USDA Forest Service, US Department of Agriculture
Northern Research Station

Maine's Forest Resources, 2009

Research Note NRS-91

This publication provides an overview of forest resource attributes for Maine 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 (2009)	Sampling error (%)	Change (%) since 2003
Forest Land Estimates			
Area (1,000 acres)	17,660	0.4	-0.3
Number of live trees > 1-inch diameter (million trees)	23,679	1.5	9.5
Dry biomass of live trees > 1-inch diameter (1,000 tons)	665,331	1.0	1.7
Net volume in live trees > 5-inch diameter (1,000,000 ft^3)	25,419	1.2	-0.6
Annual net growth of live trees > 5-inch diameter (1,000 ft^3/year)	625,960	2.3	9.9
Annual mortality of live trees > 5-inch diameter (1,000 ft^3/year)	331,830	2.9	18.3
Annual harvest removals of live trees > 5-inch diameter (1,000 ft^3/year)	623,960	5.3	23.7
Annual other removals of live trees > 5-inch diameter (1,000 ft^3/year)	4,225	65.7	-70.0
Timberland Estimates			
Area (1,000 acres)	17,165	0.5	-0.2
Number of growing-stock trees (million trees)	21,431	1.6	10.3
Biomass of live trees > 1-inch diameter (1,000 tons)	649,135	1.1	1.6
Net volume of live trees > 5-inch diameter (1,000,000 ft^3)	24,759	1.2	-0.8
Net volume of growing-stock trees (1,000,000 ft^3)	23,207	1.3	-0.6
Annual net growth of growing-stock trees (1,000 ft^3/year)	612,810	2.3	19.6
Annual mortality of growing-stock trees (1,000 ft^3/year)	251,713	3.2	2.4
Annual harvest removals of growing-stock trees (1,000 ft^3/year)	550,454	5.3	16.3
Annual other removals of growing-stock trees (1,000 ft^3/year)	14,843	41.6	-72.0

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

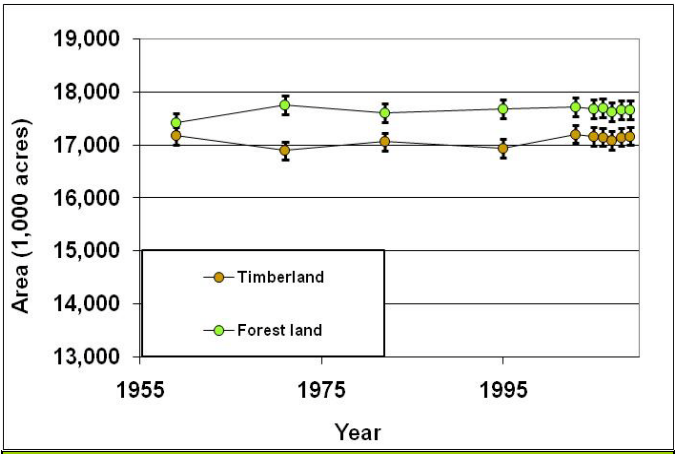

Figure 1. – Area of timberland and forest land by year.

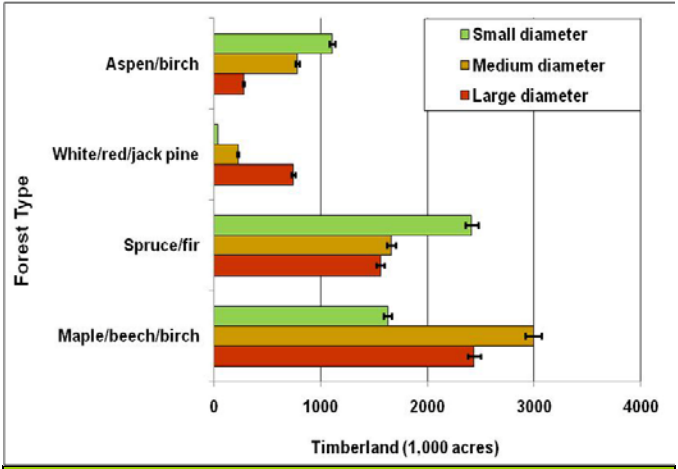

Figure 2. – Area of forest land area by top six forest types and stand size class, 2005-2009.

