



# Forests of Hope

Conserving and restoring tropical forest and combating climate change

## Site profile

### Sierra de Bahoruco, Dominican Republic

The Sierra de Bahoruco is a biodiversity hotspot located on the Caribbean island of Hispaniola, in the South West of the Dominican Republic. It forms one of three core zones in the UNESCO Jaragua-Bahoruco-Enriquillo Biosphere Reserve which supports populations of over 50 globally threatened species. The site lies in one of the poorest regions of the country and the use of forest resources imposes intense pressure on its biodiversity and other values. In collaboration with BirdLife International, Grupo Jaragua (a national NGO) aims to develop a land fund with which to purchase strategically sited plots of land for conservation purposes. This is deemed to be the most effective approach to forest conservation for this region. Without the proposed land purchase and associated improvement in forest conservation, piecemeal destruction and fragmentation of the forest will continue.

The picture below shows montane pine forest on the Sierra de Bahoruco (Photo: Grupo Jaragua).



- **Basic information**

**Country:** Dominican Republic

**Site name:** Sierra de Bahoruco

**IBA(s):** DO006

**Site area:** 112,488 ha

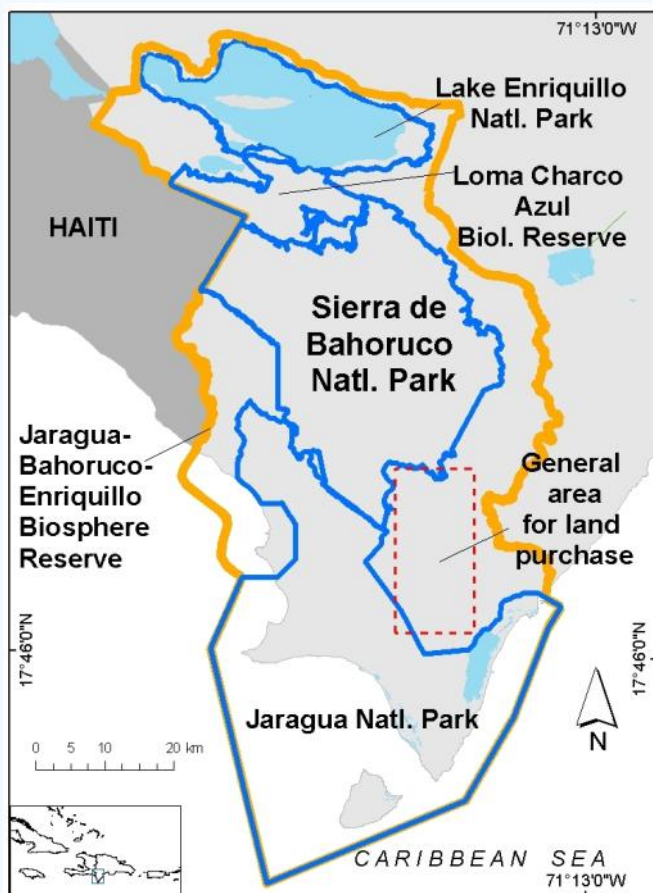
**Location:** This Forest of Hope site is located on the Caribbean island of Hispaniola, in the south-west of the Dominican Republic. It covers the Sierra de Bahoruco National Park (created in 1983) together with Charco Azul Biological Reserve (locally known as La Placa) on the northern slopes of the Sierra de Bahoruco (created in 2009) and the unprotected transitional forest in the corridor between the Jaragua National Park and the Sierra de Bahoruco Important Bird Areas (IBAs). The site lies in the provinces of Pedernales, Independencia and Barahona, south of the Lago Enriquillo IBA (IBA DO005) and north of the Jaragua National Park IBA (IBA DO007), forming one of three zones of the UNESCO Jaragua-Bahoruco-Enriquillo Biosphere Reserve. It connects to a key biodiversity area in Haiti (the Massif de la Selle mountain range), creating a transnational ecological corridor.

- **Biodiversity and current status**

The Sierra de Bahoruco IBA is one of the richest tropical



Narrow-billed Tody *Todus angustirostris* is one of the commoner species endemic to Hispaniola. Photo: Dawaira Mendez.



