Forest Inventory & Analysis Factsheet
Puerto Rico 2003

May 2006

Forestland Area

Forest cover on mainland Puerto Rico increased from 32% in 1990 to 57% in 2003, an increase of 25%. Culebra (88%) and Vieques (85%), which were inventoried for the first time in 2004, show relatively high percentages of young forest cover.

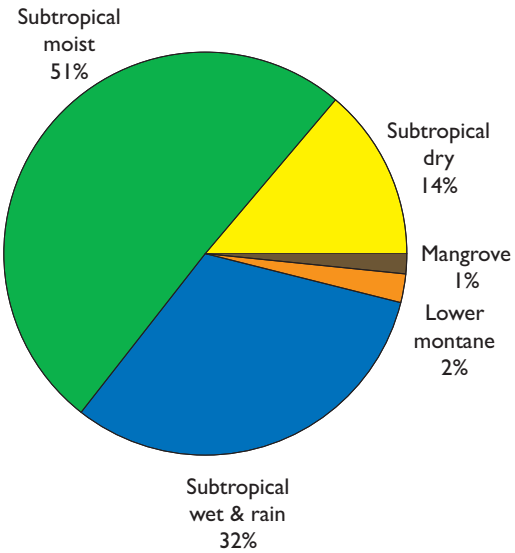
Area of forestland (*ha*)

Survey unit	Total land area	Forest	Nonforest	Percent forested
Puerto Rico	863,611	489,982	373,629	57
Vieques	13,165	10,617	2,548	85
Culebra	3,009	2,655	354	88
Mona and others	7,172	6,899	272	96
All units	886,957	510,154	376,803	57

Forest-Type Composition

Subtropical moist forest is the most prevalent forested life zone on mainland Puerto Rico with 258,861 ha of forest (49% forested), followed by subtropical wet and rain forest (161,503 ha, 81% forested), subtropical dry forest (50,346 ha, 45% forested), lower montane wet and rain forest (11,723 ha, 99% forested) and mangrove forest

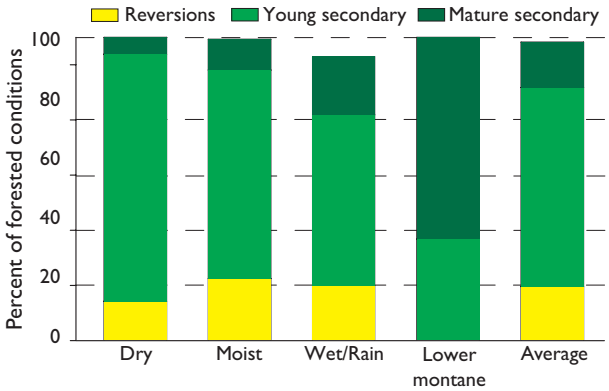
Area of timberland by forest-type group



Stand-Size Distribution

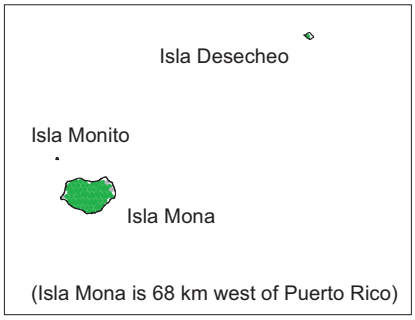
Puerto Rico's forests are still in the early stages of development. Out of all the forested conditions, 18% were naturally occurring forest reversions, that is, areas that had been recently recolonized by trees. Most reversions (57%) were subtropical moist forest. Field crews categorized 66% of the forest as young secondary and only 12% as mature secondary forest.

