

# MANAGEMENT PLAN

## WASHINGTON SLAGBAAI NATIONAL PARK



## BONAIRE, NETHERLANDS ANTILLES

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# 1. INTRODUCTION

In December of 1968 the plantation “America”, located in the Island of Bonaire, Netherlands Antilles, was acquired by the Island Government and turned into the first natural reserve of the country. It was officially open to the public on May 9, 1969 under the name of “National Park Washington”. Nine years later, on September 23<sup>rd</sup>, 1977, the adjacent plantation known as Slagbaai was also purchased from its owners with the cooperation of several private enterprises, NGO’s and some personal donations and it was added to the existing “National Park Washington”. With the addition of this new plantation, the natural reserve doubled its area and the name was changed into “**Washington Slagbaai National Park**”. Finally, in 1986, the adjacent plantations “Labra” and “Brasil” were given by the Island Government to STINAPA Bonaire (Stichting Nationale Parken, Bonaire) for their management; however, they have not yet been officially added to the nature reserve. The reserve now consists of 5.643 hectares located at the Northwest of the island, representing approximately a fifth of the total area of Bonaire.

Since its inauguration in 1969, until 1986, the park was managed by the foundation STINAPA N.A. (Stichting Nationalen Parken, Netherlands Antilles) which translated from the Dutch means Foundation of National Parks. On December 13, 1985, STINAPA Bonaire was created as an independent NGO from the central one. A year later, in 1986, the Government of the Island of Bonaire passed the management of the national parks and other natural areas to the new NGO STINAPA Bonaire, which has been in charge until today.

STINAPA Bonaire is the biggest nature NGO in the island of Bonaire. It is made up of a Board of Directors with a maximum of 11 seats (all volunteers) and approximately 16 full-time employees between administrative staff and parks employees. STINAPA Bonaire has four departments: Washington Slagbaai National Park, Bonaire National Marine Park, Environmental Education and Administration/Accounting. STINAPA Bonaire has total autonomy in daily management and decision-making regarding the park’s management, although the Government can always impose limits or rules on certain topics.

## 1.1 Background

The north area of Bonaire was exploited for economic purposes from the beginning of the XVII century until approximately 60 years ago. During those years, several species of flora and fauna were introduced for both ornamental and economic purposes.

The 36 years of the park’s existence have been characterized by a great lack of resources and infrastructure, which has made it impossible to have enough and/or qualified staff to carry out the tasks required for a sustained development of resources.

In 1992, the Island Council unanimously approved the "Pourier report" which contains the socio-economic vision for the island of Bonaire. This vision is based on sustainable development of the island's natural and historic resources. The Nature Policy Plan for the island of Bonaire was approved in 1999 by the Island Council. In order to execute this plan, the Nature Ordinance was drafted. These two documents are the main framework for this management plan.

Until April 2005, when the Nature Fee was implemented by de Island Government, the park's revenues came mostly from the fee that visitors had to pay and the purchases that they make in the Visitors Center. Donations and goat selling are also part of the revenues, but in a much lower percentage. The Island Government does not have a fixed budget for the park and only gives financial help very sporadically. Since 1995, the park receives approximately 20.000 visitors per year from which about 15.000 are tourists and the rest local residents. The entrance fee today is \$10,00 for adult tourists, \$5,00 for tourist between 2 and 12 years of age, Naf. 5,00 for local adults and Naf.1,00 for local children. With the implementation of the Nature fee all visitors have the possibility to pay \$ 10,00 as a yearly fee and SCUBA divers can enter the park with their \$ 25,00 fee. The park depends exclusively on grants for the execution of any significant projects.

Since 1967, there are no inhabitants inside the park and, except for grazing rights granted to the heir of the last owner of the plantation America, there are no industrial or agricultural activities. However, some of the old practices from the plantations, like cutting trees for the production of charcoal and goat rising have been carried on by the park to cover costs of management.

## **1.2 Justification**

### *1.2.1. Economic*

Nature related tourism is the main source of revenue for Bonaire. It will be impossible for Bonaire to compete with other Caribbean destinations which base their tourism industry on luxury accommodations, very active nightlife or world class golf courses. It is Bonaire's goal to attract the type of tourism that makes possible an ecologically sustainable development of the island's natural and historic resources.

The most important attraction of the island is the natural beauty both below and above water and its pristine environment. Most of the island's visitors find the two National Parks the island's main attractions. The well preserved coral reef contained in the Bonaire National Marine Park is the most important attraction of the island; however it cannot sustain all the tourism that the island could develop without exceeding its maximum carrying capacity. Washington Slagbaai National Park is, without a doubt, the second most important attraction for the island's visitors, apart from being the only national park where all the land based tourist activities like hiking, mountain biking and bird watching among others can be carried out.

### *1.2.2. Ecological*

The Washington Slagbaai National Park, which contains all the representative terrestrial and coastal ecosystems of the island of Bonaire, is a natural habitat for the island's biodiversity. However, the ecological importance of the park goes beyond its own ecosystems because it is directly connected to the coral reefs in the North of the Island and acts as a buffer area for the Bonaire National Marine Park in an extension of approximately 14 kilometers of coastal zone.

The BNMP has one of the best preserved coral reefs of the Caribbean and also of the planet, but it is rather threatened. The health of this delicate reef depends largely on the terrestrial vegetation that keeps the soil from eroding and being carried to the ocean as sediment; the salt pans that act as natural filters for the storm water and the type of human activities carried out on the coastal zone. Washington Slagbaai National Park plays a very important role in all three of these important topics by: a) preserving the vegetation, b) the presence of nine salt pans in the area and, c) the prohibition of coastal development within its limits.

### *1.2.3. Historical*

Due to the presence of fresh water on this area, the Northwest of Bonaire was the most populated area of the island in the past. Archaeological research around these fresh water areas has discovered several indigenous remains and artifacts that indicate human presence more than three thousand years ago.

Approximately five hundred years ago, when the Spanish colonizers invaded Bonaire, they also chose the Northern area for a first settlement. The northern plantations also accounted for much early human activity on Bonaire. Therefore, it can be said that a great part of the historic and cultural heritage of Bonaire is located in this area.

Due to the human presence in ancient times, the park is very important for possible Archaeology and/or Anthropology studies that will help define the true roots of the Bonairean character.

### *1.2.4. Scientific*

Since Bonaire is a true oceanic island, with no direct contact with the big continents, this island has certain conditions that make it very interesting from the scientific point of view, such as the presence of six endemic species: three land snails, two reptiles and one bird. All of them can be found inside the park.

The severe environmental impacts caused by human activities started to affect Bonaire only five hundred years ago. This means that for approximately sixty million years, the island ecosystem developed without significant human interference. This condition makes it ideal for studies of ecology, genetics, geology, botany and zoology among others.

The park is exceptionally interesting for geologists. Past volcanic activity and formation of coral reefs terraces are very easy to observe and understand in this area, in some cases even better than a diagram in a text book. The contrast between the limestone terraces and the volcanic hills is also impressive and easy to spot. The oldest geological

formations of Bonaire are located inside the park as well as the highest volcanic formation, Brandaris.

Finally, as mentioned in the Historical section, Archaeology and Anthropology research that could be carried out in the park will be of great significance.

#### *1.2.5. Educational*

The relatively good conditions of the park's ecosystems and the great amount of historic and cultural heritage associated with the park, make it an ideal tool for the environmental and historical education of Bonaire's residents and visitors alike.

The park's facilities include a museum with exhibits of Geology, Terrestrial Flora and Fauna, History of Bonaire, Life in the Plantations, From Plantation to National Park and Archeology in Bonaire. In addition to these exhibits, two hiking trails with interpretation signs provide education for all visitors and a small library is also available for the public.

