

PN-ACF-219

101601

## **NEGRIL ROYAL PALM RESERVE**

---

**Proposal for Development (Revised)  
Conservation/ Business Work Plan  
Resource Management and Development Strategy**

**14 August, 1998**

**Submitted to:**

**Natural Resources Conservation Authority (NRCA)  
GOJ/DEMO Project  
USAID  
Negril Royal Palm Reserve, Ltd.**

**Submitted by:**

**Mark R. Grun  
Greenpoint, Ltd.  
Hershey, PA USA**

**Under contract to:  
Technical Support Services Inc.**

## **CONTENTS**

<b>1 00</b>	<b>EXECUTIVE SUMMARY</b>
<b>2 00</b>	<b>INTRODUCTION</b>
2 01	Background
2 02	Approach
<b>3 00</b>	<b>THE RESERVE AND ITS RESOURCES</b>
<b>4 00</b>	<b>THE EXISTING FACILITIES</b>
<b>5 00</b>	<b>STRATEGIES FOR DEVELOPING, MANAGING AND UPGRADING THE RESERVE, ITS RESOURCES AND ITS FACILITIES</b>
5 01	Resource and General Environmental Management
5 02	Reforestation programme
5 03	Trails and Boardwalks
5 04	Landscaping, Facilities and Infrastructure
5 05	Alternative Revenue Generation
<b>6 00</b>	<b>THE EXPERIENCE</b>
6 01	Education and Interpretation
6 02	The Visitor Experience
<b>7 00</b>	<b>TRANSPORTATION IN AND AROUND THE RESERVE</b>
<b>8 00</b>	<b>SECURITY</b>
<b>9 00</b>	<b>EMERGENCY FACILITIES</b>
<b>10 00</b>	<b>TRAINING</b>
<b>11 00</b>	<b>INSURANCE</b>
<b>12 00</b>	<b>MARKETING</b>
<b>13 00</b>	<b>COMMUNITY RELATIONS</b>
<b>14 00</b>	<b>THE ORGANIZATION STRUCTURE THE RESERVE</b>
<b>15 00</b>	<b>CONSERVATION/BUSINESS WORK PLAN</b>
<b>16 00</b>	<b>OPERATING REVENUE AND EXPENDITURES PROJECTIONS</b>
<b>17.00</b>	<b>DRAFT/SAMPLE FUNDING PROPOSALS</b>

1 00 EXECUTIVE SUMMARY

The proposal for the Negril Royal Palm Reserve sets out development plans for the creation of a wilderness wetlands reserve centered around the last intact and significant stand of Royal Palms within the Negril Great Morass. The approach incorporates environmentally responsible resource management, education and interpretation, an outstanding visitor experience and alternative revenue generating pursuits. Specific initiatives include

- i a Resource Management strategy that recognizes and seeks to preserve and, as appropriate, enhance the ecological importance of the Reserve and its Royal Palm forest,
- ii an education and interpretation programme that strives to increase public awareness of and appreciation for the environment in general, and the reef-to-ridge ecosystem of the Negril area,
- iii the creation of an outstanding nature-based visitor experience that is at once educational and enjoyable,
- iv a diverse base of environmentally responsible revenue generation activities that will ensure that the Reserve is economically viable

In preparing the proposal all ecological and environmental constraints involved in developing these concepts have been considered and factored as guiding principles

While most of the necessary infrastructure is already in place on the Reserve, a substantial amount of repair and maintenance work is needed before the site can be opened to the general public. This work includes securing of the site, removal of stray livestock, stabilization of built facilities, training of guides and other staff, landscaping, reforestation, and others<sup>1</sup>. It has also been recognized that security, emergency facilities, on-going training and marketing also play very

---

<sup>1</sup>At the time of this writing nearly nine months after the lease for the site was secured some of this has begun and the Reserve is in a "soft opening" operating mode

significant roles in the proposed development and eventual success of the Reserve

The pursuit and implementation of these factors and elements, detailed within this proposal, will ensure that the important resource of the Royal Palm Reserve and its ecology and resident species are protected to the fullest, that visitors are safely entertained and creatively educated, and that the Reserve will be positioned to endure as an economically viable integrated conservation development enterprise

## 2 00 INTRODUCTION

This proposal has been created and is being submitted in response to a communicated interest from the international community in the potential to provide assistance to Royal Palm Reserve in its quest to realize the long-held vision of developing a wilderness wetland reserve in the Negril Great Morass. It outlines the strategies to be pursued in the management, conservation and restoration of the Reserve as a conservation area and visitor attraction that is consistent with sound environmental practice. It is envisioned that the Reserve can serve as a model for the conservation of sensitive environmental areas in Jamaica, as well as an example of the value of public-private conservation partnerships.

## 2 01 Background

The Negril Royal Palm Reserve (NRPR) was conceived as a part of the overall proposal for the mining of peat in the Negril Great Morass during the mid 1980's. At that time it was recognized that the stand of Swamp Cabbage Palms (*Roystonea princeps*) at the southwestern corner of the morass was the remnant of a once much larger wetland forest which had been extensively logged and cut down in previous years. The Swamp Cabbage Palm (locally called the Royal Palm, a misnomer as the name applies to a different species from Cuba, *R. regia*) is endemic to Jamaica, its distribution restricted to the Negril Morass and other wetlands in western Jamaica. Because of the very restricted distribution of the palm in global terms, the Petroleum Corporation of Jamaica decided to abandon its plans for peat mining and establish the NRPR so as to protect the Swamp Cabbage in Negril. The original objectives of the NRPR were:

- I to ensure the protection and conservation of the Swamp Royal Palm forest at Negril,
- II to provide an added tourist attraction for the Negril area,
- III to demonstrate the possibility of enhancing degraded tropical wetlands
- IV to educate and increase public environmental awareness regarding the value of wetlands

Accordingly, the NRPR was designed and constructed. This included an artificial lake, a wooden boardwalk through the stand of palms, an observation tower next to a shallow waterfowl pond, an access road and wooden buildings to house a restaurant, display and audio-visual centre, administration and visitor reception. The Reserve, however, was never opened to the public, and laid idle for over ten years until January of 1998, when the current owners successfully negotiated a lease with the PCJ and began planning for the completion of the development plans.

## 2 02 Approach

Given the foregoing, this development proposal incorporates adherence to the sound ecological principles and development guidelines established and followed at the outset, and accepts an integrated conservation development approach as the guiding element of the development and management of the Reserve. It recognizes that this is not only wise but necessary and responsible particularly if the Reserve is to ultimately gain the approval and acceptance of the environmental community in Jamaica and abroad and the people of Jamaica. Of paramount importance, the proposed development and its management must

- i ensure that the existing hydrological regime and drainage pattern of the Reserve and adjacent areas of the Great Morass is not negatively altered or impacted
- ii ensure that the existing ecology of the stand of swamp cabbage palms is not negatively altered or impacted by the introduction of flora and fauna that would not normally occur there

In all cases, if possible and only after considerable study, resource management strategies will seek to begin the process of restoring the wetland ecosystem of the Reserve and its surrounds to their historical condition. A conservative resource management and site development approach is being taken throughout.

## THE RESERVE AND ITS RESOURCES

The Negril Royal Palm Reserve is located along the South Negril River in the south-eastern corner of the Great Negril Morass and to the east of the tourist resort town of Negril, in the parish of Westmoreland. Access is gained by road from the district of Sheffield located along the main road between Negril and Savanna-la-Mar or via boat along the South Negril River. The road entrance to the property is approximately three (3) miles from the Negril town square.

