



February  
2010

# Forest Inventory & Analysis Factsheet

## Virgin Islands, 2004



### Forest Land Area

Forest covers 21 237 ha of the U.S. Virgin Islands (USVI), 61% of the total land area. St. John had the highest percentage of forest cover (92%), followed by St. Thomas (74%), and St. Croix (50%).

Forest cover has decreased 7% from 1994 to 2004, a loss of 1 671 ha of forest. Most notably, St. Croix lost 986 ha of subtropical dry forest (11% of the forest that was present in 1994) and St. Thomas lost 307 ha of subtropical dry forest (13% of the forest present in 1994).

#### Area of forest land in 1994 (ha)

Survey unit	Total		Percent forest
	land area	Forest	
St. Croix	21 466	11 537	53.7
St. John	5 080	4 797	94.4
St. Thomas	8 091	6 574	81.3
All units	34 637	22 908	66.1

#### Area of forest land in 2004 (ha)

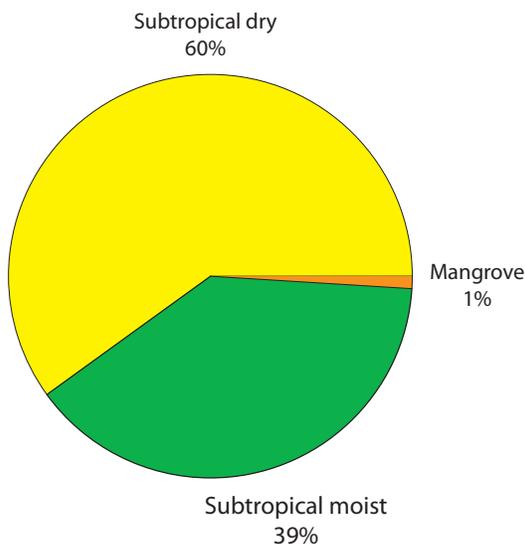
Survey unit	Total		Percent forest	Change
	land area	Forest		
St. Croix	21 466	10 619	49.5	-918
St. John	5 080	4 652	91.6	-1 455
St. Thomas	8 091	5 966	73.7	-609
All units	34 637	21 237	61.3	-1 671

### Forest-Type Composition

There are 12 533 ha of forest in the subtropical dry forest life zone, which occurs at lower elevations. At higher elevations, there are 8 704 ha of forest in the subtropical moist forest life zone.

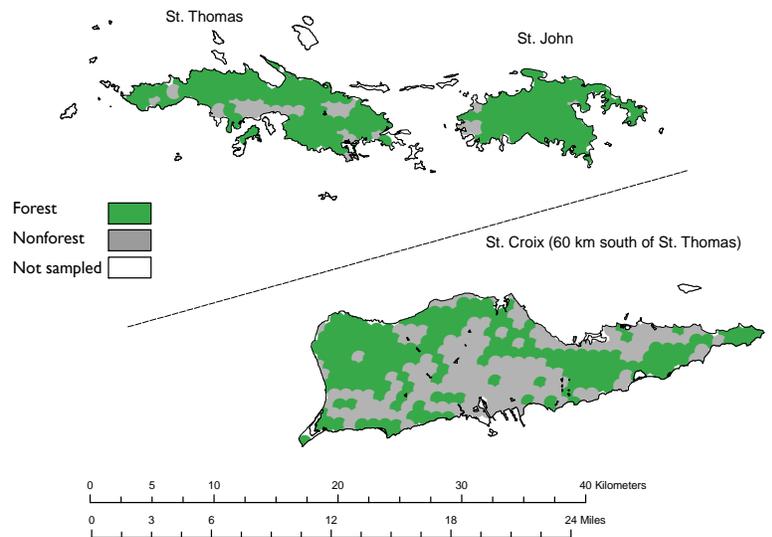
Subtropical moist forest had slightly greater species richness (74 species found) than subtropical dry forest (71 species found), even though it covers a smaller area (8 704 ha of moist forest vs. 12 533 ha of subtropical dry forest).