Scientific research carried out within the park has generated much useful knowledge about our island and will keep doing so in the future. Finally, the opportunities that the park offers for education in the form of field trips on various subjects are practically endless.

#### *1.2.6. Recreational*

The park presents an excellent recreational opportunity for several tourism sectors and residents alike:

- a) The scenic views and the landscape.
- b) The calm and relaxation that only the places with a pristine environment can offer.
- c) Sports (kayaking, mountain biking, hiking, SCUBA diving, fishing, etc.)
- d) Naturalist activities such as bird watching
- e) Family gatherings and celebrations.
- f) Overnighting in the park.

## **2. WASHINGTON SLAGBAAI NATIONAL PARK OBJECTIVES**

- I. Protect and restore (if necessary) the representative environment and landscape of the South Caribbean region found inside the park, as well as its ecosystems in order to achieve and maintain the balance and continuity of the evolutionary and ecological processes.
- II. Protect the island's native genetic diversity and biodiversity in the current ecosystems. Particularly, protect and restore (if necessary) the species that are in danger of extinction or are under special protective status.
- III. Provide an area with optimal conditions for environmentally oriented scientific research.
- IV. Generate, rescue and spread scientific and historical knowledge that promotes the use of the island resources in a sustainable way.
- V. Allow and promote exclusively sustainable use and/or development of the ecosystems, its elements, and the historical resources, mainly for the benefit of all who live and visit Bonaire.



Once in Bonaire the access to the park can be either by land or by sea, but the latter is not allowed in order to control the number of visitors that access the park.

## **3.2 Physical Features**

### *3.2.1. Physical Geography*

The central portion of WSNP is hilly, a product of the submarine volcanic activity during the Cretaceous period. The highest elevation of the park and also of the island of Bonaire is a product of this volcanic activity, with a height of 241m above sea level and an estimated age of 90-100 million years.

This hilly landscape is surrounded by terraces and limestone plateaus resulting from changes in the sea level and the formation of coral reefs during approximately the last 5 million years (Boekschoten, 1982). Depending on the location, one two or even three terraces are visible. The highest terrace of limestone reaches 50m above sea level and its age is estimated at 1 million years.

The changes in sea level are also responsible for another important feature of the landscape of Bonaire, the natural salt-pans. The northern area has nine salt-pans which vary both in size and the presence of water throughout the year.

### *3.2.2. Hydrology*

Due to the lack of precipitation during most of the year, there are no rivers that flow permanently in the park or on the island. However, the river beds (roois) are easy to see in the drought period. Most of them flow their water into one of the salt-pans, which act as a natural filter of the sediment rich water transported by the rain into the sea. The water of the salt marshes is briny, since sea water leaks through the subsoil. Other streams flow directly into the ocean, forming small inlets or bays known as "bokas" as a consequence of the limestone erosion.

It is important to mention that the precipitations in Bonaire fall as cloudbursts of high intensity and short duration, causing a big part of the water volume to fall through the mountainsides in a torrential way. This does not help the formation of streams and causes erosion on the soil. (Zonneveld, 1982).

### *3.2.3. Climate*

The leeward islands of the Dutch West Indies have a semiarid climate. This is due to an extension of the high of the Azores. Locally, it is also connected to a developed marine area with colder temperatures on the surface along the east-west coast of Venezuela, caused by the east "trade winds" (Lahey, 1958).

The influence of solid land of the South American continent located at hardly 60 Km is big: during the raining time most of the precipitations occur at the end of the night and at the beginning of the day, opposite to the common tropical pattern, which exists in solid ground. This is caused by the ocean-continent breeze. (Martis et al, 2001).

Data and average table obtained by the Climatological Service of Dutch West Indies and Aruba between the years 1951 and 1980 at the International Airport of Bonaire. (MDNA & A, 2002).

Element	Unit	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DIC	Year
Air Temperature	°C	26.6	26.6	27.0	27.2	27.8	27.9	27.8	28.1	28.2	28.4	28.0	27.0	27.5
Maximum	°C	29.1	29.5	29.8	29.9	30.3	30.5	30.5	30.8	30.9	31.2	30.7	29.7	30.2
Mínimim	°C	24.6	24.6	25.2	25.5	26.1	26.2	25.9	26.2	26.3	26.5	26.1	25.2	25.7
Sea Temp.	°C	25.8	25.4	25.6	26.4	26.5	26.8	26.9	27.5	28.1	28.0	27.8	26.9	26.8
Air Pressure(-1000)	hPa	12.9	12.5	12.4	11.4	10.9	12.2	12.6	11.5	10.7	10.5	10.2	11.3	11.6
Steam Pressure	hPa	26.8	26.1	26.3	27.3	29.2	29.2	29.0	29.3	29.1	29.5	29.0	27.8	28.2
Relative Humidity	%	76.9	74.9	73.7	75.6	78.1	77.6	77.5	77.0	76.0	76.2	76.6	77.9	76.5
Dew Temp..	°C	22.2	21.8	21.9	22.5	23.6	23.6	23.5	23.7	23.6	23.8	23.5	22.8	23.0
Daily Evaporation	mm	7.8	8.2	9.0	8.8	8.9	9.2	9.1	9.1	8.6	8.0	7.4	6.8	8.4
Monthly Precipitation	mm	50.1	26.5	15.1	15.7	15.0	15.7	25.0	28.7	32.5	69.6	112.8	83.8	490.5
Days of rain ≥ 1mm	d	8.1	4.6	3.0	2.1	1.9	2.9	4.3	4.4	3.0	6.1	10.6	10.8	61.8
Wind speed	m/s	6.3	6.9	7.2	7.1	7.1	7.9	7.7	6.8	6.5	6.1	5.6	5.7	6.7
Maximum	m/s	12.2	11.9	12.2	11.8	12.6	12.9	13.0	12.0	11.3	10.6	10.2	11.2	11.8
Wind Direction	grad	078	077	076	075	081	082	081	081	083	081	074	074	079
Wind Persistence	%	97.6	97.7	98.0	97.5	98.6	98.1	98.3	98.1	96.9	94.7	94.0	96.6	97.2

### 3.3 Geological Features\*

The geology of Northwestern Bonaire is characterized by two formations, a Mesozoic and a Neogene-Quaternary formation. The Mesozoic unit bears the name of "Washikemba" (after a plantation in East Bonaire) and is supposed to date back to the lower part of the upper Cretaceous (Albian), maybe 90 -100 million years ago. Its age reaches from Albian to Santonian, names used first in European stratigraphy. This formation, as it seen on Bonaire, is actually the Northeastern flank of a huge anticline (fold); the Southwestern flank is hidden under the sea. The rock strata of the Northeast flank dip 35-40 degrees.

The rocks are for a greater part of volcanic character. There are basic volcanites, basalt and diabases, predominantly in the basal part of the formation, and intermediate acid andesites and dacites, and tuffs higher up. The diabases are chilled and crystallized lava flows and intrusions; the tuffs are hardened volcanic ashes, all of them deposited below

\*Taken from the Field Guide Washington Slagbaai National Park. (J.H. Westermann, 1982)

the water surface. In between the volcanic strata are found subordinately, non volcanic marine sediments: cherts, radiolarites and siliceous limestone. In these sediments fossils were collected, such as coral, ammonites and inoceramids, which made possible to determine the geological age of the formation.

The Neogene (young Tertiary) and Quaternary formations of Northwestern Bonaire are only found along the coast. The limestone of the marine terraces consists mainly of consolidated coral and Lithothamnium (calcareous alga) debris; there are beach and lagunal deposits and sediments formed on submarine slopes.

The alluvial sands and silts deposited in the downstream part of the valleys and along the land locked salt water bays, generally called Salinas, also belong to the Quaternary formation.