The stand of *Roystonea* palms is one of five (5) woodland types occurring in the Negril Morass. It is subject to periodic inundation, despite the fact that the Negril Morass had been drained in the late 1950's and its hydrology modified so as to facilitate development.

The *Roystonea* forest has been subject to considerable degradation over the years as a result of tree felling and lumber removal, ganja farming with associated modification of the drainage pattern, frequent fires that sweep across the wetland, and grazing by cattle and goats.

The remaining stand of palm trees occurs at the tip of what was originally a triangular shaped patch of forest. Apart from the endemic palms themselves, the stand also contains a grove of *Grias caulifera*, another endemic Jamaican tree species, characterized by its flowers borne directly on the trunk. The rest of the forest contains numerous sedges, shrubs, ferns and climbers that are typical of Jamaican wetland eco-systems. In all, the aspect of the wetland forest is one of lush and luxuriant growth and shaded canopy.

The *Roystonea* palm stand is surrounded primarily by sedge marsh and, in the drier areas near the river, terrestrial type shrubbery. A stand of logwood trees is found near the western Reserve periphery.

When surveyed in 1987, the *Roystonea* forest supported fifty two (52) species of birds which included ten (10) Jamaican endemic species, thirteen (13) winter migrants, three (3) summer migrants and twenty six (26) resident species.

#### 4 00 THE EXISTING FACILITIES

The facilities that were put in by PCJ in the mid 1980's included a boardwalk through the stand of palms, a large artificially excavated lake a shallow pond for water-fowl, and a "floating" access road leading from the river's edge to the forest

Wooden buildings on stilts were constructed including, a visitor reception building at the edge of the river to facilitate visitors arriving by boat or by vehicle, an administration centre located at the edge of the forest and, associated with it, a restaurant with deck, an interpretive centre, and a staff changing room/storage area. An observation tower was also built so as to overlook the water-fowl pond. Parking areas were created in front of the administration building and beside the reception building. The latter can accommodate four buses.

In support of the facility, water mains were laid from Sheffield along one side of the access road to the forest, and electrical power lines were laid underground on the other side. In this fashion, the visual integrity of the site was maintained. Two small sewage treatment lagoon systems were proposed but not constructed, one near the reception building and the other near the administration building. To service the toilets in both areas, two systems will be installed:

- i a compost facility adjacent to the administration building,
- ii pit toilets adjacent to the reception building (existing)

Renovation works have commenced on all of the six (6) buildings. The canals and roadways have all been cleared and landscaping works will commence as soon as the cattle and goats have been relocated. This is a matter of concern as grazing animals destroy the vegetation to be protected and pollute the wet surface of the area.

5 00 STRATEGIES FOR DEVELOPING, MANAGING AND UPGRADING  
THE RESERVE, ITS RESOURCES AND ITS FACILITIES

5 01 Resource and General Environmental Management

The central guiding strategy for development of the Royal Palm Reserve is to pursue a programme of resource management and enhancement that focuses on the natural systems of the Reserve and its place within the Negril Great Morass. The first step in this process has already started with the acquisition of the rights to develop the site by Royal Palm, Ltd, i.e., stabilization of the existing resource through a security and control programme that limits and seeks to prevent the range of human activities which have had negative impact to the Reserve site over the course of the last two decades. These include free ranging of cattle and goats, hand-digging of drainage canals to facilitate small-scale agriculture, cutting forest for fuel, lumber and agricultural clearing (including ganja cultivation), uncontrolled fires, and others. To date, substantive progress has been made, although more remains, especially to completely eliminate cattle from the Reserve property. Much of this progress can be directly attributed to outreach efforts to individuals in the local community who had been using the Reserve for agricultural purposes.

The fundamental resource management initiatives of the Royal Palm Reserve include

- i Managing water levels in the main ponds and throughout the wetlands of the Reserve. The goal is to attempt to first understand the hydrology of the Reserve and its surrounding morass, and the associated natural drainage patterns and seasonal water table fluctuations. Once a clear understanding is achieved, systems will be pursued that will allow for a water-level management regime that balances the basic needs for water in the wetlands with the need to keep basic infrastructure (like roads) free and clear.
- ii Managing the plant communities to maximize the potential for natural plant regeneration and enhancement through reforestation.

- iii A wildlife management regime that encourages a greater concentration and diversity of wildlife in the Reserve, particularly for birds, butterflies and dragonflies This will be achieved through a combination of forest restoration, enhancement plantings of native species that provide food, cover and nesting habitats for songbirds, waterfowl, wading birds and hummingbirds, and artificial feeding and nesting stations
- iv Continued efforts to remove all cattle from the Reserve and prevent further incursions from free-ranging cattle in the area, including perimeter fencing and a new cattle-proof front gate system (from where most of the cattle still enter the Reserve)
- v Continued community outreach efforts to eliminate agricultural activities within the Reserve and to prevent fires

As part of the development strategy for the Reserve a sustainable infrastructure plan will be pursued that will lay the groundwork for a sustainable management policy The objective is to create an environmentally-responsible facility that lays lightly on the resource, that minimizes its consumption of energy and water, that does not pollute the environment and that can be used as an educational tool and working model of the value and practicality of a sustainable and environmentally-responsible approach to facilities and infrastructure

## 5 02 Reforestation Programme

It is proposed that, in addition to an ecosystem protection programme to preserve the endemic palms and other plants and plant communities in the Reserve, a reforestation programme be implemented to cultivate and expand the number of trees on the Reserve In order to best keep the palm forest in its natural state, there will be no introduction of fauna and flora not typical of Jamaican wetlands Emphasis will be placed in two areas

- i Pursuing a resource management programme that will ensure that the environment of the Reserve is best conducive to the survival and regeneration of the plants and plant communities of

the Reserve, and most acceptable for the successful re-introduction of propagated plants

- ii Enhancing the existing population of the signature species of the Reserve, the *Roystonea* palm, and other important and/or commercially attractive species on the site through the establishment of a propagation programme and nursery. Efforts will be made to replant and maintain an acre of the *Roystonea* Palm within the first year of the lease, and to continue this initiative in each of the succeeding years of the lease. At this stage, it is proposed to facilitate the reforestation programme through by locating the propagation programme/nursery located in the logwood area at the western boundary of the site, and to use it to augment natural seeding and growth of the palms and other important species within the forest

If successful, the nursery will not only provide the Reserve with plant material, but should be able to serve the surrounding communities and hotels with landscaping material, thereby mitigating the decimation of wild plant communities through the removal of wild plants

#### 5 03 Trails and Boardwalks

To date, the existing boardwalks constructed by PCJ in the mid-1980's have been cleaned, repaired and stabilized. The viewing tower, however, is still in need of additional stabilization before visitors can be permitted to use it. In addition, one new dry-season trail has been established skirting the western edge of the main pond

It is proposed that a series of new foot trails be established around the Reserve. These trails will be designed as interconnecting loops, and will serve a number of purposes

- i Trails will create dedicated corridors for grounds maintenance personnel to use as they go about their duties, preventing unnecessary impact to the fragile wetlands and wetland plant communities

- ii Trails will create new opportunities for visitors, and, with that, new opportunities for plant and wildlife observation and study and interpretive and educational activities
- iii By creating a looped trail system, management will be able to limit and control negative impacts from visitors by selectively opening and closing trails. This is especially important in a wetlands environment with distinct wet and dry seasons: some trails will be open for dry-season use only, and others will be susceptible to rapid erosion and/or compaction.

