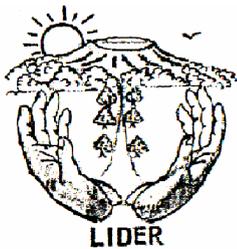


Frontier Nicaragua Environmental Research

Recommendations and additions to the Management Plan of Volcán Cosigüina Nature Reserve



FRONTIER

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Management Plan of Volcán Cosigüina
Nature Reserve

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Frontier Nicaragua and the Darwin Initiative

**LIDER
UNAN- León
Nicaragua**

**Society for Environmental Exploration
United Kingdom**

León 2006

Universidad Nacional Autónoma de Nicaragua (UNAN)-León

UNAN is the largest university in Leon, established as a centre for learning and research in the arts and the physical, nature, earth, marine, medical and human sciences. The University is surveying and mapping the flora and fauna of Nicaragua and is conducting research into the maintenance and improvement of the environment and the sustainable exploitation of Nicaragua's nature resources.

Fundación LIDER (Luchadores Integrados al Desarrollo de la Región)

LIDER is a non-governmental organisation responsible for Volcán Cosigüina Nature Reserve, working to establish and facilitate an effective management system for this area.

The Society for Environmental Exploration (SEE)

SEE is a non-profit company limited by guarantee, formed in 1989. The Society's objectives are to advance field research into environmental issues and implement practical projects contributing to the conservation of nature resources. Projects organised by SEE are joint initiatives developed in collaboration with national research agencies in co-operating countries.

Frontier Nicaragua Forest Research Programme (NRF FRP)

The Society for Environmental Exploration has been conducting research into environmental issues since January 2004 under the title of Frontier Nicaragua. Biological field surveys were conducted in the Volcán Cosigüina Nature Reserve in collaboration with UNAN León and Fundación LIDER.

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Introduction

Nicaragua possesses a system of Protected Areas that shelters a wide range of ecosystems that include thousands of flora and fauna species. With more than 12,000 classified species of flora and 1,400 classified animal species, it is a real biological treasure. However, although Nicaragua has established 76 protected areas which cover more than 2.6 million ha (18% of the national territory), only fifteen of these are currently under active management. Moreover, there are numerous threats facing the protected area system, including the lack of on-site protection and management in most areas; growing colonisation; fires and overuse of mangrove forests; and uncontrolled logging and poaching.

While the general conservation importance of the Volcán Cosigüina Nature Reserve in the Northwest Pacific region has been appreciated for a number of years, the research conducted by Frontier Nicaragua in 2005 provide baseline information on the biological values of the different habitats within the reserve as a basis for management planning and long-term monitoring.

The aim for this report, therefore, is to contribute with recommendations to the existing management plan for the reserve, and to help develop well-informed conservation practices and monitoring programmes to ensure that future generations living in, working in and visiting the area will see it for the beauty that it is today.

Volcán Cosigüina Nature Reserve in review

The Volcán Cosigüina Nature Reserve in the Northwest Pacific Coast of Nicaragua is one of the 76 national parks and protected areas in the country. The reserve is important for biodiversity conservation due to the presence of mangrove forests and tropical dry forest; however there is minimal scientific information available regarding its flora and fauna. Frontier Nicaragua (FNR), collaboration between UNAN-Leon and the UK based Society for Environmental Exploration (SEE), has conducted a baseline biodiversity survey of the area.

While the general importance of the area for conservation has been appreciated for a number of years, the findings presented in this report detail the results of the first comprehensive biological investigation conducted in several of the unstudied areas within the reserve. These findings provide baseline information on the biological values of the different habitats within the reserve as a basis for management planning and long-term monitoring.

The purpose of this report is to put forward recommendations to the reserve's existing management plan, and to help develop well-informed conservation practices and monitoring programmes to ensure that future generations living, working, and visiting the area will see it for the beauty that it is today.

Valuable biodiversity information

Volcán Cosigüina Nature Reserve has significant conservation value on local, national and international levels with several critically endangered species inhabiting the reserve. With regard to fauna surveys, the reserve is home to 254 species of birds, reptiles, amphibians and mammals, of which 6 species hold particular interest for their conservation and biological value.

