

**CODRINGTON LAGOON NATIONAL PARK  
BARBUDA**

**MANAGEMENT PLAN  
2009-2019**

**ENVIRONMENT DIVISION, ANTIGUA AND BARBUDA  
and  
THE BARBUDA COUNCIL**

February, 2009

## **ACKNOWLEDGEMENTS**

The Codrington Lagoon National Park Management Plan has been developed by the Government of Antigua and Barbuda and the Barbuda Council with technical support provided by the USAID Caribbean Open Trade Support (COTS) Programme. The COTS Programme contracted with Chemonics International, a U.S.-based consulting firm, to provide an Expert in Park Management to guide the process. With the approval of the Environment Division of Antigua and Barbuda, Chemonics hired Allen D. Putney to complete the assignment.

Many people have participated in the development of this Plan and deserve thanks. Foremost among these are the Members of the Codrington Lagoon National Park Stakeholder's Committee, which include Fabian Jones, John Webber, Melesha Banhan, Calvin Gore, Valater Webber, Tricia Lovell, Wesley Beazer, Linton Thomas, the Environmental Awareness Group (Donald Anthonyson and Junior Prosper), and Brent Parker. John Mussington, Headmaster of the Barbuda Secondary School, provided important technical information and perspective on the changes in Codrington Lagoon over time. A hearty thanks to each for their valuable inputs.

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# EXECUTIVE SUMMARY

Barbuda is a relatively flat limestone island that lies 40 km. north of the island of Antigua. It features a large wetland system at its north western end. This mangrove-fringed wetland extends 16.5 km. along Barbuda's coast, and includes two lagoons: Codrington Lagoon, which is the larger, and Goat Island Flash, which is smaller and shallower. One of the major features of Codrington Lagoon is the presence of a breeding colony of frigate birds (about 5,000 pairs), the largest in the Caribbean.

The 3,600 hectare Codrington Lagoon National Park (CLNP) was established in March, 2005, to conserve these spectacular wetlands. In June, 2006, the CLNP was added to the List of Wetlands of International Importance under the Ramsar Convention, an intergovernmental treaty that provides a framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

The Plan presented here is intended to guide all aspects of the management and development of the CNLP over the coming decade, and serve as a blueprint for marketing concessions to local and foreign investors. Three distinct phases are proposed. Phase I, basic operations, is designed to get essential management functions up and running and recruit basic staff. Phase II, enhanced operations, aims to extend the Park into the adjacent marine environment, increase use of the Park for tourism and for recreation by local Barbudans, and enhance institutional capacities to accommodate increased management requirements. Phase III, full operations, seeks to expand infrastructure for nature tourism and recreation, and develop a full scale Park Headquarters complex with offices, a Visitor Centre, and maintenance and storage facilities. This Management and Development Plan for the Park has been prepared in tandem with a Biodiversity Assessment and a Financial Sustainability Plan, and each has been adjusted to take account of the others.

The National Parks Act, 2004, currently the legal basis for the Park, will be amended by the Barbuda Lands Act, 2007. Once the final steps to legalise the Act have been completed, a corporate body, the National Parks (Barbuda) Authority, will be created to guide the management and development of national parks in Barbuda. In the meantime, a Stakeholder's Committee has been established by the Barbuda Council and the Antigua and Barbuda Environment Division to guide the management and development of the Park. The Park is in the initial stages of development with basic studies and plans being undertaken and staff being hired.

The Park environment is heavily influenced by the position of Barbuda in the North-East Trade Winds, which leads to the drying of surface vegetation and tropical storms during the hurricane season. The flatness of the terrain accentuates high solar intensity. Barbuda is a limestone island that emerges from the eastern extreme of the shallow, hourglass-shaped Barbuda Bank. The Park includes two distinct geological regions: (1) the Codrington Limestone region made up of sandy and fossil-rich sediments, and (2) the Palmetto Point region composed of beach sands and ridges with shelly strata. It is a wetland area of flat topography that encompasses lagoons, salt ponds, beaches, sand berms, islands, and lowlands. This assemblage is host to a complex set of plant communities, most of which are relatively natural except for the secondary vegetation around Codrington Village, and the impacts generated by feral livestock. The most visible fauna in the Park are the birds, especially the Frigate Bird colony, the largest in the

Caribbean. While native mammals are limited to bats, feral and semi-wild cattle, goats, donkeys, horses and sheep have over-run the island, causing enormous damage. Fourteen species of reptiles are found in the Park together with 1 amphibian and 1 freshwater fish.

Codrington Lagoon is a well-flushed, healthy ecosystem supporting a diversity of marine species. Goat Island Flash, is less well flushed, more saline, and provides habitat for fewer species. Several factors threaten, including hurricanes and droughts, sand mining, expansion of Codrington, tourism development, fuel spills from the island's diesel generator, contamination and salt water intrusion of the fresh water aquifers, and sea level rise. Codrington Lagoon is closely linked to the culture and economy of Barbuda and has always been a focus of social and economic activity, mainly because of its location adjacent to Codrington Village, the only populated area of Barbuda. Main uses include the fishing of juvenile lobster, visitor tours to the Frigate Bird Colony, and picnicking and bathing for both visitors and locals. Sand mining occurs south of the Lagoon, and has been damaging to vegetation and the underlying aquifer.

The CLNP protects the largest and best preserved wetland complex of Antigua and Barbuda. It is the resource base for a thriving lobster fishery and tourism activity that make up an estimated 60% of the Barbuda economy. The lagoon is a primary nursery site for lobsters and other fish species, and as such is a critical habitat for the replenishment of offshore ecosystems, especially coral reefs. However, there are several uses of, or influences on, the Park that began before its creation and require careful management. These include the presence of two hotels and three cottages; fishing, especially for lobster, within the Lagoon and on the reefs surrounding the Park; sand mining on Palmetto Point; and stressors from Codrington Village that impact the Lagoon (mangrove clearing, solid and liquid waste disposal, fuel leaks, and contamination and accelerating withdrawal of water from the Palmetto Point aquifer, one of the sources of Codrington's freshwater supply).

The vision for the Codrington Lagoon National Park is part of an environmentally oriented vision for Barbuda. That vision centres on a "green strategy" for sustainable development that would have the following key components:

1. development of Codrington Lagoon National Park
2. expansion of the Park to include the adjacent marine area, and the natural and cultural amenities of the East Coast;
3. adoption of an explicit island-wide policy to aggressively pursue and implement the latest technologies for sustainability;
4. the marketing of Barbuda through media coverage of the "green strategy" and the resulting recognition in the key nature tourism markets of North America and Europe;
5. the use of carbon credits to fund alternative energy projects;
6. the use of revenues generated by the sale of energy from windmills to provide sustainable finance for Park management; and,
7. the implementation of each of the green strategy components in ways that maximize benefits to the local population; minimize negative social and economic impacts; and equitably share costs among the population, outside investors, and international organisations.

The Long-term objective for Park management is to: ***protect the biodiversity and productivity of the Codrington Lagoon wetland complex, the East coast cliff environments, and adjacent near shore marine areas by maintaining their natural ecological structure and processes, while at the same time promoting sustainable tourism, fisheries, recreation,***

**and educational activities.** To achieve this objective, current Park boundaries need modification as follows:

1. re-delimitation of the eastern boundary around Codrington Village to exclude all residential plots;
2. extension of the northern and western boundaries to include the marine area to a distance of three nautical miles from the coastline; and eventually,
3. extension of the north eastern boundary to include the outstanding natural and cultural resources along the east coast of Barbuda.

Within the international categories of protected areas established by IUCN, these objectives would place the CLNP in Category VI (Protected Area with Sustainable Use of Natural Resources).

Not all Park objectives can be achieved in all areas of the Park, so zoning is used as a tool for giving a spatial dimension to specific management objectives. The majority of the Park is zoned for General Conservation, with smaller areas zoned for Strict Protection, Public Use, and Restoration. Until the recommended boundary modifications are incorporated in a new declaration of the Park under the Barbuda Lands Act, 2007, major buffer zones are included adjacent to the existing boundary to cover the marine areas that will be later be integrated into the new Park boundaries.

The specifics for management of the Park are articulated through management programmes on resource protection, visitor use, research and monitoring, environmental education and public awareness, and community outreach.

#### **Resource Protection Programme:**

Objective: safeguard the integrity of the biological resources, natural features, and ecological processes of the Park through actions that build public support and counter specific threats.

Management actions: building of stakeholder relations; infrastructure design, construction, and maintenance; education and awareness; boundary demarcation and fencing; periodic patrols; and interpretation of monitoring data.

#### **Visitor Use Programme:**

Objective: facilitate understanding and enjoyment of the Park and its resources by the general public, provide excellent outdoor recreation opportunities, and contribute to the sustainable development of Barbuda by providing a high quality environment for low impact ecotourism activities.

Management Actions: provision of access; visitor information; concessions system for visitor services; and fee system.

#### **Research and Monitoring Programme:**

Objectives: improve knowledge of the Park's biota, physical features, and natural processes; compile and make accessible research information for decision-making that will improve management effectiveness; identify trends in resource condition; and, measure changes being caused by climate change.

Management Actions: clarity on priorities; incentives for researchers; and data base.



## **Environmental Education and Awareness**

Objectives: inform visitors as to the environmental, social, and economic values of the Park; educate the public, especially leaders of public opinion, on the environmental issues relevant to the management of the CLNP; and inform the public of the management practices for the Park, threats to the Park's objectives, and ways that stakeholders can help to reduce or mitigate those threats.

Management Actions: school environmental education programmes; and public awareness campaign.

## **Community Outreach:**

Objective: insert the Park into the mainstream of sustainable development in Barbuda, thereby assuring that the Park becomes a critical development resource that is understood and appreciated by a spectrum of stakeholders.

Management Actions: wind generated energy; electric transport; off-park visitor cottages, tent camps, and research facilities; horse and mountain bike trails; guide services; and cottage industries.

A National Parks (Barbuda) Authority will be established to guide the management and development of the Park once the last steps in enactment of the Barbuda Land Act, 2007, are completed. The Authority will appoint a Park Manager and all staff. The Park Manager will be responsible for all aspects of management for Codrington Lagoon National Park, and will be guided by the Management and Development Plan and the Financial Sustainability Plan as approved by the National Parks (Barbuda) Authority. Consultants will be hired to provide support on legal and financial matters, and assist with specialised technical aspects of management. A senior volunteer with expertise in Park Management will be recruited. Training opportunities for staff will be sought on a regular basis. Park staff will be supported by fully equipped offices and Ranger Stations, adequate field equipment, and marine and terrestrial transport. Periodic evaluations of management effectiveness will be used to assess implementation of the management plan, identify problem areas and gaps, and propose remedial measures.

Cost estimates and revenue projections indicate the following:

Phase I: Annual costs = US\$ 421,000, and annual revenues = US\$ 484,000

Phase II: Annual costs = US\$ 613,000, and annual revenues = US\$1,190,000

Phase III: Annual costs = US\$ 976,000, and annual revenues = US\$1,502,000

These are preliminary estimates and all figures are expressed in 2009 U.S. dollars. Revenue projections are based on best case scenarios for user fees, project funding, and earned income (concession fees and alternative energy from wind turbines). The analysis of revenue potentials indicates that about half of the annual revenues could be raised by earned income. Thus, it is urgent that the Park acquire the necessary capacities for the development, marketing, and administration of concessions and alternative energy projects through consultants and staff training. If this is not done as a matter of priority, the potential for earned income will remain unrealised, Park management will continue to depend on the current sources of funding; that is, entrance fees charged to visitors, and project funding. Even if visitor fees and project funding are pursued vigorously, these sources of revenue can only fund basic operations --- at best.

Under this scenario, Park management will never attain international standards, nor serve as a motor for the sustainable development of Barbuda.

The generation and administration of revenues streams will rely heavily on two finance mechanisms: a National Park Fund administered by the National Parks (Barbuda) Authority, and a Conservation Trust Fund for Antigua and Barbuda operated as an independent foundation.

This is the first Management and Development Plan for CLNP, and because of this, a 10 year time horizon has been chosen. However, a great number of assumptions and estimates have been made, and to be of maximum use, this Plan should be updated at the end of each phase (every three or four years). If this is done, and management proceeds according to the Plan, it should be possible to achieve the objectives that have been set out, thereby contributing to the sustainable development of Barbuda.

# INTRODUCTION

## Key Concepts - Introduction

- Codrington Lagoon National Park (CNLP) is dedicated to the conservation and sustainable use of an important wetland complex of 3,600 hectares on the Caribbean island of Barbuda.
- The CNLP was established by law in 2005, and accepted by UNESCO as a Wetland of International Importance under the intergovernmental Ramsar Convention in 2006.
- The document presented here was developed through a participatory process, is intended to guide all aspects of management and development, and will assist in the marketing of concessions (leases).
- The Plan has a 10 year time horizon and is divided into 3 phases: I - basic operations, II - enhanced operations (addition of the marine annex, and new concessions), and III - full operations (additional concession and new Park Headquarters Complex).
- The Management and Development Plan has benefitted from, and is complemented by, a Biodiversity Assessment and a Financial Sustainability Plan

Barbuda is a relatively flat limestone island that lies 40 km. north of the island of Antigua. It covers an area of 160 km<sup>2</sup> and features a large lagoon system at its north western end. This large, mangrove-fringed wetland extends 16.5 km. along Barbuda's coast, and includes two lagoons: Codrington Lagoon, which is the larger, and Goat Island Flash, which is smaller and shallower. One of the major features of the Lagoon is the presence of a breeding colony of frigate birds (about 5,000 pairs), the largest in the Caribbean.

Codrington Lagoon National Park (CLNP) was established in March, 2005, to conserve 3,600 hectares of this spectacular wetland system (see Annex A, Map 1). A national park is one of six categories of protected areas recognised by IUCN's World Commission on Protected Areas. As defined by IUCN, a protected area is:

*“a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values”.*

However, protected areas have a wide range of management objectives and governance structures and the IUCN protected areas categories are a global framework for distinguishing among them. The specific definition of a national park, as established by IUCN is:

*a “large natural or near natural area set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities”.*

In June, 2006, the CLNP was added to the List of Wetlands of International Importance under the Ramsar Convention, an intergovernmental treaty that provides a framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. As a Ramsar Site, the CLNP is committed to wise use, effective management and international cooperation.

The Plan presented here is intended to guide all aspects of the management and development of the Codrington Lagoon National Park over the coming decade. It will also be used to convince investors of the importance of the Park for tourism, to communicate how the Park will be managed, and to demonstrate to potential concessionaires the guarantees that will be in place to protect their investments in the Park.

Three distinct phases are proposed, each of which are scheduled for implementation in 3 to 4 years. Phase I, *basic operations*, is designed to get essential management functions up and running and recruit basic staff. Phase II, *enhanced operations*, aims to extend the Park into the adjacent marine environment, increase use of the Park for ecotourism and for recreation by local Barbudans, and enhance institutional capacities to accommodate increased management requirements. Phase III, *full operations*, seeks to expand ecotourism and develop a new and larger Park Headquarters and Visitor Centre complex. During Phase III, or subsequent to it, the Park might also be expanded to include a corridor along the east coast (see Annex A, Map 2).

This Plan has been prepared through a participatory process. A consultant was hired to lead the process which included:

- field reconnaissance (see Annex B, for the schedule of field visits) ;
- in-depth discussions with the Stakeholder's Committee;
- interviews with other stakeholders, both in and out of government (see Annex C for a listing of the persons consulted);
- preparation and review of a draft;
- discussion of the draft at meetings of the Stakeholders Committee, and of the Barbuda Council; and,
- revision of the draft to incorporate recommendations.

This Management and Development Plan for the Park has been prepared in tandem with a Biodiversity Assessment and a Financial Sustainability Plan, and each has been adjusted to take account of the others.

# PART A – DESCRIPTION

## 1. BACKGROUND

### Key Concepts – Background

- The CLNP was originally established under the authority of the Antigua and Barbuda National Parks Act, 1984, and will soon be re-declared under the Barbuda Lands Act, 2007.
- The Park can be accessed both by road from Codrington Village or The River Landing, by sea, or by entrances from the sea into the Codrington Lagoon and Goat Flash.
- Though the Park belongs to the people of Barbuda in common, leases or other informal arrangements have been given for the installation 2 hotels and 3 cottages within the Park.
- Park Management is currently the responsibility of a Stakeholder’s Committee which will soon become legalized as the National Parks (Barbuda) Authority.
- The Park is in the initial stages of development with basic studies and plans being developed and initial staff being hired.

### 1.1 Park establishment

Codrington Lagoon National Park (CLNP) was established under the authority of the Antigua and Barbuda National Parks Act, 1984, through a Ministerial Decree published in the National Gazette on 31 March, 2005. This represented the culmination of a long effort to establish the Park, which was supported by the Caribbean Regional Environment Programme administered by the Caribbean Conservation Association and financed by the European Union.

The Park is located on 3,600 hectares in north western Barbuda as shown in Map 1 of Annex A. The designated area is *“bounded seaward in the west by the Caribbean Sea and landward in the east by the Martello Tower moving northwards past the Sand Ground Plantation, the Cemetery along the River Road to the intersection of the Cut line, along the south of the Codrington Airstrip, along the western portion of the Village and towards the All In Well, from the All In Well the boundary runs along the Fishing Creek Road, the Tidal flats and ends at the Trig Station “Ba 14” located approximately halfway between Fishing Creek and Hog Point”* (National Gazette, 31 March, 2005).

As can be seen on Map 1, access to the Park can be made on land from the Martello Tower to Palmetto Point and from the road north of Codrington to the Goat Island Flash. The Lagoon can be accessed by boat, from the Codrington jetty. The beaches of the Park, and the Goat Island Flash can also be accessed by boat through Cuffy Creek at the north end of the Lagoon.

All lands and waters in Barbuda, including the CLNP, are owned in common by the people of Barbuda (The Barbuda Land Act, 2007). Within the Park, leases for hotels have been let at Palm Beach and at Palmetto Point and for cottages at North Beach (see Annex A, Map 3). Smaller areas within the Park on the west side of Codrington have been assigned to local

Barbudans for residential plots. However, these plots have not been mapped in relation to the Park boundary.

