USDA Forest Service, US Department of Agriculture
Northern Research Station

Vermont's Forest Resources, 2011

Research Note NRS-141

This publication provides an overview of forest resource attributes for Vermont 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 and uncertainty

Forest Land Estimates		
Area (1,000 acres)	4,591	1.0
Number of live trees 1-inch diameter or larger (1,000,000 trees)	3,509	2.6
Biomass of live trees 1-inch diameter or larger (1,000 tons)	282,271	1.6
Net volume in live trees 5-inch diameter or larger (1,000,000 ft^3)	10,441	1.8
Annual net growth of live trees 5-inch diameter or larger (1,000 ft^3/year)	193,038	6.3
Annual mortality of live trees 5-inch diameter or larger (1,000 ft^3/year)	111,553	6.7
Annual harvest removals of live trees 5-inch diameter or larger (1,000 ft^3/year)	95,758	15.6
Annual other removals of live trees 5-inch diameter or larger (1,000 ft^3/year)	2,432	86.0
Timberland Estimates		
Area (1,000 acres)	4,477	1.1
Number of live trees 1-inch diameter or larger (1,000,000 trees)	3,429	2.7
Biomass of live trees 1-inch diameter or larger (1,000 tons)	275,887	1.7
Net volume in live trees 5-inch diameter or larger (1,000,000 ft^3)	10,211	1.9
Net volume of growing-stock trees (1,000,000 ft^3)	9,130	2.0
Annual net growth of growing-stock trees (1,000 ft^3)	187,239	4.8
Annual mortality of growing-stock trees (1,000 ft^3/year)	70,987	7.9
Annual harvest removals of growing-stock trees (1,000 ft^3/year)	81,178	15.6
Annual other removals of growing-stock trees (1,000 ft^3/year)	24,600	36.5

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

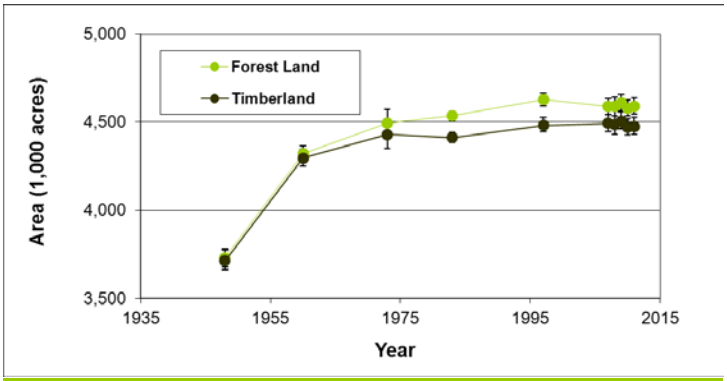

Figure 1. – Area of timberland and forest land by year, 1948-2011.

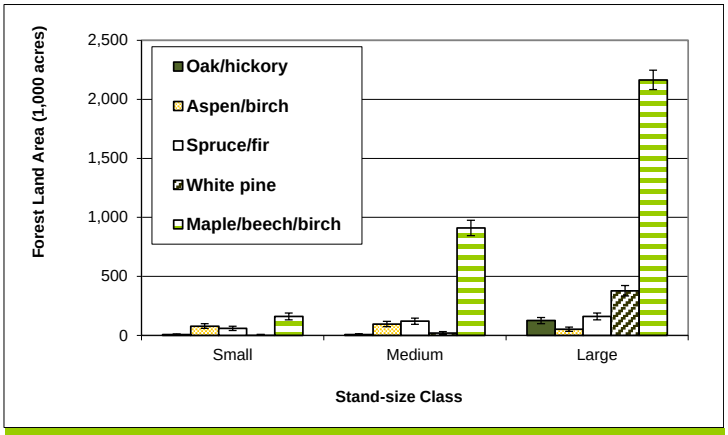

Figure 2. – Area of forest land by top six forest types and stand size class, 2007-2011.

