

Management Plan

CHAGRES

National Park



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**CHAGRES NATIONAL PARK
MANAGEMENT PLAN**

EXECUTIVE SUMMARY

Panama City, April 2005

FINANCIAL SUPPORT

This publication has been made possible thanks to the support of the Regional Sustainable Development office-Latin American and Caribbean Division of the United States Agency for International Development and The Nature Conservancy, in accordance to the conditions of Donation N° EDG-A-00-01-00023-00. Opinions hereby expressed belong to the author (or authors) and do not necessarily reflect those of the United States Agency for International Development or The Nature Conservancy.

Front Cover Design: Santiago Dam Lau, Architect

Translation: Julieta Carrión de Samudio and Lisa Bassani

The Nature Conservancy. The use or re-printing of any portion of this document should include the following bibliographical citation:

Autoridad Nacional del Ambiente. 2005. Chagres National Park Management Plan. Executive Summary. Panamá, República de Panamá. 21 pp.

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PRESENTATION

Panama is a small country, but rich in natural resources. Protected areas form 32% of the national territory. We are convinced that searching for harmony among our natural resources and the rural communities living within and in the surroundings of protected areas, through activities such as environmental education, eco-tourism, the establishment of community micro-enterprises (plant nurseries, animal husbandry, handcrafts with native species, among others), we will achieve social and economic benefits that lead to sustainable development.

Chagres National Park, established 20 years ago, is located in the central part of the Panamanian isthmus. It has as its main objective the conservation of ecological processes that maintain the health of the Chagres River and its capacity to provide environmental services to thousands of Panamanians. The numbers are already known; Chagres River provides 40% of the water required for the Panama Canal operations and 80% of the water for domestic use for half of the country's inhabitants.

The updating of the Chagres National Park Management Plan is a tool that will allow us to regulate activities developed within it and guide decision makers of the protected area in both the short and long term. This document will direct the efficient administration of natural and cultural resources, the designation of compatible land uses as well as the development of services required for environmental education, recreation, research and conservation of water resources, among others. In this sense, we are pleased to present the Chagres National Park Management Plan Executive Summary, which contains in a concise manner the most relevant aspects found in the complete document, as well as the proposed strategies and required resources for a five-year period.

With the approval of this management plan, we initiate its implementation phase. Chagres National Park has a long-term financial mechanism (Chagres Fund) to begin the execution of prioritized activities. Nevertheless, it is also true that additional resources will be required in order to accomplish the ambitious task of managing this park as a model for the country and the world. In this perspective, the work is only beginning. It can be done and together we can make it.



Ligia Castro de Doens
General Environment Administrator

April, 2005

ACKNOWLEDGEMENTS

It has to be recognized that in this effort, many persons and organizations have participated and provided experience, economic and technical resources to make this plan a reality:

The Nature Conservancy

George Hanily
Indra Candanedo
Julio Rodríguez

United States Agency for International Development (USAID)

Rita Spadafora

Centro de Estudios y Acción Social Panameña (CEASPA, Panamanian Center for Research and Social Action)

Charlotte Elton
Alibel Pizarro

Sociedad Nacional para el Desarrollo de Empresas y Áreas Rurales (SONDEAR, National Society for Business Development and Rural Areas)

Jose Agustín Espino
Glenda Bonamico

Asociación Nacional para la Conservación de la Naturaleza (ANCON, National Association for Nature Conservation)

Líder Sucre

Autoridad Nacional del Ambiente (ANAM, National Environmental Authority)

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Representatives from the following communities participated in the consultation process:

Nuevo Caimitillo
Victoriano Lorenzo
La Reforma
Tranquilla
Guarumalito
Quebrada Benitez
Quebrada Ancha
Peñas Blancas
Santo Domingo
Mono Congo
San Juan de Pequeni Rural
Santa Librada
Boqueron Arriba
Boqueron Abajo
Parara Puru
Embera Drua
Brazo Cedro
Brazo Tigre
Olla de Mesa
Rio Nombre de Dios
Rio Cascajal, Cerro Bruja
La Linea
San Cristobal
Altos de Cerro Azul

CHAGRES NATIONAL PARK MANAGEMENT PLAN

I. INTRODUCTION

Chagres National Park is located in the narrow central region of the Panamanian Isthmus, with the Chagres River as the main focus of historical and economic interest in the country. It is the backbone of the protected areas regional system and directs the land use planning of the canal watershed area. The park has an extension of 125,491 hectares that includes the Lake Alhajuela catchment area, which represents 30% of the total area of the canal watershed eastern region and provides 45% of its runoff.

Due to the aforementioned, the process of updating the Chagres National Park Management Plan is critical since it provides technical and administrative directives to guide land use planning and efficient management of the protected area. The “Technical Guidelines to Prepare Management Plans”, approved by the National Environmental Authority (ANAM, acronym in Spanish), were followed in the preparation of this management plan. This included a rigorous participatory planning process that ended with a series of technical and community consultations, resulting in the participation of 98 representatives of 25 communities located within the park.

II. DIAGNOSIS

In the analysis of the park's current condition, it was determined that 84% of the protected area remains forested. This indicates that the ecosystems present are in good condition and the hydrological system is adequately functioning. This in turn provides a diversity of habitats that host a plethora of wild fauna.

In the park we find representatives of half of the vertebrate species present in the canal watershed and one third of the vertebrate species present in the whole country. This includes unique, endemic, and endangered species such as the harpy eagle, jaguar, tapir, panther, brocket deer, gray-headed chachalaca, crested guan, great curassow and stripe-cheeked woodpecker.