Reversions, young, and mature stands

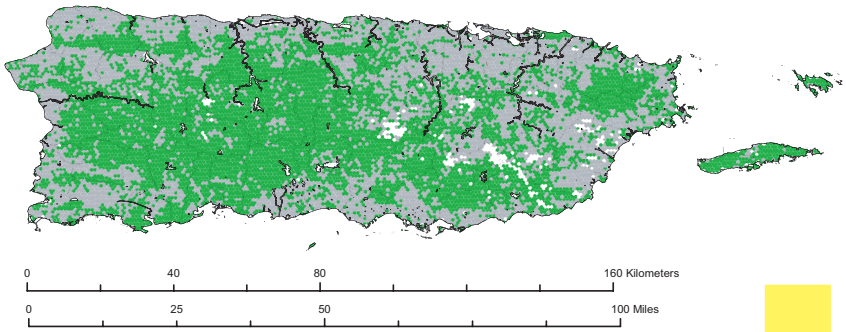


Forest Distribution

Forest cover

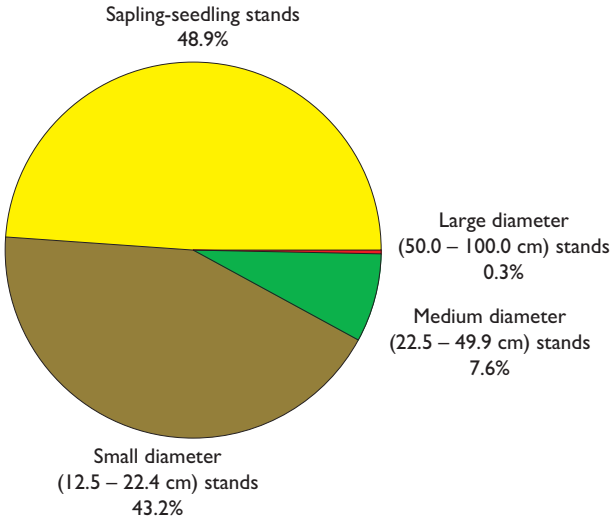


Forest
Nonforest
Not sampled



In terms of stand structure and predominate tree size, 93% of stands were in the sapling-seedling stage or small diameter stands. Forests on Culebra were entirely in the early sapling-seedling stage, while 81% of the forests found on Vieques were at the sapling-seedling stage and 19% were small diameter stands.

Stand-size class distribution

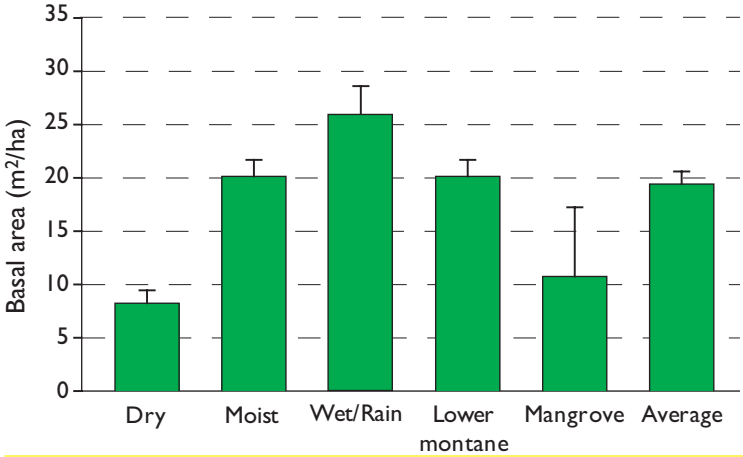


Forest Structure

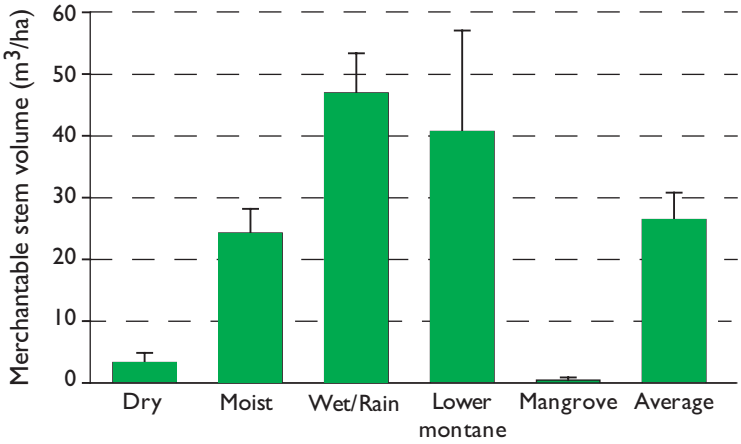
Puerto Rico's forests have 1.6 billion trees over 2.5 cm in diameter, 10.6 million m^2 of basal area, and hold 36.6 million Mg of sequestered carbon. There were 3,112 trees, 19.2 m^2 of basal area, 68.25 m^3 of merchantable stem volume, and 80 Mg of aboveground biomass in an average ha of forest.

