamaica.

3.3.1.1 History

The history of the Windward Maroons begins with the Taino, in about 1509, taking to the hills to escape slavery in the first Spanish settlement at Nuevo Sevilla in what is now St. Ann. By 1513, with the demise of the Taino in captivity, the Spaniards began to bring “Africans” to replace the Taino work-force. Many of these “Africans” were actually Spanish Moors – prisoners of war from the 1492 Battle of Granada when the Spanish monarchs of Castile won back Spain from seven hundred years of Moorish rule. Several of these Moors escaped to the Taino communities in the mountains rather than face

slavery on plantations and thus formed the nascent group of Maroons. This Islamic influence on the Maroons has been researched, and there is linguistic and other evidence confirming this influence, for example, the members of the Maroon Kamiti (Council) greet each other “assalaamu alaikum” (Afroz, 1999 in JCDT, 2009). In 1534, archaeological records and the oral tradition of the Maroons tell us, the Maroons destroyed the settlement at Nuevo Sevilla. By this time, the Spanish had resorted to bringing slaves from several parts of Africa, many of whom also escaped to join the Maroons. Years later, possibly around 1640, the Windward Maroons moved further east to Portland where they established towns and large plantations, with their ‘capital’ Great Negro Town built on the location of a Taino sacred hill site. Historical accounts indicate that the Maroons conducted trade with the Spanish, but did not live together in perfect harmony as the Spanish government sent troops to the Blue Mountains to fight the “Arawak” escapees who had established settlements there.

In 1655 the English captured Jamaica from the Spanish and rapidly expanded sugar-cane plantations with the importation of thousands of slaves, mainly from the West Coast of Africa. Large numbers of these slaves also fled the plantations and joined up with the Maroons, so that by 1690, a group of Maroons in the west of the island – the Leeward Maroons had formed. By 1710, the ratio of white to African in Jamaica was 1:10 and the English fearful of a slave uprising began providing incentives to attract additional white immigrants to the island and Portland in particular. Records of some of these white settlers indicate that this land from the mountains to the sea was controlled by the Maroons and governed from Great Negro Town. They also described large Maroon plantations of cocoa, sugar-cane, plantains, melons, yams and corn, numerous towns and well laid-out roads. By 1720, the incursion of these white settlers into Maroon territory led to war breaking out. The Windward Maroons formed an alliance with the Leeward Maroons in 1725 and between 1728 and 1740 there was non-stop fighting with the English. During this period, forty laws were passed to try to control the “rebels”, but to no avail.

This was the first war fought by the English in a humid tropical forest environment against a foe who was a master of guerrilla tactics and strategies. The Maroon warriors faced superior firepower and were heavily outnumbered, but they took maximum advantage of the BJCM environment and their intimate knowledge of its landscape, flora and fauna. They would strike and withdraw with great rapidity, apparently appearing and disappearing at will, we know now, by amongst other means, using caves behind waterfalls such as Nanny and Quao Falls. The Maroons camouflaged themselves with the leafy branches of trees in order to ambush the English soldiers, and even bathed in the infusions of plants to mask their scent when the English brought in hunting dogs and Native American trackers. In addition to using the abeng (made of cow horn) to send messages, the Maroons also used a variety of bird calls for communication during battle. Further, the Maroons would fight only when and where they chose, hence withdrawing to the mountains from the plains where they knew they were at a disadvantage.

In 1732 Great Negro Town was renamed Nanny Town in honour of the Windward Maroons spiritual leader “Na Na”, “Nya Nya” or “Nanny” who played a lead role in the

victory of the Maroons over the English. Although not involved in the day-to-day governance of the Maroons, in times of distress, Nanny would assume control. The oral tradition of the Maroons explains that all the powerful Maroon men would impart their knowledge and “science” (magical powers) to Nanny, making her Queen of the Maroons and submitting themselves to be lead by her as the central spiritual beacon (Bilby, 1994 in JCDT, 2009). The oral tradition of the Maroons report that many of their war strategies were designed by Nanny and they describe numerous strange occurrences, based on Nanny’s unusual powers, which aided the warriors in defeating the English.

By 1733, the war was so severe, and costing the Legislature so much that the Governor wrote “Jamaica is in a tottering state” and in 1734, requesting additional military aid, “this may be the last opportunity we have of applying for help” (Ebanks, 1975 in JCDT, 2009). At the end of 1734, the English thought they had won a great victory when they over-ran Nanny Town, set up camp and built a stone-wall around it. They were later to realise that the Maroons had actually abandoned Nanny Town and then decided it was better not to try to regain control. Rather, they split their group and sent about three hundred men, women and children on a 100 mile march to relative safety with the Leeward Maroons in the Cockpit Country, whilst the rest remained to continue the war.

Beleaguered and embattled, the English finally sued for, and were granted peace by the Maroons, with the signing of a Peace Treaty in 1740, which granted the Maroons land, civil autonomy, peaceful co-existence and continued free run of the BJCM. As an English soldier later wrote, “Such as those who are unacquainted with that island will be surprised when they are told that all the regular troops could not have conquered the wild Negroes by force of arms. And if Mr. Trelawny (the Governor) had not wisely given them what they had contended for, liberty, they would in all probability have been, as of this day, masters of the whole country” (Thicknesse, 1788 in JCDT, 2009).

Following the signing of the Peace Treaty, there was no need for the Maroons to occupy the harsh and rugged environment deep within the BJCM, and instead they established towns in the lower hills and valleys, primarily New Nanny Town (Moore Town), Charles Town and Scots Hall.

3.3.1.2 Intangible Heritage

The intangible heritage of the Windward Maroons includes a wide variety of components which can only be touched on briefly here:-

- Music including drumming and songs
- Dance
- Religious rites and ceremonies
- Governance institutions and practices such as the Kamiti (or Council)
- Language – both Maroon Creole and Kromanti
- Cuisine e.g. jerk pork, cacao stew, heart of palm
- Craft e.g. baskets, hats and toys
- Knowledge of medicinal herbs and their uses
- Other indigenous knowledge



Plate 15: Windward Maroons depict “Ambush” at a cultural festival in Bowden Pen (courtesy Andrea Ventimiglia)

The Maroon communities retain these traditions and particularly in the last ten years have increasingly been trying to ensure that young Maroons learn and appreciate their unique heritage. The Museum at Charles Town displays exhibits on much of this heritage, and along with the Asafu Yard, also provides for the conservation and experience of Maroon oral and intangible heritage. The UNESCO funded project which followed the Master-piece proclamation collected and recorded much of the intangible heritage of the Moore Town Maroons and resulted in a more formal process of revitalizing the heritage. An office and meeting place with a few exhibits was established and there are plans for a cultural centre.

3.3.1.3 Tangible Heritage

The tangible heritage of the Maroons is very limited in terms of buildings or possessions, as these were things the Maroon warriors forsook in order to gain and maintain their freedom. However, there are several trails e.g. Cunha Cunha Pass, Sambo Hill and Nanny Falls Trail and also physical features e.g. waterfalls such as Quao Falls that form a part of the tangible heritage of the Windward Maroons. Further, the items they make based on

their knowledge e.g. baskets, toys, jerk pork are very tangible things that contribute to the experience of Maroon culture.

3.3.1.4 Authenticity

The UNESCO Operational Guidelines for the Implementation of the World Heritage Convention (UNESCO, 2008) state that authenticity is a pre-requisite for inclusion on the World Heritage List under criteria (i) through (vi). This document also indicates that the ability to understand the value attributed to the heritage depends on the degree to which information sources about this value may be understood as credible or truthful. Further, the Guidelines note that depending on the type of cultural heritage and its cultural context, properties may be understood to meet the conditions of authenticity if the proposed cultural values are truthfully and credibly expressed through a variety of attributes including traditions, techniques and management systems, location and setting, language, and other forms of intangible heritage.

The authenticity of the BJCM is directly and tangibly related to events and living traditions, ideas and beliefs that are of outstanding universal value. The historical records of the English, archaeological evidence and the oral traditions of the Maroons vouch for the authenticity of the history of Windward Maroons. With respect to their cultural heritage both archaeological and ethnographic research and the oral tradition confirm that these cultural elements are in a state of authentic preservation. There are a number of attributes of the cultural heritage that can be viewed within the idea of authenticity. These are trails, towns, place names, natural places of historical and cultural significance including the mountains themselves, language, music, dance, festivals and cuisine.

The Trails and Towns

According to tradition many of these including Vinegar Hill and Cunha Cunha Pass trails have remained the same with respect to their form and design, use and function, and location and setting over the past three to five hundred years. There are English military maps in existence today, showing the Maroon trails in addition to trails used by the English army.

The location of the towns have been identified ((Fig. 3.2) but they are all archaeological sites, and only one has been explored so far - Nanny Town. Because of the nature of the Maroon building materials and the fact that the town has been abandoned for more than two hundred and fifty years there is nothing left except an archaeological site that is perfectly protected by its location deep in the hills. The cut-stone walls that were part of the English command post at the site built between 1734/5 when last examined in the early 1990's were in good condition.

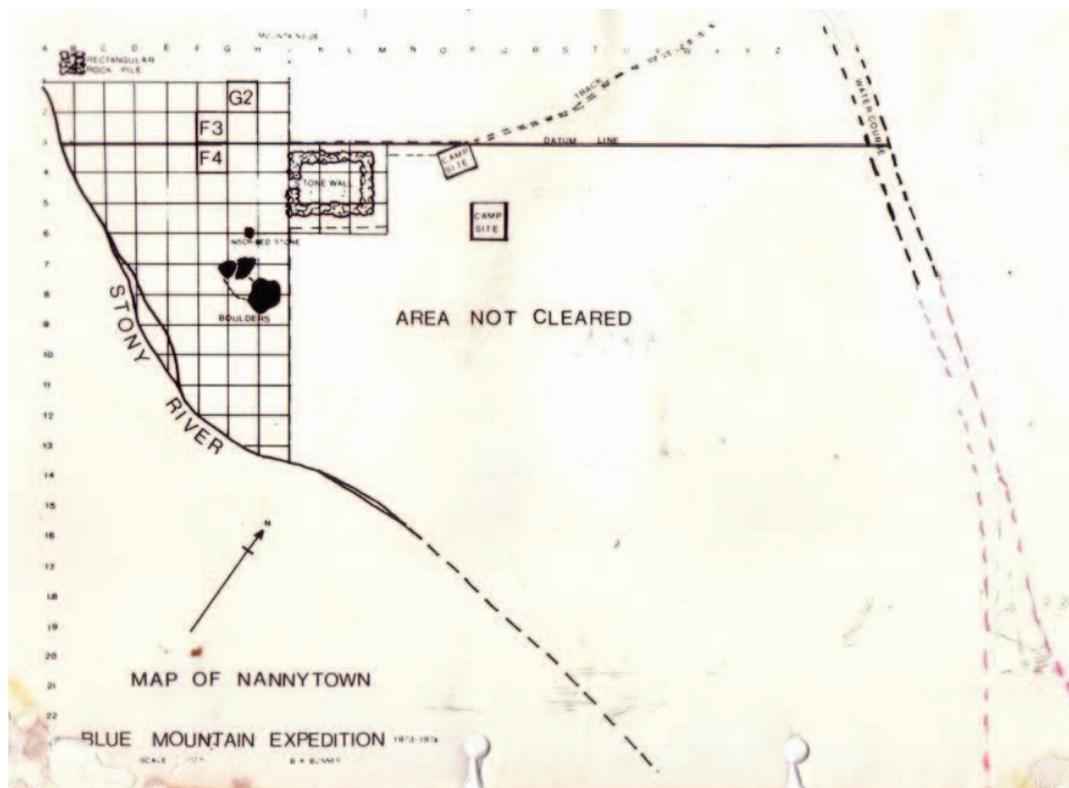


Plate 16: Map of Nanny Town produced during an archaeological expedition (courtesy Roderick Ebanks)

Place names according to documentary and oral evidence have remained the same over the five centuries, as have natural places of historical and cultural significance. Probably the most important natural place of significance is the mountains themselves. Not only has there been a long continuity of use and function but also of spirit and meaning. The mountains continue to be a place of rich material resources still used by the Maroons, but are also a place where the spirit and feelings of the Maroons in relationship to their history and culture are symbolized and most deeply entrenched. This spirit and feeling has existed from Taino days as evidenced by the use of the mountains as a ritual center, with Nanny Town itself being originally a sacred hill site used by the Taino. This was confirmed in the archaeological expeditions conducted in the 1990s which found Taino artefacts including ‘zemi images’ in the third settlement horizon of the dig.

Language, religion, music and dance, healing herbs and festivals.

The Maroons of the BJCM use two languages. The first is similar to Jamaicanese and Kromanti. Both of these languages are independent of English being based on West African linguistic principles. The first contains a mixture of West African and English words. The second consists solely of Twi words within an Akan linguistic context. The Kromanti language is the language of tradition and religion and is reserved for use in sacred rituals. Although the Windward Maroons have retained much of their religion and associated musical traditions these are not well known as the Maroons protect this

knowledge jealously. However the fragmentary historical and ethnographic descriptions that do exist indicate that they were essentially of African origin and content. Religious ceremonies include the use of herbs, chanting accompanied by the Kromanti drums, and the blowing of the Abeng. It also involves the veneration of, paying homage to and communication with the ancestors of the departed. The music of the Windward Maroons is generally associated with important religious ceremonies in particular the Kromanti Play. This ceremony is used mainly to cure the sick. Though not performed regularly, it is still practiced in Maroon communities. The importance of the music can be seen also in its declaration as a Masterpiece of the Oral and Intangible Heritage of Humanity.

Cuisine

The remoteness of their surroundings and dependence on the BJCM resulted in the development of unique and diverse methods of food preparation among Maroons. They mastered the art of using the resources around them e.g. if no metal pot was available food would be boiled in coco or wild plantain leaves, bamboo or in earthen vessels. These methods of food preparation are not in regular use today but the knowledge has been retained and Maroons can resort to these methods if necessary, or for fun. Although there has been quite a bit of exchange in cuisine between the Maroons and the general African-Jamaican population, particularly jerk pork which has become a popular “fast food” and known world-wide, the traditional Maroon dishes such as Bussu soup, Cacoon stew and Heart of Palm still differ from the standard African Jamaican food.



Plate 17: Cacoon (Entanda gigas) beans used for cooking and craft (Source: JCDT)

3.3.1.5 Integrity

UNESCO requires that all properties nominated for inscription on the World Heritage List should possess integrity. The Operational Guidelines described integrity as, “a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes” (UNESCO, 2003).

The cultural heritage of the Windward Maroons in the BJCM includes all the elements that are necessary to express its outstanding universal value, from its trails such as Cunha Cunha Pass Trail, place names such as Seaman's Valley and Lookout Point, natural places with cultural and historical value such as Nanny Falls and Quao River, and the living traditions, ideas and beliefs that are associated with it. These traditions include the sacredness of the BJCM, the idea of the ancestral spirits, the retention of the governance and jurisdictional heritage including the existence of the governing council or Kamiti, the large number of tools, foods and hunting techniques in use, and the continuing existence of traditional music and dance forms, and festivals.

In addition it is of adequate size - wholeness and intactness - to ensure the complete representation of those features which convey the property's cultural significance. Further, the presence of three distinct Maroon communities – two of which have been involved in BJCMNP planning and working with Park management for the conservation of the cultural heritage of the area, strengthens the integrity of the heritage, reducing risk of losing elements.

The property does not suffer from the adverse effects of development, and the elements that have become archaeological or that have fallen into disuse are not neglected but are left in conscious ruin such as portions of the trails, to protect the security of the park. It should be remembered that the Maroon's built environment, up to and quite possibly beyond 1740 was an ephemeral one being built of highly perishable materials. This was the product of the guerrilla/military lifestyle of the Maroons that demanded the ability to move at a moment's notice. The emphasis was therefore not on permanency but on mobility and not much energy was expended in making the shelters and other aspects of the material culture. In addition during the war years many of the towns were periodically abandoned and subsequently burnt by the British and after the war the settlements were moved to lower lying areas such as Moore Town away from the mountains interior. The original towns were left to decay and become overgrown by the forest, but archaeological research if funding and the rugged terrain permit may reveal useful information.

3.4 ATTITUDES TO THE BJCMNP

Since the last Management Plan, there have been three additional investigations into the attitudes towards the Park, of community members within the Park's Buffer Zone. These were, an M.Sc. project by students from Michigan University in 2007, research for a Ph.D. thesis at the UWI between 2004 – 2007 and the 2010 management planning community meetings. Prior to the 2005 Management Plan, one study occurred between 1995 and 1997, another between 1998 and 1999 and the third consisted of community meetings held in 2004 for the 2005 Management Plan. Other interactions e.g. through the BJCMNP's Education Officers and National Park Rangers also provide some indication of community attitudes to the BJCMNP. Most of these investigations included some of the same communities and whilst not directly comparable, seem to show an increase in

awareness and appreciation of the BJCMNP and the work of its management both in terms of forest ecosystem conservation and sustainable livelihoods.

The 2010 community meetings were much more widely promoted than the 2004 meetings with between 10 to 15 persons present at meetings in 2005, whilst in 2010, the average number was about 21. Although not a quantitative comparison, the community members in 2010 seemed more familiar with the term “national park” than during the 2004 meetings. As before however, community members, if not aware that the Blue and John Crow Mountains are a “national park”, were very aware and quite knowledgeable about the importance of the forests in these mountains. Climate change was not mentioned in 2004 but was noted during the 2010 meetings as a reason why the forests are important (mitigating against it). There continued to be a significant level of concern regarding destruction of forest and wildlife, particularly outside the BJCMNP, and a desire for action, with in 2010, recommendations for a “community volunteer corps”.

Community members reported that for many persons the need to make a living, often by clearing forest for farming or by collecting plants and hunting other wildlife, takes precedence over environmental conservation. Thus, whilst some community members indicated an interest in assisting with managing the resources of the park, there is a feeling that they would need help including education, skills training and capacity building, in order to play a role. Where persons were familiar with the “Park” and its management, there was some concern that there were not enough funds to maintain the BJCMNP’s conservation activities, and that there was a need for the community to be assisted with respect to sustainable livelihoods.

Three Local Advisory Committees (LACs) were established in each of the BJCMNP’s administrative areas (around Holywell, near the Peak Trail and in the Upper Rio Grande Valley) and operated between 1993 and about 2000. The level of environmental education and capacity building required by the communities in order to sustain these groups was under-estimated and an emphasis was placed on providing monetary and other socio-economic benefits. This level of assistance from park management declined as funding for the BJCMNP decreased after the PARC Project and eventually the LACs could not be sustained. In Millbank however, the Bowden Pen Farmers’ Association was formed, partly out of the work and influence of the park and its community outreach. This group is focused on improving the livelihood of its members through sustainable use of the natural resources in the area. They work closely with park management, with one of their founding members being a former full-time member of the park staff.

The Forestry Department has worked with communities in the Buff Bay/Pencar Watershed to establish two Local Forest Management Committees, and to assist the communities through these organizations, to better manage the forest reserve/national park. The main issue for these communities is the need for financial incentives for forest conservation, and the FD has assisted these groups to establish income-generating pilot projects – a plant nursery and a community-based nature tourism venture. Much more help is needed however, both for these projects and to build local capacity for natural resource management generally.

The positive attitude and the suggestions made by community members in all investigations, indicates a need to continue to increase involvement of community members in park and resource management, and suggests that this involvement would help to increase the effectiveness of park management. There is scope for increased involvement of community members in all aspects of park management, although it will require skilled personnel to build capacity at this level. This will include National Park Rangers who work closely with community members e.g. through a Junior or Trainee National Park Ranger programme and Community Education Officers with participatory planning and community development skills. A mechanism for involving and building capacity of community members from the BJCMNP's buffer zones in natural resource management is being developed by JCDT through a CANARI regional project (Bedasse, 2005) and should be implemented (if resources allow) through the Education and Public Involvement Programme.

3.4.1 Management Planning Meetings - 2010

Twelve community meetings were held with 233 persons registered. Some meetings involved persons from more than one community e.g. Hagley Gap/Minto, St. Thomas. In general, participants were very enthusiastic and made several useful suggestions. There was broad agreement in the views amongst community members. Of note were:-

- ▶ Recognition by community members of the importance of the BJCMNP, in particular for: water (supply, rivers, waterfalls), wildlife (including endemics) and soil conservation.
- ▶ Key vision components for the BJCMNP and Buffer Zone were: more forest (through more reforestation), flora and fauna, better watershed management (less fires, more green, more water) and more outreach to local communities e.g. information
- ▶ Key vision components for communities were: more employment especially for youth, better roads and water supply and cleaner communities
- ▶ Community members felt the main challenges to the vision for the BJCMNP, were lack of education and awareness about the BJCMNP, lack of knowledge to implement sustainable livelihoods, limited employment, inadequate resources impacting the quality of park management and lack of vision on the part of community members.
- ▶ Conservation – more reforestation including in the Buffer Zone
- ▶ Enforcement – more National Park Rangers, community involvement and more signage
- ▶ Education – more community outreach e.g. liaising with existing groups for meetings; a number of specific themes for attention included fires, sustainable farming practices; agro-forestry projects were also recommended.
- ▶ Governance and Administration – more long-term funding.



Plate 18: Community Management Planning Meeting 2010 – Cedar Valley, St. Thomas (Source: JCDT)

3.4.2 Management Planning Meetings - 2004

The discussions with persons from communities around the park during the management planning consultations indicated that whilst the majority was aware of the importance of the Blue and John Crow Mountains and its forests, they were often not familiar with the term “national park”. Many persons, particularly older residents however, were aware that the mountains are a forest reserve. Benefits identified from the national park included fresh air, rainfall, water, prevention of soil erosion, medicinal plants, endemic plants and animals and tourism opportunities.

They indicated that some community members use resources in the forest, possibly entering the BCJMNP. It was clear from the discussions with community members and also National Park Rangers, that there is a lack of certainty with respect to the park boundaries, and whether or not persons are taking resources from within the boundaries, or just in the buffer zone. Uses include food, recreation, tourism, craft development, fuel, lumber, domestic and agricultural water supply. The use of resources for tourism and recreation was much less than other uses.

Community members identified several activities they felt threatened the forest ecosystems including cutting of trees to clear land for farming as well as fuel and lumber, poisoning rivers to catch crayfish or indirectly through pesticide run-off, coffee pulp and washing vehicles. Hunting of animals e.g. birds, conies and butterflies and removal of plants e.g. orchids were also noted. Reasons cited as to why people carried out activities that were destroying the forest ecosystems included: lack of education –

knowledge/understanding of the harm they were causing, need for survival/livelihoods and greed.

Significant interest was shown by all communities with respect to environmentally friendly ways in which they could generate an income from the natural resources in the Buffer Zone and possibly the BJCMNP. There was a particular interest in the provision of recreation/tourism opportunities linked to natural resources, farming, community life and culture, including music and craft.

3.4.3 Community Assessment – 1998/9

A community assessment was conducted in three groups of communities around the BJCMNP, by the Community Outreach Officers between October 1998 and March 1999. These were the areas near to the Peak Trail – Hagley Gap, Minto, Epping Farm and Penlyne Castle, St. Thomas, Holywell – Woodford, Freetown, St. Andrew and the Upper Rio Grande Valley, Portland. Funding support came from The Nature Conservancy (JCDT/TNC, 1999). In general, there was significant awareness of the forest and its importance, even where persons were not aware of the fact that an area had been designated a national park. There was also an awareness of the importance of the forest and its conservation; however, with respect to livelihood practices there was an apparent disconnect, as farmers knew they were destroying the forest but continued their practices. This was blamed on lack of enforcement, lack of land tenure and lack of education.

3.4.4 Planning for Ecotourism in BJCM Communities – 1994 - 1997

A study on ecotourism in the Blue and John Crow Mountains National Park conducted by the North Carolina A&T State University between 1994 and 1997, included investigation into the perception of local residents with respect to rural development through ecotourism and park management. Based on a survey of 213 community members from Cascade/Section, Portland, Mavis Bank, St. Andrew and Millbank, Portland this study found that 60% of the residents indicated that ecotourism in the BJCMNP would provide many benefits. Benefits identified included: job creation and employment opportunities, and an increase in financial well-being. Better roads and improved transportation was also cited as a likely benefit, although it was noted that the poor roads in the communities would hamper the development of ecotourism.

With respect to park management and operations, the A&T State University study found that 81% of residents had knowledge of the park's existence, mainly through the work of the National Park Rangers. Some 66% said the creation of the BJCMNP had not affected their daily activities and those who had been affected reported a positive effect, namely bringing greater exposure to their communities. About 43% of those surveyed felt that the BJCMNP managers had not been helpful, whilst 24% felt they had been very helpful, particularly in community activities.

In general, the communities felt that the BJCMNP could have been more effective in assisting them with their socio-economic concerns. They expressed an interest in ecotourism, provided that the BJCMNP's management personnel planned and worked closely with them, and that job creation and income generation benefits were derived. One such example is the initiative taken and work carried out recently (2004 – 5) by the Bowden Pen Farmers' Association to restore the famous Maroon Trail through the Cunha Cunha Pass. Included in the work was an anthropological research on the natural and social history of the trail and the area, in general. Through this activity, the group worked closely with national park rangers and the Parish Council to implement the physical restoration work. Funding for this venture was provided by the Environmental Foundation of Jamaica.

3.4.5 Socio-economic Influences on Community Conservation – 2007/8

In 2007, five post-graduate students from the University of Michigan's School of Natural Resources and Environment, visited Jamaica to conduct their Master's project. This project was based on information they had obtained from the 2005 – 2010 Management Plan, and aimed to guide and inform decision-making practices for collaborative management in the BJCMNP. One component of the research was to better understand how socio-economic conditions impact local decision-making, and the students conducted surveys and interviews with community members in Millbank, Penlyne Castle and Cascade. The research indicated positive attitudes towards the BJCMNP and environmental conservation and explained that the ongoing negative practices e.g. farming on steep slopes and burning land to clear for agriculture, were seen as necessary and/or cost effective practices to ensure livelihoods were maintained. In addition, inhibited access to social services and general infrastructural neglect e.g. roads, had an impact on the conservation efforts of local residents and their willingness to participate in organizations. The study recommended local capacity-building and a localized approach towards community outreach and conservation, which addressed socio-economic as well as environmental issues (Gartner et. al., 2008).

3.4.6 Community Benefits from Ecotourism at Holywell – 2004 – 2007

Between 2004 and 2007, Susan Otuokon conducted research in communities around Holywell for the preparation of her Ph.D. thesis at the University of the West Indies. The focus was on ecotourism as conducted at Holywell, and in particular, the benefits to the local communities – Woodford/Freetown and Irish Town area, St. Andrew and Cascade/Section, Portland. 67% of persons interviewed felt that their community derived benefits from Holywell with the percentage being 71% when the Cascade/Section community was not included. The benefits stated included income generation (from employment and opportunities such as Misty Bliss) recreational opportunities, education and skills training. Community members recognized the work of BJCMNP management in capacity building and empowerment of persons, particularly youth. Recommendations included the need to increase and stabilise the assistance to the local communities for capacity building and income generation linked directly to conservation (Otuokon, 2010a).

Chapter 4

THREATS TO THE BJCMNP

Threats to the Blue and John Crow Mountains National Park have been identified in various studies and the Site Conservation Plan (2000) as deforestation, forest degradation and wildlife destruction. There are several activities which cause these threats, the most damaging of which are listed in Table 3.1 below.

Table 4.1: Active Sources of Threats

Active Sources of Threats
<ul style="list-style-type: none">• conversion of forest to agriculture• the assault of invasive species• non-timber products harvesting• logging• fires• hunting• informal settlements• channel modification
<i>(Site Conservation Planning 2000, 2001 & 2004).</i>

The Management Effectiveness Assessment of Jamaica's System of Protected Areas conducted in 2007 identified two other sources of threats – tourism and destructive fishing in fresh-water commonly known as river poisoning, which is a form of hunting (using chemicals poured in the river to catch crayfish). The former, was identified as a potential source and the latter as an active source of pressure. River poisoning has not been observed within the BJCMNP boundaries but is an issue in the Buffer Zone.

Another threat discussed during the 2007 workshops was mining, which was not considered for the BJCMNP but was discussed

mainly with reference to the Cockpit Country. However, it should be noted that the Mining Act takes precedence over most if not all other legislation in Jamaica, and the potential threat of mining within the BJCMNP should be investigated and a policy and legislation if necessary, be prepared.

4.1 Root Causes of Threats

A review of the problem tree analysis (Figure 4.1) prepared in 2004 found that it was still relevant and in line with the views of community and other stakeholders. The most common reasons identified by communities for the destructive activities that challenged their vision for the BJCMNP and its Buffer Zone including their communities were:- insufficient education and awareness about the National Park, limited knowledge to implement sustainable livelihoods, limited employment, inadequate resources impacting the quality of BJCMNP management and a lack of vision on the part of community members. The root causes of the sources of existing and potential threats identified in the problem tree were used to determine the objectives and strategies park management would employ in addressing each threat. Root causes are elaborated below:-

i) Insufficient Environmental Education. Community members identified a need within their communities, for greater environmental awareness, and specifically, awareness about the National Park, and its importance to them. Community members also stated that most persons did not have the necessary skills for sustainable livelihoods. Resource users and other stakeholders do not have the level of environmental awareness, knowledge and understanding to make decisions that avoid compromising the integrity of the natural resources, especially when faced with harsh economic realities. Further, even if they do (often because of the BJCMNP Education Programme over the years) they may not have the skills and experience to implement more environmentally sustainable practices. In addition, many stakeholders are not aware of, nor have the skills or facilities to practice non-traditional environmentally sustainable livelihoods e.g. tour guiding.

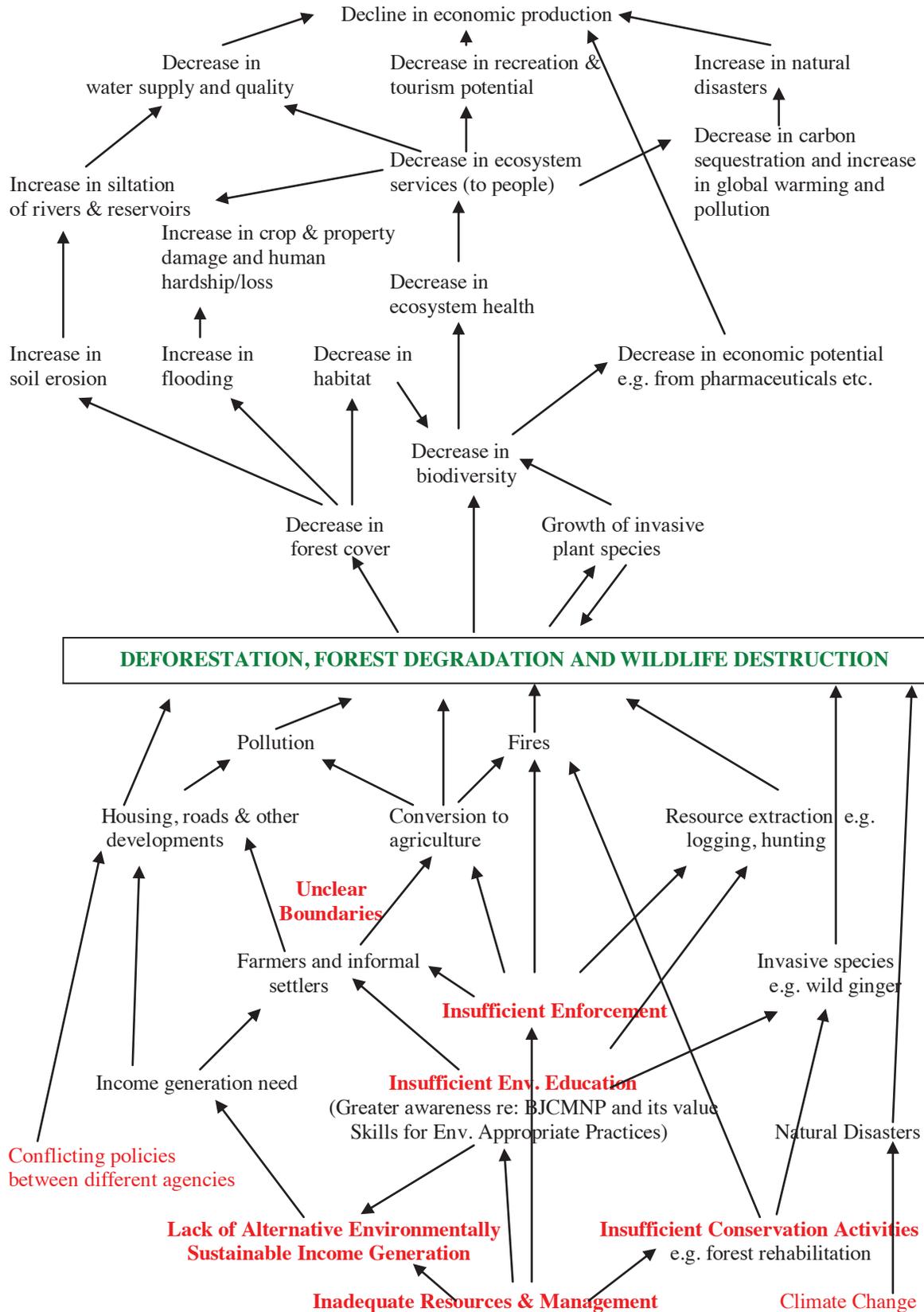
This situation has a direct bearing on education and how equipped persons are with life skills such as problem solving. However, this is not an issue that park management can address, except to undertake advocacy initiatives, provide support to teachers through the environmental education activities in schools and to a limited extent through capacity building and empowerment activities. The bottom-line therefore, is that environmental education and communications (inclusive public awareness raising campaigns, skills training and capacity building) are critical tools for effecting park management. In this regard, relevant objectives and strategies have been developed.

ii) Limited Environmentally Sustainable Income-Generating Activities.

For many people living around the BJCMNP boundaries, farming and resource extraction are the only known means of survival. More and more however, the trend is that people (especially youth) are moving away from this kind of activity and are seeking employment in urban areas. There are many unemployed youth however, who are unable to find employment within or outside the community, and the resulting poverty may eventually lead them into environmentally and socially unsustainable activities. Communities identified unemployment amongst youth in particular, as a serious concern for them. The BJCMNP has numerous natural and cultural resources that, if used in a sustainable fashion, can enhance the livelihoods of communities around its boundaries. So, increasingly, the facilitation of environmentally sustainable livelihoods based on BJCM resources, is becoming an important component of protected area management.

Through environmental education which includes skills training, capacity building and empowerment, as well as by facilitating sustainable livelihood opportunities e.g. in recreation and tourism, or other sustainable use of natural resources, park management can play a role in addressing this root cause. It is important to note that park management cannot solve this problem, as this is really a role for other social and economic agencies. Park management can, however, partner with, and facilitate interventions by such groups, as well as provide some opportunities through its own efforts to generate income e.g. employment in the Park's recreational areas. Based on project successes and plans developed over the 2005 – 2010 period, the focus will be on the promotion of sustainable agriculture and tourism and management of the Buffer Zone resources in a more ecologically sustainable manner, so that the Park does not become an 'island'.

FIGURE 4.1: PROBLEM TREE ANALYSIS FOR MAJOR THREATS TO THE BJCMNP



iii) Inadequate Enforcement. This more than inadequate legislation is often identified as one of the main reasons for environmental degradation continuing, and it is a broad problem with several facets. Limited resources in all the relevant agencies reduces the number of enforcement officers available and makes it difficult to ensure the presence of enforcement officers in areas that are difficult to access (most of the BJCMNP). The difficulty in finding offenders and bringing them to justice is another problem, as for some environmental breaches it may be very challenging to prove that there actually was a breach or that a particular individual was responsible. Further, without a full understanding and appreciation of environmental issues, along with a high rate of violent crime, unemployment and poverty, judges tend to be lenient with respect to environmental crimes. This de-motivates enforcement officers who also seem to have their hands tied as there may be loopholes in legislation or an apparent unwillingness to take offenders to court. Finally, there is the issue of corruption or apparent corruption in which affluent people are often seen to get away with breaches of environmental legislation, and this perception encourages other persons to break the law.

Dealing with lack of compliance with environmental legislation requires multiple strategies outside of enforcement, although Bruner et al, 2001 found that management effectiveness most strongly correlated with a strong enforcement programme. Critical therefore will be maintaining a level of presence of uniformed, enforcement officers throughout the park and along its boundaries, (particularly in the most threatened areas), improved boundary demarcation and the bringing of offenders to justice. Aside from enforcement however, to encourage compliance, people must be aware of the relevant legislation and also of how to make a living without breaching this legislation.

iv) Insufficient “Conservation-on-the-Ground”. This term was described in the previous management plan as referring to the implementation of specific conservation activities e.g. invasive species control. It was considered of particular concern for the last management plan as there was no organized programme of forest rehabilitation, particularly with respect to the control of invasive species. This has been significantly addressed in the past six years, but action is still needed to enhance the survival of threatened species and to speed up the closure of forest cover gaps. If the deforested and degraded areas are left without being rehabilitated, the degradation will worsen through the over-growth of invasive species that will then threaten other areas, as well as through other harmful impacts e.g. soil erosion including landslides.

For this management plan period whilst the emphasis on forest rehabilitation should continue, the need for more knowledge of particular threatened species or ecosystems and specific conservation approaches remains a concern. Research is urgently needed to guide park management, and so the drive to promote research will need to be strengthened.

With the increased attention to the conservation of Maroon cultural heritage, insufficient “conservation-on-the-ground” could be considered the primary challenge. Park management will need to facilitate the development (or improvement) and implementation of strategies to strengthen the conservation of Maroon heritage.

v) Conflicting Policies Between Government Agencies and Insufficient Support of Conservation Initiatives. Some government policies (such as FIDCO in the past) and the actions of some agencies (e.g. road development or lack of road maintenance) are very damaging to the resources of the BJCMNP. The issue of leases within the BJCMNP though being addressed continues to be a challenge that should be given additional attention. Most importantly, the government should make its support for conservation initiatives (both government and non-government) and protected area management in particular, clear to the wider public. This will result in greater understanding of, and improved attitudes towards the BJCMNP. In this regard, advocacy is a required management action, which will need to be implemented by the JCDT.

vi) Unclear Boundaries. The issue of unclear boundaries in some areas, is a source of stress on the BJCMNP's resources. It creates uncertainty about the jurisdiction of national park regulations, and may result in damaging activities being left unchecked. The management action required includes the need for more signage and markers and the resolving boundary and land ownership issues, which the FD continues to address.

vii) Inadequate Resources and Management. Availability of funding for park management has declined rapidly over the years since the BJCMNP was established under the PARC project. Whilst the last five years has seen an increase in funding, particularly from the government, the major issue continues to be a lack of secure funding. The reduction in human and other resources associated with this lack of security of funding, as well as inadequate and late disbursement of funding has hampered effective implementation of BJCMNP plans. The issue of financial sustainability must be addressed if conservation activities, related to the park are to be effective. As indicated later in this Management Plan, financial sustainability including sourcing of funding cannot be left to the JCDT as Park managers, alone. The completion and implementation of the Protected Areas Master Plan for Jamaica should assist in addressing this issue.

viii) Climate Change. This is a global environmental problem which park management can only address locally, in terms of protecting the forest. However this in itself is of major significance as it will help to increase carbon sequestration and decrease global warming, and therefore steps should be taken to access funds available globally to support forest conservation and reforestation. Jamaica is a signatory to the United Nations Framework Convention on Climate Change and should more actively seek funding assistance for management of its Protected Area System.

In the last five years, Park management has implemented projects with a climate change focus, particularly adapting to likely impacts by reducing vulnerability. Of particular concern are, the likely loss of trees during stronger tropical storms and the worsening of soil erosion with increasingly heavy rainfall during the rainy season. These will continue to be addressed through forest rehabilitation to increase forest cover and working with community members to raise awareness, reforest the Buffer Zone and make their

agricultural practices more environmentally sustainable and less vulnerable to climate change impacts. Chapter 6 provides more information on the climate change issue.

4.2 Conclusions

Based on the analysis of the root causes of the activities and factors threatening the biological diversity and ecosystem integrity of the BJCMNP, it is clear that several activities must be implemented, using a holistic and strategic approach. The threats to the BJCMNP’s cultural heritage is an issue that has to be addressed working with the Maroon communities as these are much more localized concerns. However the approach of linking the need for conservation of both natural and cultural heritage should increase management impact, particularly through targeted programmes.

Six programmes have been developed based on:-

- (i) existing knowledge
- (ii) participatory planning including government agencies, local community members, scientists and other stakeholders

Some of these programmes address more than one root cause. All programmes must be implemented together in an integrated fashion in order to create synergies for greater impact. Part II of the BJCMNP Management Plan describes these six programmes, in addition to the over-arching Zonation Plan, in detail. The Conservation Programme has been broken down into two components to ensure that adequate attention is given to cultural heritage conservation.

Table 4.2: Root Causes of Threats and the Programmes that address them

Root Causes of Threats	Relevant Programmes
1. Insufficient Environmental Education	Education and Public Involvement
2. Limited Environmentally Sustainable Income-Generating Activities	- Education and Public Involvement (includes skills training and capacity building) - Recreation and Tourism
3. Inadequate Enforcement	Enforcement and Compliance
4. Unclear Boundaries	Enforcement and Compliance
5. Insufficient “Conservation-on-the-Ground”	Conservation
6. Inadequate Resources and Management	Governance and Administration Monitoring and Evaluation (evaluating management effectiveness) Recreation and Tourism (generating income and support)
7. Conflicting Policies between Government Agencies and Insufficient Support of Conservation Initiatives	Governance and Administration
8. Climate Change	Conservation

**BLUE AND JOHN CROW MOUNTAINS
NATIONAL PARK**

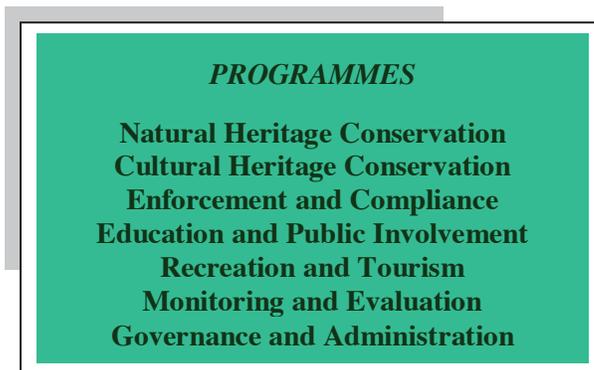
MANAGEMENT PLAN

PART II

**NATIONAL PARK ZONATION
AND PROGRAMMES**

INTRODUCTION

Based on the foregoing details, it is clear that in order to achieve the BJCMNP's goal, certain objectives must be attained. Against this background, management activities have been categorised into six programme areas: i) Conservation (natural and cultural heritage), ii) Enforcement and Compliance, iii) Education and Public Involvement, iv) Recreation and Tourism; v) Monitoring and Evaluation; and vi) Governance and Administration. Categorization is based on international and local guidelines, local national park management experience and discussions with stakeholders.



All programme areas are inter-related and effective national park management is not possible without them all. The first five programme areas in particular deal with cross-cutting issues and must dovetail with respect to the implementation of activities. Through the Governance and Administration Programme, Park management will coordinate and effectively plan, develop and implement strategies to fund and market the other

programmes. This programme is effectively the Business Plan for the BJCMNP and this is particularly relevant as the problem tree analysis (Fig. 4.1) indicates that inadequate management and resources are root causes of several other debilitating factors.

National parks are declared under the NRCA Act and therefore, come under the purview of the NEPA. Management of the BJCMNP has been delegated to the JCDT by the NRCA through NEPA, but it is also a Forest Reserve, hence there is a collaborative management agreement between the FD, JCDT and the NRCA/NEPA. The JNHT will shortly join the co-management partners to help address cultural heritage conservation. The policies, aims and objectives of both national park and forest reserve management have been taken into consideration in this management plan, to ensure that there is a dovetailing of desired outcomes and approaches. This Management Plan addresses all management issues relevant to protecting the closed broadleaf forest ecosystem and its biodiversity and other values, particularly the site's intangible Maroon heritage, and indicates where possible, the organisation that should be responsible for implementation of the relevant strategies. This Management Plan is based on the significant experience gained in the implementation of the BJCMNP's 2005 – 2010 Management Plan, and not only follows the format of that plan but builds on the achievements of its implementation.

The following chapters provide the prescriptive section of the Management Plan, starting with Zonation and the identification of priority areas for management intervention. Each Programme chapter describes the context, strategic approaches and activities required to achieve each objective and concludes with a table summarizing the above and indicating resources required, monitoring indicators, timeline and priorities.

CHAPTER 5

BJCMNP Zonation and Priority Areas for Management Interventions

The National Park Regulations of 1993, section 27, provide for the zoning of a national park. A name or other designation can be assigned for each zone and provisions made with respect to the purposes for which each zone may be used, and the relevant terms and conditions for this use. Once zones are assigned, it becomes an offence for a person to use a zone for any other purpose than provided for, or to contravene any term or condition regarding its use.

During this Management Plan period, the issue of formalizing zoning of the BJCMNP must be addressed.

5.1. PREVIOUS EFFORTS TOWARDS ZONATION OF THE BJCMNP

5.1.1. Rapid Ecological Assessment and 1992 Management Plan

The Rapid Ecological Assessment (REA) carried out in 1992 provided elements for the zonation of the BJCMNP, distinguishing general from limited access zones. The Management Plan developed in 1992 essentially followed the REA guidelines.

General access zones would primarily serve agro-forestry, recreation, education and relaxation and would be subdivided as follows:

- ▶ **Buffer zone:** a one km band outside of the park along the park boundary; a future fine-tuning of the band was recommended,
- ▶ **Sustained yield management zones:** agro-forestry areas within the park including most of the Port Royal Mountains,
- ▶ **Unguided and guided visitor trails,** and
- ▶ **Free passage roads/trails.**

Limited access zones would be managed for conservation of natural forest and forest rehabilitation. They are sub-divided as:

- ▶ **Special conservation zones:** a small number of unique ecosystems along the summit as well as selected research sites, altogether covering less than 1% of the park area,
- ▶ **Nature restoration zones:** a number of degraded areas mainly along the park boundary, and adjacent to relatively well-preserved forests. More or less severely degraded areas fragmenting natural forest,
- ▶ The suggested sites cover about 4% of the total park area.

The vast majority of the park area however, was not assigned to a management zone.

5.1.2. Forest Management and Conservation Plan

The National Forest Management and Conservation Plan (2001) of the Forestry Department (FD) contains management guidelines for forest reserves. The following guidelines apply to forest reserves that lie within protected areas and national parks (declared under the NRCA Act), and thus for the entire BJCMNP.

- i) Natural forests (closed broadleaf) should be preserved for biodiversity conservation and no timber should be harvested.
- ii) Disturbed forests (disturbed broadleaf) should retain forest cover for industrial use, selective harvesting or biodiversity protection, depending on slope and soil depth:
 - Steep slopes and shallow soil: *protection*
 - Gentle slopes and deep soil: *commercial use*
- iii) Non-forest use may be permitted in areas other than natural and disturbed forests, depending on existing land leases and traditional practices.

Forest cover and land use have been mapped by the FD based on Landsat imagery acquired in 1996 and 1998, aerial photography and ground reconnaissance. Detailed local guidelines will be developed in local forestry management plans addressing individual watersheds. So far, such a local plan has only been completed for the Buff Bay/Pencar watershed, which includes a small section of the BJCMNP.

5.2. ZONATION UNDER THE PRESENT MANAGEMENT PLAN

The present Management Plan takes into consideration:

- i) guidelines from the 2005 – 2010 Management Plan which defined the National Park's zonation by integrating the REA's management zones with the guidelines of the National Forest Management and Conservation Plan (NFMCP),
- ii) conservation of forests throughout the National Park's altitudinal range. Mesic to wet forests on shale at lower altitudes are as unique but even more threatened in Jamaica than the upper montane rainforests,
- iii) proposals by the Forestry Department to make the western section of the Forest Reserve into a forest management area, and
- iv) lessons learned from the management experience of the past six years.

Within the BJCMNP, as biodiversity protection is the primary goal, the policy regarding forest cover for disturbed forest and non-forest use will be that:

- i) Disturbed forest should retain forest cover for biodiversity protection **regardless** of the steepness of the slope or depth of the soil; the key issue is the variety of species existing and this can be enhanced through rehabilitation with native, non-lumber species. Commercial use should **not** be permitted.
- ii) Extractive non-forest use should be discouraged even where there are existing land leases and traditional practices. In general these uses and leases where possible, should be phased out over time.

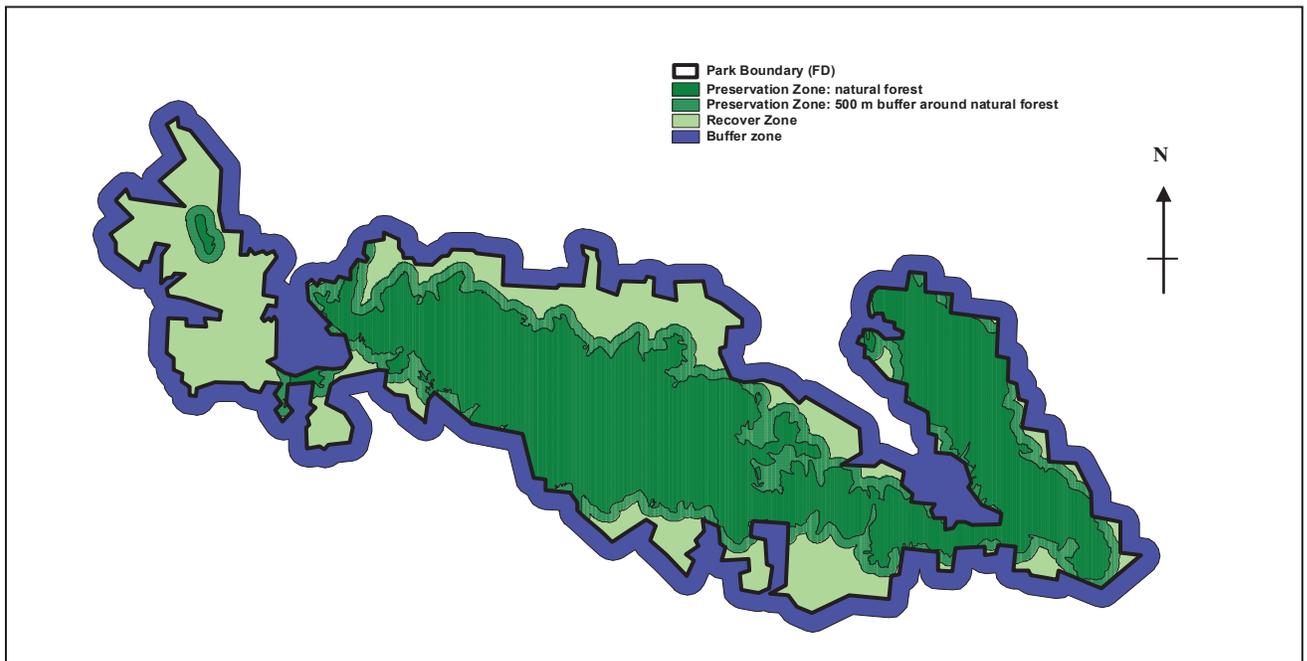
There have been minor changes in the location of the boundary (Figure 2.10) on detailed maps and on the ground, due to inaccuracies years ago in transferring data from small-scale to larger-scale maps and greater accuracy in mapping today. During this Management Plan period, every effort must be made to address these inaccuracies.

The majority of the western Port Royal Mountains is proposed as a Sustainable Use Zone, except for the Mt. Telegraph area which should remain as a Preservation Zone. In addition, disturbed forest particularly in sites close to Mt. Telegraph should be rehabilitated. Further, where the Forestry Department is able to regain control of leased lands, these should become part of the Recovery Zone depending on the location and status.

Hence, the BJCMNP Zones are (as depicted in Figure 5.1):

1. **Preservation Zone** – protects the core, natural, closed-broadleaf forest
2. **Preservation Buffer Zone** – 500m wide zone around the Preservation Zone
3. **Recovery Zone** – remainder of national park – forest rehabilitation
4. **Sustainable Use Zone** – most of the Port Royal Mountains
5. **Community Buffer Zone** – the 1km wide zone around the BJCMNP boundary

Figure 5.1: BJCMNP Zonation



Implementation of the zonation plan will be primarily through the Enforcement and Compliance and the Conservation Programmes. Working with communities to conserve the resources of the Community Buffer Zone will occur under all programmes, particularly the Education and Public Involvement and Recreation and Tourism Programmes.

5.2.1. Preservation Zone and Preservation Buffer Zone

The Preservation Zone is defined by the core of natural (closed broadleaf) forest plus a 500m buffer around this core within the boundaries of the BJCMNP (Fig. 5.1). As indicated in the NFMCP, all remaining natural (closed broadleaf) forest within the BJCMNP is set aside for strict conservation.

Since encroachment has progressed from lower to higher altitude, the natural forest is fairly well delimited in three blocks:

- i) Blue Mountains, at altitudes mainly above 1000m along the southern, and above 600 m along the northern slope,
- ii) John Crow Mountains, at altitudes mainly above 600m along the western, and above 300 m along the eastern slope, and
- iii) Port Royal Mountains, in the east, a small area stretching across Mount Horeb and Catherine's Peak and in the west, Mount Telegraph which is under severe threat from encroachment.

Some patches of degraded and converted areas exist within these blocks, but they have remained fairly small so far. Where degraded, this area will be targeted for rehabilitation, and this is highlighted in Figure 5.2.

Objectives within the Preservation Zone:

- conserve the natural forest
- prevent degradation and conversion
- rehabilitate disturbed and converted patches within the natural forest
- focus habitat monitoring along the periphery of the preservation zone in order to identify activities likely to impact the natural forest
- identify management intervention sites of high priority where non-forest use has encroached into the natural forest buffer. Some sites are listed in Box 5.1 below.

Only non-extractive use such as research and ecotourism will be allowed; these activities will be covered by strict guidelines.

Within the preservation zone, special conservation sites are defined to protect unique ecosystems covering small areas, unique historical sites and permanent research plots. Access to these sites requires special permits from the management authorities. Following the REA and previous management plans, recognized special conservation sites are:

- ▶ Hog House Hill research sites,
- ▶ Forest between Cunha Cunha Pass and Corn Puss Gap,
- ▶ Nanny Town,
- ▶ High Peak,
- ▶ John Crow Peak and research sites, and
- ▶ Blue Mountain Peak research sites.

5.2.2. Recovery Zone

All areas between the National Park boundary and the Preservation Buffer Zone are denoted as Recovery Zone (Fig. 5.1) except the western Port Royal Mountains which under this Management Plan has been designated as a Sustainable Use Zone. This was suggested in the previous plan and with more information on the leased status of much of this land, the suggested approach should be implemented. Where leases come to an end and FD can take back these lands, consideration should be given for their inclusion in the Recovery Zone, particularly where they are close to Mount Telegraph. The long-term goal for the Recovery Zone is to restore healthy natural forest ecosystems, where feasible. Management priorities are identified according to specific functions of the areas within the zone.

If an area within the Recovery Zone meets specific conditions that can significantly promote biodiversity conservation, it will receive high priority for restoration. Such conditions include the feasibility of:

- ▶ reducing forest fragmentation along the periphery of the natural forest,
- ▶ buffering negative impacts on natural ecosystems,
- ▶ promoting expansion of highly threatened and contracted ecosystems, particularly at lower altitude, and
- ▶ improving survival chances of threatened species.

Rehabilitation activities will usually be a component of site-focused interventions of high priority to preserve threatened resources. The control and/or eradication of alien invasive species and planting of native, non-lumber tree species will be significant rehabilitation activities. Such interventions will usually stretch across all the Zones.

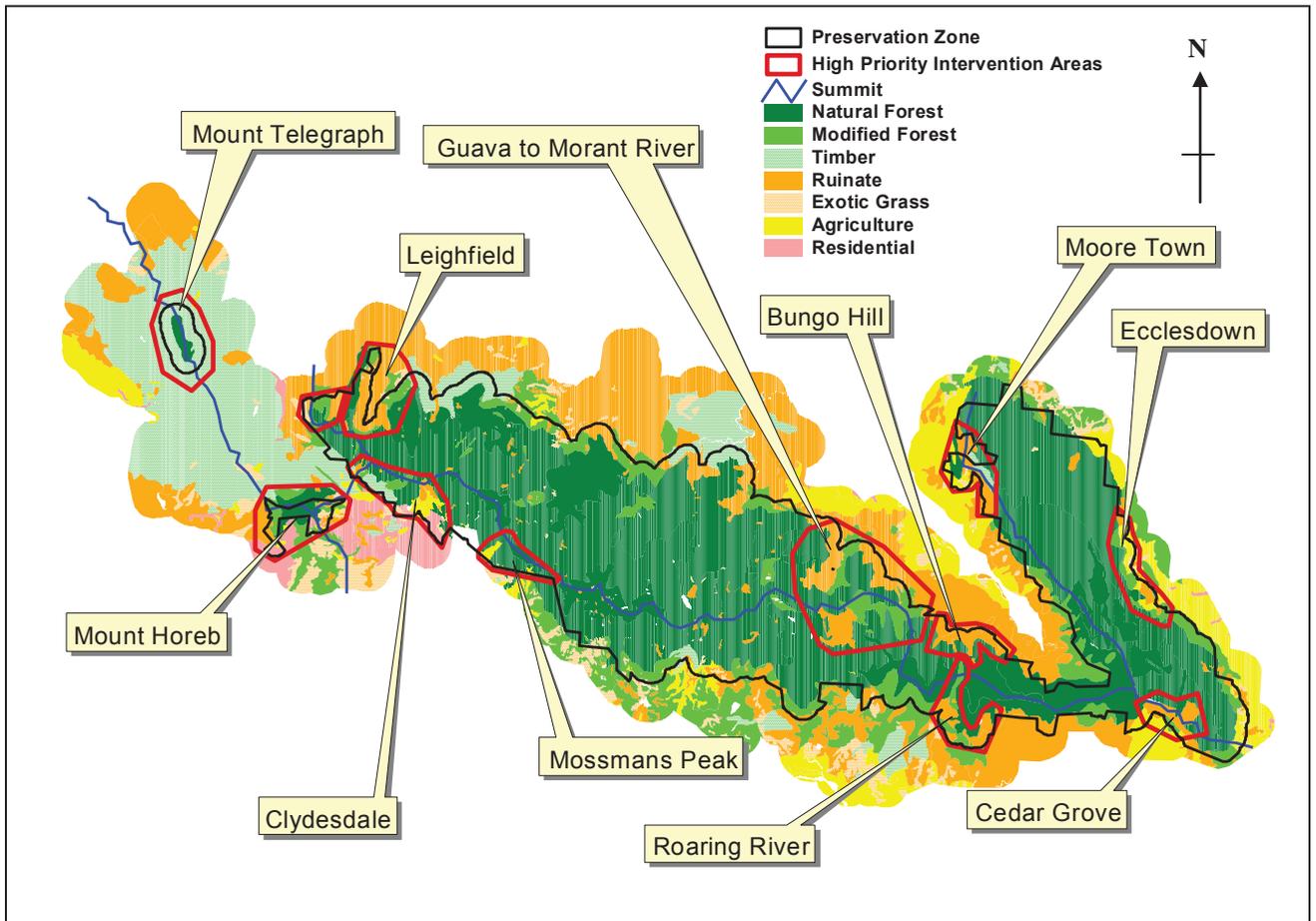
The present Management Plan includes the following restoration areas within the Recovery Zone that have already been highlighted by the REA and previous plans:

- ▶ Mt. Telegraph,
- ▶ Holywell,
- ▶ Clydesdale,
- ▶ Sportsman's Hall, Mabess River Valley,
- ▶ Queensburry Ridge, Arntully,
- ▶ Moore Town, and
- ▶ Forests south of Macungo Hill.

The low lying areas along the east arm of the Morant River and along Guava River are added. The rehabilitation and restoration of these areas and the area south of Macungo Hill, together with interior natural forests, would create an extensive low-altitude forest on shale with elevations at mainly below 600 m.

These areas are highlighted in Figure 5.2 and list in Box 5.1 below as high priority areas for management intervention – specifically, forest rehabilitation. Mt. Horeb and the Clydesdale area received attention under the previous Management Plan, but efforts must be made to expand the areas under restorative activities.

Fig. 5.2 High Priority Intervention Areas for Rehabilitation



5.2.3. Sustainable Use Zone

The previous management plan recommended that where there are areas within the Recovery Zone that are degraded forest with deep soil and relatively gentle slope, and that are not priority areas for restoration or other management intervention, sustainable land use will be promoted with pilot project and demonstration type projects implemented in order to encourage environmentally sustainable practices. The western Port Royal Mountains has several areas fitting this description and therefore under this management plan, the western PRM has been zoned for sustainable use except for Mount Telegraph which is still within the Preservation Zone.

Much of the western PRM is under lease-hold through the Commissioner of Lands (as described in other sections of this plan). Significant portions of land are being used farming, mainly for Blue Mountain Coffee. The western PRM has a large acreage of plantation forest, mainly Caribbean Pine. Much of this is mature, and ideally should be harvested. Efforts should be made in conjunction with the FD (and possibly the private sector) to harvest this timber in an environmentally sound manner, in order to generate revenue for conservation and sustainable community development. Reforestation should

be conducted with a variety of species as appropriate to the area, depending on the slope and soil depth as indicated above. Where lands can return to FD management, they should re-enter the Park's Recovery Zone, particularly if they are close to Mount Telegraph.