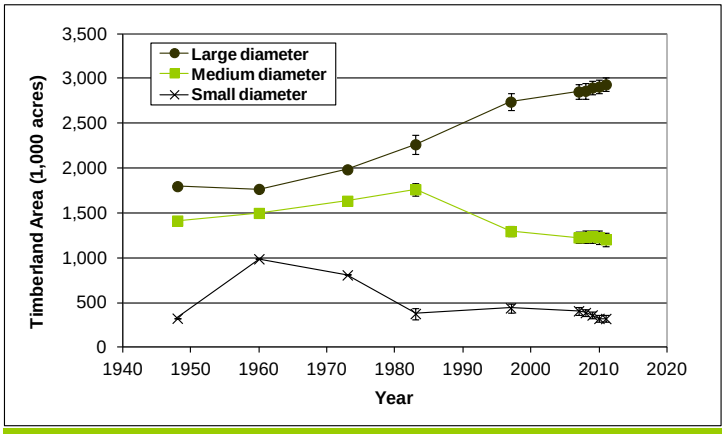

Figure 3. – Area of timberland by stand-size class and year, 1948-2011.

Table 2. – Top 10 tree species by statewide volume estimates (5-inch diameter and larger), 2007-2011

Rank	Species	Volume of live trees on forest land (1,000,000 ft^3)	Sampling error (%)	Volume of sawtimber trees on timberland (1,000,000 bdft)	Sampling error (%)
1	Sugar maple	2,466	4.8	6,906	6.3
2	Red maple	1,284	5.7	2,960	7.7
3	Eastern hemlock	1,134	8.8	3,256	10.1
4	Eastern white pine	928	10.0	3,848	10.5
5	Yellow birch	757	6.1	1,868	8.7
6	American beech	605	7.1	1,098	11.6
7	White ash	547	8.7	1,677	11.3
8	Red spruce	517	8.9	1,482	11.0
9	Paper birch	412	9.1	844	12.5
10	Balsam fir	371	9.8	695	11.5
	Other softwoods	236	15.8	597	19.5
	Other hardwoods	1,185	6.1	3,396	8.6
	All Species	**10,441**	**1.8**	**28,626**	**2.7**

Mature Forests are the Norm but "Old Growth" is Scarce

The diversity of tree ages and sizes in late-successional (i.e., old growth) forests provides a broad range of habitats for flora and fauna while making them more dynamic and resilient to disturbance. Although the trend of increasing forest land area in large-diameter stands clearly demonstrates the continuing maturation of Vermont's forests toward stands of larger, older trees (Figure 3), Vermont still has a low percentage of "old growth" forests (Figure 4) and very large trees (Figure 5).

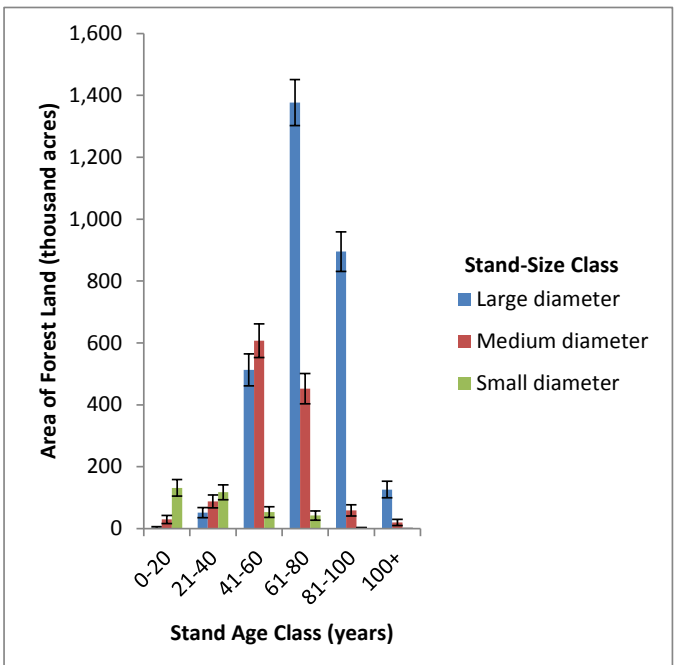

Figure 4. – Area of forest land by stand-size class and stand age class, 2010.