# Geological Map of the Washikemba Formation



## Legend

- |  |  |  |                         |  |                                     |
|--|--|--|-------------------------|--|-------------------------------------|
|  | Agglomerates and lailli tuffs  |  | Dacitic-rhyolitic flows |  | EOCENE Limestones and conglomerates |
|  | Andesitic flows with interactions of tuffs and pelagic sediments                   |  | Dacitic-rhyolitic sills |  | NEOGENE and QUATERNARY Limestones   |
|  | Cherty limestones, pillowed basalts, ash tuffs, slump conglomerates and turbidites |  | Diabase Laccoliths      |  | fault                               |

### 3.4 Biological Features

#### 3.4.1. *Vegetation and Flora*

The flora of Bonaire includes around 340 species (Stoffers, 1982). Inside the park, the vegetation can be described as a low thorny forest, although there are areas with well established differences. Two factors influence the type of vegetation: soil composition and exposure to the “trade winds”. The soil tends to be poorer in the plains and limestone terraces and richer in the areas of volcanic origin. Exposure to the “trade winds”, characterized by their perseverance and high salt content influences vegetation in the northern area of the park. Finally, there are certain areas with very specific features, such as sand dunes and salt-pans, where only very specialized species can survive.

Soils are poor in nutrients and in water retention capacity. Both conditions limit plant growth. In the north of the park there are cactuses and thorny bushes on the most exposed areas and a thorny forest in the area protected from the winds. The southern area of the park is characterized by thorny forest with a low under storey.

Many of the flora species that are in the park complete their life cycle during the three months of the rainy season, while the rest of them present very pronounced xeromorphic features.

As a result of the human interference, deterioration has been considerable and even a large part of the original vegetation has been carelessly cut down for agriculture, private or commercial use. Moreover, vegetation has suffered from the voracity of the thousands of half wild goats running over the island and by consequent prevention of rejuvenation. Where the vegetation has been strongly affected, a secondary plant cover has developed.

#### 3.4.2. *Fauna*

The fauna of Bonaire in general, and of the park in particular, shows a lack of species of mammals, of which only eight species of bats are considered native to the island, the remainder having been introduced by humans. Another important feature is the presence of two endemic reptiles one endemic bird and three endemic species of invertebrates (land snails).

198 bird species have been recorded in the park, 7 reptile species, only one species of amphibian and 2 species of fish adapted to briny or fresh water. As for invertebrates, 7 species of snails have been studied and identified. Finally, there is no information available on terrestrial arthropods.

### **3.5 Socioeconomic Context**

According to the census carried out in the year 2000 the total of population of Bonaire is 10,780 people. Only 52% of this population are native Bonaireans, the rest are come from other countries, mainly Holland, South America and the U.S.A. The population pyramid is regular, both in age and gender. There is an average of 4100 visitors per month to the island. The biggest employment sources are the government and the tourism industry, oriented to water sports, mainly SCUBA diving. There are no major industrial activities on Bonaire, except for solar and wind salt production, oil storage, and the production of fresh water and electricity for the island.

As the park was formerly 2 plantations and therefore private property, there are no inhabitants or industries of any kind located within its perimeter, except for grazing rights on the former plantation "America" for the heir of the last owner. This makes it very easy to control the activities carried out inside the park and there are therefore no problems related to land rights, customary tenure or traditional use within the park.

## 4. DIFFICULTIES & CONSTRAINS

### 4.1 Legal

#### 4.1.1. *Legal Status*

Despite being the first nature reserve in the Netherlands Antilles, Washington Slagbaai National Park does not have the status of National Park. The Island Government has to create appropriate legislation (Nature Ordinance) in order to solve this problem. In practice, this has not affected the development of the Park as a natural reserve, since in the Netherlands Antilles, nature reserves, despite holding the title of “national,” are the responsibility of the Island Government and not of the Central Government. However, lack of proper legislation adversely affects some aspects of park management such as law enforcement, funding sources, management of adjacent areas and international recognition.

#### 4.1.2. *Ownership of the land*

The plantation America was purchased by the Central Government of the Netherlands Antilles in 1968, the acquisition was carried out with aid from The Netherlands. The right to manage the area was given to STINAPA Netherlands Antilles, who in later years recommended the Central Government to pass the management to STINAPA Bonaire. The Central Government not only agreed, but also transferred the property titles to the Government of Bonaire.

The Slagbaai plantation case is different; STINAPA Netherlands Antilles, based in Curaçao, purchased it in 1977 with financial aid from many different institutions and private donations and still holds the property title today. Back in the time of the purchase, STINAPA Bonaire did not exist and all natural areas of the N.A. were managed by the central NGO. In the early eighties, nature organizations were created for each island and STINAPA Netherlands Antilles passed on the management of the areas for each island. In the case of Slagbaai, the management of the area was given under agreement to STINAPA Bonaire, however the property title was kept by STINAPA N.A.

When it comes to protection and care the sense of ownership is a very important factor. The Washington Slagbaai National Park, just as the Bonaire National Marine Park, is an icon of Bonaire and it forms part of the Bonairean identity and pride, therefore the ownership of Slagbaai, just like the one of Washington and the BNMP needs to be transferred to the hands of the Bonairean people. This need is augmented with the political situation of the Netherland Antilles today. On the last referendum held on island, it was made clear by the people of Bonaire the will to separate from the Netherlands Antilles and make a direct tie with Holland, this enhances the importance of securing every one of our natural resources for ourselves.

The people of Bonaire has to thank our mother organization STINAPA N.A. for the great efforts in the past to purchase this land, the many years dedicated to the protection of

their natural and cultural resources and the passing of the management of the area to the Bonairean people, but also has to claim the ownership of this vital area for the protection of the island nature and culture.

#### *4.1.3. Lack of Legislation*

Legislation is without a doubt one of the cornerstones to any protected area. It is practically impossible to protect, manage and develop the resources of any protected area if there are no indicators and guidelines for the different activities that need to be carried out. Furthermore, even for the approval of this management plan there should be a law that the plan can be “measured” by.

The Nature Policy Plan 1999-2004 has been officially approved by the Executive Council and the Island Council. There is a need for a next version. The Environmental Policy plan 2003-2007 has been drafted and approved by the Executive Council, but not yet for the Island Council.

#### *4.1.4. Management Agreements of the Areas*

There are legal agreements between the Island Government and STINAPA Bonaire and also between the Island Government and the heir of the last owner of the America plantation. These cover in some detail the aspects regarding the exploitation of the areas for commercial purposes, goat raising and mining mainly. However there are no specifics on environmental protection in these agreements, the **only** line regarding environmental protection reads: “the natural character of the area must be kept”, yet it does not give any description, indication or definition about what the “natural character” is, therefore leaving way too much room for speculation.

The agreements also have tremendous contradictions like for example the prohibition to introduce exotic species and the authorization to keep 10.000 goats (which are exotic) inside the park. All scientific studies and observations as well as LVV agree that this number is way too high for the vegetation in the North area of the Park to sustain without permanent damage to the native flora.

## **4.2 Financial**

The constrained financial situation has not changed in the 36 years that the park has existed. The largest source of revenues for the Park is the Nature fee paid by National parks users. Other sources of income include souvenirs sales, goat sales and grants and/or donations. The Park does not receive any regular subsidy from the Island Government or any other institution.

This lack of income is reflected on the lack of staff, the lack of infrastructure and the lack of necessary equipment to achieve sustainable use and development of the resources.

In addition, there is no structured program of research and monitoring of the various ecological aspects of the park due to lack of funding. While certain investigations,

observations and scientific studies have been carried out in the park through the years, no resources are available to apply this information to improving park management. The lack of a structured program of research and monitoring of the different ecological aspects of the park is a clear gap.

