



ANNANDALE and GRAND ETANG

FOREST RESERVES

MANAGEMENT PLAN

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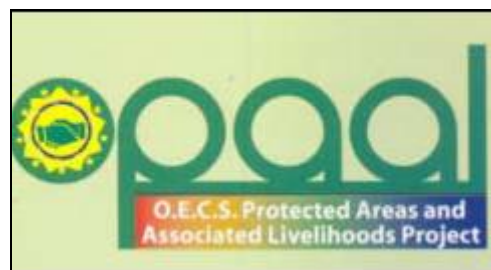
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As with any plan, this plan is a start and, as more knowledge comes available about the Forest Reserves, this plan will be modified to reflect that knowledge. It is my hope that this plan directly serves the needs of the Government and people of Grenada and indirectly others, globally, who care about protected areas and people's livelihoods in the Caribbean and the relationship between the two.

TABLE OF CONTENTS

| | | |
|-------|--|----|
| 1 | INTRODUCTION..... | 6 |
| 1.1 | Purpose and Scope of Plan..... | 7 |
| 2 | BACKGROUND..... | 8 |
| 2.1 | Geographic Setting..... | 9 |
| 2.2 | Existing Resources..... | 9 |
| 2.2.1 | Physical..... | 9 |
| 2.2.2 | Biological..... | 11 |
| 2.2.3 | Cultural..... | 11 |
| 2.2.4 | Infrastructural..... | 12 |
| 2.3 | Past and Present Use..... | 13 |
| 2.3.1 | Subsistence..... | 13 |
| 2.3.2 | Recreational..... | 13 |
| 2.3.3 | Commercial..... | 14 |
| 2.3.4 | Research and Education..... | 14 |
| 2.4 | Existing Legal, Institutional and Management Framework..... | 15 |
| 2.5 | Existing Threats and Implications for Management..... | 17 |
| 3 | THE PLAN FOR MANAGEMENT..... | 19 |
| 3.1 | Vision and Goals..... | 20 |
| 3.2 | Institutional Arrangements..... | 20 |
| 3.3 | Zoning Plan..... | 22 |
| 3.4 | Regulations and Enforcement..... | 23 |
| 3.5 | Conservation, Recreation and Resource Use Management..... | 24 |
| 3.5.1 | Soils and Landforms..... | 25 |
| 3.5.2 | Vegetation..... | 25 |
| 3.5.3 | Water..... | 30 |
| 3.5.4 | Wildlife..... | 31 |
| 3.5.5 | Culture..... | 31 |
| 3.5.6 | Recreation..... | 32 |
| 3.5.7 | Commercial Recreation..... | 33 |
| 3.6 | Public Education and Awareness..... | 34 |
| 3.7 | Administration..... | 35 |
| 3.7.1 | Staffing..... | 36 |
| 3.7.2 | Training..... | 38 |
| 3.7.3 | Infrastructure and Equipment..... | 40 |
| 3.7.4 | Financial Management..... | 41 |
| 3.8 | Monitoring and Evaluation..... | 44 |
| 3.9 | Disaster Management..... | 45 |
| 3.10 | Consultation and Involvement in the Management Plan Process..... | 45 |
| 3.11 | Plan Implementation Strategy..... | 46 |
| 4 | MANAGEMENT PLAN REVIEW PROCESS..... | 51 |

| | |
|---|----|
| Appendix 1: THREATENED SPECIES IN FOREST RESERVES | 53 |
| Appendix 2: TRAILS IN THE FOREST RESERVES..... | 54 |
| Appendix 3: FEE REVIEW OF EASTERN CARIBBEAN TOURISM SITES | 56 |
| Appendix 4: CONSULTATIONS | 57 |
| Appendix 5: PROPOSED OPAAL PROJECTS | 58 |
| Bibliography..... | 59 |
| NOTES..... | 61 |

TABLE OF FIGURES

| | | |
|-----------------|---|-----------|
| Figure 1 | Location Map | 10 |
| Figure 2 | Zoning | 24 |
| Figure 3 | Key Actions | 26 |
| Figure 4 | Grand Etang Visitor Centre Complex Key Actions | 27 |
| Figure 5 | Annandale Key Actions | 29 |
| Figure 6 | Proposed Organization Structure | 37 |
| | | |
| Table 1 | Required Increase to 2007 Budget | 43 |
| Table 2 | Plan Implementation Strategy | 47 |

1 INTRODUCTION

1.1 Purpose and Scope of Plan

Some 100 years ago, the Government of Grenada formally recognized the vital importance of the forested lands in the Central Mountains and established, by the *Grand Etang Forest Reserve Act*, some 1600 hectares as the Grand Etang Forest Reserve.

100 years later, after acquiring the lands in the mid 1960's, the Government of Grenada formally recognized the significance of a portion of the adjacent Annandale Estate and established, by Gazette Notice Volume 124, Number 19, some 236 hectares as the Annandale Forest Reserve in 2006. Although both areas have been designated as Forest Reserves, the purpose overlying their establishment has been watershed protection as these lands are relied on to supply a constant and continuous supply of water to adjacent communities.

Although the concept of forest conservation has been recognized by Grenada for over 100 years and the Grand Etang Forest Reserve has benefited from management under successive government departments and ministries charged with administration of the *Act*, a management plan outlining all of the issues associated with the Forest Reserve and how these issues will be addressed has never been prepared.¹

The Annandale Forest Reserve, benefiting from its more recent acquisition and designation, has a 1985 draft management plan. More recently, an updated version of the draft management plan was prepared in 2002 by the Forestry and National Park Department with significant community input. However, Hurricane Ivan delayed continuation of work on that plan until 2006 when the planning process was revived.

Recognizing that actions proposed in this plan are part of a regional initiative and affect environments downstream, in the sea and the rest of the Caribbean, the purpose of this plan is to build upon the longstanding and ongoing management of the Grand Etang Forest Reserve and the draft 2002 Annandale Forest Reserve Management Plan and present an overall plan for both, acting as one, that identifies the issues associated with both protected areas, addresses associated livelihoods and recommends management actions that are intended to meet not only the original intent of the Forest Reserves that is still valid today but other environmental, social and economical priorities of Grenada as well.

¹ A timber harvesting plan was prepared for the Great River component of the Reserve in 1979.

2 BACKGROUND

2.1 Geographic Setting

Generally encompassing elevations between 250 meters and 760 meters of the South Central Mountains and overlapping the Parishes of St. John, St. Andrew, St. David and St. George, the Grand Etang and Annadale Forest Reserves (Figure 1) contain the best examples of four of Grenada's six major forest communities: Cloud Forest, Montane Thicket, Secondary Tropical Forest and the Rain Forest/Lower Montane Rain Forest. The Reserves receive an average of 2500 mm of rainfall annually.

Underlain by some of the oldest known rocks in Grenada and containing andesite domes, basalt flows, a crater lake and the headwaters of a myriad of streams, some 120 in total, the Forest Reserves are home to some 18 threatened animal species (Appendix 1).

The Reserves are also essential to the needs and livelihoods of the people of Grenada as they provide the primary source of water to surrounding communities.

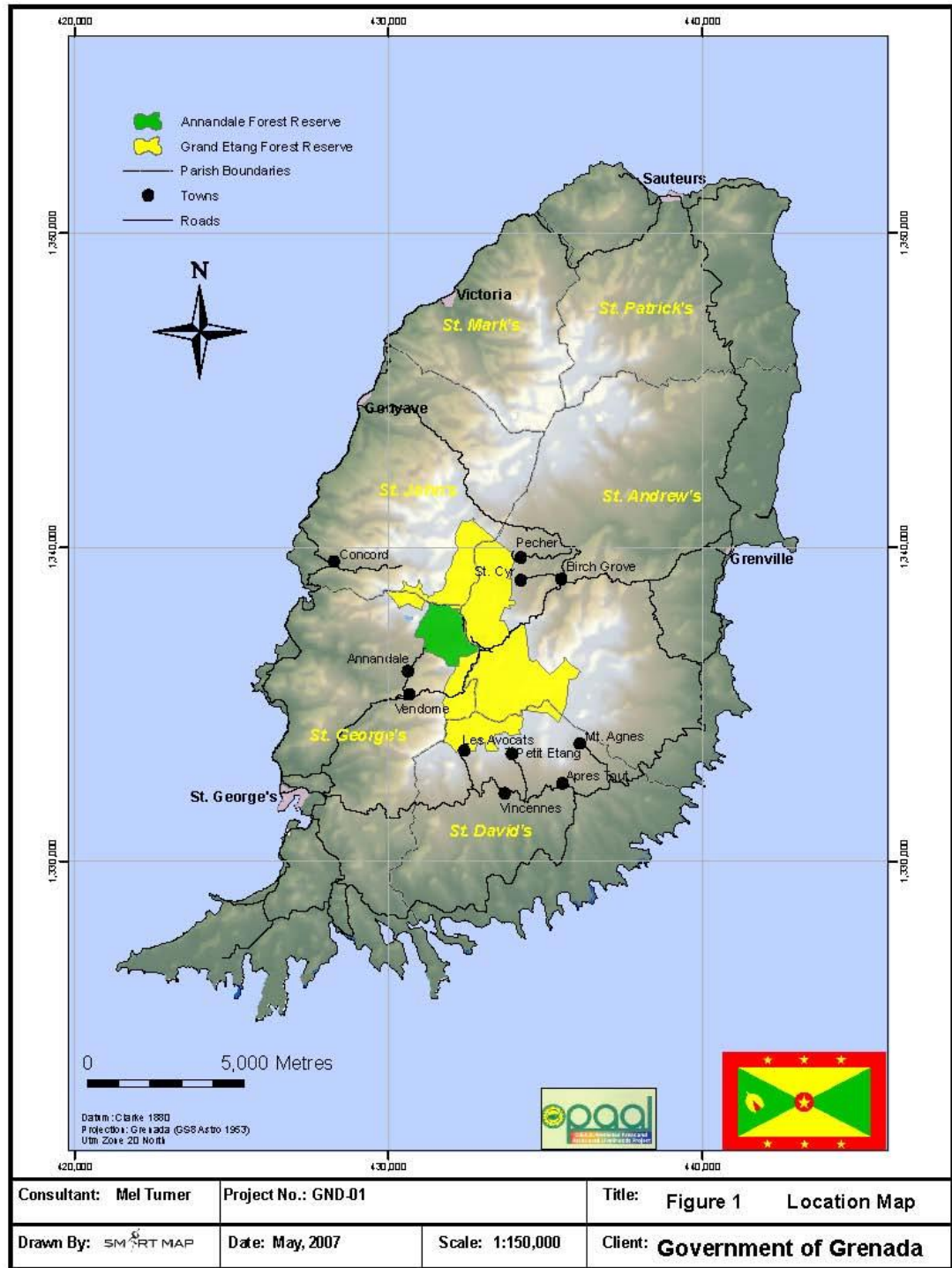
2.2 Existing Resources

2.2.1 Physical

The Grand Etang Forest Reserve, encompassing elevations from 300 meters at St. Cyr to 760 meters at an unnamed peak in the Reserve's north, displays a combination of ridges, the upper headwaters of over 10 steep-sided coastal valleys and the upper basin of a major tributary of the Great River. The Reserve contains four of Grenada's highest mountains: Southeast Mountain (712m), Mount Sinai (700m), Mount Qua Qua (713m) as well as the unnamed peak (760m). All of volcanic origin in the Pliocene and Pleistocene Periods, these mountains dominate the physical landscape. Volcanic activity also contributed to the formation of Grand Etang Lake as a crater lake: one of three explosive craters in the Reserve. Slopes on the flanks of these mountains and connecting ridges are generally in excess of 20 degrees and often in excess of 30 degrees. Grand Etang Lake empties into the tributary of the Great River.

Generally clay soils have developed atop these volcanics and dominate the soil resources of the Reserve except in the few basin areas such as Grand Etang and the gentler slopes in the tributary of the Great River. Due to slope and rainfall, these soils are subject to erosion and failure as evidenced by many slides emanating from the ridge lines. One study (Vernon et al, 1959) stated that lands over 30 degrees should never be cleared of its natural vegetation and lands between 20 degrees and 30 degrees offered extreme danger of erosion.

The Annandale Forest Reserve encompasses the headwaters of a major tributary of the Beausejour River. Abutting the westerly boundary of the Grand Etang Forest Reserve, the Annandale Forest Reserve encompasses elevations ranging from 250 meters to the 700 meter ridge line. Bedrock and soil resources for the Annandale Forest Reserve reflect those of the Grand Etang Forest Reserve.



The climate of the two Forest Reserves is dominated by north-east trade winds and the nature of the ridge lines create windward and leeward conditions.

Portions of the Grand Etang Forest Reserve receive over 4000mm of rainfall annually with an average temperature of 21 degrees. The Annandale Forest Reserve lies in the lee of the Grand Etang Forest Reserve. Climatic data for the Reserve has not been collected as yet but rainfall is expected to be less and average temperature, at the Reserve's lower elevations, higher.

2.2.2 Biological

Although detailed biophysical mapping has not yet been completed for either Forest Reserve, various inventories have been done as part of other related studies

The Forest Reserves are representative of four of Grenada's six forest communities: Cloud Forest, Montane Thicket, Secondary Tropical Rain Forest and Rain Forest/Lower Montane Rain Forest. Influenced by the prevailing wind and occasional hurricanes, these forests provide habitats for wildlife including amphibians (piping frog, giant toad), reptiles (tree boa), birds (broad winged hawk, Blue-ground dove and Gray kingbird) and mammals (nine-banded armadillo, Mona monkey and Burmese mongoose). Eighteen of the various species were recognized as threatened in 1988 (Government of Grenada, 1988). Invertebrate information on the Reserves has yet to be documented.

