



North Dakota's Forest Resources 2006

Research Note NRS 5

This publication provides an overview of forest resources attributes for this state based on annual inventory conducted by the Forest Inventory and Analysis program at the Northern Research Station of the USDA Forest Service. These annual estimates, along with web-posted core tables, will be updated annually. For more information regarding past inventory reports for this state, inventory program information, and sampling/estimation procedures, please refer to the citations at the end of this report.

Table 1—Annual estimates, uncertainty, and change

	Estimate	Sampling Error (%)	Change Since 2005 (%)
Forest Land Estimates			
Area (1,000 acres)	701.4	6.4	-3.1
Number of live trees 1-inch diameter or larger (million trees)	332.2	9.8	-4.0
Dry biomass of live trees 1-inch diameter or larger (1,000 tons)	19,364.5	8.4	-2.5
Net volume in live trees (1,000,000 ft ³)	698.4	9.9	-2.9
Net volume of growing stock trees (1,000,000 ft ³)	413.8	13.0	2.4
Annual net growth of live trees (1,000 ft ³ /year)	*	*	NA
Annual mortality of live trees (1,000 ft ³ /year)	*	*	NA
Annual removals of live trees (1,000 ft ³ /year)	*	*	NA
Timberland Estimates			
Area (1,000 acres)	508.4	7.8	-4.7
Number of live trees 1-inch diameter or larger (million trees)	240.1	12.5	-6.3
Biomass of live trees 1-inch diameter or larger (1,000 tons)	15,521.1	10.3	-4.6
Net volume in live trees (1,000,000 ft ³)	573.3	11.9	-4.8
Net volume of growing stock trees (1,000,000 ft ³)	369.0	14.7	0.6
Annual net growth of growing stock trees (1,000 ft ³ /year)	*	*	NA
Annual mortality of growing stock trees (1,000 ft ³ /year)	*	*	NA
Annual removals of growing stock trees (1,000 ft ³ /year)	*	*	NA

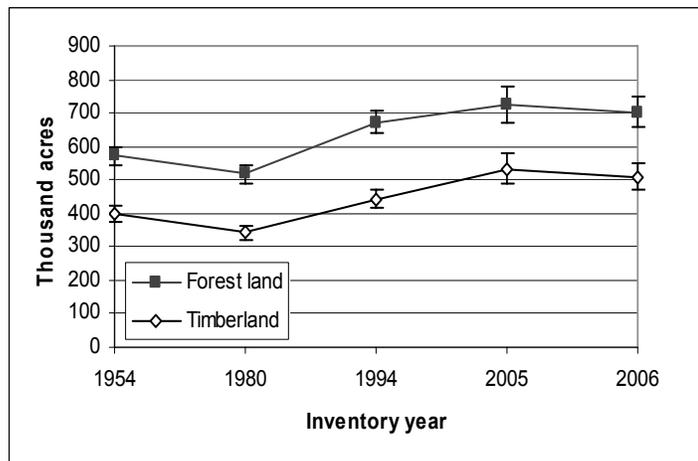


Figure 1.—Area of timberland and forest land by year

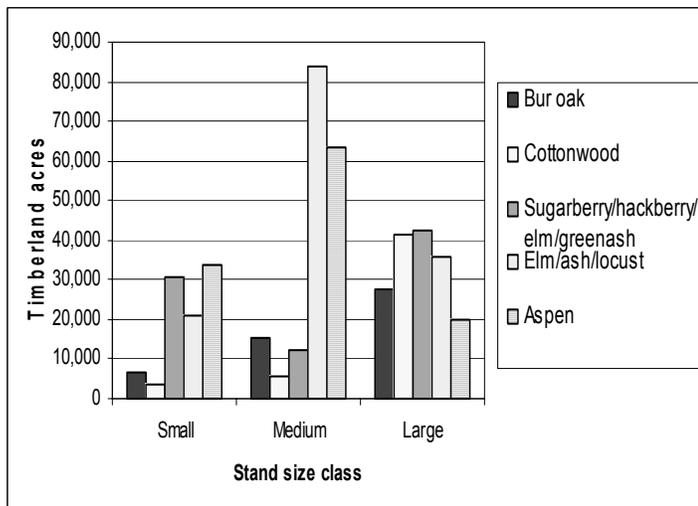


Figure 2.—Area of timberland top five forest types by stand-size class

* Estimates have been removed due to significant sampling errors. Estimates are from forested plots that were originally measured in 2002 and then remeasured in 2006. This small sample size results in high sampling errors that will decrease as subsequent plots are remeasured.