Box 5.1: Priority Areas for Management Interventions

Significant encroachment into the preservation zone signal major threats to the natural habitats, and thus point out priority areas for management interventions. Such areas are identified in Fig. 5.2 and further discussed below.

Mount Horeb: The preservation zone is intruded by agricultural and residential areas, and a drive road is crossing. The natural forest covers a relatively small area but is the most significant remaining forest of the PRM. The area also contains Holywell, the park's best developed visiting centre.

Clydesdale: Agricultural activities have spread into the natural forest and up to the vicinity of the BM summit. Ruinate woodlands have crossed the summit.

Mossman's Peak: Similar to the Clydesdale area, agriculture forms a wedge into the natural forest and approaches (and may have crossed by now) the summit. Only a narrow band of natural forest has remained. The trail to High Peak crosses the area.

Roaring River to Bungo Hill: Only an extremely narrow band of natural forest remains, and the summit vegetation is disturbed.

Cedar Grove, Ecclesdown and Moore Town: Agricultural activities have spread into the preservation zone along the lower slopes of the John Crow Mountains.

Guava to Morant River: The natural forest is breaking apart and is replaced by ruinate woodlands. This area represents one of the lowest-lying sections of the park and contains remains of natural low altitude forest.

Leighfield: A large area of ruinate woodland forms a deep wedge into the natural forest, threatening to fragment the western end to the BM.

Mount Telegraph: Only a small island of relatively good forest has remained in the northern part of the PRM.

Monitoring and research activities are needed for these areas to develop comprehensive conservation and rehabilitation strategies.

A sustainable land-use project should be designed for the Sustainable Use Zone, to conduct outreach to farmers regarding their presence within a Forest Reserve/ National Park, and promoting sustainable land-use with a focus on watershed management and biodiversity conservation. Endemic birds have been found to be particularly useful at controlling the Coffee-berry Borer and should therefore be encouraged within the Sustainable Use Zone, however they require native tree species and areas of even degraded forest as opposed to the existing plantations of Coffee and/or Pine. Agro-forestry inclusive growing of native and other lumber, and fruit trees as well as growing of native, bird feeding trees could be a major component of this project, in addition to the promotion of best practices for sustainable agriculture and watershed management.

5.2.4. Community Buffer Zone

The 1 km wide band outside the park along its boundary previously defined in the REA and earlier management plans as the Buffer Zone is now renamed the Community Buffer Zone. This is to clearly indicate the difference between this buffer zone and the Preservation Buffer Zone.

It has been argued that since the National Park does not have jurisdiction outside its boundary, that this Buffer Zone should be within the boundary, however this issue was discussed during the management planning process and it should be noted that:-

- (i) the Preservation Zone has two sections – one of which is a buffer for the core, natural or closed broadleaf forest
- (ii) the Recovery Zone effectively acts as a literal ‘Buffer Zone’
- (iii) within the context of the BJCMNP, where there are almost no inhabitants or private lands within the Park boundary, the Buffer Zone is the area in which the Park managers liaise with local community members, and seek to influence human activity that threatens the Park’s ecosystem and habitats.
- (iv) there is significant legislation aside from national park legislation that will be used to curb harmful environmental activities, in particular, the Wild Life Protection Act, Country Fires Act, ‘Litter’ Act (see Appendix 3).

The REA (Muchoney et al, 1993) identified 59 communities in the BJCMNP Buffer Zone with a total population of almost 40,000. In 2006, for the WHS nomination dossier preparation, STATIN was requested to provide demographic data for the community list provided by the REA. Only 50 of the 59 communities were found existing based on the 2001 Census data, and for the purposes of the census, 8 of these were combined to form 4 enumeration districts. The total population was found to be 26,177. This suggests a declining population, perhaps due to migration, as suggested by observation of deserted communities in some of the deepest rural areas, and feedback from community members.

These communities are within the 1km wide band around the BJCMNP boundary, however due to their relevance to the BJCMNP, some communities located outside this band, have been included in the work of the Park over the past five years and even prior

to this, since 1993 when the Park was first established. These are:-

- (i) Irish Town, St. Andrew – due to its proximity to Holywell,
- (ii) Penlyne Castle, Hagley Gap, Minto, Epping Farm in St. Thomas and Mavis Bank, St. Andrew – due to their proximity to the Blue Mountain Peak Trail, and
- (iii) Charles Town, Portland – because of its Maroon community.

When these communities are included, the Buffer Zone Communities number 51 with a total population of 30,210.

It is recognized that many, if not most of the threats to the BJCMNP's biodiversity originate from the buffer zone and further afield. The community members living around the BJCMNP are a permanent feature, and part of the area's natural and cultural resources. They use the resources of the BJCM, sometimes unsustainably, but they are also the ones who see first-hand illegal activities initiated by those outside the buffer zone (who are often large-scale in comparison to community offenders). Without the cooperation and goodwill of the local communities within this zone, the BJCMNP's conservation plans will fail. Thus, much of the management efforts will have to focus on these communities. Enforcement, through regular patrolling of the Community Buffer Zone and involvement of community members, will aim to reduce encroachment of the Park's boundary.

The communities around the BJCMNP are not that different from rural communities elsewhere in Jamaica, and suffer from the same serious developmental problems. It is beyond the capacity of the park management to address their needs comprehensively. However, as far as the BJCMNP is able to create material benefits for people, it will be essential that the people around its boundary are among the primary beneficiaries.

Past efforts by BJCMNP management have not succeeded in providing tangible benefits for local communities along the entire Buffer Zone, but only within a few communities, particularly around the Park's recreational areas. With diminished financial resources and personnel today, this will be even more difficult to achieve. Thus, management efforts will focus on areas and communities where BJCMNP resources are most threatened, as well as on sites where there is significant community interest and likelihood of success that can act as pilot projects to be replicated elsewhere. In addition, based on global park management experience, it will be important to ensure that benefits to local communities are closely and tangibly linked to conservation of the BJCMNP's resources.

The Education & Public Involvement and Recreation & Tourism Programmes will be the route for most of the intervention into the Buffer Zone communities. Awareness and knowledge about the BJCMNP and the importance of natural resource management and sustainable livelihoods will be raised, particularly through the interpretive approach to enforcement used by the National Park Rangers. Capacity building, training, involvement in BJCMNP management, and facilitation of sustainable community livelihoods and enterprise will be the strategic approach to targeting these communities.

CHAPTER 6

Conservation of Natural Heritage Programme

Conservation refers to the protection and management of biological diversity - the variety of life forms that exist, which range from genes and species to ecosystems. Conservation of the Park's rich biological diversity (detailed in Chapter 2) requires the investigation of human impacts on biodiversity and development and implementation of practical approaches to preventing the endangerment and extinction of species. As the BJCMNP contains the largest remaining tract of natural habitat left in the island (approximately one third of the remaining area of closed broadleaf forest), and represents perhaps the most biologically diverse area within Jamaica (possibly rivaled only by the Cockpit Country), conservation of the biodiversity contained within it is paramount.

This is not only relevant on a local scale, but the numerous endemic plants and animals make conservation of the area relevant in the global arena; the Blue & John Crow Mountains National Park was included in the WWF-IUCN (1997) list of globally important sites for the conservation of plant biological diversity. According to Dinerstein et al. (1995), the Jamaican moist forest ecoregion is endangered, regionally outstanding, and has the highest regional priority for conservation. The ecoregion is notable for its exceptionally high level of endemism in a wide range of taxa.

Jamaica ratified the Convention on Biological Diversity in 1995, and in fulfillment of its international obligations under the Convention, a National Biodiversity Strategy and Action Plan (NBSAP) was produced in 2003. The first goal of this strategy is to *conserve Jamaica's biodiversity*, and the strategy recognizes the establishment of protected areas as probably one of the most effective means of conserving the island's biodiversity. The objectives and strategies outlined below in this Conservation Programme operate in fulfillment of the National Strategy.

6.1 Managing for Ecological Integrity

Ecological integrity is defined as *the ability of an ecosystem to support and maintain a community of organisms that has species composition, diversity, and functional organization comparable to those of natural habitats* (Parrish et. al. 2003). BJCMNP management programmes such as Education & Public Involvement, Recreation & Tourism, and Enforcement & Compliance described in later chapters are important components of the property's conservation purpose in *managing for ecological integrity*. These management programmes seek to engage the *people* who have a stake in the natural resources of the BJCMNP by trying to work with them to change their often unsustainable attitudes and behaviours towards natural resources. The Conservation programme is another aspect of the BJCMNP's conservation goal that seeks to manage the *natural resources* more directly.

6.2 Threats and Spatial Vulnerability

The threats affecting individual aspects of BJCMNP biodiversity were discussed in Chapter 4. Overall, these threats may be summarized as: (i) conversion to agriculture, (ii) alien invasive plant species, (iii) harvesting of non-timber products, (iv) logging, and (v) fires. Spatially, there is a distinction in the susceptibility of the Park to these threats, as they affect lowlands (< 600 m), corridors, and edges to a greater extent than the higher altitude interior. Chai and Tanner, 2010 found that forest clearance in the BJCMNP was seven times as high in lowland zones (under 1,000m) than in montane zones and the density of forest fragmentation was eleven times higher. However, they found high endemism in their lowland zone plots (18% of species) and high beta-diversity, indicating the need for special protection for the lower montane areas. They also note that based on IUCN Red List data, 71% of threatened Blue Mountain trees species grow in the lowland zone and of these 92% are endemic. This highlights the importance of the property's lowland zone for conservation of plant species but these areas are also of significance for animal species including several of the BJCMNP's conservation targets. Of particular note are the Giant Swallowtail Butterfly, the Jamaican Coney and Jamaican Boa, which are virtually non-existent in their natural state over the entire island.

Being comprised of three distinct mountain ranges (the Port Royal Mountains, the Blue Mountains and John Crow Mountains), the connection corridors between these mountain ranges are of vital importance in maintaining this contiguous tract of protected area. The corridors - Silver Hill Gap and Corn Puss Gap - facilitate the movement of species between the mountain ranges which would otherwise be isolated from one another, and thereby resulting in fragmentation of the protected area. These narrow corridors have themselves, been found to harbour rich biodiversity, with spectacular areas such as Cunha Cunha Pass and Mount Horeb, in close proximity.

The edges of the BJCMNP are especially vulnerable to the threats highlighted earlier, because edges are more accessible to impinging influences. The situation is of particular concern on the southern slopes of the BM range, where the Grand Ridge is very close to the boundary, and clearing outside is advancing to the very peak of the Blue Mountains.

Mining

Whilst not an immediate threat, mining is a potential threat that has not been considered with respect to the BJCMNP, although it is a serious threat for the other area in Jamaica that may be considered of outstanding universal value for both natural and cultural heritage – the Cockpit Country. Technically, mining is only illegal under the National Parks Regulations if it is done without “the written permission of the Authority” and can be done if “in accordance with the provisions of a licence granted under any other enactment”. The Forest Act does not specifically mention the issue of mining though it indicates that taking “soil, sand or gravel” from a Forest Reserve is an offence. When the strong lobbying power of the mining industry and the legal jurisdiction of the Mining Act are taken into consideration, it cannot be assumed that permission for mining will not be granted. Further, there are apparently, permits for investigative mining, within the BJCMNP, granted before its declaration.

It is therefore essential for studies to be conducted with respect to these permits and their precise locations, the likely environmental and social impacts and also for economic valuation of the BJCMNP and relevant areas within it. Further, cost/benefit studies need to be conducted as the critical issues will not focus so much on, ‘what is the value of the resources or the services they provide ?’, but rather on, ‘how might mining reduce or negate these values ?’ and ‘what would be the financial impact on society and the economy ?’ In addition to the studies, there will need to be public awareness raising and lobbying for change in the legislation as appropriate based on the studies.

Bearing in mind the threats to the property’s biodiversity and ecological integrity and within the context of an over-arching conservation purpose for the BJCMNP, the Natural Heritage Conservation Programme reflects the BJCMNP’s over-all goal. The Conservation Programme Goal will be met through objectives implemented over a five year period as indicated in the table below.

Table 6.1 – Natural Heritage Conservation Programme Goal and Objectives

Programme Goal	
<i>To maintain and enhance the remaining area of closed broadleaf forest and component species of plants and animals which exist in the Blue and John Crow Mountains.</i>	
Objective 1	To rehabilitate and maintain at least 120 hectares of degraded forest on shale and limestone in the priority intervention areas
Objective 2	To successfully propagate and supply 22,000 native seedlings for use in forest rehabilitation, including at least 4 additional native species one of which is threatened.
Objective 3	To promote research that will inform park management, but will not threaten the resources.
Objective 4	To implement specific conservation programmes for conservation targets, as relevant information becomes available.

In order to achieve the Programme Goal, natural forest must be maintained and enhanced through rehabilitation programmes that address degraded areas including those invaded by alien species and appropriate tree species must be propagated to use. Further, maintaining forest cover will ensure healthy habitat for the many plant and animal species that make the forest ecosystems their home. Finally, maintenance and expansion of forest cover will help mitigate against climate change and reduce vulnerability to its impacts. Research is needed to identify other specific conservation tools which can then be implemented to enhance the Conservation Programme.

6.3 Reforestation and Forest Rehabilitation

Between 2005 and 2009, Park management through JCDT focused on reforestation using a variety of native species and forest rehabilitation through the control of the alien invasives Wild Ginger (*Hedychium* sp.) and Wild Coffee (*Pittosporum undulatum*). This was very successful, with over half the Management Plan objective of 80ha being met by JCDT with 15.8 hectares controlled of invasive species and 26.5 hectares reforested with

native, non-lumber species (Otuokon, 2010c). Just under half of the objective was met by the Lions Club of Mona with the Forest Conservation Fund and Forestry Department.

Aside from the use of mainly native, non-lumber tree seedlings, the approach to reforestation followed Forestry Department guidelines. The seedlings were planted in lines in pegged holes, with a minimal area cleared of weeds and maintained by circle-weeding, to ensure strong growth of the seedling without over-growth by fast-growing shrubs. The density of planting was about 400 – 500 seedlings per hectare depending on the terrain and the existence of other forest trees.

The previous Management Plan described forest rehabilitation as an approach in which conditions are created that will allow natural regeneration of the forest e.g. control of invasive species. This too was an experimental approach for Jamaica and JCDT conducted pioneering research on the eradication of *Pittosporum* along the Blue Mountain Peak Trail, with funding initially from the Rufford Foundation. Over the five year period, the successful experience was transferred to Holywell and plots in Cinchona. The slow death of adult trees (after injection with Glyphosate) and the pulling of saplings results in new growth of *Pittosporum* seedlings, but also of native trees from the soil seed bank. Maintenance is therefore essential, in terms of regular removal of seedlings and saplings to encourage the growth of the two or three native seedlings planted as well as those emerging through natural regeneration. Experimentation with the eradication of *Hedychium* sp. used mechanical removal and chemical treatment, at Mount Horeb for the former and Holywell for both approaches. At Mount Horeb where there is more shade from old-growth forest, regeneration with native species was faster than at Holywell where many of the plots were more exposed to sunlight and a variety of other invasive species such as grasses tended to grow back before native tree seedlings. It was also found that by the second or most third mechanical removal (and with increased skill of workers in removing all the rhizomes) that the *Hedychium* did not grow back. The approaches described in the previous Management Plan were therefore successfully piloted at Mount Horeb and along the Peak Trail, and lessons learned used to improve the methods for implementation on a wider scale.

Based on this success, the focus for 2011 through 2016 will be on maintenance of the areas rehabilitated between 2005 and 2010 and rehabilitation of new sites using the same methods. Greater collaboration with the Forestry Department and its other reforestation partners, in terms of more use of these techniques is also anticipated.

With Jamaica's rate of deforestation estimated at 0.1%, the area targeted for reforestation should probably be increased from the 80 ha target in the previous Plan to 244 ha. However, assuming (based on Chai et al., 2009) that deforestation is occurring at a much reduced rate within the BJCMNP, a target of half that (122ha) may be reasonable. The target of 80ha was 2.7% of the priority intervention sites identified, so 122ha would be 4%.

Objective 1: To rehabilitate and maintain at least 120 hectares of degraded forest on shale and limestone in the priority intervention areas.

Strategic Actions

1. Spatial, Temporal and Site specific approaches.

The spatial focus of rehabilitation within the BJCMNP boundary, will be the lowland zones, under 1,000 metres, as these have been identified as having the highest level of threat and significant biodiversity value (Chai and Tanner, 2010). Further, these areas will be within the priority intervention zones previously identified through satellite imagery as being degraded (See Chapter 5). Ground-truthing will identify the exact locations which will have to be accessible.

Rehabilitated areas provide suitable habitats that foster increased populations of native BJCM flora and fauna. Site-specific approaches e.g. species selection, will be developed depending on the conditions at each location. Hence in some areas traditional reforestation approaches, but using native, non-lumber species, will be used, whilst in others, natural generation will be facilitated, primarily through eradication of invasive species. Invasive control will focus on the top three species – *Pittosporum*, *Hedygium* and *Polygonum chinense* (Redbush), with work continuing on *Gleichenia*, and starting on *Polygonum*.

There will be a temporal split in the approaches, with reforestation tending to occur in the rainy seasons (except for any north-facing slope sites where rainfall tends to be fairly steady year round) and invasive species control, especially for *Pittosporum* occurring in the drier seasons, as this was found to be more successful.

2. Collaboration with Government Agencies. A critical assumption is that this objective will be met through collaboration between JCDT, as the NRCA appointed National Park manager and the Forestry Department which still retains responsibility for the management of the Forest Reserve. JCDT will aim to rehabilitate at least 60 hectares over the five year period, and it is anticipated that at least the same will be rehabilitated by the Forestry Department in conjunction with other partners. Collaboration will include determining locations in a coordinated fashion and assisting each other with seedlings and other resources as possible.
3. Collaboration with Buffer Zone farmers. Work will continue with community members and farmers, particularly on southern facing slopes and lower montane areas, to plant a variety of trees on their land and consider agro-forestry. Liaison with farmers to eradicate *Pittosporum* on farms near the BJCMNP should be considered. These strategies will prevent the property from becoming an “island” and will enhance biodiversity which will be good for conservation and sustainable tourism in the Buffer Zone.
4. Maintenance is essential, therefore funding will continue to be sought not only for initial planting/invasive species control, but also for maintenance e.g. circle-weeding

for at least two subsequent years. About 30ha from the previous Management Plan will require maintenance within the first year of this new Management Plan.

5. Data collection and research. Effort will be made to enhance data collection and research into the approaches used and their success, in order to provide a guide for future work. BJCMNP management should keep up-to-date with best practices from around the world and particularly on tropical islands.

6.4 Propagation of Native Non-lumber Tree Species

The vast majority of the over 18,000 tree seedlings (mainly native non-lumber) used for forest rehabilitation in the BJCMNP between 2005 and 2009 were produced in the BJCMNP nurseries at Holywell and Hagley Gap. The previous Management Plan proposed use of native non-lumber species to increase floristic diversity in reforestation plots, thus promoting faster rehabilitation and reducing the chances of cutting of the trees for lumber. This approach was taken despite the limited knowledge regarding these species and the fact that prior to this, well-known and presumably faster-growing introduced or native lumber species were generally used for reforestation.

Despite inadequate funding for detailed research, a pilot project approach was used and the following species were successfully propagated in the Park's nurseries mainly through the pulling of wildings: *Sapium jamaicense* (Milkwood), *Alchornea latifolia* (Dovewood), *Clethra occidentalis* (Soapwood), *Podocarpus urbanii* (Mountain Yacca). By 2009, pilot projects had been initiated with the harvesting of seeds from the wild, as a more conservation appropriate method (although the majority of wildings have been found to die back in large numbers when left under the parent tree). There is still a need for further research and an increase in the variety of species, particularly of endemic and threatened ones.



Plate 19: Dovewood and Milkwood seedlings delivered for Reforestation (Source: JCDT)

Objective 2: To successfully propagate and supply 22,000 native seedlings for use in forest rehabilitation, including at least 4 additional native species one of which is threatened.

Limited availability of seedlings and limited resources generally has been a challenge for the Conservation Programme.

Strategic Actions

1. Improve nursery management. Production must be improved significantly, in terms of consistent quantity and quality of seedlings and the variety of seedlings particularly native, endemic and threatened including *Juniperus lucayana* (Juniper Cedar).
2. Sustainability. The nurseries must become self-sustaining and therefore seedlings will have to be sold to projects (possibly at a discounted rate) and at a commercial rate for lumber, ornamentals, herbs and other horticultural species. Marketing and sales will be critical for the latter and must become of greater focus, as the survival of the Conservation Programme depends on this.
3. Propagation started mainly with the use of wildings, but has been moving towards propagation from seeds, however this will continue to require experimentation and careful recording of findings in order to improve the approaches. Park management should research best practices for propagation of plants for conservation to help guide its own approaches. In order to obtain seeds, a system will have to be developed and implemented, to identify the location of “seed trees” and to monitor them for production, so that seeds can be harvested. National Park Rangers will need to be alert to the trees for which seeds are being sought so that these can be identified and mapped during patrols. No more than 30 – 50% of seeds from any one plant should be taken. Efforts should also be made to harvest the seeds of epiphytes such as bromeliads and orchids, since this is a conservation target. Park staff will have to be alert to the presence of fruits on these plants, so that the fruit can be bagged when near to ripening, in order to catch the seeds as the pod bursts.

6.5 Research

Tropical forest ecology has been researched in the BJCMNP for many years, by noted ecologists such as Bellingham, Kelly, Iremonger, McDonald and Tanner. Tanner’s research plots are the second oldest in the neotropics (the oldest are in Puerto Rico). Much of this work has elucidated our understanding of ecological concepts and guided the strategies of the National Park’s management plans.

Whilst there has been significant research conducted within the National Park, not all of it has been published, and park management do not necessarily have access to it. As per the previous Management Plan’s fourth objective, research was promoted through the dissemination of the Plan’s Research Prospectus, presentation of papers at conferences and presentations to student groups particularly at the University of the West Indies. Further, NEPA integrated JCDT, as Park manager, into the permits application process

when researchers requested permission to conduct research in or near the BJCMNP boundaries. This allowed for recommendations relevant to BJCMNP management to be incorporated into permits and perhaps more importantly, introduced researchers to management staff resulting in opportunities for the Conservation Science Officer and National Park Rangers to accompany researchers in the field. Partnerships were developed and/or strengthened, with four academic institutions, which have already begun to benefit BJCMNP management.

Despite the above-mentioned success, numerous gaps in knowledge still remain. For many species, the current population distribution or status is in need of updating and as mentioned above, the investigation of conservation needs for some threatened species is lacking. Apart from this, basic species inventory information, research dealing with the ecological relationships between these species is also required. Almost nothing quantitative is known about the use of the biodiversity by man (harvesting regime) and the effects of this hunting and collecting of species. These information gaps continue to be a hindrance to the implementation of appropriate management strategies, as management oriented research is necessary to provide the scientific basis for developing solutions. The promotion of research will therefore continue over the next five years.

At the same time, it will be important to ensure that negative impacts on the BJCMNP's biodiversity and ecosystem integrity are kept to a minimum through careful control of the types of research given permission, numbers of specimens collected and supervision. Research requires the exploration and opening up of possibly vulnerable locations, and there have been instances where research has led to intense harvesting of the study species by the local field guide, and forest research into disturbance regimes has often called for the creation of gaps in otherwise relatively undisturbed forests. Caution must therefore be taken to mitigate against damage to the BJCMNP's resources.

Para-taxonomists

A para-taxonomist is an individual who has received informal training in taxonomy, particularly with respect to collecting specimens in the field. Such persons are usually local community members or protected area field staff, who by virtue of their living or working situation are able to assist taxonomists and other natural scientists in their research, and protected area managers in their work. The ability to identify species is useful for all aspects of BJCMNP management including tour guiding and interpretation.

Training para-taxonomists is essential to this conservation programme, as this has relevance for all four conservation objectives. Staff will need to be familiar with the species they are trying to conserve, and the identification of threatened, endemic, invasive, and native species for replanting is a necessary skill for those involved. Over the past five years implementing the previous Management Plan, there has been an emphasis on increasing species identification ability amongst National Park Rangers in particular. This has been done mainly by having National Park Rangers accompany researchers in the field and organizing field training with a variety of experts. Through the Education and Public Involvement Programme, several youth have received basic

training as well. There is a need to increase the number of community members with this training and to improve the level of species identification skills amongst BJCMNP staff.

Objective 3: To promote research that will inform park management, but will not threaten the resources.

Strategic Actions

1. Research Prospectus. Appendix 6 contains a Research Prospectus for the Park that should be added to as gaps in knowledge are identified. Whilst the prospectus was disseminated fairly widely in 2005 and 2006, it was not promoted as much as necessary. Promotion to research institutions must increase, to encourage them to conduct research that will help to fill some of these knowledge gaps. Increasing the level of information within the Prospectus should help. This initiative will facilitate information on the BJCMNP being readily available to prospective researchers. Existing websites e.g. Jamaica Clearing House Mechanism, the NRCA and Forestry Department websites should be considered for hosting or linking with the prospectus.
2. Participate in conferences. Park management should endeavour to participate in conferences and workshops to present information and papers on the BJCMNP. Papers and reports on the conservation and other programmes should be available on the BJCMNP's website and also should be sent to relevant networks for dissemination. Dovetailing with Objective 4, the Conservation Science Officer should arrange a half-day seminar annually with academic and other experts to present information (particularly pilot projects) and promote research in the BJCMNP.
3. Field Stations. The previous Management Plan suggested the establishment and maintenance of field stations in the three Ranger Stations in the Park - Holywell, Portland Gap and Millbank, to facilitate and encourage research efforts as well as to earn revenue. Unfortunately, with limited resources, there was an inability to even conduct the level of repairs required at the Ranger Stations. This meant that the repairs and expansion to include work spaces, lighting and equipment such as microscopes was not possible. Despite this, researchers and study tours were accommodated, particularly at Holywell. Field stations should still be considered and implemented where and when possible.
4. Research Permit System. For easy reference to research applications, a Research Log (Appendix 7) will continue to be kept for research activities occurring in and around the BJCMNP. Park management will continue to try and establish relations with visiting researchers and accompany them on field expeditions. This proved fairly successful under the previous Management Plan and is facilitated through NEPA's Research Permitting System under which scientists must obtain permission from NEPA to conduct research and collect specimens in Jamaica. Through this System, NEPA informs Park managers of proposed research, and allows them to comment on whether or not the research should be permitted, or to indicate any concerns regarding the research or collection. The System ensures that researchers are aware that their research is within a protected area, and allows park management to liaise with the

researcher to establish a relationship. JCDT should have discussions with NEPA regarding the research permits application process to ensure clear understanding of the procedures and any relevant legislation, in order to promote these to researchers, as part of the Park's Research Prospectus.

In addition to the above, in order to improve this System, Park management should:-

- ensure clear understanding of the Permitting System, so that this information can be included along with the Research Prospectus and that the System can be explained to researchers who may contact the BJCMNP directly.
- have discussions with NEPA and other relevant agencies to develop mechanisms to encourage the repatriation of research knowledge.
- consider development of a protocol for monitoring research in the BJCMNP.
- continue to ensure monitoring of researchers in the field to check that sample collection in the field corresponds to what has been permitted.
- alert cooperating CBOs and concerned community members when researchers will be in their area, so they can look out for researchers and query their permits.

6.6 Conservation Targets

Clearing and invasive species are two of the greatest threats to forest protected areas globally (Bruner et al., 2001) and were high on the list of active threats identified for the BJCMNP (TNC/JCDT, 2000; JCDT, 2005). These two threats reduce the population of native species, decrease habitat for wildlife and deplete biodiversity. Analysis of the BJCMNP's bird monitoring data indicates that native and endemic species are dependent on healthy, closed broadleaf forest (Vogel, 2004; Beale, 2010). This was the basis for the assumption in the previous Management Plan, that conservation of 'forest on shale' and 'forest on limestone' would have a positive impact on most of the other targets, particularly epiphytes, freshwater ecosystems and forest birds. The validity of this assumption has been confirmed by the findings of the BJCMNP's Five Year Assessment and analysis of the data from the Monitoring and Evaluation Programme (Otuokon, 2010c; Beale, 2010). Further, limited resources and knowledge regarding specific conservation needs reduce Park management's ability to implement direct species conservation activities.

The eight conservation or biodiversity targets identified in the previous Management Plan will remain (Table 6.2) however in light of the above, forest conservation through enforcement action to prevent and stop encroachment, maintenance of rehabilitated areas and rehabilitation of additional areas, will once again be the focus of the BJCMNP Conservation Programme. There will be a focus on lower montane forest on shale as this has been identified as the most threatened target and of high significance for biodiversity and endemism (Chai and Tanner, 2010). The other targets will however, continue to be monitored and research into specific conservation requirements will be more actively promoted, so that direct action where possible can be implemented.

Table 6.2 – BJCMNP Conservation Targets

<i>Conservation Target</i>	Target Justification
<i>montane forest on shale</i>	Blue Mountain forest ecosystem with over 40% plant endemism, many with a threatened status. Contracting forest habitat for dependent wildlife.
<i>montane forest on limestone</i>	John Crow Mountain forest ecosystem and Blue Mountain limestone outcrops with high plant endemism, many with a threatened status. Contracting forest habitat for dependent wildlife.
<i>epiphytic communities</i>	Major grouping of plants, including many endemic and highly threatened orchids and bromeliads, the latter of which are important habitats for many of our endemic species of <i>Eleutherodactylus</i> frogs.
<i>headwater ecosystems</i>	Vital headwater ecosystems that supply water to eastern Jamaica, and cover 10 watershed management units.
<i>montane forest birds</i>	Major grouping of native and migrant species. Natives with a high level of endemism and similar conservation requirements.
<i>Jamaican Coney</i>	Last remaining native, non-volant mammalian species high in the food chain. It is vulnerable and endemic.
<i>Yellow Snake</i>	Large, vulnerable, reptilian, endemic species often killed on sight by local people.
<i>Giant Swallowtail Butterfly</i>	Endangered, endemic, flagship species affected by illegal trade.

Objective 4: To implement specific conservation programmes for conservation targets, as relevant information becomes available.

The status of the BJCMNP’s biodiversity was discussed in Chapter 2, noting that hundreds of species both plants and animals are regarded as threatened according to the IUCN’s Red List (2003). In fact, there are threatened species within every taxonomic class represented, and the underlying common thread is that habitat degradation and destruction is one of the main contributing factors to their threatened status.

The protection of these threatened species of plants and animals is essential to the conservation of the BJCMNP’s resources, as all species work together and contribute to the functioning of an ecosystem. Especially where endemic species are concerned, their conservation is vital, as it is these species that bestow uniqueness and acclaim to the ecosystems they are part of. While general programmes involving reforestation, education and enforcement of legislation will confer some measure of conservation to threatened biodiversity, the conservation needs of these threatened species must be more fully understood and implemented.

Strategic Actions

1. Montane Forest. As indicated above, protection through enforcement and education as well as rehabilitation and expansion of area through reforestation will continue. This will be with an emphasis on lower montane forest on shale.
2. Epiphytic Communities. Efforts to propagate native orchids and bromeliads can be implemented with relative ease at Holywell through keen observation to identify fruiting bodies for capture of seeds, as recommended for Objective 2. If the seeds can be successfully propagated and plants grown for use in forest rehabilitation, this would result in the implementation of a conservation programme for epiphytes – one of the conservation targets.
3. Head-water ecosystems. The focus on conservation of another target – headwater ecosystems through forest rehabilitation along riparian zones has been eliminated as a specific management objective for this management period. However, in all areas targeted for forest rehabilitation under Objective 1, checks must be done to see if there are any riparian areas requiring rehabilitation. Further, during freshwater monitoring, where streams are identified with need for rehabilitation these should be addressed.
4. Conservation of all Targets. This will continue to be met through the conservation of the montane forest ecosystems as described earlier.
5. Implement research guidance regarding species conservation approaches. It is anticipated that with a greater level of research promotion, there may be information becoming available within the next five years that can enhance the conservation of targeted species. As Park management has an adaptive management approach, it should be possible as such information becomes available, to adjust programmes as appropriate. Where new programmes will be required, these will be dependent on the ability of Park management to access funding.

6.7 Scientific and Technical Advisory Committee (STAC)

Park management recognizes that conservation, research and monitoring activities are very technical issues and often require expert opinion and advice. As the BJCMNP covers a broad range of ecosystems and ecological communities, it would be virtually impossible to hire experts in each of the fields required. A Scientific and Technical Advisory Committee (STAC) would provide guidance for management, based on the best available scientific knowledge and promote and assist with research and monitoring.

The previous Management Plan, suggested that operating such a Committee was unlikely to be feasible and recommended other approaches and annual meetings. There were no annual meetings of experts, only the consultation for the UNESCO World Heritage Site nomination dossier and the 2011 – 2016 management planning meetings, which involved few academics.

The approach for 2011 to 2016 will therefore continue to be for the Conservation Science Officer to participate in national committees to share the work of the BJCMNP, obtain guidance and support, and promote coordination and collaboration between agencies and organizations. The STAC will consist of an informal group of experts who are called on from time to time, as their expertise is required. Efforts should still be made to hold at least one meeting (in the form of a half-day seminar) per year to share the work of the BJCMNP, seek guidance and promote research in the BJCMNP.

6.8 Climate Change

Soil erosion and associated land degradation are Caribbean-wide phenomena, however climate change is likely to increase their negative impacts, through increased seasonal rainfall following long spells of drought (McGregor, 1995). The Blue and John Crow Mountains region is particularly vulnerable because of the steep slopes, heavy rainfall and rapidly draining soils (Davis-Morrison, 1998). Thus soil erosion which may result in the breaking up of trails and roads is a likely impact of climate change in the area. In fact, the Peak Trail and other trails within the BJCMNP are already being impacted by increased soil erosion from increased rainfall during more frequent tropical storms and hurricanes. Outside the BJCMNP, communities are being negatively impacted by serious damage to roads which has affected their accessibility.

Climate change may also result in an upward migration of vegetation and wildlife (to find the appropriate temperature for their growth and reproduction) however this can only be monitored, and there is unlikely to be any mitigatory type action available. The Monitoring and Evaluation Programme describes suggested monitoring activities.

Park management has observed significantly more hurricane damage to forest trees in heavily disturbed sites e.g. recreational areas and along trails, in comparison to undisturbed forest. This supports the need to discourage the opening of new or existing trails, and additional recreational areas within the BJCMNP's boundaries.

Protecting ecosystems through protected area management, has been proven successful in buffering human settlements and resources from natural disasters such as hurricanes, landslides and flooding (Loh, 1996; IUCN/WCPA, 2008). Further, forests and other ecosystems are important for carbon storage, reducing the amount of carbon dioxide that can contribute to global warming (Mackey et. al., 2008). Hence, the BJCMNP managers will use the Conservation Programme as a key strategy to address climate change, including encouraging the conducting of research that may better guide management action. Further, as described in various papers presented by Park staff at conferences, all the BJCMNP programmes contribute to adaptation to climate change.

Programme Summary: Conservation

Goal: To maintain and enhance the remaining area of closed broadleaf forest and component species of plants and animals that exist in the Blue and John Crow Mountains.

Objectives	Programmes/Strategies	Activities	Monitoring	Resources	Timeframe & Priorities
<p>1. To rehabilitate, and maintain at least 120 hectares of degraded forest on shale and limestone, in the priority intervention areas.</p>	<p>1. Work with FD to achieve objective of 120ha (JCDDT aims for 60ha) 2. Target areas within the BJCMNP in lowland zones (under 1,000m) and areas identified as priority intervention areas due to large gaps in forest cover 3. As appropriate in each location:- (a) reforest with native, non-lumber species, or (b) eradicate and control invasive species and allow natural regeneration (c) collect & record data 4. Maintain rehabilitated areas (for 2 – 3 years) 5. Promote tree-planting and agro-forestry on private land in the Community Buffer Zone</p>	<p>1a. Liaise with FD to identify and map areas for rehabilitation 1b. Agencies sign agreements committing to area targets 1c. Monitor target achievement 2. Identify areas for reforestation or invasive species eradication and prepare site specific plans 3a. Implement site specific plans 3b. Measure and record data and produce reports e.g. on growth rate 3c. Conduct study on best practices for invasive species control 4. Maintain rehabilitated areas through patrols to prevent encroachment, circle-weeding and re-planting of seedlings where necessary 5. Liaise with community members for provision of labour and promotion of reforestation and <i>Pittosporum</i> control on private land</p>	<p>Measurement and mapping of locations; Agreements and reports Monitoring:- (i) establishment success and growth rates (ii) success of eradication and control of invasives Diversity measurements in sample plots Reports and research papers</p>	<p>CSO Ranger Corps Labour Estimated cost for 120ha is JA\$18 million to cover labour, seedlings, transportation, supervision & maintenance Estimated cost to maintain 30ha from previous 5 years is JA\$3 million Community outreach JA\$500,000</p>	<p>1– 4. Ongoing High Priority 5. Project for 2014 unless funds before</p>
<p>2. To successfully propagate and supply 22,000 native seedlings for forest</p>	<p>1. Improve production at both Holywell and Hagley Gap nurseries – quantity, quality and variety, for</p>	<p>1a. Improve management and supervision of nurseries. 1b. Identify seed(ling) sources for target trees and collect seed(ling)s</p>	<p>Monitoring growth of seedlings – nursery</p>	<p>CSO Ranger Corps Nursery staff volunteers</p>	<p>1. Ongoing from 2011. High Priority</p>

Programme Summary: Conservation

Goal: To maintain and enhance the remaining area of closed broadleaf forest and component species of plants and animals that exist in the Blue and John Crow Mountains.

Objectives	Programmes/Strategies	Activities	Monitoring	Resources	Timeframe & Priorities
rehabilitation, including at least 4 additional native plant species one of which is threatened	<p>1. rehabilitation and sale</p> <p>2. Improve marketing and sale of commercial plants to ensure sustainability of nurseries</p> <p>3. Increase propagation from seeds e.g. epiphytes</p>	<p>1c. Propagate seedlings.</p> <p>2. Prepare business plan and implement marketing and sales programme to ensure financial sustainability of nurseries</p> <p>3. Locate seed plants & source seeds in season to propagate</p>	<p>records; mapping of location of seed trees and recording time for seed collection</p>	<p>Nursery equipment and materials; Plan: JA\$500,000</p> <p>Maintenance and repairs JA\$500,000/yr</p>	<p>2.2011</p> <p>Nursery repairs as needed</p> <p>3.Start 2012</p>
3. Promotion of research that will inform Park management, but will not threaten the resources	<p>1. Maintenance and promotion of Research Prospectus to universities and researchers.</p> <p>2. Screening of all research proposals planned for the Park.</p> <p>3. Maintenance of a database for research activities carried out in and around the Park.</p> <p>4. Involvement in research activities that take place within the Park.</p> <p>5. Establishment and maintenance of research stations at ranger stations.</p> <p>6. Regular dialogue with relevant agencies and experts.</p>	<p>1a. Provide information to researchers. 1b. Increase details in Prospectus. 1c. Promote Prospectus on the internet including links e.g. to JA CHM, NEPA and FD</p> <p>2. Liaise with NEPA to clearly understand permit application process in order to promote this to researchers and advise relevant community groups of researchers</p> <p>3. Respond in a timely and appropriate fashion to research permit applications from NEPA and maintain data-base of research.</p> <p>4a. Accompany researchers in the field on at least one occasion.</p> <p>4b. Seek assistance from researchers for Park management e.g. training field staff and community members</p> <p>5. Conduct repairs and improve</p>	<p>Research activity database</p> <p>Correspondence with NEPA</p> <p>Correspondence with researchers</p> <p>Repair records</p>	<p>CSO</p> <p>All technical staff</p> <p>Mainly time of personnel and transportation to meetings and for field visits</p> <p>5.JA\$2 million to upgrade Ranger Stations for use as field stations</p>	<p>1 – 4. Promotion of research is ongoing and High Priority.</p> <p>5.2012 – 14 if funds sourced. Medium Priority – may be phased process.</p>

Programme Summary: Conservation

Goal: To maintain and enhance the remaining area of closed broadleaf forest and component species of plants and animals that exist in the Blue and John Crow Mountains.

Objectives	Programmes/Strategies	Activities	Monitoring	Resources	Timeframe & Priorities
		ranger stations, making them suitable for use as research stations. 6a. Participate on relevant committees and in conferences as possible. 6b. Meetings with relevant experts as necessary and a seminar once a year to share results and seek advice.	Meeting & Conference information	6. Funds for half day meeting with STAC, holding of seminar etc. JA\$500,000	6.Ongoing and High Priority – less funds can be used e.g. □ day seminars.
4. To implement specific conservation programmes for conservation targets as information becomes available	1. Continue Implementation of conservation measures for targets:- (i) forest rehabilitation (ii) habitat conservation for epiphytes and animals (iii) propagation of epiphytes 2. Encourage researchers to assess the conservation needs of threatened biodiversity, focusing on the conservation targets. 3. Implementation of newly identified conservation measures where possible, as information becomes available	1a. Implement conservation measures as per other Conservation Programme objectives i.e. forest rehabilitation and Enforcement Programme resulting in habitat conservation 1b. Propagate epiphytes and threatened species for forest rehabilitation 2. Promote these assessments in the research prospectus. 3a. Seek funds and implement study re: threat of mining 3b. Integrate newly identified conservation measures into existing programmes where possible and seek funds for conservation measures where needed.	Conservation Science Officer Reports	CSO Ranger Corps Programme funding for Objectives 1 and 2 3a. JA\$2 million 3b. Project funding JA\$2 million	1.Ongoing and High Priority 2.As for Objective 3 3a. Medium Priority 2012/13 3b. Low Priority dependent on information and funds

CHAPTER 7

Conservation of Cultural Heritage Programme

Heritage, according to the UNESCO World Heritage Centre website is, “our legacy from the past, what we live with today, and what we pass on to future generations” (<http://whc.unesco.org/en/about> downloaded 14/06/10). Whilst the BJCMNP was initially protected for its natural heritage – forest ecosystems and the services those systems provide, the area is well known for its rich cultural heritage. Most recently, this has been recognized through the nomination of the property as a UNESCO World Heritage Site, not only for its biological diversity, but also for its direct and tangible association with the events that established first Maroon societies post-1492 (and of the Western Hemisphere) and the living traditions of the Maroons today. This step is a reflection of the approach taken to management of the site as a national park, regarding its outreach to, and involvement of, local communities, of which the Maroons are a part. Further, recognizing the linkages between natural and cultural heritage and heritage conservation, activities such as the annual Misty Bliss festival and youth skills training sought to address these. The nomination of the BJCMNP for its Maroon heritage commits Park management to addressing the conservation of this heritage in a much more organized and targeted manner than previously. This chapter aims to guide that process and indicates links with the other management programmes, through which the aims of cultural heritage conservation will be achieved.

Culture is, “...the whole complex of distinctive spiritual, material, intellectual and emotional features that characterize a society or social group. It includes not only the arts and letters, but also modes of life, the fundamental rights of the human being, value systems, traditions and beliefs” (UNESCO,1982). In the past, cultural heritage conservation has tended to focus on tangible heritage such as monuments, buildings and artefacts however a variety of conventions and declarations have recognized the importance and vulnerability of oral and intangible heritage. The 2003 Convention defines intangible cultural heritage as the practices, representations, expressions, knowledge and skills, as well as the instruments, objects, artefacts and cultural spaces associated therewith, that communities, groups and, in some cases, individuals recognize as part of their cultural heritage (Article 2.1). The many forms of intangible heritage include language, literature, music and dance, games, culinary traditions, rituals, knowledge and practices concerning the universe and know-how linked to handicrafts.

Much of the heritage of the Windward Maroons is intangible due to the destruction by the English of much that was tangible, and the mobile lifestyle the Maroons adopted to aid in their struggle for freedom. Conservation in the context of cultural heritage refers not only to the preservation of that heritage but to its protection and management through living traditions. Conservation of the BJCMNP’s Windward Maroon heritage (described in Chapter 3) therefore requires working closely with the Maroon people in the Buffer Zone, and other relevant stakeholders, particularly the JNHT and ACIJ to revitalize and sustain this heritage.

Intangible heritage is vulnerable to the forces of globalisation, social transformation e.g. through urbanization, and intolerance. Loss of indigenous language is often a precursor to the loss of intangible heritage, as it is a critical component in the communication of oral traditions. Often, local and indigenous communities, particularly young adults view their cultural heritage as backward and an obstacle to their success in the modern world. These matters require attention both within such communities and in their external environment. This is of relevance in Jamaica, where at one point, Maroons were reviled for their perceived ‘sell-out’ of their black brothers remaining in slavery, through their agreement to return runaway slaves to the English as a part of the Peace Treaty. Further, there are apparent issues of conflict between some Maroon beliefs and practices and Christian teachings which creates tensions in the minds of some Maroons, affecting their willingness to participate in Maroon traditions. Another situation has been a refusal on the part of Maroon elders to transmit oral traditions or some aspects, to persons considered unworthy, including other Maroons, even if this meant dying without passing on this indigenous knowledge (Bilby, 2005). Youth involvement will therefore be critical.

Mountains are one of the ecosystems most commonly associated with “sacredness” globally. Specific mountains or peaks may identified by certain cultures or traditions as sacred and associated with a variety of beliefs and practices such as pilgrimages. Others may be the location of sacred sites and objects e.g. temples, which were either built there because of the sacredness of the site, or which resulted in sacredness being associated with the area. Some mountains inspire awe and wonder, and a sense of one’s being a part of something greater than oneself. The BJCM combines both the latter and the former, as for many Jamaicans, these mountains symbolize strength and determination to succeed, epitomized in hiking to the Blue Mountain Peak, the highest point in the island. For the Maroons however, the BJCM form a physical “boundary for Maroon culture and nationhood” (Lumsden, 2008 in BJCMNP UNESCO WHS Nomination Dossier) and are considered sacred as the place where their warrior ancestors now rest. “Sacred natural sites are areas where nature, the divine and remembrances come together in special combinations that are particularly meaningful to a community, society, or people. They can be the abode of deities, nature spirits and ancestors ... Common to most sacred natural sites is that they are areas removed from everyday access and resource use” (Smeets, 2006). John et. al. (2010) explore the existence of sacred natural sites amongst the Windward Maroons and identify a number of sites within the BJCM (including the whole BJCM landscape because it is a “place of burial”) however they note there appears to be little active management of these sites by the Maroons.

Jamaica acceded to the Convention on the Protection of World Cultural and Natural Heritage in 1983. This commits Jamaica to ensuring protection of its cultural and natural heritage, identify and nominate sites considered to be of outstanding universal value for the World Heritage List and manage such sites to ensure their protection for the benefit of all mankind. The Tentative Listing of the BJCMNP in 2006 and submission of its Nomination Dossier in 2009 along with the objectives and strategies outlined below in this conservation programme operate in fulfillment of this international commitment. This on-going Programme will focus on the promotion of Maroon heritage, but related Afro-Jamaican cultural heritage will also be promoted as appropriate.

7.1 Conservation of the BJCMNP's cultural heritage

The BJCMNP is recognized by the Windward Maroons as a sacred natural site because it is the burial place of their ancestors and because of its association with the events that secured their freedom and led to the establishment of the first Maroon state. The Park protects much of what tangible remains exist e.g. at Nanny Town, however the intangible heritage of the Maroons lies within the people and is a living and evolving culture. Hence the role of Park management must be one of facilitation of cultural heritage conservation, as it is the Maroons themselves who are the custodians of this heritage. Further, African Jamaican heritage e.g. particular dance forms and food preparation, is of significance to communities around the BJCM and will also be promoted alongside Maroon heritage.

Human and financial resources are limited, therefore in addition to working with the Maroon communities, park management will work with relevant organisations such as the JNHT, ACIJ and the UWI Archaeological Department. Most of the objectives can be met through the Education, Enforcement and Recreation and Tourism Programmes (and have been budgeted accordingly). A part-time officer would be useful so someone with suitable qualifications should be hired under the Community Education Officer position, to bear responsibility for the cultural heritage conservation objectives.

This Programme will be monitored using the following indicators:-

- Condition of the Nanny Town site especially the status of the cut-stone wall
- Cunha Cunha Pass Trail open for hiking.
- The establishment of a Maroon heritage route in and around the Park in five years.
- The continued preparation of foods that use ingredients that are unique to the BJCM
- The continued making of Maroon craft items to include inventory of specific items
- The convening of the Maroon Kamiti.
- Programmes in place to transmit music and dance traditions to the next generations
- Staging of Maroon festivals in Maroon Settlements of Moore and Charles Town



Plate 20: Community youth explore Charles Town Maroon Museum (Source: JCDT)

The Cultural Heritage Conservation Programme Goal will be met through objectives implemented over a five year period as indicated in the table below.

Table 7.1 – Cultural Heritage Conservation Programme Goal and Objectives

Programme Goal	
To maintain and enhance the appreciation for, and practice of the Maroon heritage associated with the Blue and John Crow Mountains.	
Objective 1	To facilitate the conservation of the tangible cultural heritage of the Windward Maroons
Objective 2	To facilitate the preservation of the intangible cultural heritage of the Windward Maroons
Objective 3	To promote awareness and appreciation of the intangible cultural heritage of the Windward Maroons, and its connection to the natural heritage of the BJCM
Objective 4	To promote research that will inform park management, but will not threaten conservation of the BJCMNP’s cultural heritage
Objective 5	To establish and protect the Intellectual Property Rights of the Maroon people

7.2 Tangible Cultural Heritage

Given the nature of the building materials used by the Maroons and the change in location of the Maroon’s major towns to outside the boundaries of the BJCMNP consequent on the signing of the peace treaty of 1739, little of the built heritage remains. The one exception is to be found in the cut-stone wall at Nanny Town left by the English in 1734/5. The upper level was first excavated in 1973, and objects dating to the period of the 1720 – 1740 Maroon war with the English were found including many fragments of green wine bottles, smoking pipes, musket parts and balls, African Jamaican earthenware shards and cutlasses. The archaeological digs at Nanny Town in the 1990s produced Taino artefacts in the third level but the second level, called the Maroon Phase did not reveal much that was distinctively Maroon. Other elements such as the trails, historic and cultural locations and place names are protected by the Maroons, by convention of use, and as part of the protection currently offered by the existence of the BJCMNP. The towns are primarily archaeological and are protected by reason of their anonymity.

Objective 1: To facilitate the conservation of the tangible cultural heritage of the Windward Maroons

This objective addresses the Maroon’s tangible heritage in terms of historic and cultural sites, trails, and place names. It does not address the tangible outputs of the intangible heritage e.g. musical instruments and craft items.

As indicated earlier, a key strategic approach will be partnership - working with the Maroon communities and relevant organizations such as the ACIJ and JNHT.

Trails

Trails are of particular interest because many of them e.g. Cunha Cunha Pass Trail, although originally cut by the Maroons were later used by all Jamaicans as access routes e.g. market trails. Trails can therefore be used not only to conserve and interpret Maroon heritage but wider African Jamaican heritage as well. For heritage conservation, trails must be kept clearly defined and accessible and their features or points of interest highlighted e.g. through signs and other forms of interpretation. Trail users are not all interested in the cultural heritage – some are just out for exercise, whilst others are more interested in the natural heritage. Therefore, experienced tour guides who can link nature with culture and bring stories to life will be important in order to conserve the heritage experience of the trails. For example, on hearing birdcalls and birdsong, the tour guide should be able to identify some of the birds and explain how the Maroons mimicked these calls to send messages the English could not understand, nor even realize were being sent.

Many community groups are interested in re-opening and developing trails, primarily because they believe the trail will help them generate income. Whilst trails have the potential to provide for income generation, making a profit is not that easy as there are numerous costs associated with trail development and management. The following issues have been experienced first-hand by Park management and the Bowden Pen Farmers' Association who operate the Cunha Cunha Pass Trail. Firstly, trails need to be maintained – kept clear of vegetation that would overgrow them, drains maintained to reduce erosion by the heavy rainfall in the BJCM, repairs to steps, railings, bridges, benches, rest-stops etc. made as needed, and refuse and other signs of human use removed regularly. Secondly, trails need to be marketed in order to attract visitors. Thirdly, visitors need to pay if income is to be generated for maintenance, and many Jamaicans do not think they should pay to use trails, and will outright refuse, sometimes becoming aggressive. Fourthly, visitors need to be monitored to prevent them from damaging the trail and its resources e.g. removing plants and defacing signs, and also to reduce the risk of accidents and/or injury. Finally, trails need to be monitored even when there is no organized tour, because persons will seek to use the trail without permission or payment and others will use the trail to clear land for farming or just burn a section for fun. For these reasons, and also because trails can become routes for invasive species, illegal activities and destruction of native vegetation, the opening of trails within the BJCMNP is discouraged. These can also be issues of concern within the Buffer Zone.

It will therefore be important for Park management to determine which, if any trails within or passing through the BJCMNP will be re-opened, guide planning and management and monitor such trails, or relevant sections. Trail planning and management for the BJCMNP and its Community Buffer Zone should address the route, conservation of both cultural and natural heritage, facilities e.g. rest stops, base camps, safety and educational experience. Park management currently has significant trail development and management experience however this should be enhanced through training locally and abroad. This knowledge should be shared with local community members through practical training and assistance with trail planning and management. Outside the BJCMNP, the Recreation and Tourism Programme, particularly the new Blue Mountains

Sustainable Tourism Programme will provide assistance to community groups, and particularly Maroon communities, with the planning and management of trails.

Archaeological sites

Whilst other sites are known to exist, Nanny Town is the only one where there has been archaeological research. Nanny Town is within the boundary of the BJCMNP and the area around it has been identified as being in need of forest rehabilitation. For this management plan period, the focus will be on Nanny Town, with the organization of at least one monitoring visit and refining of JNHT standards, rules and procedures for further archaeological work at Nanny Town and any other sites. The Nanny Town visit should address issues of both cultural and natural heritage conservation.

Specific strategic actions

- Prepare guidelines for trail development and use, particularly as it relates to natural and cultural heritage conservation and carrying capacity
- Assist communities with trail planning and management inclusive interpretation
- Monitor trails for visitor and other impacts and address these as necessary
- Consider and if resources allow, make plans for a Maroon Heritage Route
- Conduct Nanny Town monitoring and planning visit
- Use JNHT standards to prepare guidelines for archaeological digs etc.

7.3 Oral and Intangible Cultural Heritage

The oral and intangible heritage that is directly and tangibly associated with the BJCM is very much alive and being preserved by the Maroon communities, despite several challenges. Because of their location closer to the BJCMNP boundary and Preservation Zone, the communities at Moore Town and Charles Town, Portland have been involved with Park planning and programmes, whilst the Scots Hall group has not.

The Charles Town Maroon Council established an Asafu Yard for ceremonies and events (such as their annual Quao's Day Festival in June) along with a Maroon Museum. At a neighbouring river-side site, they had established Quao's Village – a relaxing river-side attraction with restaurant, but a similar facility has now been constructed in a similar site immediately adjacent to the Asafu Yard and Museum. A variety of items are on display in the Museum, which depict the use of the intangible heritage e.g. baskets and fruit wines, and these are also available for sale. Tours are conducted mainly along the Orange Vale Plantation Trail (which takes hikers to the ruins of a cocoa plantation now completely enclosed by forest) and the newly renovated Sambo Hill Trail, which was used by Maroon war leaders to access a strategic look-out for the preparation of tactical plans. The Charles Town Maroons have a dance and drumming group which meets for drumming weekly at the Asafu Yard and performs at several national and local events e.g. the National Park's annual cultural event – Misty Bliss.

The Moore Town Maroons take visitors on trails including the Nanny Falls Trail, however some sections of that Trail are hazardous due to landslides and slippery rocks. Every October, the Maroon Council organises the Nanny Day Festival to celebrate and

promote their cultural heritage. The Council has constructed a small building with bathroom facilities, as an office and for meetings and training activities. The latter has been strengthened by a project funded by UNESCO and managed by the Institute of Jamaica, though with a local project manager. The project funding was awarded in relation to UNESCO's recognition of the Oral and Intangible History of the Moore Town Maroons as being of Outstanding Universal Value. The Council has identified a site for the construction of a Cultural Centre for multiple uses, and has architect's concepts drawn for these.

The Bowden Pen Farmers' Association (BPFA) are a group of farmers mainly from the Millbank community in the Upper Rio Grande Valley. Their association formed partly out of the influence of the Park's community outreach work, concern at the destruction of forest from Hurricane Gilbert and recognition that they could improve their livelihoods through a combination of sustainable agriculture and tourism. This group works closely with Park management, and has developed a Memorandum of Understanding to guide this. They re-opened the Cunha Cunha Pass Trail with assistance from the Park's Rangers and manage the Trail and Ambassabeth Cabins. The BPFA host an annual Emancipation Day Festival on August 1st. Whilst not considered by all, as a Maroon community, the BPFA embrace their Maroon heritage and the Maroon Councils of Moore Town and Charles Town have recognised the communities of the Upper Rio Grande Valley as Maroon.

All three community-based organisations were involved in the JCDT/BJCMNP Inter-American Development Bank funded project to develop a Blue Mountains Sustainable Tourism Plan. This included certification of some members under Jamaica's basic level tourism training – TEAM JAMAICA, in addition to training in other relevant areas. JCDT is currently working with the groups to access the funding to implement their plans. Some of the factors affecting the conservation of the intangible cultural and natural heritage are the increasing interest, particularly of the youth, in popular culture and the so-called 'get-rich-quick' mentality. In addition, there are limited human resources and skills to obtain funding and manage projects that would assist in better promotion and conservation of traditions.



Plate 21: Brother Isaac blowing the Abeng to signal the start of the official ceremony at the Bowden Pen August 1 celebrations (courtesy Andrea Ventimiglia)

Objective 2: To facilitate the preservation of the intangible cultural heritage of the Windward Maroons.

This objective will be implemented in close conjunction with the Maroon communities of the Buff Bay and Upper Rio Grande Valley, in addition to relevant agencies and organisations. The first step will be the development of strategies and action plans to promote the continued use and transmission of the oral and intangible heritage such as cooking, handicraft, language, music and dance as well as good governance. Meetings and/or workshops will be held to ensure a participatory process in the development of these plans, since it is the voluntary participation of the wider Maroon community that will result in successful implementation of the plans. These plans will include monitoring procedures e.g. annual survey or checklist that can be conducted with each Maroon Council to identify areas that have been addressed and through what means. Where necessary funding will have to be sought, however effort should be made to identify and implement strategies that will encourage voluntary use and transmission of the heritage. A focus on ensuring the conservation of authenticity of the heritage will be essential.

Assuming that the specific strategies and detailed plans will be developed by Year 2, detailed activities will not be described here, however it is anticipated that some of the activities described as already taking place will continue. Further, the Blue Mountains Sustainable Tourism Programme to be implemented by the JCDT as part of the Park's Recreation and Tourism Programme, will be instrumental in helping to conserve the

intangible cultural heritage of the Maroons by promoting awareness and appreciation through festivals and tourism. Specific ideas of strategies for conserving intangible cultural heritage that can be considered during the planning meetings are:-

Table 7.2 – Possible Strategic Activities for Conservation of Intangible Heritage

Desired Outcomes	Possible Strategies and Actions
Continued preparation of foods using ingredients and techniques that are unique to Maroons e.g. bussoo soup, jerk wild hog, cacaoon stew, heart of palm	(i) Stalls with these foods for sale at the festivals and competitions for the best “Maroon Cook” (ii) Development and implementation of plans for sustainable production and harvesting e.g. bag-limits, agro-forestry (iii) Sale of these foods at Maroon attractions
Continued making of Maroon craft	(i) Stalls with these craft for sale at the festivals and competitions for the best “Maroon Artisan” (ii) Development and implementation of plans for sustainable production and harvesting e.g. agro-forestry (iii) Sales outlets
Continued making and use of Maroon herbal remedies	(i) Stalls with herbs and treatments at the various festivals and attractions (ii) Development and implementation of plans for sustainable production and harvesting of herbs (iii) Further development of product lines and Maroon ‘spas’
Continued implementation of Maroon music, song, dance, drumming etc.	(i) Maroon music, song, dance, drumming at Maroon and other festivals and events
Continued and improved good governance of Maroon communities	(i) Training and Capacity Building
Continued transmission of all the oral and intangible cultural heritage of the Windward Maroons including indigenous knowledge	(i) Training in all aspects of cultural heritage including those not identified above e.g. language

7.4 Promoting Awareness and Appreciation of Cultural Heritage

To aid in its conservation, the value of Maroon heritage must be appreciated by the Maroon communities, the wider Jamaican population and visitors. The heritage must be celebrated and people must be educated to better understand it. The linkages between the cultural heritage of the Windward Maroons and the natural heritage of the BJCM can be a useful story to tell as it can make people think about issues they face in their own lives. Interpretation of the cultural and natural heritage of the BJCM together, provides a unique opportunity to link the need for conservation of both and to educate both Maroons

and the wider community. Questions that can aid the development of interpretive programmes include:-

- what will I eat and how will I prepare it ? what plants and animals did the Maroons have access to ?
- how can I hide ? how might a knowledge of trees and caves help me ?
- how can I send a secret message ? how might a knowledge of bird calls help me ?
- what can I give my child to play with that uses only natural materials ?

