Section: Appendix A

Forestry Volume Unit to Biomass Weight Examples

(selected examples from the north central region)

Species Group	Specific gravity wood[a]	Specific gravity bark[a]	Green MC wood & bark (%)	Green weight wood & bark lb/ft^3	Dry weight wood & bark lb/ft^3	Green weight of solid cord[b] (lbs)	Green weight of solid cord[b] (tons)[c]	Air-dry tons per solid cord[b] 15% MC[c]	Oven-dry tons per solid cord 0% MC[c]
Softwood									
Southern Pine	0.47	0.32	50	64	32	5,056	2.5	1.5	1.3
Jack Pine	0.40	0.34	47	54	29	4,266	2.1	1.3	1.1
Red Pine	0.41	0.24	47	54	29	4,266	2.1	1.3	1.1
White Pine	0.37	0.49	47	53	28	4,187	2.1	1.3	1.1
Hardwood									
Red Oak	0.56	0.65	44	73	41	5,767	2.9	1.9	1.6
Beech	0.56	0.56	41	64	38	5,056	2.5	1.7	1.5
Sycamore	0.46	0.45	55	62	28	4,898	2.4	1.3	1.1
Cottonwood	0.37	0.43	55	59	27	4,661	2.3	1.2	1.0
Willow	0.34	0.43	55	56	25	4,424	2.2	1.1	1.0

Source:

Smith, B. Factors and Equations to Estimate Forest Biomass in the North Central Region. 1985. USDA Forest Service, North Central Experimental Station. Research Paper NC-268 (This paper quotes many original literature sources for the equations and estimates.)

Note: *A caution:* In extensive online research for reference sources that could provide guidance on estimating biomass per unit area from volume data (eg m^3, ft^3 or board ft), several sources of conversion factors and "rules of thumb" were found that provided insufficient information to discern whether the reference was applicable to estimation of biomass availibility. For instance moisture contents were not associated with either the volume or the weight information provided. These "rule of thumb" guides can be useful when fully understood by the user, but they can be easily misinterpreted by someone not understanding the guide's intent. For this reason, most simple "rules of thumb guides" are not useful for converting forest volume data to biomass estimates.

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[a] The SG numbers are based on weight oven-dry and volume when green (Smith, 1985; table 1) of wood and bark respectively. Wood and bark are combined for other columns (Smith, 1985, table 2).

[b] A standard solid cord for the north central region was determined by Smith, 1985 to be 79 ft^3 rather than the national average of 80 ft^3 as used in table A9 in appendix A..

[c] The green weight values in lbs provided by the Smith (1985) paper were converted to green tons, air-dry tons and oven-dry tons for convenience of the user.