Table 2-Top 10 species by statewide volume estimates

Rank	Species	Volume of live trees on timberland (million cubic feet)	Sampling error (%)	Change since 2005 (%)	Volume of sawtimber on timberland (million board feet)	Sampling error (%)	Change since 2005 (%)
1	Eastern cottonwood	149.0	34.6	-7.6	458.8	46.3	-7.9
2	Bur oak	121.9	20.9	2.3	301.8	34.9	25.7
3	Green ash	112.3	14.6	-5.2	153.5	23.7	-3.8
4	Quaking aspen	87.8	20.9	-10.8	127.0	31.9	-7.6
5	Boxelder	43.9	23.2	-1.1	21.3	74.4	267.2
6	American elm	28.3	37.2	-0.4	47.6	52.3	1.9
7	American basswood	7.9	75.9	17.9	16.4	11.6	22.4
8	Balsam poplar	7.9	45.7	-29.5	14.2	99.7	-11.3
9	Siberian elm	4.5	64.8	4.7	3.8	99.2	0.0
10	Willow spp.	3.6	100.7	1,700	12.0	99.6	0.0
	Other softwood species	0.4	106.1	-33.3	1.5	103.2	-6.3
	Other hardwood species	5.8	63.5	-37.6	0.0	0.0	0.0
	All species	573.3	11.9	-4.8	1,157.7	21.8	3.2

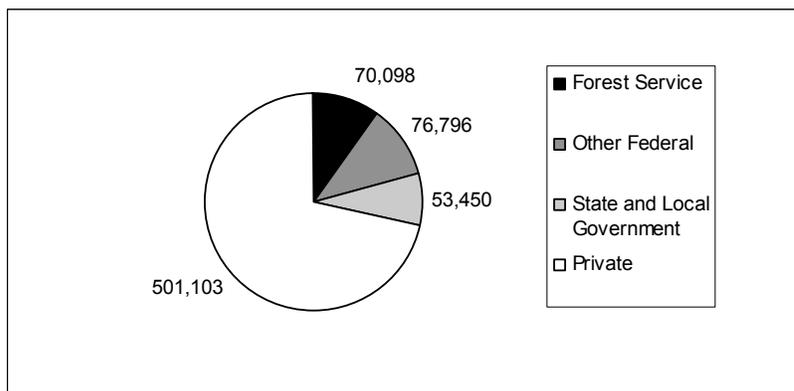


Figure 3.—Area of forest land by acres and ownership group



Figure 4.—Area of timberland by stand-size class and year



North Dakota Issue Update – Riparian Forest Health

Bottomland riparian forests consisting of American elm and green ash in eastern North Dakota and cottonwood forests along western rivers represent a large portion of North Dakota's native forests. Eastern bottomland forests have been severely impacted by Dutch elm disease. This disease has eliminated many of the American elms that once comprised a large portion of this forest type and has shifted the species composition toward green ash and boxelder. This disease is of particular concern because of the American elm's status as the state tree. The decline of cottonwood forests along the Missouri river is largely attributed to the absence of regeneration and the gradual senescence of mature overstory trees. Encroachment of non-native species, such as Russian olive, buckthorn and brome grass, has created additional management problems.

