

Minnesota's Forest Resources



**Department of Natural Resources
Division of Forestry
September 2003**

**500 Lafayette Road
St. Paul, Minnesota 55155**

Minnesota's Forest Resources

Revised 9-17-03

This book is published annually by the Minnesota DNR – Forestry Division Utilization & Marketing staff. Publication was begun in the mid 1980s by John Krantz, former Utilization & Marketing Program Coordinator. The report is intended to answer frequently asked questions about Minnesota's forest resources, such as current condition and use of forests and trends in resource use and condition that will affect forest management and forest industry. Foresters, other resource managers, planners, people in forest industry and policy makers will find items of interest in these pages.

We thank those who cooperated in providing and updating information for this report. They include many of Minnesota's wood product companies and the USDA Forest Service Forest Inventory and Analysis (FIA) unit. Without their cooperation we would be unable to gather or disseminate much of this information.

Most of the figures and charts are based on the Minnesota 2001 inventory figures (currently only three years of data are available, of a five-year inventory project). *The 2001 data are reliable enough to use for many analyses, however readers should be aware that some of the numbers will change and reliability will improve as the final inventory information becomes available next year.* A few of the charts and figures are still based on older 1990 FIA data, because growth and mortality figures are not yet available for the 2001 FIA data. The new, complete FIA data set will be available in 2004.

Highlights:

- Timber imports of pulpwood into the state continued to increase in 2001, driven largely by increasing stumpage prices. This has been an important factor in a small decrease 2000 to 2001 in harvest levels from Minnesota timberlands.
- Tight aspen timber supplies in Minnesota are the biggest reason for several mills continuing and expanding their efforts to utilize several formerly “underutilized” species such as tamarack, maple, basswood and ash pulpwood. The development of markets for maple, basswood and ash pulpwood will require increasing assistance efforts on private lands to ensure that these species are properly managed.
- Forest industry continued to struggle with profitability in 2002-03. Governor Pawlenty commissioned a task force to examine primary industry competitiveness in March of 2003. The task force report to the Governor can be accessed at: <http://files.dnr.state.mn.us/publications/forestry/govforestindustryreport2003.pdf>
- Forest Certification raised its profile as a forest management issue as several large purchasers of wood products such as Time, Inc. committed to the use of 3rd party certified wood and fiber.

Table of Contents

	Page
Wood-Based Industry	5
Forest Resources	11
Harvest Levels	15
Sustainable Harvest Levels	21
Wood Supply and Demand Information for Important Species	27
Aspen/Balm	28
Birch	32
Balsam Fir	34
Spruce	35
Tamarack	37
Northern hardwoods	38
Maple	39
Basswood	40
Oak	41
Red Pine	43
Jack Pine	44
White Pine	46
White Cedar	48
Timber Price Information	49
Forest Certification	53
Glossary	55

Wood Using Industry



Minnesota Wood Industry – 2003

Annual Economic Impact

- Value of forest products manufacturing shipments 2001: \$6.96 billion (estimated)***
- Fourth-largest manufacturing industry in Minnesota, based on Employment (#1 computer & electronic equipment, # 2 fabricated metal products, #3 food manufacturing)*
- Generates 11% of dollar value of all manufacturing shipments*
- Value-added = \$4.7 billion that stays in Minnesota*

Employment

- 55,200 Employees (25,200 in primary processing and 30,000 in secondary manufacturing)**
- \$1.9 billion in wages paid (10% of all manufacturing in Minnesota)
- **Important industries include:** cabinets and cabinet parts, window and door components (MN # 2 in U.S.), store fixtures, office and residential furniture, pallets, crating and pallet parts, millwork, wood shavings (for poultry industry).
- **Non-traditional industries dependent on forestry:** balsam boughs for wreath industry (annual sales exceed \$20 million), wood “flour” for energy for taconite industry, and six co-generation facilities utilizing wood for energy production.

Industry

- 5 pulp and paper mills and 1 paper mill with no pulping facility
- 3 recycled pulp and paper
- 3 hardboard and specialty
- 6 oriented-strand/structural board
- 500+ sawmills
- 150 associated industries

Over 850 secondary manufacturers

Annual Volume of Timber Harvested

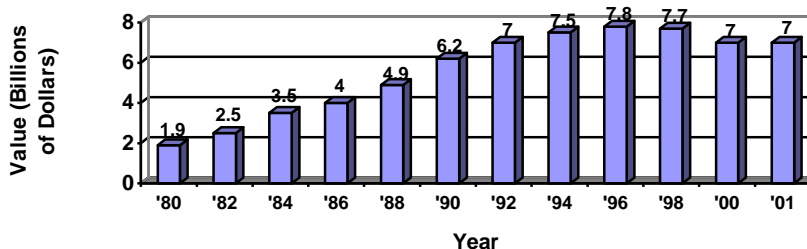
- Pulpwood = 2,755,000 Cords (2001)
- Sawlogs = 288 million board feet (2001)
- Fuelwood = 752,000 Cords (203,000 from timberland)
- Veneer = 8.0 million board feet (domestic)
= .5 million board feet (exported)
- Chips = 9,000 cords (fuel and mulch)
- Shavings = 14,000 cords (animal bedding)
- Posts and Poles = 9,100 cords

*Minnesota Department of Trade & Economic Development analysis

**Minnesota Department of Economic Security statistics (2001 data-most recent available)

***Minnesota Forest Industries estimate

Value of Forest Products Manufactured in Minnesota



Minnesota Pulp and Paper – 2003

Firm	Wood Used	Product
UPM - Kymenne Blandin Paper Company Grand Rapids	Aspen, Balsam Fir and Spruce	Lightweight coated paper used in Magazines, Catalogs
Boise International Falls	Aspen, Balm, Pine, Spruce, Balsam Fir, Birch, Tamarack, Ash, Maple	Business, Xerox, Envelope, Computer papers
International Paper Sartell	Aspen, Balsam Fir, Spruce	Lightweight coated paper used in Magazines, Catalogs
Stora Enso Duluth	Balsam Fir, Pine, Spruce	Coated paper used in Advertising Supplements
Sappi Fine Paper Company Cloquet	Aspen, Balm, Maple, Basswood, Tamarack, Pine	Business & Printing paper
Missota Paper Brainerd	Market Pulp	Uncoated Paper
Recycling Mills		
Rock-Tenn Company St. Paul	Recycled Paper & Corrugated	Cardboard & Corrugated Boxes
Stora-Enso Recycled Fiber Mill Duluth	High Grade Office Paper & Computer Paper	Market Pulp for Paper
Liberty Paper Company Becker	Recycled Paper & Corrugated	Cardboard & Corrugated Boxes

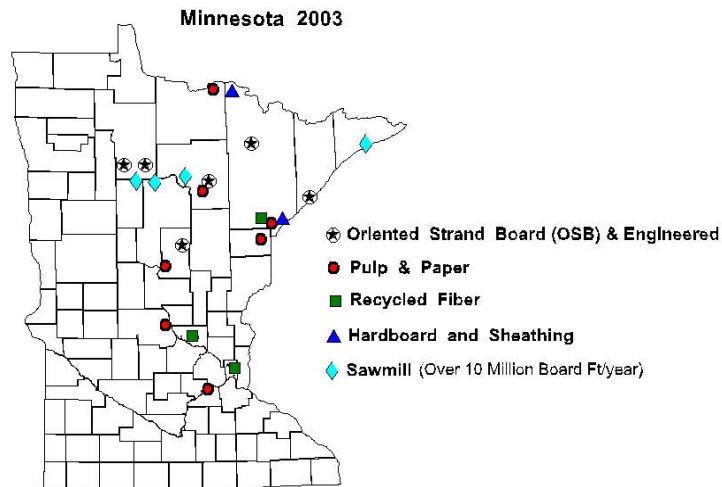
Minnesota Oriented Strand Board and Engineered Wood Products – 2003

Firm	Wood Used	Product
Potlatch Grand Rapids	Aspen, Balm, Birch, Pine, Maple	OSB – “Potlatch Select”
Louisiana-Pacific Two Harbors	Aspen & Balm	OSB – Siding “Inner Seal”
Northwood Panelboard Bemidji	Aspen & Balm	OSB – “Norboard”
Potlatch Bemidji	Aspen, Balm, Birch, Pine, Maple	OSB – “Oxboard”
Potlatch Cook	Aspen, Balm, Birch, Pine, Maple	OSB – “Oxboard”
Trus Joist a Weyerhaeuser Business Deerwood	Aspen	Laminated Strand Lumber “Timberstrand”

Minnesota Hardboard and Specialty – 2003

Firm	Wood Used	Product
Certainteed Corporation Shakopee	Aspen & Recycled Paper	Roofing Felt
International Bildrite International Falls	Aspen, Balm & Recycled Paper	Sheathing
Georgia-Pacific Corporation, Superwood Division Duluth	Aspen, Pine, Mixed Hardwoods	Industrial Hardboard

**OSB & ENGINEERED, PULP & PAPER, HARDBOARD, RECYCLING MILLS
and LARGE SAWMILLS**



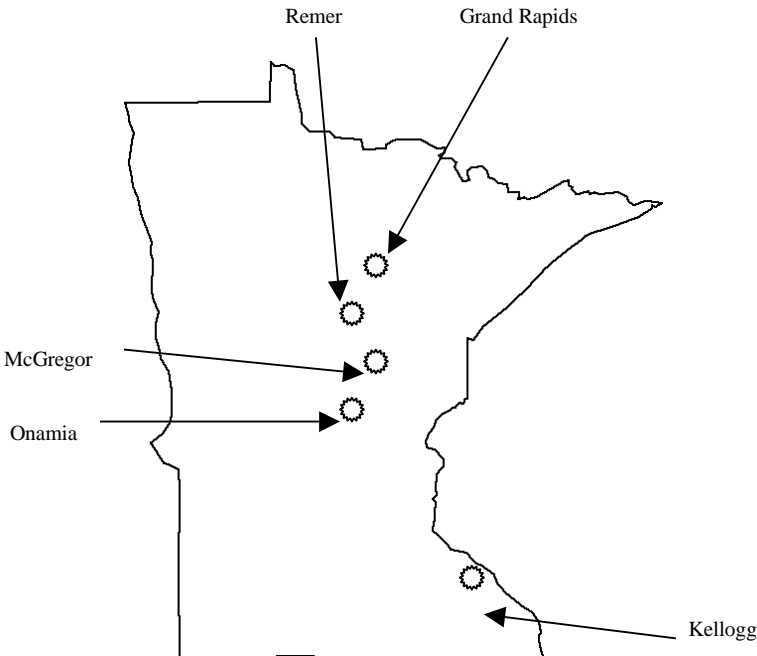
Location of mills is an important factor in determining markets for wood. The map above shows the OSB, Pulp & Paper, Recycled Fiber, Hardboard, Sheathing and large sawmills in Minnesota. These mills utilize various species of wood material, with aspen pulpwood being by far the largest component.

Minnesota – New and Expanding Large Wood Industry

1975-2002	Product	Capital Investments (\$Millions)
Potlatch (now SAPPI) - Expansion	Paper	\$100
Potlatch – Bemidji	OSB	40
Potlatch – Cook	OSB	40
Northwood Panelboard	OSB	45
Champion International (now International Paper)	Paper	250
Blandin (now Potlatch)	OSB	50
Louisiana Pacific	OSB	30
Blandin (now UPM)	Paper	350
Potlatch (now SAPPI) – Modernization	Paper	100
LSPI (now Stora-Enso)	Paper	404
International Biltrite	Sheathing	12
Boise	Paper	990
MacMillian Bloedel (now Trus Joist - a Weyerhaeuser Business)	Laminated Strand Lumber	70
Potlatch – Bemidji Expansion	OSB	35
Potlatch	Lumber	22
Potlatch (now SAPPI)	Pulp Mill	525
Potlatch – Cook expansion	OSB	60
Total		\$3.123 = \$3,123 Billion

Source: MN DNR - Forestry

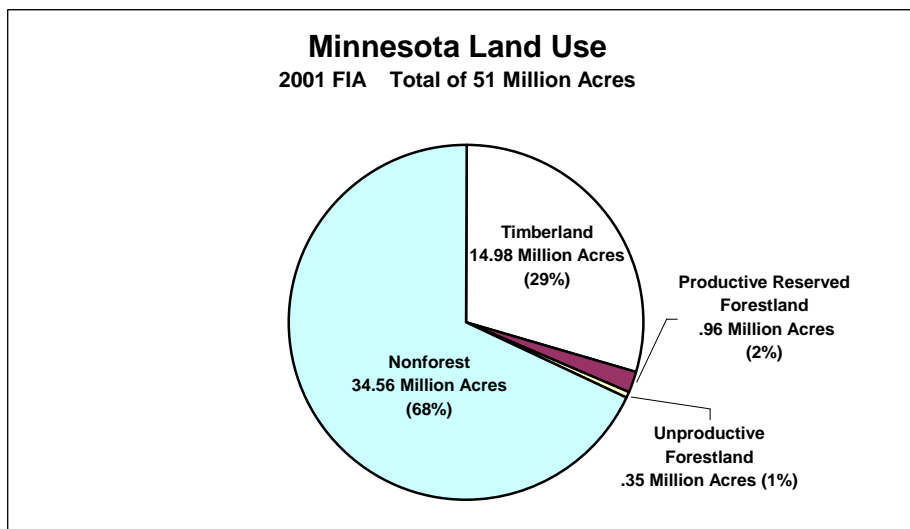
Minnesota Sawmills Utilizing Small Diameter Hardwoods – 2003



Recently, several Minnesota mills have invested in equipment that enables them to efficiently utilize smaller diameter hardwoods. This has improved markets for some of this material, giving landowners more income for their timber and giving forest managers more management options.

