

Minnesota's Forest Resources, 2008

Research Note NRS-41

This publication provides an overview of forest resource attributes for Minnesota based on an annual inventory conducted by the Forest Inventory and Analysis (FIA) program at the Northern Research Station of the U.S. Forest Service. These estimates, along with web-posted core tables, will be updated annually. For more information please refer to page 4 of this report.

Table 1. – Annual estimates, uncertainty, and change

	Estimate	Sampling error (%)	Change since 2003 (%)
Forest Land Estimates			
Area (1,000 acres)	16,990.3	0.5	4.7
Number of live trees 1-inch diameter or larger (million trees)	13,057.5	1.2	8.1
Dry biomass of live trees 1-inch diameter or larger (1,000 tons)	458,098.8	1.1	5.0
Net volume of live trees (1,000,000 ft ³)	18,099.3	1.2	2.6
Annual net growth of live trees (1,000 ft ³ /year)	428,431.4	3.8	NA
Annual mortality of live trees (1,000 ft ³ /year)	340,773.7	2.9	NA
Annual harvest removals of live trees (1,000 ft ³ /year)	256,196.2	6.4	NA
Annual other removals of live trees (1,000 ft ³ /year)	31,469.4	15.8	NA
Timberland Estimates			
Area (1,000 acres)	15,595.4	0.6	5.8
Number of live trees 1-inch diameter or larger (million trees)	12,069.8	1.3	8.4
Biomass of live trees 1-inch diameter or larger (1,000 tons)	428,366.0	1.1	4.9
Net volume of live trees (1,000,000 ft ³)	16,847.2	1.2	3.3
Net volume of growing-stock trees (1,000,000 ft ³)	14,524.7	1.3	-4.7
Annual net growth of growing-stock trees (1,000 ft ³ /year)	420,760.0	3.4	NA
Annual mortality of growing-stock trees (1,000 ft ³ /year)	243,017.6	2.7	NA
Annual harvest removals of growing-stock trees (1,000 ft ³ /year)	234,575.0	6.4	NA
Annual other removals of growing-stock trees (1,000 ft ³ /year)	62,459.3	13.7	NA

Note: When available, sampling errors/bars provided in figures and tables represent 68 percent confidence intervals

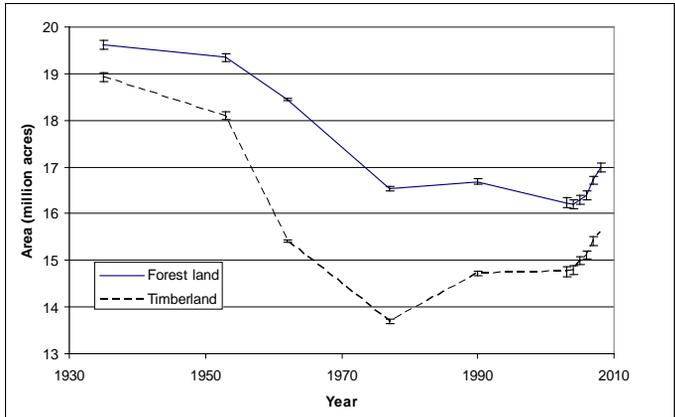


Figure 1. — Area of timberland and forest land by year.

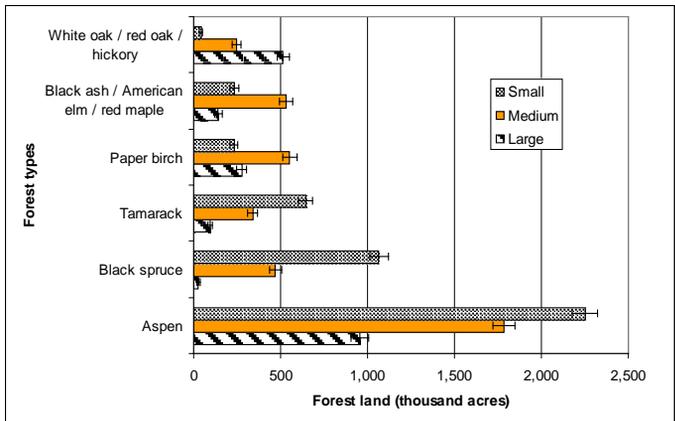


Figure 2. — Area of forest land area by top six forest types and stand size class, 2004-2008.