The subtropical moist and wet/rain secondary forests inventoried in 1980 and 1990 are still developing, increasing in average basal area from 13.2 m^2/ha in 1980, to 15.2 m^2/ha in 1990, to the current level of 20.9 m^2/ha. Merchantable stem volume per ha has held steady since 1990 due to the inclusion of less-stocked stands in the current inventory.

Mean basal area by forest-type group



Mean growing-stock merchantable volume



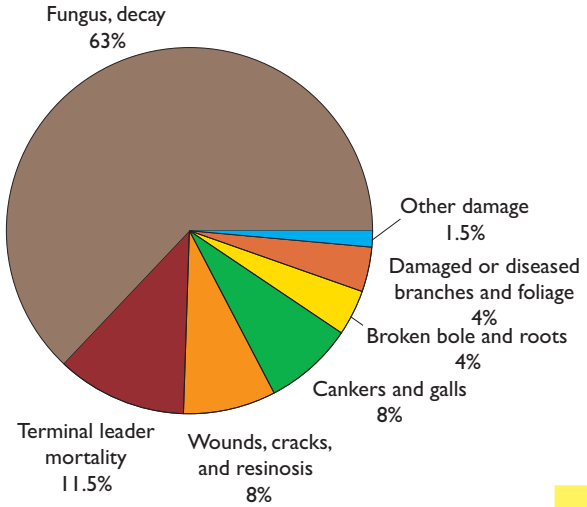
Species Composition

The forest inventory encountered 299 tree species. Both native and introduced species are naturally regenerating in established, maturing forests and in recently abandoned agricultural land. Tulipán africano (*Spathodea campanulata*) had the highest basal area of any single species on the island, and it was the most frequently encountered tree. The native species guaraguao (*Guarea guidonia*), moca (*Andira inermis*), and yagrumbo hembra (*Cecropia schreberiana*) were the next three most important species. Almacigo (*Bursera simaruba*) was the most important species in the subtropical dry forest life zone and palma de sierra (*Prestoea montana*) was the most important species found in the lower montane wet/rain forests. Mangle blanco (*Laguncularia racemosa*) was the most important mangrove species.

Forest Health

There were few indications of unhealthy, stressed trees or widespread pest and disease problems. Only 13% of live trees had some type of damage or disease. Only 5.4% of trees showed indications of crown dieback, and when it did occur it was minor more often than not. More than one-half of the trees with crown dieback showed losses of 15% of the crown or less.