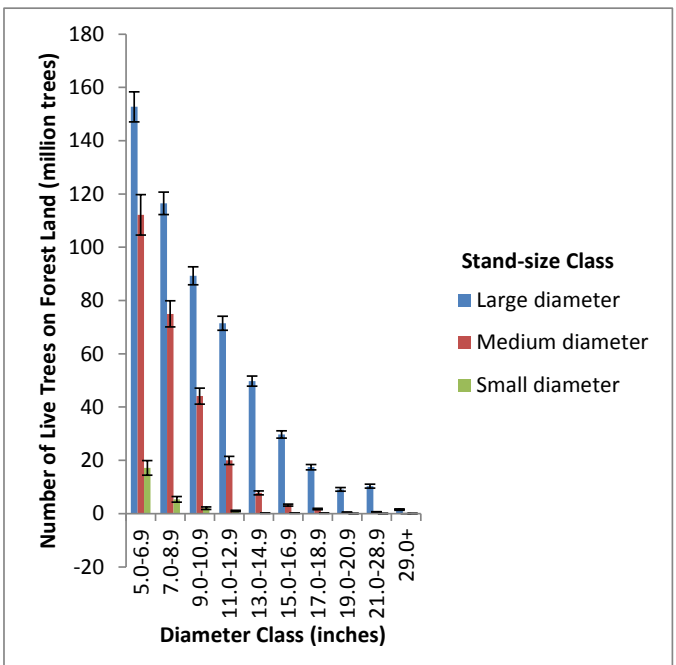

Figure 5. – Number of live trees on forest land by diameter class, 2010.

Continued

Three major characteristics of "old growth" forests are the abundance of large diameter living trees, standing dead trees, and downed coarse woody debris (CWD) (McGee et al. 1999). According to FIA estimates, 66 percent of Vermont's forest land consists of large diameter stands, but that classification is based on diameters that qualify trees to be sawtimber. McGee et al. (1999) reported that old growth northern hardwood stands contained about 22 trees per acre greater than or equal to 22 inches in diameter. By contrast, Vermont's forests only contain on average about 2.2 trees per acre of this size. Even if we limit this average to stands in the large diameter stand-size class there are only 3.4 trees per acre greater than or equal to 22 inches in diameter.

Similarly, McGee et al. (1999) reported that old growth northern hardwood stands contained about 7.4 standing dead trees per acre greater than or equal to 20 inches in diameter. By contrast, Vermont's forests on average contain less than one tree per acre (0.5) of this size. Even if we limit this average to stands in the large diameter stand-size class the average remains less than one per acre (0.8). The diameter distribution of standing dead trees highlights the dearth of trees in the largest diameter classes (Figure 6).

Finally, McGee et al. (1999) reported that old growth northern hardwood stands contained about 332 cubic feet of CWD per acre greater than or equal to 20 inches in diameter and 998 cubic feet of CWD between 10 and 20 inches in diameter. By contrast, Vermont's forests on average only contain 101 cubic feet of CWD greater than or equal to 20 inches. Even if we limit this average to stands in the large diameter stand-size class there is only 150 cubic feet per acre greater than equal to 20 inches in diameter. Additionally, the average acre in Vermont's forests only contains 201 cubic feet of CWD volume in the 10 to 20 inch diameter class and 299 cubic feet of CWD when looking only at the large diameter stand-size class. Currently, there is a dearth of CWD volume across all diameter classes and forest-type groups even in stands classified as the large diameter stand-size class (Figure 7).