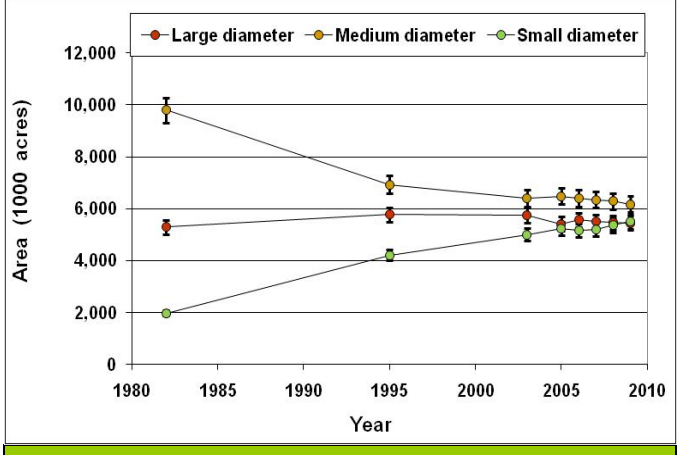

Figure 3. – Area of timberland by stand size class and year.

Table 2. – Top 10 tree species by statewide volume estimates, Maine 2005-2009

Rank	Species	Volume of live trees on forest land (1,000,000 ft^3)	Sampling error (%)	Change since 2003 (%)	Volume of sawtimber trees on timberland (1,000,000 bdft)	Sampling error (%)	Change since 2003 (%)
1	Red maple	3,170	2.8	1.5	4,808	4.8	1.0
2	Red spruce	3,126	3.7	-6.6	7,987	4.7	-3.8
3	Eastern white pine	2,719	5.2	5.3	10,127	5.8	5.5
4	Northern white-cedar	2,211	4.8	3.8	4,704	5.7	11.1
5	Balsam fir	2,197	3.0	0.8	2,584	5.2	-10.2
6	Sugar maple	2,061	5.4	-6.3	5,658	6.9	-7.0
7	Eastern hemlock	1,938	5.1	7.6	5,506	5.9	14.8
8	Yellow birch	1,596	3.8	-1.7	3,753	6.0	-3.5
9	Paper birch	1,165	4.2	-7.0	1,201	7.5	-11.5
10	American beech	904	5.7	-15.9	1,153	9.6	-25.3
	Other softwoods	**1,423**	**5.6**	**3.2**	**3,173**	**7.3**	**5.1**
	Other hardwoods	**2,910**	**3.6**	**0.7**	**6,159**	**5.3**	**3.5**
	All species	**25,419**	**1.2**	**-0.6**	**56,813**	**1.9**	**0.7**

