

Minnesota's Forest Resources, 2010

Research Note NRS-112

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 2010	Sampling error (%)	Change since 2005 (%)
Forest Land Estimates			
Area (1,000 acres)	17,291.0	.5	5.6
Number of live trees 1-inch diameter or larger (million trees)	13,590.5	1.2	9.5
Dry biomass of live trees 1-inch diameter or larger (1,000 tons)	469,219.7	1.0	6.0
Net volume of live trees (1,000,000 ft ³)	18,445.0	1.2	4.3
Annual net growth of live trees (1,000 ft ³ /year)	426,472.5	3.4	7.8
Annual mortality of live trees (1,000 ft ³ /year)	349,192.6	2.6	3.1
Annual harvest removals of live trees (1,000 ft ³ /year)	243,286.2	6.0	-13.2
Annual other removals of live trees (1,000 ft ³ /year)	8,793.2	27.7	19.3
Timberland Estimates			
Area (1,000 acres)	15,860.8	0.6	6.1
Number of live trees 1-inch diameter or larger (million trees)	12,500.8	1.2	8.6
Biomass of live trees 1-inch diameter or larger (1,000 tons)	438,416.0	1.1	5.8
Net volume of live trees (1,000,000 ft ³)	17,151.7	1.2	4.1
Net volume of growing-stock trees (1,000,000 ft ³)	14,640.7	1.3	-2.9
Annual net growth of growing-stock trees (1,000 ft ³ /year)	385,535.6	2.9	-17.6
Annual mortality of growing-stock trees (1,000 ft ³ /year)	249,200.0	2.6	6.0
Annual harvest removals of growing-stock trees (1,000 ft ³ /year)	220,623.8	6.1	-12.9
Annual other removals of growing-stock trees (1,000 ft ³ /year)	35,073.7	17.9	-37.3

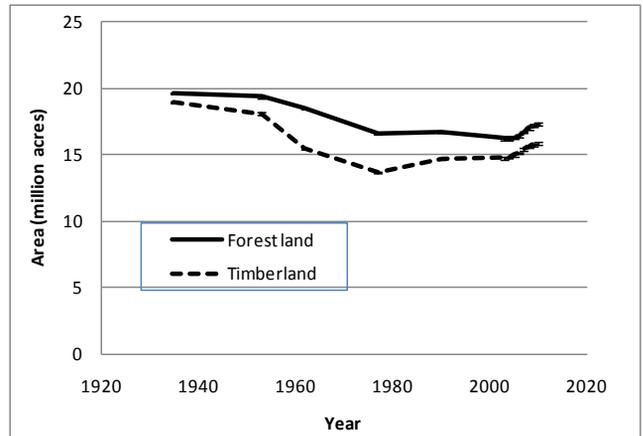


Figure 1. – Area of timberland and forest land by year.

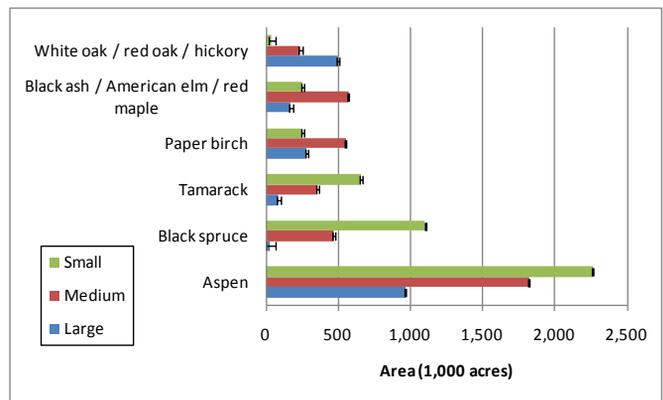


Figure 2. – Area of forest land by top six forest types and stand size class, 2006-2010.

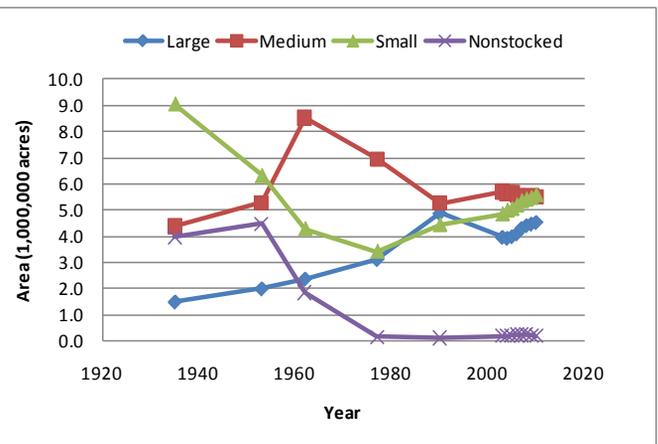


Figure 3. – Area of timberland by stand size class and year.

