

# The Mountain Pine Ridge Forest Reserve, Belize

## Carbon sequestration and forest restoration

The information contained in this case study was extracted from the Forest Securities report ([www.reforestbelize.com](http://www.reforestbelize.com) and [www.forestsecurities.com](http://www.forestsecurities.com)) and edited by Cody Walden, Forest Securities

### Ecosystem description

The Government of Belize has made a monumental effort to protect the unique environmental resources of the country. Eighty percent of the country's land is preserved under forest cover and forty-two percent has some form of legal protection. The main vegetation types in the country are dense Caribbean pine forest, including the endemic *Pinus caribaea* var. *hondurensis*, open savanna grasslands, tropical rainforest, and broadleaf forest on areas with a limestone rich substrate. The country is home to more than 500 species of birds, and the only jaguar reserve in the world. Various unusual bird species can be found in the Mountain Pine Ridge Forest Reserve, including the rare orange breasted falcon, stygian owl, white king vulture, oscillated turkey, acorn woodpecker, blue crown mot mot, keel billed toucan, and red-lored parrot. The reserve is also home to pumas, jaguars, and the endangered ocelot, coatimundi, and the Baird's tapir, Belize's national animal.



Belize ©Forest Securities

### Project description and aims



Tree planting ©Cody Walden

The Mountain Pine Ridge Forest is adjacent to Chiquibul and Sibun forests in the Maya Mountains, Cayo District, Belize. The area is unique in its red earth and mountainous terrain, ancient Caribbean pine forest, limestone caves, and open savanna grasslands bordered by tropical rainforest.

The reserve was declared in order to protect the pine forests from fire, grazing and cultivation, to conserve soil and water resources and enhance natural regeneration of the forest. Management of the reserve is a joint effort of the Government of Belize, Silviculture Belize, Ltd, Global Forest Nursery Development, Inc., Forest

Securities, Inc., and an international consortium of professionals, organizations and governments.

The Government of Belize, and the other partners in the project, have developed a management plan designed to restore 90,000 acres (365 km<sup>2</sup>), based on a management principal which combines economic benefit with preservation of the environment. The plan aims in particular to suppress additional Pine Beetle attacks, control forest fires, protect wildlife habitat and enhance soil and water quality. Over a 55-year period the project aims to produce a total carbon benefit of 48 million tonnes

of carbon dioxide equivalent. The initial commercial offering is of 18 million tonnes, which represents an opportunity cost of \$18 million.

### Threats

Natural regeneration of the endemic *Pinus caribaea* var. *hondurensis* has been prevented by a serious attack of Southern Pine Bark Beetle (*Dendroctonus frontalis*), which has damaged 80% of the forest. Additional problems include soil erosion; desertification; siltation in the watershed and effluence into the barrier reefs. There are significant economic and social problems in the tourism, recreation, and forestry industries and, importantly, Belize's primary potable water source reservoir and hydroelectric power infrastructure is under threat.

### Restoration activities

#### Carbon Credits sale

Funding for the re-establishment of *Pinus caribaea* var. *hondurensis* in the Mountain Pine Ridge Forest Reserve will come from the sale of 'Carbon Credits'. Forest Securities analysis suggests that the value of the carbon credits is equal to or greater than the cost of reforestation.

#### Seed collection, growing and planting seedlings

Seeds collected in the Mountain Pine Ridge Forest Reserve are being tested for vigour and used to grow seedlings in a nursery. The nursery environment protects the seedlings from southern pine bark beetles. Over one hundred people are employed to plant seedlings from the nursery.

Thinning activities will continue up to thirty years after the planting has been completed. It is hoped that this silvicultural treatment will prevent the return of stressful conditions that enabled the establishment of high densities of southern pine bark beetles.

#### Community involvement

The project generates employment for 800 people, and, according to Forest Securities, is the single biggest employer in the region. Local Mayan people are employed by the project and are transported to and from their homes each day in order to maintain family life. Social security payments are made for each employee.



4-month old seedling ©Cody Walden

### Results

Planting began in 2002 and Silviculture Belize planted 3.5 million seedlings over 10,000 acres (40km<sup>2</sup>) by the end of 2002.

### Lessons Learned

The sale of "carbon credits" may be a valuable financial tool in the conservation of native habitats. Maintaining or developing an ecosystem resilient enough to withstand changes in the populations of pathogens, such as the southern pine bark beetle, is vital to the long-term stability of the ecosystem.

## **Contacts and other resources**

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