



# Minnesota's Forest Resources, 2011

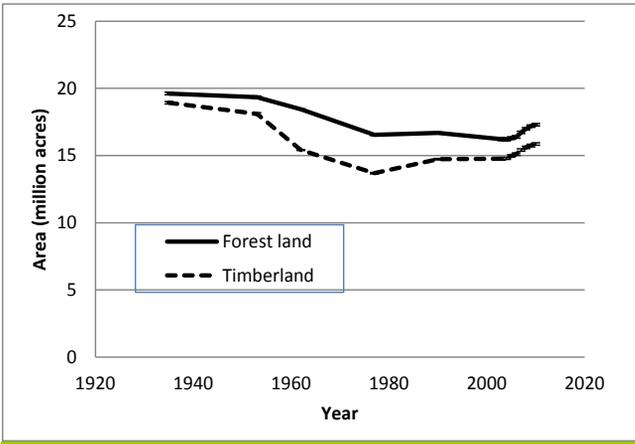
Research Note NRS-134

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.

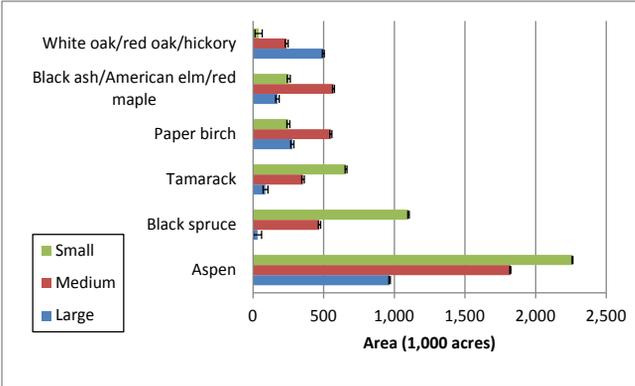
**Table 1. – Annual estimates, uncertainty, and change**

	Estimate 2011	Sampling error (%)	Change since 2006 (%)
<b>Forest Land Estimates</b>			
Area (1,000 acres)	17,370.4	0.5	6
Number of live trees 1-inch diameter or larger (million trees)	13,731.6	1.2	9.6
Dry biomass of live trees 1-inch diameter or larger (1,000 tons)	473,570.5	1.0	6.5
Net volume of live trees (1,000,000 ft <sup>3</sup> )	18,616.1	1.2	5
Annual net growth of live trees (1,000 ft <sup>3</sup> /year)	404,523.0	3.4	-6.6
Annual mortality of live trees (1,000 ft <sup>3</sup> /year)	352,088.4	2.5	5.9
Annual harvest removals of live trees (1,000 ft <sup>3</sup> /year)	233,191.2	6.2	-15.3
Annual other removals of live trees (1,000 ft <sup>3</sup> /year)	9,295.8	26.9	65.5
<b>Timberland Estimates</b>			
Area (1,000 acres)	15,929.0	0.6	5.7
Number of live trees 1-inch diameter or larger (million trees)	12,578.9	1.2	8.1
Biomass of live trees 1-inch diameter or larger (1,000 tons)	442,446.4	1.1	6.1
Net volume of live trees (1,000,000 ft <sup>3</sup> )	17,314.3	1.2	4.7
Net volume of growing-stock trees (1,000,000 ft <sup>3</sup> )	14,815.5	1.3	-0.5
Annual net growth of growing-stock trees (1,000 ft <sup>3</sup> /year)	370,240.1	2.9	-20.1
Annual mortality of growing-stock trees (1,000 ft <sup>3</sup> /year)	251,355.7	2.6	8.4
Annual harvest removals of growing-stock trees (1,000 ft <sup>3</sup> /year)	210,054.4	6.2	-15.6
Annual other removals of growing-stock trees (1,000 ft <sup>3</sup> /year)	33,964.2	18.5	-12.1

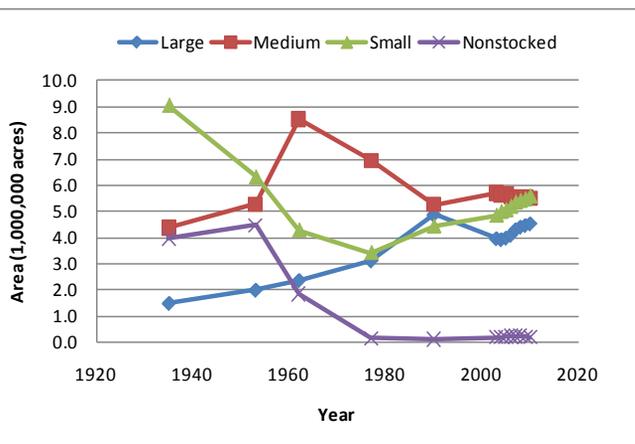
Note: When available, sampling errors/bars provided in figures and tables represent 68 percent confidence intervals



