

A FUELWOOD PRODUCTION MODEL FOR A
TYPICAL RHODE ISLAND FOREST TRACT

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ABSTRACT

Regression models to estimate tree dry-weight from tree diameter for hardwoods growing on four major site types in Rhode Island were used to estimate biomass and fuelwood production for a typical forest tract in the state- the Carolina Management Area-located in Washington County in the town of Richmond, Rhode Island. Findings were projected statewide to obtain an estimate of the fuelwood production capacity of Rhode Island's forests.

The study area was categorized into forest type/soil drainage class units based on species composition and soil drainage. A 0.04 ha circular plot systematic cruise was conducted in each forest stand 2.0 ha and greater in area and containing at least twenty percent hardwoods based on basal area. A total of 107 0.04 ha plots, representing 1.0% of the forested area containing fuelwood species (425.3 ha), were sampled.

Biomass models were applied to plot data for the appropriate forest type/soil drainage classes in the management area to estimate biomass production. Biomass was converted to cordwood volumes using tree specific gravities previously reported for the major hardwood species and site types in Rhode Island.

Total hardwood dry-weight and cordwood production in the Carolina Management Area was estimated to be 27,875,902 kg or 19908 cd. Average unit-area production was estimated to be 65544 kg or 47 cd per hectare (19 cd/acre). Mean and current annual increments were 0.9 ± 0.24 cd/ha/yr and 1.6 cd/ha/yr, respectively.

Annual production averaged 367 cd.

Well drained and moderately well drained sites were the most productive site types for all forest stands except red maple which was the most productive on poorly to very poorly drained sites.

In evaluating the relationship of site index to biomass production, site index values appeared relatively insensitive to differences in dry-weight production among the hardwood forest type/soil drainage class combinations. Site index did not appear to be an accurate predictor of site productivity.

The standing hardwood cordwood volume projected for the state was estimated to be 7,527,788 cd or 54.5 cd/ha (22.1 cd/acre). Annual production was 142,132 cd with a mean annual increment of 1.0 cd/ha/yr. Mixed hardwood and oak types contained 83% of the state's total standing hardwood cordwood volume and accounted for 80% of the annual production. Red maple, mixed hardwood, and oak types were the most productive with annual cordwood increments of 1.7 cd/ha, 1.2 cd/ha, and 0.9 cd/ha, respectively.

With the statewide annual fuelwood harvest estimated to be 210,000 cd, the annual production estimate of 142,132 cd falls short of the annual harvest by 32%. These statistics are misleading since it is likely that much of the wood cut for fuelwood comes from dead and unhealthy trees in overstocked stands, which contribute little to annual cordwood production. However, improved management practices are needed to increase fuelwood production in Rhode Island forests.