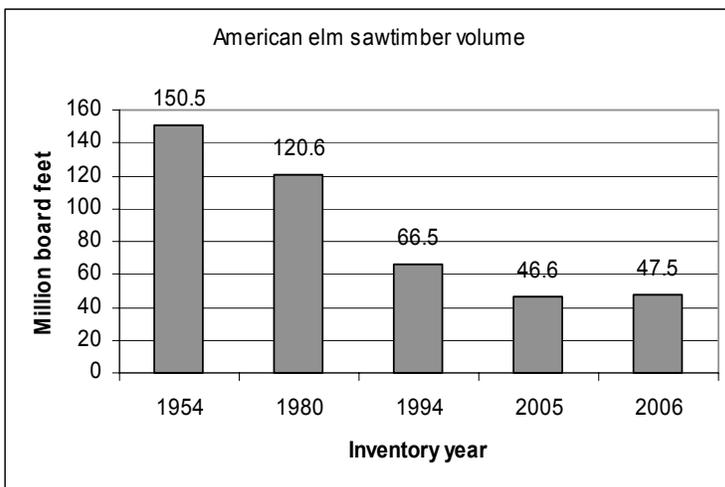


Figure 5.—Changes in American elm sawtimber volume by inventory year 1954-2006

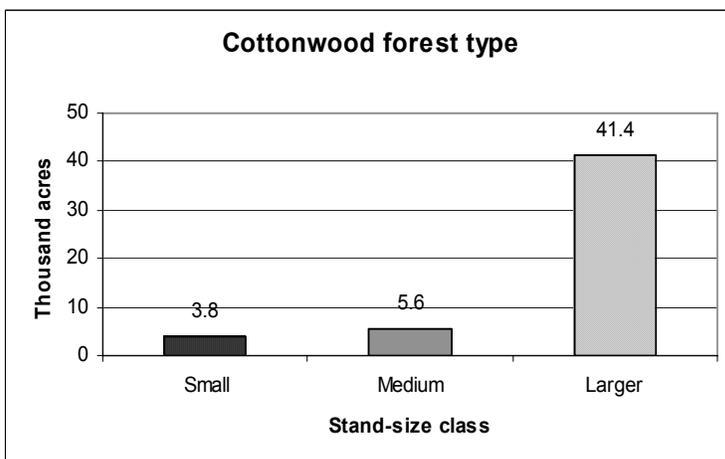


Figure 6.—Area of the cottonwood forest type on timberland by stand-size class, 2002-2006



The Forest Inventory and Analysis (FIA) program of the US Forest Service has the responsibility for conducting a comprehensive inventory and analysis of the extent, condition, status and trend of forest resources across all ownerships in the United States (Smith 2002). FIA applies a nationally consistent sampling protocol using a quasi-systematic design covering all ownerships in the entire nation based on an array of hexagons (each with an area of approximately 6,000 acres) assigned to separate interpenetrating, non-overlapping annual sampling panels (Bechtold and Patterson 2005). Permanent fixed-area plots are installed in each hexagon, and tree measurements (e.g., species, height, and diameter) are taken on four subplots where they meet the definition of forest land (USDA Forest Service 2004).

The Northern FIA research work unit of the Northern Research Station is responsible for conducting a forest inventory of a 24-state region encompassing the diverse forest ecosystems of the Great Plains, Lake States, Central States, Mid-Atlantic, and New England States. This report provides the most recent annual estimates of forest resources for one state. These annual estimates, along with web-posted core tables, will be updated every year. Please refer to the following citations for further FIA program information and for additional inventory reports for the state in this report.

Citation for this Publication

Haugen, D.E.; Kangas, M. 2007. North Dakota's forest resources, 2006. Res. Note. NRS-5. 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, N.C. 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: S233-S242.

USDA Forest Service, 2004. Forest Inventory and Analysis National Core Field Guide, Vol. 1, Field Data Collection Procedures for Phase 2 Plots, Ver. 2.0 [Online], available at www.fia.fs.fed.us/library/field-guides-methods-proc 23rd July, 2007.

Additional Indiana Inventory Information

Haugen, D.E.; Harsel, R.A. 2005. North Dakota timber industry—an assessment of timber product output and use, 2003. Resour. Bull. NC-252. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 18 p.

Haugen, D.E.; Piva, R.J.; Kingsley, N.P.; Harsel, R.A. 1999. North Dakota's forest resources, 1994. Res. Pap. NC-336. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 101 p.

Jakes, P.J.; Smith, W.B. 1982. A second look at North Dakota's timberland, 1980. Resour. Bull. NC-56. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 86 p.

Warner, J.R.; Chase, C.D. 1956. The timber resources of North Dakota. LS-SP-36. St. Paul, MN: U.S. Department of Agriculture Forest Service, Lake States Forest Experiment Station. 39 p.