Table N° 1 presents vertebrate species richness found in this park. This table shows the presence of ecosystems in good condition and with a vast potential of genetic resources. This will require greater attention in terms of pure and applied research programs in the moist forests of the country and particularly in this protected area.

TABLE N° 1
TERRESTRIAL VERTEBRATE SPECIES RICHNESS

Taxonomic Group	Number of species in the Park	Number of species Canal Watershed	Number of species Panama
Mammals	114	145	255
Birds	396	650	950
Reptiles	95	---	229
Amphibians	79	93	176

Source: R. Samudio, Chagres National Park Management Plan 2005

The park also hosts a diverse wild flora, including valuable species such as the vegetable ivory, 'jira', and 'guágara' palms, spiny cedar trees, 'cuchillito', amarrillo pepita, 'laurel', 'maría', 'espavé', yemeri wood, mahogany, 'níspero', star apple, 'guácimo', ear tree, naked Indian or gumbo limbo tree, the Panama hat false palm, 'pichindé', 'árbol de vela', and the zamia, a relict species.

The rich riverine and mountain ecosystems, noted for their biodiversity, also provide spectacular scenery. These resources should be made known to potential visitors of this national park for their appreciation and enjoyment.

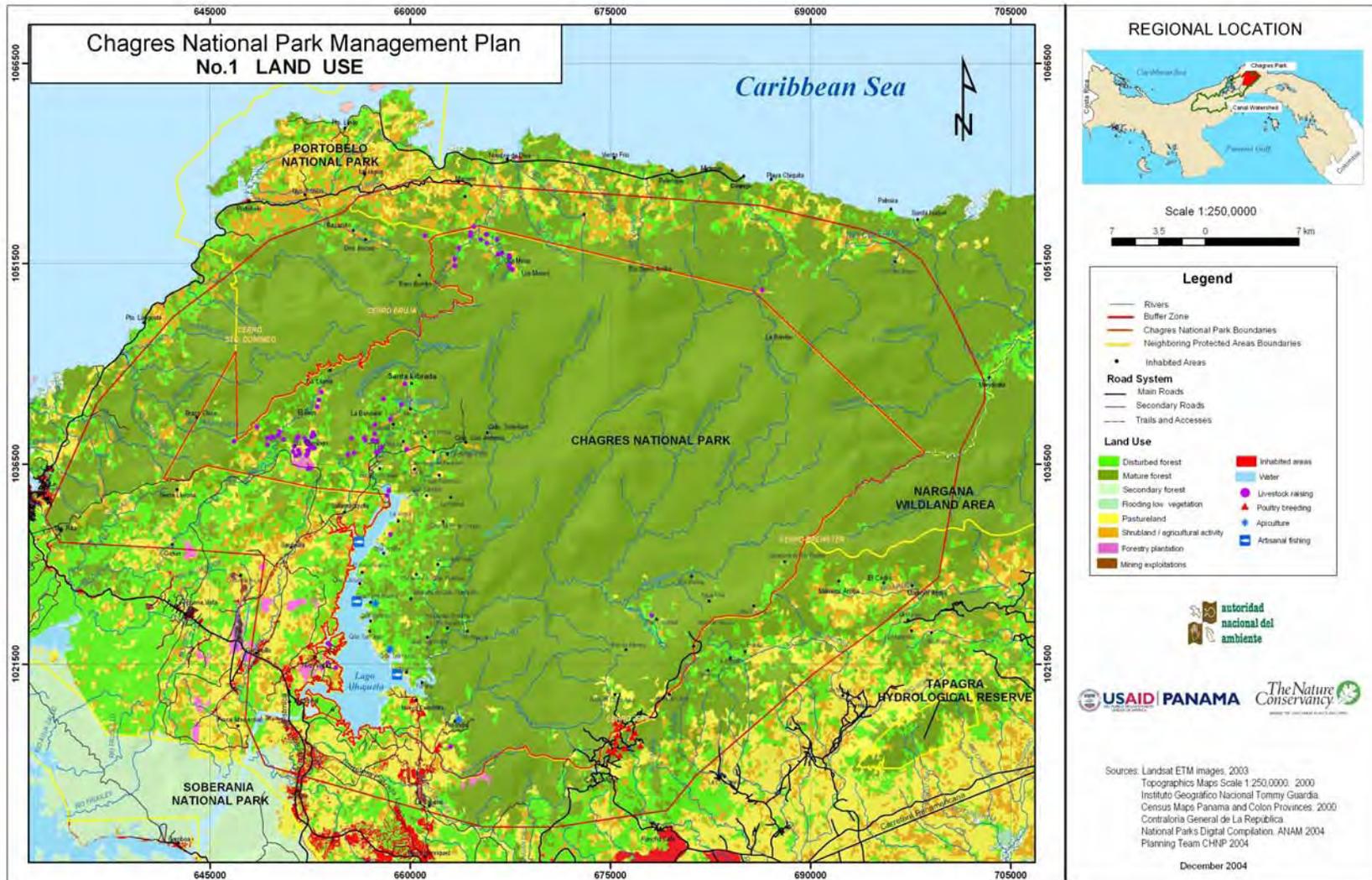
The park also contains valuable historical and cultural resources, including unaltered segments of the historic stone path of the Royal route known as 'Camino Real'. This road connects the villages of Nombre de Dios and Portobelo along the Caribbean coast with Panama City on the Pacific coast. Camino Real contributes to our understanding of the historical importance of the Panamanian Isthmus, and especially the Chagres River region, in the transit of people and materials.