## **1.2 Governance**

The National Parks Act, 2004, indicates that a corporate body, the National Parks Authority, will manage and develop the national parks of Antigua and Barbuda. The National Parks Authority, with the agreement of the Barbuda Council, has delegated management and development of national parks in Barbuda to a Stakeholder's Committee currently in the process of being gazetted as the National Parks (Barbuda) Authority. This body is made up of representatives of the following groups:

- Barbuda Council
- Fisheries Office, Barbuda
- Planning Office, Barbuda
- Environment Division, Antigua & Barbuda
- Small Businesses Association
- Sea Taxis Association
- Land Taxis Association
- Fishermen Association
- Lobster Exporters Association

The Hotel Association Representative, once chosen will complete the body. Until complete implementation of the national park, the following entities are observers on the Committee:

- Fisheries Division, Antigua & Barbuda
- Development Control Authority, Antigua & Barbuda
- Environmental Awareness Group

Each Stakeholder group chooses its representative to serve on the Committee.

A Barbuda Lands Act, 2007, is in the process of legalization. This Act authorizes the declaration of national parks in Barbuda by the Barbuda Council, and establishment of a National Park (Barbuda) Authority. It is the intention of the Council to make a new declaration of the Codrington Lagoon National Park under this legislation, and to legalize the National Park (Barbuda) Authority being created under the Barbuda Lands Act. This body would become the entity responsible for the management and development of the Park.

## **1.3 Current Status**

The Park is in the initial stages of development with basic studies and plans being undertaken and staff being hired. Basic studies and plans that have been undertaken (some not finished) include the following:

- Proposed Ecosystem Monitoring Plan for Codrington Lagoon (June, 2000 by Lianna Jarecki)
- Analysis of Beach Changes in Antigua and Barbuda, 2001-2004: Executive Summary (2006 by Philmore James).
- Park Development Plan (undated partial draft that recommends general policies).
- Business Plan (partial draft of March, 2008, by Rexford Henry).
- Barbuda Lagoon Risk Profile (Sherrod James, 2008)

- Biodiversity Assessment for the Codrington Lagoon National Park (Draft of December, 2008, by Kevel Lindsay)
- Financial Sustainability Plan for Codrington Lagoon National Park (draft of December, 2008, by Allen Putney)
- Barbuda Magnificent Frigatebird Colony Management and Monitoring Plan (Betty Anne Schreiber, 1996)

It should be noted that these different studies and plans have been developed without the benefit of a comprehensive management and development plan for the Park. Thus, each has been undertaken with varying assumptions on how protected areas are managed in general, and specifically of how the CLNP will be managed. Subsequent to the December, 2008, draft the Financial Sustainability Plan has been revised to be synchronous with the Management and Development Plan.

As of February, 2009, four Park Rangers have been hired and a Park Manager, Administrative Assistant, and an Information and Grants Officer are being recruited. While none of the Rangers have training in protected area management, they are generally knowledgeable about the Park's physical features, resources, and resource usage. Knowledge of the CLNP and of protected areas in general is low among the population of Barbuda.

## 2. PARK ENVIRONMENT

### Key Concepts – Park Environment

- The physical aspects of the CLNP are dominated by the tropical climate, the north-east trade winds, tropical storms, relatively flat terrain, and high solar intensity.
- As a low lying island, sea level rise due to climate change is a serious concern.
- The CLNP is a wetland area of flat topography that encompasses lagoons, salt ponds, beaches, sand berms, islands and lowlands covered with limestone and sand.
- The flora consists of a complex set of plant assemblages that are relatively natural, except for the secondary vegetation around Codrington and the negative impacts generated by feral horses, donkeys, sheep and goats.
- The fauna is dominated by birds, especially a large colony of nesting frigate birds.
- The wetland systems are in good health though threats are posed by hurricanes, droughts, sand mining, urban expansion, tourism, fuel spills, contamination by solid and liquid wastes, salt water intrusion into the fresh water aquifer, and sea level rise.
- The Park's lagoons are particularly important nurseries for the spiny lobster and fin fish populations that inhabit the reefs around the island, and that are the basis for the thriving lobster fishery.
- Codrington Lagoon has always been closely linked to the culture and economy of Barbuda.

The environment of the island of Barbuda includes a variety of natural and cultural features that are of particular interest. The most important sites are indicated in Map 4, Annex A.

## 2.1 Physical Aspects

### 2.1.1 Climate

The environment of the Park is heavily influenced by the position of Barbuda in the North-East Trade Winds, which leads to the drying of surface vegetation, and tropical storms during the hurricane season. The flatness of the terrain tends to accentuate high solar intensity.

Temperatures are quite stable the year around, usually with daytime temperatures of 25-29° C. and night-time temperatures that are 6° C. lower. Annual rainfall for Barbuda is 76-99 cm., though Barbuda has experienced periods of drought in 1971, 1983, 1990, 1991, 1994, and 1996 to 1998. The wet season is generally from August to December and the dry season between January and April.

Barbuda experiences predominantly easterly winds, with seasonal shifts in winds from the east-northeast to the southeast. Seasonally, the average wind direction varies throughout the year according to the following general pattern:

- December to February: from the east-northeast.
- March to May: from the east
- June to August: from east to east-southeast,
- September to November: from the east to southeast.

During the October to April period, Barbuda is occasionally influenced by frontal systems moving in an eastwardly direction across the southern part of the USA. The trailing edge of these fronts sometimes affects Barbuda and results in winds blowing between the northwest and the northeast for short periods of time, usually no more than one to two days.

Barbuda lies within the hurricane belt, and these intense storms tend occur between June and November. September is generally the month when most tropical storms/hurricanes occur. Hurricanes generate high winds and waves, storm surges, heavy rainfall and flooding. In recent years, several hurricanes have passed sufficiently close to Barbuda to cause significant damage. These hurricanes have included:

- Hurricane Hugo, September, 1989;
- Hurricanes Luis and Marilyn, September, 1995;
- Hurricane Bertha, July, 1996;
- Hurricane Georges, September, 1998;
- Hurricane Jose, October, 1999;
- Hurricane Dean, August, 2007;
- Hurricane Lenny, November, 2007; and,
- Hurricane Omar, October, 2008.

A storm surge analysis has been carried out for disaster preparedness and as a guideline for structure design. It is estimated that the maximum wave height for a 100 year event at 95% prediction limits to be 3.95 meters and the maximum surge of 4.15 meters. It is also estimated that the maximum wind speed would be 186 knots.



Sea level rise due to climate change is also an important factor to take into account for a low-lying island. It has been estimated that there will be a sea level rise of 9 cm. during the 10 year period of this plan. This could enhance salt water intrusion into the fresh water aquifers and change mangrove zonation.

### **2.1.2 Geology and Soils**

Barbuda is a limestone island that emerges from the eastern extreme of the shallow, hourglass-shaped Barbuda Bank. It covers some 3600 km<sup>2</sup>, and consists of a tilted Oligocene succession of volcanics overlain by fossil-rich tuffs and is capped by marine limestones. Fossil records indicate that Barbuda first emerged some 15 to 20 million years ago. Barbuda is unlike most of the other limestone Caribbean islands because it lies 50 km east of the axis of the island arc. It differs also as it lies on the northeast margin of its bank, rather than in the centre. The Park includes two distinct geological regions: (1) the Codrington Limestone region made up of sandy and fossil-rich sediments, and (2) the Palmetto Point region composed of beach sands and ridges with shelly strata.

The soils of the Park include:

- Codrington clay found mainly around Codrington village.
- Blackmere clay loam found northwest of Codrington village; at the south eastern tip of Barbuda and at Goat, Rabbit and Kid islands; and at the narrow sand bar separating the western shoreline (Low Bay) and Codrington Lagoon. Land in this series slopes 10° and is characterised by varying degrees of shallowness, stoniness, salinity and compaction.
- Beach sand formations at beaches and overlaying the critical aquifer at Palmetto Point.
- Mangrove swamp formations around Codrington Lagoon and the Goat Island Flash.
- Salina formations fringing sections of Codrington Lagoon.

### **2.1.3 Geomorphology and Hydrology**

CLNP is a wetland area of flat topography that encompasses lagoons, salt ponds, beaches, sand berms, islands, and lowlands covered with limestone and sand.

The beaches in Barbuda can be classified into four basic types according to their dynamic character:

- Seasonally unstable
- Depositional
- Relatively stable
- Unstable and erosional

The seasonally unstable beaches in the Park are from Cedar Tree Point to the Canal/Oyster point. The depositional beaches are the area from Coco Point to Spanish Point. The relatively stable beaches are from Billy Point to Hog Point. The unstable and erosional beaches lie several hundred meters south of the Canal, Palmetto Point and the area from the boat harbor to the Coco Point airstrip.

A sand berm separates Codrington Lagoon from the Caribbean sea. The width of the berm varies from just 44 meters to over 120 meters. The estimated depth of the sand on the berms varies between 2.5 meters to over 16 meters.

Because of the flatness of the area, there are no distinct watercourses or surface drainage. Water generally seeps into the sandy soils after rains, and the Palmetto Aquifer which underlies Palmetto Point is one the major aquifers of Barbuda.

## **2.2 Biological Aspects**

### **2.2.1 Flora**

The Park is made up of a complex set of plant assemblages, most of which are relatively natural except for the secondary vegetation around Codrington Village, and the impacts generated by feral horses and donkeys. A total of 311 plant species belonging to 84 families were identified during the biodiversity assessment carried out in October, 2008. Of these 87% are native.

These species can be found distributed in the Park in 18 different terrestrial vegetation community types. These community types are strongly influenced by a number of factors, including prevailing wind patterns, wind velocity, length of the dry season, rainfall, aspect and slope, and land use. The proximity of some of the vegetation to the strong onshore winds, in the presence of heavy salt spray reduces height, thereby altering the composition and diversity of the forest. For most of the plant communities, tree strata are generally limited to two layers (emergents and canopy layers) with a maximum height of 5-9m. Vegetation around Codrington Village, and in the areas of Palmetto Point that have mined for sand, are largely secondary and includes a number of exotics. The distribution of the natural terrestrial vegetation community types is presented in Annex 1, Map 5 and a description of each provided below (summarized from Lindsay, 2008);

#### Broad-leaved Evergreen Sclerophyllous Closed Tree Canopy Communities (Fe).

This community is characterized by a two-storied forest 5-15 m. in height. It is found in the Palmetto Point area in depressions between the sand dunes, though sand mining has obliterated over 90% of what originally existed. A very small area representative of this community still exists near the Lagoon.

#### Mixed Evergreen Drought Resistant Deciduous Communities (Sm)

This community can be found under a variety of conditions, mainly surrounding Codrington Village. It occurs adjacent to the mangroves on thin and saline soils and is characterized by stunted vegetation and bare patches of earth interspersed with flashes. Further away from the mangroves, the woodlands are taller and contain a greater portion of introduced exotics. The community suffers the effects of grazing, especially by feral donkeys and horses.

#### Dwarf Shrubland Communities (Sd)

Shrublands of this type consist of stunted trees and shrubs that grow on sand dunes or on flat sandy soils. Individual plants or vegetation clumps are scattered, exposed sand is found between them, and parasitic vines are abundant. This community occurs in the Park at Palmetto Point, though most of it has been destroyed by sand mining.

### Aquatic Plant Communities (Wm)

This community consists largely of mangroves that are found along the north, east, and south shoreline of Codrington Lagoon, and around the north and west shorelines of the Goat Island Flash. Four species occur:

- White Mangrove (*Laguncular racemosa*)
- Black Mangrove (*Avicennia germinans*).
- Red Mangrove (*Rhizophora mangle*)
- Buttonwood Mangrove (*Conocarpus erectus*)

A remnant of a variant of this community, dominated by buttonwood mangroves and dense sedges, occurs in depressions between old weathered dunes at the tip of Palmetto Point, and is found nowhere else in the Lesser Antilles. Sand mining has destroyed most of this community. These dunes are dry most of the year, but experience seasonal flooding.

### Tidally Flooded Mudflats Communities (Wf)

Found around Goat and Rabbit Islands and northwestern Codrington Lagoon, this community is made up of shrub-like mangroves, bare ground, and isolated pools. Areas of hypersaline soils, such as around the east coast of the Lagoon and Goat Island are devoid of vegetation except for algae.

### Grassland Communities (G)

This community, made up of grasses and forbs with scattered trees and shrubs, is artificial and is produced by the grazing of feral and roaming livestock around Codrington village. These areas tend to flood after heavy rains.

### Freshwater Ponds and Mudflats (Wp)

These occur around Codrington Village and are mainly characterized by algae, aquatic ferns, grasses, and sedges. They are the consequence of roads built around the village that serve as dams against the natural sheet flow of water, and as breeding grounds for mosquitoes.

## **2.2.2 Fauna**

Information on the fauna of the Park is summarised from the recent biodiversity assessment (Lindsay, 2008).

### Birds

Within the Park the avifauna is the most visible, especially at dusk when thousands of pigeons, doves and ducks can be seen heading for their roosting sites in the interior of the island. These are some of the last examples of the vast flocks that once were common in the Caribbean islands. The Frigate Bird colony at the north western corner of the Lagoon is the single most significant natural icon in the Park and is one of the most important breeding sites for this species in the Caribbean and globally.

Some 99 species of terrestrial, shore, and sea birds have been identified in the Park. This list will no doubt expand as more surveys are completed covering all seasons. Over half (57%) of the birds nesting in the Park are migrants from North and South America. The arrival of the North American migrants during the fall coincides with the period of the most active storm events. The northern migration coincides with the short but sustaining spring rains.

Several species of regional endemics, that are relatively rare in the Park, are of special concern. These include the White-tailed Tropic Bird, the Red-billed Tropic Bird, the West Indian Whistling Duck, the White-crowned Pigeon, the Lesser Antillean Flycatcher, the Antillean Euphonia, the island endemic Barbuda Warbler, and the Lesser Antillean Saltator.

### Mammals

The only native mammals in the Park today are bats, though little is known about them. These include the Velvety Free-tailed Bat, the Brazilian Free-tailed Bat, the Jamaican /fruit Bat, the Cabe Bat and the Fishing or Bulldog Bat. There are records of a native endemic rodent, the Barbuda Giant Rice or Musk Rat that went extinct at the time of the arrival of the Europeans.

While native mammals are limited, feral and semi-wild cattle, goats, donkeys, horses and sheep have over-run the island, causing enormous ecological damage. Prior to the 60's a corral system was used to raise livestock, but since then the animals have been allowed to roam free. These animals, together with the boar and fallow deer that were introduced in colonial times for hunting pose the single biggest threat to the biodiversity of the Park.

### Reptiles and Amphibians

Some 14 reptiles have been reported in the Park. They are quite common and widely distributed throughout most of Antigua and Barbuda. These include:

- the Antigua or Tree Anole (endemic to Antigua and Barbuda)
- the Brown or Watts Anole (endemic to Barbuda)
- the Antigua Ground Lizard (endemic to Antigua and Barbuda)
- the Smooth-scaled Worm Lizard
- the Dwarf Gecko (endemic to Antigua and Barbuda)
- the Forest or Tree Gecko
- the Blind Snake
- the Green Iguana
- the Red-footed Tortoise or Land Turtle
- the Hawksbill Turtle (marine turtle nesting in the Park)
- the Green Turtle (marine turtle nesting in the Park)
- the Leatherback Turtle (marine turtle nesting in the Park)

The only amphibian in the Park is the tree frog.

### Freshwater Fish

One freshwater fish species, the Magrove Rivulid, is found extensively in the Park. Though described as a freshwater species, it can be found in marine and brackish water environments, as well as in moist substrate and mangrove roots during drought periods. It can survive in hypersaline and high temperature conditions.

### **2.3 Ecosystem Health**

Codrington Lagoon is a well-flushed, healthy ecosystem supporting a diversity of marine species, including several of special concern, such as juvenile lobster and reef fish, sea turtles, nesting sea birds, and marine mammals. Goat Island Flash, on the other hand, is not well flushed, has poorer water quality and does not provide as much quality habitat for juvenile lobster or reef fish. However, it is an important mangrove wetland, and sea turtles feed on its extensive grass beds. Though the lagoon system is currently healthy, several factors threaten. These include hurricanes and droughts, sand mining, expansion of Codrington, tourism development, fuel spills from the island's diesel generator, contamination and salt water intrusion of the fresh water aquifers, and sea level rise.

### **2.4 Important Ecological Relationships**

The lagoons of the Park are particularly important nurseries for the large spiny lobster populations that live on the outer reefs of Barbuda and may migrate to fairly distant neighbouring islands as well. The salinity gradient in Codrington Lagoon appears to reverse seasonally. Barbuda, made of porous limestone, has a substantial capacity to store freshwater underground, particularly after prolonged rains. The ground water probably seeps through the limestone into the Lagoon, and then mixes with seawater that enters through Cuffy Creek channel, thereby reducing the water salinity in the southern end. After prolonged dry periods, however, the seeping and upwelling of freshwater is likely to slow or even stop. During these periods, water at the southern end of the Lagoon and areas of restricted water flow may become saltier reversing the salinity gradient in the Lagoon. This reversal affects the distribution of fish species.

The mangrove forests of the Park are particularly important. A mangrove forest regulates biological exchanges between land and marine systems. They are an important source of dissolved organic carbons to the marine community. They also stabilize the shoreline; trap pollutants, such as sediments and nutrients, before they contaminate Lagoon waters; and their roots provide shelter for juvenile fish and some invertebrates. Unfortunately some of the shoreline mangroves have been cleared around Codrington and others destroyed by the careless dumping of oil from the power plant. However, outside of these limited areas the mangrove forests of Codrington Lagoon are quite healthy.

### **2.5 Cultural Aspects**

Codrington Lagoon is closely linked to the culture and economy of Barbuda and has always been a focus of social and economic activity, mainly because of its location adjacent to Codrington Village, the only populated area of Barbuda. Children bathe on the beach at the jetty, and families cross the Lagoon for picnicking and bathing on the sand berm. More than half of the working population uses the Lagoon during some part of their fishing activity, and the two main fish landing sites are located there.