Development plans call for the addition of one more observation tower on the main boardwalk, and potentially for one observation tower in the small but dense stand of *Roystonea* palms on the northern boundary of the property (accessed by a foot trail)

In addition, another trail will be developed along the river bank from the reception building leading to the stand of logwood trees referred to above. Within this logwood area, the trail will be designed and planted with a variety of site-appropriate orchids. While the trail itself will be interesting for the habitat through which it passes, it will also provide further aesthetic and interpretive interest, and another potentially viable commercial surplus. Good candidate species have already been identified, including the endemic *Broughtonia sanguinea* and *B. negrilensis*. As will be the case with all the dominant plant species within the Reserve area, labels describing the species, its habitat and origin will be placed in close proximity.

All boardwalks and trails will include wayside interpretive presentations (plant labels and interpretive graphics). In addition, bird and butterfly enhancement plantings and feeding stations will be introduced, and at least one wildlife viewing blind will be constructed.

In order to avoid negative impacts in the Reserve area from visitors, particularly within the palm stand, it is intended that the number of visitors going on tour will be restricted to not more than fifteen (15) persons per guide at any one time. Also, strict controls will be

maintained on the generation of garbage by both visitors and staff (e.g. recycling of paper in the office). Visitors will not be allowed to litter the reserve area and garbage receptacles will be placed at convenient points outside each of the buildings and along the boardwalk and trails. These will be emptied daily and arrangements made for garbage collection services to dispose of the waste at a designated site.

Smoking will be strictly prohibited within the Reserve area to prevent fires from discarded cigarettes.

#### 5.04 Landscaping, Facilities and Infrastructure

Appropriate measures shall be taken to ensure the appropriate enhancement of the existing landscape. The services of a Landscape Architect will be used to provide an overall design scheme for the

- i Entrance Drive — From the entrance it is proposed to plant a verge of trees along one side of the road from the entrance to the Reception building.
- ii Areas around the built environment — A proposal shall be submitted which will reflect the types of flora likely to grow in the wetlands and peat deposits around these buildings. The essence of tranquillity and harmony that embraces the tourist as they approach the lake, will be reinforced. Emphasis will remain on the use of species that are typical of the Morass and that encourage greater populations and concentrations of birds, butterflies and dragonflies.
- iii Logwood Garden and Propagation Nursery — The grove of logwood trees is an interesting and attractive element of the Reserve. The approach will be enhanced with the introduction of orchids, adding colour and further interest. In addition, the propagation nursery for the reforestation programme will be located here.
- iv River Bank — From the reception building, visitors will access the logwood garden by a trail paralleling the South Negril River. This will introduce another experience enabling visitors to become

acquainted with the flora indigenous to this type of landscape (e.g. *Typha domingensis*, *Acrosticum aureum*), and will help to restore and beautify the river bank habitat

- v Trails and Trail Network — The trail network will need to be carefully designed and created. The trails need to be of appropriate length, easily accessed, interesting and educational, and aesthetically pleasing. They should provide access to good wildlife viewing without encroaching upon sensitive nesting habitat, and they should be designed and located in such a way that their impact is minimal. Finally, trails need to be easily maintained lest they become a management problem, which inevitably leads to disrepair, disuse, and negative impact.

While it is the intention to clearly define the visitor route and add to the aesthetic and interpretive appeal of the Reserve through landscaping, the overall character of the property will remain that of a “wetland wilderness reserve.”

#### 5.05 **Alternative Revenue Generation**

While, at least at the outset, the primary source of revenue generation for the Reserve will accrue from visitors' entrance fees and other visitor-related sales, the operation of the Reserve does present additional revenue generating opportunities that can help to make the Reserve even more financially viable. These include:

- i propagated and grown-on nursery stock for retail or wholesale, including landscape plants, orchids, dried flowers, cut flowers and others
- ii bee farming
- iii selective harvesting of plant materials for use in making traditional crafts
- iv butterfly farming
- v others that emerge or can be identified

6 00 THE EXPERIENCE

6 01 Education and Interpretation

A core element of the offerings of the Reserve will be the education and interpretation programme. For public nature reserves of this type, education forms the critical link between resource management and conservation and the visitor experience. Through a creative and substantive education programme visitors learn about the environment of the Reserve and its surrounding morass, the importance of the entire reef-to-ridge system in the Negril area, and the need to conserve these fragile and critical resources.

If properly crafted and presented, the education and interpretive programme teaches and entertains at the same time, "making learning fun." The proposed programme for the Reserve includes several elements, both passive and active.

*Interpretive Centre*

The focus for education and interpretation in the Reserve will be an Interpretive Centre housing a selection of passive and interactive presentations. Using an existing building on the main boardwalk spur, a lively presentation will be professionally designed and created that takes best advantage of its context and allows for the necessary flexibility to both establish and grow a vibrant educational programme. Elements of the Centre could include:

- I graphic panels and displays
- II small three-dimensional exhibits
- III interactive computer learning stations
- IV interactive wildlife and habitat observation tools (remote video)
- V aquaria and terraria
- VI live animal demonstrations by trained staff (small crocodile, turtle, snake, bird, etc.)
- VII animal and plant artifact discovery stations
- VIII others

### *Guided Tours*

Personal interaction is the best way to introduce visitors to the wonders of the Reserve and to impart information. Guides have been hired, and preliminary guide training sessions have been held. It is proposed to institute a continuing programme of guide training to further the knowledge and communication skills of the guides and the rest of staff.

### *Wayside Graphics*

Numerous opportunities abound throughout the site for passive interpretation through the use of plant labels and interpretive graphics. The Reserve proposes to use both throughout the site. All graphics and labels will be professionally designed and created.

### *Outreach*

Education and interpretation should not and need not be limited to on-site presentations. Trained staff will be made available to venture into the community to make presentations to schools, hotels, civic and service groups, community and church groups and others. Not only does this provide an important educational service, but outreach programmes also serve as good marketing tools, introducing the community to the Reserve and its offerings and encouraging people to visit the Reserve for themselves.

### *Live Animal Collections*

Live animals can excite and stimulate learning among all visitors. A very delicate balance must be established if this is to be a legitimate element of the Reserve's offerings. As discussed above, small demonstration animal collections are more than appropriate especially if the animals used in this way are animals that were injured in the wild and can no longer be released. Demonstration animals provide an opportunity to see native animals of the Morass up close, and, in some cases, to even provide the chance to touch.

Larger captive animal exhibits are somewhat more problematic. The intent of the Reserve is to create, present and interpret a wilderness

wildlife reserve. If used, captive animal exhibits must augment and support this objective, and not be perceived by the public as a 'menagerie' or zoo. At this stage, the introduction of crocodile and turtle exhibits is under discussion, and may be forwarded for more detailed consideration based upon management's operating experience with the Reserve.

## 6.02 The Visitor Experience

The core visitor experience will be presented on two levels. It is anticipated that the majority of visitors will find their way to the Reserve as part of a local day-trip package through local hotels, especially in the busy tourist seasons. A significant percentage of other visitors will also fall into the "casual visitor" category.