Forest Resources

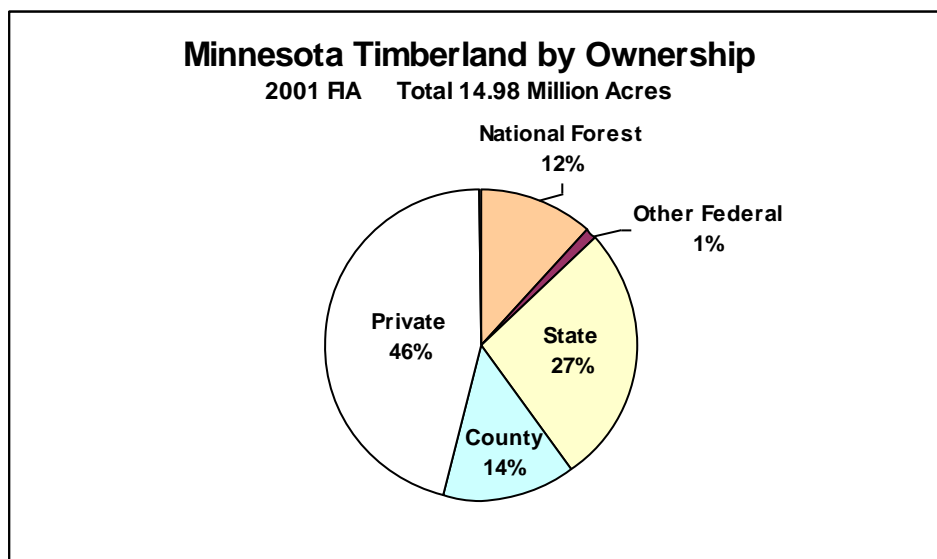




Source: Minnesota FIA 2001 Eastwide Database Provided by USFS North Central Forest Experiment Station
 Minnesota has 14.98 million acres of forest land that is classified as “timberland”. Timberland is forest land that is productive enough to produce a commercial crop of trees and is not reserved from harvesting by policy or law. Forest land reserved from harvest by policy or law include designated wilderness areas like the Boundary Waters Canoe Area (BWCA), Old Growth reserves and others.

Some highlights:

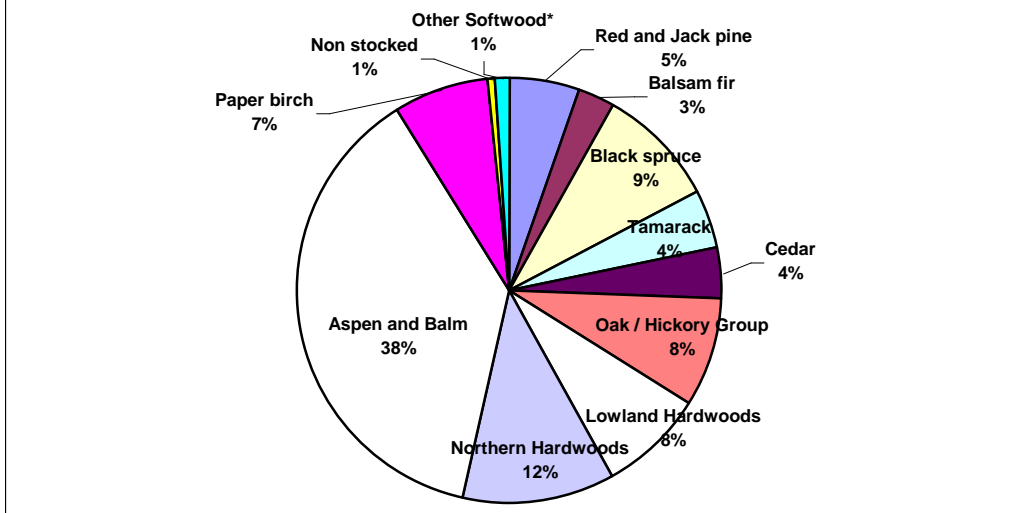
- In the 1990 FIA inventory, forestland was reported as 16.7 million acres, timberland was 14.8 million acres, productive reserved was 1.1 million acres and unproductive forestland was .8 million acres.
- It is unlikely that productive reserved forestland has actually decreased since 1990, as indicated by the 2001 FIA figures.
- The reported FIA *timberland* increase in spite of *forestland* decrease was most likely caused by a definition change in the inventory, causing some forestland that was considered unproductive in 1990 to now be considered productive.
- Total forestland in all likelihood has been reduced a bit since 1990, due to conversion to house sites, roads and other urban development, so the FIA forestland reduction from 16.7 in 1990 to 16.3 in 2001 is representative of on-the-ground reality.



Source: Minnesota FIA 2001 Eastwide Database Provided by USFS North Central Forest Experiment Station
 Ownership of timberland is an important factor in assessing many factors, including timber supply. For instance, national forestland harvest levels have dropped dramatically in the last 10 years. Since society continues to demand more raw materials including wood, the difference has been made up largely by private forestlands and imports from Canada. This has been a factor in dramatic timber price increases in the last 10 years, and has also resulted in reduced forest management control of our wood supply.

Timberland Cover Type Acres Minnesota FIA 2001

Total Timberland Acres: 14,982,476



Cover Type: A classification of forest land based on the species forming a plurality of live tree stocking.

Source: Minnesota FIA 2001 Eastwide Database Provided by USFS North Central Forest Experiment Station.

It is worthwhile to note that aspen is by far the largest cover type in Minnesota.

Some notable trends since 1990: Balsam fir cover type acres down (due mostly to spruce budworm mortality), northern hardwoods acres up (possibly due in part to inventory design change, in part to a natural tendency for more shade tolerant species to become dominant over time) cedar acres down (possibly due in part to inventory design change, but also due in part to associated species gaining in volume compared to cedar), aspen acres slight increase.

Area of Timberland in Minnesota by Forest Type – 2001

Forest Type	Acres (in Thousands)
Jack Pine	418.7
Red Pine	381.7
White Pine	70.7
Balsam Fir	421.8
White Spruce	86.6
Black Spruce	1,375.5
Cedar	565.8
Tamarack	648.2
Other Softwoods	3.9
Oak/Hickory	1,252.0
Elm-Ash-Cottonwood	1,218.0
Maple-Basswood	1,758.9
Aspen	5,143.4
Birch	1,078.6
Balm of Gilead	457.3
Non-Stocked	101.3
Total All Types	14,982.4

Source: USDA Forest Service Eastwide FIA Database provided by North Central Research Station

Harvest Levels



Total Wood Harvested in Minnesota by Species – Timberland

(Pulpwood 2001*; Sawtimber 2001; Fuelwood 1995-96)

(In Thousand Cords)

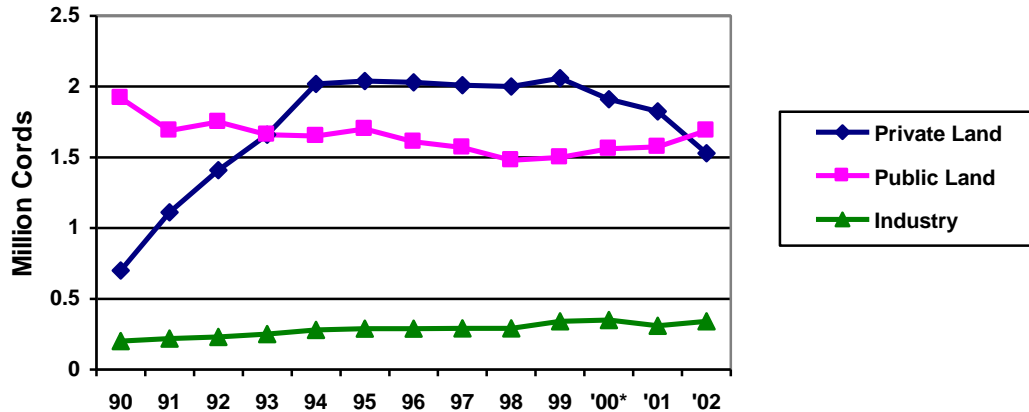
Species	Pulpwood*	Sawlogs & Others	Fuel		Total
			Residential**	Commercial	
Aspen	1895.1	120.6	29.0	.6	2045.3
Birch	147.8	32.4	40.3	6.3	226.8
Balm of Gilead	97.8	.9	0	.1	98.8
Ash	.8	10.9	11.5	.2	23.4
Oak	0	94.2	77.6	1.0	172.8
Basswood	9.7	24.5	3.2	0	37.4
Maple	49.7	11.8	11.4	4.7	77.6
Cottonwood	.2	7.7	0	0	7.9
Other Hardwood	0	9.1	13.1	0	22.2
Sub-Total Hardwood	2201.1	312.1	186.1	12.9	2712.2
Pine					
Red Pine	47.1	95.9	1.0	0	144
White Pine	1.5	13.2	.2	0	14.9
Jack Pine	89.2	151.8	1.3	0	242.3
Spruce	199.6	12.8	.1	0	212.5
Balsam	170.6	7.6	.1	0	178.3
Tamarack	45.6	1.8	.6	0	48
Cedar	0	5.3	.6	0	5.9
Other Softwood		4.9			4.9
Sub-Total Softwood	553.6	293.3	3.9	0	850.8
Total	2754.7	605.4	186.1	12.9	3563

*2001 Pulpwood consumption figures DRAFT. Figures include pulpwood exported to Wisconsin: Aspen: 30,030 cords, Spruce: 54,570 cords, Red Pine: 4,490 cords, Tamarack: 39,190 cords, Birch: 49,000 cords.

** This is fuelwood removed from growing stock.

Sources: Pulpwood (USDA Forest Service, North Central Forest Experiment Station), Sawtimber & Fuelwood (MN DNR) surveys.

Volume of Timber Sold by Ownership - Minnesota-

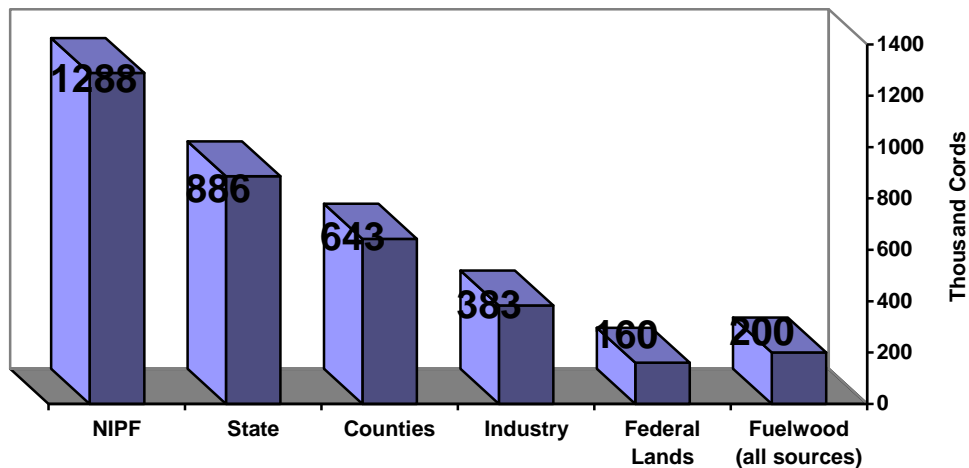


*2000 figures corrected from previous versions of this graph. Previous versions used projected figures.

Source: Public Lands: Public Stumpage Price Review. Industry Lands: Minnesota Forest Industries survey. Private Lands = An estimate figured as follows: Total estimated harvest minus public volume sold, minus industry volume harvested.