Objective 3: To promote awareness and appreciation of the intangible cultural heritage of the Windward Maroons, and its connection to the natural heritage of the BJCM

As with all other objectives, this one must be planned and implemented working with the Maroon communities and relevant organizations. Three main strategies are recommended:-

1. Organization and hosting of festivals

These can simply be an improvement on the existing ones inclusive greater collaboration and cooperation including in the fundraising:-

- February – Misty Bliss – held at Holywell and organized by Park management
- June – Quao’s Day – held at Charles Town and organized by the CTMC
- August – Emancipation Day – held at Ambassabeth and organized by the BPFA
- October – Nanny Day – held at Moore Town and organized by the MTMC

2. Educational packages and Interpretation

Educational packages should be designed for primary and secondary level students and these should be disseminated to schools at Maroon museums, cultural centres and exhibits. A manual on herbs, *Useful Plants of the Maroons: A Teachers Guide* was produced by Maroon herbalist Ivelyn Harris in 2004, working with the Centre for International Ethnomedicinal Education and Research Inc. Similar manuals that support the Jamaican school curriculum and link natural and cultural heritage to Jamaican history and living traditions should be produced to include activities and work-sheets, teacher’s guidelines and possibly DVDs. These manuals can be disseminated through the school system but tours should be offered, particularly at Maroon cultural centres but also at the Park’s recreation areas.

Interpretation is less formal than education and must be fun, as the participants are usually visitors to an attraction, whose main motivation may not be learning something. It must tell a story and be relevant to their lives. Interpretation should be implemented in various ways at heritage attractions within the BJCM, but should provide the same message – the importance of conserving our heritage. Interpretation will likely include brochures, signs, exhibits and tour guiding. Ideally all interpretive materials should be designed together to ensure good flow and support for each other rather than having conflicting designs, messages and information.

Park management should continue to work with the Maroon communities to develop, disseminate and deliver educational packages for school groups and interpretive packages for visitors.

3. Blue Mountains Sustainable Tourism Programme

This Programme has already been designed working with the Maroon and other BJCM communities. Funds are being sought for implementation which is anticipated to start by early 2011. This programme will organize tourism cluster groups to liaise with a secretariat within the JCDT for the marketing and sales of BJCM packages and tours, as well as for product development and conservation of the heritage on which the tourism depends. The Programme will facilitate the festivals as events marketing as well as tours including the exploration of the Maroon Heritage Route. It will be implemented under the BJCMNP's Recreation and Tourism Programme.

7.5 Research

Research is required to gain a better understanding of the heritage in order to better manage and conserve it. The promotion of research will therefore be an on-going focus for Park management over the next five years. This area in particular will require the Park to lean heavily on its cultural heritage partners with the capacity for research, and to promote visiting researchers who work closely with local researchers.

Involvement of the Maroons

In the past, much of indigenous, non-western culture was studied by Western scientists and often focused on artefacts preserved in museums, displaced from its cultural context. Nowadays there is greater emphasis on involving the indigenous people themselves, and giving greater attention to indigenous knowledge (Czermak et al. 2003). The secrecy of the Maroons in terms of guarding their heritage has meant that anyone wanting to research Maroon heritage must first gain the trust of, and obtain the blessing and assistance from the Maroon Council to proceed. This has meant that the study of Maroon heritage has to date very closely involved the Maroon community. Intangible heritage including indigenous knowledge can only be fully understood within its cultural context, and therefore the Maroons must continue to be fully engaged in all aspects of research. Involving not only the elders but also younger persons is important in ensuring the continued transmission of oral traditions.

Objective 4: To promote research that will inform park management, but will not threaten conservation of the BJCMNP's cultural heritage.

Appendix 6 contains a Research Prospectus for the Park that should be added to as gaps in knowledge are identified. Efforts must be made to improve the prospectus with respect to cultural heritage research need, and to disseminate this prospectus to research institutions to encourage them to conduct research that will help to fill some of the knowledge gaps. Existing websites such as the Jamaica National Heritage Trust and Institute of Jamaica – African Caribbean Institute websites should be considered for hosting or linking with the prospectus or relevant sections. Stronger linkages must be

developed with the Archaeology Department at the University of the West Indies and other relevant research institutions. This will be aided with JNHT on the BJCMNP Co-Management Committee.

Park management should endeavour to participate in conferences and workshops to present information and papers on the National Park. Papers and reports on the conservation and other Park programmes should be available on the Park's website and also should be sent to relevant networks for dissemination.

As recommended for Conservation of Natural Heritage, field stations can be particularly useful for researchers, and the Millbank Ranger Station would be of particular relevance.

For easy reference to research applications, a Research Log (Appendix 7) will continue to be kept for research activities occurring in and around the park. Park management will continue to try and establish relations with visiting researchers and accompany them on field expeditions.

Technical Advice

Park management recognizes that conservation, research and monitoring activities are very technical issues and often require expert opinion and advice. As the focus of BJCMNP has been mainly on natural heritage conservation, it will be even more important to obtain advice from relevant agencies as indicated earlier. The JNHT which will be sitting on the BJCMNP Co-Management Committee will play a vital support role in the form of technical advice, particularly on cultural heritage conservation, research and monitoring.

In addition to the regular assistance, guidance and implementation activities through the JNHT, technical advice will be sought through the ACIJ and the UWI Archaeological Department. Bearing in mind challenges to regular committee meetings (as the pool of experts is limited and they tend to be very busy, the approach for 2011 to 2016 for technical advice will be to work closely with the JNHT and to call on the other organizations as needed.

Park management should participate in national committees regarding cultural heritage, to share the work of the BJCMNP, obtain guidance and support, and promote coordination and collaboration between agencies and organizations. A list of experts who can be called on from time to time, as their expertise is required should be established. Efforts should still be made to hold at least one meeting per year to share the work of the property, seek guidance and promote research in the BJCM.

Objective 5: To establish and protect the Intellectual Property Rights of the Maroon people.

The cultural heritage of the Maroons includes intellectual property that must be protected to mitigate against the exploitation of indigenous knowledge, and to ensure that benefits from the use of intellectual property e.g. food preparation techniques, are retained within the Maroon communities. Funding will be required for the technical and legal aid that will be required.

7.6 Challenges and Opportunities in Managing Sacred Natural Sites

A number of challenges and opportunities related to the conservation and management of sacred natural sites have been identified (Schaaf and Lee (eds), 2006) and are highlighted below and detailed in Appendix 8:

Challenges

- Multiple Stakeholders – multiple perspectives may cause conflicts
- Visitor Pressures and Access – may cause conflicts, especially if community is not ready to receive visitors, or the numbers that present
- Culturally Sensitive Activities -
- Development Pressure – may threaten the site
- Economic Considerations – may impact values
- Seasonal Differences – may impact visitor numbers and hence, facilities and resources
- Conflicting Jurisdictions and Integrated Approaches to Management
- Different Ways of ‘Knowing’ – scientific and indigenous knowledge

Opportunities

- Model Sites for Community-Based Conservation – Sacred Natural Sites may become such models
- Traditional Knowledge – will be very useful for conservation
- Cultural Identity and Diversity – reduces vulnerability
- Eco-Tourism – may provide opportunities for income generation which supports conservation (if properly planned and managed).
- Intercultural Dialogue – nationally and internationally
- The Value of the Sacred

Programme Summary: Cultural Heritage Conservation

Goal: To maintain and enhance the appreciation for and practice of the Maroon heritage associated with the Blue and John Crow Mountains.

Objectives	Programmes/Strategies	Activities	Monitoring	Resources	Timeframe and Priorities
1. To facilitate the conservation of the tangible cultural heritage of the Windward Maroons	1. Work with Maroon and other communities and relevant organizations particularly the JNHT to: (a) develop plans for trail development and use, and guide implementation of these plans, particularly as it relates to natural heritage conservation (b) add natural heritage conservation guidelines to JNHT standards to guide further archaeological work at Nanny Town and any other sites in the BJCMNP (c)organise monitoring visits and possible further archaeological studies at Nanny Town 2.Through BJCMNP Enforcement & Compliance Programme to monitor integrity of tangible heritage	1ai. Assist communities with the management of heritage trails 1aii. Assist communities with planning for proposed new trails in the Buffer Zone 1aiii. Develop conservation guidelines including monitoring checklist for trails in the BJCMNP and its Buffer Zone 1aiv. Guide planning for any proposed trails passing through the Park, and carefully monitor use of such trails 1av. Consider and guide planning for a proposed Maroon Heritage Route 1b. Facilitate development of rules and procedures for archaeological studies within the BJCMNP based on JNHT standards 1ci. Facilitate monitoring and archaeological studies of Nanny Town 2. National Park Rangers monitor trails and any tangible heritage for signs of degradation, defacement or destruction and report for action	Reports on community activities Guidelines document Maroon Heritage Route Plan Guidelines for Archaeological Studies within the BJCMNP Every five years, monitoring visit to Nanny Town – Report Annual monitoring Maroon trail - reports	Park Manager Conservation Science Officer NP Rangers Recreation Officer Cultural Heritage Officer only budgeted part-time from Yr 2 Technical Assistance Guidelines (1aiii, 1aiv, 1b) (\$600,000) Heritage Route (\$1 million) Visits to archaeological sites and annual patrol of trails (\$50,000 in Yr 1 & \$15,000/yr)	Medium Priority Ongoing Ongoing Yr 1 Ongoing Yr 3 – 5 Yr 1 – 5 Ongoing

Programme Summary: Cultural Heritage Conservation

Goal: To maintain and enhance the appreciation for and practice of the Maroon heritage associated with the Blue and John Crow Mountains.

Objectives	Programmes/Strategies	Activities	Monitoring	Resources	Timeframe and Priorities
<p>2. To facilitate the preservation of the intangible cultural heritage of the Windward Maroons</p>	<p>1. Work with Maroon communities and relevant organizations to develop and implement strategies to promote continued:- (a) preparation of foods using Maroon ingredients and techniques (b) making of Maroon craft (c) making and use of Maroon herbal remedies (d) implementation and use of Maroon music, song, dance, drumming, language (e) good governance of Maroon communities (f) transmission of the oral and intangible cultural heritage of the Windward Maroons</p>	<p>Ii. Facilitate meetings and workshops to develop strategies including training of youth Iiii. Facilitate implementation of strategies e.g. through fund-raising and the Blue Mountains Sustainable Tourism Programme Iiiii. Monitor implementation of plans</p>	<p>Workshop Reports and Strategy Documents Reports Annual Survey of Maroon communities</p>	<p>Park Manager or Cultural Heritage Officer or Recreation & Tourism Officer as available Technical Assistance Funds - For workshops etc. (about \$60,000/yr) - Projects – to be developed</p>	<p>High Priority Yr 1 – 2 Ongoing Yr 2 on</p>
<p>3. To promote awareness and appreciation of the intangible cultural heritage of the Windward Maroons, and its connection to</p>	<p>1. Work with Maroon communities and relevant organizations to: (i) organize festivals (ii) develop and implement educational packages (iii) promote community-</p>	<p>1. Seek funds to assist Maroon communities to improve existing festivals 2. Seek funds to develop, disseminate and deliver educational packages for school groups and interpretive packages for visitors</p>	<p>Festival reports Educational materials & monitoring form for school groups</p>	<p>Recreation & Education Officers Festivals \$500,000/yr \$1.5million for Education Proj.</p>	<p>High Priority Ongoing Yr 1 – 3</p>

Programme Summary: Cultural Heritage Conservation

Goal: To maintain and enhance the appreciation for and practice of the Maroon heritage associated with the Blue and John Crow Mountains.

Objectives	Programmes/Strategies	Activities	Monitoring	Resources	Timeframe and Priorities
the natural heritage of the BJCM	based cultural heritage tourism	3. Work through the BM Sustainable Tourism Programme to promote community-based Maroon tourism	Visitors' Book Programme Reports		Yr 1 on
4.Promotion of research that will inform park management, but will not threaten the conservation of the Park's cultural heritage	<ol style="list-style-type: none"> 1. Maintenance and promotion of a research prospectus to universities and researchers. 2. Screening of proposals for research in the park. 3. Maintenance of a database for research in and around the park. 4. Involvement in research activities that take place within the park. 5. Establishment and maintenance of research stations. 6. Regular dialogue with relevant experts. 	<ol style="list-style-type: none"> 1a. Provision of requested information to researchers. 1b. Promotion of research prospectus on the internet including links 2. Comment on proposals if possible 3. Maintain a data-base of research. 4a. Accompany researchers in the field on at least one occasion. 4b. Seek assistance from researchers for Park management e.g. training field staff and community members 5. Conduct repairs and improve ranger station at Millbank to promote use as a research station. 6a. Participate on relevant national and other committees. 6b. Meetings with relevant experts, as necessary and a meeting once a year to share results and seek advice. 	Research activity database	ED, CSO Mainly time of personnel and transportation to meetings and for field visits JA\$500,000 to upgrade Millbank Ranger Station for use as a research station Funds: Meetings; assist research \$40,000/yr	Medium Priority Ongoing Yr 1 and on Ongoing Yr 1 and on Yr 1 and on Yr 1 – 2 Ongoing Ongoing
5.Establish and protect Intellectual Property Rights of the Maroon people	Technical and legal research and document preparation and submission to relevant agencies	<ol style="list-style-type: none"> 1a. Seek project funds 1b. Implement project 	Project report IP document	Funding for technical and legal expertise \$1million	By Year 5 Medium Priority

Chapter 8

Enforcement and Compliance Programme

Enforcement refers to the act of compelling the observance of laws, while *compliance* is acting in accordance with those laws. Numerous pieces of legislation exist to address many of the country's environmental/natural resource use problems, but they often fail to do so because they are not enforced. In fact, enforcement of environmental legislation is often said to be the biggest problem that plagues management of Jamaica's natural environment.

Bruner et.al., 2001 in a paper reporting on a study of 93 tropical forest protected areas found that of several factors considered including budget, local community involvement, number of people living in the park and number of staff working on development and education, management effectiveness was most closely correlated with three enforcement issues:-

- the density of the guards – with the 15 most effectively managed parks having a density of 3 per 100km²
- the level of deterrents to illegal activity (particularly for clearing of forest) where deterrents were measured as the product of two factors:-
 - the probability of apprehending violators (whether 'red-handed' or 'after-the-fact')
 - the probability of the violator receiving a significant sanction if apprehended
- the degree of boundary demarcation

8.1 Enforcement and Compliance issues in the BJCMNP

Interestingly, the problems identified in the previous Management Plan as being associated with enforcement and compliance in the BJCMNP bear relevance to the Bruner et. al. findings. Whilst implementation of the BJCMNP Management Plan over the last five years did significantly address these issues, much more remains to be done, and efforts must be sustained for long-term impact. The following were the main issues identified and addressed:

1. The small scale of the enforcement effort (few enforcement officers, limited patrols, limited reporting of breaches), considering the vast 486 km² protected area consisting of largely rugged terrain. Park management was able to increase the Ranger Corps from 4 in 2005 to 7 in 2009, and the number of patrols from 43 in 2005 to 175 in 2008 with a decrease in 2009 to 100 due to insecure and inadequate funding. This moved the density of guards to about half the density in the most effective parks studied by Bruner et. al, 2001.
2. The unclear delineation of park boundaries in certain areas and poor understanding of land leases to private individuals has been a longstanding

problem. Despite improvement in the accuracy of the boundary and some transfer of information between the Commissioner of Lands and Forestry Department, enforcement officers are still unsure of their jurisdiction in many areas. Further, even if the boundary is clear on a map, the monuments and signs are few and far between and not very effective at marking a boundary in the field.

3. Despite sensitization exercises carried out by Legal Officers from NEPA and the FD, the problem of lack of awareness of environmental legislation and sensitivity to environmental offences (which are often viewed as unimportant) on the part of enforcement officers and the judiciary, perhaps in light of the high rate of violent crimes, continues to be a challenge.
4. Allowing ‘small time’ offenders and offences to slide such that no punishment is meted out and therefore the level of deterrence is reduced.

The difficulty in catching people ‘red-handed’ and in gathering evidence after a crime has been committed is another factor that reduces the level of deterrence by decreasing the probability of being apprehended or found guilty of an offence.



Plate 22: National Park Rangers confiscate illegal lumber (Source: JCDT)

5. Influential people being offenders or the ones behind the offence. The tendency in such instances is for enforcement officers to be wary of pursuing these offenders, and as they are often not the ones directly committing the offences, it is difficult to prove their involvement.

6. Lack of alternative legal income-generating opportunities, and so offenders are earning a livelihood by illegal and environmentally destructive means.
7. Lack of awareness and education about the illegal practice and their environmental consequences on the part of offenders.

The Bruner et. al., 2001 findings are supported by evidence from the BJCMNP, for example, an increase in illegal activity was observed in 2009 following a decline in the number of patrols from 175 in the previous year to 100 in 2009. The issues challenging compliance with, and enforcement of, relevant legislation remain and therefore must be addressed with alacrity, particularly as attention to this programme has been identified as a key tool for enhancing the Park's management effectiveness. The Enforcement & Compliance Programme Goal will be met through objectives implemented over a five year period as indicated in the table below.

Table 8.1 – Enforcement and Compliance Programme Goal and Objectives

Programme Goal: To stop encroachment of the BJCMNP boundary and destruction of the forest and wildlife within	
Objective 1	To increase the level of presence of enforcement officers and their effectiveness in detecting and mitigating breaches of relevant legislation
Objective 2	To contribute to the resolution of breaches inclusive prosecution of offenders
Objective 3	To resolve boundary discrepancies and re-establish and mark all boundaries.
Objective 4	To raise community awareness regarding: the BJCMNP boundary and legislation, particular issues that threaten the BJCMNP, and increase community involvement in addressing these issues.

8.2 Enforcement Officers

Customs officers, forest officers, fisheries inspectors, members of the Jamaica Constabulary Force (JCF) or Jamaica Defence Force (JDF) and persons appointed as Park Manager or designated as National Park Rangers, are all identified as authorized officers under the National Park Regulations of 1993. Further, under section 33, members or officers of the JCF, JDF and the Island Special Constabulary Force (ISCF) are deemed national park rangers. Despite the number of types of officers who are authorized to enforce the National Park Regulations, an insufficient number of enforcement officers was identified as an issue to be addressed in the previous management plan. Hence, increasing the level of presence of enforcement officers became Objective 1. The objective was achieved by increasing the number of National Park Rangers, but experience and evidence from Bruner et al., 2001 indicate need for a further increase in the number of enforcement officers. Budgetary constraints may prevent employment of sufficient national park rangers to achieve the ideal figure, however as the regulations

allow other officers enforcement authority, it should be possible to work together to ensure adequate coverage of the BJCMNP.

The National Park Regulations of 1993, section 32, state the functions of a National Park Ranger as, “to patrol the area of each national park, to protect the resources of that national park and without prejudice to the generality of the foregoing, to-

- (a) patrol and monitor the various zones of the national park;
- (b) enforce these Regulations;
- (c) maintain patrol vehicles, marking facilities and trails;
- (d) provide first-aid, emergency or rescue assistance to national park users in the event of accident or injury; and
- (e) assist in the conduct of environmental monitoring programmes”.

The section goes on to state that, “in the exercise of his functions within the national park, a national park ranger may-

- (a) require any person to refrain from any unlawful act or any act which in his opinion appears likely to result in the damage or destruction of any property, real or personal, which is owned by, in the possession of, or under the management of the national park or any user of the national park;
- (b) require any person whom he finds committing or whom he reasonably suspects of having committed any such act to state his full name and true place of residence or leave the national park immediately;
- (c) require the holder of a permit or licence to produce his permit or licence, as the case may be, for inspection;
- (d) seize any weapon, trap or device of any kind with which an offence appears to have been committed;
- (e) search any person whom he may reasonably have cause to suspect of contravening any provision of these Regulations”.

Between 2005 and 2010, Park management attempted to organize joint patrols with enforcement officers from other institutions however this was abandoned as a target due to the lack of success. A more specific and detailed approach to reporting offences to the relevant government agencies was implemented at the end of 2008, and this resulted in some more joint patrols. Further, in the near future, there may be increases in enforcement officer corps within some of the agencies, and this may aid the situation.

Another way to increase the density of enforcement officers is to involve community members in a variety of ways e.g. providing intelligence, warning offenders and potential offenders and assisting with some national park ranger duties. Community members during management planning indicated keen interest in assisting with enforcement, following training. In light of limited resources, this will have to be seriously considered.

8.3 Detection and Mitigation of Breaches

The strategies implemented over the last five years, as per the 2005 – 2010 Management Plan resulted in improved detection of environmental breaches and increased effectiveness of enforcement efforts, in terms of location and description of the breaches.

Efficiency and effectiveness in detecting and even deterring breaches of legislation must continue to improve.

In the previous Management Plan discussion amongst the relevant organizations suggested a greater role for government agencies in the *enforcement* component of this programme, particularly arrests and prosecution. National park rangers were seen as having a clear role, with respect to increasing *compliance* through maintenance of a uniformed and authoritative presence of at least 12 days per month in the field and the use of “interpretive enforcement” through outreach to community members for education about Park legislation. National park rangers were also seen as playing a major role in *enforcement* by conducting monitoring, surveillance and intelligence gathering exercises through regular, systematized patrolling of the park boundaries and by liaising with community members. Discussion during planning for this Management Plan indicated similar views, however it was recognized that the national park rangers needed to have powers of arrest in order to be more effective and not totally dependent on other agencies for enforcement.

Objective 1: To increase the level of presence of enforcement officers and their effectiveness in detecting and mitigating breaches of relevant legislation

Strategic Actions

- 1. Increase number of enforcement officers in the field.** Research and experience have indicated this as the most critical component of the Enforcement and Compliance Programme – maintaining a presence of uniformed enforcement officers in the field, to deter against the committing of breaches. Park management must make every effort to maintain the National Park Ranger Corps at its current level of 6 National Park Rangers and a Chief of Corps, and to increase the numbers. In light of the limited resources within any one of the co-management agencies (JCDT, FD, NEPA, JNHT) and relevant agencies (Island Special Constabulary Force [ISCF], Jamaica Constabulary Force [JCF], Jamaica Defence Force [JDF], Jamaica Fire Brigade and the Squatter Management Dept. – Ministry of Water and Housing) cooperation and collaboration is essential.

Despite some level of joint patrolling at the beginning and end of the previous five years, the average level has not been sufficient to make up for the small numbers within the BJCMNP Ranger Corps. Fifteen (15) has now been identified as the ideal number for the Corps, bearing in mind financial constraints. However, the reality is that these constraints are likely to challenge the delegated national park manager to increase the number of national park rangers to that figure. The Management Plan budget allows for only 12 including Chief of Corps. To ensure effective Park management, it will therefore be essential either for the Government of Jamaica to provide more funds to Park management for additional national park rangers, or to second enforcement officers from other agencies. This may still not result in enough personnel and so it will also be necessary to provide for the participation of

enforcement officers (inclusive of meal and other relevant stipends) in joint patrols with National Park Rangers on a regular basis (at least once per week or more, if the additional officers are not supplied).

2. **Quarterly inter-agency enforcement meetings.** Quarterly action planning meetings between NEPA, FD, ISCF and JCDT and other agencies with authorized officers, should take place to effect better coordination and collaboration between all these parties. These meetings should include sharing of rosters and reports.
3. **Address authority of National Park Rangers.** An issue that requires addressing urgently, is the authorization of JCDT employed National Park Rangers under the NRCA Act and delegation agreement. The National Park Regulations, 1993 sections 30 and 31 describe designation, notification and identification of National Park Rangers. Further, National Park Rangers should be gazetted as Special District Constables as per the Delegation Agreement of 2002 and also as Game Wardens. Despite some effort in the previous five years, these issues have not been addressed and have had a negative impact on the morale of the Ranger Corps. There is a need for clarity with respect to the vesting of powers of arrest in National Park Rangers, so they do not have to be totally reliant on other agencies and can be more effective enforcers in the field.
4. **Community Assistance.** Another strategy for increasing the number of personnel involved in the work of the Enforcement and Compliance Programme, is to establish a community programme however this is considered under Objective 4.
5. **Patrols.** Efforts to increase the level of efficiency and effectiveness in terms of detecting or even mitigating and preventing the conduct of breaches, regular patrols and other exercises should result in field presence of at least 12 days per month. Further, patrols should be conducted in a systematic manner so as to target both known threat hotspots and ensure full coverage by circling the Park at least 3 times per year. Other approaches to increase efficiency and effectiveness of patrols will be to vary the times of implementation from early morning through to night, so that persons will have no idea what time a patrol might be in the area. Despite the fact that National Park Rangers are usually on visitor management duty on weekends, this period should not be left out of the patrol roster, whether through involvement of other enforcement officers, or use of volunteers and other personnel to cover visitor management duties.

Increasing enforcement and compliance effort is recommended during Christmas and the beginning of the new school year (August - September), as there are increased instances of offences in the Park due to increased economic demand at these times. The Monitoring and Evaluation Programme proposes arranging for a helicopter fly-over the Park at least once a year, and the Chief of Corps should participate in this exercise as it will literally provide a “bird’s eye view” of the Park. It will aid in identifying areas for enforcement attention, which would otherwise go undetected due to the rugged nature of the Park and limited road access into the interior.

6. **Cultural Heritage Legislation.** During this management plan period, certain sites are expected to be declared national monuments. With the assistance of the JNHT, orientation and training should be provided regarding relevant legislation, so that National Park Rangers can bear these in mind whilst on patrol.
7. **Training** in this and other areas will be essential but is discussed in Section 8.8.

8.4 Resolution of Breaches

As the BJCMNP is both a national park, declared in 1993 under the NRCA Act of 1991, and a forest reserve, declared under the Forest Act of 1937, both sets of legislation provide the legislative framework in which the national park must operate. In addition to these, other legislation is relevant:

- The Natural Resources (National Park) Regulations (1993), (User Fees) Regulations (2003) and (Amendments) Regulations (2003)
- The Forest Act (1996) and Forest Regulations (2001)
- The Wild Life Protection Act (1945), and its relevant amendment Orders and Regulations
- The Watersheds Protection Act (1963)
- The Country Fires Act (1942)
- The Endangered Species (Protection, Conservation and Regulation of Trade) Act (2000)
- The National Solid Waste Management Act (2001)
- The Natural Resources (Permit and Licenses) Regulations (1996)
- The Water Resources Act (1995)
- The Watersheds Protection Act (1963)

Breaches may involve one or more of the above-mentioned pieces of legislation, however the National Park Regulations (1993) and Forest Regulations, (2001) are the most significant. Appendix 3 provides a review of these and other relevant legislation and policies and Appendices 15 – 17 provide copies of the BJCMNP Order and Regulations.

Breaches of legislation are detected through patrols and the Threats Monitoring System (Chapter 11). Urgent calls will be placed to relevant agencies if back-up is required or to arrange a joint patrol. Monthly reports and specific case reports should be sent to NEPA and FD. All collaborating agencies must work towards the resolution of breaches as one of the reasons cited for on-going breaches of environmental legislation is a lack of follow-up with enforcement action. Park management will lobby (through sending of reports to relevant agencies and individuals and through use of the media) for suspected offenders to be prosecuted and brought to justice. Efforts should be taken to increase the legal capacity of the various organizations involved. Further, all agencies will need to share information, particularly regarding the arrest and sentencing (if this occurs) of offenders, in order to keep morale high amongst enforcement officers.

Objective 2: To contribute to the resolution of breaches inclusive prosecution of offenders

Strategic Actions

1. **Arrest and charge offenders.** As noted earlier, Bruner et al, 2001 found that not only is it important to have a relatively high density of enforcement officers, but also to ensure a high level of deterrent to illegal activity. The latter will be ensured where there is a high probability that offenders will be apprehended *and* receive significant sanction. This will necessitate a more aggressive approach to enforcement than previously and will therefore require the involvement of enforcement and legal officers from government agencies. Based on the feedback from stakeholder consultations, community members are supportive of this approach and willing to assist in various ways. The majority of community members are concerned about the degradation and destruction of the natural resources around them because they have seen the negative impacts that are being caused e.g. erosion, fires, flooding and reduction of water flows, amongst others. They are also concerned because they do not see any action being taken against the offenders and feel that there is a need for more prosecution and charging of offenders. This will require judges who are sensitized to environmental issues and laws, and possibly an improved system of community service (since there seems to be a view that many environmental offenders are “just poor people trying to feed their children”) which could include involvement in reforestation.
2. **Publicise Cases.** It will not be sufficient to arrest, prosecute and even charge offenders. There is a need to publicise these cases so that people are aware that it is very possible that they may be caught and charged, if they commit an environmental offence. As the saying goes, “justice must not only be served, it must be *seen* to be served”. Reports on prosecution should be sent to all the relevant organizations, as even if releases are sent to the media, they may not be printed/aired or seen/heard. The public and enforcement officers should know that action is being taken.
3. **Address major issues – generally and on a case-by-case basis.** Under this objective, we also hope to abate the threats that exert a large, direct and devastating impact on the natural resources we are trying to protect, and which conflict with the vision for the park. It is assumed that the offenders who commit these offences are a minority group, with only a small percentage of people directly harming the Park’s natural resources eg. coney hunters, illegal loggers and farmers on crown land. Another group of offenders are sometimes “big” farmers, developers and commercial interests. A few such persons or groups implementing large-scale projects or using heavy-duty equipment can have devastating effects, and very quickly. Both types of activity require investigative and collaborative efforts involving all the relevant agencies and community members.

For some issues, there is a need to address them on a case by case basis, as these offences are usually very area specific e.g. river poisoning and illegal logging. Careful investigation and documentation along with the production and dissemination

of clear, informative reports will be essential. Other issues will require an approach that includes lobbying as they are wide-scale and encouraged by factors inherent in land tenure systems in Jamaica. Specifically, there is a problem with encroachment – squatters (small and large-scale) view ‘government’ land as a ‘free-for-all’ and this is made worse by the apparent ‘turning a blind eye’ – thus people assume they can clear forest to use the land within the National Park/Forest Reserve. There is a need for urgent action in this area including moving settlers and settlements, therefore, it can only be dealt with through a multi-agency approach.

It must be noted that under the current arrangements (as indicated in section 8.3) the delegated Park management organization has not been given sufficient authority to act effectively in this area, except to provide information and assist with investigations. As recommended above, this will need to be addressed in order to better meet the objective of resolving breaches of legislation.

8.5 Boundary clarification and marking

As indicated earlier, Bruner et al, 2001 found that clear boundary demarcation was highly correlated with park management effectiveness. One of the challenges to managing the BJCMNP is inadequate clarity regarding its boundary. A part of the problem is that the boundary is not marked in the field except for a set of concrete monuments, many of which are over-grown, and a few signs. Because of the wide spacing between these markers, there is a lack of precision regarding the location of the boundary “on-the-ground”. It would be a very expensive and nearly impossible process to clearly mark the complete boundary of the park, as many sections are rugged and difficult to access, however this is an issue that needs to be addressed, perhaps by the planting of a tree species with distinctive leaf colour or shape, as apparently was done by the Forest Department with the “Dragon Plant” (*Cordyline* sp.) in the past. Investigation would be needed to identify the most suitable plant. Involvement of local community members in planting and maintenance of these trees would help ensure the boundary location was well known. In some protected areas, a fire line is cut to demarcate the boundary but with the terrain and rainfall in the BJCMNP this would be very difficult to establish and maintain. In addition to simply increasing the number of signs and/or markers, community outreach to raise awareness and inform them about the location and marking of the boundary is necessary.

Another problem is that the National Park/Forest Reserve boundary is based on the piecing together of numerous parcels of land, and the surveying and mapping done originally has now been found to be somewhat inaccurate in certain areas. This issue is being addressed by the Forest Department, and they have already made a number of fine adjustments, however this is a tedious, time-consuming and lengthy process.

There is also an issue of inadequate clarity regarding leases of land within the BJCMNP, mainly in the PRM, through the Commissioner of Lands. Park management does not know where these lands are and has to return from the field and consult with the Forest Department, which sometimes does not seem to have information either. Most of these

leases were conveyed before the establishment of the National Park in 1993 and the new Forest Act of 1996. There was often no liaison with the Forestry Department, since at the time much of the land had been leased to the now defunct Forest Industry Development Company and through that agency to the Coffee Industry Board. The view at the time was that the land should be used for agro-forestry but unfortunately resulted in the loss of significant tracts of native forest. Further, the leases do not require any conservation practices, and they can be transferred without notifying the Commissioner of Lands. Fortunately, most of these lands are in the western Port Royal Mountains. It would be very useful to have clarity regarding these lands, and to implement a project to promote sustainable land use management, inclusive increasing biodiversity, in that area. Such a project would inform lessees that they are located within a National Park/Forest Reserve in an area zoned for sustainable use, and encourage them through information and demonstration projects, to manage the land in a manner which is more environmentally sustainable and promotes watershed and biodiversity conservation.

Objective 3: Resolve boundary discrepancies and re-establish and mark all boundaries.

Strategic Actions

1. **Re-establish BJCMNP boundaries.** A critical and strategic activity therefore, is the re-establishing of the park's boundaries and establishing land ownership - mapping and marking access points and erecting signs and other markers. This should include investigation into possible use of a plant species to aid in demarcating the boundary and implementation if found feasible. The boundary signs should include a few words regarding regulations e.g. no cutting of trees, no fires and no hunting. In addition a community awareness campaign would need to be implemented in conjunction with this demarcation programme. This will be a lengthy and costly process requiring the development of a project in order to identify and secure funding. At the same time, whilst it is recognized that land ownership within some areas of the National Park is dubious, there are substantial areas where ownership by government is certain and these areas should be clearly demarcated, hence such a project could be implemented on a phased basis.
2. **Increased Cooperation with the National Lands Agency.** The need for greater involvement of the Commissioner of Lands and the National Lands Agency and greater cooperation, particularly through the Forest Department was highlighted in a number of stakeholder meetings.
3. **Sustainable land use project for the western Port Royal Mountains.**

8.6 Community Outreach

Community outreach in order to increase community 'buy-in' and support was recommended strongly by various agency stakeholder representatives. Community

members were highly vocal in their demand to see and interact more with the Rangers (not just riding through) and further indicated their willingness to assist the Rangers.

Community outreach activities will be designed with due consideration to the most common offences in the BJCMNP and its Community Buffer Zone, cultural mores and the most cost-effective approaches. The issues of fires and protected species were identified as being of particular concern. Community outreach will be coordinated with the Education and Public Involvement Programme, however Rangers on duty in the field, should be required to make at least two stops to liaise with community members, whether at a public location e.g. school, library, police station or where a group are gathered e.g. on a farm. This is an important part of maintaining the level of presence – community members are sure that there were National Park Rangers in the area, promoting compliance with environmental legislation through discussion with community members and engendering support for the Park e.g. through provision of intelligence.

Objective 4: To raise community awareness regarding the BJCMNP boundary and legislation, in particular issues that threaten the BJCMNP, and to increase community involvement in addressing these issues.

Strategic Actions

- 1. Increase liaison with community members.** Increased liaison by National Park Rangers and other Park Officers, with community members whilst travelling to and from the Park through the Community Buffer Zone. A target of at least two stops (one in either direction) should be aimed at, in order to make such liaison a habit. The stop can be at a school, library, police station, or other location where community members are gathered, and can involve the distribution of brochures or other educational materials.
- 2. Improving intelligence gathering through improved relations with communities**
In addition to increasing liaison with community members, business cards for the National Park Rangers should be produced for distribution, so that community members have a number to call in order to report an incident. A toll free number to call was also suggested as sometimes persons, especially away from the town square might not have sufficient credit to make such a call.
- 3. Establishment of some form of “Community Forest Watch”** - a volunteer Ranger Corps whereby citizens would alert National Park Rangers to cutting of trees, fire and other illegal activities in or near the National Park boundary, and possibly implement some Ranger duties. Depending on the level of work they would take on however, they would need to have some form of payment or stipend. The Bowden Pen Farmers indicated willingness to enter into an arrangement to assist in manning the Millbank Ranger Station, but recommended training for themselves and other communities involved in this type of activity.

4. **Public awareness campaigns should address common offences** e.g. boundary, clearing of forest and fires, but they need to be designed based on an understanding of local culture e.g. regarding the use of fire, explanation of the importance of conserving the forest and the damage that the practice in question results in, and finally in addition to highlighting the “don’ts” there must be a list of “do’s”.

8.6.1 Common Offences that threaten the BJCMNP

The community outreach component should address common issues, concerns and offences that threaten the Park’s ecological integrity. The following activities are offences within the boundaries of the BJCMNP and some of them are common practices outside the National Park and therefore present a threat to the property:

- **Removal/cutting of trees.** It is an offence to *wilfully cut or destroy any plant* without the written permission of the park manager (Section 13(1e), National Park Regulations, 1993) and to *wilfully/negligently damage tree to fell, cut or drag timber* (Section 13 (1), Forest Act, 1996).
- **Farming and squatting.** It is an offence to *occupy/use land to cultivate* without the written permission of the park manager (Section 13(1), National Park Regulations, 1993).
- **Using fire.** It is an offence to *light, maintain or use fire except for domestic reasons in an area designated for this* (Section 12, National Park Regulations, 1993).
- **Bird shooting and hunting/collecting animals such as the Jamaican coney, yellow snake and giant swallowtail butterfly.** It is an offence to *catch, collect, hunt, shoot or kill birds or wildlife* without the written permission of the Conservator (Section 38, Forest Regulations, 2001). It is an offence to *take, destroy/wilfully injure, disturb protected animal, nest/eggs of protected bird* without the written permission of the park manager (Section 13(1d), National Park Regulations, 1993).
- **Fishing and River poisoning.** It is an offence to *fish in a national park without the written permission of the park manager* and to *use any poisonous substance, electrical charges or any other similar device for the catching or killing of fish*, (Section 19(1) and 19(5) National Park Regulations, 1993).
- **Offences associated with recreational activities such as graffiti, littering, removal of plants.** It is an offence to *deface buildings or signs...deposit litter...cut/destroy plant* (Sections 7(4), 4 & 13(1), National Park Regulations, 1993).

The above offences which threaten the National Park’s ecosystems must be addressed in the community outreach activities related to enforcement and more generally.

8.6.2 Fire Management

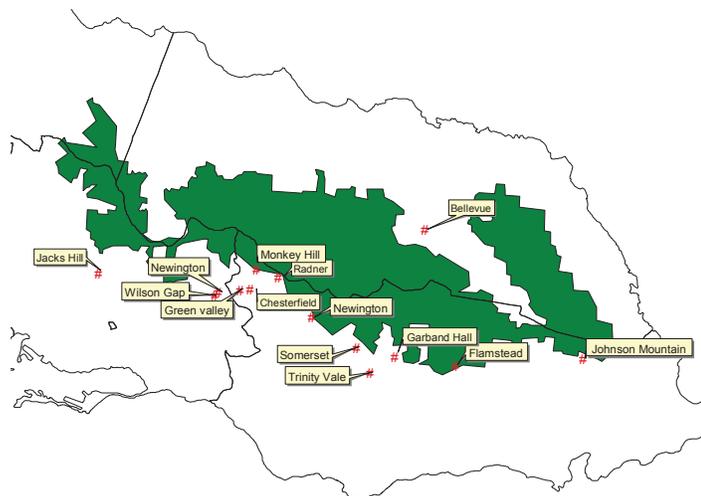
Unlike some national parks in other jurisdictions, fire has not been indicated in the natural regeneration cycle of forests in the BJCMNP. In fact, the majority of fires that burn in the National Park have been ignited by farmers as a means of clearing land, outside the boundary, for agriculture (slash and burn). Especially during the dry season, fires ignited to clear relatively small plots get out of control and become wild fires, causing tree death, land-slides, air pollution and destroying large expanses of modified forest. Fires are even sometimes lit in dry areas as a means of entertainment.

The threat of fire has been identified as a *medium* threat to the BJCMNP. The vast majority of fires in the BJCM are set and burn outside the boundary, but do present a threat to the National Park's ecosystems for many reasons. Following the passage of a wild fire, the burnt ground provides a nutrient rich seedbed for plants, a situation that invasive species take full advantage of, having the ability to colonize such disturbed environments by out-competing native species. Figure 8.1 below shows fire prone areas within the BJCM.

Considering the challenges of the terrain, the following are recommended:-

1. Sensitisation of communities through the media, signs, community meetings etc.
2. Training of community members in fire prevention and fire management
3. Institute an early warning system inclusive community volunteers for detection, reporting and action, including tools and equipment necessary for fire prevention and management and erection of "fire points" to access equipment when required.
4. Liaison with the Fire Brigade.
5. Enforcing legislation re: permit acquisition for fires, and facilitating the process.
6. Joint partnership with the JDF to out the fires from helicopter where sites were inaccessible by road or foot.
7. Record all detected instances of wildfires to track trends.

Figure 8.1. Fire Prone Areas of the BJCM



8.6.3 River Poisoning

The previous Management Plan gave the example of ‘river poisoning’ is an breach for which it was difficult to catch someone “red-handed”, however the reports indicate this practice is occurring outside the BJCMNP boundary but in the Community Buffer Zone.

Between 2007 and 2009, this activity had a focused two-year project in the Upper Rio Grande Valley. However, even with increased community support and detection by the authorities, none of the offenders except one, has been convicted due to a lack of evidence, as both the shellfish and the water need to be tested immediately after the poisoning event. These issues were raised again by community members during management planning workshops, and the question raised as to why witness testimony could not be accepted as evidence.

The Moore Town Maroon Council discussed the issue of river poisoning in some detail, expressing concern that other chemicals were now being used, and that there were serious challenges to the effectiveness of community enforcement that had been promoted in the Anti-River Poisoning Project. Specifically, these related to the issue of evidence:

- chemical testing is difficult – you have to collect a sample in a clean container (will you have one at the particular time you witness a river poisoning incident which is likely to be some distance from your home ?) then you have to freeze the sample and get it into Kingston as quickly as possible which is costly, and finally who will pay for the laboratory test which is even more costly than transportation)
- neither photographs nor eye-witnesses are accepted as evidence, only chemical evidence – this they felt was not realistic.

Finally, they noted that the Maroons used to use a herb called “Bitter Jarsie” which looks like ‘yam-head’ and they suggested that perhaps this could be introduced to the hunters as it doesn’t kill the crayfish/fish but just stuns them for a short time.

This issue will need to be addressed through arrest and successful prosecution of offenders. There also needs to be investigation into ways to better address the challenges in providing evidence.

Despite the fact that most of the fresh water within the National Park is fast-flowing headwater streams, and generally inaccessible, the broader issue of river and stream pollution must not be forgotten. National Park Ranger patrols must be alert to water pollution both within and outside the BJCMNP boundaries.

8.7 Emergency preparedness and management

Section 32(1d) of the National Parks Regulations (1993) indicates that the National Park Rangers play an important role in emergency preparedness and management, particularly as it relates to users of the national park. As managers of one of the most important components of Jamaica’s natural and cultural heritage resources, the BJCMNP management must be prepared for disasters e.g. hurricanes and other forms of emergency (e.g. fires, lost visitors) in order to manage such situations to reduce any negative impact.

This is particularly important for the National Park's recreation areas e.g. Holywell and the Blue Mountain Peak Trail.

There is a need for the analysis of the hazard vulnerability of the BJCMNP, and identification and mapping of areas of potential hazards. This information could guide the targeting of areas for specific management action e.g. reforestation, reduced access, increased monitoring. This issue has been included in the research prospectus.

Strategic Actions

1. **Audit Status.** Conduct an audit of the BJCMNP disaster/emergency preparedness status e.g. ranger station first aid and other equipment and take steps to implement any recommendations.
2. **Update Plan.** Revise and update the BJCMNP disaster/emergency preparedness and management plan.
3. **Collect Information.** Conduct or obtain hazard vulnerability and risk assessments from within the BJCMNP including maps of potential hazards.
4. **Incident Reporting.** Ensure proper reporting of any accident or other safety-related incident including lost visitors (station log book and reports to NEPA and/or JDF (search and rescue or medi-vac) as appropriate).
5. **Training.** Conduct refresher training with respect to search and rescue.

8.8 Training

Training is essential to provide and hone the skills required of a National Park Ranger. When the BJCMNP was first established, the initial Corps of Rangers received training through the JCF. This system was not maintained as new National Park Rangers were not recruited for a long period. Since the number of National Park Rangers has been increased over the past five years, the focus has been on in-house and on-the-job training. The last recruitment involved two Trainee National Park Rangers and a 3-week course was designed for them which included both class-room and field activities as well as tests. The Trainee National Park Ranger who remained on staff (as with most of the other National Park Rangers) was also able to take advantage of training organized for community youth under the Park's Education and Public Involvement Programme. This included basic tourism hospitality, tour guide and First Aid/CPR certification.

Strategic Actions

1. **Develop a Training Manual.** During this Management Plan period, efforts should be made to develop a training manual which has a specified time frame to cover a number of modules. All the relevant agencies e.g. NEPA, FD, JCF, ISCF, JDF and the Fire Brigade should be involved in the development and implementation of the

manual. This would help to ensure that National Park Rangers all had a similar level of training which was not limited to ‘on-the-job’ training. Where possible or relevant, community members e.g. from the “Community Forest Watch” could participate in the training.

Specific areas that should be covered in the training manual include:-

- Relevant legislation
 - Patrol skills – observation, recording information, map reading
 - Use of GPS units and cameras
 - Basic Ecology and Conservation (particularly as it relates to the BJCMNP)
 - Communication Skills
 - Report Writing
 - First Aid/CPR
 - Survival Skills
 - Search and Rescue
 - Fire Prevention and Management
 - Basic GIS skills
 - Conflict Resolution
2. **Conduct Training.** Training based on the Manual should be conducted. This should be done where possible in conjunction with other authorized enforcement officers. Refresher courses should also be conducted from time to time, or as required as it relates to certification e.g. for First Aid and CPR.



Plate 23: National Park Ranger at a Forest Reserve boundary monument (Source: JCDT)

Programme Summary: Enforcement and Compliance Goal: To stop encroachment of the BJCMNP boundary and destruction of the forest and wildlife within.				
Objective	Programmes/Strategies	Activities	Monitoring	Resources
1. To increase the level of presence of enforcement officers and their effectiveness in detecting and mitigating breaches of relevant legislation	<ol style="list-style-type: none"> Increase enforcement density by employing additional Rangers &/or secondment of enforcement officers from other agencies, and joint patrols (and involvement of community members – see Objective 4) Continue regular patrols but vary time of patrols to increase probability of detecting breaches Investigate possibility of at least an annual helicopter reconnaissance tour linked to forest area monitoring National Park Rangers can address legislation pertaining to cultural heritage Ensure trained National Park Ranger Corps 	<ol style="list-style-type: none"> Restore the Park's Ranger Corps to the required complement of 15 Rangers through a combination of employment of additional NP Rangers, secondment from other agencies, increased joint patrols and a Community "Forest Watch" Programme Address the issue of lack of clarity of NP Ranger status re: NRCA and ISCF Organise and implement patrols at least 14 days/month Organise and implement joint patrols at least once per week and collaborative enforcement agency meetings quarterly. Prepare and implement a roster that varies patrol times so that they do not always occur in the late morning. Implement seasonal patrols based on increases in illegal activities at certain times of the year Investigate and implement helicopter reconnaissance tour at least annually Liaise with the JNHT re: making sites in the Park and its Buffer Zone national monuments and develop and implement a plan to address the enforcing of legislation Design and conduct training and develop manual, in collaboration with relevant agencies 	<p>Monthly reports with photos and information on # patrols, # joint patrols, # offences seen and action taken e.g. breach stopped, and location (GPS)</p>	<p>Funding for NP Rangers – salaries and meal stipends, transportation, uniform, gear & communications</p> <p>Plan budget provides for only 12 Rangers inclusive C/Corps and Trainee Rangers, but adequate funds may not be sourced</p>
				<p>1a. By end of Year 5</p> <p>1b. By Year 2</p> <p>2. By end of Year 1 and ongoing</p> <p>3. By end of Year 1 and ongoing.</p> <p>1 – 3 (High Priority)</p> <p>4. By end of Year 2 (Medium Priority)</p> <p>5. Training ongoing from Year 1 (High Priority); Manual by Year 5 (Medium Priority)</p>

Programme Summary: Enforcement and Compliance
Goal: To stop encroachment of the BJCMNP boundary and destruction of the forest and wildlife within.

Objective	Programmes/Strategies	Activities	Monitoring	Resources	Timeframe and Priorities
2. To contribute to the resolution of breaches of inclusive prosecution of offenders	<p>1. Strengthen National Park Ranger Corps, as above.</p> <p>2. Collaborate with other agencies for enforcement action, particularly arresting and charging offenders. Investigate possibility of community service.</p> <p>3. Publicise cases to warn potential offenders & raise enforcement officer morale</p> <p>4. Identify issues and cases requiring special attention and work assiduously to resolve these.</p>	<p>1. Implementation of Ranger Threats-Monitoring System to gather and record information</p> <p>2a. In addition to monthly reports, send detailed reports on specific concerns</p> <p>2b. Collaborate with other agencies for investigation, arrest and prosecution</p> <p>2c. Quarterly inter-agency meetings</p> <p>3. Other agencies provide information on arrests, prosecution and charges inclusive media releases for publicity</p> <p>4. Investigate, lobby, educate and otherwise address common offences e.g. fire, river poisoning and major systemic issues e.g. squatting.</p>	<p>Ranger Threats-Monitoring System, Reports on # observed offences, # arrests, # prosecutions and # charged</p>	<p>Time of:</p> <ul style="list-style-type: none"> - Natioanl Park Rangers, - Chief of Corps, - CSO, EEO <p>Time of other Enforcement Officers including Legal Officers GPS units and digital cameras GIS</p>	<p>1. On-going</p> <p>2. Ongoing</p> <p>3. By year 1</p> <p>4. By year 1</p> <p>1 – 4 (High Priority)</p>
3. Resolve boundary discrepancies and re-establish and mark all boundaries.	<p>The Forest Department will play the lead role with respect to this programme, as the National Park is gazetted on Forest Reserve boundaries. FD will continue to work with the Commissioner of Lands to resolve these discrepancies. JCDDT will work with FD to mark/sign access points and other sections of the boundary and conduct community awareness activities.</p>	<p>1. Re-establish park boundaries on maps and clarify land ownership working with CoL and NLA (<i>FD lead</i>).</p> <p>2. Mark boundary on land, especially access points with signs</p> <p>3. Investigate possible use of plant species to mark the boundary and implement if feasible</p> <p>4. Implement community awareness programme re: boundary and Park offences</p> <p>5. Develop plan for a sustainable land-use management in the Port Royal Mountains and seek funds to implement project</p>	<p>Reports and Maps</p> <p>Reports with photographs and maps</p> <p>Reports</p> <p>Community survey</p>	<p>FD, CoL & NLA, other agencies and stake-holders</p> <p>Chief of Corps NP Rangers</p> <p>Funds for Signs etc. (see Education Prog)</p> <p>ED time</p>	<p>1. Resolution of lack of clarity by end of 5 years</p> <p>2- 4. By Year 3</p> <p>1 – 4 (Medium Priority)</p> <p>5. By Year 4 (Low Priority)</p>

Programme Summary: Enforcement and Compliance Goal: To stop encroachment of the BJCMNP boundary and destruction of the forest and wildlife within.					
Objective	Programmes/Strategies	Activities	Monitoring	Resources	Timeframe and Priorities
4. To raise community awareness regarding: the BJCMNP boundary and legislation, particular issues that threaten the BJCMNP and increase community involvement in addressing these issues	<p>Liaise with local community members and groups through education and outreach, in order to increase intelligence obtained from the communities.</p> <p>Develop specific plans for particularly threatening issues</p> <p>Revisit the National Park's fire management plans and develop an updated plan that is more cost-effective, and implement</p>	<p>1. Stop in communities whilst on patrol (2 stops per patrol) to talk with community members, distribute flyers, visit schools, police stations etc.</p> <p>2. Conduct community awareness raising activities including production & dissemination of relevant materials, regarding the boundary, fires etc.</p> <p>3. Develop a plan for a "Community Forest Watch" that involves community in providing information and also participating in some Ranger duties, and implement</p> <p>4. Develop and Implement plans to address specific threatening issues</p> <p>5. Develop and Implement a revised fire management plan</p>	<p>Monthly Reports including Maps</p> <p>Reports</p> <p>Plan and Reports</p> <p>Plans and Reports (As above)</p>	<p>Chief of Corps National Park Rangers</p> <p>Funding for: educational materials and activities, stipends for "community wardens" e.g. Trainee Rangers and Education Programme – Community Awareness</p>	<p>1. Year 1 and ongoing (High Priority)</p> <p>2. From Year 1 (High Priority)</p> <p>3. By Year 2</p> <p>4. By Year 3</p> <p>5. By Year 3</p> <p>3 – 5 (Medium Priority)</p>
	<p>Emergency Preparedness and Management</p> <p>Revise and update the National Park's disaster/emergency preparedness plan.</p>	<p>1. Conduct audit of current state of BJCMNP ability to manage emergencies</p> <p>2. Revise and update the Plan; Seek funds for training and equipment identified to enhance management capacity</p> <p>3. Conduct or obtain hazard vulnerability and risk assessments for Park</p> <p>4. Conduct refresher and other training</p> <p>5. Ensure proper reporting</p>	<p>Audit Report</p> <p>Revised Plan</p> <p>Reports Reports Reports</p>	<p>Chief of Corps National Park Rangers</p> <p>Training funds</p>	<p>By Year 2 (Medium Priority)</p>

Chapter 9

Education and Public Involvement Programme

Environmental education results in the empowering of communities to participate in the environmental management of their surroundings. Education is communication in a sustained and organised manner to bring about changes in attitudes, values, practices or knowledge (Saeed, S. et. al, 1998, IUCN).

The Education and Public Involvement Programme of the BJCMNP supports its ultimate conservation goal by providing the impetus for stakeholder involvement in activities that facilitate this goal, in particular, increasing the environmental sustainability of resource use and livelihoods around the National Park. The 2011 - 2016 programme builds on the success of the 2005 – 2010 programme. The latter had several relatively new components, based on lessons learned through experience and evaluation of previous programmes and activities.

9.1 Promoting Public Involvement

The public can be involved in supporting National Park management directly through donations of money or time, and indirectly through sustainable practices outside the boundary. This support is essential for the effectiveness and sustainability of the programmes that will conserve the resources of the BJCMNP. Involvement of the public (living and working within the Community Buffer Zone and further afield) requires first, an awareness and knowledge of the National Park – its natural and cultural resources, its role and importance to our lives; then concern and motivation to want to do something; and finally the skills and practical experience to actually implement a particular activity.

Within the context of managing the BJCMNP, the focus of education must ultimately be on changing practices, particularly those impacting on the integrity of its ecosystems. This will be of particular relevance to communities and resource users around the National Park with respect to promoting sustainable livelihoods that incorporate conservation of the natural resources of the BJCM. Education will therefore need to be addressed in the broadest sense, from raising awareness through to changing attitudes, values and practices. In order to change practices, education must include skills training and hands-on activities that allow participants to implement new or modified practices and assess the results for themselves. For community-based resource users and other community members there will likely be a need for empowerment and capacity building to enable participation as good stewards of the resources within the National Park and its Community Buffer zone. These are time-consuming and labour-intensive activities, which due to limited resources for park management (even partnering with relevant agencies and focusing only on a few communities at a time) it may not be possible to implement at an ideal level. Despite this, facilitating involvement of local community members in sustainable livelihoods will be an important Park management strategy.

Income generation (often at significant levels e.g. coffee production), cultural practices, government policies and product market strongly influence the overuse or inappropriate use of resources, therefore, it will be important to raise awareness beyond the communities surrounding the BJCMNP. A communications strategy should be designed and implemented to address this wider target group. The role of the National Park’s recreational areas in promoting an interest in conserving its resources, through interpretation will be relevant to both local communities and the wider public.

Table 9.1 – Education and Public Involvement Programme Goal and Objectives

PROGRAMME GOAL	PROGRAMME OBJECTIVES	TARGET GROUPS	SUB-PROGRAMMES
<i>To raise support for conservation of the BJCMNP’s natural and cultural heritage and improve resource management and the sustainability of livelihoods, particularly in Buffer Zone communities.</i>	1. To facilitate capacity building of at least 120 persons from at least 6 communities, for more environmentally sustainable livelihoods and greater involvement in management of the resources of the BJCMNP and its Community Buffer Zone.	1	Community Conservation and Sustainable Livelihoods Programme
	2. To increase awareness about the National Park’s natural and cultural heritage, importance and management, in order to increase the level of support for the BJCMNP.	1 and 4	Public Awareness Campaign – community and general public
		2 and 3	Interpretive Programme
		1 and 2	Buffer Zone Schools Programme

Target Groups

Group 1: Communities (particularly resource users) around the park. They include farmers, community-based organizations such as citizens, churches, schools, youth and women’s groups; and business entities such as shops and business interests in coffee, spring water and tourism.

Group 2: Schools (teachers and students) around the park, in eastern Jamaica and the rest of the island.

Group 3: Visitors (to the Park’s and Buffer Zone’s recreation areas).

Group 4: The wider public including businesses and government agencies.

9.2 Community Conservation and Sustainable Livelihoods

The purpose of this programme (or sub-programme of the Education & Public Involvement Programme) is to empower community members and organisations to better conserve natural and cultural heritage, improve environmental management and practice sustainable livelihoods. Ultimately, the natural and cultural resources within the BJCMNP and its Community Buffer Zone will show improvement in status and appearance. This sub-programme will facilitate training and ventures in sustainable livelihoods e.g. sustainable agriculture, manufacture of value-added products, and will link closely to the Recreation and Tourism Programme e.g. facilitating sustainable community tourism through the Blue Mountains Sustainable Tourism Programme.

Based on the successful implementation of activities under this sub-programme over the past five years, the emphasis will be on strengthening capacity and preparing to move on to target other communities, with the assistance of persons from communities targeted in the previous and current five years.

Objective 1: To facilitate capacity building of at least 120 persons from at least 6 communities, for more environmentally sustainable livelihoods and greater involvement in management of the resources of the BJCMNP and its Community Buffer Zone.

Capacity building aims to improve the effectiveness of individuals and organizations in their implementation of various functions. In order to better conserve the BJCMNP, management must aim to increase and improve environmentally sustainable livelihoods around the National Park, and increase involvement of community members and other stakeholders in conserving natural and cultural heritage in and around the BJCMNP. Capacity building is often thought to be synonymous with skills training and material resources, but it also includes elements such as culture and structure of an organization, adaptive strategies and linkages (Krishnaryan et. al., 2001). These elements are relevant to individuals and organizations. Strengthening capacity is a major factor in empowering individuals and organizations to address issues that impact them.

Strategic Activities

Activities under this objective will focus on targetted communities, for greater effectiveness and impact. Partnership with organizations such as the Social Development Commission (SDC) and JNHT will be essential, e.g. for provision of resource personnel for training. There will continue to be two main strategies:-

- (i) A focus on youth (17 – 25 years) as potential change-agents in local communities) and the development of a cadre of young Community Buffer Zone members who are concerned, willing and able to work for the conservation of BJCM resources.
- (ii) A focus on adults, particularly through community-based organizations (CBO) with activities that aim to make existing livelihoods more sustainable, and to introduce and develop new sustainable livelihoods opportunities. The youth will be encouraged to participate in these activities, and play a role in the local CBO.

Youth Programme:

There will be two levels of activity: (i) the basic level which will target larger numbers of youth, primarily through skills training activities, and (ii) the intensive level which will target a smaller number of keen, interested youth from within the larger group. Training will include basic BJCMNP knowledge, life skills (e.g. conflict resolution), sustainable craft development, horticulture, tour guiding and other tourism related skills. The intensive level will see the formation of a small group of environmental stewards who can accompany and assist National Park Rangers on various park management activities.

Based on the success of the 2009 youth programme, the initial focus of the first one or two years under this Management Plan may be intensive work with this cadre of youth. This will result in deepening and strengthening of the impact of the programme.

Table 9.2 Activities Under the Youth Programme

Basic Level Activities	Intensive Level Activities
<p>i) Identify training needs and interests along with potential business opportunities in specific buffer zones around the park.</p> <p>(ii) Identify training providers in the various knowledge/skill areas and make arrangements for training.</p> <p>(iii) Source funding for training activities.</p> <p>(iv) Design training such that all skills relate to natural and cultural heritage conservation.</p> <p>(v) Conduct training.</p> <p>(v) Encourage youth to upgrade their education, pursue further training, seek employment or start their own business</p>	<p>i) Identify youth from the basic level activities who have the aptitude and interest in working more closely in park management.</p> <p>ii) Identify funding sources to at least be able to provide stipends.</p> <p>iii) Roster environmental stewards to work alongside National Park Rangers in park management activities e.g. reforestation, visitor management and enforcement.</p> <p>iv) Facilitate youth in further training, job placement, business start-ups etc.</p>

Monitoring and Evaluation

This programme will be evaluated by the use of questionnaires and possibly, focus group discussions or interviews. Up to 2009, UNESCO supported this activity, inclusive of evaluation; however, the Park's management will need to develop its own source of funding in order to continue the programme.

Adult Programme:

Four to six communities will be selected each year (not necessarily different ones each year) based on interest shown by CBO and individual community members, and organizational capacity within the management entities. Participatory methodologies will be used to work with these communities to identify issues of concern related to the BJCMNP and its management and to develop and implement action plans that allow community members to participate in natural resource management activities that benefit both the National Park and themselves. Raising awareness and concern within these communities through these core groups will be one component of the activities planned. This process will also allow identification of persons interested in park management support e.g. accompanying National Park Rangers on patrols or other activities.

The basic thrust will be to:

- i) facilitate the strengthening of local, community-based capacity for cultural and natural heritage management through training and more participatory approaches; and
- ii) facilitate socio-economic benefits to communities from conservation through to sustainable livelihood opportunities, particularly in sustainable recreation, tourism, agriculture and cultural heritage use.

Training will be facilitated by Park management, such that where relevant knowledge is available in-house – this will be used, but an emphasis will be placed on using the resources of volunteers and other organizations e.g. Rural Agricultural Development Agency (RADA), Jamaica Cultural Development Commission (JCDC), FD, SDC, JNHT.