Currently the park staff is made up of a manager, a chief ranger, three rangers and one maintenance employee. Apart from the manager, the rest of the staff requires training on topics related to the management of natural areas. Also, the number of the park employees should at least double in order to cover all the aspects necessary for a successful management of the area.

### **4.3 Ecological**

#### *4.3.1. Exotic species*

Lack of data makes it difficult to quantify the negative impact on the park of the introduction of exotic herbivores, primarily goats, pigs and donkeys, but also cats, rats, mice and dogs are present. However, their impact on the ecological components of the park, and on the island of Bonaire as a whole, is obvious.

There are two studies carried out by different institutions on this topic, one by CARMABI in collaboration with the Agronomic University of Wageningen of Holland and the other by the State University of Oregon of The United States of America. Both of them agree on two important points: 1) these exotic herbivores threaten with extinction most of native species of flora that live in the park (and on the island) and 2) the urgency of taking the necessary control measures to avoid irreversible damage.

It is also important to preserve native or endemic bird species, such as *Amazonas barbadensis rotsch*, which may be threatened by other species not native to Bonaire. However, additional research is needed in this area.

#### *4.3.2. Lack of Buffer Area*

The Bonaire National Marine Park provides an excellent buffer area for Washington Slagbaai National Park and vice versa. However, the land boundaries of the park do not have a buffer area and the fence that sets the park's borders is difficult to maintain and not in perfect condition. Unfortunately the park is bordered by areas where goats and similar animals are raised, in some cases "fence to fence".

It is impossible to control or eliminate the population of herbivores if there is not a well-fenced buffer area. Considering the fact that some flora species are seriously threatened with extinction by the presence of these species, it is of utmost importance that this issue is addressed.

## 5. OBJECTIVES OF THE MANAGEMENT PLAN

### 5.1. General Objective

The general and main objective of this management plan is to become **the park planning tool** with the purpose of establishing the regulations, actions and guidelines for its use so the natural and historic resources can be used and developed in a sustainable way.

### 5.2. Management Plan Objectives

- I. Research, identify and implement all possibilities that will help achieve financial self sustainability for the park.
- II. Establish guidelines that guarantee the preservation of the park's natural ecosystems, preserving the area's native genetic diversity and the continuation of the evolving processes of the native plants and animals that have their natural habitat within its boundaries.
- III. Promote scientific research and monitoring of the ecological and social aspects that help to identify, evaluate, recover and preserve the park ecosystems and resources.
- IV. Implement mechanisms to minimize the impact of possible human activities or natural disasters on the park ecosystems and resources.
- V. Obtain legal protection for the park resources, so the park internal regulations can be applied in favor of the preservation and sustained use of its resources.

## 6. OBJECTIVES AND STRATEGIES OF THE COMPONENTS OF THE MANAGEMENT PLAN

### 6.1. Environmental Education

Environmental education is probably the most important component of this management plan, since most of the other goals and objectives cannot be achieved without broad based awareness of the importance of using resources in a sustainable way, and community and visitor support for preserving these natural and historical resources for future generations.

The organization STINAPA Bonaire has an Environmental Education Department with a Coordinator full time and a part-time assistant. All the education related matters from this management plan will be managed in cooperation with this department.

#### 6.1.1. Objective

Make the local community in particular and the foreign visitors in general aware of the need for preservation and sustainable use of resources in order to obtain their support to meet the objectives and goals of this management plan.

#### 6.1.2. Strategy

- Research the local population's knowledge on environmental issues in general and on the park in particular.
- Present to the local community in a clear and precise way the park objectives and explain why this area is reserved for preservation.
- Show to the local community the possible consequences of a hypothetical loss of the park resources.
- Increase the community's interest in environmental science.

#### 6.1.3. Actions

- a) Create an Environmental Education Committee composed of representatives of the various community sectors related to the environment to give direction and mobility to this component.

- b) Expand the program of environmental education for primary and secondary schools and introduce it into the school program of Bonaire.
- c) Carry out surveys and interviews to establish the information needs of the community regarding environmental matters in general, and the park in particular.
- d) Review the existing program of education in local schools, reach an agreement on the necessary modifications or additions to the current program and create any additional materials required.
- e) Provide more training for teachers.
- f) Create and distribute to the local community and visitors information material on the importance of the park and its resources. The information will be available in the four most widely used languages in the Netherlands Antilles.
- g) Participate in school activities on a regular basis.
- h) Elaborate and distribute educational and information material (leaflets, videos, web page, posters, bulletins, press releases, newsletters, etc.)
- i) Organize contests on topics related to the park.
- j) Commemorate special dates such as Earth Day, Environment Day, etc.
- k) Improve the knowledge of the staff working at the park and at STINAPA Bonaire on the park's natural and historical resources throughout the Ranger Course materials.
- l) Improve and maintain the Park Visitors' Centre in peak condition, especially the museum and the hiking trails with interpretation signs.
- m) Create a complete guide to the park in English to be translated later on to Papiamentu, Dutch and Spanish.
- n) Require presentations by scientists carrying out studies or environmental research in Bonaire to facilitate the dissemination and use of any new data or information.
- o) Publish the results of the studies carried out.
- p) Create a small library in the Visitors Center.
- q) Create a communications plan for STINAPA Bonaire and the park.

#### 6.1.4. *Time frame*

- Immediate: a, f, k, q.
- Short term (1-2 years): c, d, i, p, m.
- Mid term (3-5 years): b, e.
- Permanent: g, h, j, l, n, o.

## **6.2 Scientific Research and Monitoring**

Accurate and complete information about the park's resources is required to guide park resource preservation programs. Moreover, a regular monitoring program is essential to guide and evaluate the effectiveness of management decisions. This program will also allow us to obtain and store data of the different ecological aspects of the park.

### *6.2.1. Objective*

- Generate and gather the necessary knowledge and information about the natural resources of the park, its ecological processes and human activities to facilitate decision making and evaluation of preservation program effectiveness.

### *6.2.2. Strategy*

- Generate interest in the Park of Universities and other institutions capable of carrying out scientific research in protected areas.
- Create attractive conditions for interns, volunteers, graduate students and researchers.
- Optimize volunteer and staff data collection skills.

### *6.2.3. Actions*

- a) Conduct a thorough literature search.
- b) Contact Universities, other institutions and individuals for assistance with research and monitoring issues, and to establish an ongoing relationship with them.
- c) Find expertise and funding to create a monitoring program for the park.
- d) Find expertise and funding to define the biological indicators of the park, and their base lines as well.
- e) Train existing personnel and potential volunteers in data collection.
- f) Build facilities to house potential interns, graduate students or scientists and accommodate their work.
- g) Set up and implement monitoring programs.

#### 6.2.4. *Time frame*

- Immediate: a, b.
- Short term (1-2 years): c, d, e.
- Mid term (3-5 years): f.
- Permanent: g.

### **6.3 Natural resources restoration and protection.**

As mentioned in chapter 4 of this management plan, the degradation of the park's vegetation is mainly due to the presence of exotic herbivores (specifically donkeys and goats). One of this program's priorities will be the elimination and/or removal of these species and protection from new invasions. Also, clear cut practices in the past (e.g. 1800s) still leave their mark regarding degraded vegetation.

#### 6.3.1. *Objective*

Define and carry out the necessary measures for the recovery and protection of the Park's native species of flora and fauna and to create an adequate buffer area.

#### 6.3.2. *Strategy*

Work with STINAPA Bonaire, DROB, LVV and the Island Government to:

- Introduce a Nature Ordinance
- Secure land areas of Labra and Brasil.
- Acquire property adjacent to the Park always respecting the actual ownership.
- Create a proper buffer zone.
- Fence the Park.
- Eliminate the presence of exotic species.
- Implement a reforestation program.
- Minimize illegal hunting.