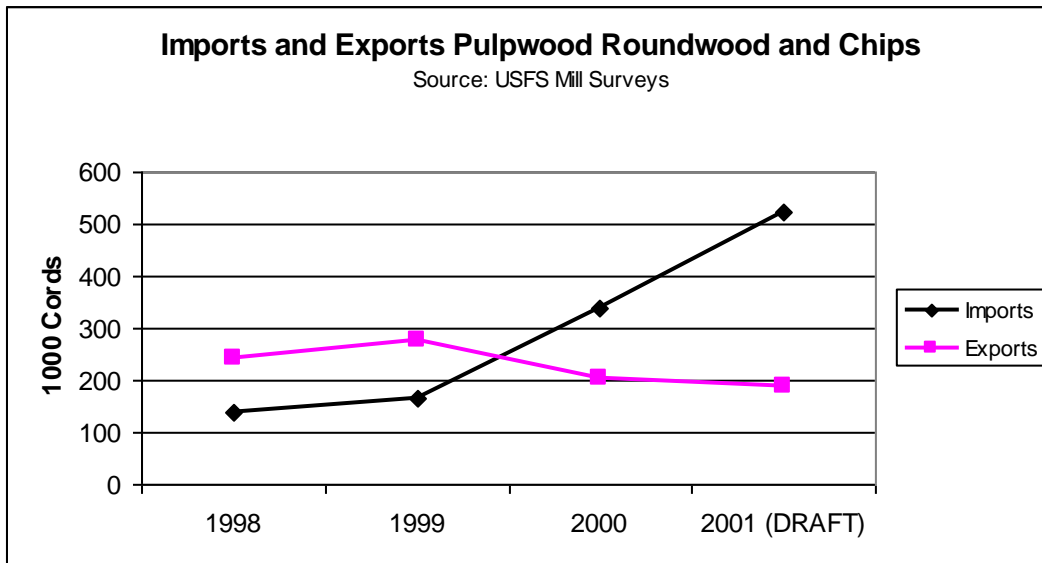
Probably of greatest interest here is the recent trend toward a slight reduction in harvest from private lands. The single biggest factor influencing this trend is imports of pulpwood, mostly from Canada. In other words, we are not consuming less wood. We are simply importing more.

Contributors to Estimated Harvest in Minnesota - 2002 Total Harvest = 3.56 Million Cords, all sources



Source: 2002 Public Stumpage Price Review, MFI survey and DNR Fuelwood Survey.

Ownership of lands has a large impact on policy regarding forest management and timber harvest. For example, forest management and harvest activity on national forests declined drastically over the last 10 years, with much of the slack picked up by increased harvest and management of private lands and by imports, especially from Canada.



Source: USFS North Central Station FIA Unit Survey of Industrial Wood Using Industry.

Exports are mainly to Wisconsin mills. Imports are largely from Canada, with some from Wisconsin and a very small volume from Michigan.

Minnesota has become a large net importer of wood over the last several years, as our stumpage prices have increased, and offerings of timber from federal lands have been reduced. Mills have needed to increasingly look outside of Minnesota's borders in order to meet their raw material needs, especially for aspen.

Estimate of Increases/Decreases 2001 to 2004: Minnesota Harvest (In Cords)

	Aspen/ Balm	Pine	Spruce	Balsam Fir	Tamarack	Ash	Birch	Maple	Basswood
Potlatch OSB Mills (Bemidji, Cook, Grand Rapids)	(-)59,000	9,000			44,000	23,000	(-)5,000		6,000
SAPPI Pulp & Paper Mill*	(-)121,000	(-)2,000			12,000	1,000	60,000	53,000	
Boise**	7,000		1,000	1,000	2,000	1,000	3,000	2,000	
Blandin	(-)37,000								
Potlatch Lumber Mill***		7,000							
Sawmills	(-)5,000								
Export					(-) 20,000				
Totals	(-)211,000	14,000	1,000	1,000	38,000	25,000	58,000	55,000	6,000

*Assumes 15% of procurement for Aspen/Balm & Pine from Wisconsin; 40% of procurement for Maple & Basswood from WI, 30% from MI, 10% Other Imported.

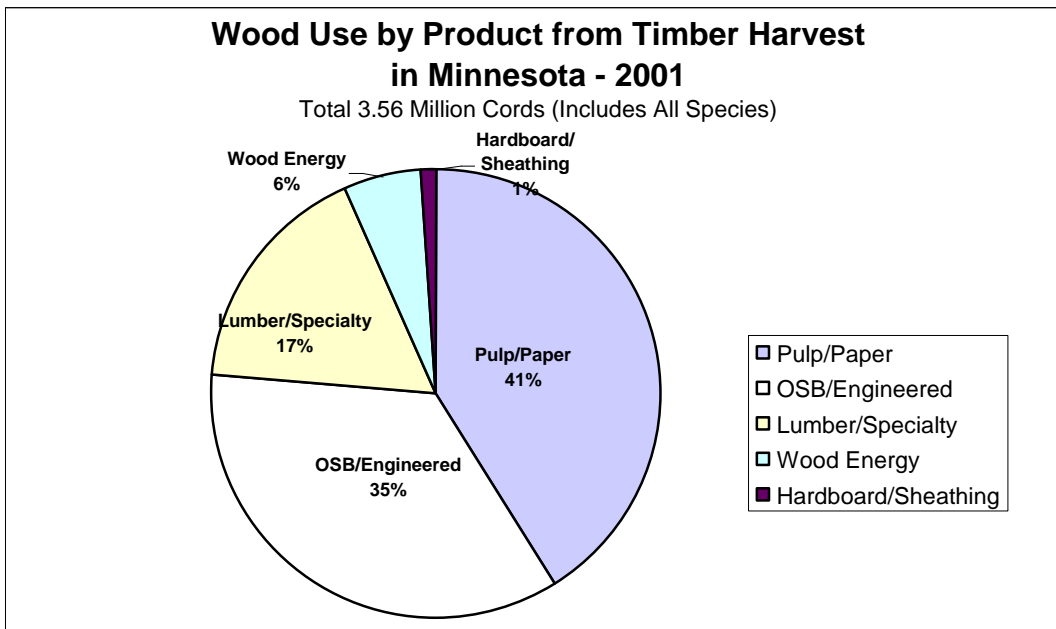
**20% of expected increase over a 10 year period.

8/19/03

***Assumes all wood harvested in Minnesota.

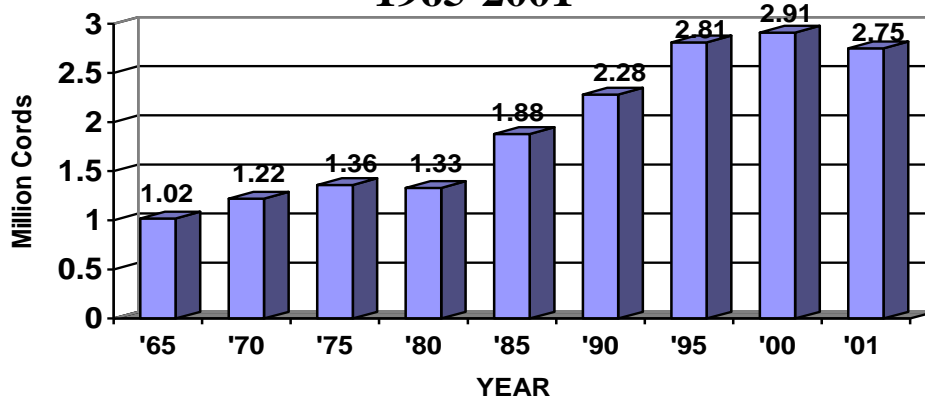
NOTES

- 1) 2001 harvest figures are used as a basis for determining estimated harvest in 2004.
- 2) Pulpwood exports to Wisconsin will continue to decrease as demand and stumpage prices in Minnesota continue to increase.
- 3) May be a decrease in softwood imports from Ontario, due to establishment of new management guidelines and the establishment of several new parks.



Harvest Data Compiled by USDA Forest Service, North Central Forest Experiment Station & DNR
Specialty products include veneer, posts & poles, shavings & landscape chips

Timber Harvested From Minnesota Timberlands and Utilized by Pulpwood Mills 1965-2001

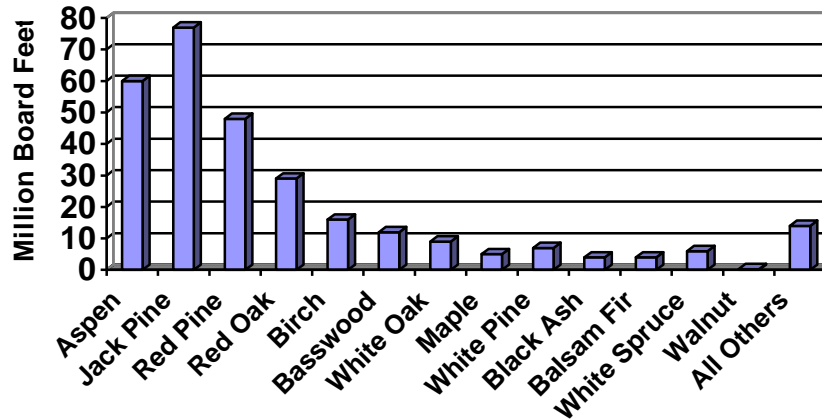


Source: USFS, North Central Forest Experiment Station Surveys

There was a nearly steady increase in pulpwood harvest from 1965 to 2000. 2001 showed the first decrease in many years. A major reason for the decrease in Minnesota harvest is higher stumpage prices, which is driving up the amount of wood we import, most of which is aspen from Canada. This means fewer logging, trucking and support jobs here in Minnesota and more in Canada.

Timber Harvested From Minnesota Timberlands Utilized by Sawmills -2001 -

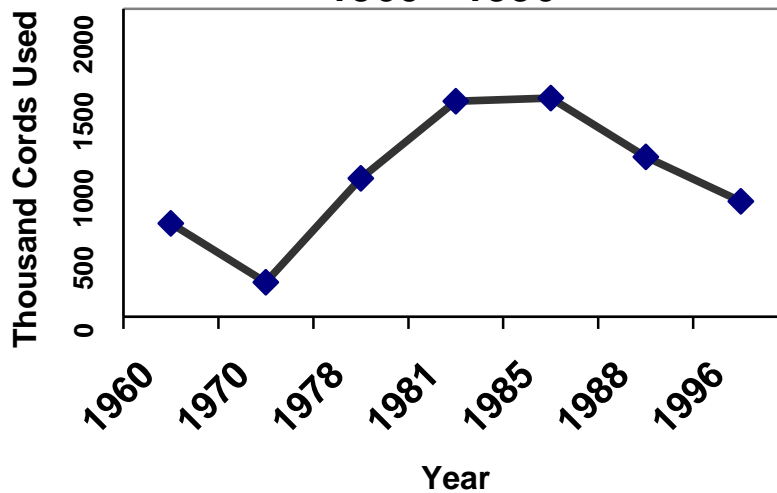
(Lumber, Posts/Poles, Shavings, Veneer, Energy & Landscape Chips)
Total 300 Million Board Feet



Source: MN DNR Sawmill Survey.

Sawtimber is generally the highest value product for wood that meets merchantability requirements. Generally speaking, a log needs to be at least 8 feet in length and 8 to 10 inches minimum diameter inside bark at the small end in order to be of merchantable sawlog size (There are some mills that can utilize smaller diameter material profitably).

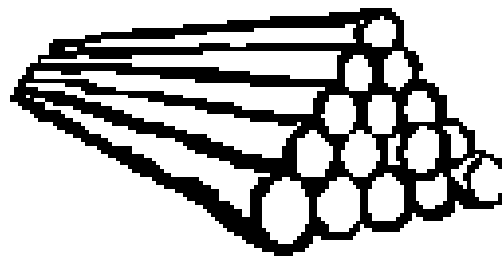
Fuelwood Demand in Minnesota 1960 - 1996



Source: MN DNR Fuelwood Surveys

Fuelwood is a relatively small portion of total timber harvest. Additionally, it is important to note that only a portion of fuelwood comes from timberland, thereby having an effect on forest management. The remainder is from sawmill residue, urban tree waste, land and powerline clearing. An updated fuelwood survey is underway and will be completed by December 2003.