Documentation of the process, achievements and lessons learned, along with the dissemination of this information will assist park management in evaluating and improving its programmes in this area. Use of photography to portray “before” and “after” conditions is a very useful method of recording information in a way that can be used for monitoring and evaluation. The following documents “*A Plan for Ongoing Stakeholder Involvement in the Management of the BJCMNP*” and “*Monitoring and Evaluation of On-going Involvement of Community Stakeholders in BJCMNP Management*” prepared by Janet Bedasse for JCDT in 2005, with funding from CANARI, will be useful in guiding the monitoring and evaluation of the activities with each community-based organisation.

Recognising the long-term and human resource-intensive nature of participatory resource management, the selected communities will be focused on for long periods of at least three to five years. Bearing this in mind, and based on activities and successes over the past five years, the targeted communities for at least the first two years of this Management Plan period should be drawn from the following:-

- Millbank and the Bowden Pen Farmers’ Association
- Ginger House/Comfort Castle
- Charles Town and the Charles Town Maroon Council
- Moore Town and the Moore Town Maroon Council
- Woodford/Freetown and the Woodford Community Action Group

- Cascade/Section
- Irish Town/Redlight/Middleton
- Mavis Bank
- Hagley Gap/Minto/Penlyne Castle

These communities have already participated in exercises to determine appropriate sustainable livelihoods and plans have already been developed and some training implemented. As per the approach described for the Youth Programme with a basic and a more intensive level, these communities will focus on implementation of their plans, and later on in the five year period, if possible other communities can begin to be targeted for capacity building. For the majority of the communities identified above, the main focus will be on sustainable community-based tourism through the implementation of the Blue Mountains Sustainable Tourism Programme e.g. trails and provision of meals.



Plate 24: Farmers from Woodford and Freetown learn to use an A-frame to contour land (Source: JCDT)

The sustainable agriculture activities initiated in the Woodford/Freetown and Cascade/Section communities should also be built on. Whilst training activities have already been implemented, “refresher” training activities should not be ignored. These communities will be encouraged to visit each other and learn from each other and a spirit of competition and local community pride will be encouraged. Where possible, for example with the Bowden Pen Farmers Association, communities should also be involved more formally in aspects of park management. This can link with the Enforcement and Compliance Programme objective of involving community members.

The use of the monitoring and evaluation system described in the Management Plan was not used in a formal or consistent manner, due to changes in staffing and general resource challenges. Effort should be made to improve implementation of the monitoring and evaluation system during the new Management Plan period.

Monitoring and Evaluation

The methodology for monitoring and evaluation will be that described in Bedasse, 2005. This has a focus on the monitoring and evaluation of activities implemented based on an action plan developed by each community, using a participatory process. The action plan will focus on areas in which the community can assist with natural resources and Park management, and address the sustainability of their livelihoods. Where there is funding for a specific project, the action plan for that project will guide monitoring and evaluation.

In addition, and particularly for communities that may not be at a stage to develop action plans, photographs will be taken pre- and post-activities and work in the community in general. Permanent photo-monitoring points will also be established and used.

9.3 Public Awareness

For people to be interested enough and then willing to be involved in new or different activities e.g. improving the sustainability of their livelihoods, volunteering to assist with park management activities, or making a cash donation, they must first be aware of the cause. They need to know what the issue is, how it is relevant to them, why and how they should get involved. The first step therefore in education aimed at changing practices, is to raise public awareness, which will require different approaches for the different target groups. There are three main target groups to be addressed under this objective – BJCMNP Community Buffer Zone members, general public and students.

Objective 2: To increase awareness about the National Park’s natural and cultural heritage, importance and management, in order to increase the level of support for the BJCMNP.

Public Awareness Campaign

A public awareness campaign which delivers basically the same message about the BJCMNP’s natural and cultural heritage, their importance and management should be developed which targets different groups. As there will be different target groups, not all the methods of delivery will be exactly the same, although some tools will probably be used for more than one group. The two main target groups identified are local communities within the National Park’s Community Buffer Zone, and the wider public.

Ideally, the public awareness campaign should be designed and implemented by professionals and should involve the use of focus groups to gather information regarding perceptions of the park, which would then be analysed and used to develop messages and the most appropriate means of delivery for each target group. Bearing in mind the limited resources available for Park management, and the fact that an organized public awareness

campaign was aimed for but not implemented during the previous Management Plan period, it is recommended that efforts are made to develop and implement a campaign using available resources. For example, information can be derived from the management planning community meetings that have already been held, and a simple questionnaire; also partnerships can be strengthened with other organizations that have professional capacity, and assistance can be obtained from volunteers.

9.3.1 Buffer Zone Communities

There are about 51 communities with a total population of approximately 30,210 within the BJCMNP's Community Buffer Zone (a 1km wide zone around the boundary plus a few other strategically located or relevant communities e.g. Charles Town, Portland) and these are listed in Appendix 6. Experience from the previous five years of National Park management and feed-back from communities during the planning process for this Management Plan indicate a need for greater outreach to communities beyond those targeted under the capacity building component of the Education and Public Involvement Programme. Whilst it is impossible to build capacity within all the Buffer Zone communities (due to the intensive work required and the limited resources available) it is essential to raise public awareness about the BJCMNP, in all of these communities.

Community Awareness-raising Campaign

Whilst the over-arching theme will always be the BJCMNP and the importance of its natural and cultural heritage, and the message one encouraging its conservation, there will be sub-themes and messages addressing particular issues and perhaps specific target groups within a community. A slogan encapsulating the "Protect our National Park" message and a clear concise set of sub-messages (what community members should do) needs to be developed. Bearing in mind the issues raised by stakeholders, key sub-messages (not actual text) could be:-

- Look out for the National Park boundary ! – stay on your side of the line
- Admire our beautiful animals – don't kill them – many are unique to Jamaica
- Plant more trees
- Careful with the Fire !

These could be repeated regularly as part of the campaign, under the broader "Protect our National Park" message, and smaller campaigns developed for each sub-message.

Special attention must be paid to the issues raised in the Enforcement and Compliance Programme e.g. Park offences (See Section 8.6 for detailed information).

In addition to the usual dissemination of flyers, brochures and posters, the following should be considered for the community awareness-raising campaign, bearing in mind that a campaign consists of several components all with the same theme and message:-

- Presentations during regular meetings of existing groups

Link into existing community groups e.g. Agricultural Production and Marketing Organisations, Police Youth Clubs, Church Groups, and obtain permission to make a presentation during one of their regular meetings. Standard presentations can be

developed so that different staff members or volunteers can present. Links can be made through government agencies that liaise or support these community groups e.g. SDC or RADA. However, linkages may need to be made through the parish headquarters rather than the national, which may not have detailed information. With respect to churches – there are usually several groups within the church, and it may be possible to place a notice or make an announcement at church services.

- Town-square meetings

These have been used successfully over the past five years, and community members recommended them for continued use. Essentially these are community meetings where an audio-visual presentation is made to disseminate the key messages. However, the venue is very central e.g. literally within the town square, and not within a community centre, school or church, as often-times some people will not enter these venues. This type of meeting is primarily for raising awareness of the wider community. If there is a need for greater participation of community members e.g. for planning or evaluation, then an in-door venue is more appropriate. Provision of refreshment e.g. soup can encourage persons to participate in meetings at in-door venues, if this will be more appropriate or convenient e.g. during rainy season. Use of relevant popular music or showing a popular video are strategies that have been used successfully to draw a crowd.

- Exhibit at Community Events or Key locations

“Pay-day” at Coffee Factories is likely to be an event at which numerous community members are gathered in one location. Sporting events e.g. football matches may also create a setting where community members are gathered. These may be opportunities to set up exhibits about the BJCMNP to capture a community audience that would not be willing to come out for a “National Park” event.

- “Walk and Talk”

Use National Park Rangers and volunteers to walk through the community prior to the meeting, to disseminate brochures and talk to community members about the BJCMNP.

- Park Song/DJ Competition

Organising a Song/DJ Competition between communities may be another way to create interest. This could be associated with the hosting of town-square meetings/events – which feature local competitors and would lead up to the grand finale which could be held during Misty Bliss. The theme of the song would have to be BJCMNP-related and it might be useful to focus on “sing-jays” to ensure both musical and lyrical content. Clear rules and regulations will need to be provided to make certain the items can actually be used in later promotion of the National Park. The National Environmental Education Committee and Panos have experience implementing such a competition.

- Radio

Use of time signals or temperature announcements should be considered as they are repetitive and relatively low cost compared to other formats. The most popular stations listened to in the Community Buffer Zone must be used.

- DVD

Brief features (15 minutes) should be produced on a variety of key conservation issues e.g. fires, clearing of forest. They could then be used not only for community awareness-raising e.g. at regular community meetings, town-square meetings, exhibitions but also in schools and in the Interpretive Programme.

Specific Community Target Groups

Within the local communities, a sub-target group was identified – farmers, particularly Blue Mountain Coffee farmers. Where possible, a specific campaign e.g. through a brochure and participation in Coffee Industry Board activities should be implemented.

9.3.2 General Public

General public refers to all Jamaicans (outside the Buffer Zone communities) and it is important for all Jamaicans to be aware of the BJCMNP as it is a significant component of Jamaica's heritage and of international importance too. For the purposes of reducing this broad group to a more manageable target group, the focus should be on adults, and at least initially (bearing in mind limited resources) a major focus should be placed on those adults in the Kingston Greater Metropolitan Area and then Eastern Jamaica. The following are key groups that should be targeted:-

- Tertiary level students – send information/make presentations at clubs to encourage hiking, outings, research
- Persons interested in natural history and cultural heritage – through participation in exhibitions that such persons might attend
- Corporate Jamaica (the business community) – invitation to sponsor and participate e.g. corporate family outings linked to planting trees
- Government agencies

The focus of the Public Awareness Campaign targeting the 'general public' should be on the national and global significance of the BJCMNP – its unique biodiversity and rich cultural heritage. The message should be that all Jamaicans need to get involved in conserving our National Park's natural and cultural heritage. This approach could easily be linked to possible UNESCO World Heritage Site status and maybe to Jamaica's 50th Independence celebrations in 2012. Further, this could be linked (for a full year or more of activities) to the BJCMNP 20th Anniversary in 2013. For the purposes of this Management Plan, the Campaign will have two components – the on-going public awareness raising described below, and the components that will be added with the raising of additional funds for a formal campaign.

On-going public awareness-raising should include:

- Website – this should highlight the BJCMNP's natural and cultural heritage and feature its management programmes, activities and achievements. The public should be encouraged to get involved by visiting the National Park and its Community Buffer Zone (linking with the Recreation and Tourism Programme marketing) and through membership/volunteering with the JCDT. The JCDT's

existing website is already dedicated to the BJCMNP however it needs updating on a more regular basis and more links to relevant environmental and cultural sites as well as a Facebook link and a search bar.

- Media – at least once a month, an article on some activity in the BJCMNP, linked to a topical issue should be prepared and sent to the media for release. More frequently, captioned photographs from events, projects and training workshops should be disseminated to the media. This will require maintenance of an updated media/journalists data-base.
- Exhibitions – these are organized by partner and other organizations on a regular basis, often associated with celebrations such as Earth Day and World Environment Day. The exhibit should include posters, brochures, multi-media and actual items e.g. plants, equipment. Where possible, efforts should be made to participate in events which will attract the wider public, and not just those with an interest in the environment. Exhibits on the BJCMNP should continue to be a component of Misty Bliss – the National Park’s annual cultural festival and the JCDT organized Green Expo.

Funds should be raised to professionally design and implement a public awareness-raising campaign about the BJCMNP, associated with major events noted earlier. This should involve greater media coverage including regular advertorials, website updating, billboards etc.

Government Agencies

In addition to the activities implemented to raise awareness, copies of documents such as the Park’s Management Plan and Annual Reports should be sent to relevant agencies. Further, invitations should be sent to agencies (both formal letters and flyers for posting on notice boards) for events such as Misty Bliss and Green Expo. Assistance should be sought from government partner agencies – NEPA and FD.

Students

Students, particularly primary and secondary level will be addressed mainly through the Interpretation Sub-programme.

9.4 Interpretation

Interpretation can be described as “an educational method that aims to reveal meanings and relationships through the use of original objects, by first-hand experience, and by illustrative media rather than simply to communicate factual information” Tilden, 1957.

Interpretation is an important aspect of the Environmental Education and Recreation/Tourism Programmes in any national park. Its purpose is to engender support for the park by relating the features of a site to everyday things with which people can identify; and hence, build understanding and appreciation of the park.

The only persons who will be impacted by the BJCMNP’s Interpretive Programme are those who see or participate in it. Therefore, the success of this programme (in terms of numbers of persons participating) is dependent on the marketing of the recreation areas

since most of the interpretation will be at these sites. As Holywell receives the most visitors of all the recreation areas within the BJCMNP, that site will be the major focus for the Interpretive Programme. However, Millbank and Portland Gap ranger stations will have posters, brochures etc., and major trails e.g. Blue Mountain Peak Trail and Cunha Cunha Pass Trail will have interpretive and other signage. Whilst the programme will be designed to impact on all visitors, some aspects will only be experienced by those persons who partake in guided tours or educational packages.

The National Park's Interpretive Programme should use a variety of strategies including signs, brochures, exhibits, Visitors' Centres (featuring all these) and interaction with people through activities like audio-visual presentations, guided tours and games.

Visitors' Centres

The Visitors' Centre is an important component of the recreational area of any national park as it plays a critical role in interpretation and education. Such a location has information on the park in the form of exhibits, brochures etc. As Holywell is the BJCMNP's main recreational area, the focus of this section will be on that location. However, the ranger stations at Portland Gap and Millbank should also be used for interpretation. This can be done through the use of copies of signs, posters, brochures and other exhibits from Holywell. Further, signage and information about the BJCMNP should be made available through the Blue Mountains Sustainable Tourism Programme, in participating community ventures e.g. Charles Town Maroon Museum and the proposed Visitors' Centre at Mavis Bank.

During implementation of the previous Management Plan, efforts were made to source funding for a new Visitors' Centre – the Holywell Pavilion in the main picnic area, and for the renovation of the existing Visitors' Centre into an Education Centre. The intention was to continue to use the existing Centre for multiple functions e.g. training and to improve the exhibits. Unfortunately, funds were not sourced for the new construction but new signs were erected and improvements made to the existing Visitors' Centre.

Under this Management Plan, efforts should continue to source funding for implementation of the Holywell Ecotourism Development and Management Plan, however whilst that is occurring the existing Visitors' Centre should be maintained and improved as possible, and information placed in other appropriate locations.

Signage Programme

Signs and exhibits should be made of durable materials (to resist weather and vandals). There should be consistency in both the design and type of materials. Treated lumber should be used, and galvanised nails/screws because of the wet conditions at the sites.

As described in the 2005 - 2010 Management Plan, a BJCMNP Signage Plan exists which guides design in terms of measurements and layout for all Park signs particularly those at Holywell. Some of the signs are directional – guiding visitors to trails and services, others are informational e.g. labeling of amenities. The majority, however are larger signs which are interpretive or provide information on trails. At locations other

than Holywell, most of the signs to be used will be directional and informational. If interpretive signs are to be prepared for other areas, it will be better to use different, location-specific content - even for those more general signs e.g. orchids.

Twenty-three signs were proposed for Holywell, some of which will be grouped at strategic locations. Appendix 10 provides an overview of these signs but they are described further in the Holywell Ecotourism Development and Management Plan and in detail in the Holywell Signage Plan. Despite efforts to produce and erect interpretive signage during the past five years, this was not achieved until 2009 when some funds were accessed which allowed for the implementation of a small component of the Holywell Signage Plan in 2010. These signs provide interpretation regarding Holywell Trails and also include signs or name tags for the cabins and gazebos.

Relevant here and for the Community Awareness-Raising Sub-Programme, interpretive signage is proposed for the Blue Mountains Sustainable Tourism Programme. These would be at the entry to targeted, participating communities, identifying them as BJCMNP Buffer Zone Communities, indicating the importance they place on protecting their natural and cultural heritage and encouraging visitors to participate. Signage related to issues of concern to the Enforcement and Compliance Programme (illegal activities and the Park boundary) are also recommended.

Botanical signs

These are generally small signs which provide the scientific and common names (that in general use, and the local name if different) of plants, sometimes with a little detail about same. Some of these were placed at Holywell and a “Tree Treasure Hunt” - was developed for use with groups on educational tours, indicating how these signs can be incorporated into interpretive activities, particularly for children.

The signs or name tags for the Holywell cabins and gazebos should be used to develop an interpretive activity for possible inclusion in the schools educational packages.

Care must be taken to avoid over-signage by placing the signs in locations where they are likely to be viewed. Smaller signs or tags for plants can also be considered.

Guided Tours

Tour guides are important to interpretive and ecotourism programmes. Their friendliness, knowledge and ability to impart information in an interesting and appropriate manner can make or break a visit. Over the past five years, the following strategies were successfully implemented and this work should continue with refresher training, improvements and new involvement under this Management Plan.

All National Park Rangers and as many other persons as possible should be trained as tour guides. Training is available locally, however at least one person should be trained abroad, in order to be exposed to international approaches and standards for tour guiding and other aspects of interpretation. This individual should be required to conduct local training on completion of his/her international training. Whilst use should be made of

formal training and certification e.g. Tourism Product Development Company, tour guide training must not be viewed as a one-time activity, as experience improves tour-guiding skills. In addition, tour guides should always be improving their knowledge base through reading e.g. information from the Internet, talking with elders, etc. Further, the techniques used for different age and interest groups will vary. The activity is a skill that can provide income-generating opportunities for community members and this kind of training and marketing of the service can be a useful benefit from park management.

Basic outlines of interpretive information should be prepared for each trail and provided to tour guides through a training session. Similarly, the current slide presentation for the National Park should be reviewed and revised as necessary and an outline script prepared. This type of outline can help to ensure that key interpretive points are covered by each tour guide, as well as provide a useful revision tool that guides can use to refresh their memories. Information should be readily available for National Park Rangers and tour guides e.g. brochures and books on plant and animal identification and therefore, a small reference book area should be maintained in the ranger station.

Educational Tours/Packages

This component of the Education and Public Involvement Programme was successfully implemented over the past five years and should continue into the future. All schools in the island will be encouraged to visit Holywell for educational and recreational visits.



Plate 25: Holywell guided tour starts at an interpretive sign describing the Trail (Source: JCDT)

Activities will be tailored according to the age-group of the students and the school curriculum. These will include a multi-media presentation e.g. power-point, viewing of exhibits, guided trail tour and activities that will help to teach concepts in a fun and interactive manner.

The packages of activities designed for primary school age groups, during the last implementation period will be improved as needed or opportune. The Kids Discovery Zone will continue to be a highlight of the educational packages for basic and primary level students.

The focus of the Education and Public Involvement Programme will be ensuring the content and successful implementation of these packages, led by trained community youth, however the Programme Officer must play a significant role in the marketing of these educational packages. Visitation will be promoted by direct marketing consisting of letters to the principals accompanied by a brochure or flyer describing the fun, educational packages, and presentations to schools, teachers and other groups. In addition, letters will also be sent to companies inviting them to sponsor a school visit, since many companies support schools in their communities.

Kids' Discovery Zone (KDZ)

The Kids' Discovery Zone is an interactive, interpretive play centre at Holywell, for children between the ages of 3 – 12 years. It is described in detail in the Holywell Ecotourism Development and Management Plan, and is geared at improving the Interpretive Programme geared at students and children in general. Efforts should be made to increase interpretive usage of the KDZ on weekends in addition to the already existing educational packages for schools.

Educational Guides

Consideration could be given to the development and implementation of two “stand-alone” educational guide projects that are not essential but would enhance awareness and knowledge of the BJCMNP in schools. These educational guides would be produced by education consultants working in collaboration with Park management, which would have to source the funds. The consultant(s) would provide liaison with the Ministry of Education and relevant agencies and schools. In this way, Park management would not be over-burdened by the implementation of these projects:-

(i) BJCMNP Field Trip Guide for Secondary level Schools

Funds should be sought for the development of a BJCMNP field trip guide describing activities suitable for secondary level students, particularly those taking Caribbean Examinations Council (CXC) examinations in Geography, Biology etc. at both the Grade 10/11 and 12/13 levels. This could be done in collaboration with a Teacher Training College and would need to involve the Ministry of Education and possibly the CXC. This would then allow the school teachers to lead these activities with Park management providing only an introductory presentation. Such a guide would be very useful, as both examination levels curricula require field trips and activities, but very little information is available for teachers to assist them in implementing these.

(ii) BJCMNP Environmental Education Manual

A manual for environmental education for sustainable development activities should be developed with a focus on the BJCMNP. This manual would be different from the Field Trip Guide as it would focus on ‘in-school’ activities for Grades 1 – 9, rather than field activities for Grades 10 – 13. The activities would essentially provide curriculum infusion ideas for each grade and subject area, but set within the context of the BJCMNP. It would be particularly appropriate for use by schools within the National Park’s Community Buffer Zone or in eastern Jamaica generally. It could be field tested in the Community Buffer Zone schools selected for the Environmental Stewardship Programme.

9.5 Community Buffer Zone Schools

This programme is designed to ensure that awareness and knowledge about the BJCMNP is developed from the earliest stages within the communities around the Park. In addition, based on lessons learned, every effort will be made to integrate the schools programme into the community capacity building component, for increased impact.

Schools’ Visitation

During 2008 and 2009, the Schools’ Visitation programme was expanded from the primary level to include basic schools. This was done through the involvement of trained community youth from the Youth Programme. There are about 38 primary and secondary level and 15 basic level schools within and around the park’s buffer zone (see list of schools in Appendix 9), and at least 35 will be visited once per year with a presentation about the BJCMNP, its resources and how to better manage these. A different theme will be identified for each year, ideally in coordination with any other community awareness theme. The Schools’ Visitation Programme ensures that a new set of youth are targeted each year and that messages are reinforced among those already exposed. This will help to develop an environmentally aware community, over time.



Plate 26: Youth presenter and National Park Ranger visit a basic school (Source: JCDT)

Presentations are to be made by the Education Officer assisted by the Youth Programme members and National Park Rangers where possible. A short training session will be held at the beginning of the school year to train all presenters on the format and materials to be used. Youth Programme members who participated in training provided through the Dudley Grant Early Education Centre will be targeted to assist, particularly with the basic schools, where they will lead the visit. A report form will be used to report on the details of the school visit, including the teacher's comments and signature.

The presentations in the primary schools will target grades five and six (not three to six as for the previous Plan) and will correlate with the national curriculum subject matter relevant to those grades. Younger children will be targeted through basic school visits and presentations. Every year, a new theme will be selected based on topical conservation issues (based on activities in other programme areas and the relevant community awareness theme). A presentation aimed at delivering a message related to the issue and promoting appropriate action will be developed. The presentation will be designed to take about one hour and will include audio-visual and interactive components, as well as activity sheets which will be left behind with teachers.

Monitoring and Evaluation

1. A short questionnaire will be administered to a sample of at least twelve primary school students before and after the presentation, to assess knowledge changes.
2. The reporting form will be used to obtain feedback on the usefulness of the presentation from the responsible teacher.

Teacher Training Workshop

A training workshop will be organized annually for Buffer Zone community school teachers. This will focus on the theme selected for that year and its incorporation into the school curriculum through a variety of activities appropriate for different grades. This has proven to be a well appreciated activity and was not implemented in the previous few years as there was no funding. Assistance from the Ministry of Education Curriculum Unit will be sought in terms of resource persons for the curriculum infusion component, with JCDT providing the content in terms of conservation and environmental information.

Monitoring and Evaluation

A workshop questionnaire will be prepared and circulated to capture not only views on the workshop but for teachers who had participated in the previous year, they will be asked to indicate if they had used the information and lessons learned in the classroom.

Schools' Environmental Stewardship

Every year, 3 - 6 of the schools in communities selected for the Community Conservation and Sustainable Livelihoods Sub-Programme, will be selected to work on the implementation of a variety of environmental activities geared at promoting environmental stewardship. There will be a focus on integrating the school and community environmental stewardship activities by facilitating linkages e.g. with school Parent Teachers' Associations and Citizens' Associations.

Table 9.3 Activities For the Schools Environmental Stewardship Programme

<i>Manual</i>	Develop a manual of activities for dissemination in the schools and for use by the teachers. This can be a simplified version of the old Schools for the Environment Programme Manual, modified for the context of use in the BJCMNP Community Buffer Zone.
<i>Liaise with Schools</i>	To identify interest and obtain agreement for involvement regarding implementation of at least one of the activities suggested in the Manual.
<i>School Visits</i>	Visit each school at least three times for the school year:- 1st visit – make BJCMNP presentation and work with teacher(s) to outline plans. Emphasis should be on a small number of simple and feasible activities. This can be done in conjunction with the presentation. 2nd visit – monitoring. Observe implementation (take photographs) and assist the teacher(s) to adapt plans, as necessary, 3rd visit – monitoring and assessment.
<i>Monitoring</i>	Schools will be asked to maintain scrapbooks for documenting their activities. These, along with observation of projects/activities and talking with the teacher(s) and student(s), will be used to assess and evaluate levels of performance. Monitoring forms will be completed on the first and final visits to assess improvements in environmental management, etc. Schools will be asked to submit essays, poems, reports, etc. on their work and these will also be used to monitor and assess performance.
<i>Newsletter</i>	A newsletter will be produced at least once a year, featuring information on school activities. The best of the items submitted, will form a “Children’s Environmental Link” to JCDT’s website.
<i>Provision of Incentives</i>	Photos, poems etc. from schools that are performing well will be included in the newsletter and sent to the media e.g. Childrens’ Own. Creative forms of rewards and incentives will need to be identified for students and teachers e.g. ice-cream/cake, gift baskets/certificates. Groups visiting the national park e.g. tourists, researchers etc. can be taken to visit the best performing schools.
<i>Evaluation of the Schools</i>	Best performing schools will be recognised with awards e.g. plaques and certificates, and mention in a media release.

PROGRAMME SUMMARY: Education and Public Involvement				
PROGRAMME GOAL: To raise support for conservation of the National Park's natural and cultural heritage and improve resource management and the sustainability of livelihoods, particularly in Buffer Zone communities.				
Programme Objective(s)	Programmes/Strategies	Activities	Monitoring & Evaluation	Resources
1. To facilitate capacity building of at least 120 persons from at least 6 communities, for more environmentally sustainable livelihoods and greater involvement in management of the resources of the BJCMNP and its Community Buffer Zone.	<p>Community Conservation and Sustainable Livelihoods.</p> <p>Through this strategy, community members and organisations will receive training and assistance in implementation of more sustainable livelihoods, particularly in:-</p> <p>(i) recreation and tourism (through the Blue Mountains Sustainable Tourism Programme)</p> <p>(ii) agriculture and</p> <p>(iii) cultural heritage.</p> <p>They will also be encouraged to participate in park management e.g. assisting with school visits, reforestation, enforcement. This Sub-Programme will focus on youth and adults in targeted communities.</p>	<p>1. Build capacity of at least 12 youth/year through training and work experience, assistance in establishing sustainable livelihoods and/or furthering their education.</p> <p>2. Build capacity of at least 12 persons/year from each of the targeted communities through training and involvement in sustainable livelihood activities.</p> <p>3. Involve at least 20 persons/year from targeted communities in Park/natural resource management activities e.g. in recreation areas and reforestation</p>	<p>Records and reports provide information on quantitative targets.</p> <p>Reports as per details within chapter.</p> <p>Photo and video monitoring indicates improved environmental and natural resource management.</p>	<p>Education & Community Outreach Officer (ECCO)</p> <p>Recreation & Tourism Officer (RTO)</p> <p>Resource personnel from other agencies</p> <p>Funds for transportation, stationery etc.</p> <p>Funds to assist communities with training & implementation of sustainable livelihoods \$480,000 in Year 1 and ongoing; major projects of \$1.3 million/yr</p>
				<p>Timeframe and Priority</p> <p>High Priority</p> <p>1a. Year 1 – 2 focus on existing youth group</p> <p>1b. Year 2 - start another programme, possibly with the assistance of members from the existing group</p> <p>2. From Year 1, with possible expansion to other communities in Year 3</p> <p>3. From Year 1</p>

PROGRAMME SUMMARY: Education and Public Involvement					
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Programme Objective(s)	Programmes/Strategies	Activities	Monitoring & Evaluation	Resources	Timeframe and Priority
<p>2. To increase awareness about the National Park's natural and cultural heritage, importance and management, in order to increase the level of support for the BJCMNP</p>	<p>1. Public Awareness Sub-Programme Increase level of awareness of:- (a) Buffer Zone community members through a campaign with main message "Protect our National Park" and sub-messages e.g. fire, trees, boundary, to include educational materials and community meetings (b) General Public through (i) regular website & Facebook updating, use of media and participation in exhibitions (ii) a major sponsored Campaign linked to BJCMNP and national events (c) Visitors to the BJCMNP and its Community Buffer Zone through Interpretation e.g. guided tours, Visitors' Centres</p>	<p>1a. Conduct simple survey to guide campaign design. 1b. For both community and public implement on-going low-cost campaign aspects e.g. participate in meetings of existing CBOs, town-square meetings, website, media releases & exhibitions 2. Seek funds and implement short, major media campaign 3. Interpretation:- (a) Visitors' Centres – Holywell, Ranger Stations, community locations (b) Signage at Holywell, Peak and other Trails, targeted communities (c) Guided Tours designed & marketed and local & international training (d) Educational packages at Holywell (e) possible education guides – field and class</p>	<p>Simple surveys conducted in communities, Holywell, and parish capitals Records kept of all materials and information sent out and being published. Campaign Report Track support e.g. number of visitors, volunteers, donations and sponsorship. Brief questionnaire for random sample of visitors and school groups entering and leaving Holywell and other locations.</p>	<p>EEO, RO Technical Assistance (marketing) Volunteers Rangers Funds for campaigns e.g. posters, flyers, DVD, radio/TV signage, marketing of tour packages \$480,000 in Year 1 and ongoing for public awareness and interpretation; 2 major campaigns at \$2million each \$2million for new signs & \$1million for guides</p>	<p>1a. By mid-Year 1 1b. Start Year 1 and on-going Basic public and community awareness campaigns are High Priority 2. As funds available but at least one media campaign by Year 5 (High Priority) 3. On-going and as funds available (High Priority)</p>

PROGRAMME SUMMARY: Education and Public Involvement					
PROGRAMME GOAL: To raise support for conservation of the National Park's natural and cultural heritage and improve resource management and the sustainability of livelihoods, particularly in Buffer Zone communities.					
Programme Objective(s)	Programmes/Strategies	Activities	Monitoring & Evaluation	Resources	Timeframe and Priority
2. as above	<p>2. Buffer Zone Schools Programme</p> <p>i. Schools' Visitation: geared at raising awareness and knowledge of park buffer zone students and school leavers regarding the BJCMPNP and ensuring an aware community member in the future.</p> <p>ii. Schools' Environmental Stewardship: geared at developing and improving natural and cultural heritage management skills and practices in schools, for transfer to the community</p> <p>iii. Teacher Training Workshops: geared at enhancing knowledge and ability to integrate BJCMPNP issues into the school curriculum</p>	<p>1. Visit at least 35 schools in the Community Buffer Zone once per year with an audio-visual and interactive presentation.</p> <p>2. Facilitate implementation of environmental activities in 3 – 6 schools each year e.g. newsletter production and implementation of park-related projects in selected schools.</p> <p>3. Training workshop for Community Buffer Zone School teachers</p>	<p>A pre- and post-presentation quiz will be implemented with at least 12 students in each presentation. Reporting form to be signed by teacher.</p> <p>Records, reports and monitoring forms kept to show changes over each year.</p> <p>Questionnaire for school leavers.</p> <p>Questionnaire for teachers</p>	<p>ECCO Assistant from Youth Prog., Ranger, Volunteer</p> <p>Funds for Transportation, Communi-cations, Supplies and Stationery, Materials</p> <p>AV Equipment</p> <p>Technical Assistance</p> <p>\$240,000 in Year 1 and ongoing for all activities</p>	<p>High Priority</p> <p>Ongoing from year 1</p> <p>Ongoing from year 1</p> <p>Start Year 1 and every other year thereafter</p>
Buffer Zone communities Teacher training workshops at least every other year					

CHAPTER 10

Recreation and Tourism Programme

10.1 Promoting Support For Conservation

Whilst conservation has occurred since ancient times as part of religious or other purposes, modern conservation practices have developed out of a concept originating in the USA, with the establishment of the Yellowstone National Park in 1872, Yosemite National Park in 1890 and the National Parks Service in 1916. Providing the public with areas where they could enjoy beautiful natural sites and opportunities for recreation were two of the main reasons for the establishment of these first national parks (Ceballos-Lascurain, 1996). Jamaica's policy on protected areas articulates recreation and public education as a goal for the system of protected areas and includes recreation and tourism as primary uses of national parks (GOJ, 1997).

Tourism is defined by the World Tourism Organisation (WTO) as “the activities of persons travelling to and staying in places outside his or her usual environment for not more than one consecutive year for leisure, business, and other purposes” (WTO in Ceballos-Lascurain, 1996). *Recreation* is activity pursued during leisure i.e. free time, usually for pleasure. Tourism can be considered a form of recreation that takes a person outside of his/her usual environment or place of residence for at least one night. Domestic tourism or the recreational activities of citizens is an important component of the tourism industry, particularly for protected areas (Cochrane, 2006). Use for recreation and relaxation, even for a few hours on a weekend, is particularly relevant for city dwellers.

Tourism in protected areas has become increasingly relevant to both the tourism industry and protected area managers. It can provide opportunities for numerous direct and indirect benefits for protected area management e.g. income generation, increased support for protected areas and the provision of benefits to local communities. Tourism and recreational use can result in degradation of the very resources that attract the visitors, therefore in protected areas, tourism must be carefully managed to maximise benefits and minimise negative impacts (Drumm and Moore, 2001).

The management approach to recreation and tourism in the BJCMNP should be ecotourism – sometimes referred to as sustainable nature tourism. Whilst not all the recreation areas or all parts of these sites are pristine, the use of ecotourism as a management tool rather than a marketing tool is an important approach for the programme, within the context of a national park. The World Tourism Organisation (2002) makes a distinction between ‘nature tourism’ and ‘ecotourism’ as follows:

Nature tourism: *a form of tourism in which the main motivation is the observation and appreciation of nature.*

Ecotourism: *a form of tourism with the following characteristics:*

- (i) *All nature-based forms of tourism in which the main motivation of the tourists is the observation and appreciation of nature as well as the traditional cultures prevailing in natural areas,*
- (ii) *It contains educational and interpretation features,*
- (iii) *It is generally, but not exclusively organized, for small groups by specialised and small locally owned businesses. Foreign operators of varying sizes also organise, operate and/or market ecotourism tours, generally for small groups,*
- (iv) *It minimises negative impacts on the natural and socio-cultural environment,*
- (v) *It supports the protection of natural areas by:*
 - *generating economic benefits for host communities, organisations and authorities that are responsible for conserving natural areas,*
 - *creating jobs and income opportunities for local communities, and*
 - *increasing awareness among both locals and tourists of the need to conserve natural and cultural assets.*

Holywell is the largest and most developed of the BJCMNP's recreational areas. It provides an opportunity to achieve all the Recreation and Tourism Programme objectives and to learn from implementation of the various strategies and actions. The Holywell Ecotourism Development and Management Plan (JCDT, 2005) is being used to improve and guide activities at Holywell, but can also help guide the development and management of the other areas. Of course, not everything implemented at Holywell will be relevant to all the areas e.g. the Blue Mountain Peak Trail is more adventure oriented and the Cuna Cuna (Cunha Cunha) Pass Trail is more cultural-heritage based.

Whilst a significant amount of work and improvements were made during implementation of the 2005 to 2010 Management Plan, some of the targets were not completely achieved. Under this Plan, the main aim will be to complete the implementation of the Holywell Plan, make the repairs to the Peak Trail and its related trails and sites as targeted in the previous Management Plan and implement the activities described in the Blue Mountains Sustainable Tourism Plan. The latter was a major output and is aimed at making the Recreation and Tourism Programme completely self-sustaining but also returning a profit for use in wider management of the BJCMNP (see Appendix 13. This will require a full-time manager for the National Park's Recreation and Tourism Programme with a focus on marketing and product development (standards and new developments).

Table 10.1 Recreation and Tourism Programme Goal and Objectives

Goal	Objectives
<p><i>To provide and facilitate the provision of recreational opportunities for local and international visitors using ecotourism principles in order to generate income and support for the BJCMNP.</i></p>	<p>1. To provide and facilitate recreational and educational opportunities geared at raising awareness and support of the BJCMNP, as per existing plans.</p>
	<p>2. To generate income to support park management by increasing income from the BJCMNP’s recreational areas and the Blue Mountains Sustainable Tourism Programme by 150% over the five years.</p>
	<p>3. To engender community support for the BJCMNP as well as natural and cultural heritage conservation by facilitating benefits to local communities.</p>
	<p>4. To ensure that recreation and tourism activities do not threaten the BJCMNP’s biodiversity, provision of ecosystem services and cultural heritage.</p>

10.2 Recreation and Interpretation

A wide variety of recreational opportunities can be made available within the National Park and its environs. In the context of national park management, it is important that ecotourism principles guide the development and management of these activities. In particular, there should be an educational component linked to the recreational activities to be achieved through interpretation, in addition to the educational opportunities provided for schools, universities and other interest groups.

Visitor activities range from “soft” to “hard” in terms of the level of activity of the visitor. Some activities are solitary whilst others involve groups of varying sizes. In addition, whilst some activities focus on enjoyment of the natural areas, others are simply making use of the relaxing ambience e.g. retreats.

Objective 1: To provide and facilitate recreational and educational opportunities geared at raising awareness and support of the BJCMNP as per existing plans.

In addition to maintaining and improving the recreational and educational opportunities within the BJCMNP over the timeframe of this Management Plan, the other part of the objective will be to facilitate the provision of recreational and interpretive opportunities in the Community Buffer Zone, particularly in communities near to the National Park’s existing recreational areas. This will be implemented through the Blue Mountains Sustainable Tourism Programme guided by the Manual developed under the IDB funded project between 2006 and 2008. The proposed Newcastle Heritage Village as well as the

community-based ventures are key recreational and educational opportunities to be established under the Programme.

Table 10.2: Visitor Activities in the BJCMNP and its Community Buffer Zone

Visitor Activities	Visitor Services/Facilities Required	Comments
Socialising in picnic areas.	Picnic Gazebos/Shelters Benches/Tables Seating Areas Toilets/Washrooms.	Snacks and meals are now offered at Holywell through a community concession
Quiet enjoyment of the ambience and views.	Viewing sites with seating areas.	Clean surroundings.
Playing	Spaces/Activities particularly for children who may be too young to go hiking e.g. KDZ at Holywell Provision of board or other games.	Safety must be considered.
Walking the grounds and short nature trails.	Attractive, safe, accessible areas linked by trails.	Safety and interpretation.
Meetings e.g. retreats, workshops.	Spaces for meetings of different sizes.	Hospitality.
Bird-watching	Trails Information Specially trained tour guides	
Hiking	Trails of varying distances and difficulties. Information Tour guides	Establish carrying capacity for all trails. Establish closed and open seasons for certain trails.
Streams, Rivers and Waterfalls	Change room & Toilet Facilities Tour guides	Mainly outside the National Park with varying levels of access challenges; care with respect to location of toilet – possible composting toilet
Cultural Experiences	Maroon Heritage Blue Mountain Coffee Rural Lifestyles – farming, cooking, music, craft etc. Military History/Hill Station	Within the communities – some more developed than others
Overnight stays	Accommodation – ranging from camping to cottages and small hotels/guest houses.	Hospitality. Clean, dry facilities

Picnic and Other Recreation Areas

Areas where visitors can sit and relax, stroll around and enjoy the ambience and views, as well as eat meals, are an important component of a recreational area. The following are specific targets for the Recreation and Tourism Programme:

- i) In the next five years, the Holywell Ecotourism Development and Management Plan will be fully implemented to improve the product and increase income.
- ii) In the next two years accommodation facilities at Portland Gap, particularly the kitchen and dining areas and bathroom, and shelter facilities at the Peak will be improved.
- iii) In the next three years, camping and research facilities will be established in the Upper Rio Grande Valley (Millbank)
- iv) In the next five years, there will be at least three community-based picnic/recreational areas being marketed under the Blue Mountains Sustainable Tourism Programme.

Trails – Establishment, Development and Management

Several trails exist in the BJCMNP and many have historical significance e.g. Maroon trails and market trails. Trails were the main routes that rural communities used to travel between communities to hunt, access farm-land or to go to market in large towns. With the advent of parochial and other roads and relatively improved transportation in rural areas, many of these trails are now over-grown, eroded and impassable. With increasing interest in hiking and exploring natural and cultural heritage and the increased perception of nature/eco/community tourism as potential income-generating activities for rural communities, there is an increase in the desire to re-open trails.

Trails, like roads, increase access not only to the destination point but also to numerous other areas along the access route. Observation of active trails shows that they tend to widen with time – causing increased deforestation and soil erosion as well as changing micro-environments. This has the potential to cause changes in forest habitats, including the introduction of invasive species. Some trails access spectacular waterfalls but these may be important water sources downstream and protection from contamination is important. Other trails result in the accessing of delicate or unique ecosystems which then require protection from trampling, cutting or other forms of destruction.

Further, trails that pass through the National Park can often be accessed without knowledge of any park personnel or even community members who are seeking to manage the trail. This means that it is difficult to control access and threatening activities e.g. setting fires, littering, collecting plants along trails, much less to collect a user fee that could make a contribution to trail management.

In light of these serious issues and the conservation objectives of the BJCMNP, the focus of the Recreation and Tourism Programme for the next five years will be on existing,

open trails including roads, primarily outside the BJCMNP's boundaries. Further, trails will not be included in the BJCMNP's system of trails until studies are conducted to determine carrying capacity, and impact assessments and management systems are designed for the new trails. The following are the main trails currently being used in and around the National Park:

- Holywell trails
- Gordon Town to Redlight/Greenwich
- Holywell to Cascade (Lowe Piece and Green Hills Pass)
- Woodford/Holywell
- Oatley Mountain Road
- Blue Mountain Peak
- Cunha Cunha Pass
- White River Falls
- Sambo Hill

The following are some specific targets:-

i) In the next three years, the Blue Mountain Peak Trail and its access trails will be improved in terms of surface/drainage, low level interpretation and management, working with local communities to train them for management (particularly of the access trails) tour guiding and other services.

ii) In the next five years, at least two trails in the Upper Rio Grande Valley area will be improved in terms of surface/drainage, low level interpretation and management and recreational areas and working with local communities.

iii) In the next five years, a Trail Management Guide will have been developed which can be used to guide management inclusive monitoring for ecosystem health, safety, etc. for all trails within the Blue Mountains Sustainable Tourism Programme

Public Safety

Public safety and health must be considered at each recreational area and therefore, steps must be taken to encourage safety e.g. through signs and rails. First aid supplies must be on hand and trained and certified staff (with competence in administering CPR and first aid) must be on duty at each site. Disaster preparedness and emergency plans should be prepared and steps taken to ensure that the plans can be implemented, as needed. Public health issues must be considered, particularly with respect to the preparation and sale of food and the maintenance of sanitary facilities.

National Park Rangers should be trained in search and rescue techniques and the current system maintained and improved, where possible. This activity is usually needed only along the Blue Mountain Peak Trail but may become important on the Cunha Cunha Pass Trail, amongst other areas. Essentially, searches are implemented on request e.g. the reporting of missing hikers.

The BJCMNP Disaster Preparedness and Emergency Management Plan provides additional details regarding Public Safety and is to be updated during this Plan timeframe.

Box 10.1 Procedure for Handling Missing Persons in the BJCMNP

Procedure for Handling Missing Persons

- i) A member of the hiking party needs to check in at Portland Gap so that the National Park Ranger on duty knows how many persons have gone to the Peak. This is often not the case, so there needs to be some sensitisation among the hiking public.
- ii) The National Park Ranger will seek assistance from local community members, as needed.
- iii) Once the person is found, first aid is administered.
- iv) BJCMNP head office or personnel is contacted for notification and assistance, if necessary.
- v) If the person is injured and requires airlift to get medical attention, the JDF is called.
- vi) If, due to bad weather the helicopter cannot land or the person cannot be hoisted out of Portland Gap on a medicine board, the National Park Ranger will need to take the individual to the Penlyne Castle All-Age School further down the mountain, where helicopters are usually able to land.
- vii) A record of the incident and action taken should be made in the incident log, and the Chief of Corps or Recreation and Tourism Officer should follow-up and record a concluding comment.

Education and Interpretation

The National Park's recreation areas can provide numerous opportunities for education ranging from interpretation to skills training.

Information must be available at each recreational area e.g. in the form of signs and brochures. There is need for significant improvement in signage in the Portland Gap/Blue Mountain Peak Trail area and the Millbank/Upper Rio Grande Valley area. Whilst Holywell has several interpretive signs and a Visitors' Centre with exhibits, the implementation of the Holywell Signage Plan has only started in the last two years, due to inadequate funding. With the implementation of the Blue Mountains Sustainable Tourism Plan, there will need to be signage outside the Park as well. These signs should

promote pride and the need for conservation within the Community Buffer Zone (as these are areas of high natural and cultural heritage significance).

Training of community members was conducted in interpretation and tour guiding over the last five year period, however this foundation will need to be built on, particularly as it relates to the professionalism of tour guides. The educational packages developed and being implemented at Holywell for primary level students have benefited from significant training and experience of the Park's Youth Programme members.

The Maroon Museum and Asafu Yard at Charles Town is quite impressive and the Moore Town Maroon Council has plans to establish a Cultural Centre. Both Maroon communities should continue to be given assistance, and are targeted communities under the Blue Mountains Sustainable Tourism Programme. Museums in both locations should include exhibits and information on the Blue and John Crow Mountains National Park.

Specific targets are:-

- i) At least two persons receive international level interpretation training over the next five years, and are sharing the knowledge with BJCMNP personnel and community members and using it to improve interpretation in the BJCM.
- ii) Within three years, a planned set of interpretive and directional signs are placed:
 - Along the Peak Trail and its access trails
 - Along the Cunha Cunha Pass Trail
 - Along at least two other Community Buffer Zone trails or attractions
 - At the 'entrance' to at least 6 targeted Buffer Zone communities
- iii) By the end of the first year, BJCMNP information should be available at all museums or other centres in targeted communities and by the end of the fifth year a small visitors' centre should be established at Holywell or other suitable location.

10.3 Business Management

The National Park's recreation areas must be run as viable businesses so they can generate income to support their own operational costs, and eventually provide some support for other park management activities. The tendency in the past for many protected areas around the world, has been to see the provision of recreational opportunities as a public service and therefore, very low rates are charged for use of the facilities. As funding becomes increasingly difficult to obtain, it is important for new sources to be tapped. Another problem faced by many protected areas around the world is that there is not enough for the visitor to purchase e.g. food, snacks, craft, and therefore, the full level of support that can be obtained from visitors is not attained. In addition, as park management seeks to facilitate benefits to local communities associated with sustainable management of the area's natural and cultural heritage, it will be essential to have a business approach to ensure a reasonable profit is made. Between 2005 and 2009, income increased by 98% and was impacted mainly by hurricanes.

The main challenge to establishing the Park's Recreation and Tourism Programme as a business is financing the capital and initial recurrent expenses.

Objective 2: To generate income to support park management by increasing income from the BJCMNP's recreational areas and the Blue Mountains Sustainable Tourism Programme by 150% over the five years.

Strategic Activities

Strategic action as described under each of the following headings must be taken over the next two years in order to achieve Objective 2:-

Preparation and Implementation of Relevant Plans

The Holywell Ecotourism Development and Management Plan will help to guide activities there and to a certain extent, the other sites. The Business Plan contained within the Holywell Plan should be updated, but can also be used as the basis for preparing a business plan for the BJCMNP in terms of Recreation and Tourism. Under the implementation of the Blue Mountains Sustainable Tourism Plan, the preparation of a Business Plan will be an important early action. Site specific plans of varying levels of detail will need to be prepared e.g. Blue Mountain Peak Trail and Access Trail Repairs and Maintenance, to guide purchase of materials, and actual work.

Management and Supervision

All other BJCMNP management programmes have a full-time manager responsible for programme implementation, the employment of a professional Programme Officer for the Recreation and Tourism Programme will make a significant improvement in business and other aspects of management. Because of the different responsibilities involved in this role, a Site Supervisor – ideally one each for Holywell and Portland Gap, or at least one supervising both sites should also be considered. Currently, these roles are played by personnel who have other major responsibilities and this has resulted in inefficient and sometimes ineffective management, at Portland Gap in particular. This is something that has been observed and remarked on by both visitors and community members, and must be addressed with urgency.

Administration e.g. bookings, purchases, accounting and financial management and reporting can continue to be roles played by relevant personnel at JCDT. NEPA conducts an annual audit, and JCDT's books are audited by an independent auditor.

Marketing and Sales

Marketing is also implemented by the JCDT using mainly public relations activities e.g. events, media releases and participation in tourism fairs. Advertising is used to a lesser extent, consisting mainly of direct mailing e.g. to churches, schools and business places and associated with events or seasons e.g. summer. The main event held in the BJCMNP is Misty Bliss, held annually at the end of February to celebrate the National Park's

designation. This cultural festival features traditional music, dance, craft and food as well as exhibits and information about the BJCMNP and its natural and cultural heritage.

The new Blue Mountains Sustainable Tourism Programme will feature the National Park's recreation areas as the centre-piece of the tourism product, with associated tours and packages linking the community-based and private sector attractions and accommodations around them. A plan for marketing and sales forms a major component of the Blue Mountains Sustainable Tourism Programme and there is also information in the Holywell Plan. If the BJCMNP is successful in being listed as a World Heritage Site, this will assist in its marketing, particularly for the type of visitor who is willing to journey long and rugged roads to experience unique natural and cultural heritage.



Plate 27: Kumina dancing at Misty Bliss, Holywell (Source: JCDT)

Particularly in light of limited resources, marketing must continue to be creative and the focus on PR and direct marketing rather than more costly advertising may need to continue for some time. However there are several other approaches which must be strengthened and tried, including:-

- Improving the web-site and web-based marketing including links to other sites
- Use of Facebook and other social networking tools
- Partnering with other tourism organizations e.g. sharing event booth space
- Partner with tour companies to assist in assessing proposed tours – particularly the community-based tours, and then to develop and promote packages
- Partner with Kingston hotels and the Kingston and Portland Tourism Associations

Marketing must be linked to sales and this will be particularly important for the Blue Mountains Sustainable Tourism Programme in which the National Park through JCDT will act as the secretariat for a cluster of Blue Mountains tourism ventures, providing marketing and sales, product development and other services. The success of this venture will depend on the level of actual sales.

Hospitality and Product Development

Hospitality and good customer service is essential, as customers must feel welcome and satisfied if they are to return and also to recommend their relatives and friends. Training, standards and supervision are required to ensure high levels of hospitality. The product e.g. trails and infrastructure must be maintained and further developed, both in terms of new infrastructure and services. Plans for product development have been prepared under the Holywell and Blue Mountains Sustainable Tourism Plans. Holywell in particular must endeavour to complete all requirements in order to obtain its Tourism License. This will necessitate close collaboration with the Tourism Product Development Company. Park management having this licence for the National Park's recreation areas will be in a better position to assist community-based ventures with this process.

Use of Profits

The lease signed for Holywell stipulates the purpose of any profit – for use in managing the National Park, and this is premise of the whole Recreation and Tourism Programme. As funding, particularly untied funding continues to be a challenge to source, revenues from this Programme will become increasingly important. It would not be wise however, to use all profits for operational purposes, it would be prudent to invest some for long term needs e.g. to cover costs currently covered by other sources and hurricane repairs. The latter is particularly important as climate change predictions suggest more frequent and stronger tropical storms, and donor agencies may not always be able to provide the funds necessary for repairs.

10.4 Community Benefits

As per ecotourism principles, local communities must benefit from the park's recreation and tourism ventures. Otuokon, 2010a found that the practices at Holywell constituted ecotourism as defined earlier, and that community members living around the site generally felt that their communities were benefitting from the site through employment, income generation and opportunities for training, education and recreation. Specifically, events such as Misty Bliss were mentioned as opportunities for community members to earn some money and have fun, and also, the Youth PATH programme which was empowering community youth through skills training.

Objective 3: To engender community support for the BJCMNP as well as natural and cultural resource conservation by facilitating benefits to local communities.

During this five year period, this objective will be met by enhancing community-based recreation and tourism opportunities in the National Park's Community Buffer Zone through the Blue Mountains Sustainable Tourism Programme. It will also be met through activities under the Education and Public Involvement Programme (community members target group) and the Cultural Heritage Conservation Programme.

The following principles will continue to be followed:

- ▶ Employ local community members, use local services and purchase local products, whenever possible.
- ▶ Encourage and promote local businesses and the establishment of cottage industries even through the provision and/or facilitation of training and other business assistance e.g. provision of incubator services.
- ▶ Encourage local visitation to ensure local communities enjoy the recreational and educational opportunities that the park provides.

The Blue Mountains Sustainable Tourism Plan was designed with community and industry stakeholders, specifically to provide for financial and other benefits to local communities and the National Park. Its implementation will be the major focus for the Recreation and Tourism Programme during this Management Plan period. Under this Programme, targeted communities (which have already worked with Park management in developing the Plan) will be assisted with product development through training, business planning and the sourcing of funds, and marketing and sales will be conducted as an umbrella activity. Marketing will continue to include events marketing and support for community festivals will be an important component of the Programme. Where concessions can be made to community members such as reduced entry fees to events, this should be done, as has been the case with Misty Bliss. It will therefore be important to seek sponsorship for all these events as early as possible, perhaps through sponsorship packages such that sponsors obtain promotion throughout the year.

The Blue Mountains Sustainable Tourism Programme was also seen as providing a forum for community members and businesses to come together to support conservation of the area's natural and cultural heritage and lobby government for sustainable development of the rural communities e.g. improved road maintenance, garbage collection, water supply, health services and greater support for eco- and community-based tourism.

10.5 Environmental Management

All the BJCMNP's recreational areas should be managed using ecotourism principles, one of which is minimising environmental impacts. Environmental management is also an essential component of sustainable tourism, therefore every effort should be made to strengthen it in the community-based ventures being marketed under the Blue Mountains

Sustainable Tourism Programme. Environmental management should be addressed under the following sectors:

- ▶ Land use and Development – selection of environmentally and culturally appropriate sites for attractions and infrastructure; use of appropriate materials for construction; retain as much natural vegetation as possible
- ▶ Visitor Management – from requiring compliance with rules and regulations through to establishment and monitoring of carrying capacity and limits of acceptable change
- ▶ Water Use and Conservation – water-saving devices installed at Holywell
- ▶ Solid Waste Management – PET plastic is collected for recycling from Holywell
- ▶ Sewage Treatment – generally soak-aways considered adequate for low usage but not ideal – composting toilets should be considered where possible
- ▶ Energy Use and Conservation – fluorescent bulbs in use at Holywell
- ▶ Use of Chemicals – limited use at all locations

An Environmental Policy and Environmental Management System (EMS) were prepared for Holywell in 2004 following an audit in 2003, and Green Globe certification achieved in 2005. However, due to the significant costs involved in maintaining the certification, it was decided to discontinue with the programme. These and other documents including the Holywell and Peak Trail Biodiversity Conservation Management Plans (prepared under a USAID funded project) contain significant details to guide environmental management. The main challenge is lack of resources to implement these plans.

The BJCMNP's recreational areas (Holywell, Peak Trail/Portland Gap and a small section of the Cunha Cunha Pass Trail) comprise less than 1% of the National Park's area, and are generally located at the edges of the site in degraded or altered habitat. Therefore, their use for recreational activities has limited impact on the majority of the National Park's forest ecosystems.

Objective 4: To ensure that recreation and tourism activities do not threaten the BJCMNP's biodiversity, provision of ecosystem services and cultural heritage.

Observations at Holywell suggest that biodiversity is not being threatened, perhaps because the vast majority of persons stay in the high intensity zones and hardly venture on most of the trails. Despite this, a carrying capacity study and development of a Limits of Acceptable Change Visitor Impact Management System should be established for both Holywell and the Peak Trail. The Environmental Management System developed for Holywell is not being significantly implemented, and should be strengthened.

The Peak Trail, and particularly the Blue Mountain Peak itself are of some concern as these sites are at the highest elevations, within high montane zones of the Park and therefore contain critical habitat, unlikely to be located elsewhere. However, the Peak and Peak Trail have been in used for over a century and is a long-standing traditional use. A study is urgently needed regarding the location of key species and habitats, in order to devise and implement a plan to reduce visitor impact.

With the establishment of the Blue Mountains Sustainable Tourism Programme, park management will need to be more concerned about environmental impacts outside the National Park, and socio-cultural impacts within the Community Buffer Zone. This will require training for buffer zone community groups involved in the Programme, and monitoring of their activities. The behavior of visitors must be managed, for example with respect to littering (a major issue on the Peak Trail) noise (e.g. trail bikes at Holywell) and the pulling of plants (e.g. along trails). Tour guides need to be aware of these issues and the rules, and need to be trained with respect to promoting appropriate behavior amongst visitors. With an increased focus on community-based tourism and the conservation of cultural heritage, consideration will need to be given with respect to visitor behavior that may be offensive to community members in general and Maroons specifically. Preparation of guidelines for distribution to visitors (and tour operators) as well as signage to alert visitors to the behavior expected would be useful.

Specific targets for this Management Plan period:-

- i) Establish a system to reduce visitor impact on any critical habitat in the Peak area.
- ii) Establish carrying capacity estimates and/or a Limits of Acceptable Change Visitor Management System for Holywell and the Peak Trail area (including a study re: vegetation at the Peak with recommendations for its protection)
- iii) Strengthen the EMS at Holywell, particularly in terms of record-keeping.
- iv) Prepare environmental best practice guidelines for implementation at Portland Gap and Blue Mountains Sustainable Tourism sites, provide training to the relevant community groups and monitor these.
- v) Prepare visitor guidelines for distribution, particularly for the Blue Mountains Sustainable Tourism Programme.
- vi) Improve signage re: rules and regulations at all sites.