In 1928, the *Wild Bird and Animals Sanctuary Act* established the Grand Etang Forest Reserve as a sanctuary. In 1957, the Government passed a further Ordinance for the Grand Etang Forest Reserve that made provision specifically for the protection of agouti, armadillo and five species of snakes and prohibited hunting, trapping and carrying of firearms. The agouti is thought to be extinct in Grenada, however interest remains in a reintroduction program in the Forest Reserve.

Many of the streams are populated with crayfish and Grand Etang Lake supports five species of fish including guppy, swordtail and Mozambique mouthbreeder.

2.2.3 Cultural

Arawak use of the Forest Reserves is unknown although it is likely that the Reserves were used sporadically for hunting and/or gathering. They may have also been used for ceremonial and spiritual purposes. Grand Etang was a camp for the Caribs (personal communication, Jessamy).

More recently, in 1796, ongoing conflict between French and British colonists on the Island was settled when the British captured the French stronghold at Fedon's Camp near Mt. Qua Qua. Associated with the late 18th century conflict, fortifications, including two cannon, were constructed in the Annandale Forest Reserve.

Historic trails connecting the valley communities are still extant in the Grand Etang Forest Reserve, however many sections are in disrepair. The Vendome-Les Avocats was reopened in 2000 but trails linking Concord with Annandale and trails connecting Petit Etang, Apres Tout and Pecher with the ridges remain generally unused. All of these trails once served both social and commercial purposes.

The Annandale Forest Reserve was, until acquired by the Government in 1964, part of the private estate of Sir William Branch. Its lower elevations were intensively developed for crop production including bananas, cocoa and nutmeg.

Today, both Forest Reserves are viewed as part of the natural heritage of Grenada, contributing to the nation's culture in a variety of ways.

2.2.4 Infrastructural

Recreation and tourist facilities, including a visitor centre, viewpoints, trails, picnic shelters, parking, washrooms, vendor stalls and food and beverage concessions have been developed at Grand Etang Forest Reserve. The facilities, with the exception of the trails, are managed by the Ministry of Tourism. The trails and surrounding forest resources are managed by the Department of Forestry and National Parks.

The Department also maintains a small, two hectare nursery in the Grand Etang Forest Reserve. The nursery provides plantings for the Reserves as well as other public and private lands requiring replanting and grows Christmas trees for seasonal sale.

At Annandale Forest Reserve, no formal recreation or tourist facilities currently exist although the old estate road serves as a *de facto* trail.

The St. George's-Grenville Highway bisects the Grand Etang Forest Reserve, lending access to Grand Etang Lake and several trails in the Reserve. A public road connects the Annandale Forest Reserve with Annandale. The 500 meters of public road from the Annandale Forest Reserve is in poor repair.

The National Water and Sewerage Authority manage three dams² in the Reserves at Grand Etang, Annandale and Les Avocats as well as associated water pumping facilities. Water collected from the dam at Grand Etang is pumped into the Beausejour watershed within the Annandale Forest Reserve for contribution to the St. George's water distribution system.

Several communication towers exist at 1910 (Hurricane Ridge), adjacent to the St. George's-Grenville Highway. The area has the potential to be a major tourist viewpoint for cruise ship and stay-over visitors. Unfortunately, damage done and left by Hurricane Ivan and an absence of maintenance and design of communication facilities, including

² It is unclear if the Les Avocats facility is actually inside the Grand Etang Forest Reserve as the boundary is not marked.

towers and supporting structures, significantly degrades the site and serves as a potential pollution source in the Grand Etang Forest Reserve.

2.3 Past and Present Use

The Reserves are surrounded by communities who depend not only on the prime watershed protection and water supply purpose of the Reserves but also, to varying extents, for their livelihoods.

2.3.1 Subsistence

Beyond the reliance of the Reserves for domestic water, local communities on the Reserve's perimeter, over the years, have used the Reserves to provide materials for shelter and crafts as well as food and cooking. It is also likely that spiritual needs were met by the Reserves' forests and streams.

Today, subsistence needs are modest. In Grand Etang Forest Reserve, trails show on old maps leading to the forested ridge of Mt. Sinai and Mt. Lebanon and it is likely illegal hunting occurs within the Reserve.

In Annandale Forest Reserve, squatters were displaced in 1985 and prohibition of harvesting, cultivation and grazing was initiated. Undoubtedly, some of these activities continued, and continue today, to a minor extent.

2.3.2 Recreational

At Grand Etang Forest Reserve, the development of the St. George's-Grenville Highway as well as the trail system, some 35 kilometers of designated trails, has made recreational access to much of the Reserve relatively easy and has helped serve the recreational needs of residents and tourists. Several communities, such as Petit Etang, Annandale and Mt. Agnes, have undesignated trails leading to the ridges. The picnic facilities at Grand Etang Lake, viewpoints and the visitor centre complex offering food and beverage and vendors concessions contribute to the recreational opportunities for some 40,000 Grenadians and their visitors (Jessamy, pers.com).

At Annandale Forest Reserve, the old estate road, as well as other tracks established to service the estate's crop production, serves as *de facto* trails for hunting and hiking. No recreation use figures have been collected for the Reserve.

Fishing, both recreational and subsistence, occurs in the streams of both Reserves and at Grand Etang Lake.

Appendix 2 lists the trails in both Forest Reserves.

2.3.3 Commercial

Historical commercial uses have centered on modest forest production in the Grand Etang Forest Reserve and crop production in the Annandale Forest Reserve.

In Grand Etang Forest Reserve, plantation programs were initiated in 1957. In 1979, a forest inventory was conducted in the area south of the St. George's-Grenville Highway and southwards into the St. David's watershed and a forest working plan developed (Johnson, 1985). A further inventory was conducted in 1985 on these lands, a harvesting plan was prepared but no significant harvesting was initiated due to economic concerns and changes in forest policy. Forest policy gradually moved from exploitation to conservation over the next 20 years.

Plantations at St. Margaret, Grand Etang, Vendome, Les Avocats and Petit Etang were established and selective harvesting was practiced for timber, fence posts and fencing. Most of the plantations, occupying some 260 hectares, are located on steep slopes with limited accessibility.

In the Grand Etang Forest Reserve, commercial uses by adjacent communities for non-timber forest products such as bamboo, Donkey Eye and bush yams, have been limited.

Commercial recreation use centered on the Grand Etang visitor complex including the visitor centre, the adjacent vendor stalls, the food and beverage concessions and the trails where tour operators offered access and guides to residents and tourists alike.

In the Annandale Forest Reserve, the cultivated area of the old estate produced agricultural crops including bananas, cocoa, citrus fruits and nutmeg. Practices associated with maximizing crop production caused sedimentation and pollution of the Annandale water supply facilities and led to the Government's acquisition of the lands. Today, commercial uses, though minor, still include plantation forestry and harvesting non-timber forest products as well as tourism and eco-tourism. The potential for these uses is significant to the livelihoods of the adjacent Annandale and Vendome communities.

No studies have been conducted on the economic value of these commercial uses of the two Forest Reserves.

2.3.4 Research and Education

The Grand Etang Visitor Centre, constructed in 1955 and reconstructed after Hurricane Ivan, began as a forest centre and has served thousands of visitors over the years. With educational programs outlining the natural history of the Forest Reserve, the Centre continues to contribute to knowledge and awareness of the Reserve's values.

Research at the Grand Etang Forest Reserve has been conducted on the Mona monkey (Glenn, 1996) and portions of the tropical forest (Potter, 1979; Johnson, 1985). The Lake House, adjacent to the Visitor Centre complex, was the accommodation base for some of the research as well as for administration of the Reserve. The Lake House was severely damaged by Hurricane Ivan and currently sits abandoned but with significant potential for education purposes.

The Annandale Forest Reserve, although not directly contributing to past educational use, also offers significant future educational opportunities. With both natural and cultural history values, it too has the potential to offer educational programs on forest communities, colonial rebellions and estate life.

Both Reserves lend themselves to further research opportunities.

2.4 Existing Legal, Institutional and Management Framework

The Grand Etang Forest Reserve was established under the *Grand Etang Forest Reserve Act* of 1906. The Act did not assign management responsibility however the Forestry Department of the Ministry of Agriculture has assumed that role throughout the Reserve's existence.

The Act is specific in the context that the Reserve was "to provide for the preservation of forest growth..." under the recognition that "it is of vital importance for the conservation and promotion of rainfall and water supply of the island...". To that end, it would seem that watershed protection and water supply is the prime management objective of the Reserve and other management objectives such as natural resource use, tourism or biodiversity conservation must be supportive of the prime objective. Of particular interest, at this point in time, is the final sentence in the Act stating "All the lands aforesaid shall for ever hereafter form part of Government land and shall be strictly reserved and set apart for the public purposes of forest conservation".

The 1928 *Wild Birds and Animals Sanctuary Act* established the Grand Etang Forest Reserve as a "sanctuary for wild animals and birds".

The Forest Reserve is also subject to the *Forest, Soil and Water Conservation Act* and the *Birds And Other Wildlife (Protection) Act*.

Although the Reserve has been managed over the last 100 years generally for the prime watershed management objective and numerous studies and reports have been conducted and prepared, the Reserve has never had an approved management plan.

The Annandale Forest Reserve was established by a Government of Grenada Gazette Notice in 2006 and responsibility for its management was vested in the Forestry and National Parks Department of the Ministry of Agriculture. The lands comprising the Reserve were acquired by the Government some 40 years earlier and vested in an earlier iteration of the Forestry and National Parks Department. In the mid 1980's, a draft management plan was produced

addressing issues of reforestation, crop rehabilitation, road maintenance, infrastructure establishment, hydrological studies, monitoring, training and supervision.

In 2002, a new working draft of the management plan was prepared by the Department, however Hurricane Ivan interrupted its approval. Further work on the draft plan occurred in 2006 when a workshop was held to review and update the draft plan and consider the encouragement of community livelihoods as part of the plan.

Administratively, the Department of Forestry and National Parks continue to manage both Reserves, except for the Grand Etang visitor complex, from its headquarters in Queens Park. Upland watershed, forest conservation and recreation issues affecting the Reserves are addressed by unit staff, reporting to the Chief Forester. Operational issues such as silviculture, road and trail maintenance and ranger duties such as surveillance and detection are conducted by field staff including three rangers, five foreman and 22 field workers. Currently, the approved Department organizational chart has five vacant established positions, including the Wildlife Conservation Officer. In essence, Grenada currently has no public servant directly responsible for wildlife conservation.

The Ministry of Tourism is responsible for the delivery of visitor programs at the Grand Etang Visitor Centre complex and the licensing, through agreements, of the food and beverage as well as the vendor concessions. Entrance fees are collected by the Ministry of Tourism under the *National Parks and Protected Areas (Fees) Order, 1992*.³ All fees collected go into the Ministry of Finance's Consolidated Revenue account.

Currently, 19 Ministry of Tourism staff provides fee collection, greeting at the Visitor Centre, vendor agreement monitoring, security, landscaping and cleaning of the facilities. Supervision of Ministry staff is provided by private contract.

The National Water and Sewerage Authority, under the *National Water and Sewerage Authority Act, 1990*, manages the three dams and associated infrastructure in the Forest Reserves. NAWASA has "full power and authority over the waters" in the Reserves. No memorandum of understanding exists between the NAWASA and the Department of Forestry and National Parks to address common issues of present and future water demands, hydrologic research, maintenance of water levels at Grand Etang Lake, sedimentation and clearing of dams, environmental impacts of proposed developments, information sharing or forest conservation.

The Lands and Surveys Department of the Ministry of Agriculture manages the granting of leases to establish communication sites. In the Grand Etang Forest Reserve, five sites have been established at 1910 (Hurricane Ridge). The ridge is an outstanding potential viewpoint however the communication sites are poorly maintained and the maintenance issue needs to be addressed in the terms and conditions of the leases.

The Ministry of Communications, Works and Transport (Ministry of Works) manages the St. George's-Grenville Highway as it bisects the Grand Etang Forest Reserve. No memorandum of

³ The Act is unclear on the actual fee to be charged as it addresses age, residency and length of trail.

understanding exists between the two Ministries to address the issues of traffic calming at the Grand Etang Visitor Centre complex or roadside vegetation and litter maintenance.

Grenada Electric Services Ltd. maintains an electrical transmission line in the Grand Etang Forest Reserve paralleling the St. George-Grenville Highway. No protocol exists between the company and the Department of Forestry and National Parks to address vegetation management.

2.5 Existing Threats and Implications for Management

Previous OPAAL reports (Parsram, 2007; Gardner, 2006) have noted that threats to the efficient management of the Reserves include lack of coordination among agencies responsible for elements of protected area management and lack of enforcement of existing laws. These threats are not unique to Grenada: they are common to protected areas globally.

The greatest threat to protected area management anywhere is inadequate government support for both policy and financial needs. To be effective, a management plan must have political support and attendant funding. Failure to implement components of existing legislation, lack of enforcement of existing regulations or denial of funds for operational and capital needs hampers the effectiveness of a management plan and the goals it has set to achieve.