Sustainable Harvest Information



Sustainable Harvest Levels

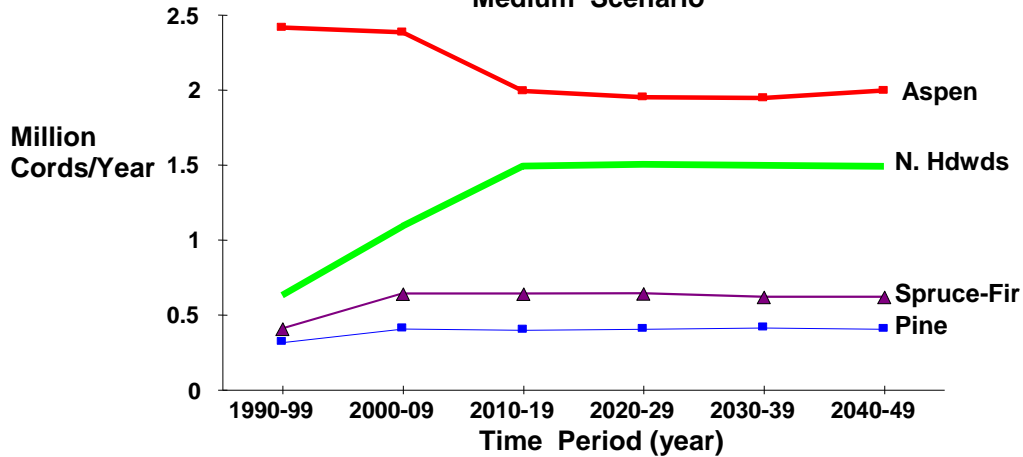
Note to readers: There is no direct correlation between current harvest levels and long term sustained harvest levels because there are many options for moving towards a fully regulated forest age class structure (which is simply an equal acreage of forest in all age classes over a rotation). Normally, transitions from the current structure to a target age class structure require several rotations. The choice of amount and timing of harvest can vary considerably by decade. Harvest plans are typically assessed periodically as markets and other conditions dictate.

There is no one best way or time period to reach a target age class structure. Transition harvests may at some time be either lower or higher than the long term sustained yield.

DNR sustainable harvest levels are an indication of *potential* wood available annually on a sustainable basis, averaged over a rotation. They are calculated based on available “timberlands” only, but they are still not exactly the same as *available* wood. Lands where harvesting is restricted by policy or low site productivity are excluded from the calculations, but the figures are not further adjusted downward for potential timber supply restrictions that can apply to timberlands (such as riparian, access, operability, extended rotation & other). Therefore actual *available* timber is likely to be somewhat lower than indicated by the DNR long-term annual *sustainable* figures.

DNR sustainable harvest levels are averages over an entire rotation. Generally therefore, for cover types with old age-class imbalances, current timber availability is likely to be *above* long-term sustainable levels. This is due to a need to manage many old stands on timberlands before their health and available timber volume deteriorates. For cover types with young age-class imbalances, current timber availability is likely to be below long-term sustainable figures.

**SCHEDULING HARVEST by MODEL for PRODUCT GROUP
Minnesota Northern Region, All Ownerships
Medium Scenario**



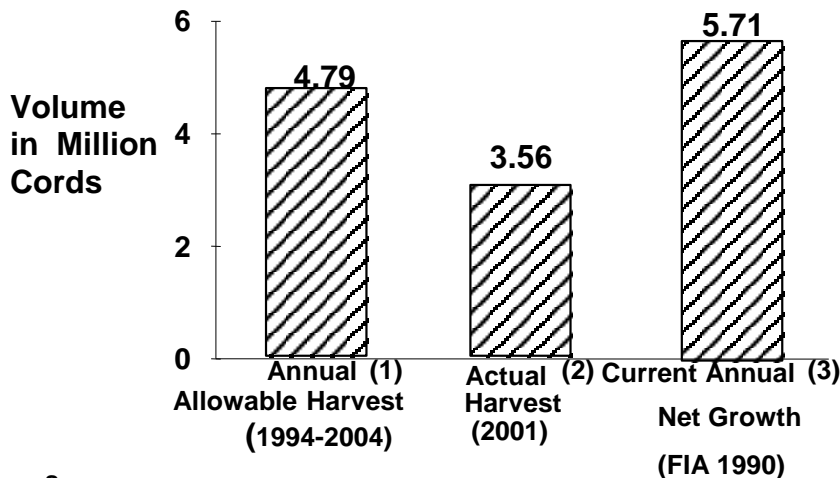
Source : GEIS table 6.8 medium scenario, 2nd run (p210 of M.P. & F. Reso. Base, 12/1992)
Assumptions used : Ownership constraints (riparian lands & old growth forests, etc.)

1994 saw the completion of Minnesota’s Generic Environmental Impact Statement on Timber Harvesting and Forest Management in Minnesota (GEIS). This study was commissioned by the Minnesota Environmental Quality Board in response to a citizen petition. The GEIS assessed how three levels of statewide timber harvesting activity relate to Minnesota’s environmental, economic and social resources. Base, medium and high harvesting scenarios were looked at: 4 million cords annually, 4.9 million cords annually, and 7 million cords annually. Each scenario was projected over a 50 year planning horizon. They are not recommended in the GEIS as levels of harvest to follow, nor should their development and analysis be considered a plan. Rather, they are levels the GEIS study was given to analyze to determine impacts if they were to occur.

ESTIMATED ALLOWABLE HARVEST, HARVEST & ANNUAL GROWTH

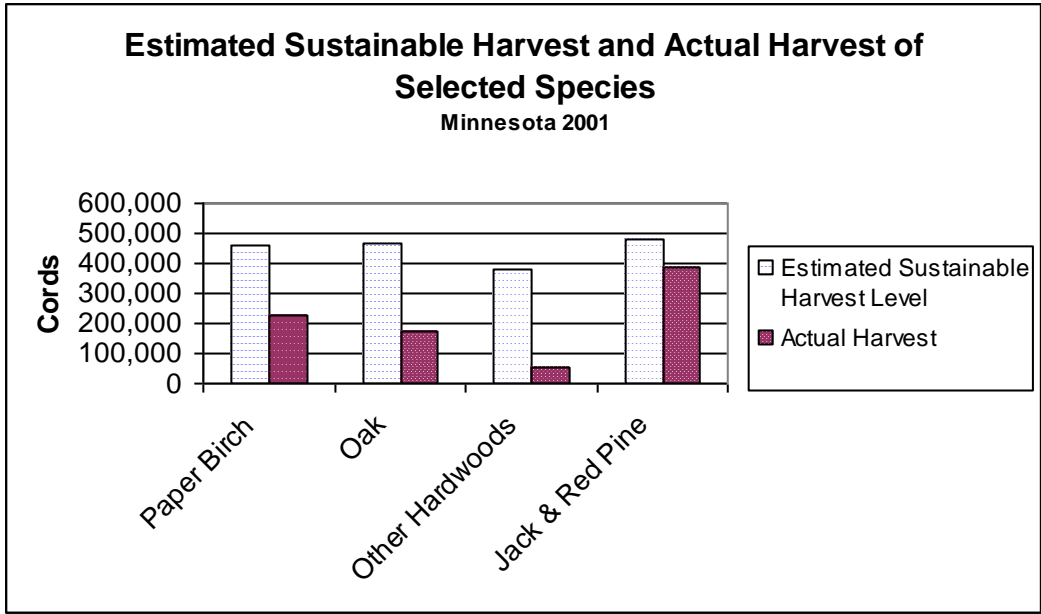
- Minnesota Statewide Timberland , all Ownerships -

For All Species

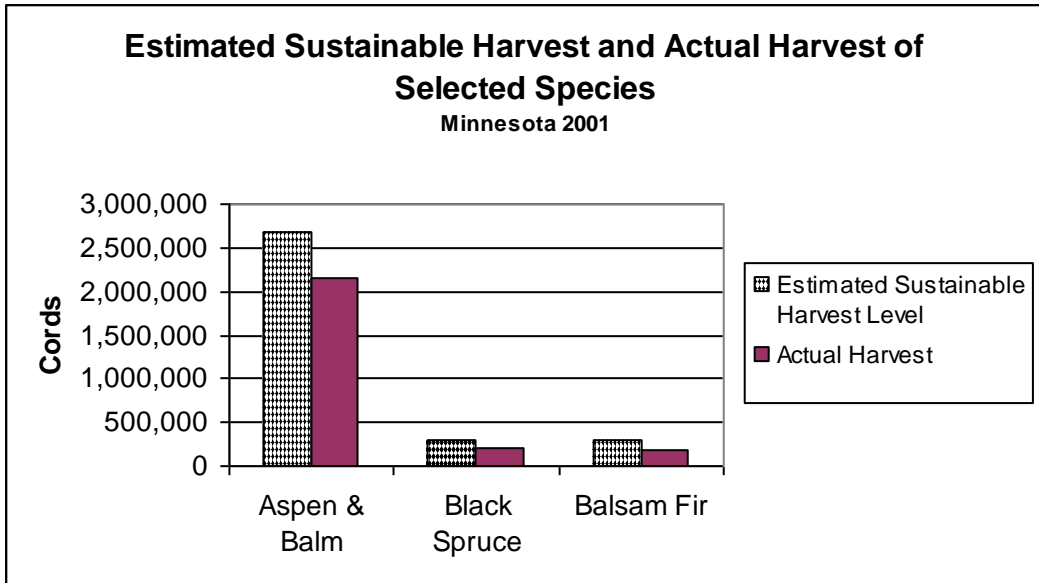


Source :

- 1). Table 6.25, GEIS, Medium Level : Maintaining Productivity & Forest Resource Base Tech. Pap., Dec 92
- 2). NCFES 2001 Pulpwood Harvest (DRAFT), 2001 DNR Sawtimber Survey, 95-96 Statewide Fuelwood Use
- 3). Table #63 of NCFES Resource Bulletin, NC-141, Aug. 92.



Harvest data for 2001 from NCFES pulpwood survey & DNR 2001 sawmill & fuelwood survey. The chart above is based on DNR method of calculating allowable harvest, which consists of area regulation with growth contribution of all live trees (based on MN 1990 FIA).



Harvest data for 2001 from NCFES pulpwood survey & DNR 2001 sawmill & fuelwood survey. Aspen/Balm sustainable harvest based on GEIS (Table 6.25, medium level, Dec. 1992) Balsam Fir sustainable harvest based on DNR method with 32% reduction in 2000 due to mortality in fir since 1990 inventory. Spruce sustainable harvest based on DNR method.

Current and Projected Wood Harvest from Timberland
- Minnesota Statewide -

Species	In Thousand Cords	
	2001	Projected 2004*
Aspen/Balm of Gilead	2,144.1	1,918.0
Birch	226.8	279.7
Ash	23.4	48.4
Oak	172.8	177.0
Basswood	37.4	45.0
Maple	77.6	134.0
Cottonwood	7.9	8.9
Other Hardwoods	22.2	24.2
Pine	401.2	415.0
Spruce	212.5	208.0
Balsam Fir	178.3	181.1
Tamarack	48.0	82.0
Cedar	5.9	6.5
Other Softwoods	4.9	5.0
Total	3,560.6	3,532.8

Source: 2001 Harvest data compiled by NCFES and DNR
Projected 2004 based on announced expansions and industry interviews

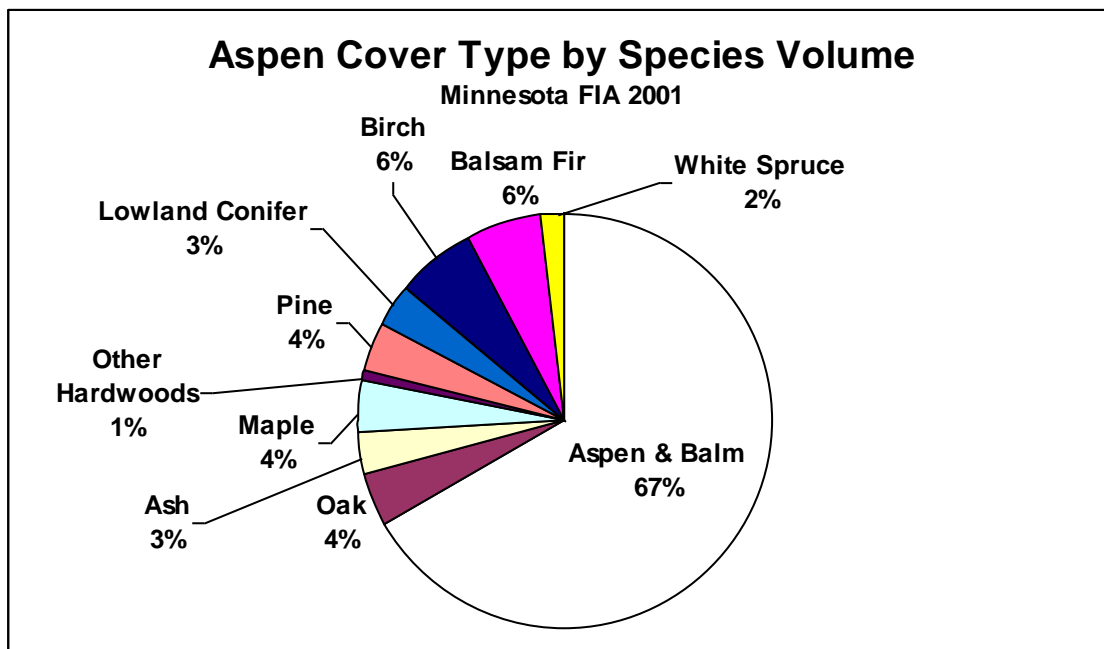
Adjustments mainly due to:

- SAPPI pulp mill in Cloquet expansion & species mix change.
- A portion of Boise Cascade proposed increase.
- Species changes at Potlatch OSB mills.
- Shutting down 2 paper machines at UPM-Blandin

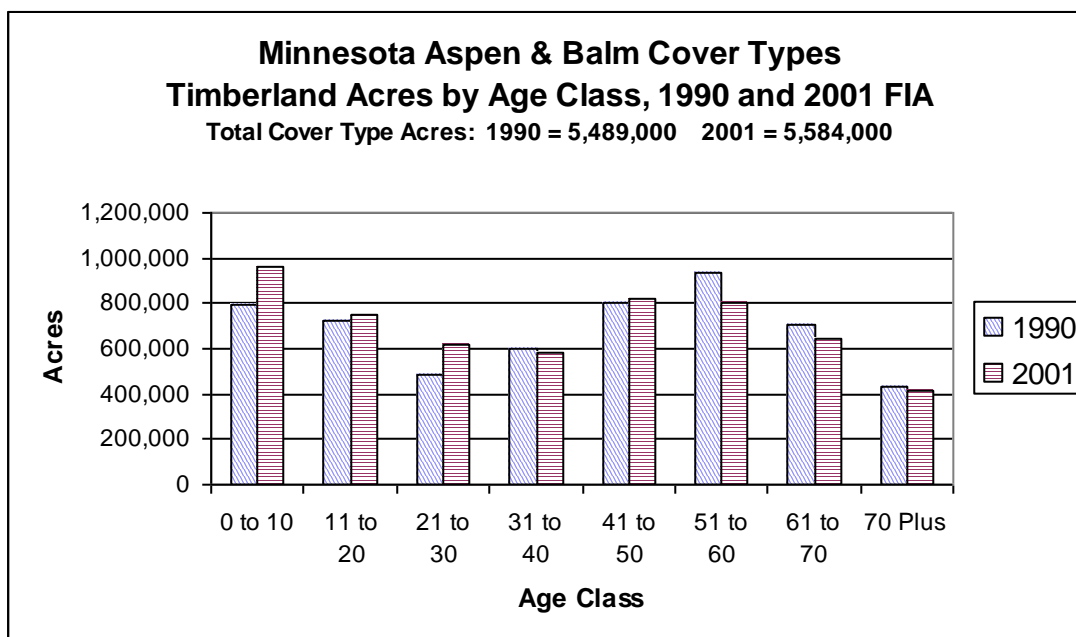
Wood Supply and Demand Information for Important Minnesota Cover Types and Species



Minnesota's Aspen Resource



Source: 2001 FIA Database provided by USFS, North Central Research Station
The aspen cover type is made up of a wide mixture of species. Predominant secondary species include balsam fir and paper birch.

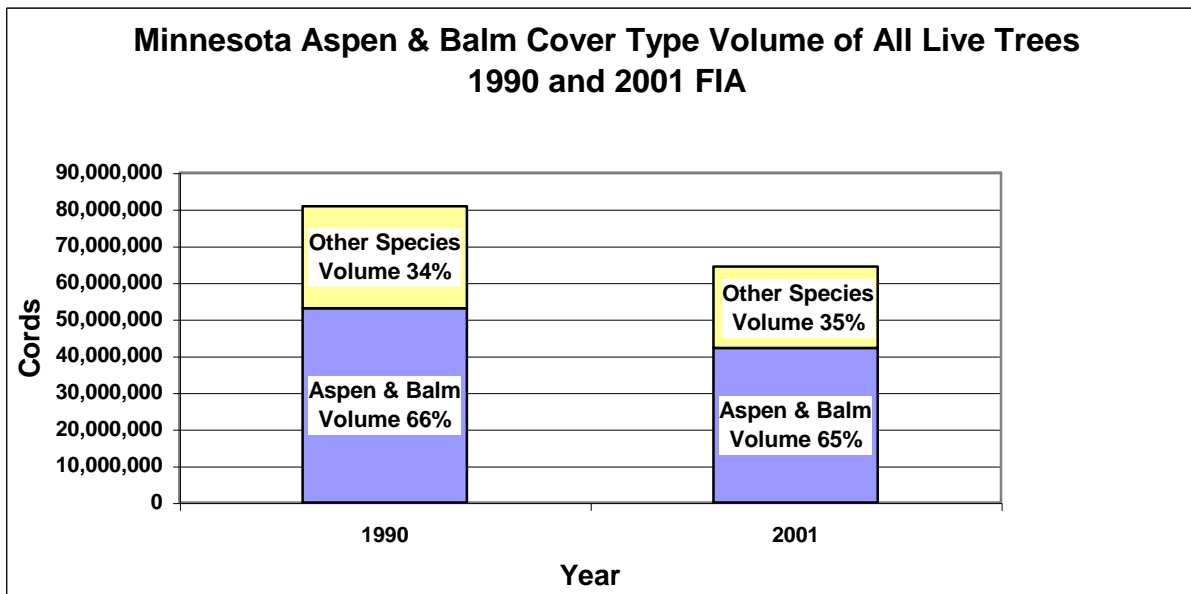


Source: FIA Database provided by USFS, North Central Research Station

Probably of greatest note: The cover type age class picture has, as a whole, “evened out” more than would have been expected. Based on an average of 11 years passing between inventory data gathering, the 2001 “31 to 40” year age class is about 100,000 acres larger than expected, since the 1990 “21 to 30” year age class should have approximately become the “31 to 40” age class in 2001. A similar thing appears in the 1990 “31 to 40” year age class. Conversely, the 1990 “11 to 20” age class went down about 100,000 acres from expected as we look at the 2001 “21 to 30” age class.

What could cause this? Probably a couple of things. First, the inventory’s method of assigning stand ages based on measuring different site index trees between inventories probably accounts for a large part of what we are seeing. Second, since cover type is essentially determined by a preponderance of species volume, the heavy balsam fir mortality since the last inventory has undoubtedly caused many mixed stands classified as balsam fir in 1990 to now be classified as aspen cover type in 2001. Third, there are 11 years average between inventories instead of 10, so the transfer to the next age class has an approximately 10% overlap

What does this mean? Well, for one thing, it means a bit less of a “roller-coaster” in the aspen supply picture than was previously anticipated. This is good news. This does not mean that aspen supplies won’t be tight, but at least they should be a bit more evenly distributed than was thought earlier.



Source: FIA Database provided by USFS, North Central Research Station

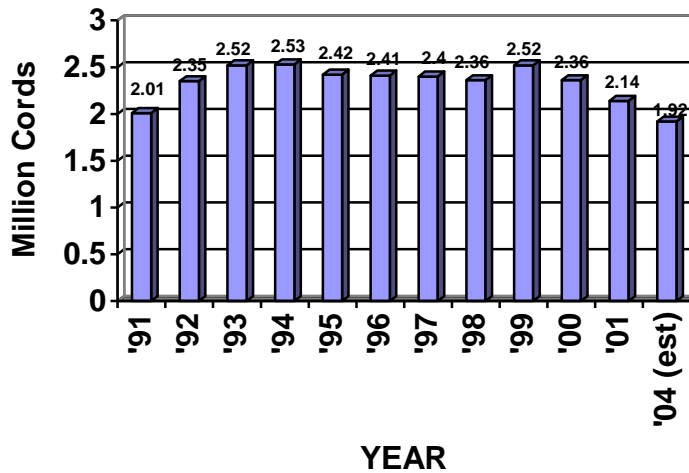
The chart above tells us that total volume in the aspen and balm cover types has gone down rapidly from 1990 to 2001. Average volume per acre fell from around 15 cords per acre in 1990 to approximately 12 cords in 2001, which is a 20% drop. The percentage of aspen and balm in the cover type remained quite stable, at 64 to 65%.

The volume drop is likely caused by several factors, including more of the cover type being in the very young age classes (containing little or no merchantable volume) in 2001, and also due to many of the unharvested older stands of aspen that remain containing lower volumes per acre. In fact, average volume of stands greater than 40 years of age dropped around 13%, from 21.6 cords in 1990 to 18.8 cords in 2001.

Aspen and balm volume contained in other cover types has undergone a significant drop from 1990 to 2001 as well. Aspen and balm volume contained in all other cover types fell from over 13 million cords in 1990 to just over 10 million cords in 2001, which is greater than a 20% drop.

In a nutshell, there is aspen out there, but much of it is likely to be found in lower volume stands, which is tough on efficiency of loggers and mills.

Aspen & Balm Harvest in Minnesota: Actual & Projected
 (Includes pulpwood, sawtimber, wood for energy & specialty products)



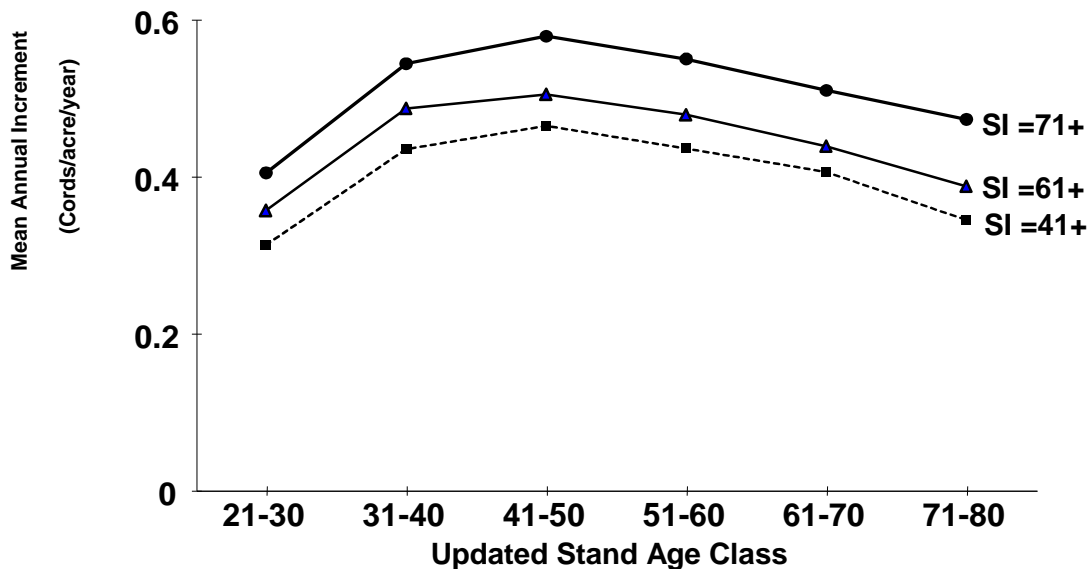
Annual sustainable yield= 2.68 million cords based on Table 6.25 GEIS, medium level, Dec. 1992

Harvest data compiled by NCFES and DNR

An important factor influencing the recent reduction in aspen and balm harvest from Minnesota timberlands is rising stumpage prices, which have resulted in increasing aspen pulpwood imports from Canada.

Another factor has been the substitution of alternative species by several large mills.

Aspen Type Mean Annual Increment by Updated Age
 CSA Statewide : Based on Volume Yield Model



* The CSA biological yield model based on stands at the time of survey age.

Gross volume including net & cull volume of live trees

DNR-Forestry 11/30/95

Mean Annual Increment (MAI) is the average annual increase in volume of a stand at a specified point in time. MAI changes with different growth phases in a tree's life, generally being highest in the middle ages & decreasing with age. The point at which MAI peaks is sometimes used as a guide to identify biological maturity and a stand's readiness for harvesting. This chart shows MAI for several different site indices (site index is a measure of site productivity).