Programme Summary: Recreation and Tourism						
Programme Goal: To provide and facilitate the provision of recreational opportunities for local and international visitors, using ecotourism principles in order to generate income and support for the BJCMNP.						
Objective	Programmes/Strategies	Activities	Targets	Resources	Monitoring	Time-Frame & Priority
1. To provide and facilitate recreational and educational opportunities geared at raising awareness of, and support for the BJCMNP.	Holywell - Improve product	Implement Holywell Ecotourism Development and Management Plan – in particular Cabin for large groups and Visitors’ Centre in main picnic area	See plan for details	Programme Officer, Site Supervisor Funds (\$40 million) Technical Assistance	- Track numbers of visitors and income, - Track support e.g. donations or other assistance from visitors.	High Priority Five years, starting in Year 1.
	ii) Portland Gap and Blue Mountain Peak Trail - Improve product	- Blue Mountain Peak Trail: repairs and maintenance, signage - Blue Mtn. Peak: shelter and signage, - Portland Gap: repairs - Access Trail & Centre: plan, repairs and community programme	- Trail surface improved - Improved facilities, maintenance & interpretation	Funds (\$3million) JDF Support, Technical Assistance		By Year 3 By Year 2 By Year 3 By Year 3
	iii) Upper Rio Grande Valley - Improve product	- Interpretive Prog. for Cunha Cunha Pass - Ranger station hosts Research Station and camping - Restoration of White River Falls Trail, including repairs to swinging bridge		Technical Assistance, Funds (at least \$2million)		By Year 2 By Year 2 By Year 3

Programme Summary: Recreation and Tourism						
Programme Goal: To provide and facilitate the provision of recreational opportunities for local and international visitors, using ecotourism principles in order to generate income and support for the BJCMNP.						
Objective	Programmes/Strategies	Activities	Targets	Resources	Monitoring	Time-Frame & Priority
	iv) Blue Mountains Sustainable Tourism Programme	- community recreation areas being marketed - Newcastle Plan	At least 3 Plan	Funds (all required funds not included in Plan budget)	Records	By Year 5
	v) Interpretation – to international standards	- Participation in international training - use and share knowledge	At least 2 persons	Technical Assistance Funds	Document Reports	Years 1–2 By Year 3
	vii) Signage	Design (as per Park Signage Plan) appropriate signs for different locations	-Peak area trails, Cunha Cunha Pass Trail - 2 community attractions - 6 Buffer Zone Entrance	Env. Education Officer, Funds for signage etc. (see Education Programme)	Signs	By Year 1 By Year 5 By Year 2
	viii) Visitors' Centre	-Park exhibits and information in community sites -Visitors' Centre e.g. Holywell	At least 3 sites At least 1	Env. Education Officer, Funds for brochures, exhibits	Photographs Plans & Reports	By Year 2 By Year 5
	vii) Disaster Preparedness & Emergency Management Plan	Update Plan and conduct refresher	By end of year 1	Chief of Corps	Document Attendance Records	By Year 2

Programme Summary: Recreation and Tourism						
Programme Goal: To provide and facilitate the provision of recreational opportunities for local and international visitors, using ecotourism principles in order to generate income and support for the BJCMNP.						
Objective	Programmes/Strategies	Activities	Targets	Resources	Monitoring	Time-Frame & Priority
2. To generate income to support park management by increasing income from BJCMNP's recreation areas and the Blue Mountains Sustainable Tourism Programme by 150% over the five years.	<p>i) Improve management and supervision</p> <p>ii) Implement and Prepare Plans for implementation</p> <p>iii) Marketing and Sales significantly increased</p> <p>iv) Hospitality & Product Development – services and standards increased and improved</p> <p>v) Increase income</p>	<p>Secure funding and source appropriate personnel</p> <p>Holywell, Signage, Blue Mountains Sustainable Tourism, Business Plan(s), Peak Area Trails</p> <p>Implementation as per Blue Mtn. Sustainable Tourism, Park Management & other relevant Plans</p> <p>–Training</p> <p>–Monitoring for maintenance etc.</p> <p>–Licences – Park 1st</p> <p>Implement business plans; Invest in “RainyDay” Fund</p>	<p>Employ Programme Officer and 1 Site Supervisor</p> <p>-Complete Holywell Plan</p> <p>-Sustainable Tourism Prog established</p> <p>-Signage up</p> <p>-Business Plans in use</p> <p>-Peak Trail Plan Prepared</p> <p>Marketing as per Blue Mountains Sustainable Tourism Programme</p> <p>As per objective</p>	<p>Funds (see budget)</p> <p>Programme Officer, Funds for planning (at least \$2million)</p> <p>Technical Assistance, All funds for Blue Mountains Sustainable Tourism Programme not included in Park budget</p> <p>Funds for marketing (\$600,000/yr for ongoing and additional \$1.4million over period</p>	<p>- Project and Monthly Reports</p> <p>- Track income, expenditure, Track marketing activities</p> <p>- Track visitor satisfaction e.g. through survey.</p>	<p>High Priority</p> <p>By Year 1</p> <p>By Year 5</p> <p>By Year 1</p> <p>By Year 1</p> <p>By Year 2</p> <p>By Year 2</p> <p>By Year 1</p> <p>Ongoing</p> <p>By year 5</p>

Programme Summary: Recreation and Tourism						
Programme Goal: To provide and facilitate the provision of recreational opportunities for local and international visitors, using ecotourism principles in order to generate income and support for the BJCMNP.						
Objective	Programmes/Strategies	Activities	Targets	Resources	Monitoring	Time-Frame & Priority
3. To engender community support for the BJCMNP and natural and cultural heritage conservation by facilitating benefits to local communities.	<p>Implementation of the Blue Mountains Sustainable Tourism Programme (working with targeted communities)</p> <p>Working through the park's Education sub-programme- Community Conservation and Sustainable Livelihoods (working with targeted communities)</p>	<ul style="list-style-type: none"> - Work with targeted communities to establish and further develop attractions, trails, accommodation to be marketed - Training in, and assistance to community members for tour guiding, craft, horticulture etc. -Lobby for better services e.g. road - Use local labour, services & products 	<ul style="list-style-type: none"> Increase number of persons employed to the park or in ventures related to the Park. Blue Mountains Sustainable Tourism Programme working 	<p>Programme Officer, Education Officer, Technical Assistance</p> <p>Funds spent on other activities will contribute to this objective.</p>	<p>Records of the Blue Mountains Sustainable Tourism Programme</p> <p>Surveys/ Interviews</p>	<p>Year 1 and ongoing.</p> <p>High Priority</p>
4. To ensure that recreation and tourism activities do not threaten the BJCMNP's biodiversity, provision of ecosystem services and cultural heritage.	<p>Focus initially on the Park but prepare a Manual and provide training to guide community ventures</p>	<ul style="list-style-type: none"> - Strengthen EMS at Holywell - Visitor impact management at the Peak re: critical habitat - Establish limits of acceptable change or other similar system for Holywell & Peak - Develop best practice manual for use in community ventures 	<ul style="list-style-type: none"> - EMS & related environmental management in place at Holywell (Reports) - Visitor Impact Monitoring at Peak, Holywell and action at Peak (Reports) - Manual 	<ul style="list-style-type: none"> - Conservation Science Officer - Recreation Area Staff - Technical Assistance - Funds - \$2million 	<p>Reports</p> <p>Records</p>	<p>By end Year 2</p> <p>By Year 2</p> <p>Year 3</p> <p>By Year 2</p> <p>Medium Priority</p>

Chapter 11

Monitoring and Evaluation Programme

Monitoring refers to the intermittent (regular or irregular) surveillance carried out to ascertain compliance with a predetermined standard and to investigate the degree of deviation from an expected norm. Monitoring is focused on assessing compliance with limits or standards, with an important aspect of the process dealing with the action to be taken whenever such limits are exceeded. Monitoring provides the information by which projects and programmes may be evaluated.

In managing the BJCMNP, monitoring will take the form of a combination of target-based and threat-based monitoring. This will allow an assessment of both the threat status and the ecological integrity of the natural resources. This is a necessary combination for effective monitoring of the national park, as each method has its own benefits and shortcomings. The BJCMNP Monitoring and Evaluation Programme is therefore aimed at providing information on the effectiveness of management, particularly with respect to the National Park's conservation goal and objectives.

Collecting information for threats monitoring is easier and simpler and the information is more straightforward. This type of monitoring is also more sensitive to changes over short time periods. Outcomes or target-based monitoring however, gives a more direct measure of biodiversity which allows us to measure the effectiveness of the actions we are taking to protect biodiversity but the information is more difficult to collect and requires a higher level of expertise.

Monitoring and Evaluation of the Park's Programmes

There are monitoring and evaluation activities associated with each of the Park's management programmes, to assess achievement of programme specific outputs and outcomes. Targets are set within the management plan and annual targets are also set, which usually relate to both programmatic and project targets. As described in the Governance and Administration Programme, there are several methods of monitoring park management and tracking achievements including regular meetings, Programme Officer, Park Manager and Project reports. Further, at least once a year, a report is prepared which assesses achievement of targets and this is compiled into a five year report at the end of each management planning period. The summary table for each programme chapter indicates the monitoring approach.

In addition, with respect to evaluation of management effectiveness, it may not be clear that any changes have been effected by BJCMNP management, as they may be due to some unrelated factor. Despite this, monitoring and evaluation is a necessary tool for guiding management, to allow it to be adaptive and more likely to result in success. A variety of approaches is therefore very useful. One useful approach that must be incorporated to a greater degree under this Management Plan, is a participatory approach

to monitoring and evaluation. Various stakeholders can and should be involved in monitoring, particularly local community members. This will enhance their knowledge and understanding of resource management and promote greater support for conservation. In addition, people living within the Community Buffer Zone are likely to be aware of relevant changes outside regular monitoring times. Involvement of community members will require their training and stipends for expenses e.g. transportation and meals, and an honorarium.

Table 11.1 Monitoring and Evaluation Programme Goal and Objectives

Goal	Objectives
To track and record both the threats and the changes to ecosystem health, so that it is possible to assess whether or not the BJCMNP is achieving its over-arching conservation goal.	1. To track, record and mitigate threats to the BJCMNP, posed by use of its resources
	2. To monitor the populations of key, threatened species – the Giant Swallowtail Butterfly, the Jamaican Coney and the Yellow Boa.
	3. To monitor forest area and encroachment activities.
	4 To monitor the quality of fresh water ecosystems in the BJCMNP.
	5. To monitor the bird distribution in the BJCMNP.

11.1 Monitoring of Traditional, Subsistence and other Resource Use

Threats Monitoring/Ranger-based Monitoring

Numerous occurrences of traditional use, subsistence and other resource use activities that place stress on, and threaten the resources, still occur in the Community Buffer Zone and may encroach into the National Park. These include hunting of the Jamaican Coney and Giant Swallowtail Butterfly, catching crayfish with toxic chemicals, harvesting of non-timber forest products such as orchids, forest clearing for lumber, and slash and burn farming. As indicated, some of these activities are traditional uses e.g. Coney hunting, some are subsistence use e.g. slash and burn farming whilst others are commercial uses e.g. catching crayfish with toxic chemicals, forest clearing for lumber and sometimes clearing of forest by a large scale farmer, with bull-dozer and/or fire. Monitoring of these threats will reveal whether they are changing in their severity or geographic range as a result of conservation strategies (or lack thereof).

This type of monitoring may be referred to as ranger-based monitoring - the most effective source of observation of sudden change and conservation status in the protected area. Rangers are regarded as the eyes and ears of protected area management as they are closest to situations on the ground. In fact, the physical presence of rangers is regarded as the main factor in the conservation of the ecological integrity of protected areas. This is because the rangers have the power to effect immediate action against unacceptable changes and are the first line of defence against offenders of protected area legislation.

In addition to the timely detection of threats, communication of the situation to the appropriate management level is equally important as rangers will often require assistance (from the police, for example) in handling delicate situations. National Park Rangers should properly record and communicate their observations and actions and the information must be analysed and reported to the Park Manager for the appropriate management actions to be taken. This must include timely and detailed reports to the relevant government agencies responsible for enforcement including legal action. The Rangers should always be informed of action taken as this feedback will be motivating.

Another important aspect of threats monitoring and surveillance is keeping tabs on the progression of mitigation and stopping the effects of illegal activities. Once detected, National Park Rangers and other enforcement officers must work towards putting an end to threatening activities. In conservation, immediate action is essential to stopping new offences (such as deforestation) in their tracks and preventing these activities from permeating as once they filter through, they are very difficult to remove.

Objective 1: To track and record threats to the BJCMNP, posed by use of its resources

This objective was changed slightly from the previous Plan by removing the section about threat mitigation (being more appropriate for the Enforcement and Compliance Programme) and no longer referring specifically to traditional and subsistence use. Not all the strategies below were implemented in the last period e.g. analysis of old enforcement log books, and this is something that an intern or researcher will need to do as the National Park's human resources are insufficient. There will need to be liaison between the Chief of Corps and Education Officer to expose incidents to the wider public as this would require a captioned photograph or media release.

Box 11.1 Strategies for Threats-Based Monitoring of the BJCMNP

Threats-based monitoring of the BJCMNP will use the following strategies:

- 1. Rostering National Park Rangers to conduct patrols so as to circle the BJCMNP at least twice a year, collecting and reporting field information and enforcing the law. Information from Buffer Zone community members and other stakeholders will help guide patrol locations.**
- 2. Entry of incidents into an enforcement and compliance log book and computerized database to record all instances and action taken towards the resolution of destructive illegal activities within the park.**
- 3. Photo monitoring of the location of the incident, wherever appropriate.**
- 4. Photo monitoring of permanent points. Appendix 6 contains a list of the photo-monitoring sites.**
- 5. Exposure of the incidents encountered (including partner agencies with jurisdiction and the wider public).**

11.2 Tracking Trends and Changes in Ecosystem Health

11.2.1 Outcomes/Targets Monitoring

As opposed to monitoring threats to biodiversity, this type of monitoring aims to provide data to assess the impacts management activities are having on the biodiversity we are trying to protect, that is, management effectiveness. Since biodiversity conservation is the National Park's goal then the biodiversity conservation targets should be tracked to help assess their status e.g. population, distribution, health. It provides the opportunity to manage adaptively, and demonstrate effectiveness to donors and other stakeholders, thereby providing the accountability needed to sustain investments for conservation. Objectives 2 through 5 aim to monitor the Park's biodiversity conservation targets.

Box 11.2 Examples of Outcome Indicators for the BJCMNP

Outcome Indicators

The following are the chief outcome indicators (that may be assessed at the end of this five year management period) for the overarching goal of the Park – to maintain and enhance the remaining area of closed broadleaf forest and component species of plants and animals that exist in the Blue and John Crow Mountains.

- 1. Extinctions and Endangerment avoided** – no increase in the threat status of biodiversity targets (according to the IUCN Red List).
- 2. Population assessments of key species** (Giant Swallowtail Butterfly, Jamaican Coney and Jamaican Boa) show at least the same (recent) historical distribution.
- 3. Maintenance or increase in the remaining percentage of closed broadleaf forest cover** – with corridors, lowlands and edges showing no further contraction in their forest cover.

Objective 2: To monitor the populations of key, threatened species – the Giant Swallowtail Butterfly, the Jamaican Coney and the Yellow Boa.

The first two indicators could only be monitored accurately with external technical assistance due to the limited amount of information available e.g. regarding species populations and species threat status. The need for such studies is already listed in the Research Prospectus but will need increased attention under the Conservation Programme's research promotion objective. Despite this, observations and reports of the conservation targets were recorded and mapped and this will eventually provide useful information, perhaps for more detailed research. In fact, National Park Rangers identified a previously unknown population of Giant Swallowtail Butterflies and this was reported to relevant experts for further investigation.

Management will continue to track these indicators as far as possible with limited resources, and should improve monitoring, if information and resources become available. Reporting by local community members and other stakeholders e.g. researchers, will be promoted and the information included in the databases.

11.2.2 Forest Area Monitoring

Perhaps the most important key ecological attribute of the BJCMNP is the remaining area of closed broadleaf forest. Once this forest is in good condition (sufficiently large area and high representative biodiversity) the assumption can reasonably be made that we are in good stead with conservation at the species level. Forest area is also something that the general public readily identifies with; everyone notices when trees are being cut down, while they will not so readily notice other conservation issues.

In the BJCMNP, what we experience is an edge issue, whereby encroachment eats away at all the edges of the forest. As the connections between the mountain ranges are relatively narrow, we risk fragmentation of this contiguous mountain habitat if linkages like Silver Hill Gap and Corn Puss Gap are not preserved. Monitoring forest area will therefore, focus on the transition zone (where encroachment meets closed broadleaf forest), examining aerial photographs that date back to the 1950s and comparing these with the latest ones in order to track trends and direct monitoring and enforcement activities to the areas which are being destructed. It is because of these issues that the overarching goal of park management, as stated in Chapter 1, is *to maintain and enhance the remaining area of closed broadleaf forest and component species that exist*. This describes a more feasible ecosystem approach rather than the single-species approach.

The threat to this remaining area of closed broadleaf forest is *encroachment* in one form or another and this will cause the *undesirable changes* in forest area, while the activities of park management (including FD, NEPA and JCDT) such as reforestation, enforcement and education will cause the *desirable changes*. It is these *changes* that this monitoring plan is designed to map - to show where and to what extent they are occurring so that management can be informed and appropriate steps taken to address the situations. Monitoring forest area will therefore, provide a means of accountability, to show up the results and impacts of park management.

Objective 3: To monitor forest area and encroachment activities

It was anticipated that this activity would be the responsibility of the Forestry Department (FD), as they have the experience and expertise. However, limited funds and human resources had a negative impact on implementation. Despite this, some funding was accessed by JCDT allowing forest area to be assessed by the FD through comparison of 2009 aerial photography (from a JDF helicopter) with 2003 satellite imagery. In addition, an independent study was undertaken by Cambridge University researcher and former BJCMNP Conservation Science Officer, Shauna Lee Chai. The latter comparison used satellite imagery and ground-truthing, and compared the periods 1983 – 1992 and 1992 –

2002. FD found no differences in forest area and Chai et al. 2009 found net deforestation had decreased due to an increase in forest re-growth.

The BJCMNP has one of the oldest sets of forest sample plots for research – 38 years. This is an asset that will be used, by liaising with the relevant researchers.

During the 2011 – 2016 period the following should be implemented:-

- i) Repeat the Chai et. al study with imagery from 2003 – 2008 and 2002 – 2012.
- ii) Conduct photo-monitoring from helicopter at least once a year, and analyse data
- iii) Partner with the FD for bio-inventory of watershed management units and satellite imagery analysis

11.2.3 Freshwater Monitoring Programme

The freshwater habitats of the BJCMNP are mainly the small high-altitude headwater streams and waterfalls of the eastern third of Jamaica but may also include subterranean habitats associated with the white limestone of the John Crow Mountains. These are the highest elevations at which freshwater ecosystems are found in Jamaica, with many streams flowing at over 1800m above sea level. Freshwater communities found in these habitats tend to be adapted to low temperatures, high dissolved oxygen levels and turbulent currents. The BJCMNP encompasses the upper parts of 10 of Jamaica's 26 watershed management units (WMUs which are vital to the water supply of metropolitan Kingston and surrounding areas. The integrity of rivers and streams in the National Park is threatened by altered hydrological regimes, degraded physical habitat and water quality and altered biological community composition and structure.

Objective 4: To monitor the quality of freshwater ecosystems in the BJCMNP

Freshwater ecosystems were selected as one of the National Park's conservation targets during Conservation Project Planning for the BJCMNP (2001 and 2004). Park management will require information in order to gauge the effectiveness of conservation strategies and to evaluate the general status of freshwater ecosystems. This information will be provided by the monitoring programme outlined below. Five years of freshwater ecosystem monitoring data have been collected under the previous Management Plan and a detailed report has been prepared. Essentially, the quality of headwater streams in the Park remained the same and even improved at some sites, but outside of the Park there were some negative changes. The programme will continue during 2011 – 2016.

i) Monitoring regime and sampling sites

The monitoring regime described below was designed to facilitate a holistic evaluation of BJCMNP freshwater ecosystems by measuring a broad range of ecological attributes while limiting the number of indicators and costs. Physical habitat quality describes the substrate of the streams as well as allochthonous inputs. Stream water quality includes the concentration of solutes in the water, temperature and suspended sediment. The

hydrological regime describes the distinct temporal patterns in stream discharge that regulate the entire ecosystem. Biological community structure and composition describes the biotic condition of the ecosystem and includes direct measurement of the stream fauna and flora. Twelve sample sites (Tables 11.2 & 11.3) have been selected based on accessibility (proximity to roads and trails), representation of the WMUs and representation of different upstream land uses.

Table 11.2: Analysis of the Water Management Units (WMU) of BJCMNP and the Number of Sampling Sites

Drainage Basin	Percentage Drainage Basin in the BJCMNP	Number of Sampling Sites
Buff Bay/Pencar	20	1
Drivers River	35	1
Hope River	6	0
Morant River	20	1
Plantain Garden River	15	1
Rio Grande	45	2
Spanish River	35	1
Swift River	45	2
Wagwater River	10	1
Yallahs River	5	2
TOTAL		12

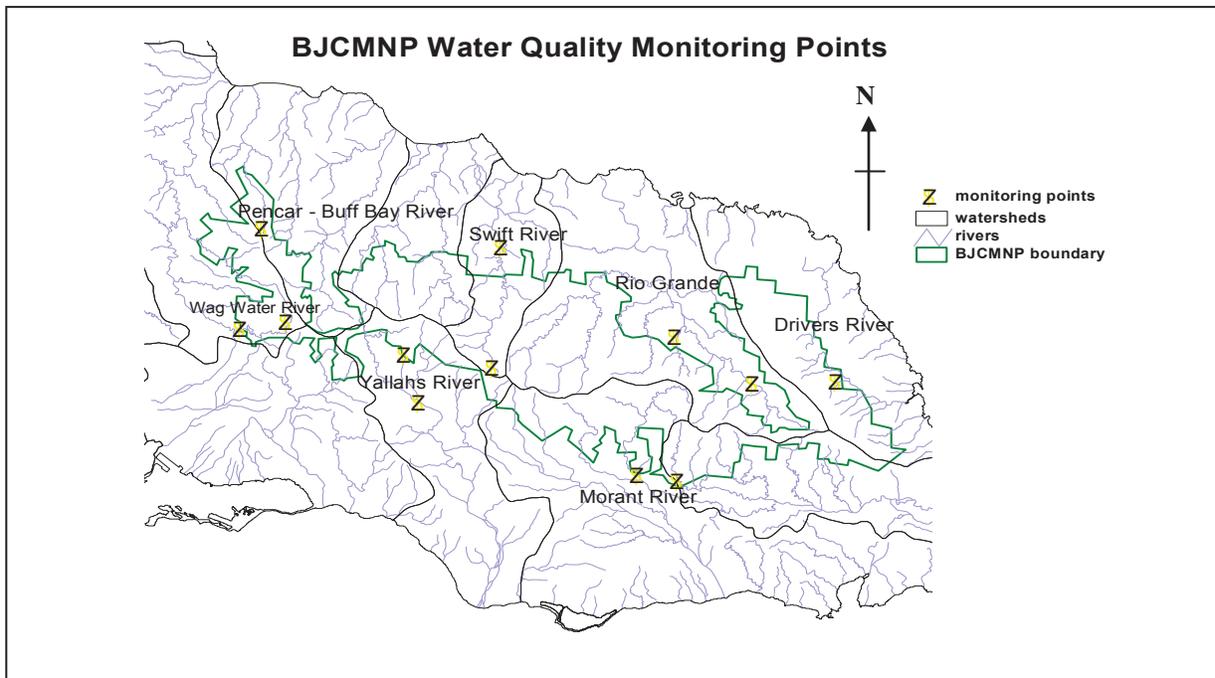


Figure 11.1: Map of BJCMNP Water Quality Monitoring Sample Sites (Source: JCDT)

Table 11.3 BJCMNP Freshwater Ecosystem Monitoring Regime (Source: JCDT)

Attribute	Indicator	Method of Measurement	Frequency of Measurement	Responsibility
i) Physical Habitat Quality	- % area of park under closed broadleaf forest & other land uses.	Derived from Forestry Department biophysical inventory, etc..	Once every five years	BJCMNP science staff
	-Forest cover at site	-Record observations	Twice per year	BJCMNP Park Rangers
ii) Stream Water Quality	Total suspended solids/turbidity	Turbidity meter measurements at permanent sampling sites.	Twice per year	BJCMNP Park Rangers
iii) Hydrological regime	Mean monthly stream discharge	Water Resources Authority (WRA) stream gauge recordings.	Data should be obtained from the WRA twice per year and collated	BJCMNP science staff
iv) Biological community composition and structure	Benthic macroinvertebrate relative abundance and community diversity	3 2-minute kick-samples at permanent sampling sites.	Twice per year (once in wet season-May to Nov. and once in dry season-Dec. to April)	BJCMNP Park Rangers

ii) Sampling methods

Biological monitoring

Biological monitoring is the direct measurement of the condition of the aquatic community. There are a variety of ways of measuring the fish, invertebrate and plant communities of streams. It is recommended that benthic macro-invertebrates are sampled because they are a relatively diverse group and are found throughout park streams even when fish and macrophytes are absent. Macro-invertebrates are also indicative of other environmental conditions such as the food base (allochthonous and autochthonous inputs), the relative health of the fish community which often preys on invertebrates, and pollution. The collection of macro-invertebrates requires simple and inexpensive equipment and with minimal training many invertebrates can be identified with the unaided eye.

Methods

At each site, three 1-minute kick samples of the macro-invertebrate community are taken every six months. This yields semi-quantitative information on the aquatic community. Qualitative sampling of the macro-invertebrate community is conducted by searching for them in likely places such as under rocks and in leaf packs. The numbers and amounts of invertebrates collected is recorded in the field (with identification to at least family) on the field sheets designed for BJCMNP by TNC. This information is analysed using the Shannon-Weiner Diversity Index. Sampling should be non-destructive and for quality control purposes, the invertebrates collected should be preserved in 70% alcohol once per year and sent to the freshwater ecologist at the Life Sciences Department, University of the West Indies for detailed identification. General observations concerning human use, riparian vegetation and allochthonous inputs, exposure to sunlight and algal growth should also be made and recorded on field data sheets.

Stream water quality

Turbidity and temperature readings should be taken at each sampling site during biological sampling and ideally, additional parameters should also be measured. Purchase of additional meters mid-way through the past five years, allows for measurement of pH and dissolved oxygen, which is very useful particularly the latter which is an indicator of biological oxygen demand (BOD). However, given their high costs, it is recommended that they only be measured to verify the effect of human activities when upstream changes in land use (such as forest clearing, agriculture or settlement) are observed. In that case, water samples should be collected, kept in cold storage and analysed by a certified laboratory for nitrates, phosphates and BOD.

Effort

- 12 sites @ 2 sites/day
- 6 days per 6 months (plus 2 additional days to cover possible delays)
- Total = 14 days per year dedicated to freshwater monitoring

Where possible (with funds for training and stipends), community-based organizations and community members will be involved.

11.2.4 Bird Monitoring Programme

As one of the most important bird habitats in the island, the BJCMNP has been engaged in bird monitoring activities for over 10 years. Being abundant, easily seen and indicative of habitat quality, birds have understandably been chosen as one of the park's conservation targets, and so monitoring their distribution is an important undertaking.

Objective 5: To monitor the bird distribution in the BJCMNP

Bird monitoring was planned to take place over the National Park's area in a five-year cycle. This was accomplished and so the first five-year cycle of this programme will serve as baseline information for the long term monitoring of birds in the Park. Monitoring using the same methodology will continue under this Management Plan. Each

year, one area will be monitored and point counts will be conducted twice per year, once in the breeding season (mid April – late July) and once in the winter season (mid September - March). Forty point counts (200m apart) will be conducted in each of three habitat types for the chosen area. Habitat types will be chosen to reflect:

- (i) **good habitat quality** - montane rain forest,
- (ii) **intermediate habitat quality** - modified montane rain forest, and
- (iii) **poor habitat quality** - ruinate (heavily degraded woodlands often dominated by invasive plant species).

These habitat types can best be identified along access trails with an elevation gradient, whereby the likelihood is that: i) lower elevations would be representative of ruinate, ii) intermediate elevations would represent modified forest types, and iii) higher elevations would represent good quality habitat.

Sample areas

Five areas were identified in the previous Management Plan, however some changes were made after reconnaissance of the areas. The final areas monitored still result in the best possible coverage of the Park's area. Ease of accessibility was also an important factor in choosing the areas and therefore, existing trails that enter the forest were chosen (see Figure 10.2). The sites are:

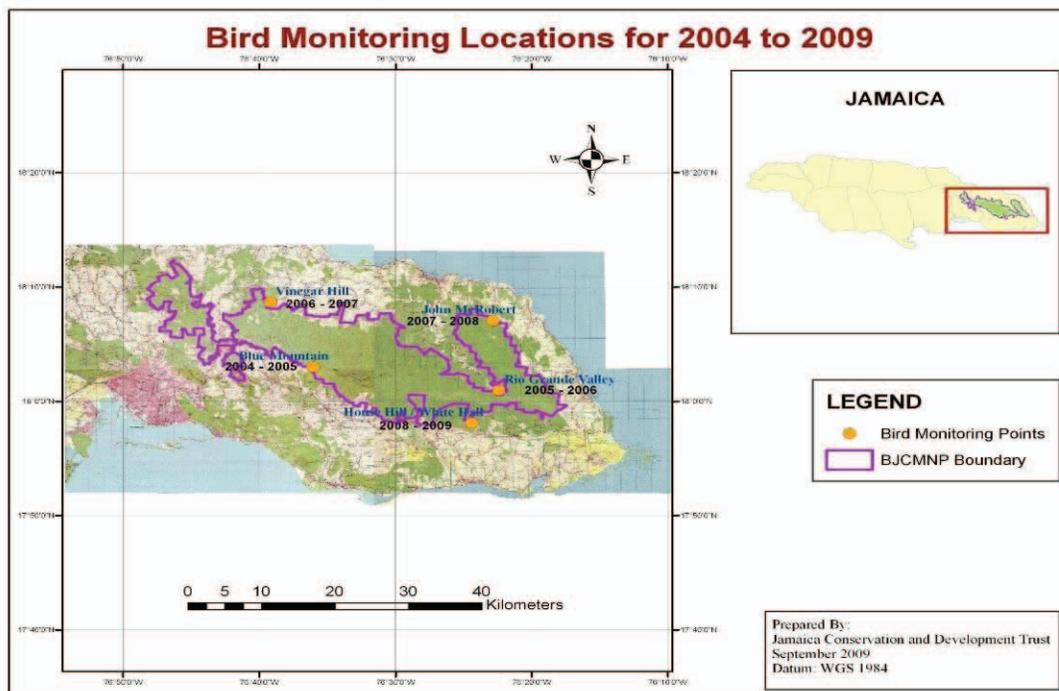
- i) Blue Mountain Peak Trail
- ii) Cunha Cunha Pass Trail
- iii) Vinegar Hill Trail
- iv) Sherwood Forest
- (v) White Hall/House Hill

Effort

One area will be covered each year totaling five sample areas over the park in a 5-year cycle. A minimum of two field personnel conducting a maximum of 15 point counts per day will yield 120 point counts per season and 240 point counts per year. This will require 18 field mornings (1 month) each year to be dedicated to this activity, with an additional 10 days being required to establish sample points in each of the five areas. Additional days are usually required as both monitoring seasons fall during the rainy season, and therefore some monitoring days are rained out. This can push the timeframe for bird monitoring to 6 or even 8 weeks. As some of these trails are not in active use, labour is required to clear a path. In addition, accommodation may need to be retained for the period, as the Rangers are in the field for 4 nights in order to conduct early morning monitoring.

Where possible (with funds for training and stipends), community-based organizations and community members will be involved.

Figure 11.2. Bird Monitoring Sites in the BJCMNP (Source: JCDT)



11.2.5 Climate Change Monitoring

In the 2005 – 2010 Management Plan, climate change was identified as a threat, but one that little could be done to address, except to implement planned programmes to conserve the forest ecosystems and to educate community members with respect to activities for both mitigation and adaptation. This would increase the resilience of both the forest and human communities to adapt to at least some levels of climate change and its impacts. Further, the protection of existing forest from clearing and the reforestation and rehabilitation of deforested and degraded forest, would help even in a small way to make a contribution to mitigation of climate change impacts.

This approach will continue during the 2011 – 2016 period, but efforts will be made to add some monitoring components. In light of the limited resources available for National Park management, the proposed monitoring activities can ‘piggy-back’ on other monitoring or patrol activities:-

- i) Bird monitoring – pay particular attention to the Smooth-billed Ani
- ii) Freshwater monitoring – identify any temperature related changes
- iii) Establish a monitoring plot at Portland Gap or the Peak

Further consideration should be given to monitoring climate change impacts and evaluating the effect on the Park’s resources, and this has been included in the Research Prospectus.

Programme Summary: Monitoring and Evaluation

Goal: To track and record both the threats and the changes to ecosystem health so that it is possible to assess whether or not the BJCMNP is achieving its overarching conservation goal.

Objectives	Strategies	Activities	Resources	Personnel	Monitoring & Evaluation
1. To track, record and mitigate threats to the BJCMNP, posed by use of its resources.	Gathering information from observations made during Ranger patrols and reporting to relevant agencies (through Enforcement and Compliance Programme Objectives 1 and 2).	<ol style="list-style-type: none"> 1. Rostering National Park Rangers to conduct periodical rounds over the Park's area to collect and report field information, including photo-monitoring of sites. 2. Entry of information collected into database. 3. Analysis of the information collected. 	<p>Database system, digital cameras, log books.</p> <p>Funds to train community members</p>	<p>National Park Rangers, CSO</p> <p>Local community members</p>	<p>Log books and database established and up-to-date.</p>
2. To monitor the populations of key, threatened species – the giant swallowtail butterfly, the Jamaican coney and the Yellow boa.	<ol style="list-style-type: none"> 1. Use information available 2. Promote the population assessments in the research prospectus. 	<ol style="list-style-type: none"> 1. Record observations and reports of these species 2. Include population assessments in research prospectus and facilitate this research. 	<p>Database system, digital cameras, log books.</p> <p>Field stations, vehicles</p>	<p>CSO, National Park Rangers</p> <p>Local community members</p>	<p>Research log maintained</p>
3. To monitor forest area and encroachment activities.	<ol style="list-style-type: none"> 1. Aerial photo and possibly video-monitoring 2. Permanent point photo-monitoring 3. Comparison of satellite images over the years 4. Collaboration with FD on bio-inventory of Watershed Management 	<ol style="list-style-type: none"> 1. Seek assistance from the JDF for helicopter fly-over of the Park at least once a year for photo-monitoring 2. Photographing permanent photo points. 3. Seek funds for satellite imagery comparison 4. Assisting the FD in the bio- 	<p>GIS specialist, JDF Airwing, Funds</p> <p>Technical Assistance</p>	<p>CSO, National Park Rangers</p> <p>Local community members (information)</p>	<p>Forest area monitoring results and analysis.</p>

Programme Summary: Monitoring and Evaluation Goal: To track and record both the threats and the changes to ecosystem health so that it is possible to assess whether or not the BJCMNP is achieving its overarching conservation goal.					
Objectives	Strategies	Activities	Resources	Personnel	Monitoring & Evaluation
4. To monitor the quality of freshwater ecosystems in the Park.	Units (WMU). 1. Macro-invertebrate monitoring. 2. Water quality monitoring.	inventory of the WMUs. 1. Establishing sample points, 2. Conducting invertebrate sampling and identification, 3. Measuring water quality parameters, 4. Analysing results, , including any possible climate change related findings	Equipment for water quality monitoring (eg. kick nets, etc) Transportation	National Park Rangers, CSO Local community members (if funds available)	Water quality monitoring results and analysis.
5. To monitor the bird distribution in the Park	Bird monitoring (using the point count method) in 5 areas over the Park's area	1. Establishing bird points, 2. Conducting bird counts, 3. Analysing results, including any possible climate change related findings	Equipment to conduct point counts (eg. binoculars), Transportation	National Park Rangers CSO Local community members (if funds available)	Point count results and analysis.

It should be noted that in the Budget, the Monitoring and Evaluation Programme is combined with the Conservation Programme. This is because the two programmes are managed by the Conservation Science Officer and the main costs are personnel (particularly Rangers – whose costs are listed under the Enforcement and Compliance Programme), transportation, stipends and technical equipment and materials. For greater involvement of community members, funds will have to be sourced for training and stipends.

CHAPTER 12

Governance & Administration Programme

In order to meet the BJCMNP's over-arching conservation goal and to execute the management programmes aimed at achieving this, several management and administrative functions are essential. Planning, project management, supervision, financial management, monitoring and evaluation are all critical management functions that ensure timely and effective implementation of activities. Financing management is of particular significance in the Jamaican context where funding from government sources is limited and un-secured. Administrative functions include procurement, accounting, reporting, filing and correspondence. Administrators and the work they do, often behind the scenes, provides the necessary support that operations staff need to get the mission of the organization accomplished. Marketing and public relations activities are necessary, not only for the recreation and tourism components of park management, but to promote the National Park's work in order to garner increased support.

The BJCMNP protects the natural and cultural heritage of the people of Jamaica, and by extension (because of the international significance of the resources) the country is protecting this heritage for the benefit of the whole world. The agencies responsible for governance of the National Park are therefore responsible to the stakeholders, to provide the best management possible and in a participatory and transparent manner. Decision making, policy direction and synchronisation of efforts among relevant agencies, collaboration and support are important governance issues. The proposed park management structure (Figure 12.1) assumes that a collaborative approach to management will continue and that partnerships will be formed with various organisations, including communities to support park management.

In terms of governance, the NRCA through NEPA is the agency with responsibility for national park management (under the NRCA (National Parks) Regulations of 1993). This Management Plan has been prepared within the context of a ten year delegation agreement which was signed between NRCA (through NEPA) and the JCDT in October, 2002. As the BJCMNP is also a forest reserve, NEPA must collaborate with FD in order to effectively manage the natural resources of the area. A collaborative management agreement was signed between FD, NRCA/NEPA and the JCDT in 2001. With the recognition of the need to legally protect and otherwise conserve cultural heritage resources, the new collaborative management agreement will include the JNHT. Despite the lack of an up-to-date formal agreement, the principles and practices of the agreement have been maintained e.g. with regular Co-management meetings between the co-management partners, reporting and cooperative efforts. This Management Plan follows on a successfully implemented 2005 – 2010 Management Plan and anticipates the signing of new agreements shortly. Whilst management roles and responsibilities will be shared through one or more agreements, the government agencies are ultimately responsible for management of the nation's natural and cultural heritage.

Table 12.1 Governance and Administration Programme Goal and Objectives

Goal	Objectives
<p>To provide efficient, effective and sustained management that will allow the BJCMNP to meet its over-arching and other goals.</p>	<p>1. To coordinate management at the policy level through establishment of a BJCMNP Advisory Committee comprising key public, private sector and community stakeholders meeting twice a year.</p>
	<p>2. To coordinate management at the operations level through regular meetings of the Co-Management Committee (management partners as per relevant agreements) and community stakeholders.</p>
	<p>3. To provide supervision, project management, financial management and administrative support for the BJCMNP’s programmes</p>
	<p>4. To source short and long-term funding for park management through grant funding, government subvention, donations, sponsorship and opportunities provided through the Recreation and Tourism Programme.</p>
	<p>5. To ensure adaptive management through monitoring and evaluation of all programmes</p>

12.1 Management Committees

Management committees are a useful way of involving stakeholders for the purposes of collaboration, increasing the set of skills and other resources needed for management, and helping to ensure transparency and accountability. There is no one agency or organization in Jamaica that has sufficient capacity to manage the BJCMNP on its own. The JCDT has significant capacity, particularly in terms of its commitment, knowledge, skills, procedures and experience however, the National Park’s government co-management partners have specialized skills and legal responsibilities. The stakeholders of the BJCMNP are varied, ranging from other government agencies, statutory bodies, Maroon Councils, academia, private sector through to a diverse assemblage of community members. Each stakeholder group has relevant knowledge, skills and experience amongst other relevant capacities. Collaboration is essential to make use of the wealth of resources in such a way as to manage the BJCMNP for the common good.

Under the implementation of the 2005 – 2010 Management Plan, only one of the recommended committees was established and functioning – the Co-Management Committee. The Advisory Committee was not established due to lack of clarity as regards its establishment and functioning. The National Park Regulations section 34 provides for the Authority (NRCA) to establish a National Parks Advisory Council, and specifies the agencies to be represented and the functions of the Council. However, this Council is to

address national parks generally. This Plan provides for the establishment of a Committee specifically for to help guide management of the BJCMNP. Whilst there was significant involvement of Maroon Councils and other Buffer Zone community members in management and project planning especially for the Blue Mountains Sustainable Tourism Programme, the proposed formal involvement and monitoring and evaluation of this involvement did not occur. This was primarily due to limited human resources. During implementation of this Management Plan, more will need to be achieved.

Objective 1: To coordinate management at the policy level through establishment of a BJCMNP Advisory Committee comprising key public, private sector and community stakeholders meeting twice a year.

i) Advisory Committee

A BJCMNP Advisory Committee should be established to provide oversight and encourage collaboration and transparency for the National Park. As indicated above, this Committee will be specific to the BJCMNP and is not a replacement for the National Parks Advisory Council described in the Regulations which is to guide wider national park management. It should meet at least twice a year, with the Park Manager providing secretariat services. There should be no more than 15 members, including the Park Manager, NEPA, FD and JNHT representatives along with representatives of the main stakeholders including:

- a) Government agencies e.g. National Water Commission, Commissioner of Lands, Ministries of Land and Environment, Tourism, and Finance and Planning.
- b) Private sector e.g. Coffee Industry Board, Jamaica Hotel and Tourist Association
- c) Non-government and community-based organisations – including community representatives from around the park (no less than five)

The Park Manager will organize the meetings including invitations, preparation of the agenda, minutes and reports. A chairperson will be selected by the committee to guide the proceedings. Meetings should be no longer than about 2 hours and the focus should be on working together to resolve Park management challenges. Thus the Park Manager should make a 20 - 25 minute power-point presentation regarding the status of the National Park and achievement of its objectives, and highlighting specific challenges and other issues. The remaining time can then be used to jointly address thematic management issues e.g. breaches of legislation, funding challenges, promotional needs etc. Responsibilities will be assigned so that the Park Manager or other relevant officer can follow up.

The first meeting should be organized within the first half of Year 1 of this Management Plan and the Co-management Committee should play a key role in determining final membership (numbers and representation).

Objective 2: To coordinate management at the operations level through regular meetings of the Co-management Committee (management partners as per relevant agreements) and with community stakeholders.

ii) Co-management Committee

A Collaborative management or Co-management Committee should be responsible for operational management – meeting at least three times per year to ensure that targets are set based on the operational plans (prepared annually and based on the management plan), to monitor and evaluate the effectiveness of park management and to facilitate cooperation between the main co-management partners. The structure and functioning of the Co-management Committee and co-management partners is described in the Co-management Agreement. It is a small committee consisting of representatives of the BJCMNP co-management partners (NEPA, FD, JNHT and JCDT). Representatives from community or other organizations may be co-opted from time to time.

iii) Buffer Zone Community Involvement

Local Advisory Committees (LACs) were established in the early to middle years of the park. Meetings were open to anyone who wished to attend but this resulted in large and somewhat cumbersome membership, with meetings being financially difficult to maintain. The following recommendations are based on an analysis of that experience and the last five years:-

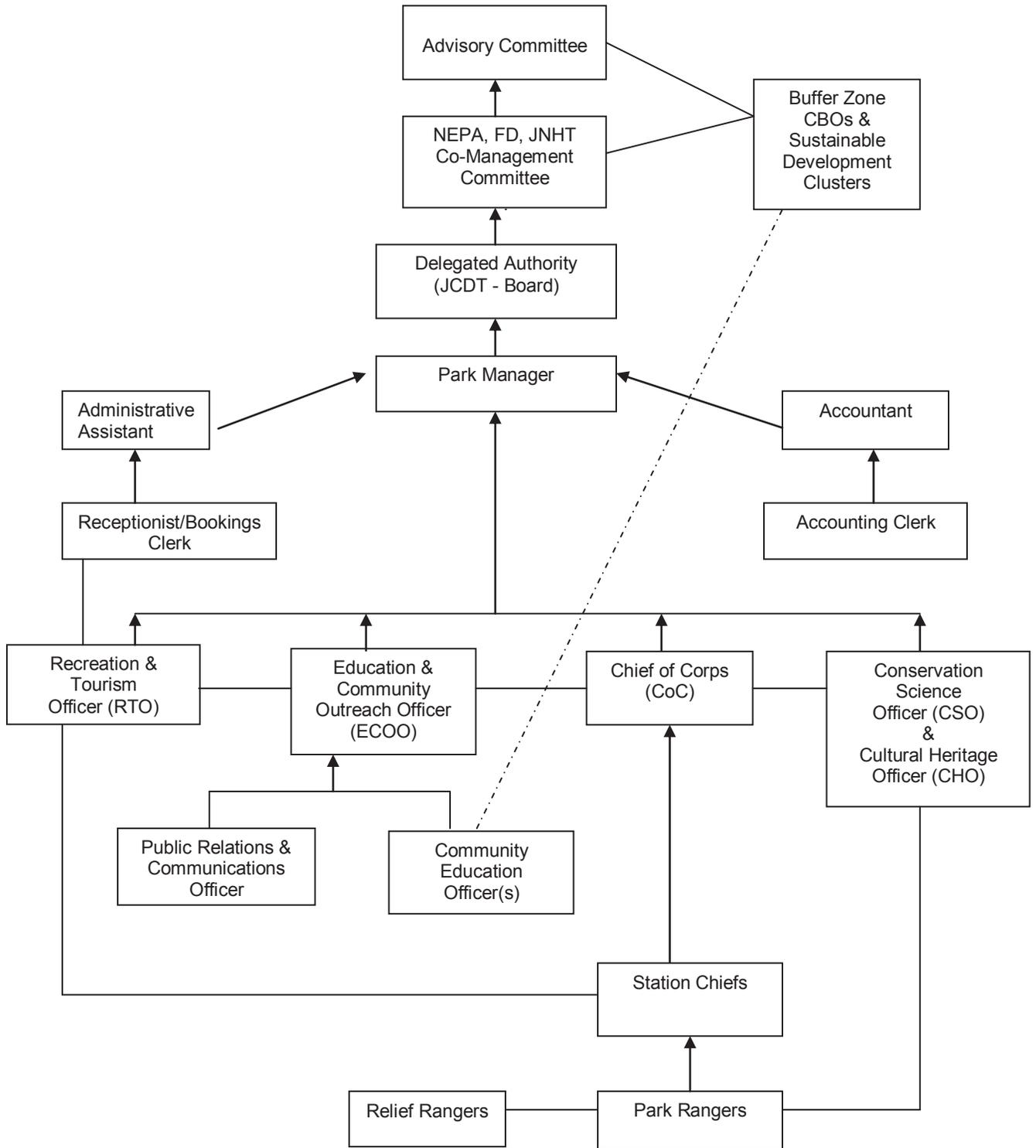
(a) **Community members should help select representatives to the BJCMNP Advisory Committee** – possibly through joint community meetings held annually.

(b) **Blue Mountains Sustainable Tourism Clusters could be expanded as Sustainable Development Clusters**, since all livelihood issues are relevant to tourism whether it is production of food, maintenance of roads, garbage collection or water supply. In fact, at the participatory planning meetings, community members saw the clusters as an opportunity to lobby government for greater support of conservation and to address livelihood issues of rural communities of the Blue and John Crow Mountains. These groupings would be similar to that of the original LACs, but much more focused and results-oriented, with hopefully a mechanism for sustainability.

(c) **BJCMNP management should liaise directly with existing, community-based organizations in the buffer zone.** In light of the importance of community involvement, park management should liaise with local community-based organizations on a regular basis through the Education and Public Involvement and other Park Management Programmes. Where assistance and other support can be provided to communities indicating interest in natural resource management this should be provided, working with other relevant agencies, and with a focus on empowerment. Selected communities will be involved in Park management through the mechanisms described in Bedasse, 2005.

(d) **Park management should ensure outreach to the wider Community Buffer Zone** (through the Park's Education and Public Involvement Programme) to ensure community members are aware of the National Park and its management.

Figure 12.1: Proposed BJCMNP Governance Structure



Legend

Lines with arrows = reporting relationships

Straight lines = working/liasing relationships

Dashed line = working/liasing relationships between Park and CBOs

12.2 Operations

Day to day operation of the BJCMNP will be guided by its annual operations or work-plan, which sets the annual targets geared at achieving programmatic objectives and goals. The Park Manager is responsible for employing the necessary management tools in order to ensure the Park achieves annual targets and hence five year objectives and finally the Park's ultimate conservation goal.

Administrative Areas

Dividing the Park geographically into zones or administrative areas is a method that assists in planning strategically. Three administrative areas are recommended to cover west, southern and north-eastern regions of the park. This is in light of the large area to be covered and is based on the 1993 Management Plan in which this arrangement was first recommended. These areas correspond to specific watersheds and each contains areas of significance both in terms of biodiversity and cultural heritage conservation and threats. A Ranger Station is located in each of the administrative areas, which is useful for the marshalling of resources for patrols and other activities within each area. In addition, each of the three recreation areas - Holywell, Peak Trail and Cunha Cunha Pass Trail fall into one of the administrative areas. Particularly for the former two, this has resulted in greater National Park management presence and project activities in the surrounding communities.

Without a Corps of at least 12 Rangers and sufficient vehicles, it is not possible to operate the Enforcement and Compliance Programme in a way that has National Park Rangers based at the Ranger Stations full-time. This is also because the Rangers have several other duties including bird and freshwater monitoring and supervision of forest rehabilitation. Despite this, the concept of administrative areas is a good one.

Table 12.2: Geographic Areas of BJCMNP Operation

AREA	BOUNDARY	COMMENTS
<p>Area 1</p> <p>Southern Blue Mountains.</p>	<p>i) South-western Blue Mountains – upper Yallahs River Watershed.</p> <p>ii) South-eastern Blue Mountains – upper Morant and Plantain Gardens Watersheds.</p>	<p>The former section (i) of area 1 is under greater threat (mainly from encroachment for agriculture and related fires and overgrowth of invasive species) and will require more attention than the other sections. This area includes the Grand Ridge of the Blue Mountains where several peaks are located, including Middle Peak – more popularly known as the Blue Mountain Peak. The Grand Ridge has unique montane vegetation and requires special conservation attention. The Blue Mountain Peak and Trail (where it crosses the park boundary) are important for recreation and must be carefully managed and monitored because of the significance of the area's flora.</p>

AREA	BOUNDARY	COMMENTS
		<p>The Area 1 Ranger Station is located at Portland Gap, along the Peak Trail.</p> <p>Section (ii) is under less threat, and therefore requires less monitoring except priority sites.</p> <p>Buffer zone communities include Mavis Bank, Hagley Gap, Minto and Penlyne Castle.</p>
<p>Area 2</p> <p>Western Blue Mountains (Port Royal Mountains and Buff Bay Valley).</p>	<p>i) West Port Royal Mountains – upper Wag Water Watershed.</p> <p>ii) East Port Royal Mountains – upper Hope and Buff Bay Watersheds.</p>	<p>The West Port Royal Mountains area is mainly modified and ruinate forest. It requires a special plan with respect to sustainable use rather than conservation, per say. Whilst the eastern Port Royal Mountains and the Buff Bay Valley area are in better condition where forest cover and type are concerned, the sections under closed broadleaf forest are limited and in need of special attention. These areas are close to the Holywell Recreation Area. The corridor up into the Hope River Valley and down into the Buff Bay Valley is a scenic route, along which there is growing a small heritage tourism industry. With the close proximity of these areas to the large population of Kingston and the north coast tourist resorts, this area is important for raising awareness and support for the park. This however, must be balanced by conservation. The Area 2 Ranger Station is located at Holywell.</p> <p>Buffer zone communities include Woodford, Freetown, Irish Town, Redlight, Greenwich, Section, Cascade and Charles Town (physically outside the Buffer Zone, but considered within because of its Maroon community).</p>
<p>Area 3</p> <p>Northern Blue Mountains and John Crow Mountains.</p>	<p>i) Northern Blue Mountains – upper Swift and Spanish River Watersheds.</p> <p>ii) John Crow Mountains and Rio Grande Valley – upper Rio Grande and Driver’s River Watersheds.</p>	<p>The Blue and John Crow Mountains, bordering the Rio Grande Valley, will require greater attention as this section of the area is under greater threat. Furthermore, it is of particular significance because of the high biological diversity of the area. The forests in Area 3 provide habitat for many of the endemic animal species including the Giant Swallowtail Butterfly, Coney and Yellow Snake. Interest in heritage tourism and natural resource management is relatively high in this area, particularly in communities like Millbank, where the park management has been working with</p>

AREA	BOUNDARY	COMMENTS
		<p>communities for the longest and most continuous period. The Area 3 Ranger Station is located in Millbank.</p> <p>Buffer zone communities include Millbank, Moore Town, Ginger House, Comfort Castle and Bellevue. All have Maroon heritage.</p>
Headquarters (HQ)	Kingston	<p>An office will be maintained in Kingston as this is strategically located in terms of:</p> <ul style="list-style-type: none"> - networking/meeting with other agencies, - logistical arrangement and facilities, - access to all areas of the National Park, - access for booking visitors. <p>Administrative and field staff will be based at HQ. Rangers will be deployed from both the ranger stations in each administrative area and the park headquarters in Kingston, with a presence being maintained at least 5 days per month at each ranger station (excluding week-end visitor management duties) by the end of this five year plan.</p>

Objective 3: To provide supervision, project management, financial management and administrative support for the BJCMNP’s programmes

The annual status report and work-plan will be prepared by the Park Manager working closely with Programme Officers towards the end of each year. An annual staff retreat will reflect on the report of the successes and challenges of the year and hence, plans for the following year. The final work-plan will be prepared based on anticipated funding as well as the five-year Management Plan objectives. Programme Officers will report monthly (in a written report and verbally at a Programme Management meeting) on the status of achievement of the targets set for the year. This will allow the Park Manager and Programme Officers to set monthly targets, and to adapt approaches as necessary e.g. to take advantage of an unexpected opportunity e.g. visiting researcher, or to address a challenge e.g. hurricane damage. Since projects will be developed based on programme objectives, meetings and reports will reflect both project and programme target achievement, since project funding often has to be used to achieve annual work-plan targets and longer term objectives.

Each staff member whether line staff, senior or junior management has a role to play in implementing work-plans and achieving the targets and objectives that will make the

BJCMNP's conservation goal successful. Staff will need to be very familiar with the Management Plan and work closely together, as there are many over-lapping areas and activities that benefit more than one programme. This is particularly important within the context of limited resources; further, integration of programmes can create useful synergies e.g. community youth trained through the Education and Public Involvement Programme can work as tour guides in the Recreation and Tourism Programme.

12.3 Staffing and Job Profiles

The staffing for the Park has been designed based on the programme areas and functional requirements. The following are recommendations and will have to be adapted as resources allow. This can be done by focusing work on threatened areas, increasing partnerships and increasing the level of funding. National Park Rangers will work mainly in enforcement – particularly with respect to patrolling and surveillance/monitoring activities but also in each programme area, particularly conservation, monitoring and recreation/tourism (for visitor management). The smaller the number of National Park Rangers, the more work each will have to perform in the other programmes. However, these are all field activities, so they are still effectively on patrol whether they are supervising forest rehabilitation or conducting freshwater monitoring. With more National Park Rangers, there will need to be more attention to community outreach, which has generally been reduced due to limited resources.

National Park Rangers

Multi-disciplinary National Park Rangers form the front-line of park operations. Whilst they may be simply considered as enforcement officers (and in terms of the Programmatic Budget are listed under the Enforcement and Compliance Programme), these personnel are literally the 'eyes and 'ears' of the Park in terms of all forms of monitoring and they use an interpretive approach to enforcement. This is an approach that promotes stakeholder understanding and interest as well as community involvement in park/natural resource management. National Park Rangers are therefore, involved not only in patrolling and investigation of breaches of legislation, but all the park management programmes and activities e.g. visiting schools, assisting with community conservation projects, natural resources monitoring and visitor management. An estimate of time for programme areas outside the Enforcement and Compliance Programme is provided in the Programme Summary Tables. National Park Regulations, section 32 describe the functions of a National Park Ranger (see Chapter 8) and refer to their recognition through the NRCA.

A National Park Ranger should have a secondary school certificate and at least two subjects at CXC level (or equivalent) including English Language. Experience working outdoors, with community groups and/or in the security forces would be an asset. A National Park Ranger must be physically fit, have an interest in conservation, enjoy the outdoors and be a responsible individual, a team-player, good communicator and always willing to learn.

12.3.1 Conservation Programmes

Implementation of the Natural Heritage Conservation and the Monitoring and Evaluation Programmes requires at least one full-time Conservation Science Officer (CSO) with about 60% of the time of two trained National Park Rangers. Implementation of the Cultural Heritage Conservation Programme requires ideally, a part-time Cultural Heritage Officer (CHO) since this Programme has been designed to work in tandem with both the Education and Public Involvement and the Recreation and Tourism Programme. The cooperation of co-management partner agencies, academic and other institutions e.g. UWI and IOJ (Natural History Museum of Jamaica and African Caribbean Institute of Jamaica) is assumed. There are numerous similarities in their job profiles, hence these are combined below.

Table 12.3.1 Job Profile – Conservation Programme Officers

Job Title: Conservation Science Officer (CSO)
Candidate’s Profile: The CSO will have at least a post-graduate degree in Conservation Science, Natural Resource Management or related field. S/he must have at least 2 years work experience in this field. S/he must have conducted research and have good field skills and excellent analytical and writing skills.
Job Title: Cultural Heritage Officer (CHO)
Candidate’s Profile: The CHO will have at least a post-graduate degree in Cultural Heritage Preservation and Management or related field. S/he must have at least 2 years work experience in this field. S/he must have conducted research and have good field skills and excellent analytical and writing skills. If the Community Education Officer had these skills, that position could cover the CHO responsibilities.
Job Profile
The CSO and CHO will report to the Park Manager and will be responsible for ensuring that the programme activities are implemented and annual work-plan targets are met - whether in-house, with or by the relevant co-management agency (NEPA, FD or JNHT) or a partner organisation e.g. UWI, IOJ, foreign universities.
S/he will liaise with the Chief of Corps in terms of assigning and rostering National Park Rangers for duties under the Programmes.
The Officers will need to seek funding for technical assistance in order to effect some aspects of their programmes.
The CSO and CHO will maintain a research prospectus available on-line, in order to promote research that will support park management.
The CSO and CHO will participate in relevant national committees to share the BJCMNP’s conservation work, and obtain input and support. S/he will convene the Scientific and Technical Advisory Committees for the BJCMNP and ensure that they meet at least once a year to provide support for the National Park’s conservation and monitoring & evaluation programmes.

12.3.2 Enforcement and Compliance Programme

It has been estimated that for this programme to be effectively conducted, based on the area of the BJMCNP, ideally there should be 15 National Park Rangers. The Ranger Corps consists of a Chief of Corps (supervisor) and National Park Rangers, at various levels. Under this Management Plan every effort should be made to bring the number of National Park Rangers up to at least 12. This is bearing in mind that the National Park Regulations (1993) recognise the JDF, JCF and ISCF personnel and other persons so designated, as National Park Rangers. JCDT employed National Park Rangers will be multi-disciplinary as this will help to reinforce the interpretive approach that the full-time National Park Rangers will employ in contrast to those from other agencies.

There should also be a group of trained persons (Relief Rangers) who can be called on when National Park Rangers are unavailable e.g. in cases of illness, or being on-leave, or when additional personnel are needed e.g. for special patrol or event. Ideally, each Ranger Station should be manned by at least one National Park Ranger or other suitable designated person, at all times.

A description of the National Park Ranger position is provided above and the functions from the National Park Regulations listed at Chapter 8.2. A supervisor or Chief of Corps has been found to be essential for the effective administration of the Programme.

Table 12.3.2 Job Profile – Chief of Corps

Job Title: Chief of Corps (CoC)
Candidate’s Profile: The Chief of Corps should have significant leadership, supervisory, organisational and administrative skills and experience. Excellent communication and interpersonal skills are essential. Tertiary level education in a relevant field would be an asset.
Job Profile
The Chief of Corps will be responsible for the Enforcement and Compliance Programme. Major responsibilities will include providing leadership and supervision for the Ranger Corps, organising joint patrols with other agencies on a weekly basis, monthly and other reports and convening quarterly meetings for review and evaluation of the programme.
The Chief of Corps will report to the Park Manager and liaise with other programme officers to ensure organised rostering of rangers for work under the various programme areas, as needed. This includes visitor management in recreational areas on weekends and public holidays.
The Chief of Corps will also liaise with other programme officers to ensure regular in-house training of national park rangers and relief or trainee rangers, along with other interested staff and community members.

12.3.3 Education and Public Involvement Programme

At least three officers are required for this programme – three sets of skills are required and ideally each of the three officers will have more than one of these skill sets. However, in the event that this is impossible, training will need to be conducted. The three skill areas are:

- a) Public Education and Interpretation,
- b) Communication e.g. media releases, production of newsletters,
- c) Community Education – participatory, sustainable community development.

With respect to the latter, ideally one Community Education Officer is required for each of the Administrative areas, if they are to be worked with simultaneously. However, it will be possible to implement focused community programmes over several small geographic areas if other personnel are trained in participatory skills, and by working with existing groups e.g. Development Area Committees (DACs) and Community Development Committees (CDCs) and agencies e.g. SDC. Further, with the appropriate skills, a Community Education Officer could implement the responsibilities of the Cultural Heritage Officer.

The Education and Community Outreach Officer will be responsible for the Programme and supervise full-time or part-time personnel in the positions. The ECOO will play a key role in implementing many activities related to the Conservation of Cultural Heritage.

Table 12.3.3 Job Profile – Education and Community Outreach Officer

Job Title: Education and Community Outreach Officer (ECOO)
Candidate’s Profile: The ECOO will have tertiary level qualification in education, social work or other related field; and experience in education, public education, community outreach and media relations. The ECOO will have excellent communications skills – able to produce power-point presentations, brochures, posters; address groups of students of all ages and levels, the general public, officers from other agencies; and be able to develop a good rapport with community members.
Job Profile
The officer will be responsible for implementation of the programme and work with the public relations and community officers (if they are in place) as a team. The ECOO will be responsible for ensuring that the programme activities are implemented - whether in-house, working with community members, volunteers and/or agency partners. The individual will assist in seeking programme funding and/or technical assistance as needed.
The Environmental Education Officer will report to the Park Manager and liaise with the Chief of Corps for National Park Ranger support and with other officers, as needed.
The Officers with specific responsibilities for public relations and communication and community education will have training and experience in these fields.

12.3.4 Recreation and Tourism Programme

A Recreation and Tourism Officer (RTO) will be required to manage this programme as a business so it can better support the other programmes. In fact, an alternate title could be Business Development Officer. Ideally, the RTO should be assisted by a full-time Site Supervisor who is responsible for ensuring maintenance of the two recreation areas managed by the Park, to the required standards, and also the supervision of construction and other product development within the Park. This will allow the RTO to focus on business development – product development, marketing and sales. Until this is possible, National Park Rangers at the level of Station Chief will carry out recreation area responsibilities.

The RTO will also play a role in implementing the Cultural Heritage Conservation Programme as this has a significant component related to tourism.

Table 12.3.4 Job Profile – Recreation and Tourism Officer

Job Title: Recreation and Tourism Officer (RTO)
Candidate’s Profile: The RTO will have tertiary level education in hospitality and tourism management, with marketing training and experience or in business development and management with tourism marketing experience. This individual should enjoy visiting natural and cultural heritage attractions and ideally should have some knowledge and experience of heritage, community-based and eco- tourism. They should have excellent communications skills and be able to develop a good rapport with community members.
Job Profile
The position will report to the Park Manager and liaise with the Site Supervisor or Station Chiefs and the Chief of Corps. Station Chiefs report to the Chief of Corps and are responsible for ranger stations that are located in the National Park’s recreation areas.
The RTO will be responsible for implementation of the programme, particularly the Blue Mountains Sustainable Tourism Programme which seeks to market the BJCMNP’s recreation areas along with local community and private sector ventures around the National Park in ways that benefit the BJCMNP conservation and sustainable development of local communities. For Maroon communities, cultural heritage conservation is an additional goal. The RTO will therefore need to:-
<ul style="list-style-type: none"> - ensure adequate product development and standards for accommodations, attractions and services within the Programme, in particular, the BJCMNP’s own recreation areas. - liaise regularly with the Blue Mountains Sustainable Tourism Clusters to keep them informed and involved in the Programme. - liaise with the EEO to provide technical assistance for tour guide and other relevant training, and for interpretation e.g. signage.
Ultimately the main focus of this Officer is developing the National Park’s Recreation and Tourism business, so it becomes significantly more profitable.