Map of south-west Dominican Republic, showing the Biosphere Reserve and the important area within it that is excluded from the two National Parks, where land purchase efforts will be focused.

highland ecosystems on the island of Hispaniola. The area is recognised as globally important from an ecological perspective and in 2002 the Jaragua National Park was included as one of three key zones in the UNESCO Jaragua-Bahoruco-Enriquillo Biosphere Reserve. These three zones include a broad range of Caribbean ecosystems and support populations of at least 50 globally threatened species, and the highest number of native, endemic and threatened species at any site on the island. Threatened non-bird species at the IBA include Hispaniolan Solenodon (*Solenodon paradoxus*), Hispaniolan Hutia (*Plagiodontia aedium*) and Minor Red Bat (*Lasiurus minor*). Many *Eleutherodactylus* frogs inhabit the area, such as the Critically Endangered *E. rufifemoralis*, *E. nortoni*, *E. fowleri*, *E. jugans*, *E. furcyensis* and *E. leoncei*. Threatened reptiles of note include the Rhinoceros iguana (*Cyclura cornuta*). For birds, the site's importance is also exceptional: the Sierra de Bahoruco supports 32 of the 34 restricted-range species of the Hispaniola Endemic Bird Area. It also supports Endangered birds such as the Black-capped Petrel (*Pterodroma hasitata*) (of which there is a small breeding population within the IBA), Bay-breasted Cuckoo (*Coccyzus ruficularis*), La Selle Thrush (*Turdus swalesi*) and the largest known population of Hispaniolan Crossbill (*Loxia megaplaga*). The IBA provides vital wintering habitat for 21 migratory species including the Vulnerable Bicknell's Thrush (*Catharus bicknelli*). Other threatened birds include the Hispaniolan Parakeet (*Aratinga chloroptera*), Hispaniolan Amazon (*Amazona ventralis*), White-necked Crow (*Corvus leucognaphalus*), Golden Swallow (*Tachycineta euchrysea*), White-winged Warbler (*Xenoligea montana*) and the Chat Tanager (*Calyptophilus frugivorus*).

In terms of flora, 1,410 species have been recorded, to date, in the Sierra de Bahoruco, including three globally threatened plants *Juniperus gracilior*, *Ekmanianthe*

*longiflora* and *Podocarpus aristulatus*. 52% of the orchid species found in the country are represented in the Sierra de Bahoruco, totalling 166 species, 10% of which are endemic to the Sierra de Bahoruco.

In addition to the ecological value of the area, the Sierra de Bahoruco provides important ecosystem services to local communities, such as the provision of food, water and non-timber forest products. Water catchments in the region carry water to Lago Enriquillo and Pedernales. The forest also protects lowland areas against landslides.

### ● Threats

The Sierra de Bahoruco IBA lies in one of the poorest regions of the country and the dependence of local populations on forest resources puts the site under intense pressure. The key threats to the forest ecosystem are summarised below.

- **Agriculture.** Much forest has been cleared for agriculture, especially in the region once covered by humid forest; this includes both subsistence (garden plots) and commercial cultivation (such as potatoes, avocados).
- **Charcoal production.** Many trees are cut to make charcoal, the main cooking fuel in most of Haiti and in some rural areas of the Dominican Republic. This intense demand is responsible for the clearing of much forest in this region.
- **Forest fires.** These occur naturally in the region, and

in the pine forest they can trigger ecologically important regeneration. However, many fires are started deliberately and go out of control; this may be to clear land for agricultural expansion (sometimes known as ‘slash and burn’) or for other reasons

- **Illegal immigration.** Temporary settlement of illegal immigrants, many originating from Haiti, creates pressure on the forest ecosystem through ‘slash and burn’ cultivation, in addition to the build-up of waste.
- **Introduced animals.** Non-native species in the IBA include feral dogs, cats, pigs and goats, together with mongooses (*Herpestes auro-punctatus*), rats (*Rattus rattus* and *Rattus norvegicus*) and mice (*Mus musculus*). These have many impacts including predation on native species and/or contribution to habitat disturbance and destruction.
- **Hunting and collection.** Illegal hunting and collection of species for the pet trade, e.g. parrot chicks, can deplete populations of rare species and result in habitat loss and destruction.
- **Mining.** Concessions for bauxite and limestone mining as well as cement production in-situ have been granted in the area, which is likely to contribute to further forest habitat loss.

If these activities continue, the forest will soon be highly fragmented and degraded. This will diminish the integrity of the ecological corridor in this region and further threaten the species which it supports.