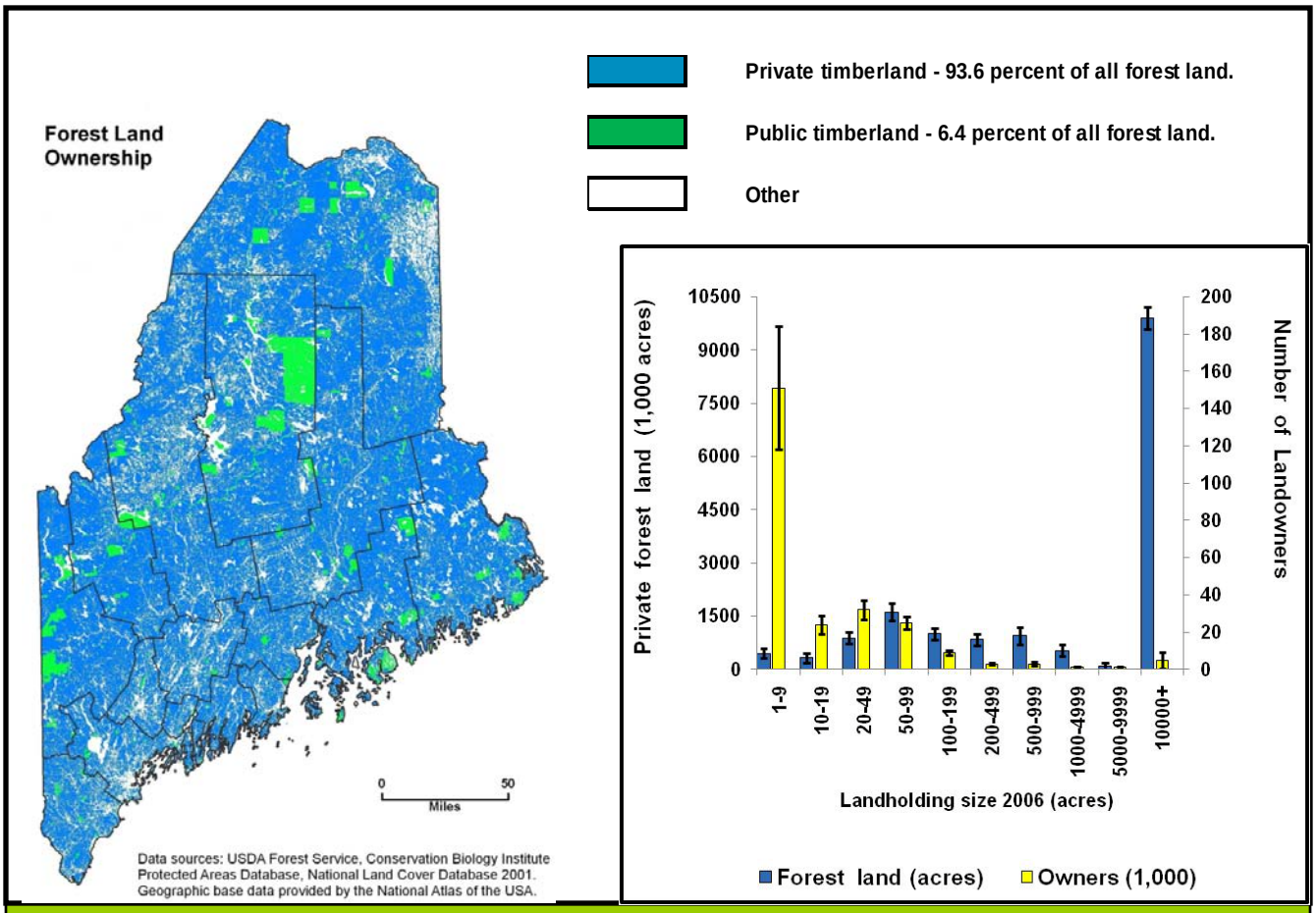

Figure 4. – Area and number of family forests by size of forest landholdings, Maine, 2002-2006.

Maine –The First Remeasurement

This is the results of field data collected during the first year of the third annual State inventory utilizing data where all of the State's plots have been remeasured. Four of the top 10 tree species have decreased in standing volume since the completion of the State's first annual inventory (1999-2003). By breaking down the components of change, we can take a closer look at some of the reasons for these declines. In-growth is the net volume of trees which became 5.0 inches diameter at breast height (d.b.h.) or greater between inventories. Accretion is the net growth on trees measured during the previous inventory divided by the number of years for the current inventory. All percentages represent net changes in each growth component divided by net change in total standing volume per species between 2003 and 2009. Refer to Table 2 on page 2 for standing volumes. All numbers in Table 3 represent percentages.

Since 2003, balsam fir in-growth decreased 1.3 percent (563,000 ft^3), but had a 38 percent increase (+31 million ft^3) in accretion. Mortality (-5 million ft^3) has remained constant, while removals have decreased 17 percent (+11.7 million ft^3).

Red spruce in-growth also decreased 1.6 percent (- 300,000 ft^3) accompanied by a 30 percent reduction in the amount of mortality (+12.6 million ft^3); but because of a 19 percent drop in accretion (-20.2 million ft^3), brought on by a 17 percent increase in harvest levels (-16 million ft^3), resulted in a decrease in standing volume.

Since 2003, sugar maple in-growth increased 15 percent (+705,000 ft^3). In contrast, accretion decreased 4 percent (-590,000 ft^3), with a 380 percent increase in mortality (-11.3 million ft^3), and a 92 percent increase in harvests (-35 million ft^3); standing volumes have decreased since 2003 (Table 2). Even though sugar maple mortality increased from 2.9 million ft^3 (2003) to 11.3 million ft^3 in 2009, this only represents an increase from 0.15 percent of sugar maple growing stock volume (2003) to 0.6 percent of the sugar maple growing stock volume in 2009. The mortality for all species during the same period of time stayed at 1.1 percent of total growing stock volume for all species.

