

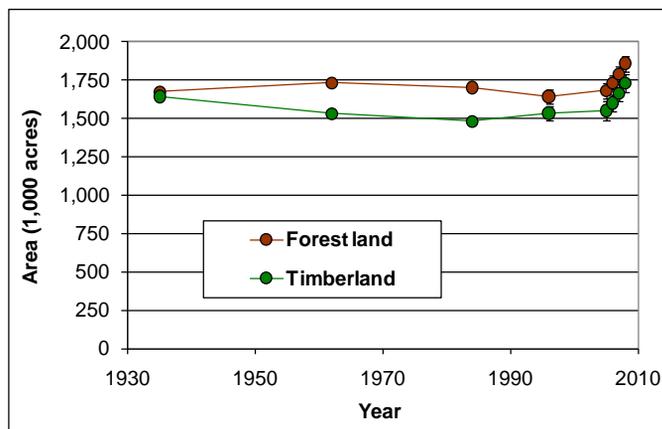
# South Dakota's Forest Resources, 2008

Research Note NRS-75

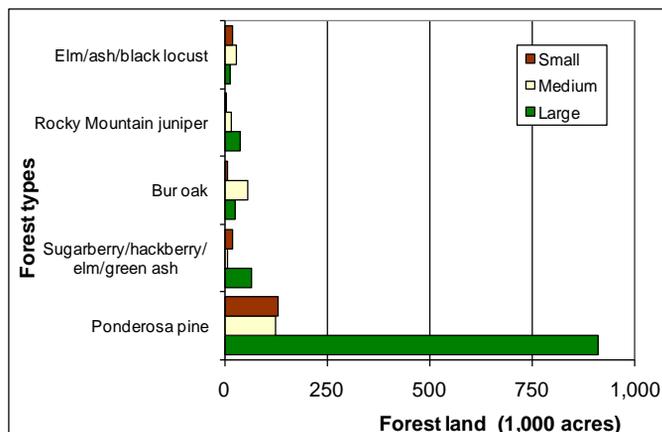
This publication provides an overview of forest resource attributes for South Dakota based on an annual inventory conducted by the Forest Inventory and Analysis program of the U.S. Forest Service, Northern Research Station. These estimates, along with web-posted core tables, will be updated annually. For more information regarding past inventory reports for South Dakota, inventory program information, and sampling/estimation procedures, please refer to the citations at the end of this report. For definitions of terms used in this report, see 'Glossary of Terms' at: <http://nrs.fs.fed.us/fia/data-tools/state-reports/SD/>.

**Table 1. – Annual estimates, uncertainty, and change for South Dakota, 2008**

	Estimate 2008	Sampling error %	Change since 2003 %
<b>Forest Land Estimates</b>			
Area (1,000 acres)	1,861.8	2.9	4.0
Number of live trees 1-inch diameter or larger (million trees)	536.7	6.0	-0.2
Dry biomass of live trees 1-inch diameter or larger (1,000 tons)	45,177.9	4.1	0.6
Net volume in live trees (1,000,000 ft <sup>3</sup> )	2,279.3	4.0	0.6
Annual net growth of live trees (1,000 ft <sup>3</sup> /year)	40,472.9	25.2	-9.8
Annual mortality of live trees (1,000 ft <sup>3</sup> /year)	27,728.2	17.4	-3.4
Annual harvest removals of live trees (1,000 ft <sup>3</sup> /year)	23,690.4	31.7	2.8
Annual other removals of live trees (1,000 ft <sup>3</sup> /year)	NA	NA	NA
<b>Timberland Estimates</b>			
Area (1,000 acres)	1,733.5	3.0	4.3
Number of live trees 1-inch diameter or larger (million trees)	505.0	6.2	-0.1
Dry biomass of live trees 1-inch diameter or larger (1,000 tons)	42,290.4	4.4	0.9
Net volume in live trees (1,000,000 ft <sup>3</sup> )	2,153.0	4.3	1.1
Net volume of growing-stock trees (1,000,000 ft <sup>3</sup> )	1,931.3	4.4	-0.6
Annual net growth of growing-stock trees (1,000 ft <sup>3</sup> /year)	37,943.2	23.3	-11.2
Annual mortality of growing-stock trees (1,000 ft <sup>3</sup> /year)	20,693.2	18.5	-5.9
Annual harvest removals of growing-stock trees (1,000 ft <sup>3</sup> /year)	22,742.4	32.6	-0.6
Annual other removals of growing-stock trees (1,000 ft <sup>3</sup> /year)	38.5	100.2	-33.6



**Figure 1. – Area of timberland and forest land by year, South Dakota, 2008.**



**Figure 2. – Area of timberland for top five forest types by stand-size class, South Dakota, 2008.**

Note: Large diameter trees are at least 11.0 inches diameter for hardwoods and at least 9.0 inches diameter for softwoods. Medium diameter trees are at least 5.0 inches diameter but not as large as large diameter trees. Small diameter trees are less than 5.0 inches diameter.