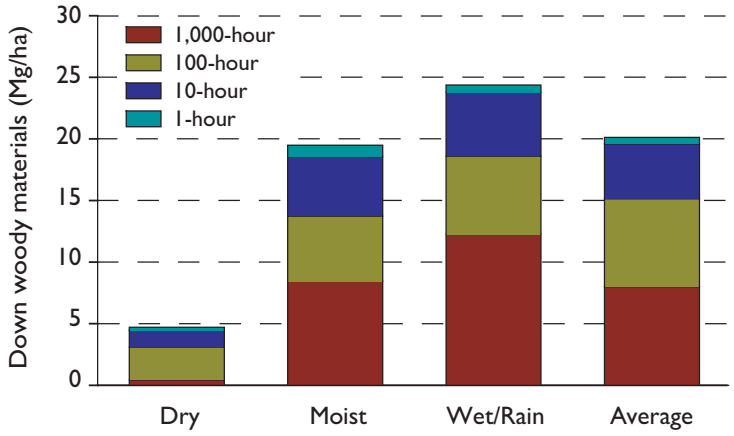
Occurrence of tree damage and disease



Forest Fire Fuels and Carbon

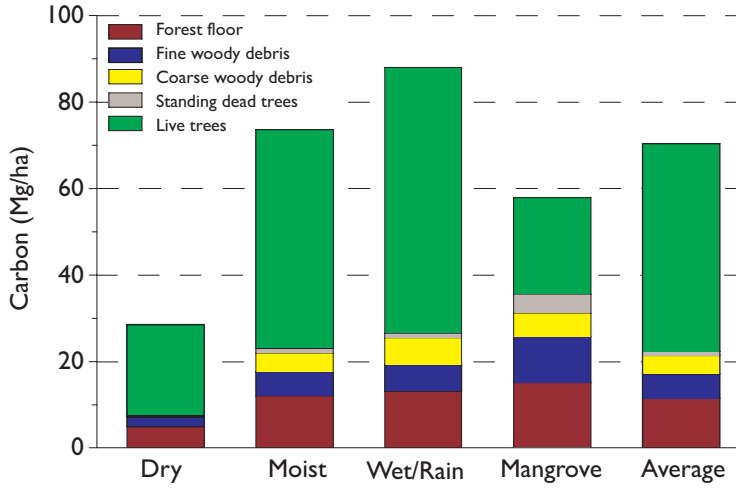
Amounts of down woody material (DWM), forest floor duff and forest floor litter increased as the forest environment became more humid. Small to medium (10- to 100-hour) forest fire fuels were most common in subtropical dry forests, while medium to large (100- to 1,000-hour) fuels were most common in all of the more humid forest life zone. Most of the DWM found in the forests was smaller diameter (8 to 20 cm) pieces of wood. Puerto Rico's forests lack large pieces of DWM on the forest floor, perhaps due to their early successional stage and the rarity of large trees in the forests.

Down woody material by fuel-hour classes



The majority of carbon sequestered by Puerto Rico's forests is found in live trees. Carbon in the forest floor and down woody materials also makes substantial contributions, however.

Mean forest carbon



Definition of Terms

Basal area. The area in square meters of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed in m^2/ha.

Aboveground biomass and carbon. Total biomass in oven-dry kilograms of all live aboveground tree parts, including stem, stump, branches, bark, seeds, and foliage, as estimated from regression equations that predict aboveground biomass from individual tree d.b.h. and total height measurements. Carbon is calculated by multiplying biomass by a factor of 0.5 estimated for all trees with d.b.h. ≥ 2.5 cm.

Coarse woody material. Down pieces of wood with a minimum small-end diameter of at least 8 cm and a length of at least 0.9 m.

D.b.h. Tree diameter in centimeters (outside bark) at breast height (1.37 cm aboveground).

Down woody material. A term used to collectively describe down and dead forest materials, fine woody material, coarse woody material, duff, litter, slash, live and dead herb and shrubs.

Fine woody material. Down pieces of wood with a diameter ≤ 8.0 cm, not including foliage or bark fragments.

Forest floor. The layer of fallen leaves, needles, twigs, fruits, dead herbaceous material, found on the forest floor. Forest floor includes the litter layer and the duff layer of decomposing organic material found just above mineral soil.

Forestland. For FIA in the Caribbean, there must be at least 10% canopy coverage by forest trees of any size, or land formerly having such tree cover, that is not currently developed for a nonforest use. The minimum area for classification as forest land is 0.4 ha.

Forest-type group. A classification of forestland based on life zone and forest type. For Puerto Rico, these groups are subtropical dry forest, subtropical moist forest, subtropical wet and rain forest, lower montane wet and rain forest, and mangrove forest.

Fuel hour classes. Fuel classes defined by the amount of time it roughly takes for moisture conditions to fluctuate. Larger coarse woody material will inherently take longer to dry out than smaller fine woody pieces (Small = 1-hour, Medium = 10-hour, Large = 100-hour, Coarse woody material = 1,000-hour).

Growing-stock trees. Living trees of commercial species classified as sawtimber, poletimber, saplings, and seedlings. For a tree to be considered growing stock, one-third or more of the gross volume in its saw-log section must meet grade, soundness, and size requirements for commercial logs, or the tree must have the potential to meet these requirements if it is poletimber size with 12.5 cm ≤ d.b.h. ≤ 27.5 cm.

Growing-stock volume. The cubic-meter volume of sound wood in growing-stock trees at least 12.5 cm d.b.h. from a 30-cm stump to a minimum 10-cm top diameter outside bark of the central stem.

Land area. The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river floodplains (omitting tidal flats below mean high tide), streams, sloughs, estuaries, and canals < 60 m wide, and lakes, reservoirs, and ponds < 1.8 ha in area.

Litter. Forest floor layer of freshly fallen leaves, needles, twigs, cones, bark chunks, dead moss, dead lichens, dead herbaceous stems, and flower parts.

Nonforestland. Land that has never supported forests and land formerly forested where timber production is precluded by development for other uses.

Reversion. Land was in a nonforest condition and is in the process of reverting to forestland.

Saplings. Live trees 2.5 to 12.5 cm d.b.h.

Seedlings. Trees < 2.5 cm d.b.h. and > 30 cm tall for hardwoods, > 15 cm tall for softwood, and > 1.3 cm in diameter at ground level for longleaf pine.

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