#### Area of forest by forest-type group



### Forest Distribution

#### Forest cover on the U.S. Virgin Islands, 2004

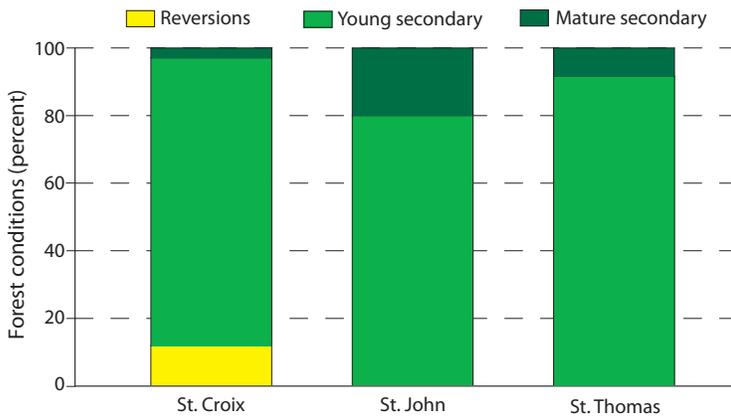


## Stand-Size Distribution

The forest of the USVI consist of very young stands, reflecting past and present land use and disturbances. Eighty percent of the forest inventoried was stands mostly made up of seedlings and saplings. Twenty percent of the forest found was in stands where small diameter (12.5 to 22.4 cm d.b.h.) trees predominated.

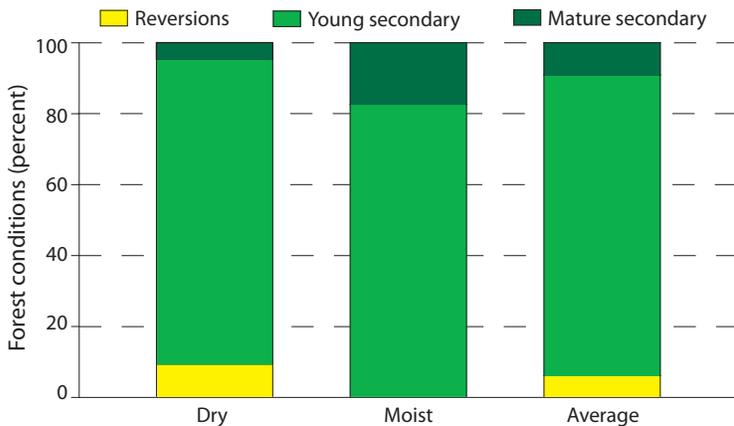
Areas recently colonized by forest vegetation were only found on St. Croix, while on St. John and St. Thomas, forest recolonization of former agricultural land is essentially complete.

Reversions, young, and mature stands, by island



Most of the forest found was relatively young and undeveloped. On St. Croix and St. Thomas, there were few (3% and 8%, respectively) stands considered to be mature secondary forest based on the number and size of trees present. The subtropical moist forest life zone on St. John had a higher percentage of mature forest (20%).

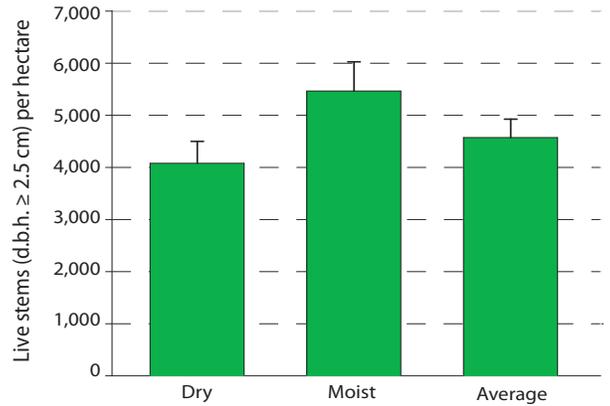
Reversions, young, and mature stands, by life zone