With this in mind, the primary visitor experience has been designed around a well-conceived site tour, with well-defined elements that can be easily and clearly marketed. The design plan clearly delineates each of the developments proposed for the Reserve and their relationships to each other and to the site. Aptly titled "the experience," these activities will be an actual observation and a practical acquaintance with the facts and events on the Reserve, thereby encouraging the visitor to return. The primary experience is proposed as follows:

Visitor parking will be provided at the reception area to accommodate buses and motorcars. Tour packages will be available at most hotels throughout the island, however, other individuals will be able to purchase the package at the reception area. On slow days, visitors will be directed to proceed to the administration building and main boardwalk area to pay their entrance fees and begin their visit.

Visitors will be able to enter the Reserve via the river or road and will first be taken to the Reception area where they will be given a non-alcoholic refreshment and undergo general orientation.

From the reception area visitors will be taken by mule<sup>2</sup> drawn "jitney" to the administrative area where "the experience" commences. The "experience" will last approximately three hours, during which the visitor will be taken along and have the opportunity to participate in a range of specific elements of the tour.

Outlined below are the proposed specific stages or elements of the primary visitor experience:

1. Guided tours of the main boardwalk system. Trained and knowledgeable Reserve guides will lead small groups (not more than 15 people per guide) along the boardwalk system, providing insight and interpretation and answering questions along the way.
2. Wildlife viewing stations and blinds will be identified for visitors to use for more leisurely wildlife observation. Feeding stations will also be placed along the boardwalk and throughout the remainder of the Reserve.
3. Self-guided tours will also be permitted. A self-guide pamphlet will be developed for visitors to use, and wayside graphics will also provide detail and information.
4. The Interpretive Center will be open for all visitors. On guided tours, the guide will take the group into the Centre and introduce it; visitors on self-guided tours will be able to make use of the Centre on their own.
5. The trail to the Logwood Gardens and Nursery will be open and available to all visitors. Access to the gardens will be gained by a path along the river. A nursery will be developed beside this area to replenish and upkeep existing flora. An orchid trail featuring various species of endemic and imported orchids will line the logwood trail.

---

<sup>2</sup> The mules will be fitted with bags to collect droppings. Special arrangements will be made for their grazing.

- 6 Canoe rides on the main pond will be available for an additional charge. An experienced boatsman trained in water life saving will guide the canoe around the lake and along the canals. Life jackets will be required to be worn.
- 7 A Snack Centre will be operated in an existing building designed and constructed for this purpose. There will be facilities for lunch at the snack counter which will be able to seat approximately eighty (80) persons. Emphasis will be placed on the serving of health foods and natural juices. There will be no alcohol available on the Reserve.
- 8 Gift and Craft Shops will be erected close to the reception area where foundations were laid to accommodate these. These will be outfitted with environmentally sensitive articles i.e. pottery, hemp clothing, leather and craft items, etc. Other gift items will include books and other literature on the natural history of Jamaica.

At the early stages of operation and development, emphasis will be on a resource management regime that will, as a result of sound resource management practices, create a more attractive environment for wildlife. This will attract birds, butterflies, dragonflies, reptiles and amphibians to the reserve in greater diversity and concentration, particularly during the dry and nesting seasons. Feeding stations for songbirds, waterfowl and hummingbirds will be created and maintained. Nesting platforms and boxes for waterfowl will be installed to encourage waterfowl nesting and help to mitigate predation from mongooses. Enhancement plantings providing cover, food and nest materials and sites will be added to attract birds, butterflies and dragonflies. The education and interpretive programme described above will further bring these resources to life.

As discussed above, captive animal exhibits for turtles and crocodiles will be considered as possible enhancements to the visitor programme.

7 00      **TRANSPORTATION IN AND AROUND THE RESERVE**

Transportation from the reception area to the administration area and boardwalk/trailhead (approximately 1/4 miles) will be provided by mule drawn jitneys, estimated to be able to accommodate a maximum of ten (10) persons each at any one time. Vehicle access will be limited and strictly controlled.

8 00      **SECURITY**

In order to provide a security presence and to control grazing, security will be implemented on a twenty four hour basis to ensure the safety and well being of visitors to the Reserve as well as the securing of property. There will be three guards during opening hours to man the reception and administrative areas, as well as two additional guards manning the boardwalk. All security personnel and tour guides will be outfitted with two-way radio systems which will be connected to the administration centre and the Negril Police Station.

9 00      **EMERGENCY FACILITIES**

Existing emergency facilities will be upgraded and new facilities and procedures put in place where none exist. There will be adequate signage, a security alarm system (connected to the Negril Police Station), and adequate fire warning and control devices put in place. A two-way radio system will also be instituted to ensure quick response time to any emergency, and trained life guard/first aid personnel will be employed to the Reserve on a full time basis. Security lighting will also be installed.

10 00     **TRAINING**

Appropriate training programmes developed through safety and environmental specialists will be mandatory for all staff employed by the Reserve. This will include training in general environmental management to make them aware of their responsibilities for preserving the Reserve and will also ensure that they are aware of the specific laws and regulations which affect the everyday operation of the Reserve. Workshops will be designed for Reserve personnel.

with particular emphasis on the natural history of the Reserve and the Great Morass and interpersonal relationships with regards to tourism

Wardens will specifically trained to manage the property and enforce the laws in respect of zonation, non-removal of flora ban on domestic animals etc

#### 11 00 INSURANCE

Insurance will be provided in respect of the following

- I public liability
- II property
- III equipment
- IV theft
- V fire

There will also be group life, health and dental schemes available for employees

#### 12 00 MARKETING

The objectives of the Reserve cannot be over emphasized — to preserve the ecology of the Reserve and its associated ecosystems, fauna and flora, to educate the public about the environment in general and the value of Reserve and its surrounding Morass, to provide an outstanding nature-based visitor experience, and to create a diverse and environmentally responsible foundation of revenue generation to ensure the viability of the Reserve. The purpose of marketing will be to notify as wide a cross section of the local and international market as possible of the existence of the Reserve. In addition to audio-visual aids, literature will be available through travel agents and hotels locally and abroad about facilities and experiences being offered. Familiarization tours will be instrumental in introducing members of the tourism infrastructure, local school and civic groups, and all groups and organizations with a special interest in natural history and the environment to the Reserve and its offerings

## 13 00 COMMUNITY RELATIONS

Community outreach programmes will be implemented to educate the local community on the ecological impact the community and its practices may have on the Reserve, thereby seeking to maintain a harmonious relationship as well as ensuring cooperation in stamping out potentially harmful practices. This programme will also attempt to educate the community of the importance of keeping domestic animals off the Reserve, preventing fires in the Reserve and the Morass, and restoring the natural hydrology of the wetland ecosystem.

Employment in and around the Reserve will be boosted as well by having as many as possible of the employees sourced from the surrounding areas. Local farmers will also experience a boost in sales as produce will be purchased from these farmers to furnish the snack counter.

## 14 00 THE ORGANISATIONAL STRUCTURE THE RESERVE

Initially the Reserve will employ in excess of thirty (30) workers. Staff benefits will include lunch subsidies, group life, health and dental insurance plans. A business manager is currently in place and overseeing day-to-day operations of the Reserve. Employment of a staff naturalist to oversee resource management and education and interpretation programmes is being considered.

All employees will be required to undergo a two (2) week orientation period. During that time they will be taught safe environmental practices, the names of origins of fauna and flora found on the Reserve, basic first-aid, how to deal with emergencies, the use and care of communication equipment and how to cope in a service oriented industry.