The reserve was found to contain a number of larger mammals, as well as a high diversity of birds, butterflies and many unique herpetofauna. Overall, the number of species identified by FNR FRP was similar to those listed in the reserve's Management Plan; although the FNR FRP identified fewer families than the Management Plan, it recorded more species, which may represent some important additions to the Management Plan inventory. FNR FRP recorded an additional 54 species of bird, 15 species of mammal and 17 additional reptiles and amphibians. Figure 3 shows the overlap of species between FNR FRP and the Management Plan as well as species only recorded by FNR FRP or the Management Plan.

Although the FNR FRP identified fewer species of mammal than the total listed in the Management Plan, a total of 14 mammalian species (within 6 families and five orders) identified during the biodiversity survey represent new records for the reserve, which are not listed under the Management Plan inventory.

- **Mammals**

Previous studies for mammal inventory lists have not recorded bat species. FNR FRP was able to add all species belonging to the order Chiroptera as new to the existing mammal inventory in the current Management Plan.

- **Birds**

125 bird species have been positively identified for the Volcán Cosigüina Nature Reserve. The Scarlet Macaw, which is CITES I listed, has been sighted on numerous occasions and a small breeding population is believed to live on the slopes of Cosigüina.

FNR FRP recorded a total of 54 more bird species than those listed in the Management Plan.

- **Herptofauna**

With regards to reptile and amphibian species, FNR FRP was able to add the endangered Pacific Green Turtle (*Chelonia mydas agassizii*) to the existing inventory. This will affect future management strategies for coastal zone protection.

Although, LIDER already has a sea turtle protection programme in place, the addition of this species will increase the importance of the nesting beaches within the reserve. To date, three other sea turtle species have been recorded for the reserve, all registered under CITES Appendix 1. More research is needed in the number of nests and nesting females in order to plan effective and efficient conservation management techniques.

- **Butterflies**

No butterflies were previously recorded for the Volcán Cosigüina Nature Reserve. 75 species of butterfly have been recorded. Specimens from the families Lycaenidae, Hesperidae, Nymphalidae, Papilionidae and Pieridae have been collected.

- **Flora**

Due to the pressure of human populations on Nicaragua's forests, disturbance of nature vegetation is often severe, with a variety of secondary forest formations being found in addition to less disturbed primary forests. Even within protected areas, a patchwork of differing vegetation types is found, and the vegetation study carried out by Frontier Nicaragua in Nicaraguan reserves aims to assess the extent and distribution of different forest types, and the degree to which nature forests have been degraded by human activity.

Observations of human disturbance and resource use were made in each vegetation plot, trap site and throughout the reserve. This information complements the standard quantifiable methods employed, helping to form a fuller picture of the state of the reserve with regards to human impact.

The vegetation structure varied greatly between the sites surveyed. Vegetation plots were dominated by light demanding pioneer species, indicative of disturbed forests. Vegetation plots were surveyed in dry forest habitat with areas of scrub where trees have been felled more recently and leaf litter dominated ground cover. All areas are used to some extent for cattle grazing and hunting. A number of sites also included sparse, small trees branching mainly from the base, forming a low canopy. There have been a number of species identified in the area but the largest population is made up of *Acacia cornigera*.

Summary

By comparing sites it can be concluded that mangrove forests are generally not as biologically diverse as other dry or coastal forests. Considering the relative trapping success of dry forest trap sites, it can be assumed that mangrove habitats do not support the small mammal species found on this reserve, at least not to the extent as was seen in dry forests. All mangrove sites had low mammal diversity, although larger mammals such as the nine-banded armadillo (*Dasyus novemcinctus*) were frequently observed, which indicates that although small mammals may be absent from mangrove habitats, larger mammals may still forage in them. This could be due to the fact that larger mammals have a larger range and can more easily move into an area for the sole purpose of foraging, whereas smaller mammals have smaller ranges and tend not to move far from their nests. However biologically diverse dry coastal forests appear to be, they also appear to be greatly fragmented, which negatively affects the wildlife species living within them.

The biodiversity assessment represents an important contribution to the knowledge of the Volcán Cosigüina area, as a number of new species were observed during the research undertaken. Some, such as the spiny pocket mouse (*Liomys salvini*), were previously unrecorded in the Volcán Cosigüina area. Scarlet macaws (*Ara macao*), which are CITES 1 listed, were previously thought to be in lower numbers than that recorded by Frontier Nicaragua. During Frontier Nicaragua's research, seven individuals were observed, as opposed to three individuals previously believed to inhabit the entire reserve (Personal com. LIDER). Local villagers have stated that approximately 15 years ago this species was abundant in the area. The results of this survey provide a resource to update the Management Plan for the Volcán Cosigüina Reserve, with the addition of new species to the existing inventories (in particular the inventory of butterflies, which at present is not listed in the Management Plan).