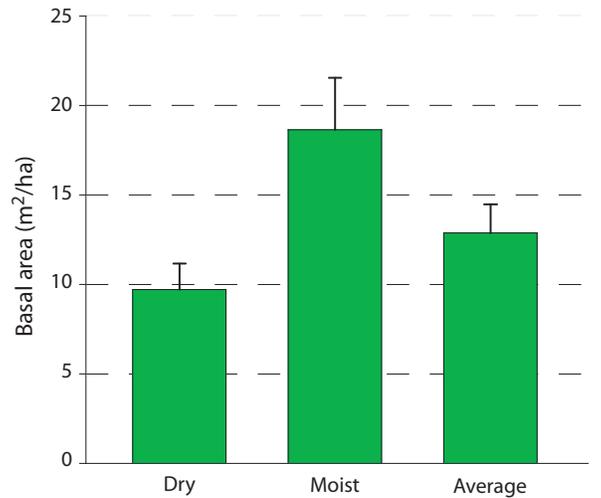
## Forest Structure

The forests of the USVI hold 90,925,585 trees over 2.5 cm in diameter, 247,682 m<sup>2</sup> of basal area, and 648,815 Mg of sequestered carbon. There were 4,573 trees, 12.9 m<sup>2</sup> of basal area, 17.7 m<sup>3</sup> of merchantable stem volume, and 48.5 Mg of aboveground biomass in an average hectare of forest.

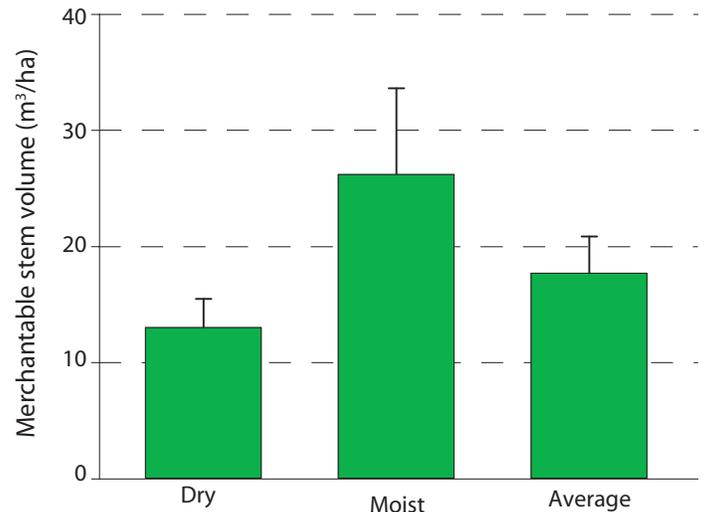
Mean stem density by forest-type group



Mean basal area by forest-type group



Mean growing-stock merchantable volume



## Species Composition

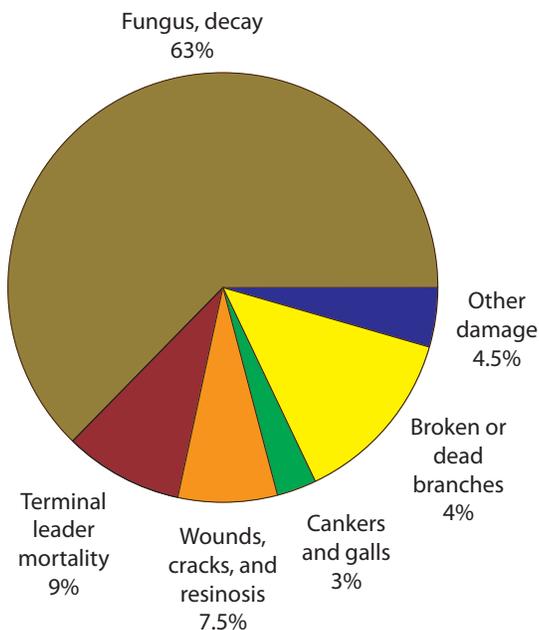
The forest inventory encountered 107 tree species, 47 species as trees with d.b.h.  $\geq 12.5$  cm. Sixty species were found only as saplings or seedlings.

Black mampoo (*Guapira fragrans*) was the most important species of trees with d.b.h.  $\geq 12.5$  cm, followed by gumbo limbo (*Bursera simaruba*) and the introduced species Spanish lime (*Melicoccus bijugatus*). However, for saplings with d.b.h.  $\leq 12.4$  cm, the white leadtree (*Leucaena leucocephala*) was the most important species.