Landowners that are interested in improving habitat for wildlife and increasing the diversity of forests can engage in management activities that increase these old growth characteristics.

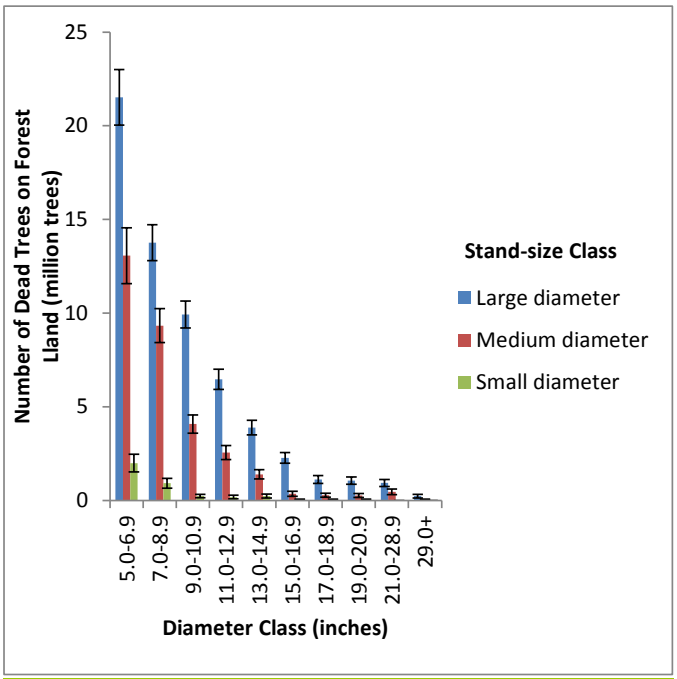

Figure 6. – Number of dead trees on forest land by diameter class, 2010.

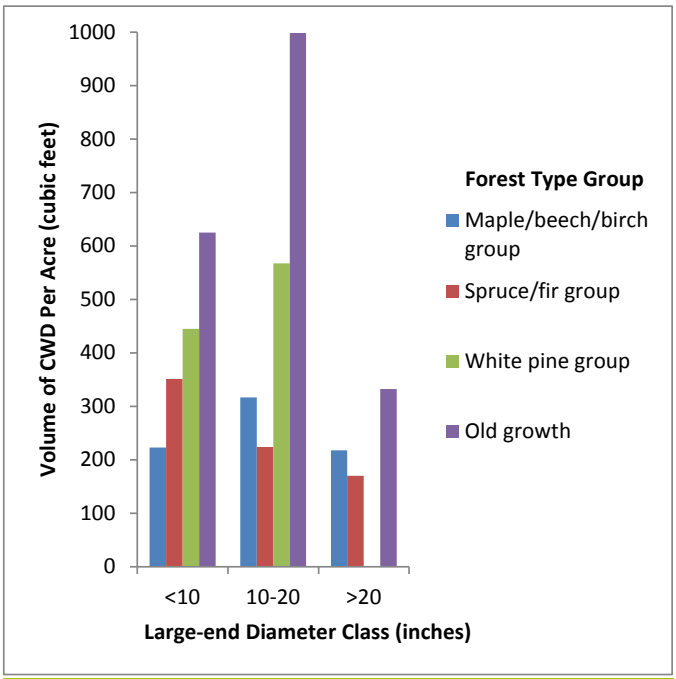

Figure 7. – Coarse woody debris volume per acre on forest land by large-end diameter class and forest type group, 2010; old growth volumes from McGee (1999).

Citation for this Publication

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FIA Program Information

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Additional Information

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Additional Vermont Inventory Information

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Estimates, tabular data, and maps from this report may be generated at: http://www.fia.fs.fed.us/tools-data/
Glossary of terms available here: http://www.nrs.fs.fed.us/fia/data-tools/state-reports/glossary/default.asp
Information from the Vermont Department of Forests, Parks, and Recreation can be obtained here: http://www.vtfpr.org/