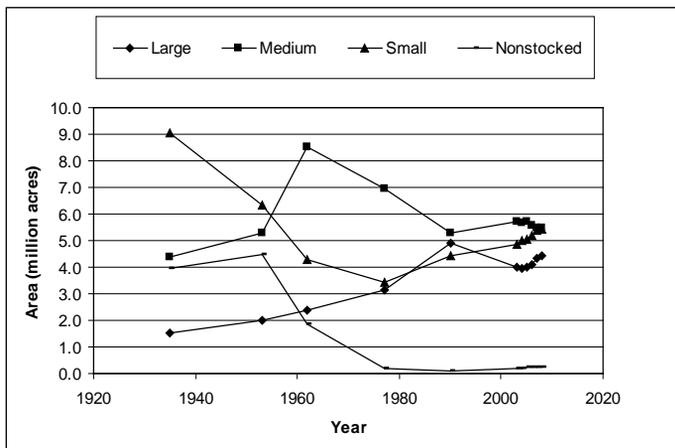


Figure 3. — Area of timberland by stand size class and year.



Table 2. – Top 10 tree species by statewide volume estimates , 2004-2008

Rank	Species	Volume of live trees on forestland (1,000,000 ft ³)	Sampling Error (%)	Change since 2003 (%)	Volume of sawtimber trees on timberland (1,000,000 bdf ^t)	Sampling Error (%)	Change since 2003 (%)
1	Quaking aspen	3,464.4	2.6	-7.3	6,664.4	3.9	-15.2
2	Paper birch	1,225.8	3.3	-11.8	1,336.8	5.7	-17.2
3	Northern white-cedar	1,074.9	5.9	5.8	2,813.3	7.4	-4.9
4	Red pine	1,022.9	6.9	22.2	3,955.7	7.8	29.2
5	Bur oak	1,008.0	4.8	15.5	1,945.1	6.7	-10.0
6	American basswood	967.6	4.9	6.9	2,305.7	6.4	-2.1
7	Black ash	967.5	4.6	8.6	1,316.2	7.2	5.6
8	Northern red oak	959.1	5.0	8.6	2,747.8	6.4	-2.9
9	Black spruce	881.9	4.6	-3.6	854.2	7.4	-0.2
10	Tamarack (native)	690.1	5.4	4.3	1,367.7	7.0	0.2
	Other softwood species	2,076.4	3.8	3.6	5,447.8	4.6	2.7
	Other hardwood species	3,760.5	2.8	6.5	5,851.1	4.8	-16.2
	All species	18,099.3	1.2	2.6	36,605.8	1.9	-5.2

Ownership of forest land

- Public 56%
- Private 44%

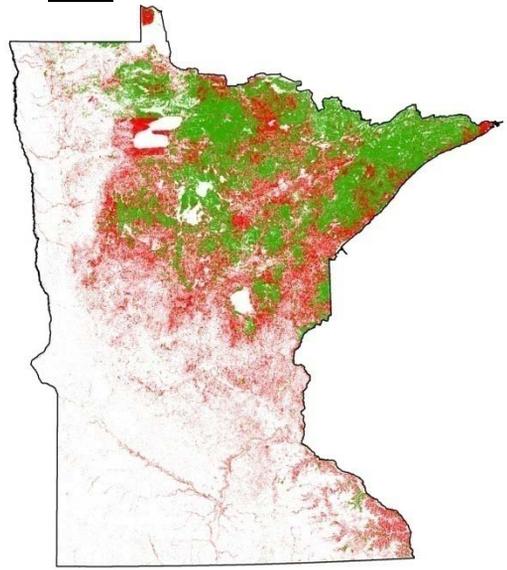


Figure 4. — Area of forest land by major owner group (33% of Minnesota land is forested).

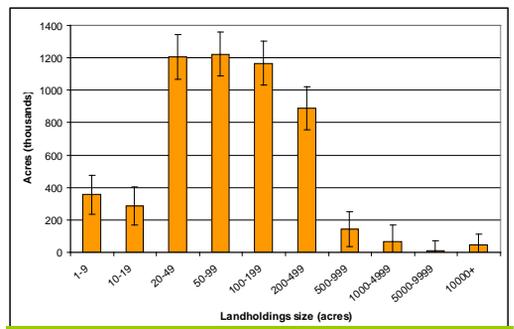


Figure 5. — Area of family forest land by size of forest landholding.

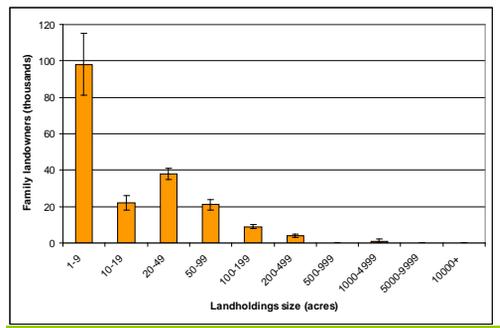


Figure 6. — Number of family forest landowners by size of forest landholding.