Current threats to the management of Grand Etang, other than the present and immediate threat to personal safety posed by reckless driving at the Visitor Centre complex and along the St. George's-Grenville Highway, and Annandale Forest Reserves include duplication and uncertainty of management responsibility brought about by the Department of Forestry and National Parks, the Ministry of Tourism and the Ministry of Finance all having a management role, lack of formal agreements between agencies responsible for protected area management, limited knowledge about the biophysical resources of the Forest Reserves and water supply needs for Grenada and the lack of database and information management.

Specifically in Grand Etang Forest Reserve, the encroachment of vegetation into Grand Etang Lake has raised concerns. Limited scientific knowledge about the Lake and its environs restricts the development of management options to address these concerns and assess environmental impacts.

Specifically, in the Annandale Forest Reserve, over-hunting, the introduction of bamboo as an invasive species, harvesting of produce without permits and grazing have raised concerns.

Public support for protected area management is also critical to the implementation of management plans as lack of public support threatens government support. The Forestry and National Parks Department has generated public support for both the process and product as it relates to national forest policy (Bass, 2000) and has engaged the communities of Annandale and Vendome in the preparation of the draft plan for the Annandale Forest Reserve. More recently, the engagement of the perimeter communities in the review of this plan has raised both awareness and expectations of those communities. This continued public engagement is crucial

to the success of any management plan and any change in course of encouraging public dialogue poses a risk.

Credibility is also significant, particularly at the global level. On visitor publications, on the Board of Tourism, Government of Grenada and Organization of American States websites as well as on-site signage at the Grand Etang Visitor Centre, Grand Etang is referred to as a national park. However, the national park has yet to be legally established. In much of the world, national park designation is seen as a commitment by governments to meet its conservation and/or recreation goals, to contribute to the protection of natural and cultural resources and to provide for recreation opportunities for its citizens and their visitors. National Park designation commonly portrays a greater protection of resources than a forest reserve and hence a greater public expectation as it relates to the conservation of biodiversity.

Finally, financing of protected areas, or rather lack of it, is always a threat. However many governments do not know what financial contribution is made by protected areas to their economy. In many instances, the combination of indirect and direct returns to governments through taxation is greater than government's financial support through its budget process. The financial contribution of the protected areas to the government treasury is fundamental in setting national economic, environmental and social priorities and the government's support of protected area management.

3 THE PLAN FOR MANAGEMENT

3.1 Vision and Goals

VISION

The Grand Etang and Annandale Forest Reserves will contribute directly to the livelihoods of most Grenadians as the Reserves are, and will continue to be, the water supply for Grenada. Although management of the use and resources of the Forest Reserves will be based on watershed protection and maintaining water quality, compatible uses associated with this exceptional tropical rainforest such as recreation, tourism, education, biodiversity conservation and production of timber and non-timber forest products will be encouraged where appropriate and strengthened by land designation; all in an effort to sustain livelihoods in local communities and contribute to the environmental, social and economic goals of Grenada.

In keeping with Grenada's approved Forest Policy, the Forestry and National Parks Department's Strategic Plan, the National Environmental Policy and the National Biological Diversity Strategy and Action Plan, the goals of the management plan are to:

- Protect the Forest Reserves to ensure a constant and continuing supply of water;
- Optimize the contribution of the Reserve's tropical forests to the livelihoods of adjacent communities;
- Contribute to the fulfilment of Grenada's obligation under the Convention of Biological Diversity;
- Enhance public awareness of the environmental, social and economic values of the Forest Reserve's resources;
- Provide leadership in the provision of education, recreation and tourism opportunities compatible with watershed protection;
- Encourage cooperation and partnerships between government, non-government and private sectors, adjacent gateway communities and associated regional and international organizations in plan implementation and plan monitoring.

3.2 Institutional Arrangements

At the legislative level, Grenada has, as has been addressed in many reports, a number of Acts that govern protection and management of its forests, soil and water conservation, planning and development, protection of wildlife habitats and control of pollution. Occasionally, closely-related responsibilities are shared or may even be separated between or among agencies by selected legal instruments such as regulations and orders. Enforcement is often poor or non-existent, either through lack of awareness of the legislation, lack of support for enforcement on unclear jurisdiction.

The 2003 Grenada Forest Management Project-Phase II Forestry and Wildlife Legislation Review, compiled with significant input from other government and non-government agencies

and the private sector, attempts to clarify protected area, forest and wildlife management responsibilities. This pending legislation is awaiting the preparation of accompanying regulations before consideration by Government.

At the management level, the facilities at the Grand Etang Visitor Centre complex are managed by the Ministry of Tourism while the management of resources, including other recreation facilities, are the responsibility of the Department of Forestry and National Parks in the Ministry of Agriculture.

In addition, NAWASA currently has infrastructure facilities in the Reserves, the Ministry of Works maintains the St. George's-Grenville Highway and manages safety and vegetation in the highway corridor and the Lands and Surveys Department of the Ministry of Agriculture issues leases in the Reserves. To ensure the protected area resources are protected, including scenery, it is essential that the Forest and National Parks Department have agreements with each agency on common issues such as location, design and management.

Separation of protected area management functions by agencies is almost always counterproductive as it tends to confuse responsibilities, leads to unclear or contradictory policies, delays decisions, institutionalises inefficiencies and thus threatens the protection of natural and cultural resource values.

Objectives

- To finalize the Protected Area, Forestry and Wildlife Review legislation;
- To streamline management responsibilities for protected areas in the interim;
- To support international conservation biodiversity obligations.

Key Actions

- encourage the timely drafting of regulations to accompany the draft Protected Area, Forestry and Wildlife legislation;
- transfer the management and administration of the Grand Etang Visitor Centre complex from the Ministry of Tourism and the issuance, management and administration of leases in the Reserves from the Lands and Survey Department in the Ministry of Agriculture to the Department of Forestry and National Parks;
- consider the majority of the contiguous sections of the conservation zone and recreation zone (Section 3.3) for designation as a national park under the existing *National Park and Protected Areas Act* or the proposed *Protected Area, Forestry and Wildlife Act*.
- develop conservation, recreation and resource use policies and a policy on public consultation and apply them to the Forest Reserves;
- prepare memoranda of understanding with NAWASA and the Ministry of Works to ensure protected area resources are protected;
- conduct environmental impact assessments on all proposed developments in the Reserves and ensure impact is not detrimental to watershed conservation.

3.3 Zoning Plan

Currently, the Forestry and National Parks Department does not have an approved zoning policy to apply to its protected area managed lands.

Zoning is a tool to assist in the planning and management of protected areas. In general terms, zoning divides protected areas into logical units in an effort to apply consistent management objectives. The zones reflect the intended land use, existing patterns of use, the degree of use desired and the level of management and development required.

In the absence of an approved zoning policy and for the purposes of this management plan, three zones have been developed: Conservation Zone, Recreation Zone and Resource Use Zone.

The objective of the Conservation Zone is to protect natural and cultural resources because of their watershed, biodiversity and historical/cultural values. This zone requires a high level of management protection with ongoing monitoring. Natural processes are normally allowed to continue unhindered but in some instances, protection may require specific management intervention. Scientific studies are encouraged under permit.

Recreation management in the Conservation Zone is dedicated to educating visitors through interpretation and visitor access may be restricted to protect conservation values. Facility development is generally limited to trails and associated camps in designated locations and taking of any resources is prohibited.

The objective of the Recreation Zone is to provide a variety of readily-accessible outdoor recreation opportunities and support services within the context of watershed protection. This zone requires an intensive level of resource management and/or control of visitor activities. Landscape changes and facility development often occurs to increase carrying capacity and to protect adjacent values. Compatible scientific research is encouraged and monitoring needs are high. Facility development should be designed for efficient operation while remaining unobtrusive to the visitor. Taking of resources is prohibited.

The objective of the Resource Use Zone is to delineate readily-accessible areas for the use of timber and non-timber forest resources within the context of watershed protection. This zone includes the existing forest plantations at St. Margaret, Les Avocats and Petit Etang and potential areas in St. Cyr and Pecher. The zone also includes areas proposed in the 2002 draft Annandale Forest Reserve management plan for forest plantations including Christmas trees and blue mahoe and non-timber forest products, such as bamboo and screw pine, for craft production.

This zone requires an intensive level of integrated resource management, including recreation and education. Research is encouraged and monitoring and surveillance needs are constant.

Taking of all resources identified in this zone will be by permit.

Each of the Resource Use Zones will be subject to a site-specific development plan addressing issues of timber and non-timber target species, silviculture, plantations, harvesting, access,

permitting, recreation, tourism, and education; all in the overall context of watershed conservation. Responsibility for the preparation of the development plan will be held jointly by the adjacent community and the Department. Approval of the plan will be held by the Minister.

Figure 2 shows the zoning plan for the two Reserves.

Approximately 87% of the Grand Etang Forest Reserve and Annandale Forest Reserve is zoned for conservation. This zoning protects the best remnants of the major forest communities, the steep ridge slopes and the majority of the tributary of the Great River. The nursery is included in this zone.

Approximately 5% of the Grand Etang Forest Reserve and Annandale Forest Reserve is zoned for recreation. This zone centres on the development of the Grand Etang including the visitor centre and the associated concessions as well as the developed day-use area at Grand Etang Lake. This zone includes the St. George's-Greenville Highway and associated trailheads as well as all existing and potential trailheads and community gateways to both the Reserves. It also includes NAWASA infrastructure facilities and the communication sites at Hurricane Ridge (1910).

Approximately 100 hectares or 6% of the Grand Etang Forest Reserve and 60 hectares or 25% of the Annandale Forest Reserve is zoned for resource use.

3.4 Regulations and Enforcement

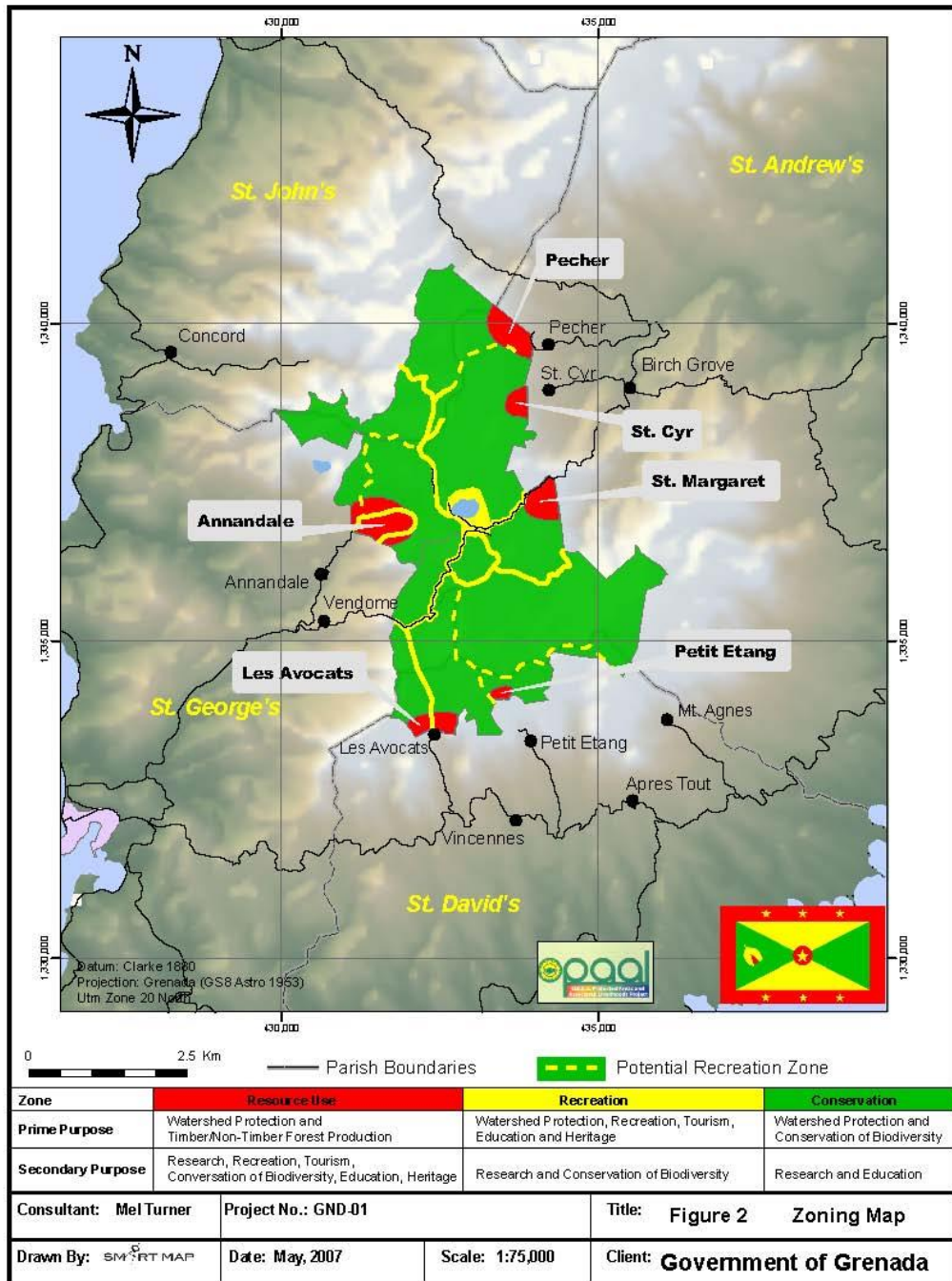
Both Forest Reserves are managed under regulations accompanying the *Forest, Soil and Water Conservation Act*. However, the regulations are not well publicized through brochures and on-site signage and are not well enforced by staff.