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



Table 2. – Top 10 tree species by statewide volume estimates, 2006-2010

Rank	Species	Volume of live trees on forest land (1,000,000 ft ³)	Sampling error (%)	Change since 2005 (%)	Volume of sawtimber trees on timberland (1,000,000 bdf)	Sampling error (%)	Change since 2005 (%)
1	Quaking aspen	3,462.9	2.64	-5.43	6,362.1	4.02	-16.16
2	Paper birch	1,188.5	3.35	-10.31	1,222.7	5.8	-22.11
3	Red pine	1,118.2	6.86	22.78	4,263.9	7.61	26.27
4	Northern white-cedar	1,117.6	5.95	8.64	2,878.3	7.31	-0.90
5	Bur oak	1,027.3	4.64	13.02	1,956.9	6.58	-6.94
6	Black ash	1,000.6	4.52	7.91	1,387.4	7.03	4.86
7	Northern red oak	965.9	5.16	5.94	2,900.9	6.41	1.24
8	American basswood	957.2	4.94	5.75	2,436.5	6.42	8.80
9	Black spruce	924.0	4.65	6.99	839.1	7.7	2.83
10	Tamarack (native)	699.5	5.42	4.08	1,284.9	7.16	-7.29
	Other softwood species	2,109.6	3.53	5.25	5,384.2	4.66	0.53
	Other hardwood species	3,873.7	2.73	8.85	6,237.3	4.79	-3.70
	All species	18,445.0	1.22	4.34	37,154.3	1.93	-2.24

Ownership of forest land

- Public 56%
- Private 44%
- Nonforest

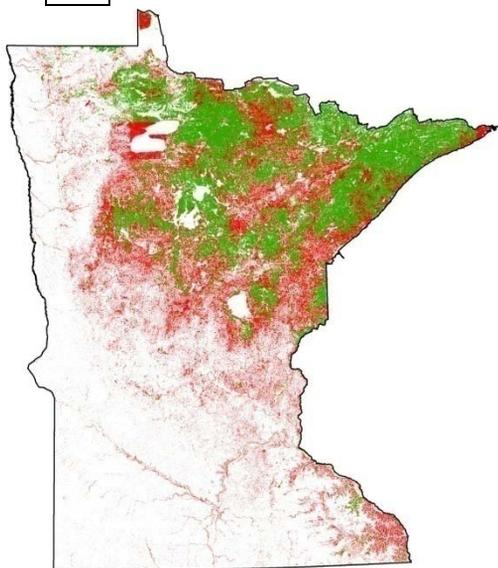


Figure 4. – Area of forest land by major owner group (34% of Minnesota land is forested), 2006-2010.

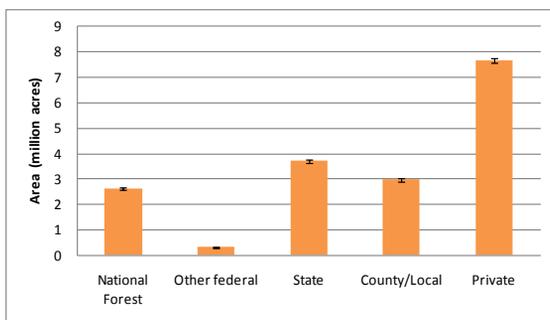


Figure 5. – Area of forest land by ownership group, 2006-2010.

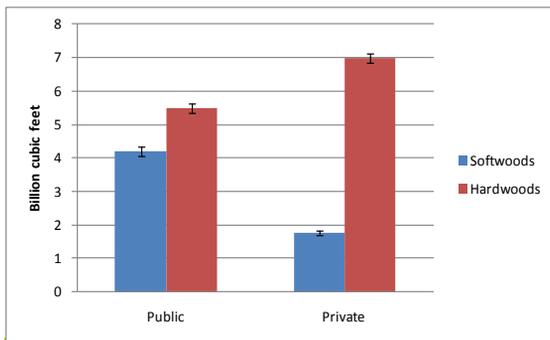


Figure 6. – Forest land live tree volume by owner group and major species group, 2006-2010.

Minnesota Issue Update – Red pine

In presettlement times, pine forests covered approximately 5.8 million of Minnesota's 31.5 million acres of forest land (Zon 1935). By 1936, the area of pine timberland had declined to 1.6 million acres due to land clearing, logging, and fire. This decline continued over the next few decades. However, more recent inventories (Fig. 7) show an increase in pine types, primarily in red pine (*Pinus resinosa*). By 2010, the area in pine had increased to 1.1 million acres with an additional 200 thousand acres of pine forests on reserved forest lands (primarily in the Boundary Waters Canoe Area Wilderness and Voyageurs National Park).