12.3.5 Park Management and Administration

Park management and administration are critical areas that are often taken for granted. Management includes planning, organizing, coordinating, monitoring and evaluating, as well as supervising and motivating staff to ensure objectives and targets are met. Administration includes clerical work, logistical support, accounting and financial management. With respect to the BJCMNP's recreation areas, bookings need to be made and fees collected. In addition, there are networking, partnership development, marketing and fundraising (proposal writing, corporate sponsorship, donations and events) activities that must be implemented to maintain operations in the short to long term.

Table 12.3.5 Job Profiles – Management and Administration

Job Title	Candidate's Profile
Park Manager	<p>The Park Manager will have tertiary level education in Environmental Management and/or Business Administration, with experience in these areas. The position will report to the Co-Management Committee and the Advisory Committee through the relevant organisation directly responsible for Park management. For the period of this Management Plan, this organisation is assumed to be the Jamaica Conservation and Development Trust (JCDDT).</p> <p>The Park Manager will have general oversight, planning, proposal writing and fund-raising responsibilities, in addition to project management and evaluation. Each of the senior staff i.e. Chief of Corps, Conservation Science Officer, Environmental Education Officer and Recreation Area Officer will report to the Park Manager with respect to project management and also to assist with project/programme development and fund-raising, particularly proposal writing.</p>
Administrative Assistant	An Administrative Assistant will provide administrative services e.g. correspondence, procurement, organisation of meetings and other logistics for park management.
Receptionist/Bookings Clerk	Receptionist and clerical functions are required, particularly for the operation of the recreation areas. These two functions could be combined into one position.
Accountant and Accounts Clerk	Accounting and financial management is also required. These positions may be part-time.

At least monthly, meetings should be held between the Park Manager and Programme Officers for reporting, communication, planning and monitoring of projects. The Chief of Corps should meet with National Park Rangers at least monthly for reporting, planning and monitoring as well as the coordination of activities through roster development. Each Officer will prepare a monthly report to the Park Manager, who in turn will prepare bi-monthly reports for the relevant co-management partners.

The Park Manager (and other Programme Officers as necessary) will organise and meet at least three times per year with the Co-management Committee, and twice a year with the Advisory Committee. The Park HQ acts as the secretariat for these meetings. The Park Manager or Programme Officers (as appropriate) will also be responsible for liaising with relevant agencies and stakeholders – informally, and also through established committees. Reports from such meetings should be shared during monthly meetings and minutes and other relevant materials made available to all personnel.

Further details regarding staff performance and organizational policy are found in the Park’s staff manual, which should be updated during this 5-year period.

12.4 Management Plan Review

Annual operations plans will be developed from the management plan and these will identify the various activities, outputs and outcomes planned for this period. These will be monitored during regular monthly meetings and evaluated every six months at a special meeting of the Park Manager, programme officers and co-management partners. The results of these evaluations will be presented to the Advisory Committee along with the annual report and plans for the following year, which they will review and accept at their meetings twice per year.

The Management Plan will be reviewed and evaluated every two years and revision of the plan will commence after four and a half years.

Monitoring and evaluation will be based on the plans for these outlined under each programme area, and with respect to the over-arching goal of the national park, which is to protect the core natural (closed broad leaf) forest within the BJCMNP.

12.5 Human Resources Development

The people involved in management of the BJCMNP are critical resources for management effectiveness. Without people to implement strategies, nothing can be done. Often, with relatively limited resources a small, committed and passionate staff can motivate local community members and other volunteers and together achieve great things. Of course, inadequate resources can de-motivate even the best team, but other sections of this chapter address the sourcing of the funding to obtain the necessary resources. Human Resource Development can be defined as: “the framework for helping employees develop their personal and organizational skills, knowledge, and abilities”, and includes such opportunities as:

“employee training, employee career development, performance management and development, coaching, mentoring, succession planning, key employee identification, tuition assistance, and organization development” (<http://www.about.com>).

Insufficient resources impact on management’s ability to provide for training and tuition assistance, however efforts to source training for staff is implemented through a variety of routes including projects and sponsorship. In addition, staff are allowed time off to

attend classes, once relevant to the work of the National Park. A small staff with horizontally oriented organizational chart as well as a poorly developed system of protected areas in Jamaica limits career development. Due to these and other restraining factors, training has been seen as a useful focus for human resources development.

Training can be a major benefit, and bearing in mind the limited benefits management may be able to provide, it is an excellent aspect to focus on. Further, training builds the capacity of the persons trained to implement their job more efficiently and effectively. It will also result in the identification of new and creative ways to do the job, and to integrate it with other aspects of National Park management. In addition, trained personnel can share their knowledge and experience with other staff and community members to enhance human capacity for park management. There are relatively few specialized training opportunities available in Jamaica and the Caribbean, particularly short-term courses.

Table 12.4 – Training Needs and Opportunities

Programme	Needs	Opportunities (Relevant Agencies)
Conservation	<ul style="list-style-type: none"> • GIS • Taxonomy and Species Identification 	<ul style="list-style-type: none"> • MonaGeoInformatix • UWI, IOJ - NHMJ
Cultural Heritage Conservation	<ul style="list-style-type: none"> • Awareness and sensitivity to cultural issues • Use of participatory and cultural tools in working with communities for conservation of both natural and cultural resources. 	<ul style="list-style-type: none"> • JNHT • IOJ – ACIJ • Jamaica Cultural Development Commission (JCDC)
Enforcement and Compliance	<ul style="list-style-type: none"> • Development of a National Park Ranger Training Manual (working with relevant agencies for its design and implementation) 	<ul style="list-style-type: none"> • NEPA • FD • JCF/ISCF
Education and Public Involvement	<ul style="list-style-type: none"> • International training in interpretation • Participatory Planning and Management 	<ul style="list-style-type: none"> • National Association of Interpreters (NAI) • CANARI
Recreation and Tourism	<ul style="list-style-type: none"> • International training in ecotourism 	<ul style="list-style-type: none"> • The International Ecotourism Society
Monitoring and Evaluation	<ul style="list-style-type: none"> • Bird and other species monitoring • Monitoring and evaluation techniques 	<ul style="list-style-type: none"> • BirdLife • JCDT
Governance and Administration	<ul style="list-style-type: none"> • Business and Financial Management • Strategic and Business Planning 	<ul style="list-style-type: none"> • UWI • Management Institute for National Development (MIND)

Funds for training should be budgeted for and sourced as far as possible. Membership and participation in relevant regional and international associations can be an excellent way to develop human resources through materials on best practices and experiences in other places, training opportunities, conferences and workshops. Personnel who receive training are encouraged to share with other staff. The JCDT's significant experience and track record in protected area management make it an excellent training resource.

Training of National Park Rangers (inclusive refresher courses) is particularly essential as there is no formal course available in the Caribbean. Bearing in mind the target set under the Enforcement and Compliance Programme, of preparing a training programme and manual for National Park Rangers and the JCDT's knowledge and experience, a national and later a regional training programme should be considered.

Community members have received training during the last management planning period and this should be continued, as requested in management planning meetings. This will provide them with the knowledge and skills to assist with Park management as well as increase the environmental sustainability of their livelihoods.

12.6 Financial Plan

Financing protected areas is a global challenge that impedes management effectiveness. The CANARI 2001 Review of Jamaica's protected areas system identified difficulties with financing as one of the issues affecting the whole system as well as individual sites. Protected area managers are encouraged to make their sites 'financially sustainable', however it is often not clear exactly what this means to different stakeholders. If by 'financially sustainable' one means that a protected areas self-generates enough income e.g. from user fees, concessions etc. then protected areas in Jamaica, as elsewhere in the world, will never be 'financially sustainable'. If the term is used to mean having secure funding from a variety of sources, then this is possible. Whilst the BJCMNP will self-generate income, it will be necessary to obtain funding from other sources, therefore the latter approach to 'financial sustainability' will be the focus of this financial plan.

The BJCMNP provides highly valuable ecosystem services including water supply and disaster mitigation. The people of Jamaica, as the beneficiaries of these services, must therefore support the conservation and management of this national park, through contributions from the Government of Jamaica (from taxes etc.) and other sources. In addition, because of its global significance and interest to special groups, the National Park will be able to generate additional income. A combination of funding sources will eventually provide the BJCMNP with financial sustainability. This financial plan seeks to guide the accessing of funds from a variety of sources over the short to long term.

12.6.1 History of BJCMNP Funding

The BJCMNP was established under the Protected Areas Resource Conservation (PARC) project – a USAID/GOJ project, and during this period, much of the funding for

operations was provided by USAID. Just after the project closed, GOJ through NEPA (then NRCA) made much more substantial contributions, however these declined very rapidly. Further, the Jamaica National Parks Trust Fund (JNPTF) established during the PARC project, to assist with funding, suffered as major new funding expected during the second phase of the project was not forth-coming. This Fund was unable to garner significant funding from other sources and in addition, the interest rates fell drastically over the years after its establishment. The level of funding to the BJCMNP therefore declined from this source as well. The vast majority of funding for the National Park since about 1998 has been raised by the JCDT from a wide variety of sources.

12.6.2 Current Funding

The JCDT is the main implementing agency for operations in the BJCMNP. It prepares budgets based not only on projected expenditure (from plans), but also the likelihood of funding. Therefore, more funds may be expended than originally budgeted for, as budgets are adjusted as new funding is sourced. It is difficult to source programmatic and operational funding, as donors prefer project grants – “one-off” activities with tangible outputs (and possibly outcomes) at the end of one to two years. The funding of salaries must be clearly linked to the production of the outputs, and are only available for the duration of the project, thus staff have little job security.

The Delegation Agreement between NRCA and the JCDT states that the former will provide a management fee to assist in management of the BJCMNP. The Agreement also states that the NRCA will allow JCDT to collect and retain all relevant user fees, once they are used for operational management of the National Park. These agreements are being implemented and NRCA audits JCDT annually in this regard.

The FD has several officers assigned to the area, but it is difficult to quantify their contribution to park management, although they play a significant role with respect to control of tree-cutting for lumber, boundary mapping and community involvement – in the Buff Bay/Pencar watershed area of the Park. The Forestry Department’s property at Portland Gap, Millbank and Holywell are used as ranger stations and recreation areas. It would be useful to quantify these and other GOJ contributions and include them in the Park’s budget, however the focus of this Plan is on management of the site as a protected area under the NRCA Act.

In 2004, approximately JA\$19 million was spent on park operations, and JCDT raised the vast majority of these funds. In the 2005 – 2010 Management Plan a proposed breakdown of source for income was proposed, and this is shown below along with actual figures for 2006 – 2009. This shows significant variation and although 2009 appears to be approaching the proposed breakdown it is not clear if this is the case, as none of the sources are secured. Even funds which may appear to be established to support the management of a site of national and even international importance, still require proposals to be entered in a form of competition which does not run in synch with the

Park's budgetary flow. There is still a need for greater and more secure funding support from the Government of Jamaica.

Table 12.5 Breakdown of BJCMNP Income Sources by Percentage of Total

Source	Percentage of Total Income (%)				
	Proposed 2010	Actual 2006	Actual 2007	Actual 2008	Actual 2009
Government of Jamaica (NRCA)	35	14	4	6	18
Grants (Bi- & Multi-lateral Agencies, Other Donors and JNPTF)	40	64	78	79	45
Recreation area (Holywell & Portland Gap)	15	13	8	8	7
JCDT – fundraisers, sponsors, donations, administrative fees etc.	10	9	10	7	30

N.B.: JCDT raised the grant funding and operates the National Park's recreation areas.

12.6.3 Budgets

Budgets have been prepared using a programmatic approach for both the first year of the Plan (2011) and five years. This information has then been summarised to provide comprehensive budgets (see Tables 12.6 and 12.7).

The budgets prepared for the 2011 – 2016 Management Plan aim to meet BJCMNP management requirements, but also to be reasonable and feasible. Despite this, it is likely, particularly with respect to the employment of staff, that insufficient funding will be sourced. Management should be wary of significantly increasing staff and then being unable to fund their salaries beyond the short term, as this “boom and bust” phenomenon results in erosion of the impact of activities implemented when funding was at a high level. Despite this, most of the National Park's activities rely on implementation by paid personnel, and it will be difficult to manage the BJCMNP effectively with limited and short-term funding for salaries.

Sources of Funding. The costs in the budgets are specific to operational park management and do not include any GOJ direct expenditure e.g. for the Forestry Department's North-Eastern Region or NEPA's Protected Areas, Enforcement or other Branches. Any expenditure by these agencies, therefore, is in addition to the budget in the BJCMNP's management plan, unless either of the agencies seconds its personnel to BJCMNP service formally or informally. For example, the Management Plan addresses the need to increase the level of presence of Enforcement Officers, and the budget includes 11 of 15 Rangers needed, which may be impossible to fund. Strategies to address this are described within the Chapter on the Enforcement and Compliance Programme, and include increasing the level of patrolling by other Enforcement Officers including the ISCF and involving community members e.g. as Trainee Rangers.

Recurrent Expenditure. The estimated recurrent expenditure for the BJCMNP for 2011 is about JA\$40.6 million or US\$472,782. Over the first five years of the 2011 – 2016 Management Plan, the total estimated recurrent expenditure is just over JA\$247 million or US\$2.9 million, averaging JA\$49.6 million or US\$576,281 per annum. This budget is based on staffing and operational expenses required to implement most of the Management Plan. Annual increases due to inflation have been factored into the budget. Some required expenditure has been placed in the Capital/Projects budget e.g. vehicles and major components of the Management Plan e.g. reforestation, public awareness campaign and recreation area development.

The 2005 – 2010 Management Plan recurrent budget estimates were fairly accurate except that less was actually spent primarily because staffing was not increased to the budgeted level. It should be noted that Jamaica's Protected Area Master Plan Financial Report estimated US\$390,000 per annum for basic level recurrent expenditure. Over the 2005 – 2009 period, US\$480,000 was budgeted but actual JCDT expenditure was about US\$277,000. It is anticipated that unless major funding is accessed, actual recurrent expenditure for the new Management Plan period will be less than estimated due to inadequate funding, and this will have a negative impact on management effectiveness.

By programme, the Enforcement and Compliance Programme is the most costly, because it includes the salaries of all the National Park Rangers, whereas the other Programmes have ranger time included in their budget as time not cash. Some strategies described under the Enforcement and Compliance Programme are to be funded from the Education and Public Involvement Programme e.g. community outreach. The cost of the part-time Cultural Heritage Officer has not been added, as funds for Community Education Officer could be used instead. The Governance and Administrative Programme costs are about 30% of the Programmes budget.

Capital and Project Expenditure. Capital and project expenditure for the period is estimated at JA\$120.8 million or US\$1.4 million, that is an average of about JA\$24 million or US\$280,930 per annum. Vehicles currently being used in BJCMNP management are all over five years old, and suffering from the poor road conditions and the high cost of repairs. Vehicle purchase is, therefore, a critical component of the capital expenditure. Forest rehabilitation is an essential activity but most costs have been assigned to project expenditure as it is usually funded by donors. The strategies described under the Cultural Heritage Conservation Programme are budgeted under the Conservation and the Education Programmes as project funding will have to be sourced. The development of Holywell to improve its potential to generate income to support park conservation has been estimated at JA\$40 million or US\$465,110. Other major components of non-recurrent expenditure are community projects (sustainable livelihoods) and public education. The budget is rolling, so that if funds are not sourced for an activity in one year, the required amount would move to the following year. See budgets below.

Table 12.6 BJCMNP 5 year Programme Budget

PROGRAMMES & LINE ITEMS	2011	2012	2013	2014	2015	TOTAL(JA\$)	TOTAL(US\$)
ENFORCEMENT & COMPLIANCE							
Personnel							
Chief of Corps	1,738,134	1,877,185	2,027,360	2,189,549	2,364,713	10,196,941	118,569
3 Station Chief/I Conservation Ranger	2,700,000	3,888,000	4,199,040	4,534,963	4,897,760	20,219,763	235,114
Ranger Level 1 (3)	1,742,400	2,822,688	3,048,503	3,292,383	3,555,774	14,461,748	168,160
Ranger (2) – 1 in Yr 1 and 2 after	492,822	1,064,496	1,149,655	2,420,718	2,614,375	7,742,066	90,024
Trainee Rangers (2) move to full-time 2014	936,000	1,010,880	1,091,750	0	0	3,038,630	35,333
Subsistence @ \$2,000/wk per Ranger	1,144,000	1,235,520	1,334,362	1,441,111	1,556,399	6,711,391	78,039
Sub-total - personnel	8,753,356	11,898,769	12,850,670	13,878,724	14,989,022	62,370,541	725,239
Supplies and services							
Uniform/gear @\$45,000/Ranger eg boots, raintgear	315,000	534,600	577,368	623,557	673,442	2,723,967	31,674
Transportn - Fuel, service, ins/lic - 3 vehicles, 5 bikes	1,200,000	1,296,000	1,399,680	1,511,654	1,632,587	7,039,921	81,860
Communication eg phone, meetings	250,000	270,000	291,600	314,928	340,122	1,466,650	17,054
Office supplies/stationery/equipment	210,000	226,800	244,944	264,540	285,703	1,231,986	14,325
Ranger station supplies/ maintenance	230,000	248,400	268,272	289,734	312,912	1,349,318	15,690
Sub-total - supplies and services	2,205,000	2,575,800	2,781,864	3,004,413	3,244,766	13,811,843	160,603
Training - local	120,000	129,600	139,968	151,165	163,259	703,992	8,168
International (2 – 3 Rangers)	550,000	0	650,000	0	700,000	1,900,000	22,093
TOTAL RECURRENT	11,628,356	14,604,169	16,422,502	17,034,302	19,097,047	78,786,376	916,121
CAPITAL/PROJECTS							
Vehicles (assume duty-free)	2,500,000	0	2,000,000	0	0	4,500,000	52,326
Ranger Station upgrade	1,000,000	0	0	600,000	0	1,600,000	18,605
TOTAL CAPITAL/PROJECTS	3,500,000	0	2,000,000	600,000	0	6,100,000	70,930
GRAND TOTAL (Recurrent & Capital/Projects)	15,128,356	14,604,169	18,422,502	17,634,302	19,097,047	84,886,376	987,051
CONSERVATION, MONITORING & EVAL'N							
Personnel							
Conservation Science Officer	1,890,814	2,042,079	2,205,445	2,381,881	2,572,431	11,092,651	128,984
Ranger (45 person dys each – 2 Rangers)	-	-	-	-	-	-	-
Casual Labour (Nursery/Invasive removal etc)	1,000,000	1,080,000	1,166,400	1,259,712	1,360,489	5,866,601	68,216
Subsistence @ \$4,000/wk	120,000	129,600	139,968	151,165	163,259	703,992	8,186
Sub-total – personnel	3,010,814	3,251,679	3,511,813	3,792,758	4,096,179	17,663,244	205,387
Supplies and services							
Transportn - Fuel, service, ins/lic - 3 vehicles, 5 bikes	350,000	378,000	408,240	440,899	476,171	2,053,310	23,876
Communication eg phone, meetings	120,000	129,600	139,968	151,165	163,259	703,992	8,186
Office supplies/stationery/equipment	150,000	162,000	174,960	188,957	204,073	879,990	10,232
Uniform/gear	50,000	54,000	58,320	62,986	68,024	293,330	3,411
Technical Equipment & Supplies	80,000	86,400	93,312	100,777	108,839	469,328	5,457

PROGRAMMES & LINE ITEMS	2011	2012	2013	2014	2015	TOTAL(JA\$)	TOTAL(US\$)
Sub-total - supplies and services	750,000	810,000	874,800	944,784	1,020,367	4,399,951	51,162
Training - local	40,000	43,200	47,520	51,322	55,427	237,469	2,761
- International (2 – 3 Rangers)	200,000		300,000		400,000	900,000	10,465
TOTAL RECURRENT	4,000,814	4,104,879	4,734,133	4,788,864	5,571,973	23,200,664	269,775
CAPITAL/PROJECTS							
Vehicles (assume duty-free)		2,500,000				2,500,000	29,070
Reforestation & Forest Rehabilitation	500,000	5,000,000	5,500,000	6,000,000	6,500,000	23,500,000	273,256
Research & other Projects	1,000,000	1,000,000	1,500,000	1,500,000	1,500,000	6,500,000	75,581
Cultural Heritage Projects	1,300,000	800,000	1,300,000	450,000	450,000	4,300,000	50,000
TOTAL CAPITAL/PROJECTS	2,800,000	9,300,000	7,000,000	7,500,000	8,000,000	32,500,000	377,907
GRAND TOTAL (Recurrent & Capital/Projects)	6,560,814	13,361,679	11,386,613	12,237,542	13,116,546	54,563,195	634,456
E. EDUCATION & PUBLIC INVOLVEMENT							
Personnel							
Education & Community Outreach Officer	1,491,180	1,610,474	1,739,312	1,878,457	1,972,380	8,691,804	101,067
Community Education Officer	1,400,000	1,512,000	1,632,960	1,763,960	1,851,777	8,160,333	94,888
Assistant Education Officer	1,050,000	1,134,000	1,224,720	1,322,698	1,388,832	6,120,250	71,166
Rangers (24 person dys each for 3 Rangers)	-	-	-	-	-	-	-
Trainee Rangers	-	-	-	-	-	-	-
Subsistence	120,000	129,600	139,968	151,165	163,259	703,992	8,186
Sub-total - personnel	4,061,180	4,386,074	4,736,960	5,115,917	5,376,248	23,676,380	275,307
Supplies and services							
Transport - Fuel, service, ins/lic - 2vehicles - Yr 2 on	350,000	728,000	786,240	849,139	891,596	3,604,975	41,918
Communication eg phone, meetings	150,000	162,000	174,960	188,957	198,405	874,321	10,167
Office supplies/stationery/equipment	400,000	432,000	466,560	503,885	529,079	2,331,524	27,111
Uniform/gear	45,000	48,600	52,488	56,687	59,521	262,296	3,050
Community training/projects/meetings	480,000	518,400	559,872	604,662	634,895	2,797,829	32,533
Schools programmes	240,000	259,200	279,936	302,331	317,447	1,398,914	16,266
Public awareness e.g. media, website	160,000	172,800	186,624	201,554	211,632	932,610	10,844
Interpretation e.g. signage, exhibits, brochures	320,000	345,600	373,248	403,108	423,263	1,865,219	21,689
Sub-total - supplies and services	2,145,000	2,316,600	2,501,928	3,110,322	3,265,838	14,067,689	163,578
Training - local	80,000	86,400	93,312	100,777	105,816	466,305	5,422
- International	200,000		300,000			500,000	5,814
TOTAL RECURRENT	6,486,180	6,789,074	7,632,200	8,327,016	8,747,902	38,710,373	450,121
CAPITAL/PROJECTS							
Vehicles (assume duty-free)	2,300,000	2,500,000				4,800,000	55,814
Community livelihoods training & projects	900,000	1,300,000	1,600,000	1,600,000	1,300,000	6,700,000	77,907
Cultural Heritage Awareness projects	1,500,000	2,000,000	1,500,000	150,000	150,000	5,300,000	61,628
BJCMNP EE for Schools Manual	400,000	700,000				1,100,000	12,791

PROGRAMMES & LINE ITEMS	2011	2012	2013	2014	2015	TOTAL(JA\$)	TOTAL(US\$)
Public Education/Awareness	200,000	1,800,000		200,000	1,800,000	4,000,000	46,512
Interpretation e.g. Sign Production	600,000	1,000,000	500,000			2,100,000	24,419
TOTAL CAPITAL/PROJECTS	5,900,000	9,300,000	3,600,000	1,950,000	3,250,000	24,000,000	279,070
GRAND TOTAL (Recurrent & Capital/Projects)	12,386,180	16,089,074	11,232,200	10,277,016	11,97,902	62,710,373	729,190
RECREATION & TOURISM							
Personnel							
Recreation & Tourism Officer	1,835,500	1,982,340	2,140,927	2,312,201	2,427,811	10,698,780	124,404
Holywell Supervisor	900,000	972,000	1,049,760	1,133,741	1,190,428	5,245,929	60,999
Booking Clerk	600,000	648,000	699,840	755,827	543,338	3,247,005	37,756
Holywell Grounds Staff	1,572,000	1,697,760	1,833,581	1,980,267	2,079,281	9,162,889	106,545
Portland Gap/Peak Trail Grounds Staff	650,000	702,000	758,160	818,813	859,753	3,788,726	44,055
Millbank Staff	200,000	216,000	233,280	251,942	264,540	1,165,762	13,555
Subsistence (RTO and Supervisor)	124,800	134,784	145,567	157,212	165,073	727,435	8,459
Subsistence	280,800	303,264	327,525	353,727	382,025	1,647,342	19,155
Sub-total - personnel	6,163,100	6,656,148	7,188,640	7,763,731	8,162,529	35,934,148	417,839
Supplies and services							
Transportn - Fuel, service, ins/lic - 1 vehicle, 1 bike	400,000	432,000	466,560	503,885	544,196	2,346,640	27,287
Communication eg phone, meetings	200,000	216,000	233,280	251,942	272,098	1,173,320	13,643
Office supplies/stationery/equipment	380,000	410,000	443,232	478,691	516,986	2,229,308	25,922
Uniform/gear e.g. overalls, water-boots, T-shirts	70,800	76,464	82,581	89,188	96,323	415,355	4,830
Marketing	600,000	648,000	699,840	755,827	816,293	3,519,961	40,930
Recreation Areas Maintenance e.g. repairs	700,000	756,000	816,480	881,798	952,342	4,106,621	47,751
Recreation Areas Operations e.g. fuel, pest control	550,000	594,000	641,520	692,842	748,269	3,226,631	37,519
Sub-total - supplies and services	2,900,800	3,132,864	3,383,493	3,654,173	3,946,506	17,017,836	197,882
Training - local	150,000	162,000	174,960	188,957	141,617	817,534	9,506
- International	200,000	0	300,000	0	0	500,000	5,814
TOTAL RECURRENT	9,413,900	9,951,012	11,047,093	11,606,860	12,250,653	54,269,518	631,041
CAPITAL/PROJECTS							
Vehicles (assume duty-free)			1,500,000		0	1,500,000	17,422
Marketing projects	200,000	300,000	300,000	300,000	300,000	1,400,000	16,279
Plans (Trail & Site, Environmental Mgmt etc)		2,000,000	2,000,000	0		4,000,000	46,512
Holywell Development Plan Implementation	5,510,000	9,700,000	6,750,000	17,540,000	500,000	40,000,000	465,116
Other Site Development	500,000	2,000,000	1,000,000	1,000,000	500,000	5,000,000	58,140
TOTAL CAPITAL/PROJECTS	6,210,000	14,000,000	11,550,000	18,840,000	1,300,000	51,900,000	603,488
GRAND TOTAL (Recurrent & Capital/Projects)	15,623,900	23,951,012	22,597,093	30,446,860	13,550,653	106,169,518	1,234,529

PROGRAMMES & LINE ITEMS GOVERNANCE & ADMINISTRATION	2011	2012	2013	2014	2015	TOTAL(JA\$)	TOTAL(US\$)
Personnel							
Park Manager	2,200,000	2,376,000	2,566,080	2,771,366	2,993,076	12,906,522	150,076
Administrative Assistant	1,000,000	1,080,000	1,166,400	1,259,712	1,360,489	5,866,601	68,216
Accounting Services	1,400,000	1,512,000	1,632,960	1,763,597	1,904,685	8,213,241	95,503
Sub-total - personnel	4,600,000	4,968,000	5,365,440	5,794,675	6,258,249	26,986,364	313,795
Supplies and services							
Transportn - Fuel, service, ins/lic - 1 vehicle, 1 bike	250,000	270,000	291,600	314,928	340,122	1,466,650	17,054
Communication e.g. phone	250,000	270,000	291,600	314,928	340,122	1,466,650	17,054
Office supplies/stationery/equipment	200,000	216,000	233,280	251,942	272,098	1,173,320	13,643
Public liability, pers'n'l accident, equip etc. insurance	200,000	216,000	233,280	251,942	272,098	1,173,320	13,643
Uniform/gear	30,000	32,400	34,992	37,791	40,815	175,998	2,046
General Office Expenses, Subscriptions etc.	400,000	432,000	466,560	503,885	544,196	2,346,640	27,287
Annual Audit/Bank Charges	500,000	540,000	583,200	629,856	680,244	2,933,300	34,108
HQ Rent and Utilities	2,000,000	2,160,000	2,332,800	2,519,424	2,720,978	11,733,202	136,433
Fundraising & Other Gov/Admin e.g. Meetings	400,000	432,000	466,560	503,885	544,196	2,346,640	27,287
Sub-total - supplies and services	4,230,000	4,568,400	4,933,872	5,328,582	5,754,868	24,815,722	288,555
Training - local	100,000	108,000	116,640	125,971	136,049	586,660	6,822
- International	200,000	216,000	233,280	251,942	272,098	1,173,320	13,643
TOTAL RECURRENT CAPITAL/PROJECTS	9,130,000	9,860,400	10,649,232	11,501,171	12,421,264	53,562,067	622,815
Vehicles (assume duty-free)		2,800,000				2,800,000	32,558
Equipment e.g. computers	100,000	300,000	400,000	200,000	400,000	1,400,000	16,279
TOTAL CAPITAL/PROJECTS	100,000	3,100,000	400,000	200,000	400,000	4,200,000	48,837
GRAND TOTAL (Recurrent & Capital/Projects)	9,230,000	12,960,400	11,049,232	11,701,171	12,821,264	57,762,067	671,652
BJCMNP Management Prog. Budget Summary							
TOTAL RECURRENT	40,659,250	45,309,534	50,485,161	53,258,214	58,088,839	247,800,998	2,881,407
TOTAL CAPITAL/PROJECTS	18,510,000	35,700,000	24,550,000	29,090,000	12,950,000	120,800,000	1,404,651
GRAND TOTAL RECURRENT & CAPITAL/PROJECTS	59,169,250	81,009,534	75,035,161	82,348,214	71,038,839	368,600,998	4,286,058

Table 12.7 Blue and John Crow Mountains National Park 5-year summary budget

LINE ITEMS	2011	2012	2013	2014	2015	TOTAL(JA\$)	TOTAL(US\$)
RECURRENT EXPENDITURE							
Personnel							
Gov. & Admin Prog. (P/Mgr, Admin Asst., Accounting Services)	4,600,000	4,968,000	5,365,440	5,794,675	6,258,249	26,986,364	313,795
Enforcement & Compliance Prog. (Chief of Corps & Rangers)	7,609,356	10,663,249	11,516,309	12,437,613	13,432,662	55,639,149	647,199
Conservation Prog. (Science Officer & Casual Labour)	2,890,814	3,122,079	3,371,845	3,641,593	3,932,920	16,759,252	197,201
Ed. & Public Involvement Prog. (Education & Comm. Officers)	3,941,180	4,256,474	4,596,992	4,964,752	5,212,989	22,972,388	267,121
Rec. & Tourism Prog. (Officer, Sup., Clerk & Casual Labour)	5,757,500	6,218,100	6,715,548	7,252,792	7,615,431	33,559,371	390,225
Subsistence (All Field staff)	1,789,600	1,932,768	2,087,389	2,254,381	2,430,015	10,494,153	122,025
Sub-Total Personnel	26,588,450	31,160,670	33,653,524	36,345,806	38,882,227	166,630,677	1,937,566
Supplies & Services							
Uniform/gear	510,800	746,064	805,749	870,209	938,125	3,870,947	45,011
Transportation - Fuel, service, insurance/licence	2,550,000	3,104,000	3,352,320	3,620,506	3,884,672	16,511,497	191,994
Communication eg phone, meetings	9790,000	1,047,600	1,131,408	1,221,921	1,314,006	5,684,934	66,104
Office supplies/stationery/equipment/ Tech. equipment & supplies	1,420,000	1,533,600	1,656,288	1,788,791	1,916,778	8,315,457	96,691
HQ & Ranger station rent, utilities & supplies/maintenance	2,230,000	2,408,400	2,601,072	2,809,158	3,033,890	13,082,520	152,122
Training (local and international)	1,840,000	745,200	2,355,680	870,134	1,974,265	7,785,280	90,527
Education & Public Involvement Prog. Activities	1,200,000	1,296,000	1,399,680	1,511,654	1,587,237	6,994,572	81,332
Recreation Area Operations, Maintenance & Marketing	1,850,000	1,998,000	2,157,840	2,330,467	2,516,905	10,853,212	126,200
Public liability/personal accident/equipment etc. insurance	200,000	216,000	233,280	251,942	272,098	1,173,320	13,643
General Office Expenses and Annual Audit & Bank Charges	900,000	972,000	1,049,760	1,133,741	1,224,440	5,279,941	61,395
Fundraising & Other Gov/Admin e.g. Meetings	400,000	432,000	466,560	503,885	544,196	2,346,640	27,287
Sub-Total - Supplies & Services	14,070,800	14,498,864	17,209,637	16,912,408	19,206,611	81,898,321	952,306
TOTAL RECURRENT EXPENDITURE	40,659,250	45,659,534	50,863,161	53,088,839	58,088,839	248,528,998	2,889,872
CAPITAL/PROJECTS COSTS							
Vehicles & Equipment	4,900,000	8,100,000	3,900,000	200,000	400,000	17,500,000	203,488
Ranger Station Upgrade	1,000,000	0	0	600,000	0	1,600,000	18,605
Natural Heritage Conservation Projects	1,500,000	6,000,000	7,000,000	7,500,000	8,000,000	30,000,000	348,837
Cultural Heritage Conservation Projects	2,800,000	2,800,000	2,800,000	600,000	600,000	9,600,000	111,628
Education & Public Involvement Projects	2,100,000	4,800,000	2,100,000	1,900,000	3,100,000	13,900,000	161,628
Recreation & Tourism Projects	6,210,000	14,000,000	10,050,000	18,840,000	1,300,000	50,400,000	586,047
TOTAL CAPITAL/PROJECTS COSTS	18,510,000	35,700,000	25,850,000	29,540,000	13,400,000	123,000,000	1,430,233
GRAND TOTAL (JA\$)	59,169,250	81,359,534	76,713,161	82,798,214	71,488,839	371,528,998	-
GRAND TOTAL (US\$)	688,015	946,041	892,013	962,770	831,266	4,320,105	-

12.7 Strategies for Financing the BJCMNP

Several strategies will be required to obtain financing for the management of the BJCMNP. They can be divided into two main sources – Government of Jamaica and Non-Government. It is assumed that the delegated manager will continue to be the Jamaica Conservation and Development Trust (JCDT). As indicated in the 2005 – 2010 Management Plan, the relevant partner should be an organization that is able to access funding from a variety of sources including grant funding, corporate sponsorship, donations and endowments, as well as generate income from the operation of the Park’s recreation areas, and related business ventures.

12.7.1 Government of Jamaica Support

The BJCMNP was established through legislation under the NRCA Act to protect the natural and cultural heritage of the people of Jamaica, maintain the ecosystem services provided to eastern Jamaica – particularly water, and to provide recreational and educational opportunities for Jamaicans and visitors. Ultimately, the Government of Jamaica (GOJ) has responsibility for managing and financing operations of the BJCMNP. There are several ways the GOJ can do this:

(i) In-kind contributions e.g. staff time, vehicles, facilitating grants

The contribution of staff time by various government agencies would be very useful, particularly with respect to enforcement officers, as this is where there is a major deficit. This should include the participation of enforcement officers from agencies such as the ISCF, FD and NEPA in regular joint patrols with the National Park Rangers (inclusive the provision of relevant stipends for these personnel). At one time, the Government through NEPA had contributed the use of vehicles, however this assistance declined significantly over the years and was eventually withdrawn under instruction from central government.

Often, bi- and multi-lateral agencies have funds available to NGOs but only if Government requests them. In addition, government agencies should be quick to respond to requests for letters of support for proposals seeking to raise funds for Park management. Very often Park management has to prepare proposals with only a very short time-frame, and considering that funds are being raised for management of a site for which government is ultimately responsible and for which there is already close collaboration, it would seem reasonable that two to three days would be sufficient for producing a general letter of support.

(ii) Technical Assistance

Use of technical expertise and equipment which government co-management partners may have is an important form of assistance. This can be for a variety of activities such as mapping and public education. The Forestry Department in particular provides significant technical assistance particularly with mapping and analysis of satellite imagery.

(iii) Financial contributions:

The Government of Jamaica, in addition to in-kind assistance must also provide financial assistance for management of the BJCMNP. The funds can come from a variety of sources, and consideration should be given to sourcing funds from a levy on resources from the National Park as suggested below.

Contribution from NRCA: As per the Delegation Agreement, since 2005/6 funding has been contributed by the NRCA to the JCDT for management of the BJCMNP. These funds presumably come from the NRCA's budget inclusive budgetary contribution from the Ministry of Finance and income generated by the NRCA through permits, licences etc. User fees from the BJCMNP recreation areas are also retained for management.

Levy on resources from the BJCMNP: As funding available from the NRCA/NEPA budget is likely to be limited, and further as a secure funding source is needed, it is recommended that a new source of income is tapped. Pantin and Reid (2005) estimate an economic value for the provision of water supply from the Buff Bay/Pencar Watershed alone, at US\$17.5 – 20.3 million. This value does not even consider water quality, and the role of forest and the work of National Park management in reducing soil erosion is significant. Bearing in mind that the BJCMNP protects the upper sections of 10 of the island's watersheds a levy on water from its watersheds would be most appropriate.

If the National Water Commission has about 400,000 connected customers, and it is assumed that half of those are in the eastern part of the island (mainly Kingston) and therefore get their water from the BJCMNP, 0.25% would make a reasonable contribution of about JA\$6 million assuming average water bill per annum is JA\$12,000. This should be seriously considered and lobbied for, and should not be placed in the type of fund that will require BJCMNP management to write proposals and compete with other groups for the funding. In other words, these funds should be used to provide a secure funding source (a definite sum provided annually) for management of the BJCMNP. Of course, there would have to be adequate reporting and auditing, as currently occurs with funds obtained through the NRCA.

Carbon Sequestration: This must be investigated as a source of funding for the management of the BJCMNP whether through informal markets or the formal market, which will likely require the involvement of the Government of Jamaica and large Trust Funds e.g. Forest Conservation Fund.

User Fees: The 2003 User Fee legislation improved the situation particularly for the marine parks, however the JCDT was already collecting a contribution from visitors at Holywell and the Blue Mountain Peak Trail for the BJCMNP. Of the approximately 10% of its budget that the Park earns from recreation areas, about 45% is from use of the cabins, 25% from services JCDT provides e.g. educational packages and only about 30% from the actual entry or 'user' fee. In addition, the fees legislated for the Peak Trail are very high and are proving near impossible to impose, particularly without the necessary funds to carry out repairs, improvements and a public awareness raising campaign.

GCT and other tax/duty exemptions: The Delegation Agreement addresses assistance with obtaining duty and GCT exemptions, and purchases could sometimes be made through NEPA in order to benefit from GCT exemptions but this has since been disallowed. Tax exemptions are available for some items through the Ministry of Tourism but Holywell would have to become licenced and the site like many other small business attractions is having difficulty in meeting the requirements. Permanent GCT exemption would provide significant assistance if addressed by the Government.

12.7.2 Other – Delegated National Park Manager (JCDT)

The JCDT in its Strategic Plan for 2010 – 2014 has strengthened its commitment to the BJCMNP. Recognising the importance of financial sustainability and the increasing challenge of sourcing funds to cover operations and core costs, greater effort to generate income through business ventures relating to National Park management will be made. JCDT subsidises park management through contribution of staff time, administrative support e.g. communications and overheads e.g. office space. The sustainability of park management requires a strong and financially stable organization, therefore the JCDT will also increase efforts to improve its own long-term sustainability.

Grants

These will remain an important source of funding; however due to increasingly stringent donor requirements, the focus of grant funding will increasingly have to support project (deliverables) and capital type expenditure only, or at least only the activity components of programmes. In the short-term, the usual donors will continue to be approached, however in the short to medium term, new donors will have to be sought and solicited. This will be particularly important as existing donor agencies in Jamaica have numerous commitments and there are many competing organisations.

Recreation Area Revenue

Despite the negative impact of hurricanes, 2005 to 2009 was successful in terms of increasing income from the BJCMNP's recreation areas. Every effort must be made to continue to increase income from the Recreation and Tourism Programme, with least impact on the National Park itself. This will include:

- (i) Increasing the numbers of visitors, as currently the sites are under-visited – this will be done through improvements in marketing and increasing week-day visits. Carrying capacity and Limits of Acceptable Change issues need to be dealt with carefully and are an area for attention in the Research Prospectus.
- (ii) Increasing the facilities, services and products the visitor can purchase e.g. tours, craft. This will be done in conjunction with local communities in the National Park's Community Buffer Zone, thus contributing to rural development.

- (iii) Establishment of the Blue Mountains Sustainable Tourism Programme to market and facilitate the development of recreational opportunities in the National Park and its Community Buffer Zone.
- (iv) Improving management to reduce over-expenditure.

It should be noted that park management needs to begin to put aside and invest some of the profit from the recreation areas as an emergency fund e.g. repairs after hurricanes. If it was not for the emergency funds established by the Environmental Foundation of Jamaica and USAID Projects (which may no longer exist), Holywell would never have recovered from Hurricanes Ivan and Dean.

Corporate Sponsorship and Donations

Donations will continue to be sought from corporate Jamaica and individuals. This approach will be improved, with the development and implementation of a campaign to encourage corporate and individual support of the BJCMNP. The current economic situation in the island makes it difficult for both companies and individuals to give, and there are an increasing number of worthy causes, particularly with government's budgetary cuts. Funding from corporate Jamaica tends to be for specific events, activities and tangible items e.g. equipment. Further, giving is often related to familiarity of the area/persons being given, and many people are still not aware of the fact that the Blue and John Crow Mountains is a national park. If they do, they likely assume significant government funding. The approach will have to bear these issues in mind in order to be effective. It will be necessary to seek assistance from Jamaicans living abroad as well, however attempts have been made and it requires a working "patron" who actually implements the programme abroad.

Fundraisers

These will continue to be held e.g. Misty Bliss, but they require a significant amount of human resources for organisation of all the components e.g. logistics, advertising and ticket sales. This generally creates a drain on staff time, as there are not enough capable volunteers, nor enough funding for hiring organisers. Further, events require significant advertising to be successful and this requires funding from sponsors, which is very difficult to raise in the current economic climate and not being viewed as 'popular' events. The interest in a concessionaire-type venture has been explored but still seems limited until the product can be improved e.g. at Holywell or someone can be found interested in organising a fundraiser in Kingston. At the same time however, fundraisers provide marketing opportunities for the park and thus have added value.

Merchandise

Although this will continue, a new product line will have to be developed and a new and improved approach to production and marketing created. This will focus on items that can be readily identified with the BJCMNP, involve local communities from the National

Park's Buffer Zone and target local consumers rather than just the tourist market. During the previous Management Plan, a craft line was developed and community youth trained for production, however as the business was about to start with its first order, the youth withdrew as it no longer seemed financially viable to them. Efforts will be made during this Management Plan, to resuscitate the Blue Mountains Craft Venture with a somewhat different business approach.

12.7.3 Proposed Breakdown of Sources

Over the next five years every effort should be made to maintain and increase support from GOJ (as described above in section 12.7.1) and reduce the dependency on grant funding. The former would be mainly for operational or recurrent expenditure, particularly salaries and transportation (fuel/oil and maintenance) and the latter would be mainly for capital and project expenditure (with some of the programmatic areas being projectised once funding for salaries of implementing officers was sourced otherwise). The target proposed for 2015 is shown below in Table 12.8

Table 12.8 Proposed Breakdown of BJCMNP Income Sources by Percentage of Total

Sources	Percentage of Total Income
GOJ (NRCA and NWC or other levy)	45%
Grants	35% (raised by JCDT through donor agencies including bi-laterals and JNPTF)
Recreational Areas	15%
Other Donations and Income raised by JCDT	5%

Programme Summary: Governance and Administration
Goal: To provide efficient, effective and sustained management that will allow the BJCMNP to meet its over-arching and other goals .

Objectives	Strategies	Activities	Monitoring	Resources	Time-frame
1.To coordinate management at the policy level through establishment of a BJCMNP Advisory Committee comprising of key public, private sector and community stakeholders who will meet twice a year.	Involve stakeholders at policy-making level to engender greater support and collaboration	Establish and organise regular meetings (twice per annum) inclusive preparing minutes and reports for the Committee Use these meetings to address issues affected by factors outside National Park management's control	Minutes	Park Manager Secretarial Support Co-Management Committee Venue	Year 1 and on-going First meeting by end first half of Year 1
2. To coordinate management at the operations level through regular meetings of the Co-Management Committee (management partners as per relevant agreements) and with community stakeholders.	1. Co-management Partners (NEPA, FD, JNHT, JCDT) meetings at least 3/yr 2.Coordinate and collaborate with community stakeholders, particularly Maroon Councils and communities	1. Organise regular meetings 2a. Blue Mountains Sustainable Tourism (Livelihoods) Clusters Meet regularly 2b. Liaison with targeted community-based organizations that assist with BJCMNP management or for projects 2c. Revisit concept of Local Advisory Committees 2d. Participatory planning	Minutes and Reports	Park Manager Secretarial Support Co-Management Partner Agencies Venues Recreation & Tourism Officer Education & Community Outreach Officer	Ongoing from before Year 1 and on
3.To provide supervision, project management, financial management and administrative support for the BJCMNP's	Requires financial support for a small team of management and administrative staff	1.Park Manager provides over-arching technical and management support 2.Administrative support 3.Regular reporting and meetings 4. Update BJCMNP Staff	Annual & Project Workplans & Budgets,Monthly Programme Reports, Bi-monthly Park Reports, Project	Park Manager Administrative Manager Accountant Receptionist & Bookings Clerk	Ongoing from before Year 1 and on

Programme Summary: Governance and Administration					
Goal: To provide efficient, effective and sustained management that will allow the BJCMNP to meet its over-arching and other goals .					
Objectives	Strategies	Activities	Monitoring	Resources	Time-frame
programmes		Manual	Reports, Annual Reports and Financial Statements		
4.To source short and long-term funding for BJCMNP management through grant funding, government subvention, donations, sponsorship and opportunities provided through the Recreation and Tourism Programme.	<ol style="list-style-type: none"> 1. Lobby GOJ for secure and significant funding (at least 45% of budget 2.Obtain at least 15% from national Trust Funds 3.Obtain over 20% from grant funding from a variety of sources 4.Generate at least 15% from Recreation & Tourism Prog 5.Obtain 5% from other sources e.g. donations etc. 	<ol style="list-style-type: none"> 1. Reporting and requests to NRCA and Trust Funds 2. Preparation of proposals to various foundations , companies and agencies 3. Seeking long-term funds through lobbying GOJ, sourcing funds for Endowment 4. Fundraisers and seeking donations 5. Tourism and other businesses 	Financial Statements	Park Manager Administrative Manager Accountant Business Development Officer (i.e. Recreation & Tourism Officer) Capital for business ventures and fund-raising events	On-going from before
5.To ensure adaptive management through monitoring and evaluation of all programmes	Monitoring implemented for all programmes in addition to the Monitoring & Evaluation Programme which monitors for the Park's conservation outcome.	<ol style="list-style-type: none"> 1. Regular reporting 2. Regular meetings to assess workplan implementation and project status 3. Make improvements in implementation as needed 	Reports	Park Manager	Ongoing from before

APPENDICES

APPENDIX 1

Stakeholders in 2010 Management Planning Process

Community Consultations

	Name		Name
Bangor Ridge - Portland		Minto, Hagley Gap, Epping Farm – St Thomas	
1	Nora Ellis	123	Sonia Hardy
2	Woodbourn Peat	124	Michelle Cain
3	Brian Jones	125	Renee Hardy
4	Sheron Stamp	126	Marsha Edwards
5	Doreen Jackson	127	Notata Sewell
6	Mickiah Bailey	128	Eulis Millwood
7	Tyrone Richards	129	Rose-Ann Shepherd
8	J. Carly Hamley	130	Ingrid Anderson
9	Olivia Jackson	131	Trudyann Duffus
10	Vincent Murray	132	Erwel Edwards
11	Melvin Tyrell	133	Ade Jackson
12	Jennifer Dunbar	134	Simona Lewis
13	Clifton McFarlane	135	Rose Marie Anderson
14	Herral Ellis	136	Shane Brown
15	Joel Leslie	137	Alton Henry
16	Antonette Roberts	138	Ninkcovia Millwood
17	Roy Ellis	139	Kenneth Moncrieffe
18	Neville Parks*	140	Leonard James
19	Lauren McFarlane	141	Lukasha Anderson
20	Felicia Dyce	142	Annette Brown
21	Aneita Morgan	143	Jerry Walker
22	Lester Richards	144	Melesia Daley
23	Shirlene Cobran	145	Vovena Whyte
24	Janet Richards*	146	Silford Gordon
Cedar Valley - St. Thomas		147	Kayden Shepherd
25	Maisie Duffus	148	Valsose Powell
26	Celeste Kelly	149	Nash Lewis
27	Diana Ford	150	Juanita Edwards
28	Murrie Blake	151	Hyacinth Ogelvie
29	Klinnified Cousins	152	Camellia Dalhouse
30	Desrine Jeffrey	153	Aletha Stewart
31	Pamila Cousins	Cascade - Portland	
32	Albert Small	154	Alice Henry
33	Tamika Whitton	155	Veronica Campbell
34	Sandra Parke	156	Marcella Taylor
35	Janice Spence	157	Garville Francis
36	Angela Bull	158	Marlon Hamilton
37	Caslia Gillian	159	Meshika
38	Euphema Cousins	160	Taj-Jaye Campbell
39	Cynthia Lynch	161	Cliftoff Finegan
40	Yasnivy Telles Legra	162	Mikaylia Scott
41	Lawrence Lawles	163	Enriave Campbell
42	Angella Lawles	164	Angella Penny

	Name		Name
43	Latoya Whitton	165	Eunice Lewars
44	Shalies Stewart	166	Ethelbert Mosaley
Mavis Bank - St. Andrew		167	Icylin Bailey
45	Clyde Jacobs	168	David Francis
46	Tashein Boothe	169	Carlton Sterling
47	Vivette Kelly Nixon	170	Marlene Henry
48	Joyce Sanford	171	Omar Henry
49	Louise Jacobs	172	Adrian Williams
50	Patricia Jacobs		Millbank - Portland
51	Stefanie Neale (USPC Volunteer) *	173	Eric McCurbin
52	Adlai Thompson (SDC)	174	Sonia Maragh
53	Nadine Edwards	175	Donald Folkes
54	Cereta Pinto	176	Donovan Gray*
55	Anna Marie Stewart	177	Evadne Gray*
56	Hezekiah Spencer	178	Elton Ewan
57	Renard Raymond	179	Errol Francis
58	L. Pack	180	Lenford McDonald
59	Lumen Minott	181	Myrtle Higgins
60	Paul Ward	182	Evadne Green
61	Kadian Brown	183	Linda Hall
62	Garfield Lattouche	184	Linnette Wilks*
63	Valus Francis	185	Dorothy Gray
64	Othniel Hall	186	Fitz King
Sherwood Forest - Portland		187	Dwayne O'Bryan
65	Devon Harris	188	Walter Gray
66	Edgar Rowe		Moore Town Maroon Council - Portland
67	Alton Nathan	189	Charmaine Shackelford
68	Pamela Leslie	190	Col. Wallace Sterling*
69	Ralph Blake	191	Major Osmond Smith
70	Winston Moore	192	Seymour Sterling
71	Ashman Cooke	193	Burchell McKenzie
72	Merlene Cousins	194	A.Burke
73	Claudette Buckley	195	Ivan Deans
74	Jenice Richards		Irish Town, Redlight, Middleton – St. Andrew
75	Leroy Harvey	196	Jeremy Schroeter
76	Evenise Clarke	197	Kalisha Shaw
77	Lois Daur	198	B.L.Dunbar
78	Valene Allen	199	Orani Dunkley
79	Rolman Haye	200	Denzil Thompson*
80	Roy Gregory	201	Dennis Shaw
81	Eric Nathan	202	C. Dunkley
82	Morrel Campbell	203	Valencia Dunkley
83	Dorvet Valentine	204	Amanda Howard
84	Jannet Purrier	205	Mr Taylor
85	Michelle Moore	206	C.Henry
86	Barbara Lodge	207	Denise McGonan
87	Davkin Sydney	208	Tonie Graham
88	Norman Moore	209	Charles Taylor
89	Dwayne Parkinson		Claverty Cottage - Portland
90	John McPherson	210	Sonia Willis
91	Velma Morrison	211	Delroy Lee
92	Annakay Moore	212	Marciann Shirley

	Name		Name
93	Alton Anderson	213	Leteria Barelay
94	Morlene Necrye	214	Annete Williams
95	R. McPherson	215	Ricardo Hamilton
96	Leslie-Ann Brown*	216	Janice Barclay
Charles Town Maroon Council - Portland		217	John Willis
97	Kerry Bryan	218	Dorine Perrin
98	Cashaine Richards	219	Delphena Willis
99	Marcia Douglas	220	Robert Watson
100	Rodney Rose	221	Madia Stewart
101	Col. Frank Lumsden*	222	Keresha Stewart
102	Omroy Anderson	223	Vanesia Tyrell
103	Delano Douglas	224	Keith Barclay
104	Gregory Hemy	225	Barbara Grant Miller
105	Danday White	226	Henry Lindo
106	Desmond Stewart	227	Lorna Tyrell
Woodford, St. Andrew		228	Sylvia Taylor
107	Kantalin Robinson	229	Evadney Sutherland
108	Christine Tapper	230	Veronica Campbell
109	Robert Hall*	231	Winsome Lee
110	Marcel Bryce	232	Jeline Headlam
111	Danyelle Okesanjo	233	Trevor Tyrell
112	Andya Morrison	234	Clifford Lewis
113	Joe Shako	235	Cardinald Taylor
114	Mervin Hibbert	236	Samuel Edwards
115	A. Jans	237	Andrea Hector
116	Debra- Kay Bailey	238	Annette Hector
117	Bradley R. Robinson	239	Glen Willis
118	Vera Simpson	240	Rufus Lee
119	Isoyln Harley	241	Frank Dixon
120	Maxine James	242	Kenneth Sterling
121	Douglas Froneiz	243	Delroy Crip
122	Patricia Brown		

(* indicates attendance at Draft Plan Review Meeting and Community consultation)

Agency Representatives at Programme workshops and Draft Plan Review meeting

	Name	Agency/Organisation
1	John P. Knight**	Island Special Constabulary Force (ISCF)
2	Leslie Watts*	ISCF
3	Osbert Stitchell	Ministry of Agriculture, Fisheries Division
4	Samuel McIntosh	Jamaica Fire Brigade (JFB)
5	Astley Lindsay*	JFB
6	Amoy Bernard-Morrison**	Squatters Unit
7	Damart Williams**	Forestry Department (FD)
8	Stephanie Donaldson Francis	FD
9	D'owen Grant	FD
10	Charles Reid	FD
11	Francine Blank*	FD
12	Natalie Fearon	National Environment & Planning Agency (NEPA)
13	Marva Smith-Moodie	NEPA
14	Ranya Reid**	NEPA
15	Warren Thomas	NEPA

16	David Reid*	NEPA
17	Tameka Clough*	NEPA
18	Ava Tomlinson*	NEPA
19	Debra-Kay Palmer*	Jamaica National Heritage Trust (JNHT)
20	June Heath*	JNHT
21	Bernard Jankee*	African Caribbean Institute of Jamaica & Jamaica Memory Bank - Institute of Jamaica (IOJ)
22	Suzanne Davis	Natural History Museum of Jamaica (NHMJ)- (IOJ)
23	Dorsia Brooks	NHMJ
24	Lori-Ann Harris*	NHMJ
25	Elizabeth Morrison*	NHMJ
26	Mickelle Hughes	Jamaica Social Investment Fund (JSIF)
27	Michelle Moses	JSIF
28	Adlai Thomson	Social Development Commission (SDC)
29	Duane Harris	SDC
30	Denton Alvaranga	RADA
31	Bevene Martin	RADA
32	Eistein McLean**	RADA
33	Siran Bent	TPDCo.
34	Althea Heron**	Ministry of Tourism
35	Osbourne Chin*	Ministry of Tourism
36	Andrew Sharpe	Authentic Caribbean
37	Donna Levy	Sun Venture Tours
38	Errol Walcott*	Sun Venture Tours
39	Andreas Oberli	National Arboretum Foundation
40	Llewelyn Meggs	The Nature Conservancy
41	Bridget Lawrence-Blake	National Water Commission
42	Basil Forsythe*	Ministry of Water and Housing
43	Thera Edwards*	Environmental Consultant
44	Susan Otuokon	Jamaica Conservation and Development Trust (JCDT)
45	Marlon Beale**	JCDT
46	Donna Fray**	JCDT
47	Samuel Johnson**	JCDT
48	Wellington Taylor	JCDT
49	Herma Dawes	JCDT
50	Georgette Dallas**	JCDT
51	Jo-Ann Johnson*	JCDT
52	Kareen Wilson*	JCDT

(* indicates attendance at Draft Plan Review meeting only)

(** indicates attendance at Draft Plan Review meeting and Programme workshop)

APPENDIX 2

List of Buffer Zone Communities

Portland	St. Andrew
Bellevue/Alligator Church	Bowden Hill
Berwick Spring	Brandon Hill
Birnamwood	Content Gap
Cascade	Free Town
Cedar Valley	Mt. Airy
Chelsea	Mt Horeb/Mt Prospect
Claverty Cottage/Clifton Hill	Newcastle
Comfort Castle	Redlight
Cornwall Barracks	Resource
Durham	Settlement (Middleton)
Ecclesdown	Somerset
Ginger House	St. Peter
Millbank	Westphalia
Moore Town	Woodford
Mt. St. Bernard	Irish Town
Pleasant Hill	Mavis Bank
Reach	
Seaman's Valley	St. Thomas
Section	Cross Pass/Mt. Felix
Spring Hill	Epping Farm
Tom's Hope	Hayfield
Whitehall	Hillside
Windsor	Johnson Mountain
Charles Town	Somerset
	Trinityville
	Westphalia/Whitfield Hall
	Penlyne Castle
	Minto
	Hagley Gap

APPENDIX 3

Review of Relevant Legislation

1. Natural Resources Conservation Authority Act (1991)

The Natural Resources Conservation Authority (NRCA) Act provides for the management, conservation and protection of the natural resources of Jamaica. The Act establishes the Natural Resources Conservation Authority, a body of persons appointed by the Minister of the Environment. The functions of the Authority include the taking of such steps that are necessary to ensure the effective management of the physical environment of Jamaica. Section 5 permits the Authority to designate specific land areas as national parks, for the benefit of the public. Section 6 permits the Authority to delegate any of its functions, apart from that of making regulations, to an agent. Section 38 allows for the preparation of regulations to guide management of national parks. Appendix 14 is a copy of the Delegation Agreement, 2002 between the NRCA and JCDT regarding management of the BJCMNP.

2. Natural Resources Conservation (BJCMNP) Declaration Order (1993)

The Blue and John Crow Mountains National Park is located in the Blue and John Crow Mountains in Jamaica, which traverse the four easternmost parishes in the island. It is the first and only designated national park in Jamaica. The Declaration Order officially designates the area defined within the boundary as the BJCMNP (see Appendix 15).

3. Natural Resources (National Park) Regulations (1993)

These regulations provide for management of national parks in Jamaica (see Appendix 16). They list a wide range of offences and provide for fines or imprisonment where persons are convicted under any of these. The offences include (but are not limited to):-

- Littering with any kind of material – all litter is to be deposited in designated areas or receptacles;
- Pollution of all types or substances whether poisonous, industrial or otherwise; water pollution is noted in particular;
- Disorderly, offensive or indecent behaviour or language;
- Damaging or injuring a protected animal or a plant, or throwing anything which could injure a person, animal or thing;
- Defacing or damaging of buildings, rocks, trees etc.;
- Playing a radio or musical instrument which disturbs others;
- Refusing to comply with orders from authorised officers;
- Using vehicles in areas not designated for this purpose;
- Erecting of a building or structure;
- Making of a trail without Park Manager permission;
- Lighting a fire for other than domestic purpose, only in a designated area;
- Introduction of a plant that may be injurious to other plants or animals;
- Occupying land within the Park;

These regulations also govern persons conducting research in the park area who may be collecting specimens, audio recordings, data (including computer records) and producing scientific publications from their activities. The regulations make provisions for the final destination of these materials to be declared.

The regulations allow for, amongst other things, the:-

- collection of fees for certain commercial activities;
- installation of signs e.g. to designate areas for specific purposes;
- seizure and forfeiture of vehicles, vessels, articles or things used to commit an offence;
- arrest of persons where there is reasonable belief that they have committed an offence;
- zoning of the Park into areas for various purposes and for use under particular terms and conditions.

The regulations require the preparation of a management plan to guide Park management and describe the administration of the Park including the appointment of a Park Manager and an Advisory Council. The designation of National Park Rangers along with a description of their functions and responsibilities is stated and JCF, JDF and ISCF members and officers are deemed National Park Rangers under these regulations.

4. Natural Resources Conservation (Blue and John Crow Mountains National Park) (User Fees) Regulations (2003)

These regulations (see Appendix 17) make provisions for the issuing of a pass and collection of fees to enter a recreational area or trail within the Park, and for camping. This pass must be in the possession of the person using it for entry at the time of entry. Two areas are highlighted – Hollywell Recreation Area and the hiking trail from Portland Gap to the Blue Mountain Peak. With respect to Hollywell the pass may be either a single entry or an annual pass for multiple entries. Authorised Officers under the National Park regulation of 1993 are exempt from using a pass. The procedure to account for the fees collected by the Park Manager is described and schedules are included stating the various fees prescribed.