#### 6.3.3. *Actions*

- a) Make a formal petition to the government so that Labra and Brasil become part of the Park.
- b) Research the deeds of the lands surrounding the park.
- c) Find funding to fence the perimeter of the park and its buffer zone.
- d) Create a plan to eliminate the presence of exotic species of mammals in the park and obtain funding to carry out this plan.

- e) Create a reforestation plan in collaboration with the LVV and any other entities and obtain the required funds to carry out the plan.
- f) Obtain funding to carry out a study to identify the factors that threaten the native fauna and flora species.
- g) Create a plan to eradicate or minimize these factors as much as possible and to obtain funding to carry out this plan.
- h) Create a contingency plan for fires, and to do it in collaboration with the corresponding authorities (fire fighters, military, etc)
- i) Patrol and provide surveillance of the park on a regular basis.
- j) Promote meetings with the government to speed up the implementation of the Nature Ordinance.
- k) Create a plan to minimize soil erosion in the park.

#### 6.3.4. *Time frame*

- Immediate: a, j, k.
- Short term: b, c, d, e, f, g.
- Mid term: h.
- Permanent: i.

### **6.4 Historic resources protection and restoration.**

As previously noted, the area which now comprises the Park had a critical role in the history of the island of Bonaire and its people. The historic and cultural resources of the Park are the “identity roots” of the people of Bonaire and should be protected for future generations. As such, this component of the management plan provides opportunities for generating community support of and interest in the Park.

#### 6.4.1. *Objective*

Define and carry out the necessary measures to restore and protect the existing historic resources of the park and promote research in order to discover new resources.

#### 6.4.2. *Strategy*

- Promote new archeological excavations.

- Improve and maintain in perfect state the Museum's exhibit: "Life in the Plantations".
- Highlight the importance of the origins of Bonaire's culture.
- Obtain legal protection in the form of an ordinance for all the historic resources (known and yet to be discovered) of the park.

#### 6.4.3. *Actions*

- a) Gather and organize previous archeological studies and its results.
- b) Discuss the possibility of doing more excavations with the government.
- c) Organize events that reflect Bonaire's history and traditions.
- d) Restore the structures from the time of the plantations and provide information about them.
- e) Coordinate the legal protection of these resources with government officials.
- f) Provide proper maintenance to all the physical resources.

#### 6.4.4. *Time frame*

- Immediate: a.
- Short term (1-2 years): b.
- Mid term (3-5 years): c, d, e.
- Permanent: f.

### **6.5 Administration**

The management program can be useful only if its implementation is managed by an organization that is able to carry out all the necessary actions in an efficient, transparent and appropriate manner. The implementation of this management program will be a challenge for STINAPA Bonaire and the Island Government.

#### 6.5.1. *Objectives*

- Establish the organizational structure required to efficiently manage, administer and provide counseling in the implementation of the management plan.

- Optimize staffing at the Park.
- Acquire the necessary equipment and infrastructure for the application of this management plan.

#### *6.5.2. Strategies*

- Create a plan to maintain infrastructure and to repair or substitute equipment.
- Increase and improve the Park's assets.

#### *6.5.3. Actions*

- a) Establish a standard training course for all personnel.
- b) Look for new courses, workshops and conferences for STINAPA employees and to promote their participation in these courses.
- c) Define infrastructure and facilities needs.
- d) Obtain resources and support in order to get the needed infrastructure.
- e) Define equipment needs for maintaining the infrastructure and the park's operations.
- f) Obtain funds to obtain, maintain and repair this equipment.
- g) Create mechanisms to report the condition of the park's infrastructure and its equipment.
- h) Create and implement an annual maintenance program.
- i) Establish the maximum carrying capacity of the park.
- j) Design a plan to increase services, activities and infrastructure that are offered to visitors and to optimize the existing ones without negatively impacting the natural environment of the park and respecting the rights of all the species that coexist in the park.

#### *6.5.4. Time frame for execution*

- Immediate: a, c, e, g, h, i.
- Short term (1-2 years): f, d, j.

- Mid term (3-5 years): none
- Permanent: b.

## **6.6 Funding**

The financial constrains of the park have been a constant during its 36 years of existence. This financial situation is the main block for proper management of the area, it translates into lack of staff, lack of training, lack of equipment, lack of infrastructure, lack of monitoring and research and more. Due to the severity of this situation, funding will be treated as a separate component instead of being part of the administration component.

### *6.6.1. Objective*

- Make the Park financially self-sustainable without causing negative impact on its natural and/or historical resources.

### *6.6.2. Strategy*

- Increase the number of visitors to the park, always respecting its carrying capacity limits.
- Optimize economically and logistically the different sources of income from the park.
- Find other sources of funding for the Park.
- Increase the amount of revenue earning on existing resources.
- Make more efficient use of human resources by using them for nature conservation instead of administration tasks.

### *6.6.3. Activities*

- a) Write an economic plan for the park.
- b) Write grant proposal to cover all momentary needs, but always aiming towards becoming self sustainable financially.
- c) Promote agreements with the government for permanently financing some aspects of the park.
- d) Plan a permanent campaign to get donations after identifying potential donors.

- e) Encourage tourism operators to increase the number of visits to the park by improving the product.
- f) Increase the admission fee, always keeping a fair price.
- g) Expand the number of opening hours of the park.
- h) Create rental agreements for third parties for the buildings at Slagbaai and the Pakus with conditions that will ensure that their use will not affect negatively the park's character.

#### *6.6.4 Time frame for execution*

- Immediate: a, c, h.
- Short term (1-2 years): b
- Mid term (3-5 years): f.
- Permanent: d, e.

## **7. ZONING**

### **7.1 Zones of general use**

The general public will have access to these areas during the established opening hours. Recreation activities will be allowed as long as they respect the park's internal rules and regulations. These areas are defined by patterns of historical use and the degree to which such general access is safe and nondestructive to vulnerable areas. Included in this category are: the visitor center, the historic buildings of Slagbaai, roads, all the coastal area and points of interest that are featured in the visitor's map and the park's brochure.

### **7.2 Zones of restricted use**

Access to these areas is only allowed with a special permit to be issued by the park's administration. The criteria to define these areas will be based on special conditions that may be present in some areas of the park, such as:

- The presence of well-preserved natural systems.
- Habitats of species that are relevant to the park's ecosystem or that are under special protection.
- Fragility of the space or species in the habitat.
- The presence of particular archeological, historic or ethnographic elements.

These areas include the salt-pans and their surroundings, monitoring areas, caves, areas of nesting and/or roosting for different bird species and areas of archeological interest.

### **7.3 Reserve Zones**

Access to these areas will only be allowed for scientific observation and research that could generate relevant information for the protection of the park's resources. A permit given by the Island Government will be required to access these areas.