### 3. RESOURCE USE IN AND AROUND THE PARK

#### Key Concepts – Resource Use in and Around the Park

- The nursery function of the Park's wetlands is of vital importance to the export-oriented lobster fishery of Barbuda, which accounts for 40% of the island's Domestic Product.
- During 2007, 10,000 tourists travelled to Barbuda by air, but that figure declined almost 40% during the first quarter of 2008. Data is not available for tourists arriving by sea on the Antigua-Barbuda ferry or by yachts.
- The Park always has been, and continues to be, used regularly by local residents for recreation. The most popular activities are bathing, picnicking, camping, and hunting.
- The Codrington water supply is derived in part from the Palmetto Aquifer under the southern portion of the Park. The aquifer is suffering from saline intrusion and contamination, most probably provoked in part by sand mining.
- Most of Barbuda is characterised by wildlands (bush). Residential areas are concentrated in Codrington, and limited agriculture is practised to the north and south of Codrington.

#### 3.1 Fisheries

Traditionally, juvenile lobster are fished in the Lagoon for local consumption, along with juvenile snappers, grunts, jacks, and goatfish. Populations vary considerably from year to year, and currently population levels are relatively low. Once sea moss was harvested near the Lagoon entrance, but was severely depleted by over-harvesting when an export market developed in the 1980's.

The Lagoon is a particularly important nursery for the large lobster populations that populate the outer reefs of Barbuda and may migrate to fairly distant neighbouring islands as well. Export oriented lobster fishing on Barbuda's reefs makes up 40% of Barbuda's Island Domestic Product, and this resource is shared with fishing vessels from Antigua and Guadeloupe. Catch restrictions include a lower size limit of 1.5 lbs, though this is only enforced for the export market, and in reality, any lobster greater than a pound is accepted for export. The requirement to license fishing boats is poorly enforced. These circumstances make resource management difficult, and the Barbuda Fisheries Office is in need of capacity building, including staff training, equipment and boat purchases, and authorization to enforce management policies. Data on the number of fishing licenses issued indicates that local fishing effort increased by over 550% from 1995 (13 licensed vessels) to 2001 (72 licensed vessels), but fishermen report that overall effort has not increased much since then. Fishermen observe that the number of fishing boats from Antigua and Guadeloupe has increased, though no statistics are available, and the Barbuda Council is concerned about the mounting pressures on lobster stocks.

#### 3.2 Tourism and Recreation

Barbuda is not a major tourism destination. During 2007, about 10,000 tourists travelled there by air from Antigua. However, during the first four months of 2008, tourist arrivals by air were down some 39% from 2007. Figures for arrivals by sea are not available, though there is a ferry service to Barbuda from Antigua five days a week. The average length of stay for hotel visitors is six days and twice that for Guest House visitors. Park entrance fees were charged to about 2,800 visitors to visit the Frigate Bird nesting colony during 2007, but this is probably only a fraction of the number of visits to the Park. Tourist visits to Barbuda represent less than 4% of

the annual tourist visits to Antigua. This is perhaps why hotels constructed in Barbuda have not done well. Of the six hotels built in Barbuda (*Lighthouse Bay Resort, Beach House Hotel, Sunset View Hotel, Dulcina Hotel, K-Club, Coco Point Lodge*), only two (*Lighthouse Bay Resort and Coco Point Lodge*) remain open.

Current use of the Park by visitors is varied. Overnight visitors stay at the Lighthouse Bay Resort which has 10 units in the hotel, and a large house for the owners and their guests. The hotel currently offers its guests water skiing, sailing, fishing, para-sailing, wind-surfing, snorkelling, scuba diving, kayaking, visits to the Frigate Bird colony, and island tours by jeep and horse. Visitors who want a more secluded experience can stay at the cottages at North Beach that are run by the Coco Point Lodge. Day use visitors usually travel by boat to the beaches at Low Bay where there is a concession (jetty, bar, beach umbrellas, garbage disposal, and bathrooms); or by taxi to Palmetto Point for bathing and picnicking.

The park is used regularly by local residents for recreation. Children bathe in the Lagoon to the south of the Codrington jetty, and families often travel by boat to the sand berm at Low Bay to picnic and bathe. Several areas in the Park are used regularly by locals for camping. Two favourite sites are at the north side of Palmetto Point and at Kid Island.

### **3.3 Water Supply**

The water supply for Codrington Village is fed by the Palmetto Point aquifer which permeates the sands of Palmetto Point and merges with the limestone formations south of Codrington. In recent years this aquifer has experienced saline intrusion, probably because of sand mining and water usage rates that are greater than the natural rate of recharge. A reverse osmosis water treatment plant, which has been installed to improve the potability of the water, has increased the degree of saline intrusion by discharging brackish water back into the aquifer. Sand mining in the Park should be halted for a number of reasons, and protection of the Palmetto Point aquifer is amongst the most important. The recuperation of the dune system should be a priority for resource management within the Park.

### **3.4 Research**

Codrington Lagoon has been the subject of several research projects over the past two and a half decades. Ecological assessments of the Lagoon were carried out in 1983, 1998, and 2008. Local environmentalist, John Mussington, has participated in all three. Currently, the Fisheries Division monitors the profile of Palm Beach at Low Bay, and the beach at Palmetto Point.

### **3.5 Hunting**

Fallow deer, wild pigs, and guinea fowl were introduced to Barbuda during colonial times. These species have adapted well to the island, and hunting them has been, and continues to be, a traditional pastime, though most of it occurs outside the Park. The West Indian Whistling Duck, which is a regional endemic listed as “vulnerable” by IUCN, is also hunted on a regular basis. There is anecdotal evidence of occasional hunting of the white-crowned pigeon by the passengers and crews of sailboats visiting from Guadeloupe, though it is not clear if this occurs within the Park.

### 3.6 Surrounding Land Use

The lands to the east of the Park are most intensively used in and around Codrington Village. The population of Barbuda, and its supporting infrastructure, is concentrated in this area. The effects on the Park are multiple.

- Because of the flat topography, the road system within the village and the road that forms the eastern Park boundary serve as dams that hinder the natural runoff of water into the lagoon. This causes flooding in and around the Village during and after storms and the proliferation of mosquitoes. It also buffers the rate of inflow of freshwater into the Lagoon during storm events.
- Several solid waste dumps have been located at different times and different locations in the mangroves to the north and south of the Village. The newest dump is located to the north of the Village. Contaminants presumably are leached into the Lagoon, but no studies have been done to determine quantities or content.
- The sewerage from Codrington Village is handled by septic tanks, which are pumped periodically. The pumped effluent is transported to the forested areas to the east of Codrington and dumped. Though few studies have been undertaken, it is probable that effluents from these septic tanks, and from the sites where they are dumped, leach into the aquifer under the Village and from there into the Lagoon, especially during storm events that produce flooding. However, though there may be some effects from this source of contamination on the health of those bathing in the Lagoon near the Codrington jetty, no obvious effects on the Lagoon ecosystem have been noted. Indeed, the inflow of nutrients may even boost the productivity of the Lagoon ecosystem.
- Energy for the Village is provided by a diesel plant located not far from the Lagoon. The not too infrequent oil and diesel spills flow directly into the Lagoon, and during major storms the water from the Lagoon rises high enough to flood the plant. This is a major source of contamination of the Lagoon.
- Livestock, both feral and tended (donkeys, horses, sheep, and goats) roam freely in an around the Village and in the eastern section of the Park. They have a large and persistent effect on the native vegetation practically eliminating grasses and forbes, and stunting the growth of shrubs and trees.

## 4. MANAGEMENT FRAMEWORK

### Key Concepts – Management Framework

- Establishment of the National Parks (Barbuda) Authority and re-declaration of the CLNP under the Barbuda Lands Act, 2007, both await the final legal steps required to formalize enactment.
- The Stakeholder’s Committee serves as an interim management board, and management actions are carried out by 4 Park Rangers that are supervised by the Barbuda Fisheries Office.
- As a wetland of international importance recognized under the Ramsar Convention, the CNLP is at once of local, national, and international importance.
- Management and development of the CLNP is supported by 4 international projects funded or administered by the UNDP/GEF, OAS, USAID/COTS, and OECS/USAID.

### 4.1 Current Management

As of the writing of this Plan, the CLNP is legally under the jurisdiction of the Antigua and Barbuda National Parks Authority, though the Authority does not exercise its jurisdiction. The separate National Parks (Barbuda) Authority authorized by the Barbuda Lands Act of 2007 is



still in the process of being legalized and established. In the meantime, the ad hoc Stakeholder's Committee formed by the Barbuda Council and the Antigua & Barbuda Environment Division serves as a temporary management board for the Park. The Committee is active and dedicated, but lacks technical capacity with respect to national park management. Until a Park Manager is recruited, the Barbuda Fisheries Officer is overseeing the work of the 4 Park Rangers that have been hired. However, until the National Parks (Barbuda) Authority is established and operational, and a Park Manager hired, park management remains at a rudimentary stage.

## **4.2 RAMSAR Status**

In June, 2006, the CLNP was designated a wetland of international importance under the Ramsar Convention. The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. As of January, 2009, there were 158 Contracting Parties to the Convention, with 1828 wetland sites, totalling 169 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance. The Convention's mission is "*the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world*".

## **4.3 Complementary Projects**

Work on the development of the CLNP is being supported by complementary projects, each of which is administered by the Antigua & Barbuda Environment Division. These projects include:

- a Global Environment Facility (GEF) full size project, *Demonstrating the Development and Implementation of a Sustainable Island Resource Management Mechanism in a Small Island Developing State (SIRMM)*;
- an Organization of American State's Project, *Integrated Management Plan for Codrington Lagoon*;
- a USAID Project, through its Caribbean Open Trade Programme (COTS), *Preparation of a Development and Management Plan for Codrington Lagoon National Park, Barbuda*.
- OECS Project, funded by USAID, *Protecting the Eastern Caribbean Region's Biodiversity (PERB)*; activity to develop infrastructure for Codrington Lagoon National Park.

# PART B – ANALYSIS

## 5. MANAGEMENT CATEGORY

### Key Concepts – Management Category

- The IUCN Protected Area Category System is designed to facilitate communication among countries about the management objectives of a given protected area, regardless of the national or local name that is given to the area.
- As currently delimited, the CLNP falls within the IUCN definition of a Category II Protected Area (National Park).
- When the adjacent marine area is added to the CNLP, the management category will have to change to take account of the export-oriented lobster fishery.
- With the marine annex included, the CLNP will then fit into the IUCN definition of a Category VI Protected Area (Protected Area with Sustainable Use of Natural Resources).
- Under the Category VI scenario, sustainable levels of fishing would continue, sand mining would be discontinued, and existing residential areas excluded from the Park.
- While internationally, the Codrington Lagoon and adjacent marine area would be listed as a Category VI Protected Area, the local name, Codrington Lagoon National Park, would still apply.

The IUCN Protected Areas Category System has been developed to facilitate communication among countries with different protected area legislation and different terminologies. The system is based on the management objectives for a protected area, and not the national or local name that has been given to the area.

As noted earlier, IUCN defines a protected area as “*a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values*”. Protected areas have a wide range of management objectives and governance structures and the IUCN protected areas categories system provides a global framework for distinguishing among them. In applying the categories system, the first step is to determine whether or not the site meets the definition of a protected area and the second step is to decide on the most suitable category.

The Antigua and Barbuda National Parks Act, 1984, is an Act “*to provide for the establishment of National Parks and a National Park Authority; to make provision for the preservation, protection, management and development of the natural physical and ecological resources and historical and cultural heritage of Antigua and Barbuda; and for matters connected with those purposes*”. Thus, the National Parks of Antigua and Barbuda should generally meet the definition of a protected area.

However, it is less clear whether the management objectives of the CLNP are consistent with the IUCN definition of a national park as a Category II protected area (national park). IUCN’s

definition of a national park is a “*large natural or near natural area set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities*”. The primary management objective is to “*protect natural biodiversity along with its underlying ecological structure and supporting environmental processes, and to promote education and recreation*”.

Secondary objectives are to:

- “*manage the area in order to perpetuate, in as natural a state as possible, representative examples of physiographic regions, biotic communities, genetic resources and unimpaired natural processes*”;
- “*maintain viable and ecologically functional populations and assemblages of native species at densities sufficient to conserve ecosystem integrity and resilience in the long term*”;
- “*contribute in particular to conservation of wide-ranging species, regional ecological processes and migration routes*”;
- “*manage visitor use for inspirational, educational, cultural and recreational purposes at a level which will not cause significant biological or ecological degradation to the natural resources*”;
- “*take into account the needs of indigenous people and local communities, including subsistence resource use, in so far as these will not adversely affect the primary management objective*”; and,
- “*contribute to local economies through tourism*”.

As currently delimited, the CLNP comes close to the IUCN definition of a Category II Protected Area (national park). The only portion of the Park that would be incompatible with the IUCN definition would be the small area adjacent to Codrington Village that includes some private residences.

However, if the Park were expanded to include the marine area adjacent to the current Park boundaries, management objectives would also have to expand to include the optimisation of a sustainable export-oriented lobster fishery. Since the objectives of an IUCN Category II Protected Area only include subsistence resource use, the inclusion of objectives for an export oriented lobster fishery would better fit the IUCN Category VI Protected Area definition. This category is termed a “**Protected Area with Sustainable Use of Natural Resources**”, and is defined as a “*protected area that conserves ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area*”. The primary management objective is “*to protect natural ecosystems and use natural resources sustainably, when conservation and sustainable use can be mutually beneficial*”. Secondary objectives are:

- *to promote sustainable use of natural resources, considering ecological, economic and social dimensions;*
- *to promote social and economic benefits to local communities where relevant;*
- *to facilitate inter-generational security for local communities’ livelihoods – therefore ensuring that such livelihoods are sustainable;*
- *to integrate other cultural approaches, belief systems and world-views within a range of social and economic approaches to nature conservation;*
- *to contribute to developing and/or maintaining a more balanced relationship between humans and the rest of nature;*

- *to contribute to sustainable development at national, regional and local level (in the last case mainly to local communities and/or indigenous peoples depending on the protected natural resources);*
- *to facilitate scientific research and environmental monitoring, mainly related to the conservation and sustainable use of natural resources;*
- *to collaborate in the delivery of benefits to people, mostly local communities, living in or near to the designated protected area; and,*
- *to facilitate recreation and appropriate small-scale tourism.*

This category would be relevant to the CLNP if uses of the Park's resources were at a non-industrial scale, and residential uses eliminated. Under this scenario, current levels of fishing would continue, sand mining would be discontinued, and existing residential areas excluded from the Park through modification of the current Park boundaries near Codrington.

It should be clear, however, that the IUCN Category System for Protected Areas is designed to facilitate communication at the international level. Thus, the local name, Codrington Lagoon National Park, could be retained while the Category VI designation would clarify management objectives at the international level.

## 6. IMPORTANCE OF THE CLNP

### Key Concepts – Importance of the CLNP

The CLNP protects the largest and best preserved wetland complex of Antigua and Barbuda and sustains fisheries and tourism activity that is the basis for 60% of the Barbuda economy.

CLNP protects the largest and best preserved wetland complex of Antigua and Barbuda. It is the resource base for a thriving lobster fishery and tourism activity that make up an estimated 60% of the Barbuda economy. The lagoon is a primary nursery site for lobsters and other fish species, and as such is a critical habitat for the replenishment of offshore ecosystems, especially coral reefs. With the addition of the 3 nautical mile marine component to the Park, the importance of the CLNP will increase considerably because of the addition of significant marine habitats (sea grass beds, coral reefs, and sand flats) and cultural sites (shipwrecks).

## 7. BOUNDARIES

### Key Concepts – Boundaries

The boundaries of the CLNP are problematic with respect to the inclusion of residential areas, and the need to include marine environments adjacent to the Park and important natural and cultural resources of the east coast.

The existing boundaries of the Park are problematic with respect to three basic points:

- Current boundaries include residential areas near Codrington that have no reason for being within the Park, and are inconsistent with the IUCN definition and objectives of a national park, a Category II protected area. These residential areas would be better managed as part of the town and country planning function of the Planning Department.
- The current boundaries do not include the marine environments adjacent to the Park which are intimately linked with the Park's ecological processes and public use.

- Many of Barbuda’s most interesting natural and cultural features are not included in the Park as currently delimited (see Annex A, Map 4).

Specific recommendations on these points are presented in Section III.9. It should be noted, however, that any change in boundaries would require submission of these changes, and the reasons for them, to the Secretariat of the Ramsar Convention with a request that the Codrington Lagoon Ramsar Site boundaries be adjusted to be congruent with the new national park boundaries.

## 8. SPECIFIC ISSUES

A number of specific issues are present in the CLNP that must be addressed adequately if the CLNP is to achieve the objectives for which it was established.

### Key Concepts – Specific Issues

- Existing Tourism Infrastructure: Lease arrangements with hotels and cottages, which were developed before Park establishment, will need to be renegotiated with the National Parks (Barbuda) Authority as National Park concession agreements.
- Projected Visitor Use: The management and the financial plans for the Park are developed around the assumption that development efforts will stimulate park visitation from an average of 13,000 visitors/year in Phase I, to 20,000 visitors/year during Phase II, and 30,000 visitors/year during Phase III.
- Fisheries: A relatively sophisticated research and monitoring programme is required to assure that the fisheries in the Codrington Lagoon and the marine annex are sustainably managed.
- Sand Mining in the Palmetto Point poses major problems to the underlying aquifer, the conservation of unique vegetation in the sand dune ecosystem, and protection of Codrington from storm damage.
- Lagoon Condition: Codrington Lagoon appears to be healthy, but a regular monitoring system is needed to detect changes that might come about because of contamination or destruction of mangroves.
- Condition of the Marine Annex: Relatively little is known about the condition of the environments of the proposed marine annex, and this needs to be remedied if the area is to be effectively managed as an integral part of the CLNP.
- Financing Park Management: The identification of revenues to pay for Park management follows the “user pays” principle, and in the case of the CLNP this means fishermen and visitors, and the businesses that serve park visitors. The fees charged to Park concessionaires and revenues earned from the sale of energy from wind turbines could potentially provide about half the funding required for Park management. Thus, acquiring the capacity to develop, market, and administer concessions and alternative energy projects is of utmost priority through the hiring of consultants and training of staff.