However, the relevant historical resources, the high biodiversity, and the maintenance of the hydrological regime found in this park

are threatened by some anthropogenic activities developed in critical areas of the national park.

There exist conflictive land uses that contrast with the park's management objectives. This land use consists of shifting cultivation developed in scarped slopes and with traditional practices of felling, slash and burn agriculture. These activities negatively affect the maintenance of the park's natural resources.

It must be noted that the activity of greatest threat and impact to the region is extensive cattle raising. It is located mainly in critical areas within and in the surroundings of the protected area (see map N° 1. Land use).



It is estimated that there are 4,528 heads of cattle within the park, distributed among approximately 180 farms with a capacity of 0.82 animals/ha. The extensive cattle raising causes soil compaction, erosion and loss of forest cover in important watersheds and micro-watersheds located within the protected area.

In the region, cattle raising is the agricultural-livestock activity that generates the largest income with the fewest risks due to the adaptability of the cattle to adverse biophysical conditions. Because of this, pastureland has become a valuable commodity in a special market for land. This negatively impacts the land tenure regime within the park since most of the referred holdings are untitled, with rights of possession granted to landholders as a result of occupation of the land.

In addition, it is estimated that a large portion of the park's territory is under some form of land tenure, including holdings registered by private owners and governmental institutions. This situation is causing serious land use conflicts and is therefore deteriorating the cohesive management of the protected area. Moreover it affects the park's limited administrative capacity when having to explain the innumerable conflicts to different land users.

Among the greatest challenges confronted by this protected area is the presence of a human population of 2,137 people located in 34 villages within the park. These inhabitants have four different systems of production and high poverty levels.

The educational infrastructure in this area is made up of 16 school facilities, 14 of which are multilevel elementary schools. Environmental education programs would have to be designed to work within the structures of these schools. This means preparing environmental educators to teach to a variety of different grade levels and ethnic backgrounds in one single classroom.

The villages located within the park are rural except for Cerro Azul residential recreational area and the Nuevo Caimitillo dormitory village that have been classified as urban. These are both located within the margins of the national park.

Community organization levels are generally low, due in part to the high dispersion of human settlements and also due to low credibility and confidence in many of the projects previously performed in the Chagres region.

However, because the Chagres region is an area of national interest, most of the communities within the park have received different levels of institutional intervention over the years. Development efforts come from both the public and the private sectors, including government institutions, environmental, development and research oriented NGOs as well as from private local and international organizations.

Efforts by the Panamanian Government (GOP), the United States Agency for International Development (USAID) and The Nature Conservancy (TNC) to support this park's required activities will help facilitate effective management within the park. To this end, these institutions established a trust fund that will provide

long-term financial sustainability for this protected area.

III. VISION AND MISSION

Strategies have been developed with a vision and mission to create a model protected area over the next twenty years. These strategies have taken into consideration the analysis of threats, problems and challenges found, as well as the great potential to conserve biodiversity and execute management activities.

Vision 2005 – 2025

“Chagres National Park is a model protected area, being financially sustainable and with the capability to effectively manage the different ecosystems it contains, in accordance with a local population that is highly aware of how to live in harmony with the natural resources and conscious of the benefits generated by the protected area.”

Mission 2005 – 2025

“Chagres National Park has a technical, administrative and financial structure that promotes self-sufficiency of the protected area, with full capacity to maintain the ecological integrity of the hydrological regime and the biodiversity of the protected area, incorporating local populations in the benefit of payments for environmental services, through the effective and efficient implementation of management and development plans.”

We designed general objectives that must be reached in the long term and operational objectives for the short term. In the next

five years, the short term objectives will be implemented to facilitate effective and efficient management of Chagres National Park. These are presented in the following section:

IV. MANAGEMENT PLAN OBJECTIVES

General Objective

To guide management actions that maintain the ecological integrity, biodiversity and provision of environmental services generated within Chagres National Park.