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



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



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



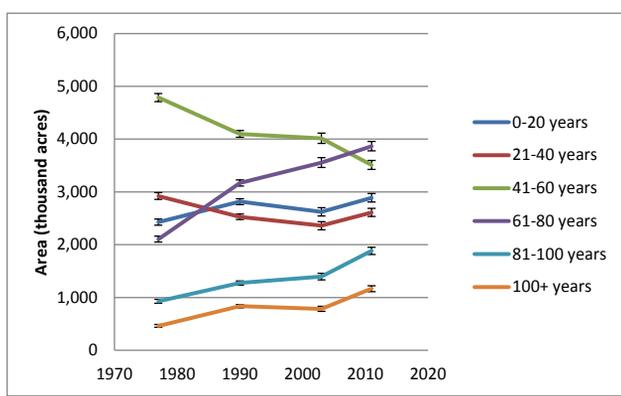
**Table 2. – Top 10 tree species by statewide volume estimates , Minnesota, 2006-2010**

Rank	Species	Volume of live trees on forest land (1,000,000 ft <sup>3</sup> )	Sampling error (%)	Change since 2006 (%)	Volume of sawtimber trees on timberland (1,000,000 bdf)	Sampling error (%)	Change since 2006 (%)
1	Quaking aspen	3,454.9	2.6	-3.6	6,244.1	4.0	-14.5
2	Paper birch	1,169.1	3.4	-9.5	1,220.3	5.9	-19.7
3	Red pine	1,153.4	6.8	24.6	4,404.1	7.5	27.5
4	Northern white-cedar	1,133.8	6	7.9	2,874.3	7.4	-2.2
5	Bur oak	1,031.9	4.6	10.6	2,066.9	6.7	1.7
6	Black ash	1,014.9	4.5	7	1,420.9	6.9	6.0
7	American basswood	973.6	4.9	7.4	2,576.0	6.3	18.7
8	Northern red oak	955.8	5.2	2.6	2,966.8	6.4	6.3
9	Black spruce	933.2	4.8	7	867.8	7.8	5.9
10	Tamarack (native)	704.0	3.4	5	1,158.3	5.5	0.2
	Other softwood species	2,153.4	3.7	6.3	5,610.5	4.7	0.1
	Other hardwood species	3,937.9	2.7	9.6	6,451.6	4.7	4.4
	All species	18,616.1	1.2	5.0	37,861.6	1.9	1.5

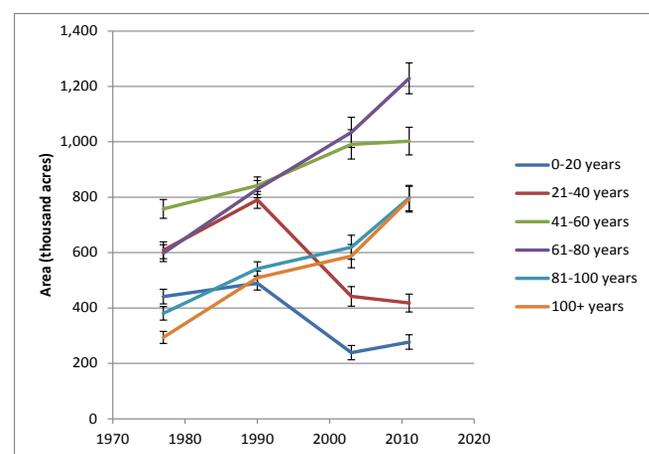
## Minnesota Issue Update – Maturing forests and removals

In the 34 years since the 1977 inventory there has been a shift in the stand age-class distribution of Minnesota’s timberland. In 1977 the largest age class was the 41 to 60-year age group with nearly 5 million acres (Fig.4). By 2011 the largest age class was the 61 to 80-year age group at nearly 4 million acres.

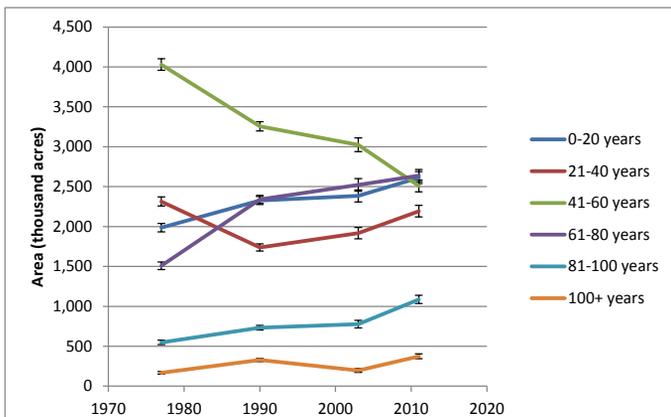
The age-class distribution of timberland differs significantly between upland and lowland forest types. The lowland forest types include black spruce, tamarack, northern white-cedar, lowland hardwoods, and cottonwood/willow. For the most part the lowland forest types have had a larger percent increase in the older age classes than the upland types (Fig. 5a and 5b).