15 00

## CONSERVATION/BUSINESS WORK PLAN — ITEMISED LIST OF SPECIFIC DEVELOPMENT ACTIVITIES AND INITIATIVES

The planning process for the development and management of Royal Palm Reserve has yielded a matrix of specific activities and initiatives which need to be pursued. While by no means an absolutely complete list, as new challenges and opportunities constantly arise as the Reserve evolves, it represents a best effort at this stage to identify fundamental needs and opportunities and begin to act upon them. For all intents and purposes, this formulates a work plan for the Reserve that addresses the spectrum of conservation and business issues necessary for the Reserve to develop and reach its potential as first rate wilderness wetland reserve.

In keeping with the goals and objectives delineated above throughout this proposal, the specific activities and initiatives have been organised under the headings of Resource Management, Interpretation and Education, Visitor Experience and Alternative Economic Development. It is the nature of facilities like the Reserve that many issues will naturally cut across more than one of the headings. For example, while the proposed reforestation nursery is primarily a resource management initiative, it also has solid potential to yield interpretation and education and alternative economic development/revenue generating benefits.

The matrix is organized by major impact area headings (Resource Management, Interpretation and Education, etc.) The second column then lists all impact areas for each specific activity and initiative, in rough priority order. Once again, using the reforestation nursery as an example, it is listed under the Resource Management heading section as its primary impact area, then has identified in column two all of the cross-cutting impact areas to which it applies — resource management, interpretation and education, and alternative economic development.

The matrix has been further sub-organised into priorities and time frames. Three priority levels have been identified and assigned for the Reserve's development issues, with a "1" being highest priority. Similarly, three time frames have been identified and assigned. "Near" indicates that the activity should be pursued within the next year, "Mid" indicates that the activity should be pursued within the next one to two years, and "Long" indicates that the activity should be pursued over the next two to three years, or longer, as the situation warrants.

No attempt has been made to identify which items should be funded solely by the Reserve management and which may be appropriate for

assistance from the donor community. This is a conscious decision, as it would involve leaps of assumption that are not valid at this time, for this writer. Instead, the matrix is presented as a menu of options, which delineates needs of the Reserve over a variety of impact areas and presents the basic information necessary for the management and the donor community to formulate funding decisions and negotiate elements, participation and priority.

Preliminary cost estimates are provided in both Jamaican and US dollars. A conservative exchange ratio of \$40J to \$1US has been used throughout the planning process (current exchange ratios are near \$37J to \$1US).

Activity Issue or Item	Impact Areas	Priority	Frame	Cost \$J	Cost \$US
<b>Resource Management</b>					
Cattle Removal	RM	1	Near	\$100 000	\$2,500
Composting Toilets	RM I&E VE	1	Near	\$1 200 000	\$30 000
Staff Naturalist (per annum)	RM I&E VE ED	1	Near	\$2 000 000	\$50 000
<i>Sub-total</i>				\$3 300 000	\$82 500
Reforestation Nursery	RM I&E ED	2	Mid	\$1 000 000	\$25 000
Sustainable Infrastructure RSAM	RM, I&E	2	Near	\$250 000	\$6 250
Waterfowl Nesting Platforms (each)	RM I&E VE	2	Mid	\$4 000	\$100
<i>Sub-total</i>				\$1 254 000	\$31 350
Water level Management Systems	RM	3	Long	\$5 000 000	\$125 000
<i>Sub-total</i>				\$5,000,000	\$125,000
<i>Section Total</i>				\$9 554,000	\$238,850
<b>Interpretation &amp; Education</b>					
Guide Training	I&E VE	1	Near	\$500 000	\$12 500
Interpretive Center	I&E VE	1	Near	\$2 000 000	\$50 000
Wayside Graphics	I&E VE	1	Near	\$1 000 000	\$25 000
<i>Sub-total</i>				\$3,500 000	\$87,500
Demo Animal Collection	I&E VE	2	Mid	\$100 000	\$2 500
<i>Sub-total</i>				\$100 000	\$2 500
Logwood Gardens/Orchid Trail	I&E VE RM ED	3	Long	\$500 000	\$12 500
<i>Sub-total</i>				\$500 000	\$12,500
<i>Section Total</i>				\$4 100 000	\$65 000
<b>Visitor Experience</b>					
Craft Center	VE	1	Near	\$750 000	\$18 750
Deck Garden	VE I&E	1	Near	\$100 000	\$2 500
Entrance Gate	VE RM	1	Near	\$150 000	\$3 750
General Site Landscaping	VE RM I&E	1	Near	\$125 000	\$3 125
Reception/Gift Shop	VE	1	Near	\$250 000	\$6,250
Tower Stabilization	VE I&E	1	Near	\$300 000	\$7 500
<i>Sub-total</i>				\$1 675 000	\$41,875
Canoes	VE	2	Mid	\$200 000	\$5 000
River Access (Dock & Boardwalk)	VE I&E	2	Mid	\$1 000 000	\$25 000
Secondary Trail Network	VE I&E	2	Mid	\$100 000	\$2 500
Wildlife Viewing Blinds (each)	VE I&E	2	Mid	\$50 000	\$1 250
<i>Sub-total</i>				\$1 350,000	\$33,750
Childrens Play Area	VE	3	Long	\$500 000	\$12 500
Crocodile/Turtle Pens	VE I&E	3	Long	\$1 000 000	\$25 000
Midway Tower	VE I&E	3	Long	\$1 000 000	\$25 000
Mule Jitneys & Associated	VE	3	Long	\$1,200 000	\$30 000
Northern Tower	VE I&E	3	Long	\$1 000 000	\$25 000
<i>Sub-total</i>				\$4,700,000	\$117,500
<i>Section Total</i>				\$7 725 000	\$193 125
<b>Alternative Economic Development</b>					
Butterfly Farming	ED VE I&E	3	Long	\$2 400 000	\$60 000
Honey Production	ED VE	3	Long	\$500 000	\$12 500
<i>Sub-total</i>				\$2 900 000	\$72 500
<i>Section Total</i>				\$2 900 000	\$72 500
<i>All Totals</i>				\$24,279 000	\$589,475

RM = Resource Management  
I&E = Interpretation & Education  
VE = Visitor Experience  
ED = Alternative Economic Development

\$40J = \$1US

## Activity Item Descriptions

### *Resource Management*

- I Cattle Removal — Continued efforts need to be made and maintained in order to prevent free-ranging cattle from wandering onto the site. Cattle are extremely hard on sensitive wetland environments: eating plants, eroding soils, breaking up and mashing surface soil layers, and leaving droppings in their wake. Cattle removal will be accomplished through a combination of outreach to local farmers, constant staff efforts to chase cattle out of the Reserve, and erecting a system of cattle-proof gates and fences.
- II Composting Toilets — Clivus Multrum composting toilets are proposed for the public toilet facilities at the main visitor and administration centre. These systems are environmentally sound, proven in the tropics, long lasting and easily maintained. In addition, they can serve as demonstration models to educate visitors and all Jamaicans as to alternative approaches to human waste management. If properly maintained, the composting toilets produce sterile, innocuous compost from human waste which can be used as a soil amendment for planting beds and nursery areas.
- III Staff Naturalist — Hiring a staff naturalist for the Reserve will have many benefits across all elements of the operation and development. Expert in resource management and natural history understanding and interpretation, the naturalist will lead all resource management and interpretation and education activities for the Reserve and assist with visitor experience and alternative economic development activities. This position is not to supersede that of the business manager; to the contrary, the positions will complement each other, with the business manager remaining responsible for all day-to-day business operations.
- IV Reforestation Nursery — See section 5.02 above.
- V Sustainable Infrastructure RSAM — The Reserve proposes to contract for a Rapid Sustainability Assessment Method (RSAM) procedure, which will assess and describe the potential for the use of sustainable infrastructure and utility systems and estimate and recommend which have practical applications for the Reserve. All infrastructure and utility elements will be examined and assessed, including electric generation, potable water supply, hot water supply, human waste treatment, solid waste treatment, and grey water treatment. RSAM is a proven approach that utilises custom computer data gathering software and remote sensing equipment, and can be completed in two to three weeks.
- VI Waterfowl Nesting Platforms — Artificial nesting structures for waterfowl encourage and facilitate waterfowl nesting, attracting

greater variety and density of waterfowl to a site. These structures are simple and easy to build, and are species-specific. In addition, they can help to mitigate nest predation from mongooses, rodents and other nest predators.