Operational objectives

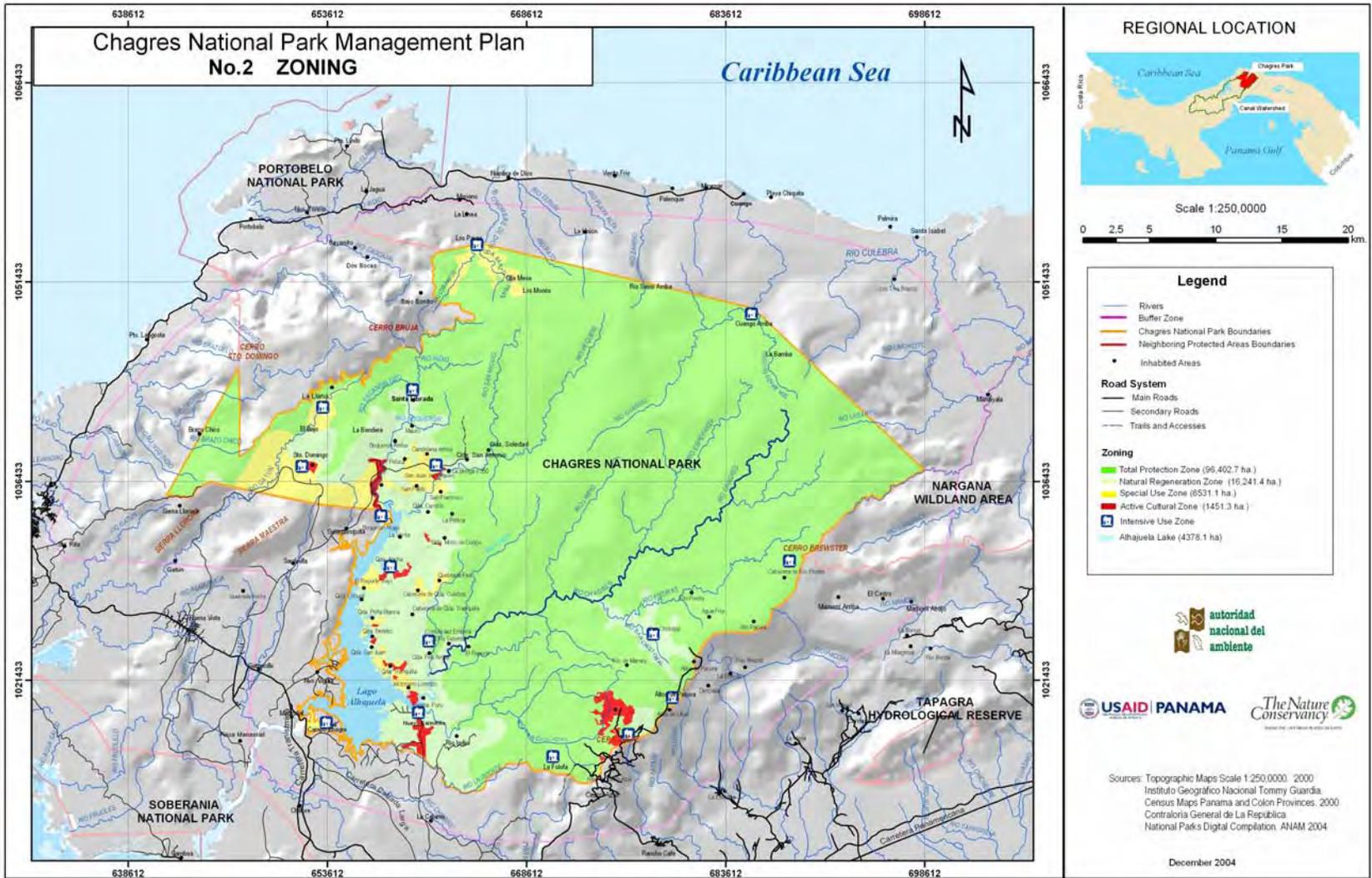
- Organize land tenure structure in the critical areas of La Linea; Victoriano Lorenzo – Boqueron Abajo; Rio Indio; San Cristobal – Rio Piedras, within the park, during a five-year period.
- Diminish extensive cattle raising activity by 10% of the current pastureland, prioritizing 4 critical areas within the park in a five-year period.
- Improve production systems and agricultural, forestry and livestock use through sustainable utilization of natural renewable resources in extremely poor areas within the park, located in Mono Congo, Peñas Blancas, Santo Domingo, San Cristobal, San Vicente de Tranquilla, San Juan de Pequení, Boqueron Arriba, in a five year period.
- Promote the development of ecological tourism and environmental education activities as well as outdoor recreation in priority areas within Campo Chagres and Embera Drua during a five year period.

- Generate basic ecological knowledge to protect and manage biodiversity in prioritized areas including Campo Chagres, Nuevo Caimitillo; Cerro Azul, Cerro Jefe; Cerro Brewster; Rio Piedras; Cuango Arriba; Nombre de Diosito; Sierra Llorona Cerro Bruja; Filo de Santa Rita; Boqueron Arriba, in a five year period.

V. ZONING

Following the methodologies established to prepare management plans in protected areas, zoning was designed as a conceptual model to facilitate land use planning within the park (see map N° 2. Zoning).

Management zones defined for the protected areas correspond to the presence of critical habitats, requirements for the protection of natural and cultural resources, the potential use of the area by visitors and current land use by local people inhabiting the protected area. The intensity of allowed uses is in accordance with the projected management objectives for the protected area, with zoning functioning as an instrument for land use planning. To this end, six management zones are proposed presenting the following modes of use:



Active Cultural Zone

This zone includes populated areas, residential areas and indigenous villages located within the park, that were established before the existence of the protected area and/or are authorized by the park's administration. In this zone, the improvement of the local people's standard of living is in accordance with the maintenance of the ecological integrity in the surroundings of occupied areas.

Five areas with these characteristics are identified:

Area 1: located towards Colon province, from San Juan de Pequeni - Boqueron Abajo to Cuango and in Chilibre, from Indio river to La Puente river.

Area 2: includes all villages concentrated around the coast of lake Alhajuela.

Area 3: includes the indigenous villages of Embera Drua, Parara Puru, and Tusipono.

Area 4: villages concentrated around the convergence point of the rivers Chagres, La Puente and Indio, including the villages of Nuevo Caimitillo, La Puente and Rio Indio.

Area 5: villages located near the region of Cerro Azul and Altos de Pacora.

Special Use Zone

These are the areas within the park where activities of agriculture, forestry and livestock production will be allowed on land adjacent to villages and in accordance with the fertility levels and slopes of the soils. Inhabitants of this zone should only use economical, simple and environmentally friendly production systems that are compatible with the park's management objectives.

Areas where this type of production is permitted are located within the sectors of Santo Domingo – La Llana; Boqueron Arriba – Santa Librada; Rio Piedras – San Cristóbal; Quebrada Ancha – Victoriano Lorenzo; Rio Indio; San Juan de Pequeni; Tusipono – Embera Drua; La Linea; Boqueron Abajo – Boqueron Arriba; Nuevo Caimitillo.