### 8.1 Existing Tourism Infrastructure

As shown on Map 3 (Annex A), two hotels and a set of cottages were built on lands that later were designated as National Park. The Lighthouse Bay Resort at Palm Beach was built without planning approval. It has 10 luxury units and separate residences for the owners and staff, and operates during the tourism high season. The Hotel has been built on the sand berm that separates Codrington Lagoon from the sea. This presents three critical problems. First, protective vegetation that holds the sand in place during storm events has been removed. Thus, the area is now vulnerable to storm surge that could potentially breach the berm during a hurricane, thereby flooding the Lagoon and Codrington as has happened in the past (see Annex A, Map 4 for the location of past breaches in the sand berm due to hurricane Donna in 1960 and Luis in 1995). Secondly, since the hotel has been built directly on the sand, and not on pilings,

storm surge could potentially undermine the foundations causing the buildings to collapse. Indeed, portions of the foundation have already been seriously undermined during storm surge in the past couple of years, though not enough to cause collapse. However, if Barbuda were to receive a direct hit from a hurricane, the storm surge and wave predictions of 4 meters mean that both would enter the Hotel, and most likely wash it away. This is not unlikely given the effects of climate change on sea level rise (estimated at 9 cm. during the period of this plan) and the increasing intensity of hurricanes. Thirdly, the placement of buildings on the primary dune interferes with the nesting activities of sea turtles.

The 25 unit Beach House Hotel with outbuildings and residences for staff was built at Palmetto Point. The Hotel operated for several years, but is now closed and slowly deteriorating. Discussions are underway with potential investors for the refurbishing and expansion of the hotel. While all buildings were built slightly back from the primary dune that once protected the Point from storm surge, the primary dune was levelled in any case so that guests could have visual contact with the Caribbean Sea from the hotel. In addition, most of the buildings, though not all, were built directly on the sand. This has made it possible for storm surge to advance inland causing a reflective pool of the hotel to fill with sand, while sand has been removed from other areas causing the foundations of some buildings and terraces to be exposed. This problem could be remedied if the primary dune were re-established through the placement of sand fences and artificial re-vegetation of the dune as it builds up.

Three cottages, support structures, and a jetty were constructed at North Beach prior to establishment of the Park. There is controversy with respect to the ownership of these cottages. While the structures have been built on the primary dune, this is less problematic than in the case of the hotels because they are located on a bay that is protected by off-shore reefs, and the beachfront is relatively stable here. The cottages are problematic, however, with respect to turtle nesting.

## **8.2 Projected Visitor Use**

Because of the severe constraints that currently exist with respect to air and sea links between Antigua and Barbuda, it is difficult to project with any confidence anticipated levels of visitation to the Park. If these transportation constraints are dealt with, and Phase I of Park development is implemented, then the current levels of Park visitation, estimated by the Business Plan at about 10,000 visitors/year, could easily increase to about 16,000 visitors/year by 2012. During Phase II, with continued improvement in transportation links, the implementation of the green strategy for Barbuda and the resulting publicity in the U.S. and European tourist markets, and new ecolodges and camping facilities at Palmetto Point and Kid Island, visitation could increase a further 50% from its 2012 level to 24,000 visitors/year by 2015. With the addition of the ecolodge and camping facilities at North Beach, the continued implementation of the “green strategy”, and the construction of other hotels and guest houses outside of the Park, it is probable that visitation will increase another 50% by 2019 to a level of 36,000 visitors/year at the end of the planning period.

Based on these projections, the average number of visitors per year during each phase of Park development would be as follows:

- Phase I – 13,000
- Phase II – 20,000
- Phase III – 30,000

While the percentage increases may seem large, it should be remembered that the actual numerical increases are not, especially considering that Antigua currently receives over 250,000 visitors/year. Thus, the projected level of visitation to the CNLP 10 years from now represents only 14.4% of today's level of visitation to Antigua.

### **8.3 Fishing**

As noted previously, fishing is mainly for lobster on the offshore reefs and banks that are currently outside the Park. Fishing within the Park is limited to the fishing of juvenile lobsters and fin fish in the Lagoon, but it is unrecorded and unregulated. This is a source of concern, however, because the taking of juveniles may have major implications for the health of the fisheries. At the same, people have a marked preference for juvenile lobster for local consumption, so the pressure on juvenile stocks in the Lagoon is likely to continue even when, as at present, stock levels are considered to be low.

The interactions of biological and human factors that determine the health of the Lagoon ecosystem, and the fisheries that depend on it, are diverse and complex. Thus, a relatively sophisticated monitoring programme would be required to develop the understanding that would be needed to identify the management measures required to ensure the sustainability of current levels and patterns of fishing. However, since the lobster fishery represents about 40% of the local economy, the benefits of a monitoring system might well outweigh its costs.

When the marine area is incorporated into the Park, the management of the fisheries in this area will become the responsibility of the CNLP. At this point, the monitoring programme would have to be extended to the marine component of the Park to provide the understanding required to implement management measures to achieve sustainable levels of harvest.

### **8.4 Sand Mining**

Palmetto Point is the most dynamic geographic area in Barbuda, and its outlines are constantly in flux because of changing sand drift and deposition patterns caused by near shore currents and wind patterns. Sand mining in the centre of the Point has removed the dunes which originally stood 2-3 m. high (see Annex A, Map 6). The vegetation types found in this area, which are unique in the Lesser Antilles, have been decimated. Sand mining has also had a detrimental effect on the Palmetto Point Aquifer and the ground water that the operation has exposed facilitates contamination. Development in the Palmetto Point area should be carefully managed, and the sand mining should be stopped immediately.

### **8.5 Lagoon Condition**

Most of Codrington Lagoon provides excellent habitat for juvenile fish and lobster. At present the greatest environmental threats to the lagoon system are over-fishing in the lagoon itself; garbage dumping, leaching of sewerage, trampling and grazing of feral animals, and mangrove clearing in the fringing forests (see Annex A, Map 6). However, construction and consequent mangrove clearing around the Codrington Lagoon threatens to expand. For example, planning is advanced for the construction of a fisheries terminal, which will be located immediately to the south of the existing Codrington Jetty. The sand berm bordering the west side of the Lagoon is prone to natural dynamics of shifting sands, especially during major storm events. Any construction of piers or walls on or near the sand berm will affect these dynamics, and could potentially erode the berm.

A salinity gradient exists within the Lagoon typified by higher salinities near the mouth and lower salinities near the southern end. Freshwater enters the southern end by seeping through Barbuda's porous limestone rock, particularly in the area of the Sucking Hole. The salinity gradient apparently reverses seasonally, causing the water to become more saline in the summer. Benthic macrophyte distribution within the Lagoon is variable and easy to measure. This parameter corresponds well with water quality data and physical differences within the Lagoon, and measurements of benthic macrophyte densities may be one of the best biological indicators for monitoring the Lagoon ecosystem.

Goat Island Flash is not well flushed, is more saline than Codrington Lagoon, and does not provide as much quality habitat for juvenile lobster or reef fish. However, it is an important mangrove wetland, and sea turtles feed on its extensive grass beds.

Mangrove forests regulate biological exchanges between land and marine systems. The forests around both lagoons are generally healthy, though hurricane damage is evident throughout. The healthiest and best developed mangrove forest is found in the Low Pond and Horse Pond areas, while the mangrove forest at the Privy Pond area is in a state of recovery.

## **8.6 Condition of the Marine Annex**

Outside the folk knowledge of local fisherman, little is known about the condition of the proposed marine annex. Considerable effort will be required, therefore, to tap into the existing knowledge of fishermen, map marine habitats and cultural sites (mainly shipwrecks), carry out assessments of the current condition of the marine component, and establish sites for regular monitoring.

## **8.7 Financing Park Management**

This, the Management and Development Plan for the Park, outlines what is to be done and when, and provides a relatively sound basis for projecting costs. It is obvious, however, that the management plan can only be implemented if adequate revenues are generated to meet the projected costs. It is the function of the Financial Sustainability Plan, which is being developed in tandem with the management plan, to estimate the cost of the planned management actions and identify the revenues required to pay the estimated costs.

The basic philosophy behind most types of revenue generation is the "user pays" paradigm. In the case of national parks, this means resource harvesters, such as fishermen, the visiting public, and the businesses that profit from the visiting public. In the case of the CLNP, this implies user fees for fishermen and visitors, and concession fees for businesses that are allowed to supply visitor services within the Park. Other sources of revenue (such as the development of windmills to provide alternative energy) and project funds are used to fill revenue gaps that still exist after the charging of user and concession fees, and to achieve other environmental objectives.

The potential sources of revenues identified in the finance plan include (1) user fees, (2) earned income, and (3) project funding. The calculations in the plan clearly show that earned income (concession fees and windmill generated power) has the greatest potential for generating revenues (from 45% to 55% of revenue sources during all three phases). This highlights the importance of:

- developing the Park's capacity to develop, negotiate, and manage concessions; and



- identifying institutional partners or hiring consultants that can develop and market alternative energy projects funded by carbon credits

The development of concessions also has a direct influence on user fees and project funding. The services offered and the marketing undertaken by concessions will attract visitors. This generates increased revenues from user fees. Project funding can also be affected by earned income because, unless the National Parks (Barbuda) Authority demonstrates that it is vigorously pursuing the revenue potentials at its disposal, it is difficult to make the case for project funding. Donors are most willing to help those who have shown they are doing the most to help themselves.

# PART C – PRESCRIPTION

## 9. VISION AND OBJECTIVES

### Key Concepts – Vision and Objectives

- Vision: Development of the CLNP as a key component of a “green strategy” that will market Barbuda as a prime nature tourism destination through environmental media.
- Long-term Objective: Protect the biodiversity and productivity of the Codrington Lagoon wetland complex, the East coast cliff environments, and adjacent near shore marine areas while at the same time promoting sustainable tourism, fisheries, recreation, and educational activities.

The vision for the Codrington Lagoon National Park is a component of an environmentally oriented vision for Barbuda. That vision centres on a “green strategy” for sustainable development that would have the following key components:

1. development of Codrington Lagoon National Park to meet international standards of management, including the development of a high-quality nature tourism product and a fully sustainable lobster fishery;
2. expansion of the Park to include as soon as possible the adjacent marine area, and eventually the natural and cultural amenities of the East Coast;
3. adoption of an explicit island-wide policy to aggressively pursue and implement the latest technologies for sustainability through the careful monitoring and management of fisheries, alternative energy, the recycling of liquid and solid wastes, organic agriculture, and the use of locally grown produce;
4. the marketing of Barbuda through media coverage of the “green strategy” and the resulting recognition in the key nature tourism markets of North America and Europe;
5. the use of credits for carbon offsets (the offsetting in Barbuda of carbon emissions produced overseas) to fund alternative energy projects;
6. the recycling of the carbon credits (use of revenues produced by the windmill project) to provide sustainable finance for Park management and implementation other elements of the “green strategy”; and,
7. the implementation of each of the green strategy components in ways that maximise benefits to the local population; minimise negative social and economic impacts; and equitably share costs among the population, outside investors, and international organisations.

The development and management of the CLNP is key to the success of the Green Strategy. If developed properly, the Park could feature a complex of high quality and sustainably used natural environments that are far broader than the Frigate Bird colony, which is currently the major attraction of the Park. The Park could be the centre of attraction (the “icon”) that would generate international interest in, and enthusiasm for, Barbuda. This interest in turn could be channelled into a specialized nature-oriented tourism product that would serve to distinguish Barbuda with respect to other Caribbean destinations, and prime the engine of sustainable development.

Thus, the vision of the CNLP is of a protected area that conserves and protects its natural resource base, including the natural elements that are key to sustainable fisheries, while stimulating a nature tourism product that is based on the development of state-of-the-art

ecologies. These Park facilities will be designed to minimise environmental impact and maximise visitors' experiences of oneness with nature. They will be complemented with interpretive programmes that enhance visitor understanding of the Park's natural environment, its sustainable use by locals, and the role of the CLNP in implementing the Green Strategy for Barbuda.

The development strategy for the Park will take place in three distinct phases over a 10 year period with each phase being implemented in 3 to 4 years. During Phase I, basic Park operations will be developed. The National Parks (Barbuda) Authority will be legally established and members trained. A Park Manager and basic staff will be recruited, trained and put to work and management programmes initiated. Agreements will be developed with existing hotels so that they become Park concessions, and new administrative and public use facilities will be developed in the Codrington Jetty and Martello Tower Development Areas. During Phase II, the Park boundaries will be extended to include the adjacent marine environment and the Resource Protection and Monitoring Programmes will be extended to include the new marine component. New concessions at Palmetto Point and Kid Island will be developed and let on a competitive basis at market prices. Wind turbines will be installed to provide alternative energy for Codrington. During Phase III, a new concession will be developed at North Beach and a new Park Headquarters and Visitor Centre complex developed south of Codrington. At some point during Phase III, or in a subsequent phase, the Park boundaries will be extended to include an East Coast Annex. After that happens, management programmes will be extended to the new Park Annex and adjacent marine area; concessions let at Two Foot Bay, The Highlands, and Spanish Point, and a trail developed between Two Foot Bay and Castle Bay.

Based on the vision outlined above, the general objective of Park management during Phase I will be as follows:

**Phase I Objective: *Protect the biodiversity and productivity of the Codrington Lagoon wetland complex by maintaining its natural ecological structure and processes, while at the same time promoting sustainable tourism, recreation, educational activities, and subsistence fishing.***

This general objective will be implemented by pursuing the following more detailed objectives which seek to:

1. *perpetuate in as natural a state as possible representative samples of the Park's biotic communities, genetic resources and ecological processes;*
2. *maintain viable and ecologically functional populations of native species at densities sufficient to conserve ecosystem integrity and resilience;*
3. *preserve the size, function, and vitality of the Frigate Bird nesting colony while permitting visitors to observe at a respectful distance that does not disturb or alter bird behaviour;*
4. *monitor and conserve Lagoon dynamics to maintain its function as a nursery with respect to species of commercial importance, especially lobster;*
5. *monitor and regulate subsistence fishing in Codrington Lagoon to assure that it is sustainable and does not conflict with other Park objectives;*
6. *catalyse the development of a nature-oriented tourism industry that has negligible environmental and social impacts while producing significant economic returns for Barbuda; and,*
7. *provide regular opportunities and facilities for Barbudans to visit the Park for inspirational, education, cultural and recreational purposes at a level and in ways that will not cause significant degradation of the natural resources.*

These objectives are consistent with IUCN's definition of a national park as a Category II Protected Area. However if during Phase II, as recommended in the following section, the Park boundaries are expanded to include the marine area adjacent to the current boundaries, then the general objective would need amendment and a further objective would be needed for fisheries management. The new general objective would be as follows:

**Phase II Objective: *Protect the biodiversity and productivity of the Codrington Lagoon wetland complex and adjacent near shore marine environments by maintaining their natural ecological structure and processes, while at the same time promoting sustainable tourism, fisheries, recreation, and educational activities.***

The new specific objective would be as follows:

8. *optimise sustainable fisheries, especially the lobster fishery, by carefully monitoring resource condition and fishing effort, and regulating catch levels and gear.*

With the addition of this eighth objective, management objectives would no longer be compatible with IUCN's definition of a **National Park** as a Category II Protected Area. Rather, management objectives would be compatible with IUCN's definition of a **Protected Area with Sustainable Use of Natural Resources**, a Category VI Protected Area.

If in Phase III, or in a subsequent phase, the boundaries are extended to include the Eastern Annex as suggested in the next section, then the Park Objective would be as follows:

**Subsequent Objective: *Protect the biodiversity and productivity of the Codrington Lagoon wetland complex, the East coast cliff environments, and adjacent near shore marine areas by maintaining their natural ecological structure and processes, while at the same time promoting sustainable tourism, fisheries, recreation, and educational activities.***

This overall management objective would continue to be compatible with IUCN's definition of a **Protected Area with Sustainable Use of Natural Resources**, a Category VI Protected Area.

## 10. BOUNDARIES

### Key Concepts – Boundaries

- Redraw the eastern boundary to eliminate all residential plots.
- Extend the northern and western boundaries to include a marine area to 3 nautical miles from shore.
- At some point, annex to the Park a corridor along the east coast from Fish Creek to Spanish Point.

Based on the analysis in Section 7 above, the current Park boundaries will be modified as follows:

1. re-delimitation of the eastern boundary around Codrington Village to exclude all residential plots;
2. extension of the northern and western boundaries to include the marine area to a distance of three nautical miles from the coastline; and

3. extension of the north eastern boundary to include the outstanding natural and cultural resources along the east coast of Barbuda (see Annex A, Map 2).

The first two suggested modifications will be sought as part of the re-declaration of the CLNP under the Barbuda Lands Act, 2007. However, modification No. 2 will have major implications for Park management capacity, and for this reason only modification No. 1 will be implemented in Phase I, while modification No. 2 will be implemented during Phase II. The implementation of modification No. 3 depends on the success of implementing Phases I to III. If management of the Park is consolidated during phases I and II, modification No. 3 could be sought during Phase III. Management programmes and concessions in the Eastern Annex could then be initiated subsequently.

## 11. ZONING

### Key Concepts – Vision and Objectives

- Vision: Development of the CLNP as a key component of a “green strategy” that will market Barbuda as a nature tourism destination through environmental media.
- Long-term Objective: Protect the biodiversity and productivity of the Codrington Lagoon wetland complex, the East coast cliff environments, and adjacent near shore marine areas while at the same time promoting sustainable tourism, fisheries, recreation, and educational activities.

Not all Park objectives can be achieved in all areas of the Park, so zoning is used as a tool for giving a spatial dimension to specific management objectives. The zoning for the CLNP is based on the current boundaries is shown in Annex A, Map 7. The majority is zoned for General Conservation, with smaller areas zoned for Strict Protection, for Public Use, and for Restoration. Until the recommended boundary modifications are authorized by decree, a major buffer zone is included adjacent to the existing boundary to cover the marine area that will be later be integrated into the authorized Park boundaries. Zoning of the marine area will have to be determined after initial studies provide the knowledge base needed for informed decisions.

### 11.1 Strict Protection Zone

This zone includes the areas that are of greatest importance for the protection of the Park’s representative ecosystems and specific features of interest. Entrance into this zone will be restricted to authorized personnel only. In particular, this zone will be managed for:

- a. maximum conservation of the natural habitats and genetic material of the Codrington wetland complex;
- b. full protection of the Frigate Bird Colony and the Sucking Hole areas; and,
- c. the provision of opportunities for non-manipulative research in unaltered environments.