Paper birch had a 28 percent decrease in in-growth (-2.5 million ft^3) and a 14 percent decrease in accretion (-2.9 million ft^3) since 2003. Birch mortality has increased 67 percent (-11.7 million ft^3) since 2003. Even though removal levels had a 33 percent decrease (-8.7 million ft^3) , standing volume continues to decrease. There is an ecological explanation in those stands where conifers are overtopping the paper birches and suppressing them out of existence.

American beech had a 23 percent increase in in-growth (+1.2 million ft^3) and a 76 percent increase in accretion (+15.3 million ft^3) since 2003. But an16 percent increase in mortality (-4.6 million ft^3) coupled with a 37 percent increase in harvest levels (-10.2 million ft^3) have continued to reduce standing volumes. Numerous smaller stems represent the gains replacing larger stems killed by beech bark disease.

Balsam fir had the greatest net change, going from a negative net change (-33.8 million ft^3) in 2003 to positive net change (+19.3 million ft^3) in 2009. In contrast, sugar maple went from a positive net gain (+27 million ft^3) in 2003 to a negative net change (-19.8 million ft^3) in 2009.

Table 3. – Percent change in growth, mortality and removals between 2003 and 2009.

Species or Group	In-growth	Accretion	Gross growth	Mortality	Net growth	Removals	Net change
Balsam fir	-1.3	38.1	24.4	0.1	72.8	-16.8	294.0
Red spruce	-1.6	-18.5	-16.5	-30.4	-9.5	17.3	-4.7
All Softwoods	30.6	-9.2	12.2	-3.8	16.8	9.9	38.3
Sugar maple	14.7	-3.9	0.2	383.0	-25.3	92.6	-33.7
Paper birch	-28.1	-14.1	-14.2	66.9	-82.5	-33.3	0.0
American beech	22.5	76.4	65.2	15.6	382.6	36.9	-11.0
All Hardwoods	-7.8	22.4	17.0	55.1	1.3	25.2	-4.0
All Species	0.7	15.3	12.7	18.3	9.9	17.2	37.8

Citation for this Publication

McCaskill, G.L.; McWilliams, W.H. 2011. **Maine's forest resources, 2009**. Res. Note NRS-91. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 4 p.

FIA Program Information

Bechtold, W.A.; Patterson, P.L., eds. 2005. **The enhanced forest inventory and analysis program: national sampling design and estimation procedures**. Gen. Tech. Rep. SRS-80. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 85 p.

Smith, W.B. 2002. **Forest inventory and analysis: a national inventory and monitoring program**. Environmental Pollution. 116: 233-242.

USDA Forest Service. 2007. **Forest Inventory and Analysis national core field guide-northern edition, vol. 1**, field data collection procedures for phase 2 plots, version 4.0. available **www.fia.fs.fed.us/library/field-guides-methods-proc** (verified July, 2007).

Additional Information

Butler, B.J. 2008. **Family forest owners of the United States, 2006**. Gen. Tech. Rep. NRS-27. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station.

Additional Maine Inventory Information

McCaskill, G.L.; McWilliams, W.H.; Butler, B.J.; Morin, R.S.; Moser, W.K.; et al. 2011 (in press). **Maine's Forests 2008**. Res. Bull. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station.

Laustsen, K.M. 2009. **The 2006 mid-cycle report on inventory and growth of Maine's forests**. Orono, ME: Forest Health & Monitoring Division, Department of Conservation, Maine Forest Service. 30 p.

McWilliams, W.H.; Butler, B.J.; Griffith, D.M.; Laustsen, K.M.; Caldwell, L.E.; et al. 2005. **The Forests of Maine: 2003**. Res. Bull. NE-164. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 188 p.

Contact Information

Maine Analyst: George L. McCaskill (610) 557-4045 **georgemccaskill@fs.fed.us**
Data processing/ access: Carol L. Alerich, 610-557-4068 **calerich@fs.fed.us**
Estimates, tabular data, and maps from this report may be generated at: fiatools.fs.fed.us