5. Natural Resources Conservation (National Parks) (Amendment) Regulations (2003)

These regulations (see Appendix 17) amend the 1993 regulations, particularly by increasing fines and fees.

6. The Forest Act (1996)

This Act addresses the sustainable management of forests on lands in the possession of the crown and vests management responsibility in the Conservator of Forests. The Act provides for the establishment of forests reserves, the establishment of protected areas, the promotion of forestry research areas, reforestation initiatives and the preparation of a forestry management plan. The Act speaks to the establishment and maintenance of recreational facilities in forest conservation areas and forest management areas as may be

designated for that purpose as well as protection and preservation of watersheds in forest reserves, protected areas and forest management areas. The Act also recognises the protection and conservation of endemic flora and fauna.

With respect to recreational facilities, the Act allows that the Conservator may establish recreational facilities in such forest reserves or forest management areas as s/he considers appropriate and such facilities may include:-

- (a) parks;
- (b) roads and trails;
- (c) camp grounds;
- (d) picnic sites;
- (e) such other facilities as the Conservator may determine.

Fees may be payable for the use of facilities provided.

7. The Forest Regulations (2001)

The Forest Regulations 2001 incorporate additional provisions related to the regulation of forest reserves, offences against burning without a permit in forest reserves and timber licences. There is no over-arching section in the Act that states that the Forestry Department is responsible for all of the island's forests. The department is restrained by the limitations placed on the areas over which the Act establishes jurisdiction namely: Forest Reserve (any area of land declared by or under the Act to be a forest reserve), Forest Management Area (any area of land declared under the Act to be a forest management area) and Protected Area (any area of land declared by the Minister pursuant to section 23 to be a protected area).

Recreation sites and facilities in a forest estate may be the subject of management contracts or leasehold arrangements with other parties. Government agencies, non-governmental organizations or private individuals who make application for such agreements may do so if:

- (a) the facility or site was approved in the Forest Management Plan; and
- (b) the Conservator is satisfied that the site or facility will be operated in compliance with the Act and the Regulations. In determining whether or not to recommend an application, the Conservator shall be guided by (but shall not be obliged to accept) the recommendations of the Forest Management Committee. The rates for any lease or management contract shall be the rates recommended by the Commissioner of Lands. The period of any lease or management contract shall not exceed 10 years in the first instance and shall be subject to performance standards and performance indicators and agreeable to both parties to the contract. A contract for the operation of a recreation site facility in a forest estate may be terminated if the terms of the contract are contravened.

6. The Wild Life Protection Act (1945) and relevant amendment orders and regulations

This is the only statute in Jamaica specifically designated to protect species of animals and regulates hunting in Jamaica. The main provision that ensures the protection is found in Section 6 of the Act which states that:-

- (1) No person shall hunt any protected animal or protected bird.

- (2) Every person who
- (a) contravenes the provisions of subsection 1; or
 - (b) has in his possession the whole or any part of any protected animal or bird; or
 - (c) Takes or has in his possession the nest or egg of any protected bird, shall be guilty of an offence.

The Act designates all birds except the 22 birds in schedule 2 and birds kept as domestic birds as not protected and 14 animals as protected e.g. Jamaican Coney, Jamaican Yellow Snake and Giant Swallowtail Butterfly.

The Act regulates the hunting of game birds, designates game birds, hunting times and limits. It also prescribes the licence, provides for the declaration of game sanctuaries and games reserves.

7. The Country Fires Act (1942)

The Act states that every person who sets fire to any crop shall be guilty of an offence. So too is every person who sets fire to any trash on any land unless the occupier of such land first serves on the officer or sub-officer in charge of the nearest police station and the occupiers of all adjoining lands the nearest boundaries of which lie within half a mile (0.8 km) of the place where it is intended to set fire to such trash, notice of his intention to set fire to such trash on the dates, not exceeding seven, specified in such notice; and clears an open space of at least fifteen feet(4.5 m) in width round such trash and removes from such open space all inflammable material or other matter likely to burn, land, unless the occupier of such land first-shall be guilty of an offence against this Act. Notices shall be served three clear days at least before the first of the dates specified in the notice. Every person who sets fire to any trash between the hours of six in the evening and six in the morning; or leaves unattended any fire he may have lit or used in the open air before it is thoroughly extinguished, shall be guilty of an offence against this Act.

Permits should specify the period, not exceeding fourteen days at the most, within which the permit shall be in force, and the hours during which fire may be set, and the person issuing such permit should send a copy thereof to the officer or sub-officer in charge of the nearest police station. Every person who, for the purpose of obtaining a permit, gives to the person to whom application is made any information knowing it to be false, or makes any statement knowing it to be false, shall be guilty of an offence against this Act. Every person who sets fire to any trash contrary to the provisions of any order issued under or contrary to the provisions of any permit granted shall be guilty of an offence against this Act.

Fires lit on any plants or trash to eradicate or prevent the dissemination of, any disease within the meaning of the Plants (Protection from Disease) Act as well as those lit for lime or charcoal kiln are noted exemptions to the main provisions of this act.

8. The Endangered Species (Protection, Conservation and Regulation of Trade) Act (2000)

This Act was promulgated to ensure that Jamaica meets its obligations under the Convention for the International Trade in Endangered Species of Wild Fauna and Flora. The Act governs international and domestic trade in endangered species to and from Jamaica. It establishes a Management Authority, which is the Natural Resources Conservation Authority, as well as a Scientific Authority. The functions of the Management Authority include the grant of permits and certificates for the purpose of international trade, the determination of national quotas and the monitoring the trade in endangered species. The primary role of the Scientific Authority is to determine whether a species is at risk, vulnerable or threatened, to advise on trade matters and to monitor the grant of permits and certificates.

Offences under the Act relate to trading in any specimen of a species without a permit or certificate; enclosing in or with any letter, parcel, packet or other matter sent by post, any endangered species; or knowingly using for the transportation of any endangered species any mail bag or mail van, aircraft, ship or other vehicle used for the carrying of mail.

9. The National Solid Waste Management Act (2002)

Commonly referred to as the 'Litter' Act, this act makes provision for a National Solid Waste Management Authority and mandates the Authority to take such steps as are necessary for the effective management of solid waste in Jamaica to safeguard public health including the collection, transportation, re-use and re-cycling of waste in an environmentally sound manner. The Act makes it an offence for any person to throw, drop or otherwise deposit and leave litter in any public place, or a private place without permission.

10. The Water Resources Act (1995)

The Water Resources Act (1995) was promulgated in the Jamaican Parliament in September 1995 and enacted into law on 1st April 1996. This marked a 25-year effort to address the deficiencies in legislation for the proper administration, development and optimal use of the island's water resources. The Act gives to the Water Resources Authority (WRA) the responsibility for planning hence, the orderly development and equitable allocation of water resources, including the analysis of alternative methods of developing and supplying water, can now be executed. The alternative methods will examine how best to supply water without damage to the environment and economic setback.

The WRA will maintain an inventory of resources and demands by sector (domestic, irrigation, industrial and tourism), and determine the growth in demand well into the future, to ensure that available water can be optimally allocated while at the same time preserving the environment. This Water Resources Master Plan recommended the projects, programmes and other steps, which should be taken in respect of development, control, abstraction and storage of water as well as its supply, distribution and disposal. The Act allows the WRA to declare a water quality zone to protect water quality in the public's interest.

APPENDIX 4

Controlling Invasive Plants

***Pittosporum undulatum* (Wild Coffee/Mock Orange)**

Controlling this most threatening invasive is highly recommended, but control programmes involving forest disturbance should proceed with caution, as this invasive regenerates readily and competitively in gaps. When *P. undulatum* trees are removed, the disturbance created triggers increased recruitment of the invasive in the gaps created, giving the copious forest floor seedlings of *P. undulatum* an opportunity to sprout.

At the present time, there is little momentum on the issue of biological control of *P. undulatum*. There are always many risks involved in introducing biological control agents, and the costs and expertise required for such activities are likely to be out of the park's reach. As *Pittosporum* is heavily used by local people, there is also the question of the socioeconomic impacts, and the resulting bare slopes that would follow *Pittosporum* eradication. The fact that there are no native members of the Pittosporaceae is however encouraging as less work would be required on the specificity of the control agent.

As recommended by Goodland and Healey (1997), guidelines and priority actions for invasive control are:

- i) Control of *P. undulatum* in lightly invaded forest on a small scale so that more information can be gained about the procedures, effects and cost involved. Eradication in 2 topographically well-defined areas of 2-5 ha like the forest north of Cinchona – the north facing hillside below Morces Gap and the northern slopes of Sir Johns Peak is recommended. Such activities should provide employment for local people, and should be carried out under strict supervision. The effects of such programmes should be carefully monitored in permanent sample plots.
- ii) Control of *Pittosporum* on trails frequented by visitors (BM Peak trail) as trails are invasion conduits, and the benefits of rehabilitation would be readily visible to the public.
- iii) Control of *Pittosporum* in small areas (< 1 ha) of particular scientific interest/representative areas of natural habitat (Special Conservation Zones: Mor Ridge forest, forest near the East arm of the Morant River and Mt. Horeb).
- iv) Uprooting *Pittosporum* seedlings is an effective method of control as there is no need for herbicide use, no risk of regrowth, and little or no gaps created. *Pittosporum* trees in lightly invaded forest should be cut down using a machete or axe, and applying undiluted glyphosate to the cut surface.

v) Wherever *Pittosporum* is removed, removal of Wild ginger and Redbush should also take place, as these are threatening invasives, and will take advantage of gaps created by *Pittosporum* removal if they are not simultaneously controlled.

***Hedychium sp.* (Wild Ginger)**

Hedychium sp. invades wet habitats up to 1700 m and displaces native species. It has been included in the Invasive Species Specialist Group's list of the world's 100 worst invasive species. Its vast, dense colonies choke the understorey in degraded forests, and hinder forest regeneration.

i) Wild ginger plants should be slashed and their rhizomes dug out.

ii) Rhizomes should be packed up and dumped in municipal dumping areas. They should not be mulched or composted as they will re-sprout and re-infest.

***Polygonum chinense* (Redbush)**

Redbush can be controlled using a combination of cutting and glyphosphate.

APPENDIX 5

Plant Species for Possible Use in Reforestation/Rehabilitation

1. Native fast-growing species recommended in McDonald et. al., 2003

Scientific name	Common name(s)	Altitude (m)	Mean density in southern slope forests (stems/ha)	Ecology and notes
<i>Alchornea latifolia</i>	Cornstick, Cornwood, Dovewood, Lablab tree,	75-1850	very abundant (>100 stems/ha)	Near pioneer, grows fast, wildlife eat seeds
<i>Turpinia occidentalis</i>	Candlewood	70-1850	130	Gap benefiting, grows fast
<i>Clethra occidentalis</i>	Soapwood, Soap Bush	610-1850	Very abundant	Near pioneer
<i>Symplocos octapetala*</i>		1160-1600	4	Gap benefiting A near threatened species occurring in the western Blue Mts. and John Crow Mts., The species has an occasional to common distribution over most montane habitats between 1160 and 1700m.
<i>Juniperus lucayana</i>	Juniper Cedar	460-1830	Moderately abundant (30-100 stems/ha)	Near pioneer, grows fast, Vulnerable This species is now rare in Cuba because of past overexploitation. It is technically extinct in Haiti and is rarely seen in the Bahamas. Of all tree species in the Blue Mts. in Jamaica, this is considered to be under the most direct threat because of its value as fuelwood and timber. It has a local and scattered distribution, mostly on steep slopes. In the Blue Mts. it occurs most commonly on southern slopes, where deforestation is prevalent and once remote populations are now accessible by road. Regeneration is spasmodic and young trees frequently colonise exposed sites and landslides.

1. Species recommended in McDonald et. al., 2003 (continued)

Scientific name	Common name	Altitude (m)	Mean density in southern slope forests (stems/ha)	Ecology and Notes
<i>Podocarpus urbanii</i>	Mountain yacca	1160-2256	100	Gap benefiting The species is common to locally dominant in the montane rainforests of the Blue Mts. At very high altitudes it is one of the commonest trees. Large populations exist on the Grand Ridge and in southern catchments. It is less common where slopes are steep or unstable.
<i>Guarea glabra*</i> <i>G. swartzii</i>	Alligator wood	150-1850	40	Shade tolerant
<i>Cinnamomum montanum</i>	Cinnamon, sweetwood	370-1700	16	Shade tolerant/gap benefiting
<i>Viburnum alpinum*</i>	Black Wattle	390-2140	113	Near pioneer/gap benefiting
<i>Turpinia occidentalis</i>	Mutton wood	70-1850	130	Gap benefiting
<i>Prunus occidentalis</i>	Prune	520-1450	3	Gap benefiting/shade tolerant
<i>Viburnum alpinum*</i>	Black Wattle	390-2140	113	Near pioneer/gap benefiting

2. Submontane species

Scientific name	Common name	Occurrence	Altitudinal range (m)	Notes
<i>Hernandia catalpifolia</i>	Water Mahoe Water wood	Locally common by streams, damp woodland and submontane woodlands	450-650	Vulnerable, A tree which is locally common in the parishes of Portland and St Thomas by streams and in damp ravines in submontane woodland. Deforestation has almost completely

Scientific name	Common name	Occurrence	Altitudinal range (m)	Notes
				removed the habitat in the latter parish, areas in ravines probably representing the only remaining fragments.
<i>Hibiscus elatus</i>	Blue Mahoe Mountain Mahoe	Common mostly as a result of planting	0-1,220	
<i>Cedrela odorata</i>	West Indian Cedar	Common in places where probably planted	30-1220	Grows fast, dense crown
<i>Calophyllum calaba</i>	Santa Maria	Woodlands on limestone in high rainfall areas	Sea-level to 630	
<i>Simarouba glauca</i>	Bitter Damson	Common in woodlands on limestone	Sea-level to 600	
<i>Pithecellobium arboreum</i>	Wild Tamarind	Mostly in woodlands on limestone	30 - 900	

3. Species recommended by communities

Scientific name	Common name	Notes
<i>Cecropia peltata</i>	Trumpet tree	Altitudinal range: 15-880m
<i>Cananga odorata</i>	Deel, Ylang Ylang	Native of Malaysia, cultivated for lumber
<i>Matabya apetala</i>	Wanika, Coby wood, Pigeon wood	Riparian, altitudinal range: 210-1310 m

4. Species for landscaping purposes in and around recreational areas

Scientific name	Common name
<i>Cephaelis elata</i> *	Hotlips
<i>Blakea trinervia</i> *	Cup and saucer
<i>Schefflera sciadophyllum</i> *	Umbrella tree
<i>Cococypselum herbaceum</i>	
<i>Cococypselum pseudotontanea</i> *	
<i>Salvia</i> sp	Scarlet sage
<i>Asclepias curassavica</i>	Redhead
<i>Asclepias nivea</i>	
<i>Meriana leucantha</i> *	

* endemic

APPENDIX 6

Research Prospectus

This prospectus is aimed at indicating major information gaps with respect to the Blue and John Crow Mountains, particularly with respect to the management of the area as a national park. The intention is to encourage researchers to investigate the subject areas, and to collaborate with Park management in these studies. The information will be posted on various websites, and will be updated regularly. During this Management Plan period, it will also be expanded in terms of the detail for each research project proposed.

Invasive Plants

1. The distribution of *Pittosporum undulatum* in the Blue and John Crow Mountains National Park and Community Buffer Zone.
2. Controlling *P. viridiflorum*, *Melinis minutiflora* (molasses or Wynne grass), *Gleichenia* sp (fern), and *Polygonum chinense* (red bush) in the Blue and John Crow Mountains National Park.
3. Investigating competition between invasive plant species such as (*P. undulatum*, *P. viridiflorum*, *Melinis minutiflora*, *Gleichenia* sp, *Hedychium gardnerianum*, *Polygonum chinense*) and the native flora of the Blue and John Crow Mountains National Park.
4. Investigation of possible economic uses of invasive plant species such as Wild Ginger (*Hedychium* sp.) and Wild Coffee/Mock Orange (*Pittosporum undulatum*).

Native Plants

5. Propagation of endemic and threatened plant species of the Blue and John Crow Mountains National Park (can use Park nurseries)

Birds

6. Bird composition in the central and eastern regions of the Blue and John Crow Mountains National Park.
7. Bird composition in the Blue and John Crow Mountains below 1,000 meters.
8. Status of the range expanding Shiny cowbird in the Blue and John Crow Mountains National Park.

9. Population status of the Jamaican Blackbird in the Blue and John Crow Mountains National Park.
10. Population estimates of key native (particularly endemics) and migrant bird species

Hutia

11. Demographic and Ecological Studies on the Jamaican Hutia (*Geocapromys browneii*) in the Blue and John Crow Mountains National Park. In particular, the status and impact of hunting on populations, and the possible use of captive breeding and release as a conservation strategy.

Invertebrates

12. A taxonomic survey of the insects found in the Blue and John Crow Mountains National Park.
13. Investigation of potential bio-indicators of ecosystem health in the Blue and John Crow Mountains National Park.
14. Demographic study of the Giant Swallowtail Butterfly (*Papilio homerus*)
15. Demographic and ecological study of Land crabs in the BJCMNP
16. A taxonomic survey of the aquatic invertebrates found in the streams and rivers Blue and John Crow Mountains National Park.
17. Taxonomic and ecological study of the fauna of bromeliads in the BJCMNP

Ecology

18. Ecological studies of conservation targets and other species within the Blue and John Crow Mountains National Park, with particular emphasis on specific threats and conservation management requirements.

Agriculture

19. The distribution, size, growth and shrinking rate of coffee farms in and around the Blue and John Crow Mountains National Park.
20. Harvesting non timber forest resources - resource dynamics and resource users

Forest Ecology and Forestry

21. Silvicultural requirements and suitability of some indigenous tree species on farmland areas around the Blue and John Crow Mountains National Park.
22. The survival and growth rates of young indigenous trees in open agricultural areas around the Blue and John Crow Mountains National Park.
23. Species composition in forest soil seed banks of the Blue and John Crow Mountains National Park.
24. Habitat assessment of the upper montane rainforest over limestone on John Crow peak
25. Habitat assessment of the Montane Summit Savanna and Riparian communities in the Blue and John Crow Mountains National Park.
26. Assessment of species on the northern slopes of the Blue Mountains, particularly bryophytes and lichens.
27. The effect of forest clearance on soil fertility and productivity and water yield.
28. Updated forest and wildlife inventory

Communities and Socio-economic Issues

29. The impact of buffer zone communities on the Blue and John Crow Mountains National Park, including issues related to demographic changes.
30. Analysis of participatory approaches to natural resources management in the Blue and John Crow Mountains National Park.
31. Analysis of old enforcement and natural resource log books to establish trends and comparison with more current, geographical and electronic observation data, to identify any changes in the threats to the Park and to guide management approaches.
32. Impact of wild hog hunting on the ecological integrity of the BJCMNP.
33. Studies and pilot projects on sustainable harvesting and use of natural resources e.g. wicker, insects.
34. Studies and pilot projects on growing of native plant species e.g. orchids, and farming of animal species e.g. Giant Swallowtail Butterfly for revenue generation.

Maroon Cultural Heritage

35. Clarification of Maroon communal land location in relation to the Blue and John Crow Mountains National Park. The location is believed to be outside the Park boundary but the exact location is uncertain.
36. Further archaeological research at Nanny Town in the Blue and John Crow Mountains National Park.
37. Growing of plants e.g. Cacao, Thatch Palm, medicinal herbs, relevant to Maroon heritage, to ensure their conservation and sustainable harvesting.

Recreation

38. Estimate of carrying capacity and development of Limits of Acceptable Change Monitoring and Visitor Impact Management Systems particularly in the BJCMNP recreation areas – Holywell, Blue Mountain Peak Trail and Cunha Cunha Pass Trail, but possibly also for Buffer Zone Community attractions e.g. Cascade Waterfall.
39. A study on trails within the Park and its Community Buffer Zone to identify trails suitable for development, management and monitoring requirements, based on ecological, environmental and other assessments.

Other

40. Analysis of hazard vulnerability within the Blue and John Crow Mountains National Park, and identification and mapping of areas for special management.
41. Climate change and its impacts on the BJCMNP, especially flora and fauna (can use data from Park monitoring) Aim to make recommendations for action.
42. Study on potential mining in the Park, and its ecological, environmental, social and economic impacts including cost/benefit analysis which considers the ecosystem services the Park provides.

APPENDIX 7 Research Log

Name of researcher(s)	Institution & contact information	Research category	Title of research	Site	Period of visitation	Date (s) accompanied by park staff	Copy of findings/papers produced

APPENDIX 8

Conservation and Management of Sacred Natural Sites (UNESCO, 2006)

Challenges

- **Multiple Stakeholders:** SNS may be sacred or important areas for more than one group. In such cases, multiple stakeholders with differing perceptions, uses of a site, nomenclatures, practices and traditions must be taken into account if conflict is to be avoided. Traditional custodians, pilgrims, local residents, tourists and recreationists may all have differing demands for the site.
- **Visitor Pressures and Access:** Designation of an important SNS as a protected area at the national level, or designation as a biosphere reserve and/or World Heritage site at the international level, can popularize a site and cause increased visitor pressures for which managers and traditional custodians are unprepared. With increased visitation, rights of access and demands for infrastructure development can become significant issues that conflict with sacred values and negatively impact the site's quality and integrity. Pilgrimages and pilgrimage routes can also cause conflicts with local land use and/or property rights.
- **Culturally Sensitive Activities:** Many activities normally engaged in by visitors or local groups may be culturally inappropriate in SNS. Some examples of such activities are the climbing of sacred mountains or rock formations, entering into sacred caves or forests, bathing in sacred rivers, lakes or springs, participating in sacred ceremonies without permission of the celebrants, hunting of sacred animals, scattering of cremation ashes, leaving of 'New Age' offerings, or entering into sacred areas without permission or without culturally appropriate preparation.
- **Development Pressure:** Encroachment, agriculture, pastoralism, hunting, logging, road-building, tourism and mining are development pressures that can have significant adverse impacts on SNS. Such pressures are particularly difficult to deal with if the SNS is not officially recognized or if there is secrecy regarding the site or rituals associated with it.
- **Environmental Pressure:** Anthropogenic and natural disasters such as pollution, climate change, fires, floods, erosion, and other related factors can create stresses that negatively impact sacred values and practices, as well as the physical integrity of sites.
- **Buffering:** SNS which are not properly buffered from surrounding activities, such as population increase, residential development, agriculture, grazing, hunting or tourism, can be negatively impacted.
- **Ownership:** SNS located in areas not owned by the traditional custodians, and not within established protected areas, create extraordinary challenges for management.
- **Political Access:** SNS recognized by minority groups or the powerless in a society are often unable to marshal the political support needed to gain national recognition

or install sympathetic management regimes. This is particularly true of sites recognized by minority ethnic or religious communities.

- **Economic Considerations:** Balancing the material and non-material values of an area is always difficult, but especially so in the case of SNS.
- **Seasonal Differences:** Some SNS may be of cultural importance during limited periods, as when the area's values are associated with pilgrimages or festivals at specific times of the year. This may lead to increased demands or peak usage during specific periods that may be incompatible with uses the rest of the year.
- **Conflicting Jurisdictions and Integrated Approaches to Management:** SNS may contain cultural resources managed by traditional custodians or government agencies that differ from the natural resource management entity. This may cause conflicts between the management perspectives or philosophies of the different entities, and make integrated approaches to management an ongoing challenge. The charging and allocation of visitor use fees is often a particularly divisive issue.
- **Different Ways of 'Knowing':** Modern and traditional management entities often have conflicting views as to the means for acquiring the knowledge needed to make informed decisions on site management. While for modern management agencies science is the basis for acquiring information, traditional custodians may have greater confidence in knowledge and understandings that have been passed down through the ages, or which are acquired through spiritual revelations. Finding ways to balance these different approaches to knowledge and understanding can be extremely challenging.
- **Historically Sacred Sites No Longer Associated with Traditional Custodians:** Sites which were historically considered sacred (e.g. Machu Picchu, Peru), but which are no longer associated with traditional custodians, present a series of difficulties for management. There are no traditional stakeholders to consult or to include in participatory management schemes. The value of a historically sacred site to modern societies is often difficult to establish and defend, especially when there have been multiple custodians over the centuries.

Opportunities

- **Conservation Value:** Many SNS have a high degree of biodiversity and are often important areas for freshwater conservation. Due to access restrictions, they are often found in a natural or near-natural state in virtually all the world's ecosystems and landscapes, thus serving as sanctuaries and gene pools for rare, endangered and endemic species. In areas suffering from excessive human impact and environmental degradation, SNS can serve as 'indicator sites' for the restoration and rehabilitation of degraded systems. Based on species inventories in SNS, strategies can be formulated for the reintroduction of native and endemic species in a wider spatial context beyond the area covered by a SNS itself.
- **Sustainable Dimension of Conservation:** As SNS are mostly community-based conservation areas, and are usually fully in line with traditional belief systems and values, their protection tends to be more sustainable than established legally

protected areas. Traditional custodians and local people often manage SNSs in ways that have proven to be effective over long periods of time.

- **Model Sites for Integrated Management:** SNSs reflect a more holistic view of human-nature interactions. They integrate cultural, natural and social values in a single management system.
- **Model Sites for Community-Based Conservation:** Many SNSs can be considered as model sites for participatory conservation strategies and practises. As local people recognize the importance of protecting *their* SNS, such culturally important sites facilitate community participation in overall resource management and conservation.
- **Traditional Knowledge:** Custodians of SNS often also perform the function of traditional healers who have intimate knowledge of local plant and animal species. With a plethora of traditional ecological knowledge on ecosystem structure, functioning and dynamics, custodians can be important resource people for overall ecosystem management. The integration of traditional ecological knowledge and modern environmental science can be beneficial for sustainable land management.
- **Cultural Identity and Diversity:** As carriers of culture-specific worldviews, traditional belief systems and languages, SNS have tremendous cultural value. Many SNS are reference areas of cultural, religious and national identity. Cultural rites and practices (including music, song, dance, poetry, folklore), which should be preserved in the context of maintaining cultural diversity, are associated with SNS. The recognition of SNS offers a possibility to support endangered and vanishing cultural systems.
- **Eco-Tourism:** SNS are both a cultural and natural heritage for local people. At the interface of culture and nature, they can provide important opportunities for eco-tourism development, assisting visitors in experiencing new cultures while also learning about nature. If practised well and managed with a guiding set of ethical principles, eco-tourism linked to SNS can benefit local people directly, but only if due respect is paid to indigenous and local peoples' value systems.
- **Intercultural Dialogue:** SNS can provide a valuable intercultural space to experience human-nature relationships from different cultural perspectives. As such, they can serve to build bridges for intercultural dialogue, understanding, tolerance and peace.
- **The Value of the Sacred:** To many people, the 'sacred nature' of a SNS has an intrinsic value, which should be respected and preserved. There are many shared, fundamental religious/spiritual/philosophical values that exist between different cultures illustrating that cultural and biological diversity are intertwined and reinforced by such unique and long established relations between people and place as embodied in SNS.

APPENDIX 9

List for the School Visitation Programme

	<i>Primary & Secondary Level Schools</i>	<i>Basic Schools</i>
1	Content Gap All Age	Shirley Castle
2	Clifton All Age	Mooretown
3	Craighton All Age	Free Town
4	Minto All Age	Maryland
5	Westphalia All Age	St. Joseph's
6	Woodford All Age	Westphalia
7	Woodford Prep	Charles Town
8	Mt. James All Age	Ebenezer
9	Peters Rock Christian	Cascade Pilgrim Holiness
10	Gordon Town All Age	Mount Lebanon
11	St. Martin de Porres Primary	Ginger Hall
12	Mavis Bank High	Bath
13	Grove Primary	St. Martin de Porres
14	Penlyne Castle All Age	Johnson Mountain
15	Cascade All Age	Bellevue
16	Mount Fletcher All Age	
17	Mooretown Primary & Junior High	
18	Bellevue All Age	
19	Tower Hill Primary	
20	Windsor Primary	
21	Cedar Valley Primary	
22	Buff Bay Primary	
23	Fellowship Primary	
24	Charles Town Primary	
25	Birnhamwood Primary & Junior High	
26	Trinityville Primary	
27	Bath Primary & Junior High	
28	Hayfield Primary	
29	Halls Delight Primary & Junior High	
30	Bowden Hill All Age	
31	Reach Primary & Infant	
32	Johnson Mountain All Age	
33	Comfort Castle Primary & Junior High	
34	Cooper's Hill Primary	
35	Sherwood Forest Primary	
36	Nonsuch Primary	
37	Mount Hermon Primary & Junior High	
38	Shirley Castle Primary	

APPENDIX 10

Holywell Signage Programme Summary

Signs	Description
<p>Welcome Orientation Kiosk</p> <p>1. Holywell Orientation Panel</p> <p>2. Watersheds Orientation Panel</p> <p>3. Tropical Mist Forest</p>	<ul style="list-style-type: none"> - includes map of Holywell, and information about its history and recreational opportunities - interprets watersheds and makes the link to drinking a glass of water - interprets mist forest, making the connection with the water cycle and describing some of the species
<p>Visitor Pavilion</p> <p>4. Information/Notice Panel</p>	<p>This will provide space for information on the rules of the park, and for notices e.g. for up-coming events</p>
<p>Campfire Circle</p> <p>5. Overlook Interpretive Panel</p>	<p>This will interpret the view to Kingston from this point</p>
<p>Recycle Exhibit</p> <p>6. Recycling Panel</p> <p>7. Plastics Panel</p> <p>8. Compost Panel</p>	<p>This exhibit will encourage visitors to participate in Holywell's recycling programme, and therefore help to keep the area clean and more environmentally friendly. It will provide for recycling, resulting in action-learning.</p>
<p>Wag Water Trail</p> <p>9. Trailhead Panel</p>	<p>Information on the Trail - a drawing of the trail with information on its difficulty and what to look out for.</p>
<p>Waterfall Trail</p> <p>10. Trailhead Panel</p>	<p>Information on the Trail</p>
<p>Blue Mahoe Interpretive Trail</p> <p>11. Trailhead Panel</p> <p>12. "Creepers and Hangers"</p> <p>13. "Heart of the Forest"</p> <p>14. Oatley Mountain Trailhead</p> <p>15. Orchids</p>	<ul style="list-style-type: none"> - Information on the Blue Mahoe Trail - Interpretation of the layers of plants in the forest - Interpretation of reforestation - Information on the Trail - Information on orchids especially endemic species
<p>New Stairway</p> <p>16. Overlook Interpretive Panel</p>	<p>This will interpret the view to Kingston from this point</p>
<p>Trail Orientation Kiosk</p> <p>17. Holywell Orientation Panel</p> <p>18. Trail Network Panel</p> <p>19. Trail Natural History</p>	<ul style="list-style-type: none"> - As above - Description of all trails - Interpretation of natural features likely seen on the trails
<p>Shelter Trail</p> <p>20. Trailhead Panel</p>	<p>Information on the Trail</p>
<p>Misty Glade Kiosk</p> <p>21. Holywell Orientation Panel</p> <p>22. Conservation Interpretive Panel</p> <p>23. Blue Mountain Coffee Interpretive Panel</p>	<ul style="list-style-type: none"> - As above - Interpretation of some local conservation activities - Interpretation of growing & processing of Blue Mountain Coffee

Note: Sign numbers indicate location on map in Holywell Plan.

APPENDIX 11

Tourism and Recreation in Jamaica

The tourism industry is one of the most important industries in Jamaica and provides considerable direct economic contribution to the country. It comprises 7.7% of Gross Domestic Product (GDP) and 7.6% employment and the foreign exchange equivalent of up to 56% of other inflows (Res & Co, 1998). The tourism industry is recognised as a lead sector and potential catalyst for economic development.

In 2009, total stopover arrivals were 1,831,097 (an increase of 3.7% over 2008) with 147,256 of those being Non-resident Jamaicans and the remainder foreign nationals. 73.1% stated leisure, recreation or holidays as their reason for visiting, 9.6% said visiting friends and relatives, 5.9% were visiting for business and 7.7% had other reasons. Male visitors were 46.4% of the total and females, 53.6%. 64% of these arrivals were from the USA, 15.9% were from Canada, 15.1% from Europe (mainly from the UK, Italy and Germany), 3.6% were from the Caribbean and the remaining 1.4% from Asia, Pacific and other areas. Intended Resort Area of Stay for Stop-over Arrivals was 28.3% for Montego Bay, 23.1% for Ocho Rios, 21.7% for Negril, 12.2% for Kingston, 5.8% for Mandeville and the South Coast, 7.9% Other and 1% for Port Antonio. Total Cruise Ship Passengers were 922,349 (a decrease of 15.6% over 2008) but there were only 4 cruise ships stopping in Port Antonio with 1,339 passengers and 1 stopping in Kingston with 870 passengers. (Annual Travel Statistics 2009, JTB)

Visitor Expenditure in 2009 was US\$1,848 million for stop-over visitors and US\$78 million from cruise passengers. In terms of distribution of expenditure for foreign nationals, accommodation accounted for 54.9%, entertainment 11.3%, shopping 5.4% and the remaining 28.4% on Food and Beverage, Transportation and Miscellaneous. For Cruise Passengers, 48.6% was spent on Shopping (30% in-bond), 26.2% on Attractions and the remaining amount on Food and Beverage, Transportation and Miscellaneous. (Annual Travel Statistics 2009, JTB). According to 2003 statistics, 54% of visitors were first-timers and foreign nationals spent an average of US\$95 per person per night whilst cruise passengers spent US\$80 per person (Annual Travel Statistics 2003, JTB).

Average Length of Stay for Foreign Nationals depends on nationality, with those from the USA averaging 7.9 nights, from Canada – 9.6, UK – 16, Europe – 10.8, Latin America – 8.3 and the Caribbean – 8.9 nights. Hotel stays were usually shorter on average for Foreign Nationals – averaging 7 nights whilst Non-hotel stays e.g. villas averaged 14.8 nights. Most non-resident Jamaicans stayed in private homes for an average of 17 nights (Annual Travel Statistics 2009, JTB).

Jamaica's Master Plan for Sustainable Tourism, (2002) notes that the success of the tourism industry ought not only to be measured by the amount of GDP, foreign exchange and jobs it provides, but more importantly by the extent to which the industry serves as a vehicle for providing economic and social opportunities for the Jamaican people. At

present, tourism tends to be of benefit to the large hotelier, business etc. and to a lesser extent to small, remote local communities. Tourism in Jamaica has long been synonymous with sun, sand and sea. The security of this type of tourism is being threatened however, as crime, harassment, growing price competition, and the need for alternative types of tourism and attractions are also increasing.

The need for increased environmental management, community involvement and product diversification are identified by the Tourism Master Plan and hence nature, cultural, adventure, community, heritage and ecotourism are all now being promoted at the government, private sector and community levels.

Just as international tourists view Jamaica as a “sun, sea and sand” destination, domestic tourists or Jamaicans seeking recreational opportunities tend to go to the beach during the holidays or on weekends. However, picnicking in natural areas or hiking a forest trail are recreational activities that many Jamaicans participate in, whether as groups seeking a quiet retreat e.g. church group, or light adventure e.g. youth group.

Though ecotourism is very different from the proverbial, sun, sea and sand tourism, there is still a place for it amongst the tourism opportunities being offered to visitors, both local and foreign. Eco-tourism attractions can be marketed to eco-tourists but also, as is currently the case at Holywell, to the local visitor (primarily from Kingston) and to the average tourist seeking a break from the “sun, sea and sand”. Cochrane, 2006 notes the importance of domestic and even ‘mass-market’ tourists to National Parks, and therefore the importance of good visitor management. A survey of tourists (sample size 200) to Jamaica in 1995 indicated that the Blue and John Crow Mountains region is a special site of interest. The increasing numbers of visitors to the park’s recreational areas is testament to this: the number of visitors to the BJCMNP’s recreational areas (Holywell and Portland Gap) increased from 5,880 in 2005 to 11,364 in 2009. Larger increases were anticipated over the period, as in 2003 the figures were 10,168, however, the hurricanes and severe tropical storms between 2004 and 2008 had a negative impact on numbers due to road and infrastructural damage at the sites. Globally, eco-tourism is the fastest growing sector of tourism internationally, and nationally there is a move to market the island as a nature-culture-adventure destination.

It is hoped that the nomination of the BJCMNP as UNESCO World Heritage Site, will be accepted and the site listed, as this would significantly increase promotion of the area. Park management has been preparing through improvements at the sites and the development of a Blue Mountains Sustainable Tourism Programme linking community-based and private sector ventures to the National Park’s recreational areas.

APPENDIX 12

Recreational Areas in the BJCMNP

Holywell

Holywell, one of the two main recreational sites of the BJCMNP, is a 10-hectare (25 acre) mountain retreat set within the cool, mist forests of the BJCMNP. It is located at Hardwar Gap, two miles above the Jamaica Defence Force - New Castle Training Depot and is between 3,250 ft and 4,000 ft (more than 990m) above sea-level. Holywell was initially established by the Forest Department as a plant nursery for reforestation of the forest reserve in the 1940's. Later, in the 1960's it was converted into a recreational area – Holywell park. The site is now leased by the JCDT/Green Jamaica from the Commissioner of Lands through NRCA/NEPA and the Forest Dept. for the purpose of generating income for conservation of the national park.

Facilities and services currently include:

- ▶ Nature trails – a network connecting the picnic, cabin and administrative areas (including Blue Mahoe Trail) and four longer walking trails – Oatley, Waterfall, Shelter and Dick's Pond/Wag Water,
- ▶ Accommodation,
- ▶ Three fully-furnished cabins (bed space for ten) each with its own bathroom and kitchen facilities,
- ▶ Five campsites and tents available for rent,
- ▶ Large picnic areas including ten gazebos, additional tables and benches and bathrooms,
- ▶ An educational Visitors' Centre and interpretive signs,
- ▶ Guided tours available on request,
- ▶ Concessionaire – (lunch and snacks on weekends),
- ▶ Educational packages for different age-groups and levels,
- ▶ Gift shop, and
- ▶ Facilities are available for meetings, workshops (of up to 20 persons), small and large camping retreats.

There are currently eight positions for staff at Holywell – the Station Chief and an Assistant, a Ticket Clerk, Night Watchman, one Housekeeper and three Grounds Staff. In addition, at JCDT's office in Kingston, there is a Bookings Clerk, and the Administrative Officer, Administrative Manager and Executive Director each spend between 15% - 25% of their time dealing with site development and management e.g. marketing, fund-raising and project management. Further, the Environmental Education Officer conducts tours and other educational packages (assisted by trained local youth) and is responsible for the Interpretive Programme for the area. Currently, the Ticket Clerk position is shared by two persons working alternate weeks, and the housekeeper and grounds staff work three days

per week. This casual labour is supported by two additional persons twice per week, paid for by Peak Bottlers Ltd. (Catherine’s Peak Spring Water). Daily activities of the site staff in addition to site maintenance are monitoring and assisting visitors and giving guided tours.

The number of visitors is steadily increasing each year, and there were 9,603 visitors in 2009 (up from the 7,299 visitors in 2003 reported in the previous Management Plan). Visitors come to picnic, hike, camp, relax outdoors or in the cabins, or to bird-watch or carry out research. The majority are local visitors and there are few if any tour buses, despite attempts to interest tour operators. There are a wide variety of visitors e.g. school groups, church groups, youth clubs, families, couples, tourists etc.

Holywell Visitor Numbers (2005-2009)

Year	Number of Visitors
2005	4,533
2006	6,952
2007	6,894
2008	6,046
2009	9,603

Figures do not include visitor numbers of between 1,000 – 2,000 for the annual cultural event (Misty Bliss)

The income generated from Holywell is derived from user (entry) fees (30%), rental of cabins (45%), special packages e.g. educational or other tours (9%) etc. In addition, annual events (Misty Bliss) held at Holywell, also help to raise funds for the Park. Annual operational costs for Holywell are approximately \$1.8 million (excluding supervision), with average annual income amounting to approximately \$1.8 million.

Developing and managing Holywell as an ecotourism attraction will contribute to better management of the BJCMNP by:

- ▶ the provision of recreational and educational opportunities for Jamaicans and visitors that will raise awareness and knowledge about the area, and hence motivate concern and support for conservation of the area,
- ▶ the generation of income for park conservation through user fees, merchandise etc.,
- ▶ ensuring environmental management of the site such that least negative environmental impact occurs, and
- ▶ the provision of income-generating opportunities and other benefits for the communities around the site, hence increasing the level of support for park/natural resources conservation from the local community.

The site has an Ecotourism Development and Management Plan prepared in 2004 inclusive of a Business Plan, and efforts to implement the Plan are ongoing, though thwarted by hurricane damage and limited funding.

Blue Mountain Peak Trail/Portland Gap

The Blue Mountain Peak Trail and Portland Gap area is one of the two main recreational facilities found in the BJCMNP. The Peak Trail, (the final ascent) is a 3-mile walk, approximately a 2 to 3 hours (from Portland Gap), which ends at the famous Blue Mountain Peak, the highest point on the island (2256m). Portland Gap is the last rest stop and overnight point for the hiker looking to conquer Jamaica's highest point. It is a recreational area, which offers very rustic accommodation in beautiful natural surroundings for the nature lover. Hikers begin their ascent from various points and the time taken to reach the peak can take any time above 2 hours. The climb to the peak may also consist of a variety of transport methods, varying from walking to 4-wheel-drive vehicles.

The table below gives figures which indicate the relative importance of the Blue Mountain Peak Trail and Portland Gap. The figures only indicate the numbers of people who visit Portland Gap, however they provide a fair indication of the number of people who visit the Peak, as most of them pass through Portland Gap (the numbers are a count of tickets, and there is an issue with regards to paying the user fee). On the other hand, not everyone who arrives at Portland Gap goes on to the Peak, although the majority do.

Portland Gap Visitor Numbers (2005-2009)

Year	No. of Visitors
2005	1,347
2006	1,466
2007	1,242
2008	1,683
2009	1,761

The Peak Trail is in need of some repairs and the Peak itself needs attention with respect to the derelict building there. The trails used to access the Peak Trail are in very poor condition, particularly at specific sections, and there are issues with untrained local guides and unwillingness to pay the user fee. There is need for a project to be designed and implemented to address these issues. Funding has been sought during the previous Management Plan period but without success.

Clydesdale and Cinchona

Clydesdale is an old coffee farm and processing factory. The site was used by the Forestry Department as a nursery, however with insufficient resources, the buildings and grounds have become run-down. There is a river with a large pool suitable for swimming, and the site is a favourite with youth groups such as cadets. The road from the community of Section/Silver Hill (just below Holywell on the Portland side) is very rough. Despite the condition of the site, there are still visitors, mainly school groups – particularly Cadets. The Forestry Department has some plans for re-developing the site however, the road will require significant attention.

Cinchona is a botanical garden established about a century ago by the Ministry of Agriculture's Garden Division. The Cinchona trees grown there were used for the production of quinine which was used to treat malaria. There is a caretaker who maintains the grounds but the infrastructure is in very poor condition. The road from Clydesdale to Cinchona can only be accessed with 4WD and even then requires very skillful driving. The Ministry of Agriculture has some plans for re-developing this site, however the road and its maintenance will be a critical issue.

Upper Rio Grande Valley

The communities of the Rio Grande Valley are nestled between the Blue and the John Crow Mountain ranges. Further up the valley (above Fellowship) where the mountain ranges are closer together, the area is particularly lush and beautiful with numerous streams and waterfalls. The biological diversity here is very high as the ecosystems of the two mountain ranges are quite different – the former being tropical montane rainforest on shale and the latter being based on limestone rock. Further, this area is the main habitat for the endemic giant swallowtail butterfly (*Pterourus homerus*) – the largest butterfly in the Western Hemisphere.

This area could be considered the cultural center of the national park as these communities include Moore Town, the major village of the Windward Maroons, and many people within the Upper Rio Grande Valley are of Maroon descent. Millbank is the last in a chain of villages running up the Rio Grande Valley, and the location of one of the BJCMNP Ranger Stations was established in an old Forestry Department building. The Park and managers, JCDT/Green Jamaica have a long-standing relationship with these communities, particularly in Millbank where one of the Local Advisory Committees (LAC) was established. That committee no longer exists but a community-based organization – the Bowden Pen Farmers' Association (BPFA) was formed by many of the community members who had participated in the LAC. The CBO is called Bowden Pen because this was the village beyond Millbank, however no-one lives there any more although many people farm in the area, and the BPFA have an eco-tourism accommodation there called Ambassabeth.

Cunha Cunha Pass Trail

The Cunha Cunha Pass is a Maroon trail across the north-eastern Blue Mountains. It is an access route through the hillside districts of northern St. Thomas, from Hayfield to Bowden Pen and on to other districts in the Upper Rio Grande Valley, Portland. The trail is one of the most famous trails across the Blue Mountain and is widely used by residents and visitors alike. After the Peace Treaty was signed between the Maroons and the English, the trail was used by community members to go to market in Port Antonio, and the close relationships developed between the two communities resulted in families with relatives at either end.

The Bowden Pen Farmers' Association restored this Trail (with funding from the Environmental Foundation of Jamaica and assistance from the National Park Rangers and

JCDT/Green Jamaica). It is a component of the community-based ecotourism opportunities managed by the BPFA. A case study regarding the development of this project indicated that members acknowledged the work of the BJCMNP staff in educating them about conservation and the need to find more environmentally sustainable income generating activities (Bedasse, 2004).

There have been some challenges including marketing the trail, and limiting access to the trail in order to ensure fees can be collected to maintain the trail and provide income for both the local community group and park management. This will need to be addressed under the Blue Mountains Sustainable Tourism Programme.

White River Falls Trail

This trail follows the White River (a tributary of the Rio Grande) up the John Crow Mountains, down which the river cascades in a series of beautiful waterfalls. Access to the trail is across a swinging bridge, rebuilt by the JCDT with the assistance of the British DFID, Jamaica Defence Force, Jamaica Public Service Co. Ltd. and the local community in 1995. Visitors can relax in the pool and shallow falls just before the river enters the Rio Grande, or can hike as far as they wish to access the other falls and pools. Currently the bridge is in need of repairs, the trail requires bushing, infrastructural improvements and maintenance. This is an example of the challenges of marketing and maintaining a trail.

Other Sites

Most other recreational sites associated with the Blue and John Crow Mountains are actually outside the National Park, and in fact most of the two trails mentioned above are actually within the Park's Community Buffer Zone. In light of the challenges associated with trails and management (maintenance) of recreation areas, the policy of Park management is to improve existing facilities, avoid re-opening of existing but over-grown trails, and focus on the Blue Mountains Sustainable Tourism Programme as a way of generating income from sites outside the Park as well as inside.

APPENDIX 13

Blue Mountains Sustainable Tourism Programme

Funding for management of the BJCMNP and opportunities for sustainable development for communities living around the National Park are limited. Jamaica Conservation and Development Trust (JCDT) a non-government organisation which manages the BJCMNP under delegation from the Natural Resources Conservation Authority has been seeking creative and sustainable income generation tools for the National Park and its Buffer Zone communities. One such tool is sustainable tourism, and through the Holywell and Rio Grande Valley Commercial Development Project (2006 – 2009) funded by the Inter-American Development Bank (IDB), the JCDT has prepared a manual for implementation of the **Blue Mountains Sustainable Tourism Programme**.

Goal: To establish and operate a programme of sustainable tourism in the Blue Mountains region, that supports conservation of the natural and cultural heritage of the Blue and John Crow Mountains National Park (BJCMNP) and sustainable community development in the Park's Buffer Zone.

The Programme developed is described in detail in a Manual produced under the IDB funded project, and is comprised of three main components:-

- (i) Governance – through establishment of cluster groups (community-based and private sector ventures) and an Advisory Committee, with JCDT as the secretariat,
- (ii) Operations of the Blue Mountains Sustainable Tourism Coordination and Marketing Office (within JCDT) which will provide packaging of tours and marketing of the Blue Mountains Sustainable Tourism product and specific tours – locally and internationally and,
- (iii) Product development (detailed planning through consultancies, infrastructural improvements, training, maintenance of standards) within the National Park (Holywell, Peak Trail), at Newcastle and in targeted communities around these sites, and the Upper Rio Grande Valley and Maroon communities at Moore Town and Charles Town.

The hub of the Product will be the Blue and John Crow Mountains National Park and the proposed Newcastle Heritage Village and Gateway to the National Park. The National Park and the support it derives from packages sold, will help ensure the environmental sustainability of the Product and makes this a true ecotourism product. Further, with the anticipated UNESCO World Heritage Site award, the National Park will be recognised and promoted internationally for its natural and cultural heritage significance and as a site well worth the time and expenditure of an international visitor interested in eco-, heritage, adventure and/or community tourism. The 'rim' of the product will be the community-based and private sector owned attractions, festivals, accommodation etc. in the clusters of communities around the National Park.

APPENDIX 14

BJCMNP Delegation Agreement

**JAMAICA CONSERVATION
&
DEVELOPMENT TRUST**

AND

**NATURAL RESOURCES
CONSERVATION AUTHORITY**

DELEGATION INSTRUMENT

SEPTEMBER 19, 2002

THE NATURAL RESOURCES CONSERVATION AUTHORITY ACT (1991)

DELEGATION INSTRUMENT

PARTIES

THE NATURAL RESOURCES CONSERVATION AUTHORITY whose address for service within the jurisdiction of the courts of Jamaica is 10 Caledonia Avenue, Kingston 5, in the parish of St. Andrew (hereinafter referred to as the "Authority").

THE JAMAICA CONSERVATION AND DEVELOPMENT TRUST, a company limited by guarantee not having a share capital, with registered office at 22B Old Hope Road, Kingston, in the parish of St. Andrew (hereinafter referred to as "JCDT").

DEFINITIONS

"**Authority**" means the Natural Resources Conservation Authority established pursuant to Section 3 of the Natural Resources Conservation Authority Act (1991) and its successors and assigns.

"**Commencement Date**" means the 1st of October 2002.

"**Expiry Date**" means the 31st October 2012.

"**Management Plan**" is the last revision of the plan governing the management of the National Park as approved by the Authority.

"**Term**" means a period of ten years between the first day of October 2002 and the Expiry Date subject to the provisions relating to the renewal as set out in clause 10 of this agreement.

"**The Act**" means the Natural Resources Conservation Authority Act (1991)

"**Operational Expenses for the Park**" means expenses of the Park, including park management, costs associated with maintenance, salary of park personnel, insurance, equipment and other related costs and costs associated with scientific research, conservation and management programs.

"**Protected Area**" means the National Park as declared in the Natural Resources (National Park) Regulations 1993.

"**User fees**" means any fees that may be collected in accordance with any Regulations governing user fees prescribed for the National Park and any user fees collected from the Hollywell Park.

PREAMBLE

WHEREAS Section 6 of the Natural Resources Conservation Authority Act 1991 (hereinafter referred to as "the Act") provides that the Authority may delegate any of its functions under the Act (other than the power to make regulations) to any member, officer or agent of the Authority;

1



AND WHEREAS the JCDT has indicated its intention to manage, protect, and preserve the National Park in the Blue and John Crow Mountains;

AND WHEREAS the JCDT, the NRCA and the Forestry Department have signed a Co-Management Agreement for the Blue and John Crow Mountain National Park dated March 17, 2000.

AND WHEREAS the Authority is desirous of delegating to JCDT as its agent the functions and obligations set out herein on the terms and conditions so specified;

NOW THEREFORE IT IS HEREBY AGREED AS FOLLOWS:-

GRANT

- 1.0 The Authority hereby appoints JCDT as an agent of the Authority in accordance with this agreement and pursuant to section 6 of the Act delegates to JCDT the functions and obligations specified herein subject to the terms and conditions so specified.
- 2.0 The instrument of delegation shall be for a term of ten (10) years and may be renewed at the option of the Authority by notice in writing with the consent of JCDT in accordance with clause 10.3.

3.0 THE OBLIGATIONS OF THE AUTHORITY

The Authority shall:

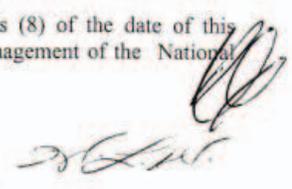
- 3.1 Assist JCDT in performing its obligations and functions described herein by providing a requisite sum as a management fee to be determined by the Parties to this agreement.
- 3.2 Put in place such user fee regulations as may be necessary to assist in the costs associated with management of the National Park, and to revise such fees from time to time as is needed to achieve the goals of the Park .
- 3.3 As far as is practicable to do so co-operate with JCDT in its efforts to perform the functions and obligations stated herein including but not limited to providing technical, enforcement and legal assistance except where it is not practicable to do so.
- 3.4 Use its best efforts to provide JCDT with research assistance and information of which the Authority is possessed, which it may require in its efforts to carry out the functions and obligations described herein.
- 3.5 Monitor the progress of the implementation of the National Park Management Plan and assist in achieving the objectives of such plan and its revisions.
- 3.6 Along with JCDT enter into necessary co-operative agreements with persons and organisations and individuals for the effective management of the National Park according to the provisions of the National Park Management Plan.
- 3.7 Assist JCDT in training its staff with the skills necessary to achieve the goals of the National Park Management Plan as agreed between the parties.

- 3.8 Authorize JCDT to collect on its behalf as its agent, in a manner to be agreed upon user fees payable by users of the National Park and any such other fees as the Authority and JCDT may agree should be collected.
- 3.9 Remit to JCDT as its agent user fees and such other fees collected by the Authority, as the parties may agree. The User fees generated shall be used to cover the operational expenses of the Park.
- 3.10 All user-fees collected and such other fees remitted to JCDT shall be retained by the JCDT in a special account, to be specially reported on, and shall be used to manage the National Park in accordance with the National Park Management Plan and this agreement.
- 3.11 Use its best efforts to obtain duty-free status and GCT-free status for any equipment or service imported or purchased in connection with the management of the National Park, provided that the procurement of such equipment or service is first approved by the Authority.
- 3.12 Identify and assign a senior member of staff who shall be the official liaison between the Authority and JCDT, who will monitor the performance of JCDT within the National Park and who will co-ordinate the fulfillment of the obligations of the Authority under this delegation instrument and the co-management agreement with the Forestry Department.
- 3.13 Consult the JCDT on approvals for permits and development applications, including analysis of environmental impact assessments, and allow representations to be made to the Authority by JCDT before finally approving or determining such matter if the activity for which the permit or approval is sought falls within the National Park or will significantly impact the National Park.
- 3.14 Assist in the appointment of the National Park Rangers and the Protected Area Manager selected by JCDT to become Special District Constables.
- 3.15 Provide guidelines on the standards for management of the National Park including safety, disaster preparedness, preparation of management and operation plans.

4. THE OBLIGATIONS AND FUNCTIONS OF JCDT

JCDT shall:

- 4.1 Develop an annual operation plan prior to the month of October of each year that details all the activities that JCDT plans to carry out in the Park each year. This operation plan shall contain a budget for such activities to be conducted by JCDT, which shall be reviewed by the Authority to assess a management fee to be paid yearly. The Operation plan shall include information on activities that will be carried out in relation to staffing, financing, maintenance and improvement of facilities, infrastructure, programs and projects on the following areas, protection and conservation, enforcement, traditional and concurrent uses, recreation and tourism, education, public relations development and administration. The Plan shall be submitted three months from the date of signature of this agreement.
- 4.2 Prepare and submit a National Park Management Plan within eight months (8) of the date of this delegation agreement and take such steps as are necessary for the effective management of the National



Park in keeping with the provisions of the National Park Management Plan and any other legislation so as to ensure the conservation, protection and sustainable use of its natural resources.

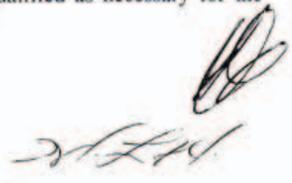
- 4.3 Develop, implement and monitor plans and programmes relating to the management of the National Park according to the National Park Management Plan.
- 4.4 In consultation with the Authority revise the National Park Management Plan where so required and where the parties intend to renew the delegation instrument in accordance with section 10.
- 4.5 Promote public awareness of the ecological systems and natural resources of the National Park and the importance of their sustainable use to the social and economic life of Jamaica.
- 4.6 Consult and advise the Authority on matters of general policy relating to the management, development, conservation and care of the environment within the National Park.
- 4.7 Provide all relevant information to the Authority in good time when it is consulted concerning applications for permits and development permission.
- 4.8 Permit the Authority to conduct financial and operational audits of its activities within the National Park after giving seven days (7) notice,
- 4.9 Perform such other functions in the National Park as may be assigned to it by the Authority from time to time by mutual consent.
- 4.10 Maintain in good order and repair all buildings and other facilities for which it has responsibility.
- 4.11 Put in place insurance, employee, property and public liability policies as approved by the Authority to cover equipment, buildings, employees, agents and visitors within the recreational areas of the Protected Area and submit relevant policies to the Authority on an annual basis. Where any claim or suit is made against JCDT it shall report such to the Authority immediately.
- 4.12 Manage the Hollywell Park in accordance with a lease agreement which may be subject to termination in accordance with the termination clause in the said agreement.
- 4.13 Submit to the Authority, bi-annual reports specifying the progress or setbacks in accomplishing the goals of the National Park Management Plan.

5. IMPLEMENTATION

- 5.1 In performing the obligations and functions specified in clause 4, JCDT may with the written consent of the Authority:
 - 5.1.1 Construct buildings and other facilities for administration, education, enforcement and recreation, according to the National Park Management Plan.



- 5.1.2 Monitor compliance with the National Park Regulations and any other laws governing the protection of the environment and report on infractions, record official complaints and conduct such enforcement action where authorized.
- 5.1.3 Investigate the effect on the environment of the National Park of any activity that causes or might cause pollution or might involve waste management or disposal or damage to flora or fauna or might involve dangers to public health.
- 5.1.4 Report to the Authority all environmental incidents and breaches within the National Park of the NRCA Act and its Regulations, the Wild Life Protection Act and its Regulations, and the Watershed Protection Act and its Regulations and any other Act under which the Authority exercises jurisdiction, within twenty-four hours (24) of such breaches coming to the attention of JCDT, its employees, servants or agents, unless it is not practicable to do so.
- 5.1.5 Make recommendations to the Authority on the zoning of areas within the National Park in order to provide for the effective management of the area, and to advise on regulations or rules with respect to the purposes for which the resources in each zone may be used.
- 5.2 In performing the obligations and functions specified in clause 4, JCDT shall:
 - 5.2.1 Procure the requisite facilities and equipment to carry out the functions herein described.
 - 5.2.2 Undertake studies in relation to the National Park and in collaboration with the Authority to encourage and promote research into the use of techniques for the management of pollution and the conservation of natural resources and sustainable development.
 - 5.2.3 Recommend that an Environmental Impact Assessment be undertaken for any activity or undertaking or development to be carried out or that is being carried out within or nearby the National Park, if it is in the opinion of JCDT that such activity is or is likely to have an adverse effect on the environment and public health.
 - 5.2.4 Conduct seminars and training programs, gather and disseminate information relating to environmental matters.
 - 5.2.5 Formulate and design projects aimed at ensuring the sustainable use of the natural resources within the National Park and the environment in general with 30 days notice to the Authority, and to operate and publicize such projects pursuant to the agreed operation plan.
 - 5.2.6 Provide pertinent information to and to inform the public in respect of all aspects of the quality of the environment generally and specifically of the quality of the environment within the National Park.
 - 5.2.7 Perform the functions listed in Section 4 of this agreement in accordance with the National Park Management Plan, in accordance with the Act and the Regulations made thereunder.
 - 5.2.8 Employ and supervise adequately trained staff who are competent and qualified as necessary for the proper carrying out of the functions for which they were hired.



6. SUB-DELEGATION

- 6.1 The Authority shall not assign or delegate any of the specified functions or obligations contained herein within the National Park without the prior consent in writing of JCDT. This consent shall not unreasonably be withheld. Where a delegation is made by the Authority such delegation agreement shall be negotiated in association with JCDT.
- 6.2 JCDT shall not delegate any of its obligations contained within this delegation instrument without the written consent of the Authority. This consent shall not be unreasonably withheld. Where a delegation is made by JCDT such delegation agreement shall be negotiated in association with Authority.

7. INDEMNIFICATION

- 7.1 The Authority shall indemnify and shall keep indemnified JCDT against any loss, damage or liability whether criminal or civil suffered, arising out of or relating to the Authority's default in the carrying out of its obligations under this agreement.
- 7.2 JCDT shall indemnify and shall keep indemnified the Authority against any and all costs, claims and expenses, loss, damage or liability whether criminal or civil suffered, which may be incurred by the Authority arising out of, or relating to the carrying out of any one or more or all of the functions described herein due to the negligence of JCDT, its employees and agents, or to a breach of this agreement.

8. REPORTING

JCDT shall:

- 8.1 As soon as may be practicable before the 1st day of October in each year, submit to the Authority for consideration, its estimates of revenue and expenditure in respect of the period commencing on the 1st day of April in the following year and ending on the 31st day of March of the subsequent year, and shall during that year, submit to the Authority for approval any estimate for further expenditure as may become necessary.
- 8.2 Keep accounts and other records in relation to its business, receipts, expenditure and investments and shall prepare annually a statement of accounts in a form satisfactory to the Authority.
- 8.3 Provide annual audited financial statements to the Authority within three (3) months of the end of each financial year of the activities within the National Park.

9. TERMINATION

- 9.1 This agreement shall terminate at the end of the term.
- 9.2 Either party may terminate this agreement by six (6) months notice in writing to the registered office of the other party for a fundamental breach of this agreement.