The areas included in this zone are those that are the best examples of each of the vegetation types in the Park, the area occupied by the Frigate Bird colony, and the Sucking Hole area of the Lagoon.

### 11.2 General Conservation Zone

This is the largest zone within the current Park boundaries and is dedicated to the conservation of the Park’s natural ecosystems, dispersed visitor use, regulated subsistence fishing in the

portions of the Codrington Lagoon that are in this zone, and the regulation of boat traffic. The objectives for management of this zone are to:

- a. perpetuate in as natural a state as possible representative samples of the Park's biotic communities, genetic resources and ecological processes;
- b. maintain viable and ecologically functional populations of native species at densities sufficient to conserve ecosystem integrity and resilience;
- c. provide opportunities for dispersed nature-oriented tourism and recreational opportunities that have negligible environmental and social impacts while producing significant economic returns for Barbuda;
- d. monitor and regulate subsistence fishing in Codrington Lagoon to assure that it is sustainable and does not conflict with other Park objectives; and,
- e. regulate boat traffic in Codrington Lagoon so that it causes minimal environmental impact.

This is a residual zone made up of those areas not included in the strict protection, visitor use, or restoration zones.

### **11.3 Visitor Use (or Public Use) Zone**

This zone is dedicated to sustainable nature-oriented tourism, recreation, and environmental education and is the only zone in which visitor facilities will be permitted. Management objectives for this zone are to:

- a. provide facilities and opportunities for concentrated nature-oriented tourism activities that have minimal environmental and social impacts, and maximum economic returns to Barbudans;
- b. provide facilities and opportunities for nature oriented recreation and education for Barbudans that are in harmony with the Park vision and overall objective;
- c. orient visitors to the Park, its resources and values (both material and non-material), and to its role in the sustainable development of Barbuda;
- d. stimulate business opportunities that are in harmony with the Park's overall objective and that share the costs and benefits equitably between outside investors and Barbudans.

The areas included in this zone have been selected because of their traditional use for recreational activities by Barbudans, or because of existing hotels or cottages.

### **11.4 Restoration Zone**

This zone is dedicated to the restoration of native ecosystems and the elimination of human generated solid wastes where needed. Management in this zone will focus on the:

- a. restoration of biological diversity, community structure, and natural processes of ecosystems in areas that have been heavily altered by human use; and,
- b. clean up of human generated solid wastes in areas that have been used for dumping.

The areas selected for this zone include the sand mining area of Palmetto Point, and the areas south of Codrington that have been used for dumping.

## 11.5 Buffer Zone

This zone has two major components: an urban buffer zone that includes residential plots that are currently located within the Park, but which should be excluded; and a marine buffer zone that is outside of the current boundaries of the Park.

The objectives for management of the urban buffer zone are to:

- a. identify current and future residential and commercial plots in Codrington Village that should be excluded from the Park; and,
- b. establish a new Park boundary adjacent to Codrington Village that excludes all residential and commercial land.

The objectives for management of the marine buffer zone are to:

- a. actively work with the Barbuda Fisheries Office to assure that the marine ecosystems that are adjacent to the current Park boundaries are managed to assure conservation of the marine ecosystems, species, and processes; and,
- b. cooperate with the Barbuda Fisheries Office to monitor and regulate fisheries to assure sustainable use.

This general zoning concept will be extended to include any new marine and terrestrial areas that may later be annexed to the Park.

## 12. MANAGEMENT PROGRAMMES

Specific measures for Park management are articulated through the following programmes on resource protection, visitor use, research, environmental education, and community outreach. The timing of activities is indicated according to development phases for the Park.

### Key Concepts – Management Programmes

#### Resource Protection Programme:

- Objective: safeguard the integrity of the biological resources, natural features, and ecological processes of the Park through actions that build public support and counter specific threats.
- Management actions: building of stakeholder relations; infrastructure design, construction, and maintenance; education and awareness; boundary demarcation and fencing; periodic patrols; and interpretation of monitoring data.

#### Visitor Use Programme:

- Objective: facilitate understanding and enjoyment of the Park and its resources by the general public, provide excellent outdoor recreation opportunities, and contribute to the sustainable development of Barbuda by providing a high quality environment for low impact ecotourism activities.
- Management Actions: provision of access; visitor information; concessions system for visitor services; and fee system.

#### Research and Monitoring Programme:

- Objectives: improve knowledge of the Park's biota, physical features, and natural processes; compile and make accessible research information for decision-making that will improve management effectiveness; identify trends in resource condition; and, measure changes being caused by climate change
- Management Actions: clarity on priorities; incentives for researchers; and data base.

#### Environmental Education and Awareness

- Objectives: inform visitors as to the environmental, social, and economic values of the Park; educate the public, especially leaders of public opinion, on the environmental issues relevant to the management of the CLNP; and inform the public of the management practices for the Park, threats to the Park's objectives, and ways that stakeholders can help to reduce or mitigate those threats.
- Management Actions: school environmental education programmes; and public awareness campaign.

#### Community Outreach:

- Objective: insert the Park into the mainstream of sustainable development in Barbuda, thereby assuring that the Park becomes a critical development resource that is understood and appreciated by a spectrum of stakeholders.
- Management Actions: wind generated energy; electric transport; off-park visitor cottages, tent camps, and research facilities; horse and mountain bike trails; guide services; and cottage industries.

## 12.1 Resource Protection Programme

The Resource Protection Programme is the most important for attaining the Park's objectives, and will be given priority in budget allocations.

### 12.1.1 Objective

The Programme objective is to safeguard the integrity of the biological resources, natural features, and ecological processes of the Park through actions that build public support and counter specific threats.

Specific threats to the resources of the Park that have been identified include:

- poorly regulated fishing of juvenile lobsters and finfish in the Lagoon, and of adult lobsters in adjacent marine areas;
- grazing and trampling of native vegetation by feral animals,
- the impacts of concessionaire and/or visitor activities,
- contamination of the Lagoon and flashes through leaching of liquid wastes and diesel fuel,
- dumping of solid wastes in the mangroves near Codrington Village, and
- the cutting of mangroves.



It is probable that an equal level of threat exists for the marine component that is to be added to the Park in Phase II. However, the level of information is currently not good enough to detail these with any level of confidence and further research will be needed during Phase I to fill this gap.

### **12.1.2 Policy**

The policy for resource protection is to give highest priority to the development of sound relations with stakeholders through active cooperation in sustainable development that focuses on shared agendas. Supporting strategies will include:

- cooperation with the Barbuda Council to deal with solid and liquid wastes, diesel fuel leaks, and the regulation of fisheries;
- proper design of Park infrastructure;
- public education; and
- the fencing of boundaries.

Law enforcement will only be used as a last resort. Monitoring of resource condition, concessionaire compliance, and management effectiveness will provide the information for measuring the success of protection efforts.

### **12.1.3 Management Actions**

#### **12.1.3.1 Building of stakeholder relations**

Park resources will be best protected when the Park is seen as a vital element of, and dynamic partner in, the sustainable development of Barbuda. Three approaches will be employed to achieve that outcome: (1) proactive cooperation with the Barbuda Council in implementing a Green Strategy for development, (2) training of the members of the Park Stakeholder Committee which will become the National Parks (Barbuda) Authority when it is established (see Section 13), (3) recognition and honouring of the accomplishments of the members of the Park Stakeholder Committee [National Parks (Barbuda) Authority] and (4) the provision of recreational facilities and education programmes for Barbudans.

#### Proactive Cooperation in Sustainable Development:

This element of the Resource Protection Programme is one of the most powerful tools for developing commitment to the Park's management objectives. It relies on the development of understanding through practical experience, and the friendship derived from coordinated action toward shared goals. This approach is more effective and long-lasting than theoretical understanding promulgated through teaching and preaching.

Members of the Park Stakeholder Committee [National Parks (Barbuda) Authority] will work with the Barbuda Council to promote and implement the Green Strategy for the sustainable development of Barbuda. The Committee (Authority) will promote the management of the Park for nature-oriented tourism, and let concessions for recreational activities and planned ecodges. They will also serve as a link to the Antigua and Barbuda Conservation Trust Fund (ABCTF) that is being developed as part of Antigua and Barbuda's participation in the regional Global Environment Facility Project on marine protected areas. This link with the proposed

ABCTF is particularly important as a key component for the sustainable finance of CLNP management (see the CLNP Financial Sustainability Plan, 2009).

#### Training for Members of the Park Stakeholder Committee [National Parks (Barbuda) Authority]

Though the members of the Park Stakeholder Committee [National Parks (Barbuda) Authority] are dedicated individuals who are knowledgeable about the activities of their stakeholder group, they have limited knowledge of Park management. This limitation will be overcome through the implementation of a workshop series for members of the Stakeholder Committee [National Parks (Barbuda) Authority], field trips to other protected areas in the region, and access to technical advice from experienced Park Managers through IUCN's World Commission on Protected Areas.

#### Recognition of the Stakeholder Committee Members and their Accomplishments

The Stakeholder's Committee [National Park (Barbuda) Authority] will enable stakeholder groups to provide direct input into Park management decisions. It will also be a tool for engaging stakeholders in the management process, raising their awareness of issues related to management, and to develop and transmit values that are consonant with the vision and objectives of the Park. The members of the Stakeholder Committee [National Parks (Barbuda) Authority] will be encouraged to pass on Park information and values to their constituents. To assist this process, a yearly event will be held in the Park to honour the work of the Stakeholder Committee [National Park (Barbuda) Authority], and engage their constituencies.

### **12.1.3.2 Infrastructure design, construction, and maintenance**

Quality design, construction, and maintenance of Park infrastructure supports resource protection by inducing visitors to behave in appropriate ways, and reducing the environmental impacts of facilities to a minimum. The characteristics of visitor facilities will be described in the section on "Visitor Use". In this section, the focus is on the reduction of environmental impacts of these facilities.

All Park facilities will be designed and sited so as to cause minimal environmental impact and as examples of site conservation and efficient resource use. Facilities and walkways will be elevated to minimise the removal of vegetation, the potential for erosion, and interference with natural processes. The use of recycled building materials will reduce demands on natural resources. Buildings will be designed for low energy and water consumption, the use of alternative energy, the capture and storage of rainwater, and water recycling.

All Park facilities will be energy efficient and use energy produced either by wind or solar power. Not only will this reduce carbon emissions, but also eliminate the need for the transport and transfer of fuels, thereby preventing spills. All vehicles and boats used by the Park will be electric powered, and batteries will be charged by wind or solar power sources.

### **12.1.3.3 Education and Awareness**

The Environmental Education and Awareness Programme for the Park is outlined in Section 12.4. It is important to note that one of the purposes of the Programme is to assist in resource protection. For this reason, there will be close interaction between the Resource Protection and Environmental Education and Awareness Programmes so that threats to the Park are defined in

specific terms and education efforts undertaken to change the behaviours that produce these threats.

#### **12.1.3.4 Boundary Demarcation and Fencing**

The eastern Park boundary will be demarcated in its entirety so that locals and visitors alike are aware of when they are in the Park. There will also be an attempt to fence portions of the eastern boundary to keep out the large populations of feral donkeys, horses, goats and sheep that cause extensive damage to the Park's native vegetation. However, fencing programmes are notoriously difficult to implement successfully, so an experimental approach will be taken that closely involves all stakeholders and evaluates alternative designs before large scale commitments are made. As a first step, a small experimental area will be fenced to determine the degree to which the natural vegetation can respond to the elimination of grazing pressure.

#### **12.1.3.5 Periodic patrols**

Regular patrolling of Park boundaries will be carried out to control hunting and fishing, encroachment, and/or contamination of water sources. The level of effort required for patrolling will be increased significantly when the marine annex is integrated into the Park during Phase II. An electronic data base will be established to archive incident reports; the observation of endemic, rare, threatened and invasive species; and provide the raw data that will enable the identification of the most problematic areas, and the most effective programming and required frequency of patrols.

#### **12.1.3.6 Interpretation of Monitoring Data**

The monitoring component of the Research and Monitoring Programme is outlined in section 12.3.3.1. The monitoring information generated will be stored in a data base and will be analyzed on a quarterly basis to detect trends and patterns that require actions by the Resource Protection Programme. The following data will be of special concern and will trigger a search for remedial actions:

- disturbance of Frigate Bird or turtle nesting sites, or other critical habitats by visitors or locals;
- loss of native vegetation through grazing and trampling by feral donkeys, horses, sheep and goats or by unauthorized removal for human uses;
- declines in the populations of juvenile lobsters and finfish and/or changes in water quality in the Codrington Lagoon;
- dumping, agricultural encroachment, and/or sand mining,
- indications of hunting within the Park; or,
- unauthorized activities or secondary impacts by concessionaires.

When the Park is expanded to include the marine annex, the monitoring programme will have to be extended as well to capture the following data of special concern:

- illegal entry into Strict Protection Zones where no fishing will be allowed;
- fishing by boats without the requisite Park permits;
- violations of fishing gear or size restrictions;
- die-off of corals or other marine species;
- algal blooms; or,

- dismantling of shipwrecks or removal of artefacts.

#### **12.1.4 Input Requirements**

Development of the Resource Protection Programme outlined here will require the following inputs:

##### Training

1. Training course for Stakeholder's Committee [National Parks (Barbuda) Authority] Members including field trips to other Caribbean protected areas.
2. Training modules in resource protection for Park Rangers.

##### Infrastructure

1. Demarcation of the Park's boundaries.
2. Experimental fencing of demonstration plot; fence maintenance and evaluation.
3. Fencing of eastern Park Boundary in increments to determine if it is feasible; fence maintenance.
4. Ranger Stations. During Phase I, a Ranger Station will be built by the Park Administration near Martello Tower to facilitate resource protection activities in the Palmetto Point area. In Phase II, a Ranger Station will be constructed and maintained as part of the Kid Island Concession. In Phase III, a Ranger Station will be constructed and maintained as part of the North Beach Concession.
5. In Phase III, a new Park Administration complex will be built south of Codrington.

##### Other

1. Access to technical advice through IUCN's World Commission on Protected Areas.
2. Development of a data base on resource protection that includes patrol reports and monitoring data, and subsequent analysis for decision-making.

## **12.2 Visitor Use Programme**

### **12.2.1 Objectives**

The objective of the Visitor Use Programme is to facilitate the understanding and enjoyment of the Park and its resources by the general public, provide quality outdoor recreation opportunities, and contribute to the sustainable development of Barbuda by providing a healthy and attractive environment for low impact ecotourism activities.

### **12.2.2 Policy**

The policy for the Visitor Use Programme is to contribute to the sustainable development of Barbuda by providing facilities and recreational opportunities that are in scale with the demand, consonant with the Park's resources and objectives, that are of interest to visitors (both local and foreign), and that fit with the scheduling requirements of the tourism industry. The facilities and recreational opportunities that are provided will be concentrated in specific development areas. Development areas within the current Park boundaries, and the facilities they will contain, are indicated in Annex A, Map 8. Development areas proposed for the Eastern Annex, and the facilities they will contain, are presented in Annex A, Map 9.

### **12.2.3 Management Actions**

#### **12.2.3.1 Access** (see Annex A, Map 1)

Access to the Park's terrestrial areas will be provided by roads to Palmetto Point and to Cobb Cove. Boat access will be facilitated by jetties at each of the development areas.

##### Roads (see Annex A, Map 1):

Phase I - current access to the Park on the Palmetto Point and Fishing Creek Roads will be maintained.

Phase II - the road to Fishing Creek will be improved, and a bridge to Kid Island and road to Cobb Cove will be developed as part of the Kid Island Concession.

##### Trails:

Phase I – an elevated boardwalk trail will be constructed to enable visitors to visit the mangrove near where the Visitor Centre is to be built.

Phase III – an elevated boardwalk trail will be constructed from the new Park Headquarters Complex to conduct visitors through the nearby mangrove environment; a trail will be constructed around the south side of the Lagoon to connect the Park Headquarters complex with the picnic and bathing areas on Palmetto Point.

Subsequent to Phase III – a trail along the East Coast from Two Foot Bay to Castle Bay (see Annex A, Map 4) will be developed, signed, and maintained on an annual basis as part of the Castle Bay Concession.

##### Jetties:

Phase I – the existing jetty at Codrington Village will be maintained by the Park; existing jetties at the Lighthouse Hotel, at North Point, and at the Low Day Use Areas, will be maintained by the current lease holders who will become Park concessionaires.

Phase II – new jetties will be constructed and maintained by concessionaires on the Caribbean side of the sand berm at Low Bay, and as part of the Kid Island concession.

Phase III - new jetties will be constructed and maintained as part of the North Beach concession, and the new Park Headquarters Complex south of Codrington..

#### **12.2.3.2 Visitor Information**

Information for visitors is one of the key services provided by a Park Authority. In the case of the CLNP the visitor information programme will require the following:

- public exhibits incorporated in the Park Headquarters building being constructed near the Codrington Jetty (Phase I);
- information Booths at the River Landing and at the Airport, as well as written materials and a video (Phase II); and

- a full Visitor Centre to be incorporated within an expanded Park Headquarters complex to be located south of Codrington (Phase III).

#### Codrington Park Headquarters

This facility will be designed to provide information to visitors on the Park, its resources, and recreational opportunities. An information desk will be complemented by exhibits, a short video, and a table model of the Park. A Park library will be developed to capture, store, and make available to the public all information available with respect to the Park. An elevated interpretive trail outside the Centre will enable visitors to enter, and become knowledgeable about, the mangrove environment.

#### The River Landing and Airport Information Booths

These compact facilities will be designed to provide information to Park visitors. A basic brochure on the Park and its attractions and accommodations will be complemented by a large map of the Park and pictures of key areas. During Phase I, these will be unattended facilities. For Phases II and III the need for Park personnel to attend during peak periods of visitation will be evaluated.

#### Expanded Park Headquarters Complex (south of Codrington and the Airport)

The area near the Codrington Jetty will become congested in the future. Not only will the initial Park Headquarters Building be constructed there, but a Fisheries Terminal will be built in the same general area as well. During Phase III, an average annual visitation of 30,000 visitors is projected. It will be necessary to expand the Park Headquarters Facility and relocate it south of Codrington and the Airport (west of the Race Track). The new Park Headquarters Complex will include a National Park Office Building, maintenance and storage building, Visitor Centre Building, and ample car parking. Trails from the Visitor Centre will lead to an elevated boardwalk to introduce the visitor to the mangrove environment, and around the southern edge of the Lagoon to the picnic and bathing area at Palmetto Point.