- vii Water-level Management Systems — Managing water levels in the wetland environment of the Reserve is a critical resource management issue. It is also complicated. The first step will entail detailed observation of water level fluctuations throughout the seasons, studies of the hydrology of the Reserve and its surrounding morass, identification of all drainage canals in the area, and design and construction of sluice gates on appropriate major canals that can allow for active management of water levels while accommodating operating needs of the Reserve (like keeping roads free from flooding).

#### *Interpretation and Education*

- i Guide Training — Guide and staff training in natural history, visitor relations, and resource management is fundamental and on-going. Interactive, interpersonal communication is the most effective way to educate visitors and provide a memorable visitor experience. Guide training needs to be on-going and consistent, and is often not solely accomplished through formal training sessions but by taking advantage of learning opportunities. The staff naturalist will be responsible for guide training and monitoring as a primary duty. Supplemental guide training sessions using guest trainers expert in relevant fields and by taking field trips to experience other interpretive approaches, will also be used.
- ii Interpretive Centre — See section 6.01 above
- iii Wayside Graphics — See section 6.01 above
- iv Demonstration Animal collection — See section 6.01 above
- v Logwood Gardens/Orchid Trail — See section 5.03 above

#### *Visitor Experience*

- i Craft Centre — See section 6.02 above
- ii Deck Garden — It is proposed to landscape the small cleared area immediately adjacent to the snack centre deck with appropriate and colourful species that are aesthetically pleasing and attractive to songbirds, hummingbirds, butterflies and dragonflies. This will provide an enhanced visitor experience and further opportunities to observe and learn about the flora and fauna of Reserve.
- iii Entrance Gate — An attractive, even striking, entrance gate is essential in creating a welcoming and interesting atmosphere for visitors immediately upon their approach to the Reserve. In

addition, effective cattle barriers need to be included in the design and construction of the gate, as cattle are currently using the main gate for primary access to the site. The entrance gate is also a security element.

- iv General Site Landscaping — See section 5.04 above
- v Reception/Gift Shop — See section 6.02 above
- vi Tower Stabilisation — The existing tower is in serious disrepair. It must be stabilised before anyone can be permitted to use it.
- vii Canoes — See section 6.02 above
- viii River Access — Eventually, access to the Reserve by boat via the South Negril River is proposed. A dock and boardwalk from the dock to the Welcome Centre is needed to accommodate this means of access.
- ix Secondary Trail Network — See section 5.03 above
- x Wildlife Viewing Blinds — Wildlife viewing blinds are simple enclosed structures with narrow viewing slits and benches for visitors. They allow visitors very close views of birds, as the observer remains unseen and normally shy birds will venture very close to the blind.
- xi Children's Play Area — Anticipating many children and school groups, the Reserve proposes to design and construct a play area for children that is themed to reflect the ambiance of a wilderness wetland reserve.
- xii Crocodile/Turtle Pens — See section 6.02 above
- xiii Midway Tower — A second observation tower is proposed for the boardwalk system.
- xiv Mule Jitneys — See section 6.02 above
- xv Northern Tower — A third observation tower is proposed, to be accessed by a footpath and located within the stand of Royal Palms on the northern boundary of the Reserve.

*Alternative Economic Development* — See section 5.05 for discussions of alternative economic development opportunities.

16 00 **OPERATING REVENUE AND EXPENDITURES PROJECTIONS**

As part of the development planning for the Royal Palm Reserve, basic operating revenue and expenditures projections have been made and used for business planning purposes. Notes and assumptions used in the projections follow:

General Notes

Exchange rate of \$40J = \$1US were used throughout. All projections are in US dollars.

An inflation figure of 7.5% was used for most expenditures, where appropriate.

I Income

- (1) Average Visitors/Day — 36 visitors/day was projected as a first year average. Average daily visitor numbers were increased by four (4) visitors per day per year.
- (2) Total Visitors/Year — Average visitors/day x 365 days
- (3) Entrance Fees — Net entrance fees are projected at \$12.00 per visitor for each of the first three years.
- (4) Gift Shop, Restaurant, Canoe Ride and Craft Shop per capita — per capita, or average spending per visitor, figures were projected for each of these four visitor-related revenue sources.
- (5) Total Revenue — Total revenue from all visitor-related revenue sources.

II Expenditures

- (1) Directors' Expenses — travelling and other relevant expenses related to the implementation of the project.
- (2) Security — cost of contracted security personnel.
- (3) Salaries & Commissions — Staff salaries and 20% commission paid to tour operators.
- (5) Specific development activities and initiatives are not, as a rule, included in these annual operating projections.

III Loan Funds

- (1) Loan Repayment A & B — The purpose of these loans is to facilitate the facility improvements needed to open and begin operating the Reserve. A six month moratorium on principal and interest on the bank loan is anticipated. As of this writing, 65% of the Directors' loan fund has been disbursed.