Threatened species include (clockwise from top left) the La Selle Thrush, Hispaniolan Hutia, Hispaniolan Crossbill, and Hispaniolan Solenodon. Photos: Eladio Fernandez, Caribbean Nature Photography.

- **Current legal status and site governance**

This site includes two Protected Areas: the Sierra de Bahoruco National Park and the Charco Azul Biological Reserve. The transitional forest in the corridor between the Jaragua IBA and the Sierra de Bahoruco IBA is unprotected, but of very great conservation value: it should be a particular focus of conservation efforts in order to reduce habitat fragmentation and maintain the viability of small, often ecologically isolated species populations.

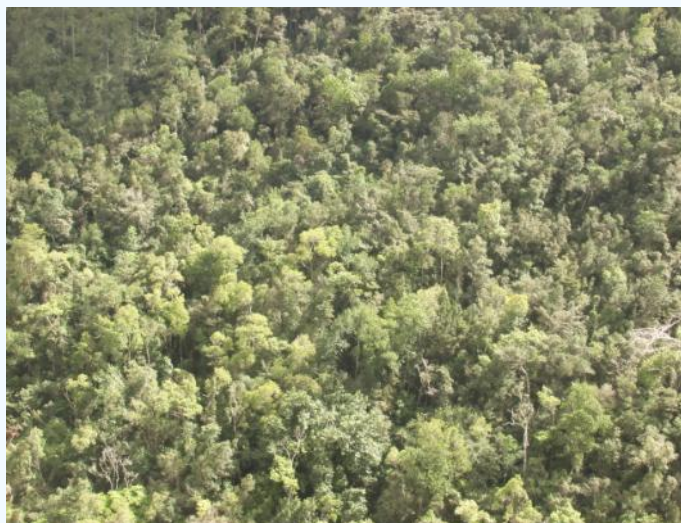
A Management Plan has been created for the Sierra de Bahoruco National Park. Currently, the area has an administration office in Puerto Escondido, on-site management staff, 5 guard houses and one visitors' center with a lookout at 'Mirador de Pelempito'. The Office for Protected Areas and Biodiversity manages the Park on a day-to-day basis but there is shortage of equipment, infrastructure and transport. Support is available from the Ministry of the Environment and Natural Resources but it remains difficult to enforce park boundaries and undertake effective management. Lack of money to implement the management plan and insufficient political will to assign

necessary resources have constrained conservation efforts.

A new management system for Sierra de Bahoruco and its integration to the Biosphere Reserve is composed of three elements: (1) the current Administration (Office for Protected Areas and Biodiversity and Ministry of the Environment and Natural Resources) for day-to-day management, in particular surveillance, infrastructure maintenance, park personnel supervision, research and public uses; (2) a Board of Directors including local stakeholders for the National Park and its buffer zone, deciding on key issues of planning and integrity of the territory; and (3) a body for strategic management of the whole Biosphere Reserve, with capacity to coordinate actions and relations with sectorial institutions.

- **New conservation and governance approach**

As part of the BirdLife International *Forests of Hope* initiative, the national NGO Grupo Jaragua (BirdLife in the Dominican Republic) aims to develop a 'land fund' with which to purchase land for conservation purposes, based on experience already acquired through buying land for



"Before and after": intact forest in the Bahoruco-Enriquillo Biosphere Reserve, and the results of soil erosion forest clearance and browsing and grazing by cattle. Bottom right photo taken in nearby Haiti. Photos: Grupo Jaragua.



Forest fire in pine forest. Forest fires are a natural feature of these forests, but they occur at an unsustainable rate and many are started deliberately in order to clear land for agricultural or residential expansion. Photo: Grupo Jaragua.

biodiversity conservation. Two plots which are particularly important for the protection of the two endangered mammals, *Solenodon* and *Hutia*, were recently bought. Privately owned land is well respected and so land acquisition provides the most effective approach to complement existing forest conservation efforts: a focus on the buffer zone of the Jaragua-Bahoruco-Enriquillo Biosphere Reserve would help to ensure that the altitudinal continuity of the ecological corridor in the region is preserved. Without the proposed land purchase, piecemeal destruction of the forest will continue and the conservation value of both the Jaragua and the Sierra de Bahoruco IBA will diminish as a result.