Red pine has been the most widely planted species in the Lake States region over the past 70 years (Gilmore et al. 2006). Over that period approximately 46 percent of the stands artificially regenerated in Minnesota were planted to red pine (Fig. 8). More than half of the area in red pine is the result of artificial regeneration. Planting of red pine, however, has declined significantly over the last decade and the percentage of total red pine trees in smaller diameter classes is significantly lower than that of other species (Fig. 9).

High red pine net growth rates (Fig. 10) are the result of a large number of trees crossing the 5-inch d.b.h. threshold as ingrowth and very low mortality rates on this long-lived species. Jack pine, a relatively short-lived species, has a much lower net growth rate due to high rates of mortality in this aging resource. The net growth rate of red pine may decline in future inventories due to the relatively small number of trees currently in the 1.0-2.9 and 3.0-4.9 inch diameter classes.

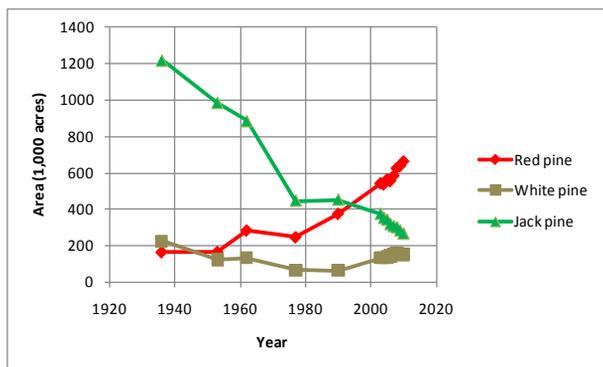


Figure 7. – Area of timberland in pine forest types by inventory year.

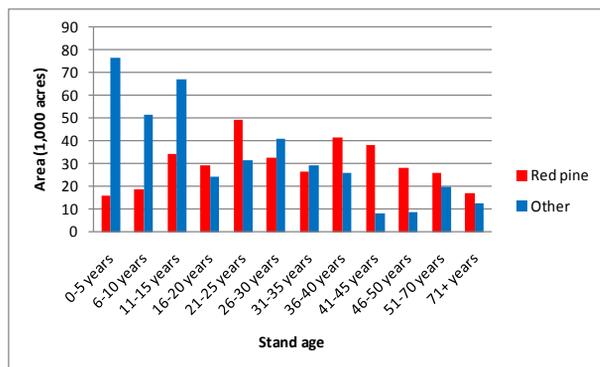


Figure 8. – Area of artificially regenerated timberland by type and stand age class, 2006-2010.

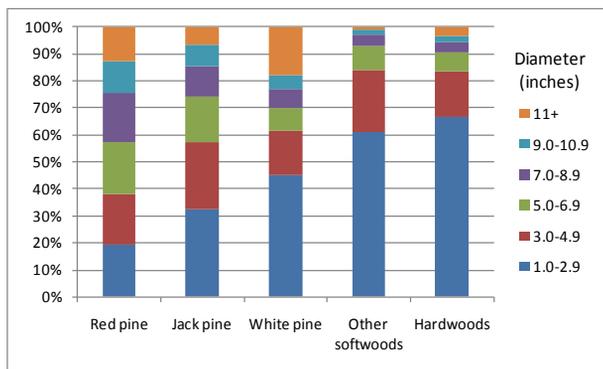


Figure 9. – Percent of live trees by diameter class for selected species and species groups, 2006-2010.

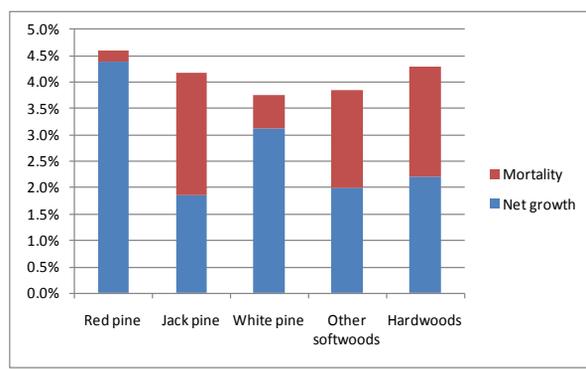


Figure 10. – Average annual net growth and mortality on forest land as percent of live volume for selected species and species groups, 2006-2010.



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FIA Program Information

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Special issue citation

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