**Negril Royal Palm Reserve Projected Revenue & Expenditures**

Stated in US\$ (conversion rate \$40J = \$1US)			
<b>REVENUE (I )</b>	<b>YEAR 1</b>	<b>YEAR 2</b>	<b>YEAR 3</b>
Average Visitors/Day	36	40	44
Operating Days	365	365	365
<i>Total Visitors/Year</i>	<i>13 140</i>	<i>14 600</i>	<i>16 060</i>
Entrance Fee	\$12 00	\$12 00	\$12 00
<i>Total Entrance Fee Revenue</i>	<i>\$157 680</i>	<i>\$175 200</i>	<i>\$192 720</i>
Gift Per Capita	\$4 50	\$4 50	\$4 80
<i>Total Gift Sales Revenue</i>	<i>\$59,130</i>	<i>\$66,700</i>	<i>\$77 088</i>
F&B Per Capita	\$8 00	\$8 00	\$8 00
<i>Total F&amp;B Revenue</i>	<i>\$105 120</i>	<i>\$116,800</i>	<i>\$128 480</i>
Canoe Per Capita	\$5 00	\$5 00	\$5 00
<i>Total Canoe Revenue</i>	<i>\$65 700</i>	<i>\$73 000</i>	<i>\$80,300</i>
Craft Shop Per Capita	\$2 50	\$2 50	\$2 50
<i>Total Craft Shop Revenue</i>	<i>\$32,350</i>	<i>\$36 500</i>	<i>\$40,160</i>
<b>Total Revenue</b>	<b>\$420,480</b>	<b>\$467,200</b>	<b>\$518,738</b>
<b>EXPENDITURES - RECURRENT (II )</b>	<b>YEAR 1</b>	<b>YEAR 2</b>	<b>YEAR 3</b>
Accomodation (executive staff)	\$12 000	\$12 000	\$12 900
Audit Fees	\$3 750	\$4 031	\$4 334
Staff Uniforms	\$5 000	\$5 375	\$5 778
Staff Transportation	\$10 000	\$10 750	\$11 556
Community Relations	\$7 500	\$8 063	\$8 667
Directors Expenses	\$4 500	\$4 838	\$5 200
Subscription	\$180	\$194	\$208
Electricity	\$13 500	\$14 513	\$15 601
P/R & Advertising	\$20 000	\$21 500	\$23 113
Insurance (Public Liability)	\$2 000	\$2 150	\$2 311
Insurance (Property/Equipment/Fire/Etc )	\$4 500	\$4 838	\$5 200
Insurance (Group Health/Dental)	\$5 400	\$5 805	\$6 240
Legal Expenses (Company Formation)	\$600	\$645	\$693
Courier Expenses	\$1 500	\$1 613	\$1 733
Site Lease (Rental - PCJ)	\$30,000	\$30 000	\$30 000
Motor Vehicle Expenses	\$9 600	\$10 320	\$11 094
Printing & Stationery	\$4 500	\$4 838	\$5 200
Telephone	\$4 000	\$4 300	\$4 623
Repairs & Maintenance	\$9 000	\$9 675	\$10 401
Sanitation (Disposal)	\$1 200	\$1 290	\$1 387
Security	\$50 000	\$53 750	\$57 781
Salaries - Commissions	\$169 824	\$182 561	\$196 253
Staff Training	\$3 000	\$3 225	\$3 467
Water	\$12 096	\$13,003	\$13 978
Contingency Provision	\$20 000	\$20,000	\$20,000
<b>Total Expenditures</b>	<b>\$403 660</b>	<b>\$428,274</b>	<b>\$467 719</b>
<b>OPERATING PROFIT/(LOSS)</b>	<b>\$16,830</b>	<b>\$37,926</b>	<b>\$61,019</b>
<b>Finance Charges (III )</b>			
Loan Repayment A (Interest)	\$13 875	\$27 750	\$27 750
Loan Repayment B (Directors)	-	-	-
Bank Charges	\$1,650	\$1 650	\$1 650
<b>Total Finance Charges</b>	<b>\$15,525</b>	<b>\$29,400</b>	<b>\$29,400</b>
<b>Total Profit/(Loss)</b>	<b>\$1,305</b>	<b>\$8,526</b>	<b>\$31,619</b>
Depreciation	\$15,500	\$15,500	\$15,500
<b>SURPLUS/(DEFICIT)</b>	<b>(\$14,196)</b>	<b>(\$6,974)</b>	<b>\$16,119</b>

**NEGRIL ROYAL PALM RESERVE  
FACILITATION OF RESOURCE MANAGEMENT APPROACHES  
DRAFT PROPOSAL TO USAID/JAMAICA**

- I Environmental Issue/Opportunity — Design and implementation of a water-level management programme for the Negril Royal Palm Reserve in Negril, Jamaica

The central mission to be pursued in the development of the Royal Palm Reserve as a wilderness wetland reserve will be an effective resource management regime that stabilizes, restores and appropriately enhances the wetlands morass ecosystem. All other hoped-for and projected benefits of the Reserve, i.e., interpretation and education, an outstanding visitor experience, etc., cannot be successfully realized if the resource itself is not properly and effectively preserved and managed.

Central to an effective resource management programme is the mitigation of the accumulated and on-going effects of decades of systematic drainage and the active management of water levels.

II Proposed Mitigation/Enhancement Activities

Activity 1 Baseline Data

It is not possible to design and implement an effective water level management programme without the necessary baseline data on the hydrology, seasonal fluctuations, location of drainage canals, amounts of rainfall and other fundamental and necessary information elements. It is proposed to institute a daily systems monitoring regime over a period of one full year to provide a complete picture of exactly what is happening with water levels and drainage patterns in the Reserve.

Activity 2 Programme Design

Once the baseline database has been compiled, programme design can commence. The design will include both active and passive mitigation initiatives, and will make use of expert outside consultants when necessary. It is projected that some system of sluice gates to actively manage water levels in at least the main drainage canals will be needed. These gates will give the Reserve the ability to balance the need for the wetlands to retain more water with the need to keep infrastructure open and functioning (for example, to keep roads free from flooding in heavy rains and high water).

### Activity 3 Programme Implementation

Upon completion of programme design, implementation of mitigation initiatives will commence

### Activity 4 Monitoring and Adjustment

Implementation will be accompanied by an on-going monitoring programme that will assess the effects of the programme and indicate the need for adjustment as time goes by. The monitoring programme will be designed as part of the systems design process, in order for it to be properly integrated with the designs and objectives of the programme.

### III Funding Requirements (in US dollars)

Baseline Data (by staff, with minimal outside assistance)	\$ 5,000
Systems Design	\$ 30,000
Programme Implementation (including sluice gate construction)	\$ 75,000
Monitoring and Adjustment	\$ <u>15,000</u>
Total Funding Requirements	\$125,000

### IV Expected Results

A water-level management programme for the Reserve, incorporating both active and passive mitigation measures, will be the central resource management element in the operation and evolution of the Royal Palm Reserve. It is expected that the benefits will accrue over time, resulting in increased water-levels in the wetlands, particularly in the dry season, and the eventual restoration of the historic natural hydrology. The ultimate goal is a much healthier wetlands ecosystem than exists today, with associated benefits to plant and animal communities in the Reserve, its surrounding morass, and to the entire reef-to-ridge ecosystem of the Negril area.

### V Schedule

Activity	Year One	Year Two	Year Three & On-going
Baseline Data	<----->	----->	
Systems Design (6 mos )		<----->	
Programme Implementation			<----->
Monitoring and Adjustment			<----->

**NEGRIL ROYAL PALM RESERVE  
FACILITATION OF RESOURCE MANAGEMENT APPROACHES  
DRAFT PROPOSAL TO USAID/JAMAICA**

- I Environmental Issue/Opportunity — Installation of Clivus Multrim Composting Toilets to serve as the public toilet facilities for the Negril Royal Palm Reserve in Negril, Jamaica

With the development of the Royal Palm Reserve as a wilderness wetland reserve with a mission that includes resource management, interpretation and education, and a quality visitor experience, the Reserve recognizes the need to make responsible use of environmentally sound approaches to all of its infrastructure, including human waste treatment and handling. Furthermore, the Reserve recognizes the opportunity to demonstrate to the community of Jamaica the value and validity of "alternative" and sustainable approaches to all elements of resource protection.

Clivus Multrim Composting Toilets are proven systems in the tropics. They are designed to treat human waste through biological decomposition, resulting in sterile, innocuous garden compost that can be used as a soil amendment.

II Proposed Mitigation/Enhancement Activities

Activity 1 Systems Design

There are two elements to the design of a composting toilet system: Sizing, model selection and installation design of the Clivus Multrim model best suited for the facility and its anticipated loads, and, design of the building to house the composting units.

The sizing, model selection and installation design are done in conjunction with the professional staff of Clivus, located at corporate headquarters in Cambridge, Massachusetts, USA. This service is provided as part of the purchase package. In addition, the staff of Clivus provides specifications for the building needed to house the units.