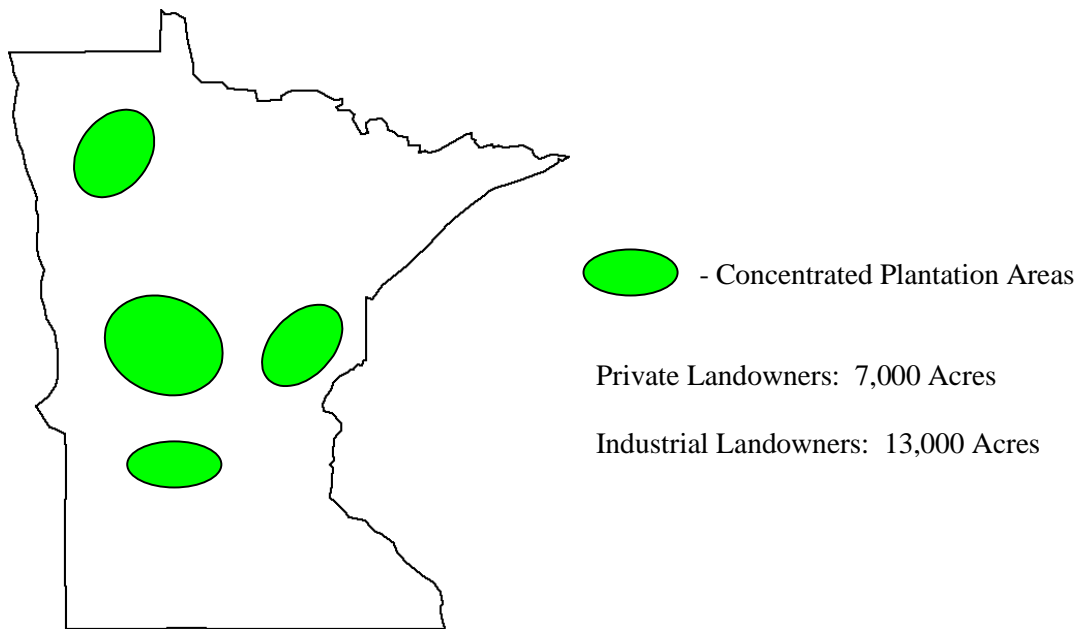
Current and Projected Demand for Aspen/Balm of Gilead from Minnesota Timberlands



	Cords
2001 Harvest.....	2,141,400
• Minnesota Pulpwood Industries	1,960,000
• Pulpwood Export.....	33,000
• Sawlogs & Other.....	121,700
• Fuelwood (from growing stock).....	29,700
 2004 Projected Harvest.....	 1,918,000
• Minnesota Pulpwood Industries.....	1,747,000
• Pulpwood Export.....	30,000
• Sawlogs & Other.....	111,000
• Fuelwood (from growing stock).....	30,000

Figures include a shift to use of alternative species by several existing OSB & pulp companies.

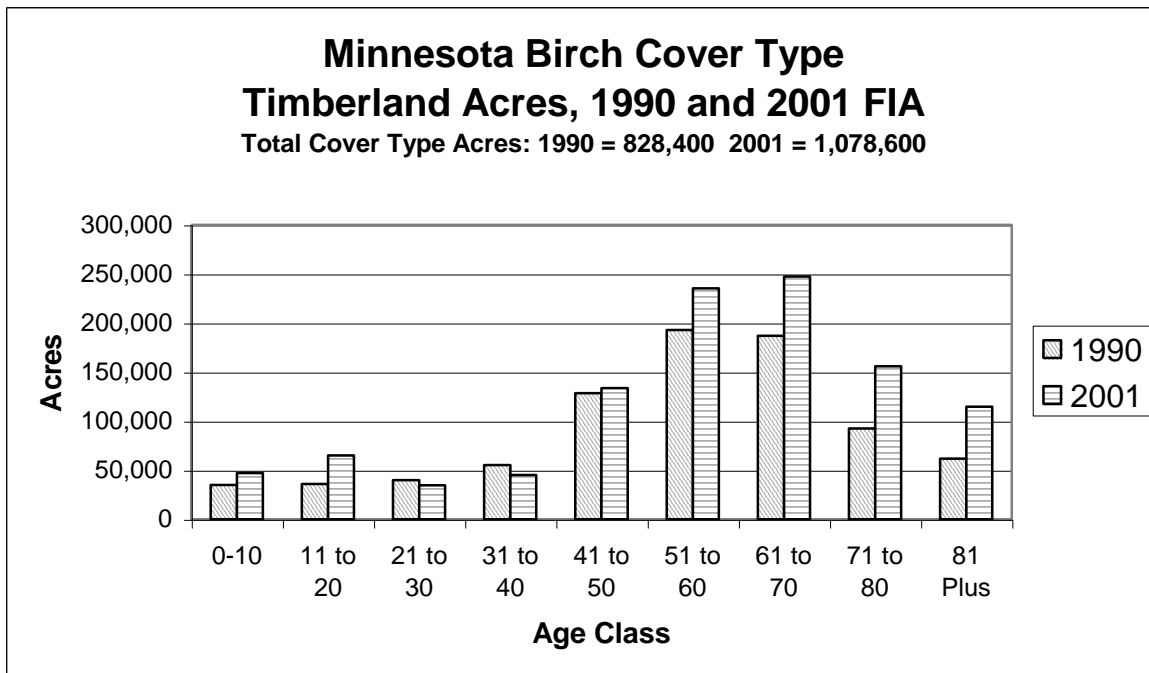
Hybrid Poplar in Minnesota - 2003



Hybrid Poplar has been found to be an excellent substitute for aspen fiber in papermaking and Oriented Strand Board (OSB) production.

- Hybrid Poplar can reach merchantable size in 7 to 12 years.
- Intensive culture is required for the first 3 years in order to grow hybrid poplar.
- It is commonly grown on marginal agricultural fields.

Minnesota's Birch Resource



Source: FIA Database provided by USFS, North Central Research Station

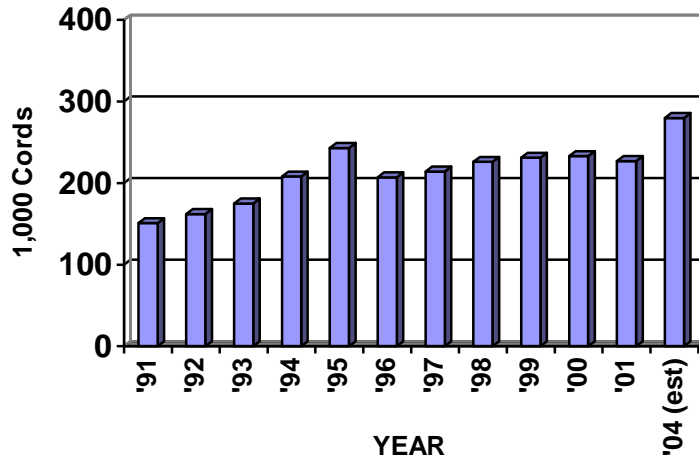
Of greatest note are two things: The increase of over 20% in birch cover type acreage since 1990, and the extreme age class imbalance. This is clearly an old resource, in need of management. Probably the biggest factor in causing increased birch cover type acreage is that as aspen has been harvested from mixed stands, birch has become the species of predominant volume in some stands classified as aspen in 1990. Statistical variance and inventory design modifications may also explain part of the change.

Average volume in the birch cover type has been dropping as the type ages. Total average volume of all species dropped from 17.7 cords in 1990 to 14.8 cords in 2001 - a 16% drop. There was a bit more total volume in the birch cover type in 2001 due to increased cover type acreage, but stands contained less volume per acre.

Birch has been a neglected resource for too long in Minnesota, but markets are improving as some larger mills widen their species use to include some birch. This should help greatly. There is also a clear need to increase efforts aimed at improving our ability to consistently regenerate birch stands.

BIRCH HARVEST IN MINNESOTA: ACTUAL & PROJECTED

(includes pulpwood, sawtimber, wood energy & specialty products)

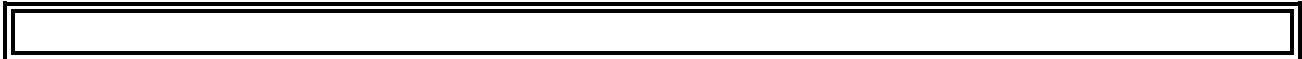


Harvest data compiled by NCFES & DNR

Sustainable harvest 457,000 cords/year, based on DNR method, which consists of Area regulation with growth contribution of all live trees (based on MN 1990 FIA). Figure was adjusted downward 30% due to heavy mortality since 1990 inventory due mostly to 1987 and 1988 drought effects. Sustainable harvest not adjusted for restrictions (riparian & other).

Estimated average net annual growth of birch growing stock: 296,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 21. Estimated average annual mortality of birch growing stock: 266,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 25.

Current and Projected Demand for Birch from Minnesota Timberlands



	Cords
2001 Harvest.....	227,300
• Minnesota Pulpwood Industries.....	120,700
• Pulpwood Export.....	27,600
• Sawlogs & Other.....	32,400
• Fuelwood (from growing stock).....	46,600
2004 Projected Harvest.....	279,700
• Minnesota Pulpwood Industries.....	178,700
• Pulpwood Export.....	20,000
• Sawlogs & Other.....	35,000
• Fuelwood (from growing stock).....	46,000

Concerns:

- Consistency in achieving adequate regeneration.
- Wood quality (lots of rot in old birch)

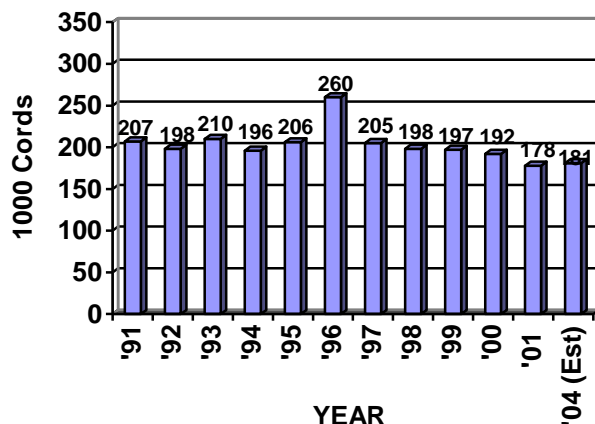
Figures include increases in OSB use by currently operating companies

Source: NCFES & DNR Surveys

Projections based on DNR/Industry Announcements

Minnesota's Balsam Fir Resource

BALSAM FIR HARVEST IN MINNESOTA: ACTUAL & PROJECTED (includes pulpwood and sawtimber)

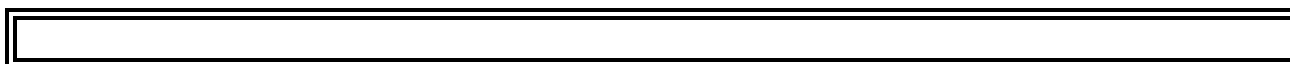


Source: Harvest data compiled by NCFES & DNR.

Sustainable harvest 291,000 cords/year, based on DNR method, which consists of Area regulation with growth contribution of all live trees (based on MN 1990 FIA). Figure was reduced 32 % since 1989 due to mortality from spruce budworm. Sustainable harvest not adjusted for restrictions (riparian and other).

Estimated average net annual growth of balsam fir growing stock: 216,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 21. Estimated average annual mortality of balsam fir growing stock: 280,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 25.

Current and Projected Demand for Balsam Fir from Minnesota Timberlands

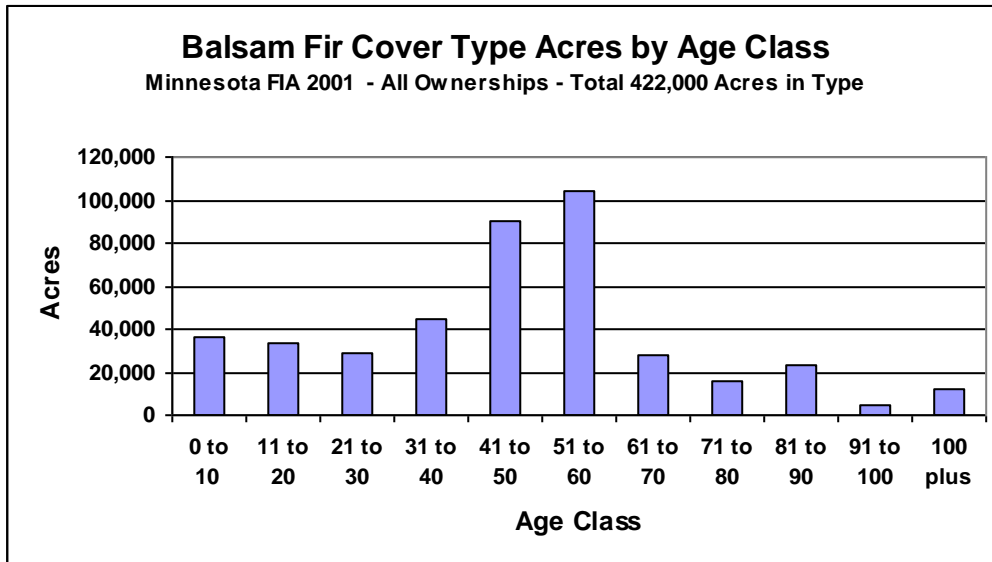


	Cords
2001 Harvest.....	178,300
• Minnesota Pulpwood Industries & Export (Export only 920 cords).....	170,600
• Sawlogs & Other.....	7,600
• Fuelwood.....	100
2004 Projected Harvest.....	181,100
• Minnesota Pulpwood Industries & Export.....	171,000
• Sawlogs & Other.....	10,000
• Fuelwood.....	100

Concerns:

- Balsam availability dependent on harvest of aspen (45% of balsam in aspen type).
- Volume tied up in types not currently harvestable.
- Summer access wood: 30 to 50% maximum.
- Spruce budworm impact in NE Minnesota.