Intensive Use Zone

Refers to the areas programmed to provide services and infrastructure for public use and park administration. This includes facilities related to eco-tourism, environmental education, outdoor recreation, interpretation of natural and cultural resources, research, surveillance, protection, control and administration of the protected area.

Areas selected to form the intensive use zone are: Campo Chagres, Alhajuela station,

El Corotu port, Cerro Azul station, Altos de Pacora control post, Boqueron Abajo station, Quebrada Ancha control post, Cuango station, Cuango Arriba control post and the Embera Drua control post.

Natural Regeneration Zone

This zone is formed by a series of areas with evident anthropogenic intervention, but that could quickly be restored to a more pristine state. These zones represent key places for the connection of fragmented habitats and are areas that should be managed under strict protection.

It refers to the recovered and/or disturbed forests located in the surroundings of the

Caribbean lowlands, along Lake Alhajuela, in the San Cristobal region and in the most western limit of the park, the Sierra Llorona region and Sierra Maestra.

Total Protection Zone

The total protection zone is formed by forested areas that maintain a rich biological diversity and contain a high number of endemic and endangered species. This includes fragile ecosystems that have undergone few anthropogenic interventions and that play an essential role in the maintenance of the hydrological regime of Alto Chagres.

This zone is located in forested areas of the eastern mountain sector (Cerro Azul – headwaters of the rivers Chagres – Mandinga), the western mountain region (Sierra Llorona – Cerro Bruja), the northern mountain region (headwaters of the rivers Nombre de Dios – Boqueron to the rivers Lagarto – Chagres), lowlands of the Caribbean sector (rivers Mandinga – the border with Portobelo National Park and Maria Chiquita), eastern lowlands (watersheds of the Chagres River) and the western lowlands (watersheds of the rivers Boqueron and Pequení).

Buffer Zone

This refers to the periphery zone of the park and extends out 5 kilometers around the entire limit of the protected area. The buffer zone contains areas where the best land use is forest conservation due to poor soils and steep slopes. It also includes zones of hydrological importance; cultivation areas, populated places and areas where environmental management activities are

needed to minimize negative impacts to the national park.

To accomplish proposed objectives for the buffer zone, park administration will promote the establishment of community organizations, the development of rural micro-enterprises for agro-industrial production, the development of sustainable agricultural practices, and will support the establishment of private reserves located in the park surroundings.

VI. MANAGEMENT PROGRAMS

Programs and subprograms for the park's management plan were designed to accomplish the operational objectives for the protected area. These consist of a set of concrete activities, with geographical locations and time periods determined. This allows for the accurate estimation of costs and for the planning of possible follow-up activities. The six programs that will be developed in the park are the following:

Land Use Planning and Sustainable Community Development Program

This program was established to plan land uses, to satisfy the basic needs of the local people, and to comply with Chagres National Park's conservation objectives.

Taking into consideration the complexity of the program's actions in which key actors located within the park will be involved, the aforementioned program will be divided into two sub-programs.

Sustainable Community Development Sub-program

This sub-program has been established to promote the land use planning of agro-productive activities within the active cultural zone and to improve the quality of life of local people living in conditions of extreme poverty.

The Land Use Planning and Consolidation Sub-program This subprogram has been designed to plan land uses in the park's territories, to consolidate the land tenure regime and regulate urban growth.

The main efforts of this program will be focused on facilitating the following actions:

- Define specific areas to develop permitted agricultural activities, considering the soil's characteristics and protection and management of the resources.
- Carry out a livestock survey to determine and monitor the amount of farms, their surface area, and the number of heads of cattle existing per farm within the park.
- Develop sustainable agricultural activities in the active cultural zone, based on the application of environmentally sound technologies compatible with the park's objectives, through the implementation sustainable production modules. These modules include: sustainable agricultural production, associated perennial crops, small species animal husbandry, sustainable cattle production and rural agricultural industries.
- Carry out a land tenure study in four prioritized areas and develop a technical

and administrative proposal to acquire this land.

- Promote the incorporation of state farms and/or private lands in critical areas into the park administration.
- Promote stabilization of landholders without title within the protected area through the adoption of agreements with the park's administration to incorporate these lands into the farms management program.
- Carry out the study of land use regulation in the urban sectors of Nuevo Caimitillo and Cerro Azul, to define ordering and application of development norms.

Control and Surveillance Program

This program was established to monitor and control the park's natural resources in order to protect the park's biodiversity, and to maintain the integrity of the ecosystems and the security of the residents and users within the protected area.

Given the wide geographical range in which the park rangers have to work, and the numerous logistical supports required to conduct effective patrolling, the protected area has been divided into different patrol circuits. These define the territory to be covered and the types of activities to be conducted by the park rangers during their patrols. These patrol circuits include the following areas: Cuango, la Linea, Altos de Cerro Azul, Alhajuela, Campo Chagres, Santa Librada and la Llana.

The program's main efforts will be directed to the execution of the following activities:

- Carry out patrols to guarantee the appropriate surveillance and control of unauthorized activities incompatible with the park's management objectives.
- Protect infrastructure, works, equipment, materials and any other good or service belonging to the park and offer support to all programmatic actions performed by the park's administration.
- Guide activities performed by visitors within the protected area and offer security to the tourist, to local villagers and to park personnel.

Research and Environmental Monitoring Program

This program was established to improve the knowledge of the composition and functioning of natural ecosystems and to manage anthropogenic impacts in the park. This program proposes the design and implementation of a monitoring plan to gather information on the interrelation of proposed and implemented conservation strategies and the reduction of threats and the improvement of ecological processes occurring in the protected area.

