

BELIZE FACTS AND FIGURES

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Section: The Nation and Its Resources Belize's Geopolitical Position/Pine Forests

Pine Forests

Although these pine dominated ecosystems which are called "Pine Ridges" locally only occupy about 3.5 % of the territory, they are some of the more unique and fragile of Belize's ecosystems. The largest pine forest in Belize is the Mountain Pine Ridge which is located in the Cayo District. The Mountain Pine Ridge Forest reserve covers approximately 106,352 acres.

Pine forest flora

Besides the Mountain Pine Ridge, there are other pine forests in the Orange Walk, Belize and Stann Creek Districts. The type of pine in these pine ridges is the Caribbean Pine (*Pinus caribaea*). Fire resistant oak (*Quercus* species) and craboo (*Byrsonima crassifolia*) trees are also found in Belize's pine forests. The shrub called St. John's Wort (*Hypericum* sp.) as well as the tiger fern (*Dicranopteris pectinata*) are also found in some of Belize's pine forests.

Pine forest zonation

Lowland pines

The lowland pine forests are dominated by Caribbean Pine (*Pinus caribaea*). If these lowlands are allowed to burn, the pine forest structure may decline and become sparse broadleaf forests or pine savanna.

Upland pines

Pine forests at elevations above 650 meters are upland conifer forests also called subtropical lower montane moist forests. At these locations, the pine species present is *Pinus patula* which is fire resistant. Like the Patula pine trees, Cypress (*Podocarpus guatemalensis*) is another conifer (See

Glossary) only found at locations above 650 meters.



Figure 1: A pine forest in the Belize District.

Pine forest fires

Pine forests may transition into scrublands or pine savannas if fires are allowed to burn annually. These fires are fuelled by the considerable tonnage of pine needles which fall to the floor of pine forests.

Pine savannas have less pine and more craboo trees and may also contain sedges and cutting grass of the family *Cyperaceae* and grasses of the family *Gramineae*.

Fires in pine forests may occur naturally but are often illegally lit by hunters seeking deer and other game. Because the pine forests are carpeted by pine needles which are a potent fuel for forest fires, the pine trees, oak, craboo and other species have a thick fire resistant bark.

Pine forest soils and microbiology

The soils underlying pine forests are very acidic and generally poor in nutrients,

especially phosphorous. The root systems of pine trees are also very sensitive to damage. To improve nutrient uptake, pine trees have evolved a symbiotic relationship with soil fungi called *mycorrhiza*. These fungi form netlike structures around the root hairs of the pine trees and help to dissolve soil nutrients such as phosphorous. In this way, the fungi help the pine trees to uptake vital nutrients and the trees supply energy rich organic compounds which the *mycorrhiza* require.

Pine forest fauna

The fauna of Belize's pine forests include large cats such as jaguars and pumas at the top of the food chain. These cats feed on gibbon, deer, tapir and armadillos, etc.

Pine forest resident birds include the Rufous-capped Warbler (*Basileuterus rufifrons*), Common Crossbill (*Loxia curvirostra*), Pine Siskin (*Carduelis pinus*), Eastern Bluebird (*Sialia sialis*), Stygian Owl (*Asio stygius*), King Vulture (*Sarcoramphus papa*), Ocellated Turkey (*Meleagris ocellata*), Acorn Woodpecker (*Melanerpes formicivorus*), Blue-crowned Motmot (*Momotus momota*), Plumbeous Vireo (*Vireo plumbeus*), Keel-billed toucan (*Ramphastos sulfuratus*) and Red-lored Parrot (*Amazona autumnalis*).



Figure 2: The forest floor in a pine forest of Belize.

The Pine Beetle

Between 1999 and 2003, the pine forests of Belize were severely affected by a nationwide infestation of the Southern Pine Beetle (*Dendroctonus frontalis*). The Pine Beetle affected 80% of the trees, killing hundreds of acres of pure stands of pine. The beetles feed on pine sap in the plant's phloem tissue where they construct winding tunnels. The beetles also introduce a pathogenic (See Glossary) fungus into the xylem tissue of the trees. These fungi colonize xylem tissue and block water flow within the tree which causes tree mortality. It is believed that proper thinning of pine forests and prescribed burns can manage the pine beetle.

What are the goods and services that pine forests provide?

1. Protection of the headwaters of the Belize River which is used to supply drinking water to numerous communities.
2. Wood to construct homes, businesses, etc.
3. Sites for locals and tourists to swim and enjoy.
4. The pine forests provide sand and stones for construction.
5. Pine forests protect the Belize River which supplies the water to produce electricity at the three hydroelectric facilities.
6. Pine forests trap carbon dioxide in the wood biomass.

Threats to the pine forests
Climate change which can cause insect pest invasion
Poor decisions on prescribed burns
Conversion into pasture
Unattended camp fires
Visitor garbage
Infestation by Pine beetles