Assessment of Protected Areas through tracking tools

In order to assess and evaluate the current state of the management of Nature Reserves, WWF (World Wildlife Fund) and the World Bank have constructed a tracking tool in the form of an evaluation of these areas to assess whether Nature Reserves are achieving the objectives for which they were established originally. This site-level management effectiveness tracking tool has been used for three Nature Reserves in the Northwest Pacific Region of Nicaragua; Isla Juan Venado (2.930 ha), Estero Padre Ramos (9.157 ha) and Volcán Cosigüina (12.420). Evaluation forms were completed by different hierarchic levels within the organization, responsible for the co-management of the area, respectively SELVA (Somos Ecologistas en Lucha por la Vida y el

Ambiente), LIDER (Luchadores Integrados al Desarrollo de la Region) and MARENA (Ministry of Environment and Nature Resources).

Although the completion of the evaluation forms was integrated as an exercise within the “Conservation Management” course, conclusions could still be made from the opinions expressed by park rangers, managers and directors. A total of 5 staff members of the Volcán Cosigüina Nature Reserve had completed the hypothetical tracking tool and following the score system (for each category and as a total), it could be determined which score could be appointed to the reserve best and why as well as which problems could be highlighted with possible solutions.

This section will highlight the findings from the exercise, which have been presented as a management tool to the co-managing NGO’s of the previously mentioned Nature Reserves.

From the total of 95 points, an average of 49 points was scored for the reserve. This showed that certain aspects of the management of the reserve need to be improved in order to comply to a perfect ‘Nature Reserve’ status. The following aspects need to be addressed:

- Rules and regulations for the protected area
- Implementation of the law
- Management plan
- Research
- Number of personnel
- Current budget
- Stability of budget
- Equipment maintenance
- Infrastructure
- Evaluation
- Monitoring

The design of the reserve for effective management (such as patrol) scored highly with all staff members.

Formulating problem areas

Nature reserve personnel working in Volcán Cosigüina Nature Reserve agreed on the following recommendations for some of the aspects which needed to be addressed.

- Mechanisms for controlling inappropriate land use and activities in the protected area exist but there are major problems in implementing them effectively.
Recommendation: More staff, improvement of control of the extraction of natural resources.
- There are major deficiencies in staff capacity/resources to enforce protected area legislation and regulations (e.g. lack of skills, no patrol budget).
Recommendation: More funding for resources and capacity training of staff.
- A management plan is being prepared or has been prepared but is not being implemented.
Recommendation: More capacity training for co-managers of the area as well as local communities on the management plan and its implications.
- There is *some* ad hoc survey and research work taking place in the protected area.

Recommendation: More research is needed as it could give guidance to effective management, increase the involvement of student research groups from UNAN Leon.

- Staff numbers are inadequate for critical management activities.

Recommendation: More staff is needed

- There is very little secure budget and the protected area could not function adequately without outside funding.

Recommendation: The budget needs to be less specific for certain activities and aims.

- The available budget is inadequate for basic management needs and presents a serious constraint to the capacity to manage.

Recommendation: More funding is needed for more extensive management.

- There is *some* ad hoc maintenance of equipment and facilities

Recommendation: A maintenance plan and more resources (such as motorised vehicles to cover the extensive area) are needed.

- Visitor facilities and services are inappropriate for current levels of visitation or are under construction.

Recommendation: Improvement of infrastructure of the area to increase visitor numbers eg: accommodation with light and running water facilities, easier road access.

- Some biodiversity, ecological and cultural values are being severely degraded

Recommendation: Focus on critical resources such as the Scarlet Macaw and sea turtles

- Protection systems are only partially effective in controlling access or use of the reserve in accordance with designated objectives

Recommendation: More staffing is needed and more checkpoints need to be set up in vulnerable areas such as Oro Verde.

- There is *some* ad hoc monitoring and evaluation, but no overall strategy and/or no regular collection of results.

Recommendation: Yearly monitoring programmes for marine turtles need to be in place.