This information should be integrated and used to adapt strategies in accordance with the results found, thus improving the effective management of the park.

Efforts will be mainly directed to the development of the following activities:

- Design and implement a monitoring plan on the state of biodiversity, threats and management effectiveness, using groups of plants and animals as bio-indicators (bees, amphibians, bats, reptiles, birds) as well as the physical-

chemical, biological, social, spatial and temporal parameters.

- Perform bio-medical studies on wildlife, in forests close to areas with cattle raising and/or populated centers.
- Carry out studies on plant flowering and fructification to establish reproductive patterns and food availability for wild animals.
- Develop research on participation and negotiation capabilities of the community organizations in the management of the protected area.
- Perform an annual survey of the villages within the park with variables related to socio-demographic conditions and environmental quality of the communities.

Communication, Promotion and Environmental Education Program

This program was established to promote the intrinsic values of the protected area, in terms of its function as a provider of important environmental services. As part of this program, we wish to develop activities that highlight environmental

services provided by the watershed, such as: the production of water for the Panama Canal, potable water supply for the metropolitan region, the maintenance of a rich biodiversity, eco-tourism and the promotion of sustainable agriculture and environmentally friendly activities.

This program will focus on implementing the following activities:

- Creation of Local Management Committees as a means of coordinating

activities among the local actors directly involved in park management.

- Develop a comprehensive guide on environmental education to guide school teachers in multilevel schools on the protected area's outstanding resources and the importance of the park's management for the involved communities and the rest of the country.
- Develop a program to promote the transfer of ethno-botanical knowledge from the Jaibanas or "medicine men", who hold ancestral knowledge of traditional healing methods, to young people from the indigenous villages.
- Develop a non-academic environmental education program for local villagers in collaboration with teachers of the respective elementary schools.
- Design and carry out a development plan for Campo Chagres, including the construction of facilities to offer services to visitors and equip a documentation center (CEDOC, acronym in Spanish) to disseminate information on social, economic, environmental and management aspects of the protected area.
- Promote the renovation of El Corotú port to provide facilities for dressing areas, rest rooms, food provision and equipment rental.

Natural Resources Management and Conservation Program

This program was established to guide management actions on wild flora and fauna promoting the restoration and maintenance of species and ecosystems in accordance with soil capability and seeking sustainable community development.

This program has been divided into the Wild Flora and Fauna Management Sub-program and the Cultural and Landscape Management Sub-program.

In this respect, the main efforts will be concentrated on the following activities:

- Develop management projects to conserve endangered species such as the palms, orchids, zamia, harpy eagle, jaguar, panther, brocket deer and tapir.
- Monitor commercial and artisanal fishing and the hunting of wildlife; manage exotic species and pests.
- Establish the means of preventing and controlling forest fires in the areas of higher occurrence.
- Promote natural regeneration of the areas covered by shrubbery or young secondary forest leaving to natural selection the changes in succession until forests become mature.
- Establish management and promote applied research for the control of the elephant grass (*Sacharum sp*) that allows the incorporation of new areas into sustainable agricultural project.
- Develop recovery actions of the gallery forest located on the margins of the Boqueron river, in the area between Boqueron Arriba to La Escandalosa and from Santa Librada to the surroundings of the bridge named El Puente de El Rey.
- Establish soil management and conservation actions in the Lake Alhajuela floodplains, called 'pampones', to plan land uses for compatible agriculture activities.
- Develop archaeological prospecting of historic sites that formed the Royal route or El Camino Real of the colonial period and prepare documentation to

guide interpretation of historic-environmental activities.

Administrative Program

This program was established to provide guidance and support to all protection and management actions to be conducted in Chagres National Park. This includes the appropriate provision of personnel, infrastructure, equipment and basic services for the whole protected area program.

The implementation of strategic actions has been proposed to improve the image of the park through funds acquisition, technical assistance, international cooperation, and the application of legal instruments that allow the establishment of agreements, strategic alliances and specific regulations to comply with the park's objectives.

The most relevant activities to be conducted during the five-year period are the following:

- Carry out the adaptation of the executive decree establishing the park, through the enactment of a new legal instrument that would provide stronger legal force for administration and management of the protected area. It is proposed that this

instrument eliminates the interpretive deficiencies regarding land use rights, land titling option and the capability to guide, coordinate and/or authorize the diverse, public and private intervention exerted within the national park.

- Establish a payment mechanism for environmental services; based on an analysis of strategic natural resources valuation present in the park, the land tenure status of prioritized areas, the socio-economical analysis of local villagers involved and the identified financial resources.
- Implement a clear strategy to capture new sources of income to enable the protected area to be self-sustaining in 10 years.
 - Carry out technical and administrative studies that facilitate the assignment of administrative and service concessions. These concessions will create cash flow and economic resources to improve park administration and support park management programs.