Based upon specifications from Clivus, the site manager must design and construct (or have constructed) the building, using materials and architectural design of their choosing. A two-story structure is needed, with the actual bathroom units on the second floor and the composting tanks below on the ground floor. No water is needed, other than for hand washing, which can be drained away as "grey water" and used for irrigation. For the Reserve, one of the principals, an architect in Jamaica, will complete the building designs and necessary working drawings. A local contractor will be engaged for construction.

## Activity 2 Facility Construction and Installation

Once the necessary designs are complete, the installation proceeds on two parallel tracks. First, once a purchase agreement is sealed with Clivus, Clivus arranges for shipping (by sea cargo) to Jamaica. The Reserve then arranges for overland transportation to the site. At the same time, building construction to house the composting units proceeds in time to receive and install the units.

## Activity 3 On-going Maintenance and Monitoring

A large part of the appeal of composting toilets is the fact that they utilize a completely biological and self-contained process, needing no supplemental water, energy or soak-aways. They do, however, need regular maintenance, primarily to add organic material to facilitate the composting process. Soft-wood chips or sawdust is recommended. Staff needs moderate training in the systems and their maintenance. Regular (bi-weekly) checks of the system tanks is needed to make sure that there is a sufficient organic material in the tanks, if needed, a few shovels full are added. If properly sized, installed, maintained and vented, there is no objectionable odor generated from the composting toilets.

## III Funding Requirements

Cost of Toilet Units and shipping (US dollars)	\$15,000
Cost of building design and construction	<u>\$15,000</u>
Total cost	\$30,000

## IV Expected Results — The use of composting toilets will yield benefits in three operating areas

- 1) Provides a safe, clean, efficient and *environmentally responsible* approach to human waste management for the Royal Palm Reserve, in keeping with its resource management mandate
- 2) Serves as a working model of a sustainable alternative to human waste treatment. The Reserve will install interpretive graphic panels for the bathrooms, describing the composting system, how it works and its value
- 3) Provides the visitors with a clean, safe and pleasant bathroom facility as part of their visitor experience at Royal Palm Reserve

## V Schedule

Activity	Sept	Oct	Nov	Dec	Jan	Feb	On-going
Systems Design	←→						
Construction and Installation		←—————→					
Maintenance and Monitoring					←—————→		

**NEGRIL ROYAL PALM RESERVE  
FACILITATION OF RESOURCE MANAGEMENT APPROACHES  
DRAFT PROPOSAL TO USAID/JAMAICA**

- I Environmental Issue/Opportunity — Hiring of a Staff Naturalist for the Negril Royal Palm Reserve in Negril, Jamaica

With the development of the Royal Palm Reserve as a wilderness wetland reserve with a mission that includes resource management, interpretation/education, and a quality visitor experience, the Reserve recognizes the need for dedicated on-site expertise, in the form of a full-time staff member, to lead its resource management and interpretation/ education programmes, and add value to the visitor experience

- II Proposed Mitigation/Enhancement Activities — The specific activities for this opportunity issue will be in the form of a scope of work/position description Responsibilities will be divided among the four primary operating mandates of the Reserve, and are listed here as such

A Resource Management

- 1 Water-level Management keep detailed daily observation logs and weather records, design a mitigation programme, hire outside expertise for highly technical areas if necessary, implement and monitor programme
- 2 Cattle/Agricultural Control work closely with local community in controlling the problems, maintain perimeter control measures
- 3 Wildlife Management keep detailed records of wildlife sightings and maintain a Reserve log of sighted species, manage bird feeding programme, attempt to control mongoose population, manage waterfowl nesting programme, assist with landscape design to emphasize species that attract birds, butterflies and dragonflies
- 4 Reforestation lead the reforestation programme

B Interpretation and Education

- 1 Guide Training lead the guide training programme, including weekly guide meetings and mini-training sessions, regular longer training sessions, etc  
Serve as primary training instructor for resource-related issues
- 2 Interpretive Center oversee and assist in the design of the Interpretive Center Manage the Interpretive Center once it is complete
- 3 Wayside Graphics oversee and assist in the design of the Wayside Graphics programme, including selection of locations of graphics, completing background research, writing graphics copy, etc
- 4 Presentation Programmes create on- and off-site presentation programmes, serve as lead presenter for off-site and outreach programmes

C Visitor Experience

- 1 Enhance the visitor experience through a productive resource management programme
- 2 Enhance the visitor experience through a creative, educational and entertaining interpretive and educational programme
- 3 Enhance the visitor experience through interaction with guests

D Alternative Economic Development Activities

- 1 Assist in the design and test implementation of a range of alternative economic development (revenue-generating) activities
- 2 Provide the necessary resource management oversight to the alternative economic development programme, ensuring that any proposed activity has only positive impact to the resource and monitoring the activity to make sure that it continues to pass this test

III Funding Requirements

It is projected that \$50,000US per year will be needed to attract and keep a qualified and experienced Staff Naturalist. This cost includes housing, and, potentially, benefits. It is proposed that funding be dedicated over a three year, incrementally decreasing period. The object is to get the position started with a full contribution the first year, and then have the Reserve begin to participate in covering the costs until the position is fully funded by the operating budget of the Reserve. The following schedule is proposed:

Donor contribution for Staff Naturalist position, year one	\$50,000
Donor contribution for Staff Naturalist position, year two	\$30,000
Donor contribution for Staff Naturalist position, year three	<u>\$15,000</u>
Total donor contribution over three years	\$95,000

IV Expected Results

The impact of a full-time Staff Naturalist as part of the Royal Palm Reserve management team will be realized over each of the four operating mandates of the Reserve.

The primary focus of the Staff Naturalist will be associated with the two mandates most closely related to the conservation mission of the Reserve: direct resource management and interpretation and education. Management of the wetlands forest resource is a significant challenge. The Reserve and its surrounding morass have been under considerable stress for nearly four decades, with serious degradation accruing from systematic draining, clearing for agriculture, fire, development, cattle grazing, and others. In order for direct and active mitigation programmes to be effectively undertaken to stabilize and restore the wetlands ecosystem, sound science-based investigation must be pursued, and conservative approaches designed, tested, monitored and implemented. While it

is conceivable that this could be achieved through the use of outside consultants, the most effective and time-efficient approach will result from one person taking direct responsibility for the programme. The result will be an accelerated and effective resource management programme that demonstrates positive impacts and results.

Similarly, the critical need to understand and interpret the natural systems, and effectively communicate these resources and the importance of the Reserve and the morass in their reef-to-ridge context needs informed, expert and interested leadership. The training of guides and other staff, the design and creation of on-site active and passive interpretive presentations, the design and implementation of educational and interpretive programmes (both on- and off-site) are all major challenges. They will be the responsibility of the Naturalist.

Secondary responsibilities that will also serve to enhance the evolution of the Reserve as a viable wilderness wetlands institution will accrue to the overall visitor experience and to the pursuit of alternative economic, revenue-generating activities. Through the interpretive and educational programmes and presentations, the Naturalist will have direct personal impact on the visitor experience and will be responsible for improving the effectiveness of the guides and other staff in their interactions with the public.

Finally, the Staff Naturalist will bring their expertise to bear to assist in the development and implementation of alternative economic activities. Since they will all be resource-based, it is logical that the Naturalist will be in a sound position to contribute input and expertise.

A full-time Staff Naturalist at the Royal Palm Reserve will result in more effective, more consistent results in all areas of the Reserve's operation. Further, these results will be realized much more quickly, with far greater early impact, than if they were to be undertaken by a combination of existing staff, outside consultants and implementing contractors.