9.3 JCDT may, after consultation with the Authority, terminate this agreement provided a minimum of six (6) months notice is given to the Authority and public notice is given by placing such notice in a daily newspaper widely circulating in the island.

10. RENEWAL

- 10.1 Should for any reason either party does not wish to renew the instrument of delegation, this should be conveyed in writing to the other party not less than twelve (12) months before the expiry of the current agreement.
- 10.2 At the end of three years, the two parties shall begin discussions towards the renewal of the National Park Management Plan. JCDT is to submit to the Authority for its approval a draft of a new Plan for a period of five-years. This plan should be reviewed by the Authority and comments submitted in writing within six months of the review of the management plan..
- 10.3 At the end of nine years after the commencement of this agreement, the two parties shall begin discussions towards the renewal of the instrument of delegation. The Authority is to submit to JCDT in writing at that time any wishes it may have concerning the delegation agreement. All negotiations should be complete at least six (6) months before the expiry of this instrument of delegation.

11. MISCELLANEOUS

- 11.1 In the event that any provision of this agreement is declared by any judicial or other competent authority to be void, voidable, illegal or otherwise unenforceable the parties shall amend that provision in such reasonable manner as achieves the intention of the parties without illegality.
- 11.2 This agreement is capable of amendment by both Parties in writing at any time during its term.

12. SUPERCEDES PRIOR AGREEMENT

This agreement supercedes any prior agreement between the parties whether written or oral and any such prior agreements are cancelled at the commencement date but without prejudice to any rights that have already accrued to either of the parties. However if any rights are accrued prior to this agreement which are in conflict to this agreement then the agreement prevails.

13. NOTICES

Any notice to be served shall be sent by registered post, or by facsimile or electronic mail supported by the original document, to the registered office or address for service of the addressee and shall be deemed to be received by the addressee within five (5) working days of posting or twenty-four hours if sent by facsimile or electronic mail to the correct fax number or electronic mail address of the party.

14. ARBITRATION

All disputes and differences which shall at any time arise between the parties whether during the term or afterward constituting a fundamental breach of this agreement, or touching or concerning this delegation instrument or its construction or effect of the rights, duties or liabilities of the parties under or by virtue of it or otherwise or any other matter in any way connected with or arising out of the subject matter of this agreement shall be referred to panel of three arbitrators, one proposed by the Authority, one proposed by JCDT and the third to be agreed upon by both parties, the majority decision of those arbitrators being binding upon both parties.

Dated this 19th day of September 2002.

Signed for and on behalf of the
Natural Resources Conservation Authority)

in the presence of)

Carlo Exall
Witness)

[Signature]
Chairman)

Signed for and on behalf of the
Jamaica Conservation and Development Trust)

in the presence of)

[Signature]
Witness)

[Signature]
Chairman)



[Signature]

APPENDIX 15

BJCMNP Declaration Order



THE
JAMAICA GAZETTE
SUPPLEMENT

PROCLAMATIONS, RULES AND REGULATIONS

22k

Vol. CXVI

FRIDAY, FEBRUARY 26, 1993

No. 8F

No. 9F

THE NATURAL RESOURCES CONSERVATION AUTHORITY ACT

**THE NATURAL RESOURCES CONSERVATION (BLUE AND JOHN CROW MOUNTAINS
NATIONAL PARK) (DECLARATION) ORDER, 1993**

In exercise of the powers conferred upon the Minister by section 38 of the Natural Resources Conservation Authority Act and upon the recommendations of the Natural Resources Conservation Authority, the following Order is hereby made:—

1. This Order may be cited as the Natural Resources Conservation (Blue and John Crow Mountains National Park) (Declaration) Order, 1993 and commences on the 26th day of February, 1993.
2. The boundaries of the Blue and John Crow Mountains National Park shall be as set out in the Schedule hereto:

SCHEDULE

All the piece or parcel of Crown Land known as Silver Hill and Chestervale Plantation situated in the parishes of St. Andrew and Portland containing by survey 206.88 hectares and butting:

- NORTHERLY:** On Silver Hill in possession of the Chief Secretary;
- EASTERLY:** On part of Chestervale in possession of the Chief Secretary and Clydesdale Forest Reserve;
- SOUTHERLY:** On part of Clifton Mount in possession of the Commissioner of Lands and part of Chestervale in possession of Yallahs Valley Land Authority;
- WESTERLY:** On part of Silver Hill in possession of the Chief Secretary, Wallenford in possession of Ina Benn, main road from Buff Bay to St. Peters;

or however, otherwise the same may be butted, bounded, known, distinguished or described.

All that piece or parcel of Crown Land part of the Tom's Hope Land Settlement in the parish of Portland containing by survey 29.67 hectares and butting:

- NORTHERLY:** On parts of the Tom's Hope Land Settlement allotted to small settlers east on a portion of the property known as Mt. Lebanon in the possession of Valdin Morrison and on Crown Lands known as Adam Brandon's patent south on a portion of Adam Prandon's patent in the possession of Charles Moresby west on a parochial road leading from Windsor to Park Mount and on a reserved road save and except:
- (a) that portion of the parochial road 149.8 metres wide leading from Windsor to Park Mount and passing through the area above described; and
 - (b) that portion of a road reserved 62.42 metres wide leading from lot 156 of the Tom's Hope Land Settlement to Mt. Lebanon and passing through the area above described.

All those parcels of Crown Lands in the parishes of St. Mary, St. Andrew, Portland, and St. Thomas known as the Blue Mountain Forest Reserve and containing by estimation 41,939.87 hectares more or less and including the following blocks:

Ginger River Block (District 17)

Comprising the following patents or parts thereof—

Cottage, Andover, Joppa, Keith Hall, Mullet Hall and Killi-Krankie part of Knowsley, Westminster Cottage, remainder of Westminster Cottage, Unpatented Land, Fair Hill, Shooter's Hill, Osbourne Mountain part of Samuel Hyde, J. Gordon and Edward McGeachy, Warminster, Daniel D'Luskie, part of Dry River Retreat, part of Juniper Grove and butting:

SCHEDULE, *contd.*

- NORTHERLY: From Good Hope, Hermitage, Dumfries and Port George Pen
- EASTERLY: On Mount Joseph, Lovely Grove and Alexander Gordon Plantation, Dry River Retreat in the possession of small settlers, Shantamee and Birnamwood Plantations and part of the Blue Mountain Forest Reserve, District 18
- SOUTHERLY: On Wm. Whitfield and Mt. Cressy, Mt. Olive, New Garden, Mt. Prospect
- WESTERLY: On Mt. Horeb, Mt. Sinai and Belle Air, Prospect Hill or however otherwise the same may be butted, bounded, known, distinguished or described save and except those parcels of land in the possession of small settlers.

Juniper Block (District 17)

All that portion of Crown Land forming part of the Blue Mountain Forest Reserve and butting:

- NORTHERLY: On part of the Blue Mountain Forest Reserve, District 18
- WESTERLY: On Mt. Moses, Tweedside and Wm. Whitfield in the possession of the Water Commission;

or however otherwise the same may be butted, bounded, known, distinguished or described.

Springfield Block (District 17)

Comprising the following patents or parts thereof—

Springfield, Heirs of Bains and butting:

- NORTHERLY: On Summer Hill;
- EASTERLY: On part of the Blue Mountain Forest Reserve, District 18 and Hermitage in the possession of the Water Commission;
- SOUTHERLY: On Norwich Castle and part of Campbell's Mount in the possession of the Water Commission;
- WESTERLY: On Moresham and Muff Castle in the possession of of the Water Commission;

or however otherwise the same may be butted, bounded, known, distinguished or described.

Newcastle Block, Western (District 18)

Comprising the following patents or parts thereof:

Juniper Grove, Old England, Heirs of Dodd, Oathley, Castle Dawson, Green Hills, Hollywell, Mt. Horeb and West Vale, Cold Spring, Clifton Mt., Limerick Mtn., Silver Hill, Jamaica Spa, Pleasant Hill, Middleton, Greenwich Hill, Caledonia, part of Lancaster, Southfield, part of Smithfield, Copper Castle, Newcastle and butting:

SCHEDULE, *contd.*

- NORTHERLY:** On part of the Blue Mtn. Forest Reserve, Shantamee and Birnamwood Plantations;
- EASTERLY:** On Shantamee and Birnamwood Plantations, part of Smithfield, part of Lancaster in possession of small settlers, Wakefield Plantation in possession of H. H. Burgher, Cedar Valley Plantation in possession of Miss V. Benn *et al* part of Middleton, Eldersite, part of Castle Dawson, Green Hills, Marlborough Castle, Wallenford, Jamaica Spa, part of Silver Hill, Clifton Mount, part of Pleasant Hill, and Mt. Lebanon;
- SOUTHERLY:** On Charlottenburgh, Little Pleasant Hill, part of Middleton, part of New Castle and Hopewell Plantation;
- WESTERLY:** On Maryland Plantation, Mt. Dorothy and part of the Blue Mountain Forest Reserve District 17.

or however otherwise the same may be butted, bounded, known, distinguished or described, save and except those parcels of land in the possession of small settlers.

Silver Hill Block, Eastern (District 18)

Comprising the following patents or parts thereof —

John Ferguson's patent, part of Chestervale Plantations, Ross Patent, part of Silver Hill, part of Cedar Valley Plantation, part of Spring Hill, and Clydesdale and butting:

- NORTHERLY:** On part of the Blue Mountain Forest Reserve, District 19;
- EASTERLY:** On part of the Blue Mountain Forest Reserve, Districts 19 and 26;
- SOUTHERLY:** On Pleasant Hill and part of Chestervale Plantation;
- WESTERLY:** On part of Wallenford, part of Cedar Valley Plantation, Spring Hill and Chestervale

or however otherwise the same may be butted, bounded, known, distinguished or described.

Trafalgar Block (District 19)

Comprising the following patents or parts thereof —

Part of Geo. Wright, part of Sportsman's Hall, Patality, part of Atkinson and Hanbury, Colthirst's Run, Trafalgar Plantation, part of Leighfield, part of Pleasant, Mount John Buck's Patent, Westphalia, Edward McGeachy, Samuel Linwood, and Wm. Linwood, Robert B. Hugh, New Haven part of Wood and Plummer, part of Geo. Burrell, Richard Faith part of Hall's Delight and un-reserved Crown land — part of Geo. Wright and part of Sportsman's Hall, and butting:

- NORTHERLY:** On Retreat, M. Biggs, part of Hall's Delight, part of Atkinson and Hanbury, Resource and Trouble Hill;

SCHEDULE, *contd.*

- EASTERLY: On part of the Blue Mountain Forest Reserve, Districts 20 and 26
- SOUTHERLY: On part of Blue Mtn. Forest Reserve, District 26
- WESTERLY: On part of Blue Mountain Forest Reserve, District 18 Breman Valley, part of Leighfield in the possession of small settlers, and the Brook Plantation

or however otherwise the same may be butted, bounded, known, distinguished or described.

Swift River Block (District 20)

Comprising the following patents or parts thereof —

Part of Friendship Hall, part of Thomas Cockburn, Sartoga, part of Wm. Pearch, Geo. McKeand, part of Geo. Burrell part of Wood and Plummer, part of Wm. Collard, unpatented bound part on Colthirsts Run, John Reader, part of Scotland, part of Bengal, Holland, Wm. Lee, John Anguin, Boston, part of John Sanderson, Batavia, John Symes, unreserved Crown Land — Richard Ivy Mann, Robert McKay, part of Fruitful Vale, Davis Sherrif, James Jenkins, Geo. Brooks, part of Friendship Hall part of Wm. Pearee, part of Wm. Collard, part of Scotland, part of Bengal and butting

- NORTHERLY: On Allany, Pippingford, Shirley Castle, Liberty Hill, Rev. Geo. Hall, Pigeon Hill, Ashcott, Jno. Lowe, Twickenham Plantation, part of Fruitful Vale, Dunbar, Burton Hill, Manchester, part of unpatented Land
- EASTERLY: On part of the Blue Mtn. Forest Reserve, District 21
- SOUTHERLY: On part of the Blue Mountain Reserve, District 21
- WESTERLY: On part of the Blue Mountain Forest Reserve Districts 26 and 19 or however otherwise the same may be butted, bounded, known, distinguished or described.

John's Hall Block (District 21)

Comprising the following patents or parts thereof —

Part of Charles Stewart, part of John Sanderson John Neilson, Thomas Reece, John Swarbeck, Paul Phipps, Jno. P. Barker, Wm. Smellie, James Farrier, James Campbell, Wm. Lane, Colin McKenzie I and II, Anne Lane, Charles Phipps I and II, Abigail Phipps, Edward P. Wallen I and II, Thomas Gray, Thomas Cushnie, Mark Howard, Elizabeth Ann Adams and unreserved Crown Lands, that is part of John Sanderson, Tuscany, Madrid, part of John Swarbeck, part of Friendship Hall, part of Geo. Christie, and butting

- NORTHERLY: On unpatented Land, Brook Dale and Golden Vale Estate
- EASTERLY: On Rose Hill, Garland, Grove, Kensington Plantation, Experiment Hill, Brownsfield and part of the Blue Mountain Forest Reserve, District 22

SCHEDULE, *contd.*

- SOUTHERLY: On part of the Blue Mountain Forest Reserve, District 25
- WESTERLY: On part of the Blue Mountain Forest Reserve District 20

or however otherwise the same may be butted, bounded, known, distinguished or described.

Rio Grande Block, Western (District 22)

Comprising the following patents or parts thereof —

Part of Geo. Christie, Patk. Johnson Natty, Fraser and Kinneard Wm. Smellie I and II, Edward Barry I and II part of Marshall Hall, Alex. Cumming I, II and III, part of Daniel Moore, Edward West, part of Robert McDermott, Kings Land, Edward Bernard, Geo. French I, II and III, part of Thomas Cockburn, Francis Moore, part of John Moore I and II, and part of Edgar's Rio Grande Pen, and butting

- NORTHERLY: On Kent
- EASTERLY: On Claremont, Marshall's Hall, Altimont Township Mill Bank, Bowden Pen, part of Edgar's Rio Grande
- SOUTHERLY: On part of the Blue Mountain Forest Reserve, District 24
- WESTERLY: On part of the Blue Mountain Forest Reserve, Districts 21 and 25

or however otherwise the same may be butted, bounded, known, distinguished or described.

Rio Grande Block, Eastern (District 22)

Comprising the following patents or parts thereof —

Part of Holland Mountain, part of Silvera's Run, part of Joe Hill, part of Adam Brandon, James Barton and Gardner, Wm. Fullerton I and II, Robert Graham, Thos. Wainsborough, part of James Lindsay, Mt. Gambier, John Proctor, The Alurement, part of Mt. Rodney, Come-and-see-me, part of Holland Rio Grande Pen, part of Alex. Bell Patrick Grant, John McLean, Allan and John McLean, Charles Grant, and unreserved Crown Land, that is Mt. Lebanus and butting

- NORTHERLY: On Caledonia and Cambridge Back Lands
- EASTERLY: On part of the Blue Mountain Forest Reserve, District 23
- WESTERLY: On part of Alex Bell, part of Holland Rio Grande part of Holland Mtn., part of Silvera's Run, Fish Brook, Rio Grande River, Cornwall Pen, Nottingham Pen, Moore Town Maroon Land, part of Joe Hill, Windsor Estate, Small Settlers' Lots, Tom's Hope Estate

or however otherwise the same may be butted, bounded, known, distinguished or described.

SCHEDULE, *contd.**John Crow Block (District 25)*

Comprising the following patents or parts thereof —

Part of John McRoberts, Sm. Baillie, part of James Baillie, Elizabeth Baillie, part of John Salmon, John Moodie I and II, Allan McLean I, II and III, part of Wm. Ross, part of Thomas Weir, part of Hodgson, and Malgred, unclaimed Land South of Cambridge Back Lands; H. Littlejohn, Wm. Fulton III, Thomas Wainsborough, Hospitality, part of John Scarlett, part of Windsor Castle Mtn., Thomas Davidson I and II, Robert Locke, Geo. Ball, Geo. French IV, part of Edward Stanton, Lawrence Arglesworth and unreserved Crown Lands, that is, part of Jno. Salmon, part of John Scarlett, part of Windsor Castle Mountain part of Edward Stanton, Greenfield, Bellevue and butting

- NORTHERLY: On Cambridge Back Lands, part of John McRoberts
- EASTERLY: On part of John McRoberts, part of Thos. Weir, Hodgson and Malgren, part of Wm. Ross, Vineyard Hill, Ecclesdown Penn, Spring Valley, part of James Baillie in possession of small settlers, Muriton Back Lands, Eddingham Plantation, Haining Estate
- SOUTHERLY: On Rowlandsfield, part of the Blue Mountain Forest Reserve, District 24
- WESTERLY: On part of the Blue Mountain Forest Reserve District 24

or however otherwise the same may be butted, bounded, known, distinguished or described.

Plantain Garden Block (District 24)

Comprising the following patents or parts thereof —

Wind Hill, Duart Castle and Farm, Craighead, Nathaniel Beckford, Donald Taylor Henry Lumsden, Alex Sheriff I, II and III, Wm. Craigie, part of John McKinley, Cave, Bottom Pound Hill, Wm. Probart, Aeneas Grant, John Nimmo, Lots Mt. Donald, Edward East, part of Cedar Grove and butting

- NORTHERLY: On part of the Blue Mountain Forest Reserve, Districts 22 and 23
- EASTERLY: On part of the Blue Mountain Forest Reserve, District 23
- SOUTHERLY: On Kent, Lebanon, part of Cedar Grove, Dr. Alex. McLean, Wm. Forbes, part of Mt. Donald, Murray's Plantation Walk, part of John McKinley, House Hill, Greenwood Castle and Golden Valley, White Hall
- WESTERLY: On part of the Blue Mountain Forest Reserve, District 25

or however otherwise the same may be butted, bounded, known, distinguished or described.

SCHEDULE, *contd.**Trinityville Block (District 25)*

Comprising the following patents or parts thereof —

Francis Rigley Broadbelt, David Henriques, Dunrobin, Duncan McGlashan, Newington, part of Union Hill, Parket Bennett Franklin, James Gardner, Nicholas Bourke, Geo. Hall, Robert Sutherland, Daniel Moore, Thos. Fearon, Robert Arcedeckne, Wm. Hall Willeys I, II and III, Wm. Willeys IV and V, John H. Cudgar, Elizabeth Willeys, H. Andrew Franklin, Geo. Munroe, Wm. Logan, Wm. Pollack, Geo. Campbell I, II and III, James Farrier, James Campbell, Edward P. Wallen I and II, Alex. Brown, Augustus Vallett, Mark Howard, Chas. Mais I and II, John Mais, Geo. Parker, Elizabeth Ann Adams, Moy Hall, Garerand Hall and butting

- NORTHERLY: On part of the Blue Mountain Forest Reserve, District 21
- EASTERLY: On part of the Blue Mountain Forest Reserve, Districts 22 and 24
- SOUTHERLY: On property known as Spring, Hillside, Mullet Hall and Garbrand Hall, part of Union Hill in the possession of small settlers, Island Head, Benn Lomond, Newfield, Newington, Moy Hall and Windsor
- WESTERLY: On part of the Blue Mountain Forest Reserve, District 26

or however otherwise the same may be butted, bounded, known, distinguished or described.

Cinchona Block (District 26)

Comprising the following patents or parts thereof —

Part of Pleasant Hill, Bellevue, remainder of Crichton Run, Dulee Domum, **Markham Hill**, part of Woodland, part of Strawberry Hill, Helen Whair, Thos. Rurpin, unpatented land (north of Hibernia), Old England, part of Mt. Teviot, J. Fowles I and II, Wm. Cowan, Alex. Robertson, Alex. Stephenson, S. J. Dallas, Portland Gap I, II and III, part of Abbey Green, part of Whitfield Hall, part of Radnor, Ector's Patent, Wm. Gordon, unpatented land (North of Portland Gap), Anthony Davis, Henry Stanley, Iron River, Henry Turpin, W. H. Hall, John Hall and Sheldon Back Land, Maria French and butting

- NORTHERLY: On part of the Blue Mountain Forest Reserve, Districts 19 and 20
- EASTERLY: On part of the Blue Mountain Forest Reserve, Districts 20, 21 and 25
- SOUTHERLY: On Arntully, Sherwood Forest, remaining portions of Radnor, Abbey Green and Whitfield Hall, Sheldon, remaining portions of Mt. Teviot, Old England, Strawberry Hill and Woodlands and Mount Hybia
- WESTERLY: On Resource, Pleasant Hill and part of the Blue Mountain Forest Reserve, District 18

or however otherwise the same may be butted, bounded, known, distinguished or described.

Dated this 26th day of February, 1993.

JOHN A. JUNOR,
Minister of Tourism and the Environment.

APPENDIX 16

National Park Regulations (1993)

No. 9G

THE NATURAL RESOURCES CONSERVATION AUTHORITY ACT

THE NATURAL RESOURCES (NATIONAL PARKS) REGULATIONS, 1993

In exercise of the powers conferred upon the Minister by section 38 of the Natural Resources Conservation Authority Act, the following Regulations are hereby made:—

PRELIMINARY

Citation. 1. These Regulations may be cited as the Natural Resources (National Parks) Regulations, 1993.

Interpretation. 2. In these Regulations—
“authorized officer” means any officer employed to the Customs Department, any member or officer of the Jamaica Constabulary Force, any member or officer of the Jamaica Defence Force, any public officer designated a Fishery Inspector under the Fishing Industry Act, a person appointed a forest officer under the Forest Act, any person appointed a park manager or designated a national park ranger;

“national park ranger” means a person so designated pursuant to regulation 30;

“park manager” means a person appointed under regulation 29;

“sell” includes any attempt or offer to sell, barter, cause or permit to be sold or offered for sale, have in possession for sale or send or receive for sale;

“service” includes any accommodation or transportation.

OFFENCES

Animals. 3.—(1) A person shall not, except with the written permission of a park manager, cause or allow an animal to enter a national park.

(2) Notwithstanding paragraph (1)—

- (a) a person in need of the assistance of a guide dog may bring such dog into a national park if such dog is securely held or fastened to a leash which does not exceed 4 feet in length; or
- (b) a person may ride or lead a horse or donkey in a national park in any area set aside for that purpose by the park manager.

- Litter.** 4.—(1) A person shall not, in a national park—
- (a) deposit or leave any litter, bottle, broken glass, china, pottery, plastic article, rubbish, refuse or other waste material, except in an area or receptacle provided for that purpose;
 - (b) deposit, discharge or leave any noxious, noisome, offensive or polluting substance, matter or thing;
 - (c) deposit or leave any offal, dead animal, dung or other filth;
 - (d) deposit in any receptacle provided for litter any domestic garbage;
 - (e) wilfully break any article of glass, china, pottery, plastic or other brittle material;
 - (f) deposit, discharge or leave any mineral, mineral waste or other industrial waste or by-product thereof, oily liquids, acids or other deleterious, toxic or polluting substance.
- (2) A person who contravenes paragraph (1) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars or to imprisonment with or without hard labour for a term not exceeding one year or to both such fine and imprisonment.
- Pollution of waters.** 5.—(1) A person shall not pollute or cause to be polluted any water in a lake, stream, river, well, dam, reservoir or in any container.
- (2) A person who contravenes paragraph (1) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding ten thousand dollars or to imprisonment with or without hard labour for a term not exceeding two years or to both such fine and imprisonment.
- Abandoned property.** 6. A person shall not, except with the written permission of a park manager, abandon or leave unattended for more than 24 hours, any personal property, in a national park.
- Disorderly behaviour.** 7.—(1) A person shall not behave in a disorderly, offensive or indecent manner or use any offensive or indecent language or create any disturbance in a national park.
- (2) A person shall not, obstruct, disturb, interrupt or annoy any other person engaged in the proper use of a national park nor behave in a manner likely to create any disturbance.
- (3) A person shall not in a national park throw, roll or discharge any stone, substance or missile to the danger of any person, animal or thing.
- (4) A person shall not deface, paint, write, cut names or letters or otherwise make marks or affix bills on trees, rocks, gates, fences, buildings, signs or other property in a national park.
- (5) A person shall not, within a national park, play or operate a radio, tape recorder, gramophone or other musical instrument in a manner which disturbs or is likely to disturb other users of the park.

(6) A person who contravenes a provision of this Regulation commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars or to imprisonment with or without hard labour for a term not exceeding one year or to both such fine and imprisonment.

Refusal to
comply
with
orders.

8. A person who—

- (a) refuses, neglects or fails to comply with any direction given to him by an authorised officer;
- (b) refuses or fails to produce any licence or permit that he is required to produce by an authorized officer;
- (c) assaults, resists or obstructs an authorized officer in the execution of his duty;
- (d) uses threatening language or behaves in a threatening manner towards an authorized officer in the execution of his duty;
- (e) refuses to leave a national park when ordered to do so by an authorized officer;
- (f) removes, alters or interferes with any article seized under these Regulations without the authority of an authorized officer; or
- (g) impersonates an authorized officer,

commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars or to imprisonment with or without hard labour for a term not exceeding one year or to both such fine and imprisonment.

Camping.

9.—(1) A park manager may establish designated camping areas in a national park.

(2) A park manager may display signs or notices in any national park prohibiting or restricting the use of any site for camping or prohibiting or restricting the use of a caravan or similar vehicle.

(3) A person using a site for camping, or using a caravan or other vehicle, in any national park who fails to comply with a prohibition or restriction contained in a sign or notice displayed pursuant to paragraph (2) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars or to imprisonment with or without hard labour for a term not exceeding one year or to both such fine and imprisonment.

Use of
vehicles.

10.—(1) A person shall not take, drive, use or leave a vehicle in a national park in contravention of a prohibition or restriction contained in a sign or notice.

(2) A person shall not, except with the written permission of a park manager, take, drive, or use a vehicle on a road or track on any land that has been closed by a barrier erected by or under the authority of the Authority.

(3) A person shall not, except with the permission of a park manager, take, drive, or use any vehicle in a national park except on a road designated for that purpose.

(4) An authorized person, may, for the purpose of regulating the use of any road within a national park or for the purpose of avoiding inconvenience or risk of danger to persons using a national park, give directions to any person driving or in charge of a vehicle prohibiting its being taken or being allowed to remain on any road, or any part of a road in a national park, or requiring its removal from any such road or part thereof.

(5) A person driving, using, or in charge of a vehicle in a national park who contravenes or fails to comply with—

- (a) a prohibition or restriction contained in a sign or notice displayed pursuant to paragraph (1);
- (b) any directions contained in a sign or notice so displayed; or
- (c) any directions given by an authorized person pursuant to paragraph (4).

commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars or to imprisonment with or without hard labour for a term not exceeding one year or to both such fine and imprisonment.

General provisions as to preservation of national parks.

11.—(1) A person shall not, except with the written permission of the park manager, in a national park —

- (a) erect any building or structure; or
- (b) make or mark out any track or route.

(2) A person who contravenes the provisions of paragraph (1), commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding ten thousand dollars or to imprisonment with or without hard labour for a term not exceeding two years or to both such fine and imprisonment.

Fires.

12.—(1) A person shall not, in a national park, light, maintain or use a fire other than a domestic fire in an area designated for that purpose.

(2) A person who contravenes the provisions of paragraph (1) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding ten thousand dollars or to imprisonment with or without hard labour for a term not exceeding two years or to both such fine and imprisonment.

Other offences.

13.—(1) A person commits an offence who, except with the written permission of the park manager—

- (a) plants any plant, or sows or scatters the seed of any plant, or introduces any substances that he knows or ought to have known is injurious to plant or animal life, in any national park; or
- (b) occupies or uses any land in a national park for cultivation or any other purpose; or
- (c) wilfully damages or defaces any fence, building or equipment in any national park; or

(d) takes or destroys or wilfully injures or in any manner disturbs or interferes with any protected animal or the nest or eggs of any protected bird as specified in the Wildlife Protection Act in any national park; or

(e) wilfully cuts or destroys any plant in a national park.

(2) A person shall not—

(a) when required by notice from the park manager to remove from a national park any animal owned by him or under his control, fail to do so within the period specified in the notice; or

(b) being the driver of any vehicle that is illegally in a national park or part thereof, fail or refuse to remove it from such national park or part thereof when required to do so by any national park ranger; or

(c) do or cause to be done any act, matter, or thing for which such written permission is required under these Regulations; or

(d) unlawfully alter, obliterate, deface, pull up, remove, interfere with, or destroy any boundary marks, stamp, mark, licence, lease, permit or other right or authority issued by the Authority;

(3) A person shall not use, receive, sell, or otherwise dispose of any property knowing it to have been unlawfully removed from any national park.

(4) A person shall not, except with the written permission of the park manager have in his possession in a national park any chain-saw or any trap, net or other like object.

(5) A person who contravenes the provisions of paragraph (1), (2), (3) or (4) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars or to imprisonment with or without hard labour for a term not exceeding one year or to both such fine and imprisonment.

(6) A person convicted of an offence under this Regulation shall, in addition to any penalty for which he may be liable for the offence, be liable to pay the cost of repairing or restoring any damage done to a national park, or to any plant growing therein or property of a national park affected by the commission of such an offence.

Commercial activities. 14.—(1) A person shall not, except with the written permission of the park manager in a national park—

(a) hire or sell anything;

(b) produce anything for hire or sale;

(c) provide any service for reward; or

(d) carry on any other commercial activity.

(2) A person who contravenes the provisions of paragraph (1) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars, and where the offence is a continuing one to a further fine or five hundred dollars per day for each day on which the offence continues after conviction.

(3) A park manager shall not grant permission for the carrying on of commercial activities under this Regulation unless in his opinion the activity is likely to benefit persons engaged in the lawful use of the park or the wider public in general.

Mining.

15.—(1) A person shall not, except with the written permission of the Authority or except in accordance with the provisions of a licence granted under any other enactment, carry out any operation for the extraction or mining of minerals in a national park.

(2) A person who contravenes paragraph (1) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding ten thousand dollars or to imprisonment with or without hard labour for a term not exceeding two years.

Research and collection of objects and specimens.

16.—(1) The Authority may, on such terms as it thinks fit, grant a permit for—

- (a) the carrying out of research; or
- (b) the collection of natural objects or specimens, animal or plant life in a national park for educational, scientific or environmental purposes.

(2) The Authority shall not grant a permit under paragraph (1) where the carrying out of any research or collection is likely to damage the national park or interfere unduly with the management of the flora or fauna.

(3) An application for a permit under paragraph (1) shall be in writing and shall—

- (a) be transmitted through the park manager; and
- (b) contain information as to—
 - (i) the type of research and the natural objects or specimens to which the application relates;
 - (ii) the methods to be employed in carrying out the research and in collecting objects or specimens;
 - (iii) the estimated cost of such research or collection.

(4) Where the Authority refuses to grant a permit under paragraph (1), it shall, in writing, inform the applicant of the reasons for the refusal and the right of appeal under section 35 of the Act.

(5) A person who carries out any form of research or collects any object, specimen, animal or plant life in a national park without a permit issued under this Regulation commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding ten thousand dollars or to imprisonment with or without hard labour for a term not exceeding two years or to both such fine and imprisonment.

Parking etc. of vehicles and mooring of vessels.

17.—(1) A person shall not, in a national park—

- (a) park a vehicle or moor a vessel in any place other than in a parking lot mooring area or a place designated for such purpose by the Authority;

- (b) park a vehicle or moor a vessel in such manner as to obstruct or to be a danger to persons in the national park;
- (c) abandon a vehicle or vessel or leave it in a position, condition or in circumstances so that it appears to be abandoned.

(2) A vehicle or vessel shall be deemed to have been abandoned if it is left unattended for a period of forty-eight hours or more.

(3) A person who contravenes paragraph (1) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding two thousand dollars or to imprisonment with or without hard labour for a term not exceeding one year or to both such fine and imprisonment.

Exemptions. 18.—(1) In granting a permit under these Regulations with respect to the carrying on of an activity, the park manager may exempt the person to whom the permit was granted, from such of the provisions of these Regulations as are necessary to enable such person to carry on the activity.

(2) An exemption under this Regulation may be in general terms or may be limited to the activities, area and period specified in the permit.

Fishing. 19.—(1) A person shall not fish in a national park without the written permission of the park manager; and such permission may contain any term or condition as is necessary for the management of the fishing resources of the park.

(2) The Authority may declare in writing that an area of water in a national park is an area where, at any time or for a period specified by the Authority in such declaration, fishing is prohibited.

(3) The Authority may declare in writing that an area of water in a national park is an area in which fishing is allowed subject to conditions relating to—

- (a) the kind of fish which may be caught or, as the case may be, the kind of fish in respect of which fishing is prohibited;
- (b) the number of fish that may be caught by a person in a day;
- (c) the type of fishing equipment that may be used; or
- (d) the devices which may be used for fishing.

(4) A person shall not fish in an area of water in a period during which fishing is prohibited under paragraph (2).

(5) A person shall not, in a national park, use any poisonous substance, electrical charges or any other similar device for the catching or killing of fish.

(6) A person who contravenes paragraph (1), (4) or (5) commits an offence and is liable to a fine not exceeding ten thousand dollars or to imprisonment with or without hard labour for a term not exceeding two years or to both such fine and imprisonment.

(7) A person who contravenes any term or condition imposed by the Authority under paragraph (1), (2) or (3) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars or to imprisonment for a term not exceeding two years or to both such fine and imprisonment.

Markers.

20.—(1) A person shall not wilfully mark, deface or injure in any way, or remove or interfere in any way with any mooring, buoy, national park sign, notice or placard, whether temporary or permanent, or with any monument, stake, post or other boundary marker in any national park.

(2) A person who contravenes paragraph (1) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars or to imprisonment with or without hard labour for a term not exceeding two years or to both such fine or imprisonment.

Signs.

21.—(1) A person shall not, except with the written permission of the Authority, erect, exhibit, display or cause to be erected, exhibited or displayed in a national park any notice, sign, slogan or other device containing any advertising or other kind of message.

(2) A person shall not, except with the written permission of the Authority, remove, damage, obscure or otherwise interfere with a notice, sign, slogan or other device, erected by the Authority in a national park.

(3) The park manager may authorize the erecting, placing or displaying of signs in a national park for the purpose of—

- (a) regulating, prohibiting or restricting the stopping or parking of vehicles, or defining the manner in which vehicles may be parked;
- (b) designating a part of a national park as an area within which the parking of vehicles is permitted or the mooring of vessels;
- (c) designating a part of a national park as an area within which camping is permitted;
- (d) conveying information or warning to persons using such national park.

(4) A sign erected for the purpose of designating a part of a national park as an area within which the parking of vehicles is permitted shall, in addition to the words designating that part, bear the words "PARKING AREA".

(5) A sign erected for the purpose of designating a part of a national park as an area within which camping is permitted shall, in addition to the words designating that part, bear the words "CAMPING AREA".

(6) A sign, or other device erected, placed or displayed in a national park indicating that it has been approved by the Authority shall, unless the contrary is established, be taken to have been erected, placed or displayed, as the case may be, by the Authority as the case may be.

(7) A person who contravenes paragraph (1) or (2) commits an offence and is liable on summary conviction before a Resident Magistrate to a fine not exceeding five thousand dollars or to imprisonment with or without hard labour for a term not exceeding one year or to both such fine or imprisonment.

(8) Any person who wilfully defaces, destroys, damages, obliterates, pulls up, removes, obscures or otherwise interferes with any sign erected, placed or displayed pursuant to paragraph (3) commits an offence.

Court may order payment.

22. Where a person is convicted of an offence of removing any property from or causing any damage to, a national park or any plant or animal therein, the Court before which he is convicted may, in addition to any penalty for which he may be liable under these Regulations, order him to pay to the Crown the full market value or the cost of rehabilitation (whichever is the greater) as assessed by the Court, of the property removed or of the damage done to the national park or any plant or animal therein.

Presumptions re-offences.

23. If, in the vicinity of a national park, any person is found in possession of any plant, stone, mineral, nest, animal, artefact, or relic, or any part thereof which belongs in that national park and upon being required by a national park ranger that person fails or refuses to give a satisfactory account of the manner in which he came into possession of such plant, stone, mineral, nest, animal artefact or relic or part thereof, it shall be presumed that he has removed it from such national park.

Penalty for offences.

24. A person who commits an offence against these Regulations for which no penalty is provided is liable on summary conviction before a Resident Magistrate—

- (a) where the offence is committed by an individual, to imprisonment for a term not exceeding one year or to a fine not exceeding five thousand dollars and where the offence is a continuing one to a further fine not exceeding five hundred dollars per day for each day on which the offence continues after conviction;
- (b) where the offence is committed by a body corporate, to a fine not exceeding five thousand dollars and where the offence is a continuing one to a further fine not exceeding five hundred dollars per day for each day on which the offence continues after conviction.

ENFORCEMENT

Seizure and forfeiture.

25.—(1) If any authorized officer has reasonable cause to suspect that any vehicle, vessel, article or thing is being used or has been used in the commission of an offence against these Regulations, he may seize and detain such vehicle, vessel, article or thing and may—

- (a) without a warrant, search such vehicle, vessel, article or thing; and
- (b) if such search reveals evidence that the vehicle, vessel, article or thing is being used or has been used for the commission of any offence, seize and detain such vehicle, vessel, article or thing.

(2) Where any vehicle, vessel, article or thing is seized pursuant to paragraph (1) and—

(a) any person is convicted of an offence against these Regulations; and

(b) the Court is satisfied that—

(i) the person owns the vehicle, vessel, article or thing used in the commission of the offence; or

(ii) the owner thereof permitted it to be so used; or

(iii) the circumstances are otherwise such that it is just so to do.

the Court shall, upon the application of the Authority, order the forfeiture of the vehicle, vessel, article or thing.

(3) On the application of the Authority before a Resident Magistrate's Court having jurisdiction in the area where a vehicle, vessel, article or thing is seized pursuant to paragraph (1), the Court may, notwithstanding that the conditions mentioned in paragraph (2) have not been satisfied, order the forfeiture of the said vehicle, vessel, article or thing if the Court is satisfied that—

(a) the vehicle, vessel, article or thing has been abandoned; or

(b) the circumstances in which it was seized give reasonable cause to suspect that it was being used or has been used in the commission of an offence against these Regulations; or

(c) it is otherwise just to do so.

(4) Where the Authority proposes to apply for forfeiture of a vehicle, vessel, article or other thing under paragraph (3), it shall, subject to paragraph (5), give to any person who, to its knowledge, was at the time of the seizure the owner thereof, notice of the seizure and of the intention, after the expiration of thirty days from the date of the notice, to apply for forfeiture thereof and of the grounds therefor.

(5) Notice shall not be required under paragraph (4) if the seizure was made in the presence of the owner or any of the owners of the vehicle, vessel, article or thing seized or any servant or agent of the owner.

(6) Without prejudice to any other form of service, notice under paragraph (4) may be published in a daily newspaper circulating in the Island.

(7) Any person having a claim to any vehicle, vessel, article or thing seized under this Regulation may appear before the Court at the hearing of the application and show cause why an order for forfeiture should not be made.

(8) Where, at the hearing of an application pursuant to paragraph (3), no person appears before the Court to show cause why an order for forfeiture should not be made, the Court shall presume that the vehicle, vessel, article or thing has been abandoned.

(9) If, upon the application of any person prejudiced by an order made by the Court under paragraph (2) or (3), the Court is satisfied that it is just to revoke such order, the Court may revoke such order upon such terms and conditions as it deems appropriate, and without prejudice to the generality of the foregoing, shall require such person, to pay in respect of storage, maintenance, administrative expenses, security and insurance of the vehicle, vessel, article or thing such charges as may be charged by the person in whose custody the vehicle, article or thing is and approved by the Court, not exceeding one and one-half times the value thereof as determined by the Court.

(10) An application to the Court under paragraph (9) for the revocation of an order, shall be made within thirty days of the date of the order or within such greater time as the Court may allow, not exceeding six months from the date of the order.

Arrest with-
out
warrant.

26.—(1) An authorized officer may, without warrant, arrest any person, where the authorized officer reasonably believes that—

- (a) the person has committed an offence against these Regulations; and
- (b) proceedings against the person by summons would not be effective.

(2) Where an authorized officer arrests a person under paragraph (1), he shall produce his identity card for inspection by that person unless it is not reasonably practicable to do so.

(3) Where a person is arrested under paragraph (1), an authorized officer shall immediately bring the person, or cause him to be brought, to the nearest police station.

(4) Nothing in this section shall prevent the arrest of a person in accordance with any other law.

ZONES

Zones.

27.—(1) The Authority may, as it thinks fit, zone areas of a national park and may—

- (a) assign a name or other designation for each zone;
- (b) make provisions with respect to the purposes for which each zone may be used; and
- (c) attach terms and conditions with regard to the use of each zone.

(2) A person who uses the zone for a purpose other than which provision is made or contravenes any term or condition with regard to the use thereof commits an offence.

MANAGEMENT PLANS

28.—(1) As soon as is reasonably practicable after a national park has been declared, the Authority shall prepare or cause to be prepared, a plan of management in respect of such national park.

management of the national park or any user of the national park;

- (b) require any person whom he finds committing or whom he reasonably suspects of having committed any such act to state his full name and true place of residence or leave the national park immediately.

Persons
deemed
national
park
rangers.

33. For the purposes of these Regulations a member or officer of the Jamaica Constabulary Force, the Jamaica Defence Force and the Island Special Constabulary Force respectively shall be deemed to be a national park ranger.

National
Parks
Councils.

34.—(1) The Authority may by notice published in the *Gazette* appoint an Advisory Council (hereinafter referred to as the Council) for national parks.

(2) The Council appointed under paragraph (1) shall consist of—

- (a) the Executive Director of the Authority or his nominee;
- (b) the park manager of each national park;
- (c) a representative of the Forestry Division of the Ministry of Agriculture;
- (d) a representative of the Fisheries Division of the Ministry of Agriculture;
- (e) a representative of the Jamaica Conservation Development Trust;
- (f) a representative of the Ministry of Finance and Planning;
- (g) a representative of the Ministry of Production, Mining and Commerce;
- (h) a representative of the National Environment Societies Trust;
- (i) a representative of the Planning Institute of Jamaica;
- (j) a representative of the Jamaica National Heritage Trust;
- (k) a representative of the Town Planning Department; and
- (l) four other persons of whom one shall be qualified in geology.

(3) The members of the Council shall hold office for such period not exceeding two years as the Authority may determine and shall be eligible for reappointment.

(4) The Authority shall appoint one of the members of the Council to be chairman thereof.

(5) The Authority may appoint any person to act in place of the chairman or any other member of the Council in the case of the absence or inability to act of the chairman or other member.

(6) The meetings of the Council shall be held at such time and such places as the chairman may from time to time appoint.

(7) Five members of the Council shall form a quorum at any meeting.

(8) The decision of the Council shall be by a majority of the members, and in addition to an original vote, the chairman shall have a casting vote in any case in which the voting is equal.

(9) The functions of the Council shall be to make recommendations to the Authority on the preservation of the ecological system of each national park and, without prejudice to the generality of the foregoing, to—

- (a) advise the Authority on matters relating to the administration, control and preservation of the resources of each national park and for the development of such national park on a national basis;
- (b) advise the authority on a management plan for the proper operation and management of each national park and to review that plan annually;
- (c) advise the Authority on management strategies to ensure that such management strategies achieve their desired effect; and
- (d) institute programmes to raise revenue for each national park.

(10) In performing the functions specified in paragraph (9), the Council may—

- (a) advise on educational programmes to ensure community involvement in the preservation of each national park;
- (b) advise the Authority on zoning and the establishment of boundaries in each national park.

Certificate. 35. A certificate by the Executive Director that an area is within a national park shall be *prima facie* evidence of that fact.

Dated this 26th day of February, 1993.

JOHN A. JUNOR,
Minister of Tourism and the
Environment.

APPENDIX 17

BJCMNP (User Fee) Regulations (2003) and National Park (Amendments) Regulations (2003)



THE
JAMAICA GAZETTE
SUPPLEMENT

PROCLAMATIONS, RULES AND REGULATIONS

18211

Vol CXXVI

TUESDAY, JUNE 17, 2003

No. 59C

No. 70G

THE NATURAL RESOURCES CONSERVATION AUTHORITY ACT

THE NATURAL RESOURCES CONSERVATION (BLUE AND JOHN CROW MOUNTAINS NATIONAL PARK) (USER FEES) REGULATIONS, 2003

In exercise of the power conferred upon the Minister by section 38(1)(h) of the Natural Resources Conservation Authority Act, the following Regulations are hereby made:—

1. These Regulations may be cited as the Natural Resources Conservation (Blue and John Crow Mountains National Park) (User Fees) Regulations, 2003.

2. In these Regulations:—

"annual pass" means a pass issued for a period of twelve months;

"hiking ticket" means a ticket issued by the Park Manager entitling the holder to utilize the main recreational hiking trail;

"recreational area" means that portion of the Park designated for recreational purposes and for which a pass is required for entry;

"Park" means the Blue and John Crow Mountains National Park, the boundaries of which are set out in the Natural Resources Conservation (Blue and John Crow Mountains National Park) (Declaration) Order, 1993;

"pass" means a pass issued by the Park Manager entitling the holder to utilize a recreational area in the Park.

3.—(1) Subject to paragraph (3) a person shall not enter the grounds of any recreational area unless he holds a valid pass which he has in his possession at the time of entry.

(2) The Park Manager may, in respect to the Hollywell Recreational Area issue:—

- (a) a pass for a single entry; or
- (b) an annual pass for multiple entries.

(3) An authorized officer under the Natural Resources (National Parks) Regulations, 1993 may enter the Hollywell Recreational Area without a pass.

(4) The Park Manager with the approval of the Authority may exempt any person from the provisions of paragraph (1).

Part I
Schedule (5) The fees specified in Part I of the Schedule shall be payable in respect to a pass issued under this regulation.

4. Every person who intends to utilize the main recreational hiking trail from Portland Gap to the Blue Mountain Peak shall pay the appropriate fee set out in Part II of the Schedule.

Part II
Schedule (1) Every persons who intends to camp in a designated campground in the park shall pay the fee specified in Part III of the Schedule.

(2) A person shall not camp in any area of the Park unless such an area is a designated campground.

6.—(1) The Park Manager shall establish an account into which fees collected under regulations 3, 4 and 5 shall be deposited.

(2) The Park Manager shall within three months after the end of each calendar year present to the Authority an audited report of the account.

(3) The Authority shall within two months after receiving the report forward a copy thereof to the Minister.

SCHEDULE

(Regulations 3, 4 and 5)

PART I

*Fees payable for passes issued under
Regulation 3*

Type of Pass	Amount of Fee
<i>Single Entry</i>	
1. Persons ordinarily resident in Jamaica	\$100.00 for each adult and child over the age of 12 years. \$50.00 for each child 6 to 12 years of age. No fee is charged in respect of a child under the age of 6 years.
2. Persons not ordinarily resident in Jamaica	US\$10.00 or the equivalent in Jamaican currency for each adult and child over the age of 12 years of age. US\$5.00 or the equivalent in Jamaican currency for each child 6 to 12 years of age. No fee is payable in respect of a child under 6 years of age.
3. A group of ten or more adults ordinarily resident in Jamaica	\$70.00 for each person.
4. A group of ten or more adults not ordinarily resident in Jamaica	US\$7.50 or the equivalent in Jamaican currency for each person.
<i>Annual</i>	
1. A person ordinarily resident in Jamaica	\$1,000.00
2. A person not ordinarily resident in Jamaica	US\$30.00 or the equivalent in Jamaican currency.

SCHEDULE, *contd.*

PART II

Fees payable for hiking trail under Regulation 4

Type of Pass	Amount of Fee
1. Persons over 12 years of age ordinarily resident in Jamaica	\$200.00
2. Persons over 12 years of age not ordinarily resident in Jamaica	US\$20.00 or the equivalent in Jamaican currency.
3. Children 12 years of age and under	\$50.00

PART III

Fee payable for camping in a designated campground

Type of Pass	Amount of Fee
Camp fee	\$100.00 per night for each adult and child over the age of 12 years of age. \$50.00 per night for each child 6 to 12 years of age.

Dated the 16th day of June, 2003.

DEAN PEART,
Minister of Land and Environment.

No. 7011

THE NATURAL RESOURCES CONSERVATION AUTHORITY ACT**THE NATURAL RESOURCES (NATIONAL PARKS) (AMENDMENT) REGULATIONS, 2003**

In exercise of the power conferred upon the Minister by section 38(1)(h) of the Natural Resources Conservation Authority Act, the following Regulations are hereby made:—

1. These Regulations may be cited as the Natural Resources (National Parks) (Amendment) Regulations, 2003 and shall be read and construed as one with the Natural Resources (National Parks) Regulations, 1993, hereinafter referred to as the principal Regulations.

2. Regulation 5 of the principal Regulations is hereby amended by deleting from paragraph (2) the word "ten" and substituting therefor the word "fifty".

3. Regulation 12 of the principal Regulations is hereby amended by deleting from paragraph (2) the word "ten" and substituting therefor the word "fifty".

4. Regulation 13 of the principal Regulations is hereby amended by deleting from paragraph (5) the word "five" and substituting therefor the word "twenty".

5. Regulation 14 of the principal Regulations is amended:—

(a) by deleting paragraph (1) and substituting therefor the following:—

" (1) Any person who is desirous of:—

- (a) hiring or selling anything;
- (b) producing anything for hire or sale;
- (c) providing any service for reward;
- (d) carrying on any other commercial activity,

in a national park shall apply to the Authority, in such manner as the Authority may determine, for a commercial licence or a concession permit specified in paragraph (3), as the case may require."

(b) in paragraph (2) by:—

- (i) deleting the words "five thousand" and substituting therefor the words "forty thousand";
- (ii) renumbering the paragraph as paragraph (8);

(c) in paragraph (3) by:—

- (i) deleting the words "A park manager" and "his" and substituting therefor the words "The Authority" and "its", respectively;
- (ii) renumbering the paragraph as paragraph (9);

(d) by inserting next after paragraph (1) the following as paragraphs (2), (3), (4), (5), (6) and (7):—

" (2) An application for:—

- (a) a commercial licence shall be accompanied by an application fee of five hundred dollars; and
- (b) a concession permit shall be accompanied by an application fee of one thousand dollars.

(3) On receipt of an application under paragraph (1) the Authority may grant:—

- (a) a commercial licence; or
- (b) a concession permit,

to any person who made an application under paragraph (2) having regard to the following:—

- (i) the designated space to be allocated for the activity;
- (ii) the type of commercial activity;
- (iii) the gross annual earnings of the applicant;
- (iv) the size of operation and facilities that are provided by the Authority.

(4) A person shall pay to the Authority on the grant of:—

- (a) a commercial licence:—
 - (i) an annual licence fee of ten thousand dollars; or
 - (ii) a monthly licence fee of one thousand dollars; or
 - (iii) a weekly licence fee of two hundred and fifty dollars; or
- (b) a concession permit, a permit fee of five thousand dollars.

(5) A person to whom a concession permit is granted shall, in addition to the permit fee payable under paragraph (4) (b), pay an annual franchise fee calculated:—

- (a) as a fixed sum based on an estimate of gross earnings; or
- (b) as a percentage of the estimated profits to be made by

the holder of the concession permit.

(6) The percentage of estimated profits referred to in paragraph 5 (b) shall be determined by the Authority on an annual basis.

(7) A concession permit granted under paragraph (3) may be granted for a period not exceeding three years and a commercial licence may be granted for a period of one week, one month or one year as the authority thinks fit.”.

6. The principal Regulations are amended by inserting next after regulation 14 the following as regulation 14A:—

* Exclusive commercial activity. 14A. Where the carrying on of a commercial activity under Regulation 14 involves the exclusive use of any part of a National Park, the location fee in respect to that activity, specified in Part B of the Schedule, shall be payable by the person carrying on the commercial activity.”.

7. Regulation 16 of the principal Regulations is hereby amended:—

- (a) in paragraph (1) (b) by inserting immediately after the word "educational," the word "commercial.";
- (b) by deleting paragraph (3) and substituting therefor the following as paragraph (3):—

" (3) An application for a permit under paragraph (1) shall be in the form set out as Form A in Part A of the Schedule and shall be accompanied by a fee of:—

- (a) one thousand dollars, in the case of an application to conduct research or collect specimens for purposes other than commercial purposes; or
- (b) two thousand dollars in the case of an application to conduct research or collect specimens for purposes that are commercial. ";
- (c) by renumbering paragraphs (4) and (5) as paragraphs (8) and (9) respectively; and
- (d) by inserting next after paragraph (3) the following as paragraphs (4), (5), (6) and (7):—

" (4) Where the application for a permit under paragraph (1) is approved, the applicant shall pay a fee of:—

- (a) three thousand dollars where the permit is for research or collection of specimens for purposes other than commercial; and
- (b) six thousand dollars where the permit is for research or collection of specimens for purposes that are commercial.

(5) An application shall be made in respect of each natural object or species of plants or animals.

(6) The Authority shall grant a permit to carry out research in the form set out as Form B in Part A of the Schedule.

(7) The Authority shall grant a separate permit in the form set out as Form C in Part A of the Schedule for each natural object and each species of plant or animal."

8. Regulation 24 of the principal Regulations is hereby amended by deleting therefrom the words "five thousand" wherever they appear and substituting therefor in each case the words "twenty thousand".

9. The principal Regulations are hereby amended by inserting next after regulation 29 the following as regulation 29A:—

" 29A. A park manager may designate and open hiking trails for use by the public for recreational purposes and may close such trails in the interest of public safety."

10. Paragraph (2) of regulation 32 of the principal Regulations is amended:—

- (a) by deleting the full stop at the end of sub-paragraph (b) and substituting therefor a semicolon; and

(b) by inserting next after sub-paragraph (b) the following:—

- " (c) require the holder of a permit or licence to produce his permit or licence, as the case may be, for inspection;
- (d) seize any weapon, trap or device of any kind with which an offence appears to have been committed;
- (e) search any person whom he may reasonably have cause to suspect of contravening any provision of these Regulations."

11. The Principal Regulations are hereby amended by inserting next after regulation 35 the following as regulation 36:—

^{"Recovery of civil debts.} 36. The Authority shall be entitled to recover any debt due to the Authority as a civil debt in a Resident Magistrate's Court, notwithstanding any limitations as to amount recoverable under the Judicature (Resident Magistrates) Act."

SCHEDULE (Regulations 14A and 16)

PART A

FORM A (Regulation 16(3))

THE NATURAL RESOURCES CONSERVATION AUTHORITY ACT

THE NATURAL RESOURCES (NATIONAL PARKS) REGULATIONS, 1993

Application for Permit to Carry Out Research or for the Collection of Natural Objects or Specimen Animal or Plant Life in a National Park

A. *General Information*

1. Name of Applicant(s) _____

2. Postal Address of Applicant(s) _____

3. Telephone No(s) _____ Facsimile No(s) _____
 E-mail Address _____

B. *General Projects Information*

4. Title of Project _____

PART A, *contd.*

FORM A, *contd.*

5. Agency or Institution on behalf of which the Application is being made, if any:

6. Name and Institutional Address of Principal Investigator:

7. Qualification of Principal Investigator:

8. Names and qualifications of Associates who will work on the project (attach very brief C.Vs):

9. Why was Jamaica selected as the research site?

C. *Research Project Information*

1. Give short description of the proposed research including its objectives (a copy or separate sheet may be attached if required):

PART A, *contd.*

FORM A, *contd.*

2. State precisely the proposed location of the project and the site(s) at which research will be conducted:

3. State the duration of the project:

4. Expected output at end of the project:

5. What kinds of materials or information are to be collected or produced?

Specimen or Sample Collection

Recordings (Audio/Video)

Photographs

Written notes

Computer entries

Reports

Articles and Scientific Papers

Other outputs (specify) _____

6. Name the slated transitional and final destinations to which all information, results, specimens and materials are to be sent.

PART A, *contd.*

FORM A, *contd.*

7 (a). Is your project meant to facilitate commercial, industrial or exclusively academic purposes?

7 (b). *NOTE: Commercial purposes here include but are not limited to:*

- (i) The use of samples or specimens, photographic and audio-visual materials and illustrations, for commercial purposes.
- (ii) Chemical, pharmacological and biotechnological study.
- (iii) The use of materials or specimens for propagation or breeding purposes.

Academic purposes here refer to only taxonomic, conservation, ecological and biogeographical investigations.

8. Proposed linkage(s) with local institution(s), if any. (State whether each institution has been formally approached and indicated (very briefly its response).

9. Indicate any training component for local counterparts:

10. Do you intend to conduct research on lands legally owned or occupied by indigenous or local communities? If so, where?

11. Please state briefly how Jamaica will benefit from the research including levels of compensation be they in the short, medium or long term which will accrue to Jamaica (e.g. cash, sharing of future research, production possibilities, royalties, equipment and materials, etc.):

PART A, *contd.*

FORM A, *contd.*

D. *Collection of Specimens*

Researchers desiring to collect specimens should provide the following information:

1. What are the scientific and common names of the organisms to be collected (if any are endemic to Jamaica or non-classified, i.e. a new species, please state):

2. Indicate the total number of specimens of each species which is required for collection (If animals are to be collected, state sex):

3. Number of specimens to be collected: alive dead

- 4a. Frequency of collection:

weekly monthly quarterly semi-annually annually

- 4b. Please indicate the collection period: Day Month Year

- 5a. Method of collection to be employed:

- 5b. Experience in collection of specimen:

PART A, *contd.*

FORM A, *contd.*

6. Method of storage/transportation of specimen: _____

7. Purpose for which specimens are to be collected:

8. If specimens are to be exported, indicate the institution at which they are to be deposited:

9. Specimens will be:
 - a. Deposited in a national institution: yes no
If yes, name and address of institution: _____

 - b. Used for laboratory experiments: yes no
If yes, name and address of institution: _____

 - c. Re-introduced: yes no

If yes, name of location: _____

I/We hereby apply for permission to conduct this research and I/We agree to submit to the Natural Resources Conservation Authority (NRCA) two (2) copies of all publications and/or other written reports arising from this research. I/We also understand that depending on the type of research to be conducted in Jamaica a Material Transfer Agreement may need to be negotiated.

Signature of Applicant

Date

Endorsed by

Date

FORM B

(Regulation 16 (6))

THE NATURAL RESOURCES CONSERVATION AUTHORITY ACT

THE NATURAL RESOURCES (NATIONAL PARKS) REGULATIONS, 1993

Permit to Conduct Research

Permit No.: _____

Pursuant to an application under regulation 16 (5) of the Natural Resources (National Parks) Regulations, 1993 the Authority hereby grants a permit to:—

Name of Permittee _____

Address of Permittee _____

Type of Research _____ in _____

Name and Location of Research Site _____

_____ Parish _____

For the purpose herein mentioned _____

Objectives _____

Type of specimen _____

Valid from _____ to _____

This Permit is subject to the conditions contained in the Schedule.

Any contravention of any condition(s) may result in suspension or revocation of this Permit.

N.B.: A person who carries out any form of research or collects any object, specimens, animals or plant life in a National Park without a valid permit commits an offence under Regulation 16 (8) of the National Parks Regulations.

SCHEDULE

(Specify conditions)

Dated

SEAL

Authorized Officer

FORM C

(Regulation 16 (7))

THE NATURAL RESOURCES CONSERVATION AUTHORITY ACT
THE NATURAL RESOURCES (NATIONAL PARKS) REGULATIONS, 1993
*Permit to Conduct Collection of Natural Objects and Specimens
of Plants or Animals within the National Park*

Permit No.: _____

Pursuant to an application under regulation 16 (5) of the Natural Resources (National Parks) Regulations 1993, the Authority hereby grants a permit to:—

Name of Permittee _____

Address of Permittee _____

To carry out research in _____

Location of Research Site _____ Parish _____

For the purpose herein mentioned _____

To collect _____ specimens

Type of specimens/objectives _____

Valid from _____ to _____

This Permit is subject to the conditions in the Schedule.

Any contravention of any condition (s) may result in suspension or revocation of this Permit.

N.B.: A person who carries out any form of research or collects any object, specimens of animal or plant life in a National Park without a valid permit commits an offence under regulation 16(8) of the National Parks Regulations.

SCHEDULE

(Specify conditions)

Dated

SEAL

Authorized Officer

PART B

(Regulation 14A)

Activities and Location Fee payable in respect of Research

The location fees referred to are:—

(a)	concerts, parties and any other such activities	\$60,000.00
(b)	the making of commercial films/ television, documentaries or advertisements	\$75,000.00
(c)	weddings and sporting events	\$30,000.00

Dated this 16th day of June, 2003.

DEAN PEART,
Minister of Land and Environment.

No. 701

APPENDIX 18

Map of the BJCMNP



GLOSSARY

Protected Area - A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values

Buffer zone - a one km band outside of the park along the park boundary

Community buffer zone - a one km band outside of the park along the park boundary

Endemic - the ecological state of being unique to a defined geographic location

Rare - seldom occurring or found

Biodiversity - the numbers of different species of plants and animals in an environment

Stakeholder - one who is involved in or affected by a course of action

Participatory Process - specific method(s) employed to achieve active participation by all members of a group in a decision making process

Cultural heritage - the things, places and practices that define who we are as individuals, as communities, as nations or civilisations and as a species. It is that which we want to keep, share and pass on

Maroon - a fugitive black slave of the West Indies and Guiana in the 17th and 18th centuries; *also* : a descendant of such a slave

Closed broadleaf forest – forest dominated by angiosperms, with a high proportion of stand covered by the crowns of live trees

Co-management - to manage jointly

Ecology – the branch of biology dealing with the relations and interactions between organisms and their environment, including other organisms

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