Minnesota Issue Update – Biomass

A new procedure for estimating biomass was implemented in 2008 to promote national consistency and provide better estimates of individual tree biomass components. This new procedure, the component ratio method (CRM) (Heath et al. 2009), is based on: converting the sound volume of wood in the bole to biomass using a compiled set of wood specific gravities; calculating the biomass of bark on the bole using compiled set of percent bark and bark specific gravities; estimating the stump, tops, and limbs as a proportion of the bole based on component proportions; and summing the parts for a total aboveground live biomass. As a result of this new procedure FIA can now report estimates of the biomass in the bole, tops and limbs, stump, bark, and foliage. This is especially relevant given the interest in utilizing tops and limbs as a bioenergy source.

Live tree and sapling aboveground biomass includes bole, bark, stump, top and limbs but excludes foliage. Figure 7 illustrates differences by diameter class in all live aboveground biomass on timberland estimated using the new component ratio method versus the old regional method.

Figure 8 shows the CRM biomass by tree component. Table 3 shows the proportion of aboveground biomass by tree component, for trees over 1-inch in diameter, by hardwoods and softwoods.

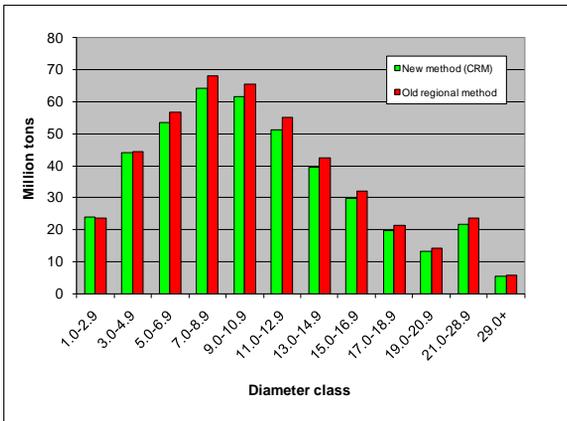


Figure 7. — Comparison of biomass estimates using new CRM method and old regional method.

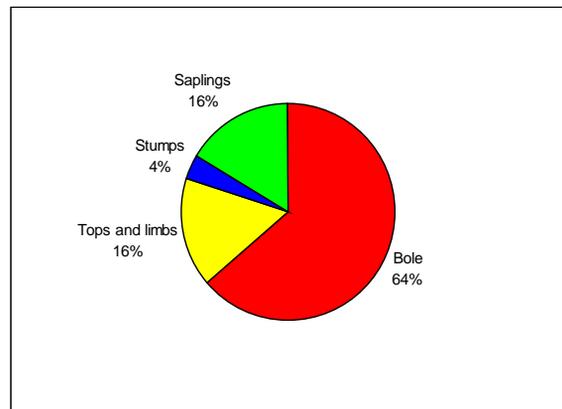


Figure 8. — Biomass on timberland by tree component, Minnesota, 2004-2008.

Table 3. – Aboveground biomass (oven-dry tons) on timberland by tree component.

Tree component	Softwoods		Hardwoods		Total	
	Tons	Percent	Tons	Percent	Tons	Percent
Bole bark	10,078,329	9.25%	35,768,020	11.20%	45,846,349	10.70%
Bole wood	60,934,600	55.96%	166,821,028	52.22%	227,755,628	53.17%
Bole (trees 5.0+ inches d.b.h.) total	71,012,928	65.21%	202,589,048	63.41%	273,601,977	63.87%
Top and limb bark	1,794,725	1.65%	10,160,770	3.18%	11,955,495	2.79%
Top and limb wood	10,765,184	9.89%	47,582,851	14.89%	58,348,035	13.62%
Top and limb (trees 5.0+ inches d.b.h.) total	12,559,908	11.53%	57,743,621	18.07%	70,303,529	16.41%
Stump bark	630,660	0.58%	2,016,532	0.63%	2,647,193	0.62%
Stump wood	4,010,129	3.68%	9,663,394	3.02%	13,673,524	3.19%
Stump (trees 5.0+ inches d.b.h.) total	4,640,790	4.26%	11,679,927	3.66%	16,320,717	3.81%
Sapling bark	2,902,159	2.67%	8,271,985	2.59%	11,174,144	2.61%
Sapling wood	17,782,865	16.33%	39,182,744	12.27%	56,965,609	13.30%
Sapling (trees 1 to 4.9 inches d.b.h.) total	20,685,024	18.99%	47,454,729	14.85%	68,139,754	15.91%
Total live tree and sapling biomass	108,898,651	100.00%	319,467,325	100.00%	428,365,977	100.00%



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FIA Program Information

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Special issue citation

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