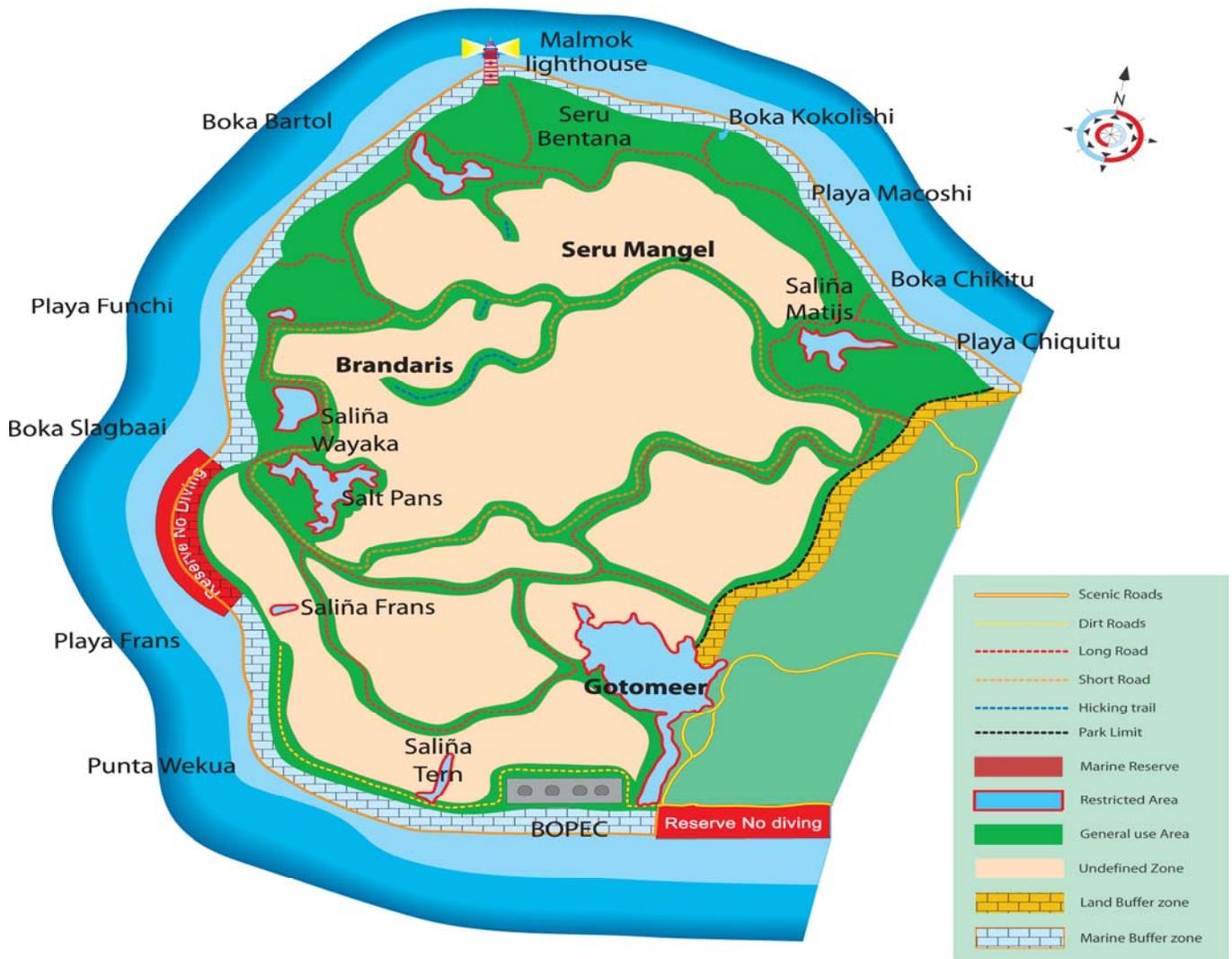
Due to the lack of data and preliminary research, these areas are not defined in this plan. The criterion for defining these areas will be to safeguard some areas from human influence. These areas may guarantee the continuity of the park's natural systems.

### 7.4 Buffer Zones

For the terrestrial border, the buffer area will be designated taking in consideration the actual ownership status of the land adjacent to the park boundary. Wherever possible, a line parallel to the park boundary at a distance of 100m outside of the park will be designated as buffer area and properly fenced. In order to respect actual ownership of the land, in some cases actual park territory will be designated buffer area and properly fenced as well.

The buffer area in the coastal area is the Bonaire National Marine Park, which goes from the high water line to a depth of 60m and includes two reserves for diving, snorkeling or swimming.

### 7.5 Zones map



## **8. APPROVAL, FOLLOW UP AND EVALUATION OF THE MANAGEMENT PLAN**

The effectiveness of this program, as well as the effectiveness of its implementation will be identified through evaluations and a periodic analysis of goals achieved regarding the objectives, strategies and actions.

For the approval of the management plan, the regular channels of STINAPA Bonaire will be used. First, it will be approved by the Management Team, later from the Board of Directors and finally it will be submitted to the Island Government for final approval.

After approval by the Island Government, the Management Team will meet once a year with the only purpose of evaluating the progress of the activities and objectives of the management plan and will make a report for the Board of Directors. Changes or additions of objectives and/or strategies of the management plan may result from these meetings. This management plan may also be reviewed and changed outside the time stipulated in the event of ecological, demographic, political, regulatory or economic unexpected circumstances requiring a new zone plan, regulation or other drastic change in the general structure of the program.

Since this is the first official management plan of the Washington Slagbaai National Park, many of the objectives are focused on getting the necessary infrastructure, equipment and resources for a sound management of the natural area. After 5 years, the plan will be reviewed and, if necessary, a new complete plan will be produced.

## 9. PARK RULES AND REGULATIONS

As it is mentioned on Chapter 4 of this plan, the lack of an environmental law is one of the main problems for the management of the park. While this law is being drafted and approved, the following regulations will be applied within the park:

- a) An admission ticket will be required in order to remain in the park area and visitors will only be able to stay in the park during opening hours (08:00 – 17:00).
- b) Only motor vehicles with four or more tires and a spare one will be allowed to enter the park. Bicycles are allowed in the park as well.
- c) It is strictly prohibited to bring animals or plants to the park.
- d) It is strictly prohibited to take out animals and/or plants from the park.
- e) It is strictly prohibited to bring arms or traps (including fishing nets) to the park.
- f) It is strictly prohibited to leave garbage in the park, except in garbage containers.
- g) It is strictly prohibited to make fires in the park, with the exception of barbecue charcoal in the places where barbecues are allowed.
- h) It is strictly prohibited to throw cigarettes of any kind in the park, lit up or put out.
- i) It is strictly prohibited to play music at a very high volume, especially close to the salt pans.
- j) It is strictly prohibited to give out pamphlets or to place any political, commercial or religious ads. It also prohibited carrying out meetings or events of the same kind without previous authorization by the park's administration.
- k) Roads are only one way roads, except for the roads that are indicated to be two-way.
- l) The speed limit is 25Km/h.
- m) Camping is only allowed in the designated areas.
- n) It is strictly prohibited to use roads, walkways or caves as bathrooms.
- o) It is strictly prohibited to capture, kill or bother animals or plants in the park.

- p) It is strictly prohibited to take pictures inside the caves.
- q) It is strictly prohibited to start any SCUBA diving activities after 2:30pm.
- r) It is strictly prohibited to go outside the roads with the vehicles, especially to the salt pans.
- s) It is strictly prohibited to swim, fish, do kayak or any other kind of activities in the salt pans.
- t) It is mandatory to follow the instructions that are indicated by the park's rangers.
- u) Quads are not permitted in the park.

## 10. APPENDIX

### 10.1 Lists of flora

List of families with number of gender and species.