Objectives

- To ensure existing regulations are understood by staff and the public and are enforced;
- To ensure pending regulations accompanying the proposed legislation are incorporated when approved.

Key Actions

- provide information on key regulations at all in-Forest information outlets including the Visitor Centre, trailheads and entrance portals;
- ensure all staff, in particular, ranger staff, are fully trained in the regulations and their enforcement including ticketing and judicial process;
- ensure all non-government actions are authorized by permit;
- ensure permittees are aware of relevant regulations to their permit;



3.5 Conservation, Recreation and Resource Use Management

In support of the Reserves' goals and the zoning plan, this section addresses the elements of the plan, states their objective(s) and key actions required to meet the objective(s).

Figures 3 and 4 display some of the Key Actions for conservation, recreation and resource use management.

3.5.1 Soils and Landforms

Soil conservation is fundamental to water conservation and the protection of the forest communities. The combination of high rainfall and steep slopes in the Forest Reserves tend to exacerbate erosion of the clay soils.

Objective

- To minimize soil erosion caused naturally in the Forest Reserves and by developments undertaken in the resource use and recreation zones.

Key Actions

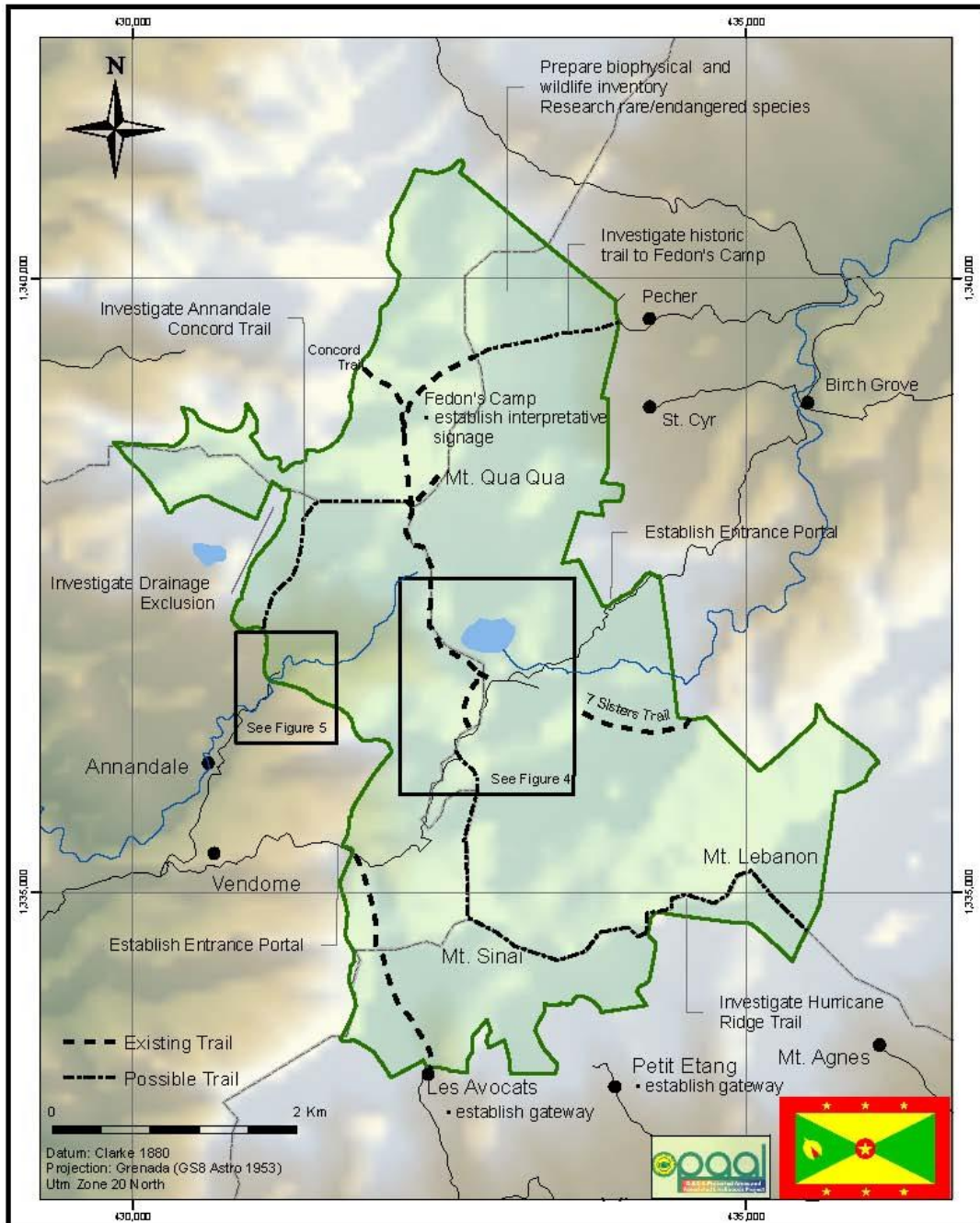
- ensure best practices to control siltation during facility construction;
- evaluate slide areas and, if possible, encourage natural re-vegetation through erosion abatement measures and re-planting;
- maintain drainages to prevent debris blockages and build-ups.

3.5.2 Vegetation

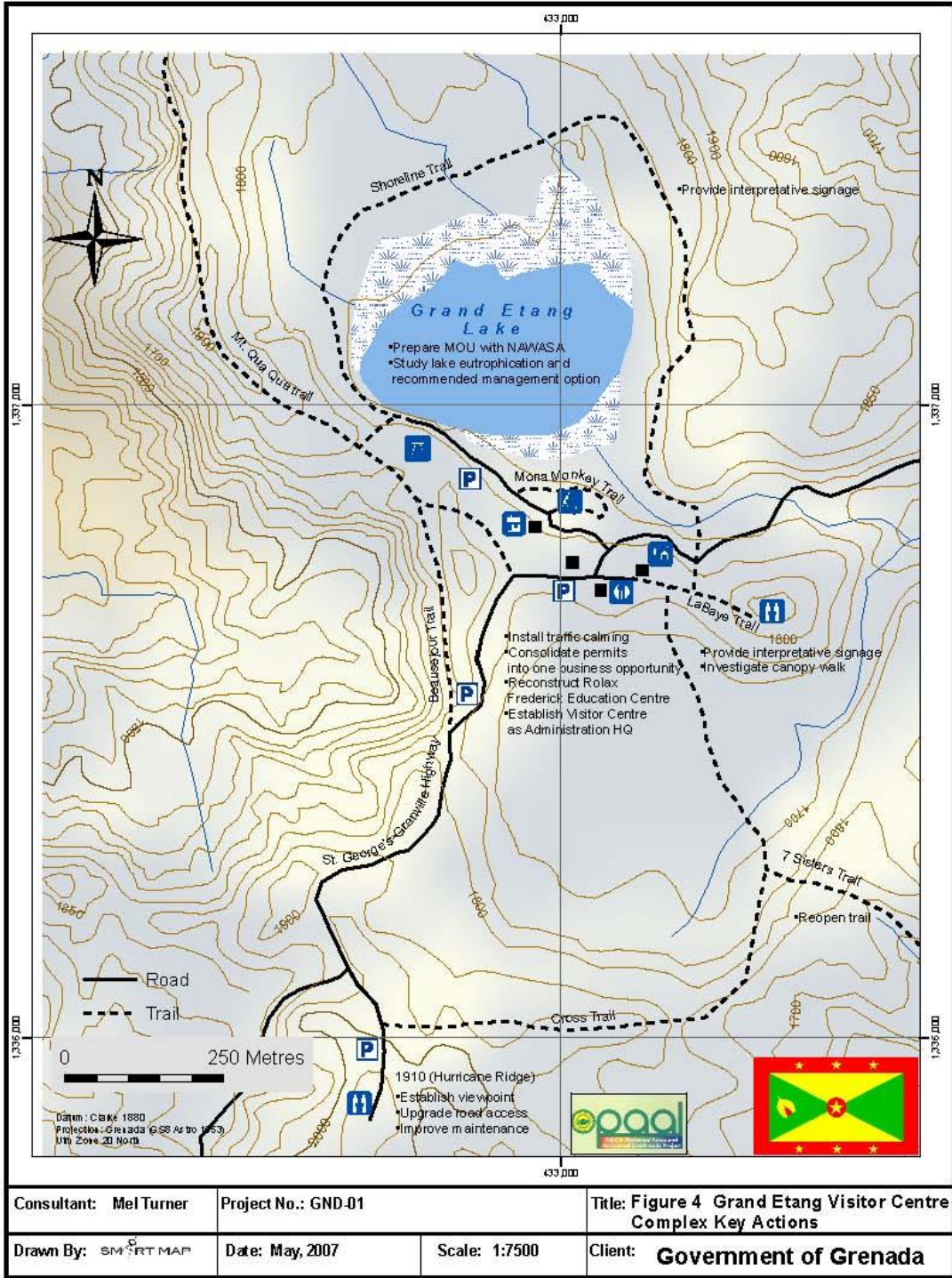
The protection of the forest communities is also essential to water conservation as well as conserving biodiversity, providing wildlife habitat and contributing to the sustainable livelihoods of local communities.

Several plantations have been developed over the years, including the nursery. However the history of the plantations, including mapped locations, species planted, success and failures, infestations, volumes, silviculture methods practiced and so on is all in the memories of the staff and presently not recorded. As such, as staff move on, so does institutional knowledge.

In addition, local communities, with the exception of Annandale and Vendome, have not been fully engaged on identifying their needs for timber or non-timber forest products in the plantations or on adjacent and accessible Forest Reserve lands.



| | | | |
|------------------------|---------------------|-----------------------------|-------------------------------|
| Consultant: Mel Turner | Project No.: GND-01 | Title: Figure 3 Key Actions | |
| Drawn By: SMART MAP | Date: May, 2007 | Scale: 1:40,000 | Client: Government of Grenada |



| | | | |
|------------------------|---------------------|--|-------------------------------|
| Consultant: Mel Turner | Project No.: GND-01 | Title: Figure 4 Grand Etang Visitor Centre Complex Key Actions | |
| Drawn By: SMART MAP | Date: May, 2007 | Scale: 1:7500 | Client: Government of Grenada |

At Annandale and Vendome, the public has been engaged in the development of the draft Annandale Forest Reserve management plan in 2002 and the most recent review in 2006. (Espeut, 2006).

Although this plan addressed possible livelihood opportunities that could occur in the Annandale Forest Reserve, specific issues of timber and non-timber target species, their abundance and location, silviculture treatments to ensure their sustainability, access, permitting including necessary conditions, site planning for recreation and eco-tourism development including trailhead and trail development as well as establishment of partnerships had not yet been addressed and documented.

These issues should be addressed thorough the preparation of a site-specific development plan for that area of the Annandale Forest Reserve identified for contributing to associated livelihoods (resource use zone and recreation zone) as shown in Figure 5. The plan should be jointly prepared in more detail, as described in Section 3.3 and below in Key Actions, by the Department and the Annandale/Vendome community. Once approved by the Minister, the plan should be implemented.

The preparation process and the site-specific development plan can be used as a model for the preparation of other plans by other communities adjacent to the resource use zones at Les Avocats, Petit Etang, St. Margaret, St. Cyr and Pecher.

The Department maintains a nursery near the St. George's-Grenville Highway at the west end of the Grand Etang Forest Reserve. The nursery provides stock for all forested areas, including private lands.

