

# Dung beetles, ants and restoration

## in the Ecuadorian Chocó

Unplanned deforestation by smallholders and large corporations is quickly changing and endangering the Chocó rainforests in Ecuador and its economy. To protect the last remaining, large tract of rainforest, Fundación Jocotoco acquires so called 'old growth forest': forest that has been selectively logged and even pastures to stitch together a large contiguous area. Jocotoco owns about 24,000 ha in Ecuador. By acquiring and managing land as biological reserves, the NGO aims at the conservation and restoration of endemic and threatened species.

Martin Schaefer, CEO of Jocotoco, explains: "The area we protect is still wild. It is the only western Ecuadorian area holding viable populations of key species, such as white-lipped peccaries, jaguars, and critically endangered brown-headed spider monkeys. The presence of these animals testifies to a still healthy ecosystem. Without expanding our protection however, it will be gone in 5 till 8 years. Since the forest matrix is intact, our protection has a rapid impact. Within ten years, a diverse forest will be established, consisting of a good mix of pioneer and climax tree species."

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*"If we can preserve the networks of interacting species, tropical forests will recover and often surprisingly quickly so. These networks are the backbone of life on earth."*



Brown-headed spider monkey

### Programme

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Buy and restore 24,000 ha of Chocó forest, Ecuador.

### Goal

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The DOB Ecology grant for Jocotoco supports the acquisition of 2,100 ha of Chocó rainforest. This contributes to Jocotoco's ambitious plan to buy and restore 24,000 ha of Chocó forest to ensure its long-term ecological survival. This plan will connect the Canandé Reserve owned by Jocotoco with the government-owned El Pambilar Wildlife Refuge and the Cotacachi-Cayapas Reserve. By connecting three reserves and the nearby Cachi Indigenous reserve a protected area of more than 300km<sup>2</sup> would be created.

### Partner

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Jocotoco



#### Discovering new species

The discoveries of new species are as varied as the creatures themselves. For example, during nights of strong downpours amphibians abound, while many animals leave their terrestrial hideouts for fear of drowning. Insects however are hard to find under such conditions. They are best attracted to light on clear nights. Recently a conspicuous, large new species of trap jaw ant (*Odontomachus davidsoni*) flew one night into the illuminated room of a scientist in Jocotoco's lodge. These ants move their mandibles ultra-fast (equivalent to up to 230 km/h) to grab their prey.

***“There is no doubt that the future of the Ecuadorian Chocó hangs in the balance, and that they must be placed at or near the top of any list of global biodiversity priorities”***

*Mittermeier, RA, Gil PR, Hoffman, M. Pilgrim J, Brooks T, Goettsch Mittermeier C, Lamoreux J & GAB Da Fonseca (2005). Hotspots revisited. Cemex.*

## Complex networks of interacting species

White-lipped peccaries and brown-headed spider monkeys have key roles in forest regeneration, as they are the largest terrestrial and arboreal seed dispersers, respectively. However, just focusing on these key species oversimplifies the intricate interactions among myriads of rainforest species, Martin states. "Dung beetles, for example, bury seeds and nutrients within one hour, thereby increasing the survival and germination probabilities of seeds. Some of the dung beetles are generalists - such as those following me on my hikes in the rainforest -, others are specialists, following monkey troops high up in the canopy. These specialists clean feces and seeds on the foliage, roll them into a ball, take a big leap, and then jump with the ball to the ground where they bury the material. The fundamental ecological processes of pollination, seed dispersal, seedling recruitment, predation, and nutrient recycling all depend on complex networks of interacting species. And so does the resilience and recovery of the Chocó ecosystem."

## So much more awaits discovery

Not all interacting species in the Chocó are known to science. The region lacks established science stations such as those in Central America, the Amazon or in Danum Valley on Borneo. Jocotoco and its partners regularly discover species new to science: from snakes, frogs and caecilians (legless amphibians up to a meter) to butterflies, ants, and plants. "Ants and termites are as important as peccaries and monkeys for the persistence of neotropical forests, as they make up to one third of all the biomass of animals", Martin explains. "Scientific exploration of our forests has been limited; so much more awaits discovery. This also includes the exploration of human history, as ancient pottery is scattered in places on the forest floor."



### [The Lookfar Podcast: Voices from the Wild](#)

Martin Schaefer speaks about Jocotoco's origins, the remarkable network of protected reserves it has built over the past two decades, and the close ties it fosters with local communities. He also tells about the Chocó Campaign.



The Chocó comprises wet rainforests that originally stretched from eastern Panama to western Ecuador. Within the Chocó, the western slopes of the Andes are among the wettest places on earth with more than 8 m annual rainfall and up to 13 m in exceptional years. Rampant deforestation is the biggest threat to the Chocó, particularly in the lowlands of western Ecuador. Here, only 2% of natural forests remain.

## Persistence versus rewilding

As mentioned above, forest recovery can soon show results in the Chocó, even though the line of deforestation moves quickly, but only as long as the networks of interacting species persist. Science has shown that once species vanish, the networks become less stable. A lower stability translates presumably into less resilience and less restoration. Rewilding will then become necessary. Rewilding however is slower, far more costly, and likely less complete in terms of recovering the diversity and complexity of the original ecosystem.

## A positive vibe

Since the fastest growing trees in the Chocó gain 4-6 m in height annually, Martin is very hopeful: "The way we are acting now, before ecosystems move beyond their tipping points, and by preserving the species as backbone of life, makes it possible to protect areas like the Chocó without the necessity of rewilding."