## Forest Health

There were few indications of unhealthy, stressed trees or widespread pest and disease problems. Only 3.8% of live trees had some type of damage or disease. The most common disease was fungal infection (2.4% of live trees), as indicated by the presence of external fungal fruiting bodies or signs of advanced decay. Only 1.5% of trees showed indications of crown dieback, and when it did occur it was minor more often than not. Sixty-three percent of the trees with crown dieback showed losses of 15% of the crown or less.

### Occurrence of tree damage and disease

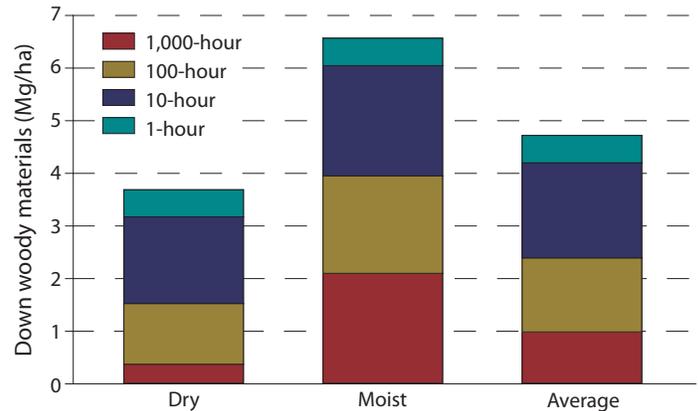


## Forest Fire Fuels and Carbon

Amounts of down woody material, forest floor duff, and forest floor litter increased as the forest environment became more humid. Subtropical dry and moist forests had comparable amounts of fine woody materials on the forest floor (1-hour fuels). Subtropical moist forests had increasingly greater amounts of larger forest fire fuels than subtropical dry forests. Large

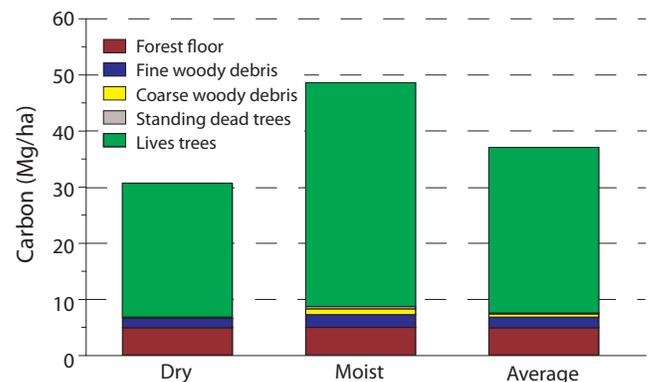
(1,000-hour) fuel loads were higher in subtropical moist forests. Most of the down woody material found in the forests was smaller diameter (8 to 20 cm) pieces of wood. The USVI forests lack large pieces of down woody material on the forest floor, perhaps due to their early successional stage and the rarity of large trees in the forests.

### Down woody material by fuel hour classes



The majority of carbon sequestered by forests on the USVI is found in live trees. However, Carbon in the forest floor and fine woody debris makes substantial contributions. Relatively little carbon is stored in coarse woody debris and standing dead trees.

### Mean forest carbon



## First Forest Inventory and Successful Implementation

This was the first forest inventory of the USVI conducted by the U.S. Department of Agriculture Forest Service's Forest Inventory and Analysis (FIA) program. The new systematic sampling system used by the FIA program was successfully adapted to the forest inventory challenges found in highly diverse Caribbean island tropical forests. The creation of a permanent forest inventory and monitoring grid in the USVI not only allows for the evaluation of the current status of forest resources. As the forest inventory plots are remeasured every 5 years, it also enables monitoring of changes over time. Impacts from development, hurricanes, forest fires, and many other potential pressures on the forest can be assessed at these permanent plots in the future.

## 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<sup>2</sup>/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.  $\geq$  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  $\leq$  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.

**Forest land.** 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 forest land based on life zone and forest type. For the U.S. Virgin Islands, these groups are subtropical dry forest, subtropical moist 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  $12.5 \text{ cm} \leq \text{d.b.h.} \leq 27.5 \text{ cm}$ .

**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  $< 60 \text{ m}$  wide, and lakes, reservoirs, and ponds  $< 1.8 \text{ ha}$  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.

**Nonforest land.** 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 forest land.

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

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

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