With access to a land fund, Grupo Jaragua would be in a position to react quickly to land sales. Being well connected to the local communities in the area, Grupo Jaragua would receive news of possible buying opportunities quickly and this would offer an advantage during purchase negotiations. Once land is acquired, it would be monitored primarily by Grupo Jaragua personnel and community volunteers with additional support provided by National Park staff.

Once land is acquired, a co-management agreement with the Ministry of the Environment and local government agencies would be signed, on the basis of the numerous environmental benefits of the programme. As well as biodiversity, conservation of the forest will protect the ecosystem services that it provides, but few data are available on the economic value of these services. Ecotourism is being developed with direct links to conservation, in order to incentivise the protection of the forest; studies to assess feasibility and needs are a high priority. Adequate agroforestry models could produce US\$500 per hectare per year.

## ● History and capacity

Grupo Jaragua has been undertaking conservation activities for the past 20 years, in collaboration with the Government, other NGOs and local community stakeholders in the Jaragua-Bahoruco-Enriquillo Biosphere Reserve. In collaboration with project partners, Ministry of the Environment and Natural Resources, the Dominican Environmental Consortium and the American Bird Conservancy, Grupo Jaragua has established a protocol for National Park staff to patrol the Park boundaries and improve protection of the forest. Park staff have been trained in bird identification and survey techniques, in order to establish an ongoing monitoring programme for migratory and resident bird species. The Park's north-west boundary has been expanded to include an area of dry forest and semi-deciduous forest which is critical to endemic and migratory bird species. Nature trails have also been developed in order to attract more visitors to the area. Work has also been undertaken to increase local awareness of environmental issues.

Grupo Jaragua receives support from various donors and has successfully managed conservation funds from a wide range of national and international sources including Foundations, Development Agencies (e.g. CIDA of Canada, AECID of Spain) and embassies. The Sierra de Bahoruco is considered an investment priority in the Caribbean profile of the Critical Ecosystem Partnership Fund (CEPF); one of CEPF's contributors, the John D. and Catherine T. MacArthur Foundation, has already supported Jaragua's work. A strategy for financial sustainability is being developed, for implementation in the next three years. This includes an analysis of the organization's strengths developed by several international sources, including BirdLife International, and of its financial history concerning the major sources of support. Especial efforts are being made to develop new financing activities coming mainly from national sources.



Forest-based honey production is one of the many values of the forests of the Sierra de Bahoruco. Photo: Grupo Jaragua.



Biodiversity monitoring programmes for the rare and elusive fauna of the Sierra de Bahoruco has made full use of radio telemetry methods and camera-trapping methods by Grupo Jaragua and also local people; the latter has resulted in these unusual pictures of the endemic Hutia. Photos: Grupo Jaragua.

The Government has demonstrated its willingness to address environmental and conservation issues in the Dominican Republic. It established a Presidential Office for Climate Change and the Clean Development Mechanism, and is promoting and supporting carbon financing actions. The Government also works with NGOs to manage and conserve protected areas and natural resources, and supports a participatory/collaborative approach to management plan development. However, insufficient government funding limits the implementation of management plans in protected areas.

- **Detailed knowledge of the forest**

Ecological research on the Sierra de Bahoruco forest has been extensive and a range of publications has resulted. Species inventories of flora and fauna were undertaken in the 1980s and further botanical studies undertaken more recently by the New York Botanical Garden, in collaboration with the Grupo Jaragua. These and other studies have not been compiled in detail into a single

source, although BirdLife International has compiled summaries in directories such as the book *Important Bird Areas of the Caribbean*. A Monitoring Strategy for endangered species in the Reserve has been developed, based largely on data from research carried out by Grupo Jaragua; some additional information about the Park has also been collected to aid management planning.

No detailed studies of ecosystem services in the Sierra de Bahoruco have been undertaken. Currently the three main economic land uses in the region are agriculture, timber extraction and cattle ranching. Revenues from timber and cattle ranching are very low; agriculture is more lucrative, taking place mainly in the middle to upper catchment areas, but of questionable sustainability as it is dependent on forest clearance by illegal Haitian immigrants who are paid exploitative wages, it has associated problems of soil erosion, pollution and reduction of water resources, which impact particularly on the c.9000 inhabitants of the middle and lower catchment. Clearance for agriculture is of course incompatible with conservation of forest biodiversity.

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