Table 2 - Top 10 species by volume, South Dakota, 2008

Rank	Species	Volume of live trees on forest land (1,000,000 ft <sup>3</sup> )	Sampling Error (%)	Change since 2003 (%)	Volume of sawtimber trees on timberland (1,000,000 bdf)	Sampling error (%)	Change since 2003 (%)
1	Ponderosa pine	1,737.0	4.6	0.3	5,926.2	6.2	1.1
2	Bur oak	102.7	23.3	-7.0	103.0	36.3	-16.9
3	Cottonwood	91.7	32.6	4.0	299.0	38.0	-19.0
4	Green ash	88.7	20.7	6.9	136.6	35.0	18.7
5	White spruce	82.5	24.7	0.1	289.4	26.2	0.5
6	American elm	52.9	26.9	2.3	54.9	50.8	64.4
7	Rocky Mountain juniper	33.6	29.0	30.7	0.0	0.0	0.0
8	Boxelder	26.4	35.8	-10.5	4.5	99.6	2.3
9	Quaking aspen	20.3	30.4	-5.1	4.2	74.5	-52.8
10	Eastern redcedar	13.7	34.2	8.7	33.2	51.9	-6.7
	Other softwoods	0.0	0.0	0.0	0.0	0.0	0.0
	Other hardwoods	29.6	25.8	8.4	21.5	94.8	-12.6
	<b>All Species</b>	<b>2,279.3</b>	<b>4.0</b>	<b>0.6</b>	<b>6,872.5</b>	<b>5.7</b>	<b>0.1</b>

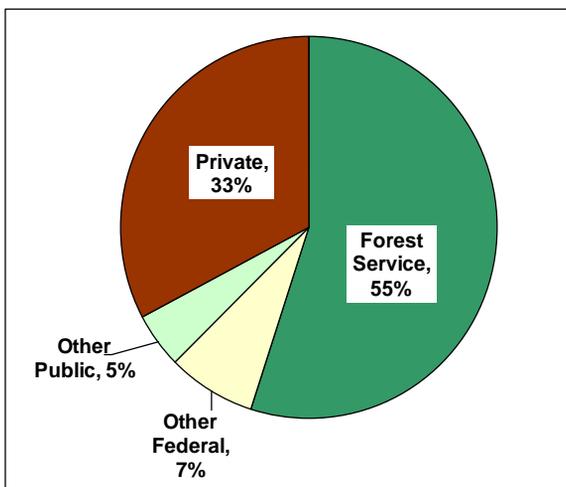


Figure 3. – Percent of forest land by ownership group, South Dakota, 2008.

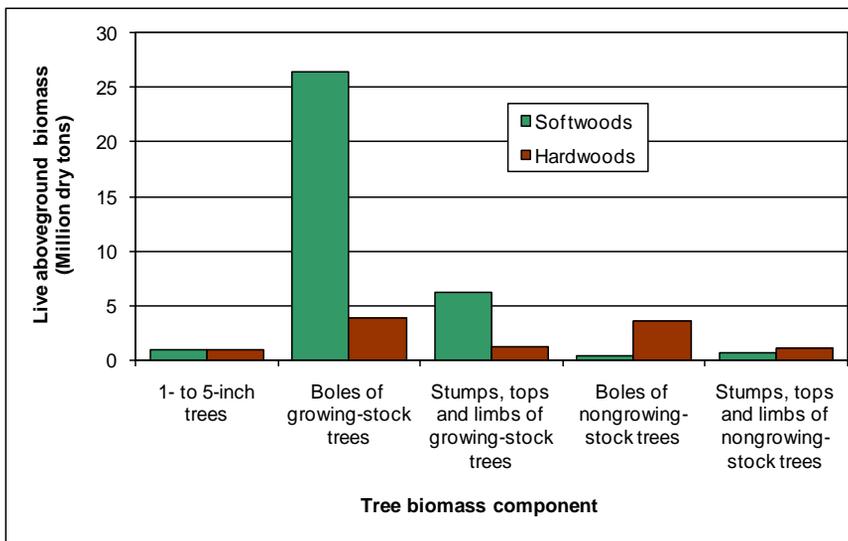


Figure 4. – Live aboveground tree biomass on timberland by softwood/hardwood and tree biomass component, South Dakota, 2008.