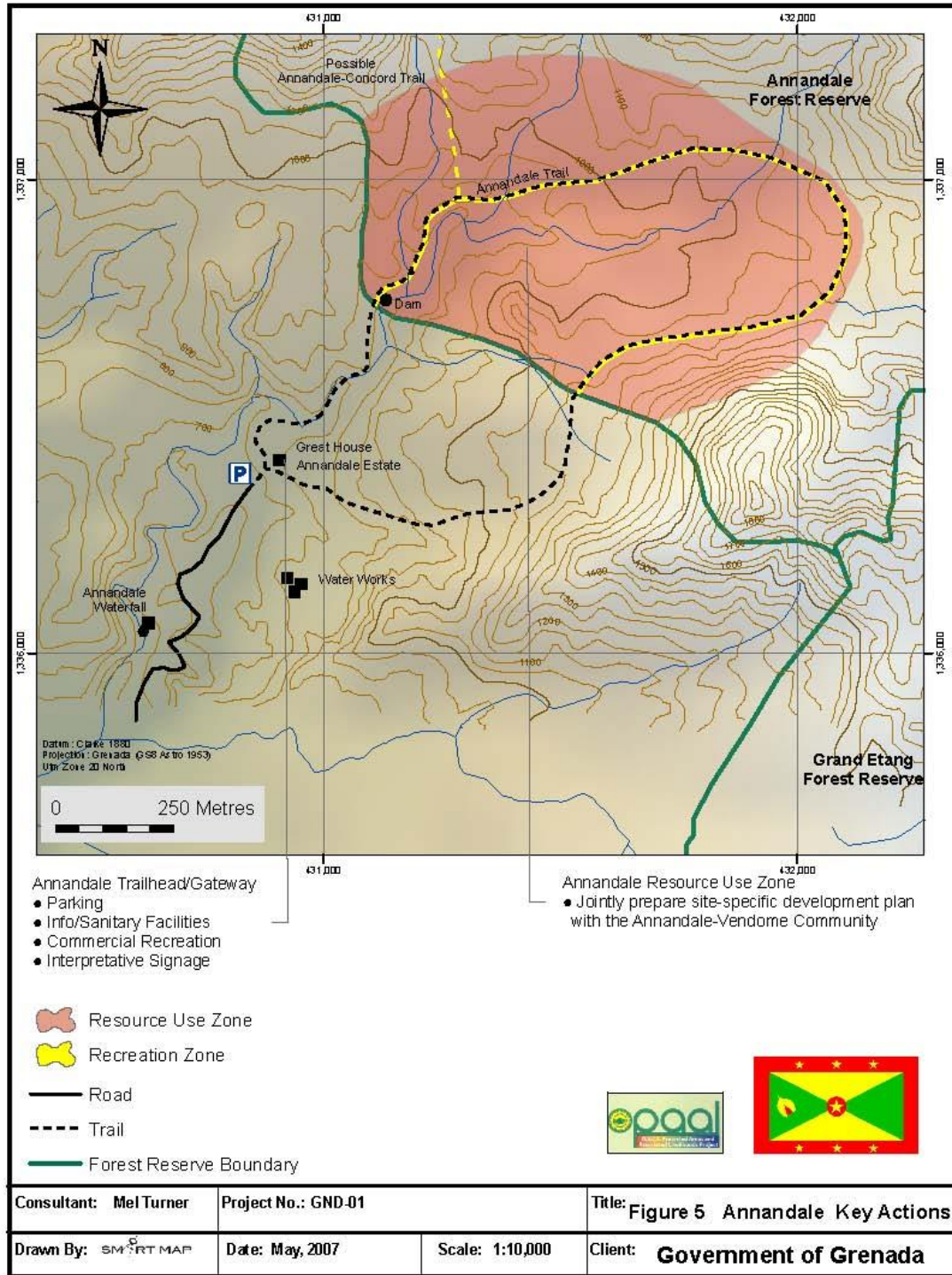
Objectives

- To protect the forests;
- To provide livelihood opportunities associated with timber and non-timber product production in the resource use zone of the Forest Reserves;
- To maximize the return on commercial resource use products.

Key Actions

- prepare a biophysical inventory (1:10,000) of the Forest Reserves;
- based on the biophysical inventory, and in association with the local community, prepare sustainable site-specific development plans for each resource use zone addressing issues of target species, silviculture, harvesting, access and permitting as well as recreation and tourism;
- establish/update resource use fees, based on, at a minimum, cost recovery, for timber and non-timber forest products;
- prepare and execute agreements for the sustainable production of timber and non-timber forest products in the resource use zone;
- based on the biophysical inventory, conduct research on rare and/or endangered species; conduct ethno-botany research into non-timber forest products;

- continue, and upgrade for shade and water, the nursery operation as a means to encourage conservation and watershed protection;
- prepare a fire suppression plan and provide equipment and training.



3.5.3 Water

The significance of the Reserves for water supply for local communities is paramount, however little is known about the Reserves' hydrological cycle and no formal agreement exists between the Department and NAWASA on water management.

The open water surface area of Grand Etang Lake has gradually diminished over time as the Lake, like all lakes, naturally fills in with sediments and the attendant vegetation. This process has raised concerns about loss of scenic and tourism values associated with the Lake, as well as loss of water storage capacity, and has led to calls for action to be taken.

The Annandale Forest Reserve boundary has not been placed on cadastral and terrestrial mapping as yet, but it appears that a drainage of the Annandale watershed at the most northerly point has not been included in the Reserve.

Objectives

- To protect the watersheds to ensure constant and continuing supply of water to Grenada's communities;
- To consider science based options, including taking no action, to address the in-filling of the Lake.

Key Actions

- in association with NAWASA, conduct research to measure rainfall inflows and stream flows in the Reserves;
- prepare and execute a memorandum of understanding with NAWASA to deal with issues of future water demand, existing water management, maintenance of water levels at Grand Etang Lake, sedimentation, environmental impacts of future water infrastructure and information sharing (see Section 3.2 Key Actions);
- as part of the memorandum of understanding, establish a continuing watershed improvement account, funded by NAWASA, to provide financial assistance to the Department for studies and developments associated with forest conservation, planting and silviculture treatments in the Forest Reserves:
- ensure stream setbacks (15 metres) for all recreation or resource use developments;
- in association with relevant Ministries, NAWASA and the public, prepare a scientific study of the in-filling of Grand Etang Lake, outlining the existing conditions and values of the Lake;
- based on the results of the scientific study, develop management options and mitigation measures to address the issue, assess their environmental impact and review options with the public and make recommendations to Government;
- pending final mapping of the Annandale Forest Reserve's boundary, determine the status of the most northerly tributary drainages. If they are excluded from the Reserve, consider their acquisition to ensure the watershed protection and integrity of the Reserve;
- in conjunction with adjacent landowners, encourage best practices for water conservation on adjacent lands.

3.5.4 Wildlife

Although some general wildlife information has been gathered and research conducted on the Mona monkey, specific inventories, species lists and habitat needs have not been assessed. This information is significant to meeting Grenada's commitments to biodiversity, in measuring impacts of future developments in the recreation and resource zones and in possible species reintroduction.

Currently, hunting is prohibited in the Grand Etang Forest Reserve and permitted in the Annandale Forest Reserve. The draft *Protected Area, Forestry and Wildlife Act* would prohibit hunting in both Reserves.

Objectives

- To protect wildlife species and habitat in the conservation zones, particularly endemic, rare and threatened species;
- To manage wildlife species and habitat in the recreation and resource use zones:

Key Actions

- in conjunction with the biophysical inventory, conduct wildlife inventory and identify habitat requirements;
- study the extirpation of native species and consider a reintroduction program;
- in conjunction with the biophysical inventory, encourage research on rare and/or endangered species;
- based on the inventory, establish fishing regulations.

3.5.5 Culture

Although cultural heritage in the Reserves appears limited to Carib camps, colonial rebellion and the estate developments of Sir William Branch, old maps show historic trails linking mountain communities with each other and the forests for hunting and gathering and social interactions.

Objective

- To preserve and present the Reserves' culture and heritage values.

Key Actions

- encourage research and education and interpretive programs on the Reserves' Carib and colonial rebellion past and estate developments;
- establish cultural interpretive signage at the Visitor Centre and at Fedon's Camp in the Grand Etang Forest Reserve and at the gateway to the Annandale Forest Reserve;

- investigate the location of the historic trails and camps linking Annandale with Concord, Petit Etang and Mount Agnes communities with the forest ridge of Mt. Sinai and the Pecher community with Fedon's Camp and Concord.

3.5.6 Recreation

For the most part, recreation in Grenada's mountains is confined to the two Forest Reserves. With day-use developments for viewing and picnicking at Grand Etang Lake and the Visitor Centre and with some 35 kilometres of trails for hiking, viewing, nature and cultural interpretation and sightseeing, the Reserves offer excellent recreation opportunities in the Central Mountains.

Prior to Hurricane Ivan, all of the trails identified in Appendix 2 in the Grand Etang Forest Reserve were open and signed at the trailheads. As well, interpretive signing was placed along the trail and associated trail brochures were available. Today, all of the trails require maintenance. The Seven Sisters Trail remains closed and no signage or trail information is readily available.

Recreation opportunities at the Annandale Forest Reserve include hiking the old estate road, interpretation and education associated with natural and cultural resources and hunting. The development at Annandale Falls offering viewing, walking, bathing and interpretation and education opportunities, will always be the focus for the Annandale community. Encouraging those visitors to continue and visit the Forest Reserve will be a priority.

Objective

- To maintain and encourage existing recreation opportunities and develop new opportunities.

Key Actions

- maintain the park-like atmosphere of the Grand Etang Visitor Centre and Grand Etang Lake Day Use Area, upgrade park furniture and provide potable water and disabled access to all facilities;
- request Ministry of Works to define the parking area and install traffic calming at the Visitor Centre complex to increase visitor safety;
- maintain the existing trails and meet trail maintenance standards;
- re-open the Seven Sisters Trail;
- provide interpretive signage at the Morne LaBaye Trail, Annandale Trail and the Shoreline Trail;
- establish trailheads with informational signage for the Shoreline, Beausejour, Cross, Mt. Qua Qua, Seven Sisters, Concord, Annandale, Vendome, Les Avocats Trails;
- establish directional and informational signage at all trail junctions;
- establish the Mona Monkey Loop Trail as a short interpretive trail;
- upgrade the access road at 1910 (Hurricane Ridge) to paved status and ensure communication companies clean up their sites;

- establish a viewpoint, with disabled access, at Hurricane Ridge;
- pending the investigation of the Annandale-Concord, Petit Etang and Mount Agnes historic trails, consider reopening them as historic and eco-tourism trails to Hurricane Ridge and link to Mt. Qua Qua-Concord as a long distance, Cloud Forest ridge hike;
- investigate the opportunity to develop a rainforest canopy walk in association with the Morne LeBaye Trail;
- establish and interpret gardens of natural forest species such as orchids and ferns at the Grand Etang Visitor Centre.

3.5.7 Commercial Recreation

Except for the Grand Etang Visitor Centre complex, commercial recreation is managed by the Department of Forestry and National parks. Currently, six tour companies provide designated tours to visitors in the Reserves. In addition to the drive-through tour accessed by the St. George's-Grenville Highway and stopover at the Visitor Centre and/or Grand Etang Lake, several tours include guided hikes to Mt. Qua Qua, Seven Sisters and St. Margaret Waterfalls and Fedon's Camp. The most popular access to St. Margaret Waterfall traverses private land at St. Margaret. Visitors can leave their vehicles in a protected parking lot, obtain a guide, as well as food and beverages, and visit the waterfall⁴.

At the Visitor Centre, including the vacant portion, and its surrounding grounds, commercial recreation is managed by the Ministry of Tourism with services provided by a variety of private sector concessionaires under annual service agreements. These agreements are monitored by the Ministry from St. George. Ministry of Tourism on-site staff provides security, entrance fee collection, information at the Visitor Centre and maintenance of the grounds and buildings. Staff supervision at Grand Etang is provided by contract.

The fees charged by the Ministry of Tourism to the private sector concessionaires appear to have no relationship to the actual business value of licenses. Similarly, the fees charged to the visitors to Grand Etang, \$1US, appear to have no relationship to the services provided, are not enforced on Grenadian residents and are confusing (Section 2.4).

Appendix 3 shows entrance fees for other tourism facilities in the Caribbean.

As identified in Section 3.2, this duplication of management responsibilities leads to inefficiencies and uncertainty for both program policy and delivery.

Currently, no commercial recreation opportunities have been developed at the Annandale Forest Reserve. However, similar to the existing provision of services at St. Margaret, an excellent opportunity exists, in possible partnership with the adjacent landowner and others, to provide both recreation and commercial recreation and eco-tourism opportunities associated with the developed facilities at Annandale Waterfall.

⁴ Livelihoods can also be provided by protected area managers not taking action. By not reopening the St. Margaret's Waterfall Trail at the Gate after the Trail's closure by Hurricane Ivan, the adjacent community met the trail access need privately, employing five people.

Commercial recreation and eco-tourism provides the significant opportunity for sustainable livelihoods associated with both Forest Reserves.

Objectives

- To encourage livelihood opportunities associated with commercial recreation opportunities within the context of the zoning plan;
- To maximise the return on entrance and service agreement concession fees to the Government.

Key Actions

- consolidate all business opportunities at the Grand Etang Visitor Centre complex into one business enterprise permit and advertise for the private sector delivery of those services including food and beverage sales, craft sales and interpretive guiding. Assuming a successful bid, negotiate and award the contract for a medium term;
- conduct a study on the current and potential economic tourism value of the Reserves to the Government's treasury;
- based on the economic study and social policy considerations, adjust the entrance fee to Grand Etang Forest Reserve and set an entrance fee for Annandale Forest Reserve that reflects the costs of provided public services;
- encourage local communities and the private sector to develop or upgrade gateway sites on the Reserves' boundary, adjacent to existing trailheads (Concord, Vendome and Les Avocats) and possible trailheads (Petit Etang, Pecher, Mount Agnes and Annandale), for guiding services and food and beverages and craft concessions;
- upgrade the public road to Annandale Forest Reserve to the vicinity of the "Great House" and in partnership with adjacent landowner, establish trailhead, parking, information and sanitary facilities;
- ensure all guides operating in the reserves are appropriately trained and permitted;
- encourage tour operators and the Annandale community to promote commercial recreation associated with the Annandale Trail.

3.6 Public Education and Awareness

In an effort to meet the goals of the Reserves, it is essential that the public, as well as government, has easily accessible information and complete awareness of the Reserves: their location, their values and their management.

Prior to Hurricane Ivan, public awareness of the Reserves and associated education was much higher than today. Brochures on trails had been produced, trailhead signage was in place and research projects had been completed. The Grand Etang Visitor Centre hosted seminars, workshops and conferences.

Objectives

- To provide and increase public education and awareness of the Forest Reserves;
- To strive to develop the Visitor Centre complex as the Caribbean leader in Tropical Rainforest eco-tourism through interpretation and education programs.