#### Informational Materials

1. A colour brochure for the Park, which will include a map, basic information on the park's resources, and notes on road and boat access, will be printed. It will be made available at the Visitor Centre, the River Landing, and at the airports and tourist accommodations on Barbuda and Antigua.
2. A general video on the CLNP, 15 minutes in length, for television and for distribution to hotels and guest houses in Barbuda and Antigua

#### **12.2.3.4 Concession System for Visitor Services**

All visitor services will be provided by concessionaires, whether for recreational activities, overnight accommodations, or food and beverage. This will shift the cost of providing these services to the private sector, but will also require that the Park Administration develop the capacity for a highly professional and business-like concession management system. The system will be run by a Concessions Specialist supported by specialized consultants who will assist in the design and monitoring of each new concession.

The Concession System will operate as follows:

1. Working with the National Park (Barbuda) Authority and the Park Staff, the Concession Specialist and Concession Consultant will develop the Terms of Reference (TOR) for the Concession. The TOR will include a technical description and required characteristics of the facilities or service to be included in the concession, the materials to be used in construction or the quality of the service, utility requirements, design and capacity considerations, minimum concession fees and taxes to be charged, and monitoring requirements.
2. The TOR will be published and distributed internationally with the assistance of international organizations. Written indications of interest will be requested. These indications of interest should include information about the entities showing interest, especially with respect to their previous experience, technical and operational capacity, and financial solvency.
3. Entities that indicate interest, and are considered to have the requisite experience, capacity, and solvency, will be asked to bid on the concession.
4. The bids will be judged by a panel selected by the National Parks (Barbuda) Authority and recommendations made. Bids will be judged on the quality of the proposals, the demonstrated capacity of the applicant, and the level of concession fees offered.
5. The National Parks (Barbuda) Authority will make the final selection of the entity to be awarded the concession based on the recommendation of the Panel, and any other information they may consider pertinent. Every attempt will be made to make the bidding process as transparent as possible, while respecting the needs of confidentiality of the bidding entities.

#### **12.2.3.5 Fee System**

A fee will also be charged to all visitors who enter the Park. Visitors will be able to buy an entrance pass to the Park at the proposed Information Booth at the River Landing, at the Airport, and at the soon-to-be-built Park Headquarters. Sea and land taxi operators who take visitors to or around the Park will be required to ask each visitor to show their entrance pass, and if they do not have one will require that it be purchased before transportation is provided. Park Rangers will regularly check visitor passes while patrolling the Park.

Fees for specific activities and accommodations within the Park will be charged as part of the overall cost of each service provided by the concessionaire. These fees will be collected from each concessionaire by the National Parks (Barbuda) Authority and deposited in the Codrington Lagoon National Park Fund.

Concessions will be let on a competitive basis at going market rates, and international organizations, such as the RAMSAR Secretariat and the International Ecotourism Society, will be enlisted to support the distribution of calls for bids. The term "concession", which is commonly used with respect to national parks, has the same meaning as the term "lease", which is commonly applied outside of national parks. Concession fees that are charged in each case will be those that are prescribed in the winning bid for that concession. However, in each bidding process a minimum concession fee will be stipulated. This minimum concession fee will be based on general international norms for national park concessions, which call for fees that vary from 3% to 8% of gross receipts, depending on the specific situation. If the concession deals with a facility that was leased to the managing entity before the park was created, or is for a short period, then the rate will be at the low end of the scale. If the concession deals with

facility that has already been constructed, or is for a long period, then the fee would be at the higher end of the scale. Any concession fees that are charged by the National Parks (Barbuda) Authority will be in addition to any business taxes, license fees, or payroll taxes that may also be charged by the Barbuda Council.

As noted in the CLNP Financial Sustainability Plan (2009), efforts are underway to establish an Antigua and Barbuda Conservation Trust Fund. This new institution would function as a foundation and would be established as a not-for-profit corporation as provided for under the laws of Antigua and Barbuda. Once this Fund becomes operational, negotiations will be undertaken to transfer to the Fund for administration all revenues received by the CLNP in order to generate matching grants from the planned regional Caribbean Conservation Trust Fund, and to achieve lower administrative costs.

More details on the fee system and projected revenues are provided in the CLNP Sustainable Finance Plan (2009).

#### **12.2.4 Inputs Required**

A variety of inputs will be required to implement the Visitor Use Programme, including infrastructure that will be built and maintained by the Parks Authority, concessions that will mobilise the resources of the private sector, and staff time.

##### **12.2.4.3 Infrastructure Built and Maintained by the Park Authority**

While most infrastructure to be built in the Park will be the responsibility of concessionaires, some basic infrastructure, which is required outside of concession areas, will have to be built and maintained directly by the National Parks (Barbuda) Authority. This includes the following (see Annex A, Map 19):

##### Phase I

1. Codrington Jetty (maintenance)
2. Codrington Park Offices and Visitor Exhibits
3. Martello Tower Ranger Station
4. The River Landing and Airport Information Booths

##### Phases II and III

1. Arrangements with Public Works to maintain the Palmetto Point and Kid Island access roads.
2. Maintenance of all facilities built by the Park Administration in Phase I.
3. New Park Headquarters complex South of Codrington with Offices and Meeting Room, Visitor Centre, Maintenance and Storage Facilities, and car parks for official vehicles and visitors. Phase III.

##### **12.2.4.1 Concessions:**

The following concessions are planned (see Annex A, Maps 8 and 9):



## Phase I

1. Activity Centre, located near the Codrington Pier, to attend recreational activities that originate in the Codrington area (space to attend the public and also for storage of marine sports gear):
  - guided boat tours to the Frigate Bird nesting area
  - tours to the Low Bay and Palmetto Point / Martello Tower day use areas (see Annex , Maps 10 and 11).
  - bone fishing in Codrington Lagoon
  - kayaking in Codrington Lagoon
  - sailing in Codrington Lagoon
  - snorkeling and diving in the marine buffer zone
  - horseback riding
2. Add mooring buoys to the Low Bay day use concession.
3. Conversion of the Lighthouse Resort Hotel lease into a Park concession
4. Conversion of the currently defunct Beach Hotel at Palmetto Point into a functioning Park concession.

## Phase II

1. Development and letting of major concessions at Palmetto Point and Kid Island, which will include the following Components (see Annex A, Maps 11 and 13 ):
  - improved access roads to both concessions;
  - ecolodges at each concession with 25 luxury tent units, 25 cabanas, and a dining and event area
  - a jetty and Marine Sports Centre (desk to attend the public, and storage of marine sports gear) at each concession
  - a camping complex at each concession with rustic elevated tent pads and tents, group kitchen and dining area, showers and restrooms, and an outdoor amphitheater for educational programs and special events; vehicle parking for the Kid Island and Palmetto Point concessions.
  - a day use beach area at each concession with picnic tables, restrooms, and showers; vehicle parking for the Kid Island and Palmetto Point concessions.
  - a Park Guard residence at the Kid Island and North Beach concessions.

## Phase III

- Development and letting of a major concession at North Beach (see Annex A, Map 14).
- The concession will have the same facilities as the Kid Island concession.
- Access will be provided by a boat service.

## After Phase III

If the Eastern Annex is brought into the Park, develop major concessions at Two Foot Bay, Castle Bay and Spanish Point:

### **Two Foot Bay Concession** (see Annex A, Map 15):

- a guest house and restaurant to be part of a restoration of the Highland House Historic Complex within the Two Foot Bay Concession;

- foot trail system and interpretive signs connecting Highland House, Two Foot Bay, the caves of Hog Point and the Highlands, and the East Coast Foot Trail.
- a day use beach area at Two Foot Bay with picnic tables, restrooms, showers and vehicle parking; and,
- a Ranger Station built as an adaptive restoration of one of the out buildings in the Highland House Historic Complex.

**Castle Bay and Spanish Point Concessions** (see Annex A, Maps 16 and 17):

- improved access roads;
- ecolodges each with 25 luxury tent units, 25 cabanas, and a dining and event area;
- camping complexes with rustic elevated tent pads and tents, group kitchen and dining area, showers and restrooms, an outdoor amphitheater for educational programs and special events, and vehicle parking;
- day use beach areas with picnic tables, restrooms, showers, and vehicle parking;
- an interpretive trail to Spanish Point from the ecolodge and camping and picnic areas; and,
- a Park Ranger Station.

### **12.3 Research and Monitoring Programme**

#### **12.3.1 Objectives**

The objective of the Research and Monitoring Programme is to:

- improve knowledge of the Park's biota, physical features, and natural processes;
- compile and make accessible research information for decision-making that will improve management effectiveness;
- identify trends in resource condition;
- measure changes being caused by climate change; and,
- provide information for decision making with respect to the marine component to be added to the Park in Phase II especially with respect to the mapping of marine habitats, the assessment of resource condition, and tendencies with respect to fisheries.

#### **12.3.2 Policy**

The policy of the Research and Monitoring Programme is to provide incentives for researchers to carry out projects in the Park that will provide information relevant to management decisions; and to regularise the capture, organisation, and disposition of information during regular Park patrols and monitoring assignments that will assist in early identification of trends in resource condition.

#### **12.3.3 Management Actions**

##### **12.3.3.1 Research and Monitoring Priorities**

Researchers interested in carrying out research in the Park will be encouraged to address one or more of the following priorities as part of their research plan:

- characterization of the environment and resource condition of the marine annex
- trends in the condition of Codrington Lagoon
- species inventories

- life histories, and population and distribution studies of key species;
- identification of critical sites and habitats; and,
- threshold levels for disturbances to wildlife populations, especially the Frigate Bird.

Permits will be required for all research activities and will be judged by what is presented in the research plan. Where possible, foreign researchers will be expected to work with local researchers and Park staff, and provide training. This should form part of the research plan and will be a factor used in determining whether or not to grant a permit.

Monitoring of the Park environment is essential for understanding the dynamics of the lagoon and marine ecosystems, for generating data that provides early warnings of deterioration of Park resources, and to provide information about the relationships between physical, biological, and economic components related to management.

A detailed ecosystem monitoring plan was proposed by the Environmental Awareness Group of Antigua and Barbuda (Jarecki, 2000) and will form the basis for the Park monitoring programme. Key elements that will be monitored on a regular basis include (see Annex A, Map 18):

<b>Category</b>	<b>Parameter</b>	<b>Monitoring Frequency</b>
Economic	Fishery yield per hour of effort	daily to weekly, as feasible
	Number of tours	daily
	Garbage, dumping	by event
	Fill dumping	by event
	Mangrove cutting	by event
	Effluent discharge (if a point source is identified)	by event
Physical	Aerial photography	2 years
	Depth and width of inlet	annually*
	Rainfall	daily
Biological	Water quality	quarterly*
	Bottom sediment composition	annually*
	Sea grass/macrophyte density	quarterly*
	Benthic macro-invertebrates by transect	quarterly*
	Fish by transect	quarterly*
	Mangrove forest structure and health	annually*
	Fiddler crab hole density	annually*
	Birds and other important mobile species	all sampling days

\* These parameters should also be monitored after extreme weather events, such as hurricanes, prolonged heavy rainfall, or drought, and after other major events such as pollution spills, dredging, etc.

A full description of monitoring methods and protocols is presented in the EAG Monitoring Plan (Jarecki, 2000). The information derived from monitoring will be incorporated into a data base in

formats that facilitate retrieval and analysis for decision making. Observation of deteriorating resources will trigger a search for possible causes and the identification of mitigation actions.

### **12.3.3.2 Incentives for Researchers**

Research on the Park's resources is highly desirable as it can generate important information for use in decision-making for Park management. While all researchers will have to obtain a research permit, wherever possible, researchers will be actively encouraged. The following Incentives will be offered for researchers to work in the Park on themes of interest for Park management, including the following:

- free access to the Park library and the monitoring data base;
- rapid consideration of research requests and the granting of permits;
- free guide services by Park Rangers;
- the provision of free terrestrial or marine transport, wherever possible; and
- negotiations with concessionaires to assist with obtaining preferential rates for accommodations for researchers.

The specific incentives to be offered to each researcher and the information to be provided to the Park Administration by the researcher will be clearly spelled out in a Research permit.

### **12.3.3.3 Data Base**

An electronic research and monitoring data base will be established to provide a virtual library of park research, and record and maintain monitoring data. The data base will be established in a format that facilitates easy retrieval and analysis of information. The data that will be collected during regular patrols was outlined in section 12.1.3.6, and this will be complemented from the data obtained during monitoring activities.

## **12.3.4 Input Requirements**

### Infrastructure

- Park Library housed in the Park Headquarters Building
- Computerized data base of research and monitoring data that will be part of the Park Library.

### Other

- Agreement with the Ministry of Health to analyze annual water samples.
- Recording by concessionaires of visitor numbers, whether local or foreign, whether they arrive in tour groups or self-organized groups, and the recreational activities in which they participate.
- Recording by the Fisheries Office of fish catches in the Lagoon and adjacent marine area.

## **12.4 Environmental Education and Public Awareness Programme**

### **12.4.1 Objectives**

Management actions for diminishing or mitigating Immediate threats to the Park, such as hunting, visitor impacts, contamination of water sources, and the eating and trampling of vegetation by feral animals will be dealt with by the Resource Protection Programme as outlined in section 12.1. The objectives for the Environmental Education and Public Awareness Programme, are different, and seek to:

- inform visitors as to the environmental, social, and economic values of the Park;
- educate the public, and especially leaders of public opinion, on the environmental issues relevant to the management of the CLNP;
- inform the public of the management practices for the Park, threats to the Park's objectives, and ways that stakeholders can help to reduce or mitigate those threats; and,
- assist public school teachers in local schools to give students a solid grounding in environmental studies that include local content related to the CLNP.

### **12.4.2 Policy**

The policy for the Programme is to give first priority to environmental education for students near the end of their primary schooling, and second priority to general information for public awareness through media coverage.

### **12.4.3 Management Actions**

#### **12.4.3.1 Environmental Education**

The environmental education component will focus on the training of school teachers who teach students in the last year of their primary education, and assisting secondary students carrying out projects related to the environment. Teachers will be trained to develop a set of lesson plans that use the Park as the focus. This training will include the provision of materials that can be used by the teachers in their lesson plans. Teachers will also be trained on how to conduct field trips to the Park, and how to carry out specific activities that take advantage of the Codrington wetland environment. Practical exercises will enable the students to take a hands-on approach through appropriate exercises, such as the following:

- making a boat
- replanting mangroves
- knot tying
- competition to construct a better fish pot

The environmental education component will be coordinated with the Ministry of Education.

#### **12.4.3.2 Public awareness**

The public awareness component will focus on media coverage and interpretive exhibits. These exhibits will be placed within the Park Headquarters Building at Codrington during Phases I and II, and then integrated into the Visitor Centre that will be built south of Codrington and the airport during Phase III. This work will be coordinated closely with the Barbuda Information Service.

Media coverage of the Park and its values is currently sporadic and infrequent. Media coverage will be improved by preparing a short general video on the Park. The video will be provided to

the media, and will be available for local programmes on a range of themes. The same video will be provided to major tour operators, hotels, and restaurants as well, and they will be encouraged to have the video available for their clients. A major theme of the video will be a presentation of the Park's values, and its contribution to the economy of Barbuda. Thus, considerable work will be required in preparation of the video to develop authoritative data on the economic value of the Park, as it is, and the value to be added through implementation of this management plan. This work will be implemented through an agreement with the University of the West Indies. The Park will provide funding for a student thesis on the subject through the CERMES Programme.

Interpretive Exhibits: The displays at the Visitor Centre will cover the major interpretive themes for the Park by presenting information on Park resources, enhancing awareness of critical issues, and stimulating appreciation of the park's values. The major interpretive themes will be as follows:

- an overview of the human and natural history of the Park;
- the life cycle, global status, and nesting habits of the Frigate Bird;
- threats to the Park's values and possible solutions; and,
- the economic value of the Park as part of the green development strategy for Barbuda.

#### Special events

An annual event will be staged at the Visitor Centre facility to enhance public outreach. This will be a Codrington Lagoon Day in the Park, which will be scheduled to:

- encourage policy makers, key civil servants, members of the National Parks (Barbuda) Authority, Park staff, representatives of collaborating international organisations, hoteliers, restaurant owners, researchers, and collaborating educators to spend a day together in the Park;
- provide an opportunity to feature cultural activities that feature conservation messages;
- announce or launch new projects or activities;
- recognize stakeholders who have contributed to Park management;
- present awards to Park staff who have performed above and beyond the call of duty;
- provide an opportunity for Park staff and the families of stakeholders to enjoy the Park and become familiar with its features; and,
- stimulate media coverage.

#### **12.4.4 Input Requirements**

##### Infrastructure

- Interpretive exhibits for the Visitor's Centre

##### Materials

1 Training Syllabus for Teachers

1 Publication of materials for use in developing lesson plans

## Other

Annual organisation of a Special Event.

### **12.5 Community Outreach Programme**

#### **12.5.1 Objectives**

The objective of the Community Outreach Programme is to insert the Park into the mainstream of sustainable development in Barbuda, thereby assuring that the Park becomes a critical development resource that is understood and appreciated by a spectrum of stakeholders.

#### **12.5.2 Policy**

The policy of the Community Outreach Programme is to work with stakeholders to determine how the Park can best support sustainable development, and develop cooperative projects that will achieve that goal.

#### **12.5.3 Management Actions**

A number of options will be considered for cooperative projects to be undertaken by the Park in cooperation with the Barbuda Council, the private sector, and the Antigua and Barbuda Conservation Trust Fund once it is established. Priority will be given to those projects that further the objectives of the Green Strategy for development of Barbuda as outlined in Section 8.