Family	Gender	Species
Agavaceae	1	4
Anacardiaceae	2	2
Bignoniaceae	2	2
Boraginaceae	2	2
Bromeliaceae	1	1
Burseraceae	1	3
Cactaceae	3	5
Capparaceae	2	6
Celastraceae	1	1
Clusiaceae	1	1
Combretaceae	2	2
Euphorbiaceae	3	4
Fabaceae	2	2
Flacourtiaceae	1	1
Liliaceae	1	1
Malpighiaceae	1	2
Mimosaceae	3	4
Nyctaginaceae	1	2
Olacaceae	1	1
Polygonaceae	1	1
Rhamnaceae	2	2
Rhizophoraceae	1	1
Rubiaceae	2	2
Rutaceae	1	1
Sapindaceae	1	1

Theophrastaceae	1	1
Zygophyllaceae	1	2

**List of tree species.**

*Bursera simaruba*  
*Bursera bonariensis*  
*Bursera tormentosa*  
*Haematoxylon brasiletto*  
*Randia acuelata*  
*Malpighia puniceifolia*  
*Machaonia ottonis*  
*Bourreria succulenta*  
*Coccoloba swartzii*  
*Jacquinia barbasco*  
*Casearea tremula*  
*Guapira pacurero*  
*Guapira fragrans*  
*Capparis odoratissima*  
*Capparis indica*  
*Capparis hastata*  
*Capparis flexuosa*  
*Condalia henriquezzi*  
*Bumelia obovata*  
*Prosopis juliflora*  
*Caesalpinia coriaria*  
*Acacia tortuosa*  
*Fagara aonophylla*  
*Maytenus sieberiana*  
*Guaiacum officinale*  
*Crateva tapia*  
*Melicocca bijuga*  
*Celtis iguanaea*  
*Manihot carthaginensis*  
*Psidium cf. Sartorianum*  
*Spondias mombin*

*Geoffrea spinosa*  
*Pithecellobium unguis-cati*  
*Crescentia cujete*  
*Tabebuia billberghii*  
*Cordia alba*  
*Phyllanthus botryanthus*

## 10.2 List of fauna

### **VERTEBRATES**

#### **MAMMALS**

(Chiroptera)  
*Mormoops megalophylla*  
*Molossus molossus*  
*Glossophaga longirostris*  
*Noctilio leporinus*  
*Leptonycteris curasoae*  
*Ametrida centurio*  
*Myotis nesopolus*  
*Nathalus tumidirostris*

#### **BIRDS (Courtesy Jerry Ligon)**

##### **Fam. Podicipedae**

*Podilymbus podiceps*  
*Tachybaptus dominicus*

##### **Fam. Procellariidae**

*Puffinus gravis*  
*Puffinus lherminieri*

##### **Fam. Hydrobatidae**

*Oceanodroma leucorhoa*

##### **Fam. Fregatidae**

*Fregata magnificens*

##### **Fam. Phaethontidae**

*Phaeton aerhereus*  
*Phaeton lepturus*

##### **Fam. Pelicanidae**

*Pelecanus occidentalis*

**Fam. Sulidae**

*Sula sula*  
*Sula dactylatra*  
*Sula leucogaster*

**Fam. Phalacrocoracidae**

*Phalacrocorax auritus*  
*Phalacrocorax olivaceous*

**Fam. Ardeidae**

*Syrigma sibilatrix*  
*Nycticorax nycticorax*  
*Cochlearius cochlearius*  
*Butorides striatus*  
*Bubulcus ibis*  
*Egretta tricolor*  
*Egretta refescens*  
*Egretta thula*  
*Casmerodius albus*  
*Ardea herodias*  
*Ardea cinerea*

**Fam. Threskiornithidae**

*Ajaja ajaja*

**Fam. Phoenicopteridae**

*Phoenicopterus ruber*

**Fam. Anatidae**

*Dendrocygna bicolor*  
*Dendrocygna autumnalis*  
*Sarkidionis melanotos*  
*Anas americana*  
*Anas acuta*  
*Anas bahamensis*  
*Anas discors*  
*Anas clypeata*  
*Aythya affinis*  
*Aythya collaris*  
*Oxyura dominica*

**Fam. Rallidae**

*Porzana carolina*  
*Galinula chloropus*  
*Fufica caribibaca*

**Fam. Haematopodidae**

*Haematopus palliatus*

**Fam. Recurvirostridae**

*Himantopus mexicanus*

*Recurvirostra americana*

**Fam. Charadriidae**

*Charadrius semipalmatus*

*Charadrius wisonia*

*Charadrius vociferus*

*Charadrius melodus*

*Charadrius alexandrinus*

*Charadrius collaris*

*Pluvialis dominica*

*Pluvialis squatarola*

**Fam. Scolopacidae**

*Calidris canutus*

*Calidris alba*

*Calladris pusilla*

*Caladris mauri*

*Caladris minutilla*

*Caladris funscicollia*

*Caladris bardii*

*Caladris melanotos*

*Caladris alpina*

*Micropalama himantopus*

*Tryngitis subruficollis*

*Gallinago gallinago*

*Limnodromus grieseus*

*Limnodromus solopaceus*

*Limosa haemastica*

*Numenius phaeopus*

*Bartramia longicaudia*

*Tringa melanoleuca*

*Tringa flavipes*

*Tringa solitaria*

*Actitis macularia*

*Catoptrophorus semipalmatus*

*Arenaria interpres*

*Phalaropus fulicaria*

*Phalaropus tricolor*

*Phalaropus lobatus*

**Fam. Stercorariidae**

*Stercorarius parasiticus*

**Fam. Laridae**

*Larus atricilla*

*Larus philadelphia*

*Larus ridibundus*

*Larus delawarensis*

*Larus argentatus*

**Fam. Sternidae**

*Gelochelidon nilotica*

*Sterna caspia*

*Sterna maxima*

*Sterna dougalli*

*Sterna sandvicensis*

*Sterna hirundo*

*Sterna anaethetus*

*Sterna fuscata*

*Sterna albitrons*

*Chlidonia niger*

*Anous minutus*

*Anous stolidus*

**Fam. Rynchopidae**

*Rynchops nigra*

**Fam. Accipitridae**

*Elanus leucurus*

*Elanoides forficatus*

*Buteo albicaudatus*

**Fam. Panadionidae**

*Pandion haliaetus*

**Fam. Falconidae**

*Milvago chimachima*

*Polyborus plancus*

*Falco sparverius Falco columbaris*

*Falco peregrinus*

**Fam. Columbidae**

*Columba squamosa*

*Columba corensis*

*Zenaida auriculata*

*Columbigallina passerina*

*Columbigallina talpacoti*

*Leptorila verreauxi*

*Columba livia*

**Fam. Psittacidae**

*Aratinga pertinax xanthogenius*

*Amazonas barbadensis rotschildi* (endemic of Bonaire)