Key Actions

- reconstruct the Lake House as the Rolax Frederick Education Centre and encourage schools to visit the Reserves as part of their curricula and stay overnight at the Centre;
- organize and conduct special events associated with Tropical Rainforest conservation;
- establish partnerships with NAWASA, the Ministry of Tourism and the Board of Tourism to increase awareness of the Reserves;
- in association with partners, establish highway signage at the egress/access of the Forest Reserves and at key highway junctions leading to trailheads;
- in association with partners, produce a brochure for the Reserves outlining their goals and key objectives, their location and access and important management messages such as features, opportunities, safety and conduct and link brochure to the government and tourism web sites;
- in association with partners, produce a poster of the Reserves and other Grenadian protected areas in an effort to encourage awareness and visitation, and distribute to tourism and accommodation outlets, local communities and schools;
- mark the boundary of the Reserves at all access/egress points, including entrance portals on the St. George's-Grenville Highway and meet with adjacent neighbours to confirm boundaries;
- encourage media outlets to increase awareness of the Reserves through print articles and television/radio productions; in particular those with communication facilities at Hurricane Ridge;
- provide uniforms for the rangers so they are easily identifiable;
- encourage research and education, by school, institutions and community groups as well as the global community, in the Forest Reserves;
- prepare and execute a communication plan;
- encourage NAWASA to maintain safety fencing at its dam structures and provide interpretive signing on watershed conservation;
- design and use a keepsake entrance ticket stub for Grand Etang and make available a "passport" stamp for use at the Visitor Centre.

3.7 Administration

The Department of Forestry and National Parks manages the Forest Reserves, except for the Grand Etang Visitor Centre and its associated concessions and facilities, from its Queens Park Headquarters. Program staff, reporting to the Chief Forestry Officer, manages recreation

facilities, forest conservation, upland watersheds, mangrove and coastal woodlands and tree establishment for all areas throughout Grenada that are managed by the Department.

Three permanent forest rangers, five non-established (auxiliary) foreman and 22 non-established (auxiliary) field staff provide day-to-day management services, including surveillance, reporting, silviculture and road and trail maintenance of the Forest Reserves. The Queens Park Headquarters is the point of assembly for all staff.

The Ministry of Tourism has 19 staff responsible for security, fee collection, cleaning, landscaping and greeting visitors at the Visitor Centre.

This plan proposes to bring the management of all matters, including recreation and tourism at the Grand Etang Visitor Complex, under the Department of Forestry and National Parks in an effort to address inefficiencies and duplication of services and ensure protection of the Forest Reserves' resources⁵.

3.7.1 Staffing

To effectively manage both Forest Reserves and implement the management plan, some modifications should be made to the existing, approved Department organization chart. Specifically, the operational component of the two Forest Reserves should be placed under one Forest Officer, responsible for all matters in the Forest Reserves and reporting directly to the Chief Forestry Officer. The point-of-assembly for the operational arm should be located at the Grand Etang Visitor Centre, not only for effective management, but also on-site presence.

Operational staff currently servicing the two Forest Reserves, including the existing Forest Rangers, Foremen and Field Workers, would also base themselves out of the Grand Etang Field Office. The Forest Rangers, reporting to the Grand Etang/Annandale Forest Officer, would be responsible for one of three geographic areas (Grand Etang, Annandale and Boundary including Les Avocats, Petit Etang and St. Margaret) and would also assume the added duty of Foreman supervision for each of the areas.

Ministry of Tourism staff would be transferred to the Department of Forestry; actually transferred back as the management of the Visitor Centre complex was recently with the Department. As visitor services staff and field staff, they would report to the Forest Ranger responsible for the Grand Etang Visitor Centre complex.

The nursery would be a separate management unit within the Grand Etang operation, reporting directly to the Grand Etang/Annandale Forest Officer.

An Advisory Committee (Section 3.10), reporting to the Forestry Officer, is also recommended as part of the organizational structure.

⁵ Pending the filling of current vacancies in the Department's approved organization chart and the acceptance of the administration and staffing components of this plan, the existing Department organization, oriented by various Department programs, will continue to apply.

Figure 6 shows the proposed organizational chart for the operational arm.

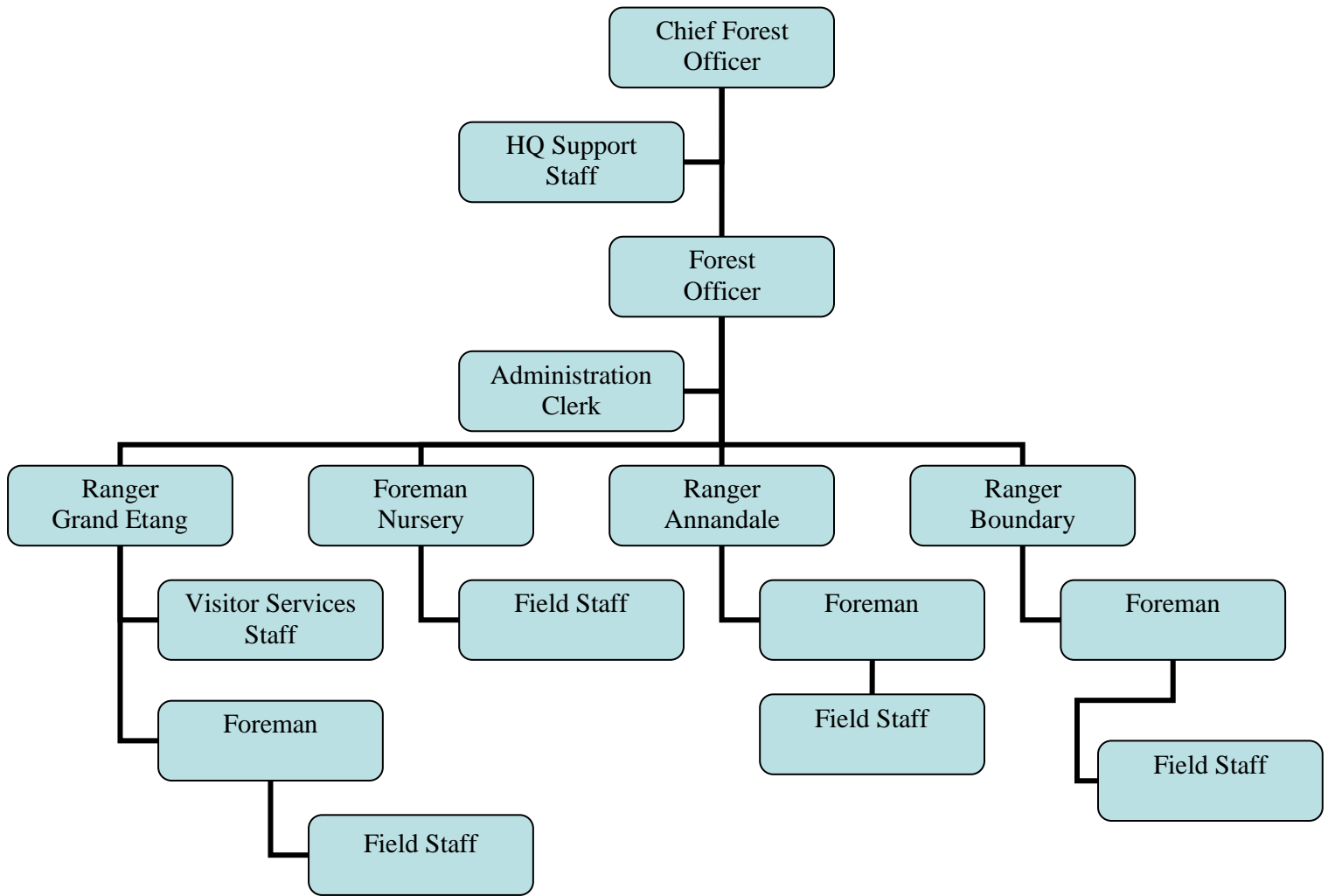


FIGURE 6 Proposed Grand Etang/Annandale Forest Reserve Organization Structure

With the exception of the Grand Etang/Annandale Forest Officer, the operational complement is the same as currently exists within both the Department of Forestry and National Parks and the Ministry of Tourism. In essence, the only organizational changes are point-of-assembly for Department of Forestry and National Park staff and change in supervisor reporting for some Department of Forestry and National Park staff and all the Grand Etang Ministry of Tourism staff. The existing Ministry of Tourism supervision contract, now redundant, can contribute to the establishment of the Forest Officer position.

Although indirect, the other two vacant Department Unit head positions at the Queens Park Headquarters (Wildlife Conservation and Forest Recreation) should also be filled to provide needed support, not only to these Forest Reserves, but other reserves and protected areas under the Department's management.

Objective

- To simplify the delivery of effective and efficient protected area management services

Key Actions

- as noted in Section 3.2, transfer Ministry of Tourism responsibilities, staff and equipment to the Department of Forestry and National Parks Department;
- establish Forest Officer position, reporting to the Chief Forestry Officer, responsible for all operational matters in both Reserves;
- reassign reporting relationships for the Grand Etang and Annandale Forest Reserve's existing ranger, foreman and field staff, including nursery staff and the transferred Ministry of Tourism staff as shown on Figure 6;
- establish Grand Etang Visitor Centre complex as point-of-assembly, using the unused portion of the Visitor Centre as administration offices;
- fill existing vacancies for WL and FC officers in overall support of forest conservation programme

3.7.2 Training

Training and assessment needs have previously been identified (Parsram, 2007) as part of the Capacity Building component of the OECS Protected Areas and Associated Livelihood Project. The assessment recommended the following training required:

At the national level

- organizational management and leadership
- communications
- project management
- fundraising
- protected areas financing
- identifying and building partnerships
- networking techniques
- community outreach and management
- integrated conservation and development planning
- participatory processes
- planning methods and management plan development
- protected areas regulation protection and enforcement
- protected areas systems and network planning
- tourism/associated livelihoods strategic planning operations
- education and awareness strategy/methods/tools

At the site level

- product development and marketing
- organizational management and leadership
- tour guiding skills
- cooperation/collaboration partnerships
- communication
- business management
- project development
- environmental education
- customer service training
- communication skills
- negotiation skills
- protected areas planning methods and management plan development
- site operations and management

Objective

- To ensure staff have access to training programs that will enable them to effectively carry out their duties;
- To ensure Advisory Committee members (see Section 3.10) have access to training opportunities to assist them in understanding relevant legislation, regulation and policy associated with Forest Reserves.

Key Actions

- in light of revised organization chart, prepare individual training plans for each staff member and integrate training into their individual work plans;
- adequately fund training as a Department budget item;
- conduct training based on training plans;
- conduct training program for Advisory Committee members on relevant legislation, regulation and policy;
- allow for succession planning

The assessment also identified livelihood training needs for those wishing to provide commercial recreation services or become involved in timber or non-timber forest production. The needs included:

- product development
- project development and management
- communications
- negotiation and conflict resolution
- environmental education
- cooperation and collaboration
- marketing

- organization management and leadership
- tour guiding
- strategic planning
- customer service
- financial resources management
- business management
- health and safety

Objective

- To assist potential commercial recreation service providers as well as non-timber product producers in meeting their training needs.

Key Action

- liaise with the Board of Tourism and other agencies to encourage appropriate training and certification for prospective permittees;

3.7.3 Infrastructure and Equipment

As the two Forest Reserves have been managed for several years, the infrastructure and equipment is, for the most part, in place to implement the management plan. One notable exception is the lack of ‘as-built’ drawings of existing facilities, including trails.

At Grand Etang Forest Reserve, management of the Forest Reserve was, until recently, conducted from the Grand Etang Visitor Centre complex. Currently, the Ministry of Tourism staff conducts operations from the Visitor Centre which includes storage and staff facilities. A portion of the Visitor Centre is now vacant and is available to accommodate the offices and administration of both the Grand Etang and Annandale Forest Reserves. Only furniture, communication equipment and a vehicle, currently provided by the OPAAL program, is required. Other support services and existing equipment can be provided readily from the Queens Park Headquarters.

The major infrastructure investment in the Grand Etang Forest Reserve will be the reconstruction of the Rolax Frederick Education Centre which was heavily damaged by Hurricane Ivan. The major infrastructure investment for the Annandale Forest Reserve will be the upgrading of 500 meters of road to the vicinity of the “Great House”.

Objective

- To establish the Grand Etang Visitor Centre as the operational headquarters for the administration of the Grand Etang and Annandale Forest Reserves;
- To re-establish the Grand Etang Lake House as the Rolax Frederick Education Centre and develop, in association with the adjacent landowner, a gateway/staging area for the Annandale Forest Reserve.

Key Actions

- provide office, communications, staff and visitor safety, field and transportation equipment at the Visitor Centre;
- as part of the existing agreements with communication companies at Hurricane Ridge, negotiate with the companies to provide communication equipment and coverage for Department staff to assist them to carryout their duties;
- obtain funding agreements with partners to realize major capital projects;
- ensure existing facilities are recorded with “as built” plans.

3.7.4 Financial Management

Expenditures for the existing management of the Forest Reserves are financed by the Government Vote, by program, for the Ministry of Agriculture and, in the case of the Grand Etang Visitor Centre complex, for the Ministry of Tourism. Road maintenance in the Reserve is financed by the Ministry of Works. No effort is made in the current Ministry budgets to separate geographically the financial management of the two Forest Reserves from other management responsibilities of the respective Ministries.

The total Vote for the Department of Forestry and National Parks in 2007 in Eastern Caribbean Dollars for all Department responsibilities is \$1.29 million of which \$1.04 million, or 80%, is staff wages and salaries.