As a result of the participatory planning process, the wide array of communities, villages, and regions located within the protected area will be participating in the execution of the programs and sub-programs to be developed in the park (see Table N°2)

TABLE N° 2
COMMUNITIES AND VILLAGES PARTICIPATING IN
CHAGRES NATIONAL PARK MANAGEMENT PROGRAMS

PROGRAMS / SUB-PROGRAMS	PARTICIPATING COMMUNITIES
Administrative Management Program	<ul style="list-style-type: none"> • Administrative headquarters of the park located at Campo Chagres.
Control and Surveillance Program	<ul style="list-style-type: none"> • Cuango, Cuango Arriba, Altos de Cerro Azul, Quebrada Ancha, Campo Chagres, San Cristobal, Embera Drua, Boqueron Abajo, Santa Librada, Altos de Pacora, La Linea, Santo Domingo, La Llana, Alhajuela, La Folofa, San Juan de Pequeni, El Guagaral.
Communication, Promotion and Environmental Education Program. <ul style="list-style-type: none"> ➤ Communication Sub-Program. ➤ Environmental Education Sub-Program. ➤ Promotion Sub-Program. ➤ Visitors Management Sub-Program. 	<ul style="list-style-type: none"> • All communities and villages located inside Chagres National Park and its buffer zone • Nuevo Caimitillo, Quebrada Ancha, Quebrada Fea, Boqueron Arriba, Boqueron Abajo, Santa Librada, San Juan de Pequeni rural village, San Juan de Pequeni Indian village, Embera Drua, Tranquilla, Victoriano Lorenzo, Mono Congo, Santo Domingo, Peñas Blancas, Altos de Pacora. • Park's headquarters in Campo Chagres. • Campo Chagres, Puerto El Corotu, Embera Drua.
Natural Resources Management and Conservation Program <ul style="list-style-type: none"> ➤ Wild Flora and Fauna Management Sub-Program. ➤ Cultural and Landscape Management Sub-Program. 	<ul style="list-style-type: none"> • Santa Librada, Peñas Blancas, Quebrada Ancha, Mono Congo, San Cristobal, Tranquilla, La Llana, Quebrada Fea, Salamanca, Boqueron. • Puente de El Rey-Santa Librada and the better conserved segments of El Camino Real, located at Peluca, La Venta and Quebrada Ancha.
Land Use Planning and Sustainable Community Development Program. <ul style="list-style-type: none"> ➤ Sustainable Community Development Sub-Program. ➤ Land use planning and Consolidation sub-Program 	<ul style="list-style-type: none"> • Mono Congo, Peñas Blancas, Santo Domingo, Boqueron Arriba, San Cristobal, La Linea, Tranquilla, Rio Indio, San Juan de Pequeni rural village, Embera Drua, Parara Puru and San Juan de Pequeni Indian village. • Critical areas within the communities of Victoriano Lorenzo-Boqueron Abajo, La Linea, San Cristobal-Rio Piedras-Altos de Pacora, Rio Indio.
Research and Environmental Monitoring Program <ul style="list-style-type: none"> ➤ Research and Biological Monitoring Sub-Program. ➤ Research and Socio-economic Monitoring Sub-Program. 	<ul style="list-style-type: none"> • Geographical regions of Cerro Azul-Cerro Jefe, Rio Indio-Valle del Chagres, watersheds of Boqueron-Pequeni, Sierra Llorona-Cerro Brujas, mountains of Cuango river, Nombre de Diosito, Filo de Santa Rita, Campo Chagres. • All villages located within and in the surroundings of the park.

VII. STRATEGIC GUIDELINES

In order to establish the conditions that will facilitate the effective implementation of programs and zoning, political and financial support will be required in the following five strategic areas:

Control and Surveillance of the protected area

The maintenance of the forest cover and the conservation of biodiversity will be based primarily on the protection and control measures executed by the park's administration.

- Basic investments should be directed to guarantee the continued operation of protective actions by the corps of park rangers. This should be coordinated with and complemented by the provision of personnel and technical assistance by the National Police.
- Participation of local authorities or 'regidores who, once trained and supported by the protected area administration, will help in effective protection efforts.

Land use planning and sustainable agro-productive activities.

Land use planning will start with the execution of a land tenure study. This will provide basic updated information regarding the legal status of each private farm, as well as the land tenure data of the holdings with rights of possession claimed in the protected area.

This information will provide the different social and environmental elements needed to define critical areas that should be prioritized and inserted in a land acquisition program within the park.

- To improve the park's land tenure situation, a project will be developed to acquire land through direct buying, exchange, donations or other forms.
- Orient agricultural, forestry and livestock raising activities to a process of productive re-conversion in efforts to develop simple, economic and environmentally friendly activities. This will be developed in accordance with soil classification and following guidelines for sustainable community development.
- A payment system for environmental services will be established for producers located in prioritized critical areas. To promote sustainable agricultural practices, recipients must comply with the abovementioned reconversion of land.
- A sole centralized registry will be fomented for producers to promote land use planning, the application of corresponding farm management plans, and appropriate soil use.

Institutional Leadership, Coordination and Public Participation

The National Environment Authority (ANAM) will establish a managerial structure for the park that includes technical and administrative functions. This structure will be directed by a professional with confirmed leadership, capacity to manage multidisciplinary staff, ability to solve land

use conflicts and with experience in protected area administration.

- The organizational structure of the diverse formal and non-formal groups existing in all inhabited locations within the park will be reinforced so that they can participate in an effective manner in environmental management processes. This will be achieved through the creation and support of the respective Local Management Committee. These Committees will facilitate dialogue between communities and the protected area administration.
- Co-management efforts will be developed between a representation of civil society and ANAM. This will promote the efficient management of the protected area and utilize the financial resources from the trust fund to achieve self-sufficiency in the medium term.
- Negotiations will be conducted with different private and public entities, both local and international, to establish strategic alliances. These alliances will facilitate access to a larger resource pool, promote the efficient use of assigned funds and complement designed activities in the protected area management and development programs.
- A new legal instrument will be enacted establishing regulations that clearly define the primary responsibilities of the protected area administration regarding land use, land administration within the national park and the coordination of actions developed by public and private entities that support environmental management in the park.