##### **12.5.3.1 Wind Generated Energy**

One of the most important components of the proposed Green Strategy for the sustainable development of Barbuda, and a potential source of significant revenues for the Park, is wind generated energy. The westerly trade winds that caress Barbuda provide a reliable, constant, and carbon-free source of energy. Wind energy could easily replace the current diesel generators that provide electric power for Barbuda. Wind turbines could be acquired by the Park at low cost through an alternative energy project paid for by carbon credits. This kind of a project could be developed in cooperation with the Antigua and Barbuda Conservation Trust Fund once it is established, or in partnership with international non-governmental organisations. Under carbon credit schemes, and there are several to choose from internationally, the requirement for key industries in developed countries to reduce carbon emissions is offset by funding alternative energy schemes in developing countries, in this case Barbuda. The power produced by the Park could be sold to the Antigua Public Utilities Authority (APUA), Barbuda's electricity company, thereby providing a steady stream of income to the Park. An estimate of the revenues that could be generated for the Park through development of a wind energy project is presented in the CLNP Financial Sustainability Plan (2009). The use of wind energy not only has the potential for generating major revenues for the Park, but also would have the added benefit of significantly reducing the use of the current diesel generator that is a source of carbon emissions and pollution for the Codrington Lagoon. Perhaps most importantly, however, reliance on wind energy in Barbuda would greatly enhance Barbuda's reputation as an environmentally responsible ecotourism destination. If handled properly, an enormous amount of free publicity for Barbuda could be catalyzed through a major wind energy project.

### **12.5.3.2 Electric Transport**

Once wind power provides an abundant source of non-carbon, non-contaminating energy for Barbuda, the next logical step in the Green Strategy would be to reduce reliance on internal combustion engines by replacing them with electric engines, especially with respect to autos, trucks, and outboard motors for boats. Though the replacement will undoubtedly have to take place over time, it could be accelerated if the Barbuda Council were to require all new vehicles and outboard engines imported to Barbuda to be electric. The process could be further encouraged by establishing a fund with carbon credits that would pay the difference between the cost of importing an electric powered vehicle or outboard motor and the cost of a gasoline or diesel powered vehicle or outboard motor. As with the wind turbine project, the electric transport project would have to be developed in cooperation with the Antigua and Barbuda Conservation Trust Fund once it is established, or an international non-governmental organisation, and if handled properly could stimulate favourable free media coverage by the international press.

### **12.5.3.3 Cottages, tent camps, and research facilities**

There is potential for entrepreneurial Barbudans to diversify their income by accommodating visitors and researchers. However, marketing is a major obstacle, so a good deal of caution needs to be exercised before investment is made. Current levels of visitation and research are not great enough to warrant the building of new accommodations. This may change, however, over the course of implementation of this plan. In any case, an incremental approach needs to be taken. If demand by visitors and researchers indicates that a basic facility, such as a small group of tent cabins, could be feasible, this could be a first investment. If demand continues to increase, further units could be added, or more elaborate facilities, such as cottages, could be included in the accommodation mix. Decisions will have to be made on a project by project basis, and supported by clear projections of demand based on experience. Funding for such facilities could potentially be shared by the entrepreneur and the Antigua and Barbuda Conservation Trust Fund once it is operational.

### **12.5.3.4 Horse and Mountain Bike Trails**

There are a number of old roads, tracks, and trails in Barbuda that are outside of the Park, but which have potential for development as horseback riding trails or mountain bike trails. The Park Authority will be alert to entrepreneurs who may be interested in developing these opportunities, and where possible, assist in project development for submission to the Antigua and Barbuda Conservation Trust Fund when it is established.

### **12.5.3.5 Guides**

Because of the sensitivity of the Frigate Bird nesting colony to human disturbance, all visitors to the colony will be required to have a guide that is licensed by the National Park. Many visitors will also want guided tours of the Park and guides with specialized knowledge of the CLNP will be needed. This would benefit the Park by having guides available that are familiar with the Park's objectives, its resources, and management. Thus, a special course will be held for individual wanting to provide guide services in the Park. Satisfactory completion of this course will be a requirement for licensing by the Park. In preparation for the course, tour operators will be contacted to determine what they think the needs are for specialized training, and the



mechanisms that can be put in place to be able to create a market place for specialized guides; that is, a mechanism for connecting the needs for guide services by tour operators and self-formed tourist groups with the guides who are trained and ready to perform this function. Guides who successfully complete this course will be provided with a certificate, and entered into a list of preferred guides for the Park. After the course, the Park Administration will promote the use of these guides, monitor performance, identify a cadre that is particularly competent, and promote their continued learning and regular service in the Park.

#### **12.5.3.6 Cottage Industries**

The projected influx of visitors to the Park provides a ready market for distinct arts and crafts made by Barbudans. The currently operating Arts and Crafts Workshop provides a vehicle for promoting the cottage industry concept and the teaching of skills. High quality arts and crafts could be sold at the Visitor Centre.

#### **12.5.4 Input Requirements**

##### Infrastructure

1. A 2 KW wind farm with a feed to the Barbuda power grid; to be developed in coordination with the Barbuda Council, the Antigua and Barbuda Conservation Trust Fund (when established), and APUA, the electric utility company for Barbuda.
2. A private tent cabin complex for researchers and visitors with a group food preparation and dining area, restrooms, and showers; to be located outside the Park and developed by a private entrepreneur with financial assistance from the Antigua and Barbuda Conservation Trust Fund, when established.
3. Horse and mountain bike trails outside of the Park; to be developed by private entrepreneurs with technical assistance from the CLNP.

##### Other

1. Work with the Antigua and Barbuda Conservation Trust Fund, when established, to develop a local fund for conversion to electric transport with financing from carbon credits.
2. Organize a guide's course on the CLNP for individuals interested in becoming guides licensed by the Park.
3. Establish procedures for connecting individual visitors or visitor groups with suitable guides.
4. Work with the local Arts and Crafts Centre to produce and market high quality items for the visiting public.

## 13. ORGANISATIONAL STRUCTURE

### Key Concepts – Organisational Structure

- The organisational structure of the CLNP is built around the voluntary National Parks (Barbuda) Authority, a Park Manager and other paid staff, a Senior Volunteer with expertise in Park Management, and occasional consultants hired for specific tasks.
- The administrative infrastructure will include a Park Headquarters with offices, library, data centre, and meeting room, and maintenance and storage facilities; and Ranger Stations.
- Park Staff activities will be supported with transportation (motor bikes, pickup trucks, and launches), and office and field equipment.

### 13.1 National Parks (Barbuda) Authority

A National Parks (Barbuda) Authority will be established to guide the management and development of the Park in accordance with the National Parks Bill of 1984 as amended by the Barbuda Land Act of 2007. The Authority and will have the following functions:

1. to review and approve a Management and Development Plan and a Financial Sustainability Plan for the CNLP, which will achieve the stated management objectives for the Park;
2. to hire a Park Manager and other staff as required implement the Management and Development Plan, and to work with the Antigua and Barbuda Conservation Trust Fund, when established, to implement the Financial Sustainability Plan;
3. to monitor and evaluate management effectiveness and the performance of Park Staff; and,
4. to periodically update the Management and Development Plan and Financial Sustainability Plan to incorporate lessons learned during implementation, and improve management effectiveness.

The National Parks (Barbuda) Authority will have the same make-up as the existing CLNP Stakeholder's Committee and each member will serve in his/her personal capacity. Honorary members, with voice but no vote, will be recruited from time to time to provide specialized expertise. Members will be appointed by the Barbuda Council for terms of 3 years, and may serve up to three consecutive terms. The CLNP Park Manager will serve as Secretary to the Authority and will have a voice but no vote. The Authority will meet a least twice a year, and more often when required, and will elect its own officers and develop its own procedural rules. Decisions of the National Parks (Barbuda) Authority will be binding unless overruled by the Barbuda Council.

### 13.2 Park Manager and Staff

The National Park Authority will appoint a Park Manager and all staff. The Park Manager will be responsible for all aspects of management for Codrington Lagoon National Park, and will be guided by the Management and Development Plan and the Financial Sustainability Plan for the Park as approved by the National Parks (Barbuda) Authority. Since national park management

is relatively new in Barbuda, it is probable that the candidate named Park Manager will require basic training, subsequent mentoring, and a regular upgrading of knowledge and skills.

Other staff that will be required during the different stages of park management, include:

### Phase I

- Conservation Officer who will be responsible for the Resource Protection and the Monitoring and Evaluation Programmes.
- Visitor Services Officer who will be responsible for the Visitor Use, Environmental Education and Public Awareness, and Community Outreach Programmes
- Administrator who will be responsible for all administrative operations and procedures.
- Clerk/Secretary
- 4 Park Rangers (existing),

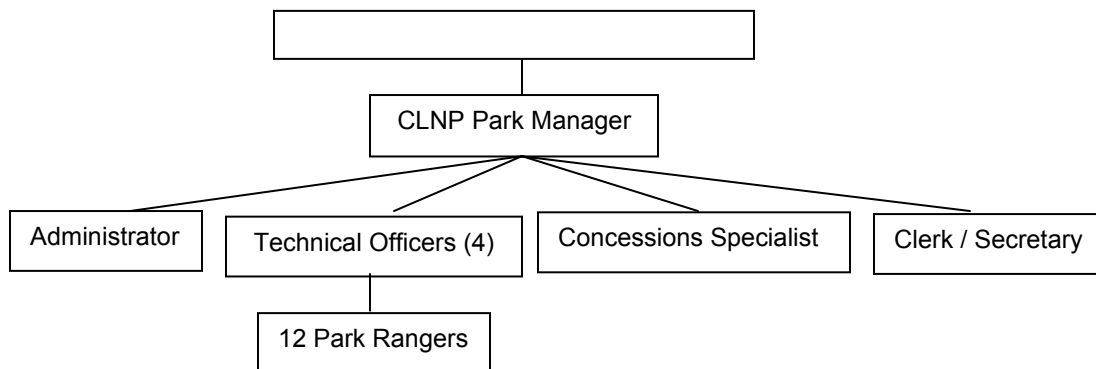
### Phase II (additional personnel)

- Concessions Specialist who will be responsible for the development, bidding, monitoring and evaluation of concessions.
- Monitoring and Evaluation Officer who will take charge of the Monitoring and Evaluation Programme.
- 4 Park Rangers

### Phase III (additional personnel)

- Environmental Education Officer who will take charge of the Environmental Education and Public Awareness, and Community Outreach Programmes.
- 4 Park Rangers

All staff will be supervised by, and report to, the Park Manager, who in turn will report to the National Parks (Barbuda) Authority as shown in the simple organigram below:



### **13.3 Technical assistance**

Management of a national park is a new undertaking in Barbuda, and quality technical assistance will be required during Phase I of operations in order get the CLNP up and running, and staff trained. During this stage of park development, the following consultants will be required:

- Legal Consultant
- Financial Consultant
- Consultant on Carbon Credit Projects
- Consultant on the Park Patrol System
- Senior Volunteer with expertise in Park Management (through the Executive Service Corps, U.S. Peace Corps, British Volunteer Service Overseas, United Nations Volunteers, or others)

During Phases II and III, additional consultants will be needed to develop and coordinate the bid process for park concessions; and then supervise, monitor, and evaluate their implementation.

#### **13.4 Training and Incentives**

All staff members will be provided with regular training opportunities to upgrade their knowledge and skills related to national park management. Salary increases will be conditioned on the successful completion of the training opportunities that are offered.

#### **13.5 Administrative Infrastructure**

The distribution of administrative infrastructure is indicated in Map 19 (see Annex A) The Offices of the CNLP will be housed in the Headquarters Building, which will be built near the Codrington Jetty. Ranger Stations will be built near Martello Tower, and as part of the North Beach and Kid Island concessions. An enlarged Park Headquarters Complex will be built during Phase III.

#### **13.6 Transportation and Equipment**

Adequate transportation and equipment are essential if Park management is to be efficient and effective. This includes office and field equipment, and well as terrestrial and marine transport. The estimated requirements are as follows:

##### Phase I

Office equipment:

- 3 computers
- 1 copier/scanner/fax
- 6 desks and chairs
- 1 file cabinet
- 4 air conditioners
- 2 fans

Field Equipment

- 10 life jackets
- 10 first aid kits
- 2 GPS
- 2 digital cameras
- 2 binoculars
- 3 cell phones

Transport

- 2 motor bikes
- 1 Pickup (existing)
- 1 boat and 2 outboard engines (existing)

## Phase II

### Office Equipment:

- 2 computers
- 1 copier/scanner/fax
- 6 desks and chairs
- 2 fans

### Field Equipment

- 10 life jackets
- 10 first aid kits
- 2 GPS
- 2 digital cameras
- 3 cell phones

### Transport

- 2 motorbikes
- 1 pickup
- 1 boat and 2 outboard engines

## Phase III

### Office Equipment

- 1 computer
- 1 scanner/copier/fax
- 5 desks and chairs
- 5 fans

### Field Equipment

- 10 life jackets
- 10 first aid kits
- 2 GPS
- 2 digital cameras
- 2 binoculars
- 3 cell phones

### Transport

- 2 motorbikes
- 1 pickup
- 1 boat and 2 outboard engines

## **14. MANAGEMENT EFFECTIVENESS**

### **Key Concepts – Management Effectiveness**

Regular assessments of management effectiveness will be used as a tool to track progress, and monitor performance, and evaluate success.

Since the establishment of the CLNP, the costs of management and development have been shared by the Barbuda Council, the Government of Antigua and Barbuda, and international donors. The Barbuda Council and Government of Antigua and Barbuda have:

- dedicated the lands of the Codrington Lagoon wetland complex for National Park management, thereby forgoing alternative resource uses (opportunity cost);
- paid some initial staff costs; and,
- provided terrestrial and marine transportation for Park Rangers.

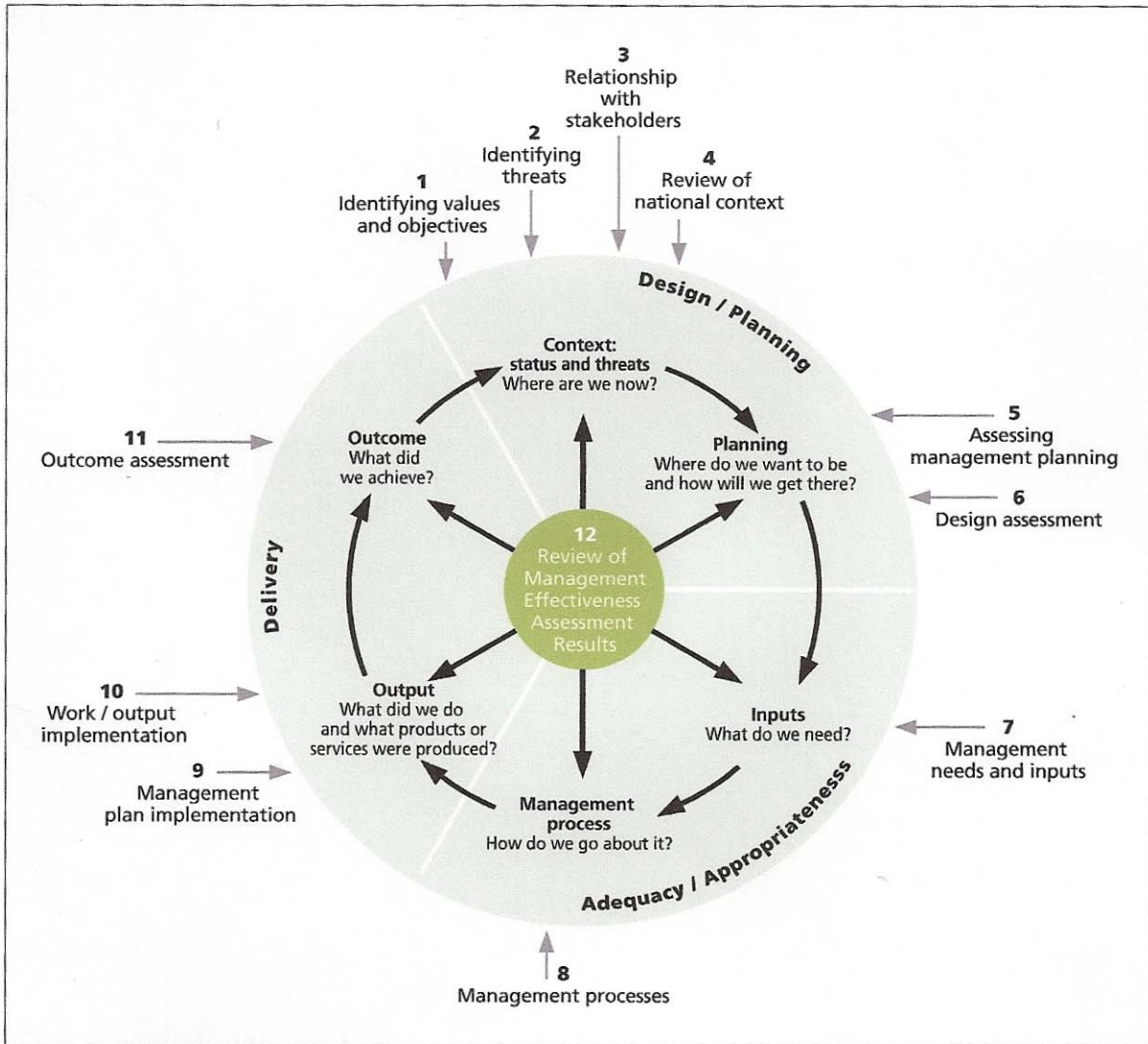
International donors have provided:

- funding for the development of the Management and Development Plan and the Financial Sustainability Plan;
- funding for the design and construction of a Park Headquarters, and a Ranger Station; and,
- boats and motors for Park personnel.

Implementation of this management plan will require consistently higher levels of investment than has been forthcoming since establishment of the Park. As new mechanisms are put into place to raise additional funding nationally and internationally, more sophisticated procedures will be needed to track progress in management of the Park, and to provide data on costs and benefits. This is needed so that donors can receive reliable data that enables them to evaluate in concrete terms the return on their investment, and justify further investments.

One mechanism for generating the required data is through the assessment of management effectiveness, which uses specific criteria for measuring progress with respect to the Park's management plan. A first evaluation will be conducted at the beginning of the Plan period to record the base-line condition of Park management. Subsequent evaluations will be conducted to track progress. The frequency of repeat evaluations will depend on the demand for this information. As a minimum, an evaluation will be conducted in 2014, midway through the Plan period, to track progress, and identify future targets for improvement. The evaluation will be used to identify clear priorities for the remaining planning period, from 2014 to 2019. More frequent evaluations will be conducted if donors want this kind of evaluation at the beginning and end of individual investment projects, or to generate reliable quantitative data to use to justify a project proposal.