Revenue to the Government, realized in the form of entrance fees, sale of timber and vendor agreement fees, is paid directly into General Revenue. The annual amount of the revenue is presently unavailable⁶.

Under the financial management of both Forest Reserves as proposed by this management plan, these existing expenditure and revenue streams will continue as the Forest Reserves are part of an overall forestry and national park government program.

Potential Revenue Sources

Revenue sources for the management of the Forest Reserves will continue to be the Government Vote, the proposed NAWASA watershed improvement account and international assistance, including the OPAAL program.

However, Government Vote should consider that, in addition to the results of the proposed economic study (Section 3.5), revenue attributed to the Forest Reserves, based on expected visitation⁷, an increased entrance fee (see Section 3.5.7)⁸, the business enterprise fees⁹ and permit fees for timber and non-timber forest products, is projected at \$600,000 annually.

⁶ To date, data has not been forthcoming on the existing annual revenue from entrance and permit fees

⁷ 50,000 visits to both Reserves

⁸ \$10 average

⁹ see Turner, 2006

OPAAL PROGRAM

Because the preparation of the management plan is a joint effort between the Government of Grenada and the OECS-ESDU under the OPAAL program, key actions recommended in the plan that might qualify for funding under components of the OPAAL program have been proposed in Appendix 5. It is expected that the Department of Forestry and National Parks will prepare proposals to other funding agencies in keeping with those agency's objectives and the key actions of this plan.

The public review of the management plan in the five communities clearly resulted in two key recommendations having strong community priority and livelihood opportunity:

1. the preparation of joint community/Forestry Department site-specific development plans for each of the six Resource Use zones;
2. the development of the historic trails including Annandale to Concord, Pecher to Fedon's Camp and Petite Etang to 1910. Associated trailhead development and directional signage from primary highways would be a component of the trail development.

OPAAL funding of these two projects would clearly demonstrate to the affected communities that the OPAAL program is committed, in both the short term and the long term, to livelihood enhancement.

Potential Expenditure Streams

Operations and Maintenance

For the most part, this management plan is expenditure-neutral for operations and maintenance based on current Government Vote.

As noted, existing annual operating costs to manage the Forest Reserves are incorporated in global Department and Ministry budgets. However, wages and salaries for established and un-established staff, at 80%, are the largest budget expenditure. Based on existing staffing levels of both the Department of Forestry and National Parks and the Ministry of Tourism at the Forest Reserves, direct staffing costs are estimated at \$750,000 annually.

As identified in Section 3.7.1, the proposed staffing under the revised organization for operations remains constant except for the addition of a Forest Officer reporting to the Chief Forester. The additional staffing cost (\$60,000) would be partially offset by the cancellation of the now-redundant contract currently in place to supervise the Ministry of Tourism staff at the Grand Etang Visitor Centre complex. An additional \$40,000 would be required to provide some new equipment to the Grand Etang Field Office. The OPAAL vehicle would be assigned to the Field Office.

No other significant operation costs are forecast initially as the proposed organization generally involves a shift in reporting relationships and a shift of equipment to the Grand Etang Field Office.

In total, increased operations and maintenance expenditures would be \$100,000 in Phase 1 (Section 3.11)

Phases 2 and 3 would see an annual lift of \$20,000 for the provision of training needs for staff and advisors as outlined in 3.7.2.

Capital Maintenance/Resource Management

The continuing recovery from Hurricane Ivan necessitates significant capital maintenance expenditures. Fortunately, organizations such as the Agency for Reconstruction and Development and the Canadian International Development Agency have established funding assistance programs to aid in capital maintenance projects associated with disaster recovery.

For this management plan, a capital maintenance/resource management program of \$900,000 is proposed including the reconstruction of the Rolax Frederick Education Centre (\$400,000), the study of the Grand Etang Lake and the preparation of management options (\$200,000), trail maintenance (\$100,000) and the provision of highway, trail and interpretive signage (\$200,000).

The Grand Etang study would be initiated in Phase 1.

Capital New

The management plan also proposes new capital developments including the Mona Monkey Interpretive Trail (\$30,000), a canopy walk (\$100,000), the Annandale Gateway (\$100,000) and, based on a previous study, improvements to the nursery (\$300,000). A combination of a financial lift to the Department, the provision of continued international financial assistance and private sector partnerships should address new capital needs.

Table 1 outlines the overall budget needs.

TABLE 1 REQUIRED INCREASE to 2007 BUDGET¹⁰

| Budget Item | Phase 1 | Phase 2 | Phase 3 |
|---------------------|-----------|-------------------------|-------------------------|
| Operations | \$100,000 | \$20,000 ¹¹ | \$20,000 ¹² |
| Capital Maintenance | \$200,000 | \$700,000 ¹³ | |
| Capital New | | \$230,000 ¹⁴ | \$300,000 ¹⁵ |

¹⁰ Budget refers to existing Department of Forestry and National Parks and transferred Ministry of Tourism Grand Etang Visitor Centre component

¹¹ Estimated training needs

¹² Estimated training needs

¹³ Contribution funding

¹⁴ Contribution funding

¹⁵ Contribution funding

In summary, actual operations and maintenance expenditures beyond the present Vote are primarily directed to the new Forest Officer position and staff and advocate training. These expenditures should be recovered by the significant increase in expected revenue from entrance and permit fees.

Capital new and capital maintenance projects are expected to be supported by contributions from existing disaster relief programs, international assistance programs and private sector and non-government organization partners.

3.8 Monitoring and Evaluation

Monitoring and evaluation includes two components:

1. environmental and social site studies and assessments of the two Forest Reserves;
2. review of the progress of implementing the key actions in the management plan.

The OPAAL project has endorsed the use of the World Wildlife Fund-World Bank Alliance Scorecard, with adaptations, to assist in reporting on the effectiveness of management of protected areas in the OECS region. The Scorecard, listing general criteria including legal status, enforcement, boundary demarcation, inventory, awareness, management needs, stakeholder involvement and facilities, is helpful in providing a basic structure and standard for assessing effective management.

In 2006, the initial Scorecard was completed for both Reserves. It is the Department's intention to update the Scorecards on an annual basis to chart progress.

In addition, the OPAAL project prepares environmental and socio-economic site assessments and baseline studies in an effort to evaluate potential impacts of project interventions, identify appropriate safeguards and mitigation measures, facilitate environmental screening of potential livelihood activities and identify those activities that are incompatible with the management plan due to negative environmental and social impacts. To date, these assessments and baseline studies have not been conducted on the Forest Reserves.

The Scorecard reflects a state-of-the protected area snapshot and the studies and assessments provide a base from which to measure overall changes. While helpful for comparison purposes with other areas in both Grenada and elsewhere in the Caribbean, monitoring and evaluation also needs to be specific to the management plan and the key actions identified in the plan.

Objective

- To conduct environmental and socio-economic site assessments and baseline studies;
- To monitor and evaluate the progress on the implementation of key actions identified in the management plan.

Key Actions

- undertake site assessments and baseline studies;
- incorporate key actions, by priority, into the Department's annual workplan and the individual workplans for staff;
- formally monitor workplans quarterly and report as part of the Department's quarterly review;
- formally review progress on implementing key actions of the management plan with the Advisory Committee (see Section 3.10) on an annual basis.

3.9 Disaster Management

Hurricanes pose the greatest disaster threat generally, however local land slides or spills associated with highway accidents are also constant threats.

Objectives

- To minimize damage to the Forest Reserves' resources posed by potential disasters;
- To ensure as safe an outdoor environment as possible for staff and visitors.

Key Actions

- develop a disaster management plan for the site;
- ensure all facilities, including permitted facilities, are designed to minimize disaster threats;
- establish interpretive signage to highlight the recovery of the Grand Etang and Annandale Forest Reserves from Hurricane Ivan;
- establish emergency response protocols and plans for highway accidents with the Ministry of Works;
- prepare safety plans for staff and visitors.

3.10 Consultation and Involvement in the Management Plan Process

The Forestry and National Parks Department, led by its widely acclaimed initiative of public involvement for the development of its 1999 Forest Policy, has a strong history of consultation and public involvement in policy development.

The development of this plan included many consultations (Appendix 4) from individuals, companies, and government and non-government agencies and the involvement of the communities of Vendome, Annandale, Birch Grove, Apres Tout, Vincennes and St. George's. In total, over 80 people attended the public consultative process to review the draft management plan in the five communities. The support garnered from public consultation is essential to the approval and implementation of the management plan.

Objective

- To consult, involve and empower the public in the review of future management planning processes and in the preparation and review of associated resource use development plans, permits and environmental impact processes.

Key Actions

- appoint an Advisory Committee with membership from the local communities, business community, naturalists and recreation users to provide counsel to the Forest Officer responsible for the Grand Etang/Annandale Forest Reserves on existing and emerging issues as they relate to the Forest Reserves, including reviewing and recommending permits;
- engage and empower local communities adjacent to the Resource Use zones in the joint preparation of site-specific development plans with the Department;
- provide training to staff and local communities on consultation methods and to local communities and advisors on government policies, regulations and legislation as it applies to the Forest Reserves;
- initiate public review of management options to based on the scientific study of Grand Etang Lake;
- establish an honouraria policy to assist members of the public who are appointed to planning and advisory committees.

3.11 Plan Implementation Strategy

Implementation of approved management plans is limited by many factors including other Department priorities, other Government priorities and availability of funding and human resources. As such, no attempt has been made to place dates on plan implementation.

This plan includes a significant number of key actions, some of which are dependent upon the completion of others. These key actions have been prioritised into three phases.

Phase 1 Immediate Action

These key actions are generally Government-led and can be implemented by the Department and/or Ministry own forces as part of individual workplanning and shifting management responsibilities. For the most part, these actions can be implemented within existing Government budgets. In some instances though, key actions will require outside funding assistance.

Phase 2 Short Term

These key actions are slated for the short term and often involve a lift in human and financial resources for the managing Department. They are the basis for long term actions and decision making.

Phase 3 Long Term

These key actions are sometimes continual and generally dependent upon the completion of short term actions. In many instances, they require significant outside funding assistance as their implementation is usually beyond the ability of the managing Department, Ministry and Government because of other Government priorities.

Table 2 lists all the key actions identified in the management plan and their priority. The Table also identifies how each key action will be funded, by;

- outside funding assistance.
- own forces of the Department of Forestry;
- a lift from the Ministry of Agriculture;

| TABLE 2 PLAN IMPLEMENTATION STRATEGY | | | | | | |
|---|-------|---|---|-------------|------------|---------------|
| Key Actions | Phase | | | Outside Aid | Own Forces | Ministry Lift |
| | 1 | 2 | 3 | | | |
| 3.1 Institutional Arrangements | | | | | | |
| encourage regulations | | | | | | |
| transfer management | | | | | | |
| consider park designation | | | | | | |
| develop policies | | | | | | |
| prepare MOU's | | | | | | |
| conduct EIA's | | | | | | |
| 3.4 Regulations & Enforcement | | | | | | |
| provide information | | | | | | |
| ensure training | | | | | | |
| ensure awareness | | | | | | |
| 3.5 Conservation, Recreation & Resource Use Management | | | | | | |
| 3.5.1 Soils | | | | | | |
| ensure best practices | | | | | | |
| rehab slide areas | | | | | | |
| maintain drainages | | | | | | |

| | | | | | | |
|--|--------|---------|--------|-------------|------------|---------------|
| 3.5.2 Vegetation | | | | | | |
| conduct inventory | Yellow | | | Red | Red | Red |
| prepare resource use plans | Yellow | Yellow | | | Red | |
| execute agreements | Yellow | | | | Red | Red |
| conduct research | Yellow | | Yellow | Red | | Red |
| upgrade nursery | | Yellow | | | Red | Red |
| prepare fire plan | Yellow | | | | Red | |
| 3.5.3 Water | | | | | | |
| conduct research | Yellow | Yellow | Yellow | | Red | Red |
| prepare MOU | Yellow | | | | Red | |
| ensure setbacks | Yellow | Yellow | Yellow | | Red | |
| prepare Lake study | Yellow | | | Red | Red | Red |
| develop/recommend options | | Yellow | | Red | Red | Red |
| determine tributary status | | | Yellow | | Red | |
| Table 2 continued | 1 | Phase 2 | 3 | Outside Aid | Own Forces | Ministry Lift |
| 3.5.4 Wildlife | | | | | | |
| conduct inventory | | Yellow | | Red | Red | Red |
| study extirpation | | | Yellow | Red | Red | Red |
| encourage research | Yellow | Yellow | Yellow | Red | Red | Red |
| establish fishing regulations | | Yellow | | | Red | |
| 3.5.5 Culture | | | | | | |
| encourage research/education | Yellow | Yellow | Yellow | Red | Red | Red |
| establish signage | | Yellow | | | Red | Red |
| investigate historic trails | Yellow | | | Red | Red | Red |
| 3.5.6 Recreation | | | | | | |
| improve existing facilities | | Yellow | | | Red | Red |
| request traffic calming | Yellow | | | | Red | |
| re-open 7 Sisters Trail | | Yellow | | | Red | |
| establish trailheads | | Yellow | | | Red | Red |
| establish 1910 (Hurricane Ridge) viewpoint | | Yellow | | Red | Red | Red |
| establish short trails | | Yellow | | | Red | Red |
| re-open historic trails | | Yellow | Yellow | Red | Red | Red |
| investigate canopy walk | | Yellow | | Red | Red | |