Source: NCFES & DNR Surveys
Projections based on DNR/Industry Announcements



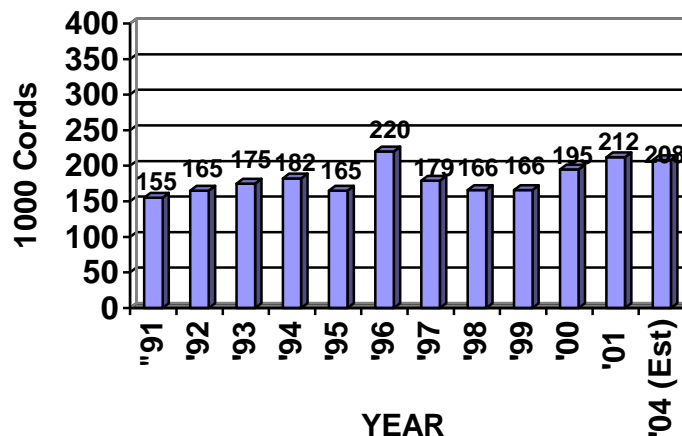
Source: FIA Database provided by USFS, North Central Research Station

Balsam fir is a cover type weighted toward older age classes (average rotation age = 50). This raises forest health and timber quality concerns. Cover type acres have been reduced from 734,000 in 1990 to 422,000 in 2001, due mainly to mortality caused by spruce budworm.



Minnesota's Spruce Resource

SPRUCE HARVEST IN MINNESOTA: ACTUAL & PROJECTED (includes pulpwood and sawtimber)



Source: Harvest data compiled by NCFES & DNR

Estimated sustainable harvest = 298,700 cords/year based on DNR method, which consists of Area regulation with growth contribution of all live trees (based on MN 1990 FIA). Sustainable harvest not adjusted for restrictions (riparian & other).

Estimated average net annual growth of spruce growing stock: 308,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 21. Estimated average annual mortality of spruce growing stock: 212,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 25.

Current and Projected Demand for Spruce from Minnesota Timberlands

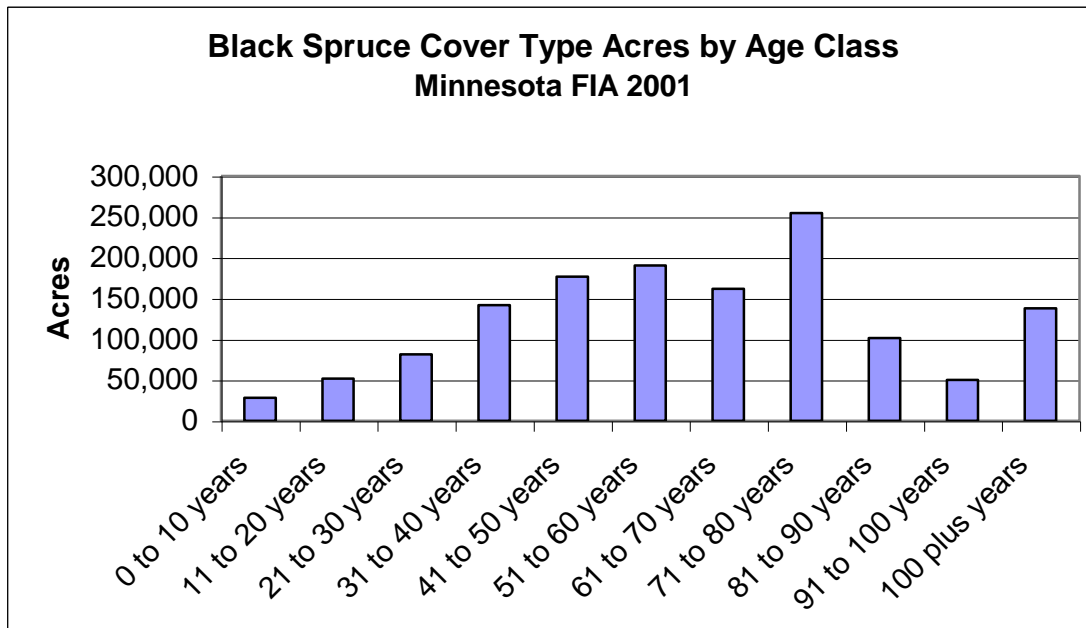
	Cords
2001 Harvest.....	212,500
• Minnesota Pulpwood Industries.....	143,900
• Pulpwood Export.....	55,700
• Sawlogs & Other.....	12,800
• Fuelwood.....	100
2004 Projected Harvest.....	208,000
• Minnesota Pulpwood Industries.....	145,000
• Pulpwood Export.....	48,000
• Sawlogs & Other.....	15,000

Concerns:

- Forest types with low volume/acre of spruce.
- Volume tied up in types not currently harvestable.
- Little summer access.
- Increasing competition for sawbolts.

Source: NCFES & DNR Surveys

Projections based on DNR/Industry Announcements

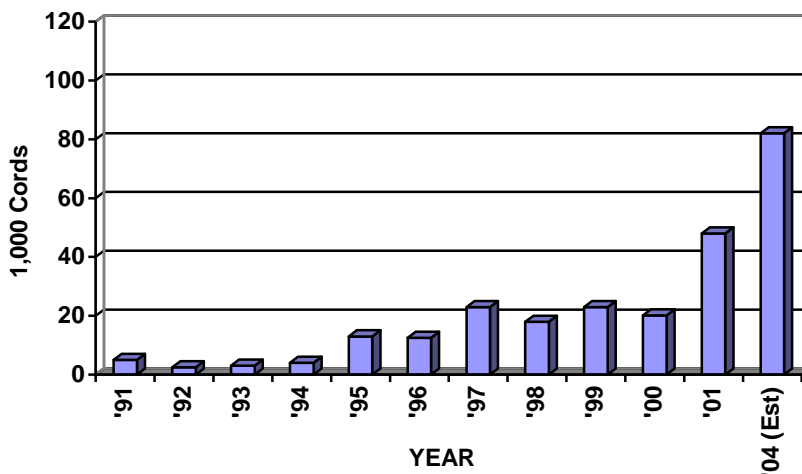


Source: 2001 FIA Database provided by USFS, North Central Research Station

The black spruce cover type is dominated by “middle-aged” stands (average rotation age = 90). The state of Minnesota owns over 40% of the black spruce cover type.

Minnesota's Tamarack Resource

TAMARACK HARVEST IN MINNESOTA: ACTUAL & PROJECTED (from Timberland)



Estimated sustainable harvest for tamarack is 121,000 cords/year, based on DNR method, which consists of Area regulation with growth contribution of all live trees (based on MN 1990 FIA). Not adjusted for restrictions (Riparian & other).

Estimated average net annual growth of tamarack growing stock: 156,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 21. Estimated average annual mortality of tamarack growing stock: 56,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 25.

Current and Projected Demand for Tamarack from Minnesota Timberlands

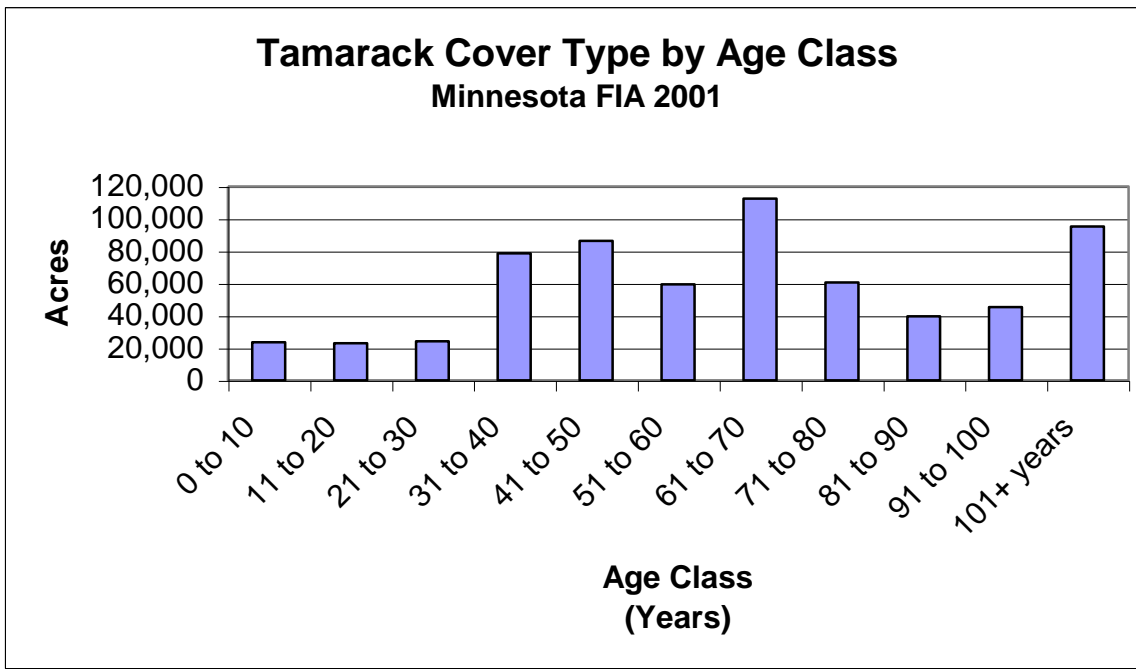


	Cords
2001 Harvest.....	48,000
• Minnesota Pulpwood Industries.....	6,400
• Pulpwood Export (2 Wisconsin pulp & paper mills).....	39,200
• Sawlogs & Other.....	1,800
• Fuelwood.....	600
2004 Projected Harvest.....	82,000
• Minnesota Pulpwood Industries.....	64,000
• Pulpwood Export.....	15,000
• Sawlogs & Other.....	2,000
• Fuelwood.....	1,000

Concerns:

- Forest stands with low volume/acre of tamarack.
- Forest health (insect) issues, especially in older stands.
- Winter access only.
- Some small, poor site stands.

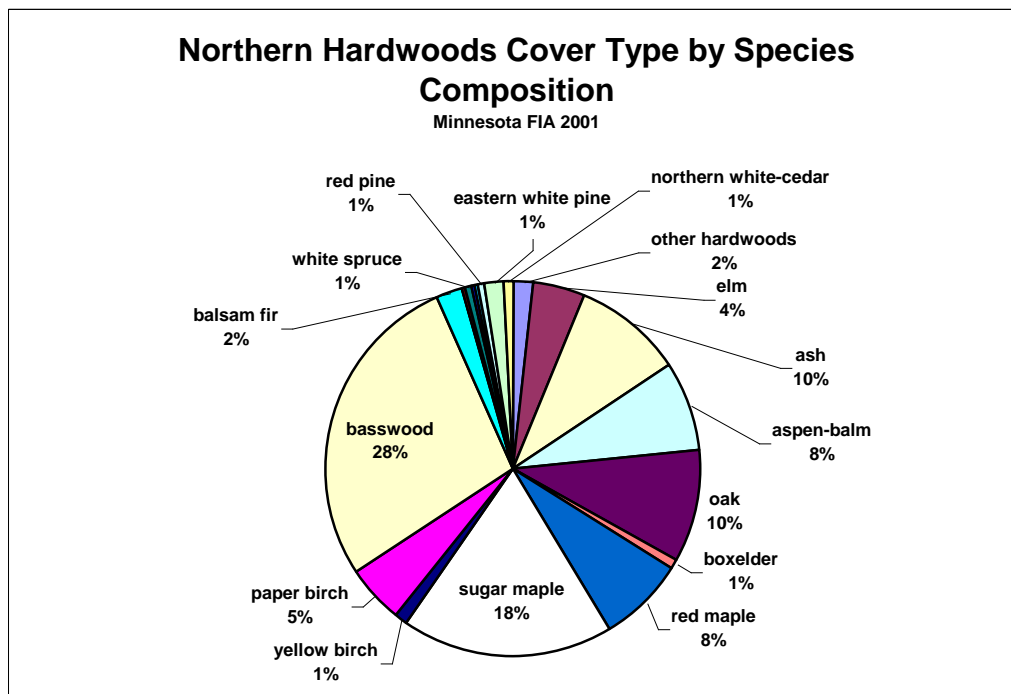
Source: NCFES & DNR Surveys. Projections based on DNR/Industry Announcements