**Figure 4. – Area of timberland by stand-age class and inventory year.**

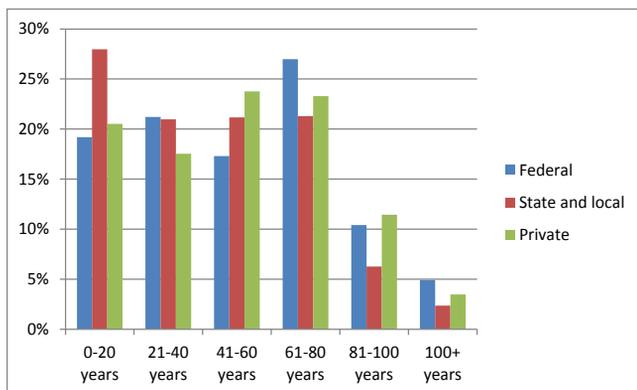


**Figure 5a. – Area of lowland timberland by stand-age class and inventory year.**



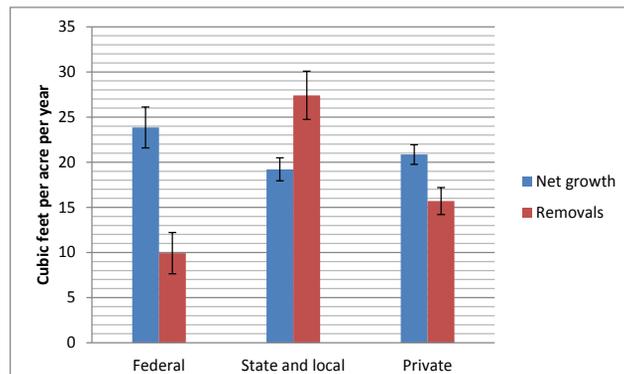
**Figure 5b. – Area of upland timberland by stand-age class and inventory year.**

The area in each stand-age class varies by major ownership group (Fig. 6). State and local governments have a higher percentage of upland timberland in the 0 to 20-year age class than private or federal owners but the lowest percentage in the 100+ stand-age class. The federal government has the lowest percentage in the 0 to 20-year age class and the highest percentage in the 100+ stand-age class.



**Figure 6. – Upland timberland, percent of each ownership in each stand-age class, Minnesota 2011.**

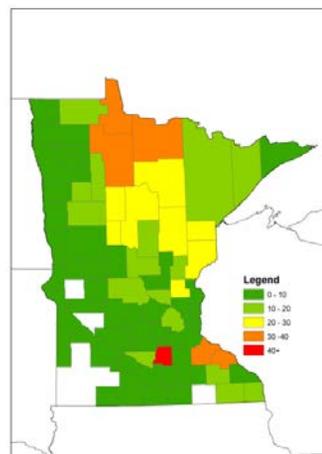
While the distribution of timberland by stand age-class does not vary tremendously between ownership classes the same cannot be said for removals on upland timberland (Fig. 7). Live tree average annual cubic foot per acre removals on State and local government upland timberlands were approximately 75 percent higher than on private lands and nearly three times higher than on federal lands.



**Figure 7. – Average annual net growth and removals of live trees, in cubic feet per acre, on upland timberland that was timberland during the 2002-2006 inventory and the 2007-2011 inventory.**

Growth per acre may increase on State and local government upland timberland as saplings in the 0 to 20 year stand-age class grow into the 5 inch diameter class. Growth per acre on Federal lands may decrease as older stands are more susceptible to mortality.

Upland timberland removals are generally higher in the north-central portion of the state (Fig. 8). Removals were recorded on 445 of the 3,976 upland plots. The number of plots used to derive these county level estimates depends on both the size of the county and the percentage of land that is in upland forest. Upland removals for Le Sueur County, shaded red, occurred on only 1 plot while upland removals for Lake of the Woods County (the northern most county) occurred on 13 plots.



**Figure 8. – Upland timberland average annual live tree cubic foot removals per acre, Minnesota, 2011.**



### Citation for this Publication

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### FIA Program Information

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Estimates, tabular data, and maps from this report may be generated at: <http://apps.fs.fed.us/Evalidator/tmattribute.jsp>

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