- The park's institutional image will be strengthened through the rehabilitation of Campo Chagres infrastructure and the establishment of the Conservation Education and Eco-tourism Center. The Center, which will serve as a formal entry to the different park regions, will be equipped with facilities to interpret the park's natural resources and to promote outdoor recreation, eco-tourism and research in the tropics.

Environmental Monitoring, Learning and Adaptive Management.

Research and environmental monitoring will be consolidated to focus on actions that improve the knowledge of the park's biodiversity and its threats. Resources will also be oriented to improve our understanding of the impacts that our conservation activities have on park resources. Lessons learnt during the implementation of the monitoring plan will provide criteria to guide new actions and investments.

Funding

The activities in the management plan will be financed through income obtained from the Chagres Fund, which will be administered through a joint administration between ANAM and a private not for profit entity. This will ensure that investments foreseen for basic operations will be effective and permanent.

- Chagres Fund investment will serve as a counterpart for other financial initiatives, to complement expenses of prioritized actions for implementing the management plan.

Strategic alliances will be formed to facilitate the incorporation of other financial resources.

- New infrastructure will be developed and equipped in the park to provide visitors to the area with better services and to improve income generation. The negotiation of concessions with private firms for its administration will provide financial support for activities foreseen in the management plan and create jobs for local communities.

VIII. ECONOMIC REQUIREMENTS

To implement the management plan proposal during the following five years, the budget required is estimated to be \$4,449,610.00. The budget takes into consideration the large geographic area that has to be covered, the diverse ecosystems present, the presence of humans in the protected area and thus the complexity of the problems that should be resolved.

Fortunately, fixed income to meet the financial requirements of the plan come from the Chagres Fund, the Ecological Trust Fund, ANAM budgetary designation to pay for personnel and funds approved by the Parks in Peril program, adding up to \$2,709,992.00, for the five year period 2005 - 2009. This indicates a budget deficit of B/. 1, 739,618.00 that must be resolved through the search for alternative financial resources.

Funds from the Parks in Peril program/USAID and from the Natural Resource Management project/JICA have

been identified as complementary funding sources for park management totaling B/. 535,000.00 for the period 2005 – 2006. These funds will enable the execution of new activities developed for land use planning and sustainable community development.

IX. ANNUAL OPERATING PLAN

Following the planning process, the operative annual plan for 2005 was prepared. The Annual Operating Plan takes into consideration the priority of activities programmed for the first year of execution and the availability of funds from Chagres Fund, the Ecological Trust Fund, and contributions from ANAM and the Parks in Peril Program. These contributions add up to a grand total of B/. 731,861.00, to carry out the 2005 Annual Operating Plan (POA, acronym in Spanish).

In the first year of the management plan, efforts will be directed towards completing studies to obtain detailed information and subsequently to develop proposals on the following themes: land tenure, zoning of urban developments, livestock production characterization, non-academic environmental education, the development of community organization and the enactment of the new legal instrument to improve the protected area administration.

Park administration will be strengthened by the designation of an officer as director of the protected area, an administrative accountant, a secretary and a custodial worker.

Furthermore, the control and surveillance program will be strengthened with the incorporation of eight new park rangers, the designation of managers for the stations at Altos de Cerro Azul and Cuango and the designation of a program director. In addition, economic resources will be available for the acquisition of transportation equipment and delimitation of 70 Kilometers of park borders located in the southwestern coastal region of Lake Alhajuela.

The planning and sustainable community development program will start with the designation of an agricultural science and/or forestry professional to follow up on the land tenure studies, the farms registry and the development of actions to improve sustainable agriculture and livestock production in the involved communities.

In terms of research and environmental monitoring the program will start with the designation of a biologist to coordinate the implementation of the monitoring plan and the first biological and socio environmental studies.

The communication, promotion and environmental education program will be strengthened with the incorporation of a social promoter, the publication of informal environmental education guides, the edition of a quarterly informative bulletin, information disseminated through radio spots and educational events with park villages.

In terms of wild flora and fauna management actions, the main efforts will be directed towards the prevention and control of forest fires and silvicultural

research within the natural recovery zone. Finally, efforts to better manage visitors will concentrate in the improvement of facilities in Campo Chagres, including the rehabilitation of the road that leads to the referred intensive use zone of the protected area. Other efforts will include the renovation and maintenance of current administrative buildings, the provision of basic services of potable water and phone lines and the rehabilitation and maintenance of the 'Las Grietas' trail. This trail provides an opportunity to interpret the natural resources to visitors that reach the park.

X. THE FOLLOWING STEPS

Considering the immediate problems to be solved in the park as well the wide variety of opportunities to conserve biodiversity and to improve the livelihoods for local inhabitants, it is of utmost importance to take the following steps to implement the management plan.

- The selection and designation of a park director, in agreement with the profile indicated for the position.
- Establishment of the private not-for-profit entity required for co-administration of the park with ANAM to facilitate the immediate execution of Chagres Fund disbursements for the year 2005.
- Formal approval of the management plan by the highest competent authority within ANAM and its corresponding official publication in the Official Gazette to reinforce all technical, legal and administrative actions considered in this document.
- Adapt the current executive decree that establishes the park, enacting a new instrument with stronger legal force to support the development of an integral, timely, and efficient administration of the protected area.
- Speed up the approval and execution of the administrative commitments acquired through the Chagres Fund, to execute technical studies and consultancies foreseen for the first year of the management plan execution.
- Undertake needed management efforts to organize the different Local Management Committees. The Committees will serve as a means of consultation and environmental management mechanisms among communities and public and private entities of regional scope, with the administration of the protected area.

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