**Fam. Cuculidae**

*Coccyzus americanus*

*Coccyzus minor*

*Coccyzus lansbergi*

*Crotophaga sulcirostris*

**Fam. Tytonidae**

*Tyto alba*

**Fam. Caprimulgidae**

*Caprimulgus cayennensis*

*Caprimulgus carolinensis*

*Chordeiles acutipennis*

*Chordeiles minor*

**Fam. Apodidae**

*Chaetura peligica*

**Fam. Trochillidae**

*Chrysolampis mosquitus*

*Chlorostilbon meliisugus*

**Fam. Alcedinidae**

*Ceryle alcyon*

**Fam. Picidae**

*Sphyrapicus varius*

**Fam. Tyrannidae**

*Elaenia martinica*

*Sublegatus modestus*

*Contopus virens*

*Contopus borealis*

*Myiarchus tyrannulus*

*Myiodynastes maculatus*

*Tyrannus melancholicus*

*Tyrannus dominicensis*

*Tyrannus tyrannus*

*Muscivora tyrannus*

**Fam. Hirundinidae**

*Riparia riparia*

*Steligidopteryx ruficollis*

*Progne dominicensis Progne subis*

*Hirundo rustica*

*Hirundo pyrrhonota*

Fam. Mimidae

*Mimus gilvus*

*Margarops fuscatus*

**Fam. Turdidae**

*Oenanthe oenanthe*

*Catharus ustulatus*

*Catharus minimus*

**Fam. Passeridae**

*Passer domesticus*

**Fam. Vireonidae**

*Vireo olivaceus*

*Vireo altiloquus*

**Fam. Parulidae**

*Mniotilta varia*

*Vermivora chrysoptera*

*Vermivora peregrina*

*Parula americana*

*Dendroica magnolia*

*Dendroica petechia*

*Dendroica pennsylvanica*

*Dendroica cerulea*

*Dendroica caerulescens*

*Dendroica virens*

*Dendroica fusca*

*Dendroica tigrina*

*Dendroica coronata*

*Dendroica striata*

*Dendroica castanea*

*Setophaga rusticilla*

*Seiurus aurocapillus*

*Seiurus noveboracensis*

*Seiurus motacilla*

*Protonotaria citrea*

*Oporormis formosus*

*Oporormis agifis*

*Wilsonia citrina*

*Wilsonia canadensis*

**Fam. Coerebidae**

*Coereba flaveola*

*Piranga ludoviciana*

*Piranga olivacea*

*Cyanerpes cyaneus*

**Fam. Emberizidae**

*Sicalis flaveola*

*Tiaris bicolor*

*Volantinia jacarina*

*Ammodramus savannarum*

*Zonotrichia capensis*

*Guiraca caerulea*

*Passerina cyanea*

**Fam. Icteridae**

*Dolichonyx oryzivorus*

*Quiscalus lugubris*

*Sturnella magna*

*Agelaius icterocephalus*

*Icterus galbula*

*Icterus icterus*

*Icterus nigrogularis*

**REPTILES**

(Sauria)

*Anolis bonairensis*

*Cnemidophorus murinus ruthveni*

*Phyllodactillus martini*

*Gymnodactylus antillensis*

*Thecadactylus rapicaudus*

*Iguana iguana*

(Serpentes)

*Leptotyphlos albifrons*

**Amphibian**

*Pleurodema brachyops (introducido)*

**FISH (salt works and freshwater wells only)**

*Cyprinodon dearborni*

*Poecilia sphenops*

**INVERTEBRATES**

(Gastropoda)

*Cerion uva*

*Tudora aurantia*

*Tudora maculata*

*Neosubulina harteri*

*Microceramus bonairensis*

*Brachypodella gibbonsi*

*Stoastomops walkeri*

(Arthropoda (Terrestrial))

No list available

### **10.3 Summary of activities per component for the next 5 years.**

As mentioned previously in this management plan, the park has existed for the last 30 years in a constant constrain of financial resources that have translated in many lacks at the areas of infrastructure, equipment, human resources and legislation. This 5 years management plan has been created with the idea of reaching a functional and operational level on all these areas in order to be able to achieve the original objectives of preservation and restoration of the natural and historic resources of the area, which is the main reason that the park was created for.

The following tables are a summary of all activities that need to be carried out during the next five years in order for the park to become functional and achieve its objectives. In the year 2011 a new plan will be drafted focused more in management and not so much in acquiring and improving infrastructure, equipment, human resources and legislation.

## EDUCATION (ALL ACTIVITIES IN COORDINATION WITH ECU DEPARTMENT)

IMMEDIATE	SHORT TERM (1-2 YEARS)	MID TERM (3-5 YEARS)	PERMANENT
Create an Environmental Education Committee composed of representatives of the various community sectors related to the environment to give direction and mobility to this component.	Carry out surveys and interviews to establish the information needs of the community regarding environmental matters in general, and the park in particular.	Expand the program of environmental education for primary and secondary schools and introduce it into the school program of Bonaire.	Participate in school activities on a regular basis.
Create and distribute to the local community and visitors information material on the importance of the park and its resources. The information will be available in the four most widely used languages in the Netherlands Antilles.	Review the existing program of education in local schools, reach an agreement on the necessary modifications or additions to the current program and create any additional materials required.	Provide more training for teachers.	Elaborate and distribute educational and information material (leaflets, videos, web page, posters, bulletins, press releases, newsletters, etc.)
Improve the knowledge of the staff working at the park and at STINAPA Bonaire on the park's natural and historical resources throughout the Ranger Course materials.	Organize contests on topics related to the park.		Commemorate special dates such as Earth Day, Environment Day, etc.
	Create a complete guide to the park in English to be translated later on to Papiamento, Dutch and Spanish.		Improve and maintain the Park Visitors' Centre in peak condition, especially the museum and the hiking trails with interpretation signs.
	Create a small library in the Visitors Center.		Require presentations by scientists carrying out studies or environmental research in Bonaire to facilitate the dissemination and use of any new data or information.

## SCIENTIFIC RESEARCH & MONITORING

INMEDIATE	SHORT TERM (1-2 YEARS)	MID TERM (3-5 YEARS)	PERMANENT
Conduct a thorough literature search	Find expertise and funding to create a monitoring program for the park.	Build facilities to house potential interns, graduate students or scientists and accommodate their work.	Set up and implement monitoring programs.
Contact Universities, other institutions and individuals for assistance with research and monitoring issues, and to establish an ongoing relationship with them.	Find expertise and funding to define the biological indicators of the park, and their base lines as well.		
	Train existing personnel and potential volunteers in data collection.		

## NATURAL RESOURCES RESTORATION AND PROTECTION

IMMEDIATE	SHORT TERM (1-2 YEARS)	MID TERM (3-5 YEARS)	PERMANENT
Make a formal petition to the government so that Labra and Brasil become part of the Park.	Find funding to fence the perimeter of the park and its buffer zone.	Create a contingency plan for fires, and to do it in collaboration with the corresponding authorities (fire fighters, military, etc)	Patrol and provide surveillance of the park on a regular basis.
Research the deeds of the lands surrounding the park.	Create a plan to eliminate the presence of exotic species of herbivores in the park and obtain funding to carry out this plan.		
Create a plan to minimize soil erosion in the park.	Create a reforestation plan in collaboration with the LVV and any other entities and obtain the required funds to carry out the plan.		
	Obtain funding to carry out a study to identify the factors that threaten the native fauna and flora species		

## HISTORIC RESOURCES RESTORATION AND PROTECTION

<b>INMEDIATE</b>	<b>SHORT TERM (1-2 YEARS)</b>	<b>MID TERM (3-5 YEARS)</b>	<b>PERMANENT</b>
Gather and organize previous archeological studies and its results.	Discuss the possibility of doing more excavations with the government.	Organize events that reflect Bonaire's history and traditions.	Provide proper maintenance to all the physical resources.
		Restore the structures from the time of the plantations and provide information about them.	
		Coordinate the legal protection of these resources with government officials.	

## ADMINISTRATION

IMMEDIATE	SHORT TERM (1-2 YEARS)	MID TERM (3-5 YEARS)	PERMANENT
Establish a standard training course for all personnel.	Obtain resources and support in order to get the needed infrastructure.		Look for new courses, workshops and conferences for STINAPA employees and to promote their participation in these courses.
Define infrastructure needs.	Obtain funds to obtain, maintain and repair this equipment.		
Define equipment needs for maintaining the infrastructure and the park's operations.			
Create mechanisms to report the condition of the park's infrastructure and its equipment.			
Create and implement an annual maintenance program.			
Establish the maximum carrying capacity of the park.			
Design a plan to increase services, activities and infrastructure that are offered to visitors and to optimize the existing ones without negatively impacting the natural environment of the park and respecting...			

## FUNDING

INMEDIATE	SHORT TERM (1-2 YEARS)	MID TERM (3-5 YEARS)	PERMANENT
Write grant proposal to cover all momentary needs, but always aiming towards becoming self sustainable financially	Promote agreements with the government for permanently financing some aspects of the park.	Expand the number of opening hours of the park.	Encourage tourism operators to increase the number of visits to the park by improving the product.
Plan a permanent campaign to get donations after identifying potential donors.			Increase the admission fee, always keeping a fair price.
Write an economic plan for the park.			
Create rental agreements for pakus and Slagbaai			

10.4 Washington Slagbaai National Park Map



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