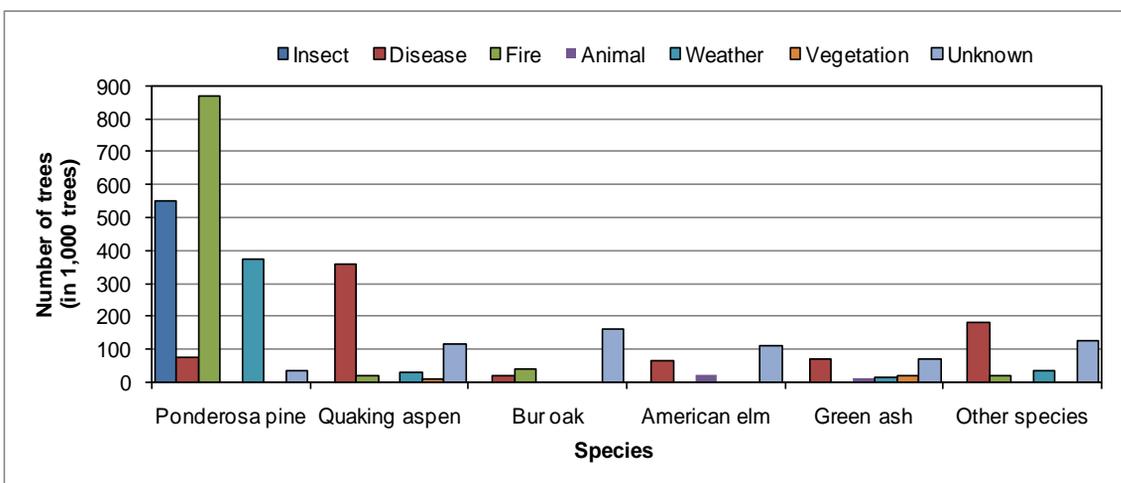


## Annual Mortality of South Dakota's Trees

Mortality is a natural part of forest stand development. Because mortality can be the result of numerous factors over many years, it is difficult to identify exact causes of tree death. FIA plots are remeasured every 5 years, so it can be difficult to identify causes of mortality for intervening years. Droughts can weaken trees making them susceptible to pests over subsequent years. Trees that are killed by insects and disease may later be burned in a fire that erases the original evidence of mortality. Mortality is a concern when it surpasses the capacity of the forest to respond (growth and regeneration) or when it creates potential fire hazards. The mortality information presented here is based on three out of five remeasured panels of the complete five-panel inventory system.

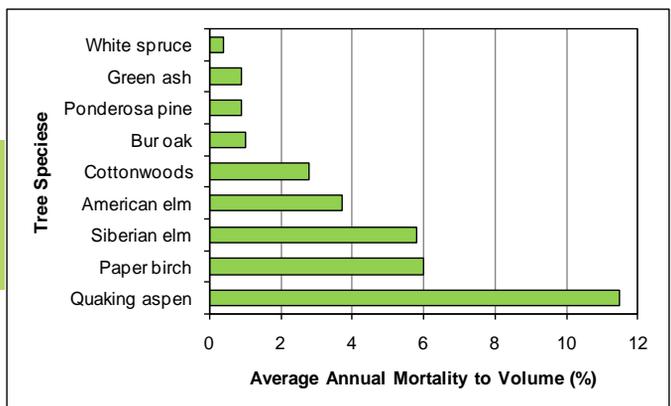
In South Dakota, an average of 3.4 million trees per year were found to have died on forest land since the 2001-2003 survey period, less than 1 percent of the number of all live trees on forest land. Of that total mortality, nearly 2 million were ponderosa pine with 45 percent of these deaths attributed to fire (Fig. 5). Insects killed another 30 percent of the ponderosa pine each year. Even though the 2 million ponderosa pine trees that died on forest land each year represent only about one-half of 1 percent of the total live trees on forest land, they are a large concern due to the fire hazards they pose to South Dakota's forest land.

The volume of annual mortality of growing stock on timberland as a percent of the current volume provides a different picture and may indicate forest health issues. Quaking aspen stands out as a species that may be experiencing atypical rates of mortality with nearly 12 percent of the growing stock volume being lost to mortality each year (Fig. 6). Some of this mortality may be attributed to hypoxylon canker or Sudden Aspen Decline (SAD) which results in severe and rapid dieback of aspen trees



**Figure 5. – Average number of trees that died by species and cause of death, South Dakota, 2004-2008.**

**Figure 6. – Average annual mortality of growing stock on timberland as a percent of current volume by species, South Dakota, 2004-2008**



### Citation for this Publication

Piva, Ronald J. 2010. **South Dakota's forest resources, 2008**. Res. Note NRS-75. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 4 p.

### FIA Program Information

Bechtold, W.A.; Patterson, P.L. 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.

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. 72 p.

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

USDA Forest Service. 2005. **Forest inventory and analysis national core field guide, Vol. 1, field data collection procedures for phase 2 plots, Ver. 3.0**. Available at <http://www.fia.fs.fed.us/library/field-guides-methods-proc/> (verified Aug. 1 2008).

### Additional South Dakota Inventory Information

Piva, Ronald J.; Moser, W. Keith; Haugan, Douglas D.; Josten, Gregory J.; Brand, Gary J.; Butler, Brett J.; Crocker, Susan J.; Hansen, Mark H.; Meneguzzo, Dacia M.; Perry, Charles H.; Woodall, Christopher W. 2009. **South Dakota's forests 2005**. Resour. Bull. NRS-35. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 96 p.

Piva, Ronald J.; Josten, Gregory J.; Mayko, Richard D. 2006. South Dakota timber industry—an assessment of timber product output and use, 2004. Resour. Bull. NC-264. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 36 p.

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Estimates, tabular data, and maps from this report may be generated at <http://www.fia.fs.fed.us/tools-data>

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