The diagram below indicates the general process that can be used for assessing management effectiveness:



Source: UNESCO / IUCN, 2001. *Enhancing our Heritage – Monitoring and Managing for Success in World Natural Heritage Sites.*

**15. FINANCE**

**Key Concepts – Finance**

- The Management and Development Plan indicates the requirements for management while a separate Sustainable Finance Plan projects the costs of the management requirements, and identifies revenue potentials to cover these costs.
- Estimated annual costs and revenue projections indicate that management costs can potentially be met:
  - Phase I - Costs = US\$ 421,000; Revenues = US\$ 483,000
  - Phase II - Costs = US\$ 613,000; Revenues = US\$ 1,190,000
  - Phase III – Costs = US\$ 976,000; Revenues = US\$ 1,502,000
- These figures are based on best case scenarios, however, and not all of the revenue potentials will be realised.
- Two mechanisms are required for the raising, collection, and administration of these funds:
  - a CLNP Fund administered by the National Parks (Barbuda) Authority; and,
  - an Antigua and Barbuda Conservation Trust Fund, functioning as an independent foundation.

This, the Management and Development Plan for the Park lays out the essential requirements for management. A separate Financial Sustainability Plan (Environment Division and Barbuda Council, 2009) estimates the cost of these inputs, and indicates mechanisms for paying for them on a sustainable basis.

**15.1 Estimated Costs and Revenue Potentials**

Based on the calculations presented in the Financial Sustainability Plan, the annual costs and potential revenues for Park management and development are estimated as follows:

<b>Phase I</b>	
• Projected Annual Costs (operations and capital investments)	420,983
• Projected Annual Revenues	483,955
<b>Phase II</b>	
• Projected Annual Costs	613,050
• Projected Annual Revenues	1,190,247
<b>Phase III</b>	
• Projected Annual Costs (operations and capital investments)	975,850
• Projected Annual Revenues	1,501,631

These are rough estimates based on a best case scenario. However, the revenues indicated are **potentials**, not all of which will necessarily be realised. Since earned income has the greatest potential for revenue generation (see Section 8.7), priority should be given to:

- concession development, marketing, and management; and
- the development and marketing of alternative energy production by windmills through carbon credit projects.



## **15.2 What if?**

The development and marketing of concessions (leases) and alternative energy projects are capacities that do not currently exist in Barbuda. Indeed, the negotiation of leases for hotels in Barbuda has until now been considered a political function, not a technical one. Each lease is presently negotiated on an individual basis in reaction to investor interest. The development and proactive marketing of Park concessions as part of an overall Park Management and Development Plan would represent a marked change in approach. This change would require politicians to see concession development and marketing as a technical function that requires political support.

Thus, if revenue potentials are to be realised, it is essential that concession development and marketing be treated as a technical function, and that the needed capacity be acquired through the hiring of qualified consultants and the training of Park staff. If this is not done as a matter of priority, the potential for earned income will remain exactly that --- a potential --- and Park management will have to continue to depend on the current sources of funding; that is, entrance fees charged to visitors, and project funding. The management costs projected in the Financial Sustainability Plan indicate unequivocally that, even if visitor fees and project funding are pursued vigorously, these sources of revenue can only fund basic operations --- at best. Under this scenario, Park management will never attain international standards, nor serve as a motor for the sustainable development of Barbuda.

## **15.3 Essential Financial Mechanisms**

Two major finance mechanisms would be required to capture, administer and disburse the different potential sources of Park revenue outlined above. A National Park Fund, administered by the National Parks (Barbuda) Authority, is required to serve as a rotating fund for Park operations. A separate and independent Antigua and Barbuda Conservation Trust Fund is also needed to develop, market, and administer conservation and carbon credit projects. More information on the Conservation Trust Fund concept is presented in Annex D.

## **16. CONCLUSION**

This is the first Management and Development Plan for CLNP, and because of this, a 10 year time horizon has been chosen. However, because of this 10 year time horizon, a great number of assumptions and estimates have been made, many of which will not materialise or will materialise in ways that are different from the assumptions made here. Thus, for this Plan to be of maximum use, it should be updated at the end of each phase (every three or four years) as better information becomes available through the on-going management process. If this is done, and management proceeds according to the Plan, it should be possible to achieve the objectives that have been set out and contribute effectively and efficiently to the sustainable development of Barbuda.

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# ANNEXES

## A. MAPS

1. Location
2. Proposed Eastern Park Annex
3. Existing Tourism Infrastructure
4. Points of Interest
5. Vegetation Communities
6. Resource Degradation
7. Zoning
8. Development Areas – Existing Park
9. Development Areas – Proposed Eastern Annex
10. Low Bay Concession
11. Palmetto Point Concession
12. Codrington Development Area
13. Kid Island Concession
14. North Beach Concession
15. Two Foot Bay Concession
16. Castle Bay Concession
17. Spanish Point Concession
18. Monitoring Stations
19. Park Administration

## B. SCHEDULE OF ACTIVITIES

## C. STAKEHOLDER INTERVIEWS

## D. CONSERVATION TRUST FUND CONCEPT

## **ANNEX A**

See maps in separate file.

## **ANNEX B: SCHEDULE OF ACTIVITIES**

11-12.10	Travel to Antigua
13-14.10	Interviews and gathering of reference materials, Antigua
15-20.10	Field visit to Barbuda; Hurricane Omar; field visits post hurricane to assess damage and extent of flooding; interviews; hike along the east coast from Two Foot Bay to Castle Bay.
21-22.10	Interviews and gathering of reference materials, Antigua
23-26	Travel to Barbuda; meetings with Stakeholder's Committee and Barbuda Council.
27.10	Meetings in Antigua
28.10	Return travel to home for Consultant
29.10-16.01	Telephone interviews and write-up of Plan
16.01-10.02	Circulation of draft Plan to the Stakeholder's Committee and the Barbuda Council for review.
11.02	Meeting of Stakeholder Committee with the Consultant to review the draft Plan.
12.02	Meeting of the Stakeholder Committee and the Barbuda Council to further review the draft Plan.
13.02	Consultant travel home
14-28.02	Revision of the draft Plan to incorporate the comments received from the Stakeholder's Committee and the Barbuda Council.
01.03	Submission of the final version of the Management and Development Plan

## **ANNEX C: STAKEHOLDER INTERVIEWS**

- Banhan, Melesha. Environment Division
- Black-Lane, Diann. Environment Division
- Blyther, Ruth. The Nature Conservancy, St. Croix Office.
- Codrington National Park Stakeholders Committee
  - Melesha Banhan (The environment Division), Committee Chair
  - Fabian Jones, Barbuda Council
  - John Webber, Committee Secretary
  - Calvin Gore, Sea Taxis
  - Brent Parker, Planning
  - Lynton Thomas, land taxis
  - Valater Webber, Fisherman
  - Wesley Beazel, Lobster Exporter
  - Freeston Thomas, small business
  - Representative, Environmental Awareness Group
  - Representative, Fisheries Antigua & Barbuda
- Cooper, Brian. Environmental Awareness Group
- Davis, Rasona. Coordinator Economic Policy and Planning, Ministry of Finance and the Economy.
- Fernandez, Joe. West Indies Oil Co.
- Forrester Neil. Antigua and Barbuda Hotel and Tourism Association
- Freeman, Patrick. Director of Sustainable Development, Auberge Resorts
- Jackson, Ivor. Consultant
- Jones, Fabian. Chair of the Barbuda Council
- Laureano, Efrain. Programme Director, Antigua, Caribbean Open Trade Support
- LeBlanc, Suzie. Programme Director, Dominica, Caribbean Open Trade Support
- Lee, Doleen. Permanent Secretary, Ministry of Finance and the Economy
- Lindsay, Kevel. Consultant
- Muir, James and Sharon. Peace Corps Volunteers
- Mussington, John. Consultant and Secondary School Headmaster, Codrington
- Murphy, Reg. Archaeologist, National Park Authority
- Peters, James. Park Ranger
- Pidduck, Geoffrey. Real Estate Agent, Antigua
- Prosper, Junior. Environmental Awareness Group
- Wilson, Greg. Ex Peace Corps Volunteer

## **ANNEX D: CONSERVATION TRUST FUND CONCEPT**

### **SOURCE**

The concept of a Conservation Trust Fund (CTF) is new to Antigua and Barbuda. However, the establishment and operation of a CTF is a critical component of the sustainable finance strategy for the management of the CLNP. It is for this reason that this annex, which is copied from the Financial Sustainability Plan (Environment Division and Barbuda Council, 2009), is presented here as well.

### **INTRODUCTION**

The Environment Division of Antigua and Barbuda is supporting the development of a Management Plan for Codrington Lagoon National Park (CLNP) on Barbuda with financing for USAID. The Park covers about a third of the land area of Barbuda and is thus a major resource for the conservation and development of the island, especially with respect to fisheries and tourism.

One important aspect of the management plan for the CLNP is financial sustainability, because implementation of the plan depends to a great degree on the availability of funding. Since the CLNP is a part of a wider system of protected areas for the twin island state of Antigua and Barbuda, questions of finance must be considered in the wider context. How can the protected areas of Antigua and Barbuda be funded so that they contribute fully to the conservation of the islands' biodiversity while at the same time supporting the tourism industry? The current government budget and concessionaire and visitor fee systems are inadequate. So what can be done to develop adequate funding?

The answer is that much can be done if the right mechanisms are in place. In fact, the problem is not a lack of funding sources, but rather the lack of appropriate mechanisms to adequately tap the available sources.

### **CONSERVATION TRUST FUNDS**

One financing mechanism that has received attention during the past 15 years is the Conservation Trust Fund (CTF). CTFs are legally independent, non-governmental institutions that raise, administer, and disburse funding. They do not implement projects but rather work through other existing implementing organizations. They usually make grants to government protected area agencies, NGOs, and/or local community groups for activities that protect biodiversity and amenities for tourism, and promote community-based sustainable development near protected areas. The last 15 years of experience with CTFs in more than 50 countries demonstrates that they not only complement the funding provided by national governments and international donor agencies, but can also serve to mobilize substantial additional funding from national governments, international donor agencies, and the private sector.

Although CTFs do not implement conservation activities or projects themselves, they can influence the priorities and the operating procedures of government agencies and NGOs by providing them with otherwise hard-to-obtain additional financial resources. In many cases (Mexico, Peru, Ecuador, South Africa and Bhutan), CTFs serve not only as funding



mechanisms, but also as catalysts for institutional reform of government protected area agencies. In other countries such as Brazil, CTFs have served as catalysts for the creation of new partnerships with the private sector. In still other cases (as in the 23 CTFs whose financing comes from the proceeds of bilateral debt reductions by the US Government), CTFs have served as mechanisms for strengthening NGOs.

## **OPERATION OF A CONSERVATION TRUST FUND**

### Governance

CTFs are set up as independent institutions, usually as a foundation or not-for-profit corporation, depending on the particular legislation of a country. For example, the Environmental Awareness Group of Antigua and Barbuda is a not-for-profit corporation set up under the Companies Act. An Antigua and Barbuda CTF could be a similar type of organization, or could be integrated into an existing not-for-profit.

One important lesson learned from experience around the world is that the most critical factor for good governance of a CTF is to have a large non-government majority on its Board of Directors, and to limit the number of government representatives to 20% or less. CTFs whose governing boards have a non-government majority, and are not chaired by a government Minister or housed inside of a government Ministry, are more transparent and accountable in how they spend funds. In some cases, donor representatives are included on the Board, but this has turned out to be limiting in some cases where the presence of a specific donor representative gives the perception that the CTF is the client of only one donor institution, thereby driving away other potential donors.

In some CTFs, a Founder's Committee or similar body is set up to play an oversight function with respect to the Board. The Founder's Committee is made up of the representatives of the institutions that established the CTF in the first place. This Committee has the power of veto over any decision made by the Board of Directors that contravenes the original intent of the legal instruments that established the Fund.

In some cases, CTFs play a lead role in strategic planning and priority setting for a country's national park system, either at the direct request of the government, or by default (i.e., because neither the government nor anyone else is doing this). Recent studies show that CTFs have served as the mechanism for financing up to 75% (in Peru) or even 90% (in Bolivia) of the annual operating costs of a country's protected area system, which can give them a significant indirect (or direct) influence on how those protected area systems are managed. This is true even in cases like Ecuador, where a CTF provides only 20% of such operating costs, or Mexico where a CTF provides only 14% of the total operating costs for 22 protected areas.

### Staffing

CTFs seek to maintain low staff levels so they can maximize the amount available for grant-making. The larger the CTF, the more efficient operations can be as a percentage of total revenues. At start-up, CTFs usually have to spend up to 40% of their funding on administrative overheads, but as they grow in experience and resources, even small funds can usually get their administrative overheads down to about 25% of total revenues. Starting CTFs usually need only a Director and a Secretary. As the CTF develops, an Administrative Officer and one or more Project Officers can be brought on board to administer funds, organize and implement the requests for proposals, advise the Board of Directors on project selection, supervise and

monitor project implementation, and report to donors. These functions can also be outsourced if preferred.

### Sources of Funding

A 2002 study of CTFs in Latin America and the Caribbean found the following distribution of funding sources:

Debt for nature swaps	48%
Global Environment Facility (GEF)	27%
Bilateral Grants	9%
Governments	7%
Loans through bi-lateral or multi-lateral institutions	5%
Earned income (fines, entrance fees, concessions, etc.)	2%
Private foundations	1%
Donations from multilateral organizations	<1%

These figures show clearly the importance of international funding which adds up to 91% of all current sources. Since this study was carried out, some CTFs have made breakthroughs in tapping into private sources of funding, mostly through the corporate sector.

### Grant Making

The basic function of a CTF is to make grants that further biodiversity conservation and other relevant objectives. The guidelines for grant-making are normally outlined in a "Grant-Making Manual", or in a broader "Operations Manual" that has a section on grant-making. Grant priorities can either follow established government policy, such as a biodiversity strategy or protected area action program, or can be developed by the CTF's Board of Directors. The entities eligible for grants are usually defined by the Board of Directors as well and can include government agencies, NGOs, local community groups and/or the private sector. In many instances, the guidelines for grant-making at any particular time are defined in a "call for proposals" that clearly sets out priorities (thematic and/or geographical), deadlines for application, eligibility criteria, monitoring and evaluation requirements, amounts to be granted, and other operational details.

### Monitoring and Evaluation

Most CTFs monitor and evaluate "project completion" indicators. There are no reported cases of CTF funds being stolen, misappropriated, or diverted for unauthorized uses. The general record of CTFs seems to be better than the general record of accountability of individual projects financed by international donor agencies or national governments.

However, many CTFs have not collected detailed baseline data that would permit monitoring of biodiversity impacts of their grants, because collecting such data is often expensive, time-consuming, highly skilled work, for which the best methodologies are sometimes still a subject of debate even among scientific experts. Instead, many CTFs collect and analyze "proxy indicators" for biodiversity conservation, such as the number of (1) additional Park Rangers that have been hired, (2) vehicles and radios purchased to equip Park Rangers, (3) training courses given to park managers, (4) public environmental awareness campaigns that have conducted, and/or (5) environmentally sustainable livelihood projects for local communities in park buffer zones.

## Fund Administration

Most CTFs administer their funds through a variety of account types. In general these accounts include trust funds (where the capital is maintained and only the interest is available for grant-making), sinking funds (where an initial seed capital is spent over time, such as with project funding), or revolving funds (where regular income, such as concession fees, entrance fees, or fines build up in an account until spent). Each of these account types may also be divided into sub-accounts so that the funding from different sources is tracked independently. This is a must for most donors.

## Investment Performance

The financial performance of CTFs ---i.e., the annual rates of return on the investment of their endowments, sinking funds, and revolving funds---has generally been similar to that of many developed country non-profit institutions such as universities and foundations, averaging between 6% and 9%, depending on which years are used as a reference, and on how much of the CTFs' portfolios are invested in stocks as opposed to bonds.

## **A CTF FOR ANTIGUA AND BARBUDA**

There is great potential for the development of a CTF in Antigua and Barbuda. This kind of entity would be a major asset in mobilizing financial resources for the protection and management of biodiversity and the natural and cultural amenities critical to tourism. It could also be a useful and functional national counterpart to the Caribbean CTF being developed by the World Bank / Global Environment Facility, the German Government, and The Nature Conservancy (a U.S. based non-governmental environmental organization). It is envisioned that the Caribbean CTF will operate at the island level through national CTFs, and thus an Antigua and Barbuda CTF would enable national participation in the regional fund. It is expected that seed funding will be made available to those islands wishing to set up a national CTF.

## **A NATIONAL CTF AND CODRINGTON LAGOON NATIONAL PARK**

While an Antigua and Barbuda CTF would be an important asset for conservation in the twin island state, it could play an especially important role in the development of Barbuda in general, and in the management and development of the CLNP Park in particular.

It is conceivable that Park infrastructure and visitor services could be financed through the granting of concessions, and the Park's administration funded through user fees. However, for this approach to be viable, the number of visitors would have to increase from the current level of 10,000 visitors/year to 30,000 visitors/year. This is a tall order in the face of world recession and the rapidly rising costs of air transport.

One way of achieving this, especially under current conditions, would be through the implementation on an aggressive "greening" strategy for Barbuda that will generate free publicity in the North American and European markets that would in turn result in increased visitation to the island. In essence a Greening Strategy for Barbuda would consist of modelling the island as example of environmental sustainability based on the conservation of biological diversity, zero impact on climate change, and sustainable lifestyles. This would be reflected in

the style of development of the National Park, conversion of the island to alternative energy, and the pursuit of sustainable resource use.

The conversion to alternative energy would be the most expensive component of this Greening Strategy, but could be funded through carbon credits from developed countries. The Antigua and Barbuda CTF would be essential for the development, marketing, and administration of the energy conversion projects that would be funded by carbon credits. If done properly, these projects could be structured as investments that would yield regular streams of income that could be reinvested in other aspects of the Greening Strategy.

Thus, a national CTF would be an essential, though indirect, tool for the development and management of the CLNP. It would be the key for marketing and administering an energy conversion project, which could in turn generate free publicity for Barbuda, and further funding for the Greening Strategy. This publicity would result in more visitors which in turn would make it viable for the Park to develop through concessions for visitor services, and the funding of Park Administration through user fees. Best of all, however, this strategy would result in the sustainable development of Barbuda.