| | | | | | | |
|---|--------|--------|--------|-------|-------|-------|
| 3.5.7 Commercial Recreation | | | | | | |
| encourage community gateways | Yellow | Yellow | White | Red | Red | Red |
| encourage Annandale gateway | Yellow | Yellow | White | White | Red | Red |
| ensure guide permits | Yellow | Yellow | Yellow | White | Red | White |
| consolidate business permit | White | Yellow | White | White | Red | White |
| conduct economic study | White | Yellow | White | Red | Red | Red |
| set entrance fees | White | Yellow | White | White | Red | White |
| 3.5 Public Awareness & Education | Green | Green | Green | Green | Green | Green |
| establish partnerships | White | Yellow | White | White | Red | White |
| establish signage | Yellow | White | White | White | Red | Red |
| mark boundary | Yellow | White | White | White | Red | White |
| produce brochure/poster | White | Yellow | White | Red | Red | Red |
| encourage media awareness | White | Yellow | White | White | Red | White |
| provide uniforms | Yellow | White | White | White | Red | Red |
| encourage research | White | Yellow | Yellow | Red | Red | Red |
| prepare communication plan | White | White | Yellow | Red | Red | White |
| reconstruct education centre | Yellow | White | White | Red | Red | Red |
| design entrance ticket | White | Yellow | Yellow | White | Red | White |
| conduct special events | Yellow | White | Yellow | White | Red | Red |
| 3.6 Administration | Green | Green | Green | Green | Green | Green |
| implement organization | Yellow | White | White | White | Red | White |
| establish training plans | Yellow | White | White | White | Red | White |
| conduct training | Yellow | Yellow | Yellow | Red | Red | Red |
| locate office | Yellow | White | White | White | Red | White |
| obtain funding | White | Yellow | Yellow | Red | Red | Red |
| develop workplans | Yellow | Yellow | Yellow | White | Red | White |
| conduct assessments/review progress | White | White | Yellow | White | Red | White |

| Key Actions | Phase | | | Outside Aid | Own Forces | Ministry Lift |
|--------------------------------|--------|--------|--------|-------------|------------|---------------|
| | 1 | 2 | 3 | | | |
| 3.7 Disaster Management | Green | Green | Green | Green | Green | Green |
| minimize facility exposure | Yellow | White | Yellow | White | Red | White |
| establish signage | White | Yellow | White | Red | Red | White |

| | | | | | | |
|----------------------------|--------|--------|--------|--|-----|--|
| establish protocols | yellow | yellow | yellow | | red | |
| establish safety plans | yellow | | | | red | |
| 3.8 Consultation | | | | | | |
| appoint Advisory Committee | | yellow | | | red | |
| engage local communities | yellow | yellow | yellow | | red | |
| provide training | yellow | yellow | yellow | | red | |
| establish honouraria | yellow | | | | red | |

4 MANAGEMENT PLAN REVIEW PROCESS

Over the next five years, as recommended inventories and facility improvements are completed, as research is conducted, as site-specific development plans are prepared and approved for timber and non-timber forest products in the resource use zones, as recreation, culture and tourism opportunities are realized and as government policies are adopted, adjustments to this management plan will have to be considered.

The process to review the management plan should continue with significant public involvement; more enhanced than the process undertaken to prepare this plan.

The process should be jointly managed by the Forestry and National Parks Department, or its successor responsible for managing the existing Grand Etang and Annandale Forest Reserves, and the proposed Advisory Committee. A process that includes identifying issues, reviewing the issues in a public forum, preparing options and seeking comments on the options, preparing a draft plan and seeking comments on the draft prior to finalizing the plan for Government's consideration should be adopted. Such a process ensures participation at the highest level, is transparent, strengthens confidence and understanding in the process and establishes relationships so fundamental in protected areas management.

Appendix 1: THREATENED SPECIES IN FOREST RESERVES

(from Government of Grenada, 1988)

| Species | Status |
|---|------------------------------|
| Amphibians | |
| Giant Toad (<i>Bufo marinus</i>) | Rare |
| Piping Frog (<i>Eleutherodactylus johnstonei</i>) | Status uncertain |
| Highland Piping Frog (<i>Eleutherodactylus urichi</i>) | Status uncertain |
| Giant Woodland Frog (<i>Leptodactylus fallax</i>) | Status uncertain |
| Reptiles | |
| Tree boa (<i>Corallus cookii</i>) | Status uncertain |
| (<i>Clelia clelia</i>) | Status uncertain |
| Neuweid's moonsnake (<i>Psuedoboa newwiedi</i>) | Endangered, possibly extinct |
| Shaw's racer (<i>Liophis melanosus</i>) | Endangered, possibly extinct |
| Morocoy tortoise (<i>Geochelone carbonaria</i>) | Threatened, possibly extinct |
| Birds | |
| Bat Falcon (<i>Falco ruficularis</i>) | Vulnerable |
| Blue-ground Dove (<i>Claravis pretiosa</i>) | Vulnerable |
| Blue-hooded euphonia (<i>Euphonia musica</i>) | Vulnerable |
| Garnet throated hummingbird (<i>Eulampis jugularis</i>) | Vulnerable |
| Gray kingbird (<i>Tyrannus dominicensis</i>) | Vulnerable |
| Mammals | |
| Nine-banded armadillo (<i>Dasypus novemcinctus</i>) | Rare |
| Greater Chapman's marine opossum (<i>Marmosa robinsoni chapmani</i>) | Rare |
| Agouti (<i>Dasyprocta leponia</i>) | Endangered, possibly extinct |
| Freshwater Fish | |
| Antillean fish fauna | Endangered |

Appendix 2: TRAILS IN THE FOREST RESERVES

Morne LaBaye

This 200 metre trail links the Grand Etang Visitor Centre to a viewpoint overlooking the eastern portion of the Grand Etang Forest Reserve, including the watershed of the Great River, as well as Grenville and the Atlantic Ocean. The trail passes through a representative example of the Cloud Forest.

Beausejour

This 300 metre ridge-crest trail, south of the Visitor Centre, passes through Elfin Forest and offers views of the Annandale Forest Reserve, St. George's, Point Salinas and the Caribbean Sea.

Shoreline

The two kilometre long Shoreline Trail loops around Grand Etang Lake. Although often well-back from the lake's shoreline, the trail offers glimpses of the Lake and the Mount Qua Qua ridge and passes through a variety of tropical forest environments, including habitat for the Mona Monkey.

Mount Qua Qua

The three kilometre long (one way) Mount Qua Qua Trail links the Visitor Centre complex with Mount Qua Qua. Located along the ridgeline, in the Cloud Forest, the trail offers numerous viewing and interpretive opportunities.

Concord

This trail links the Village of Concord with the Grand Etang Forest Reserve and the Visitor Centre complex. Some six kilometres in length (four kilometres in the Forest Reserve), the trail begins at the Concord Waterfall development at the end of the Concord Road and follows the valley and stream environment upwards until it joins the Mount Qua Qua Trail at the ridgeline.

Seven Sisters Trail

This five kilometre trail branches off the Cross Trail and follows the stream as it descends through the rainforest to the series of waterfalls, terminating at St. Margaret's Falls. The trail connects with the private trail at St. Margaret's.

Annandale Trail

The six kilometre Annandale Trail follows an old estate road. Some four kilometres is within the Forest Reserve and the remaining section is on private land. With little change in elevation, the trail meanders past active forest plantations and remnants of estate plantations of cloves, citrus and nutmegs, erased by Hurricane Ivan. Opportunities to highlight the history of the estate, including its role in the later 18th century rebellion, its natural recovery from natural disaster and its significance now as a protected area, are evident.

Vendome-Les Avocats Trail

This three kilometre rainforest trail follows the historic link from Vendome to Les Avocats.

Cross Trail

The five kilometre Cross Trail links Hurricane Ridge with the Grand Etang Visitor Centre complex and offers opportunities for tropical rainforest interpretation.

Fedon's Camp Trail

Fedon's Camp Trail links Fedon's Camp with the Concord-Visitor Centre complex trail. The Trail has historic significance with the 18th century rebellion.

Appendix 3: FEE REVIEW OF EASTERN CARIBBEAN TOURISM SITES

(from Turner, 2006)

In establishing a fee schedule for the Reserves, consideration of comparable Eastern Caribbean opportunities that are similar to those offered by the Reserves must be given. The review has been grouped by adult entrance fees, all in \$EC. Children are commonly half price.

Above \$30

- Ardastra Conservation Centre-Bahamas
- Graeme Hall Nature Sanctuary-Barbados

\$25-\$30

- Garden of the Groves-Bahamas
- Botanical Gardens of Nevis
- Dunn's River Falls-Jamaica
- Estate St. Peter Botanical Gardens-St. Thomas

\$20-\$25

- Flower Forest-Barbados
- Andromeda Botanic Gardens-Barbados
- Musee Archeologique Edgar Clerc-Guadeloupe
- Rum Factory and Heritage Park-Barbados

\$15-\$20

- Shirley Heights-Antigua
- Barbados Museum
- Tyrol Cot Heritage Village-Barbados
- St. George Village Botanical Gardens-St. Croix
- Whim Plantation Museum-St. Croix
- Brimstone Hill-St. Kitts
- Morne Coubrail Estate-St. Lucia
- Kura Hulanda Museum-Curacao

\$10-\$15

- Rand Nature Centre-Bahamas
- Ajoupa-Bouillon-Martinique
- Corossol-St. Barthelemy

Under \$10

- English Harbour-Antigua
- Botanical Garden-St. Vincent
- Nevisian Heritage Village-Nevis

Appendix 4: CONSULTATIONS

For Preparation of Draft Plan-April/May

| | |
|---------------------|--|
| Michael Jessamy* | Ministry of Tourism |
| Anthony Jeremiah* | Forestry and National Parks Department |
| Augustus Thomas* | Forestry and National Parks Department |
| Allan Neptune | National Water and Sewerage Authority |
| Michael Mason | Land Use Division |
| Paul Philip | Fisheries Division |
| Ester Thomas* | Board of Tourism |
| Chris Joseph* | Ministry of Health and Environment |
| Tyrone Buckmire* | RARE |
| Jocelyn Paul | Ministry of Finance-Economic Affairs |
| Dennis Henry* | Henry's Safari Tours Ltd. |
| Dr. Spencer Thomas | National Biodiversity Coordinator |
| Lawrence Duncan* | Huggin's Tours Inc. |
| Francis Robertson* | Ministry of Tourism |
| Richardson Andrews* | Agency of Reconstruction and Development |
| Judy Williams | Grenada Community Development Agency |
| Wilfred Jones | Site Manager, Grand Etang |
| Fitzroy Alexander* | Vendome Development Committee |
| John Branch* | Branch Estates |
| Nigel Hamilton | Concord Falls |
| Wayne Langdon* | Apres Tout Development Committee |
| Veda Bruno* | Vincennes Sport and Culture Club |
| Cecil Frederick | Physical Planning Unit |
| Sandra Ferguson | Agency for Rural Transformation |
| Claudius Pierre* | Birch Grove Community Council |
| Alan Joseph* | Forestry and National Parks Department |

For Review of Draft Plan-June/July

| | |
|-----------------------|-----------|
| Vendome Community | 22 people |
| Birch Grove Community | 13 people |
| Apres Tout Community | 18 people |
| Annandale Community | 18 people |
| Vincennes Community | 16 people |

* These people also participated in the review of the draft plan

Appendix 5: PROPOSED OPAAL PROJECTS

| COMPONENT | KEY ACTION | PAGE | PHASE |
|--|---|---|-------|
| 201.2.2.1 Informational Signage/trail development/historic information | <ul style="list-style-type: none"> • investigate historic trails | 32 | 1 |
| | <ul style="list-style-type: none"> • establish cultural interpretive signage at the Visitor Centre and Fedon's Camp | 31 | 2 |
| | <ul style="list-style-type: none"> • provide interpretive signage at Morne LaBaye, Annandale and Shoreline Trails | 32 | 2 |
| | <ul style="list-style-type: none"> • establish trailheads and directional signage | 32 | 2 |
| | <ul style="list-style-type: none"> • establish Mona Monkey Loop Trail | 32 | 2 |
| | <ul style="list-style-type: none"> • reopen historic trails | 33 | 1 |
| | <ul style="list-style-type: none"> • establish interpretive signage to highlight the recovery from Hurricane Ivan | 45 | 2 |
| | <ul style="list-style-type: none"> • establish highway signage | 35 | 1 |
| | <ul style="list-style-type: none"> • mark boundary | 35 | 1 |
| | 202.1.3 Local technical support | <ul style="list-style-type: none"> • based on biophysical inventory, and in association with the local community, prepare sustainable, site-specific development plans | 28 |
| 202.2 Small project facility | <ul style="list-style-type: none"> • upgrade the public road to Annandale Forest Reserve and establish trailhead, parking, information and sanitary facilities <p>other projects will be a product of the completion of the site-specific plans</p> | 34 | 1 |
| 301.1 Training for management of protected areas | <ul style="list-style-type: none"> • conduct training based on staff training plans | 39 | 2 |
| | <ul style="list-style-type: none"> • conduct training for Advisory Committee members | 39 | 2 |
| 302.1 Livelihood training | <ul style="list-style-type: none"> • liaise with the Board of Tourism and other agencies to encourage appropriate training and certification for prospective permittees | 40 | 2 |

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NOTES