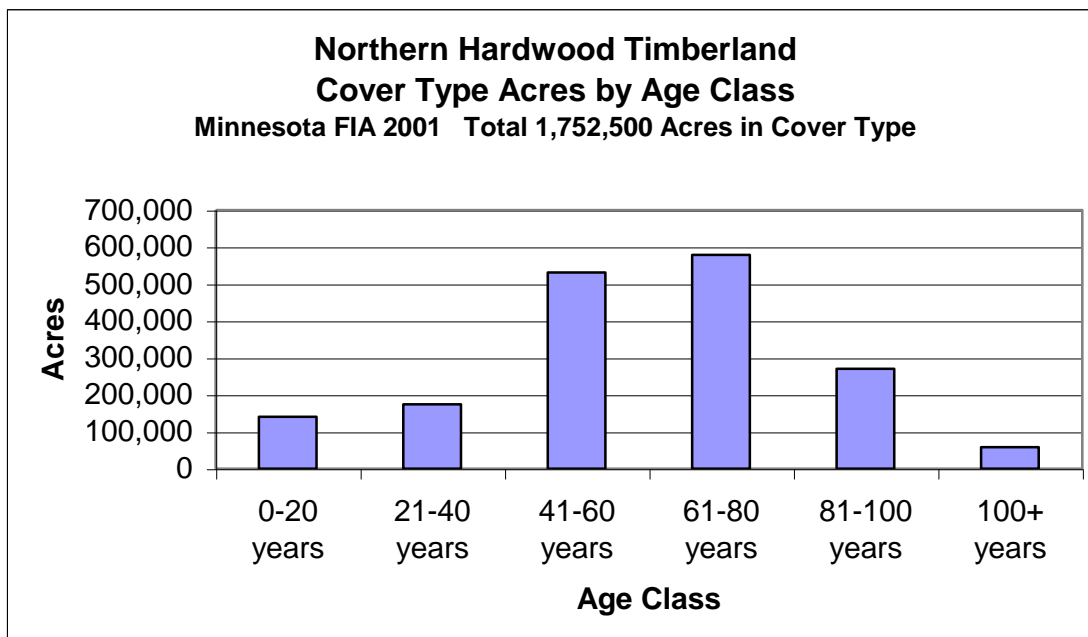
Source: 2001 FIA Database provided by USFS, North Central Research Station
 Tamarack is dominated by “middle-aged” stands, but there is a fair amount of very old tamarack (average rotation age= 90). The state of Minnesota owns over 50% of the tamarack cover type.



Minnesota’s Northern Hardwood Resource



Source: 2001 FIA Database provided by USFS, North Central Research Station
 The northern hardwoods cover type is a conglomeration of a wide group of species. The dominant species present are the shade tolerant maple and basswood. There are also significant ash, oak, birch and aspen volumes present.



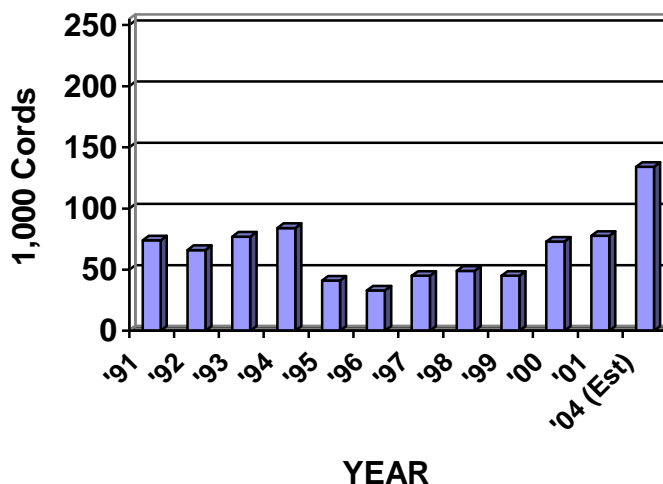
Source: 2001 FIA Database provided by USFS, North Central Research Station
The northern hardwood cover type is dominated by late “middle aged” stands (average rotation age = 80).



Minnesota’s Maple Resource

MAPLE HARVEST IN MINNESOTA: ACTUAL & PROJECTED

From MN Statewide Timberland, all Ownerships



Source: NCFES Pulpwood Surveys, DNR Sawmill & Fuelwood Surveys.

Sustainable harvest for maple in Minnesota is 255,000 cords/year, based on DNR method, which consists of Area regulation with growth contribution of all live trees (based on MN 1990 FIA).

Estimated average annual net growth for maple growing stock in Minnesota is 346,000 cords (based on 1990 USDA FS Resource Bulletin NC-141, Table # 21) Estimated average annual mortality of maple growing stock is 42,000 cords (based on 1990 USDA FS Resource Bulletin NC-141, Table # 61)

Current and Projected Demand for Maple from Minnesota Timberlands

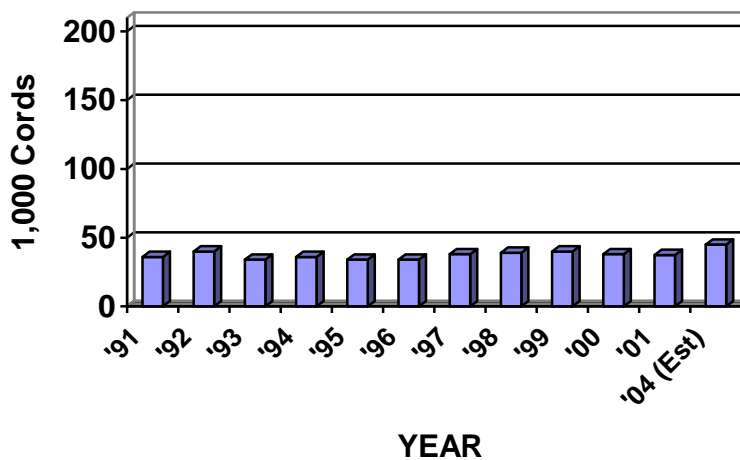
	Cords
2001 Harvest.....	77,600
• Minnesota Pulpwood Industries.....	46,100
• Pulpwood Export.....	3,600
• Sawlogs & Other.....	11,800
• Fuelwood.....	16,100
2004 Projected Harvest.....	134,000
• Minnesota Pulpwood Industries.....	100,000
• Pulpwood Export.....	5,000
• Sawlogs & Other.....	12,000
• Fuelwood.....	17,000

Concerns:

- Promoting good management on non-industrial private lands: with the recent development of a pulpwood market for maple, it will become critical to prevent the harvest of potential high-quality sawlogs as pulp on productive sites.

Minnesota's Basswood Resource

BASSWOOD HARVEST IN MINNESOTA: ACTUAL & PROJECTED
Minnesota statewide Timberland, all Ownerships



Source: NCFES Pulpwood Surveys, DNR Sawmill & Fuelwood Surveys.

Sustainable harvest level for basswood in Minnesota is 213,000 cords/year, based on DNR method, which consists of Area regulation with growth contribution of all live trees (based on MN 1990 FIA).

Estimated net annual basswood growth: 222,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 21. Estimated annual basswood mortality: 39,000 Cords, based on table # 25 in 1990 USDA FS Resource Bulletin NC-141.

Current and Projected Demand for Basswood from Minnesota Timberlands

	Cords
2001 Harvest.....	37,400
• Minnesota Pulpwood Industries.....	9,100
• Pulpwood Export.....	500
• Sawlogs & Other.....	24,500
• Fuelwood.....	3,200
2004 Projected Harvest.....	45,000
• Minnesota Pulpwood Industries.....	15,000
• Pulpwood Export.....	1,000
• Sawlogs & Other.....	25,000
• Fuelwood.....	4,000

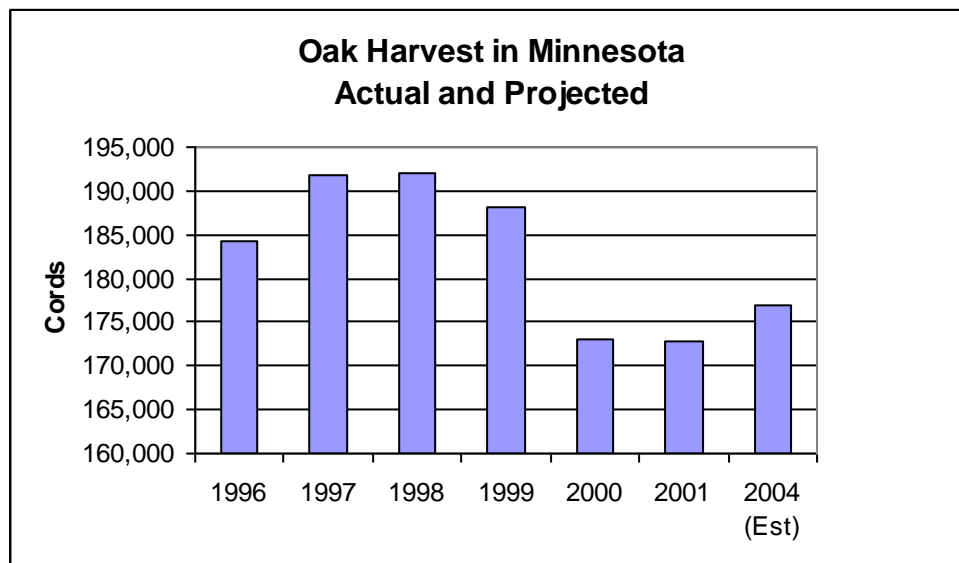
Concerns:

- Promoting good management on non-industrial private lands: with the recent development of a pulpwood market for basswood, it will become critical to prevent the harvest of potential high-quality sawlogs as pulp on productive sites.

Minnesota's Oak Resource

OAK HARVEST IN MINNESOTA: ACTUAL & PROJECTED

Minnesota statewide Timberland, all Ownerships



Source: NCFES Pulpwood Surveys, DNR Sawmill & Fuelwood Surveys.

Sustainable harvest level for Oak in Minnesota is 460,000 cords/year, based on DNR method, which consists of Area regulation with growth contribution of all live trees (based on MN 1990 FIA).

Estimated net annual oak growth: 413,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 21.

Estimated annual oak mortality: 107,000 cords, based on table # 25 in 1990 USDA FS Resource Bulletin NC-141.

Current and Projected Demand for Oak from Minnesota Timberlands



	Cords
2001 Harvest.....	172,820
• Minnesota Pulpwood Industries.....	0
• Pulpwood Export.....	20
• Sawlogs & Other.....	94,200
• Fuelwood.....	78,600
 2004 Projected Harvest.....	 177,000
• Minnesota Pulpwood Industries.....	2,000
• Pulpwood Export.....	1,000
• Sawlogs & Other.....	94,000
• Fuelwood.....	80,000

Concerns:

- High quality red oak sawlog resource continues to decline.
- Gypsy moth invasion likely to make it's way to MN by 2010 will have a negative impact on oak resource.
- There are opportunities to improve future oak volume and quality through investments in intermediate stand treatments on private and public lands.

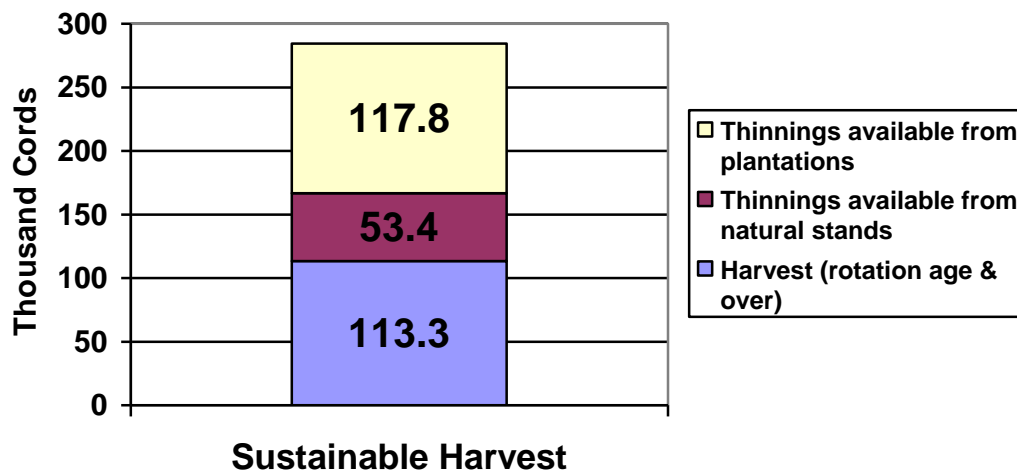
Minnesota's Pine Resource

Red Pine

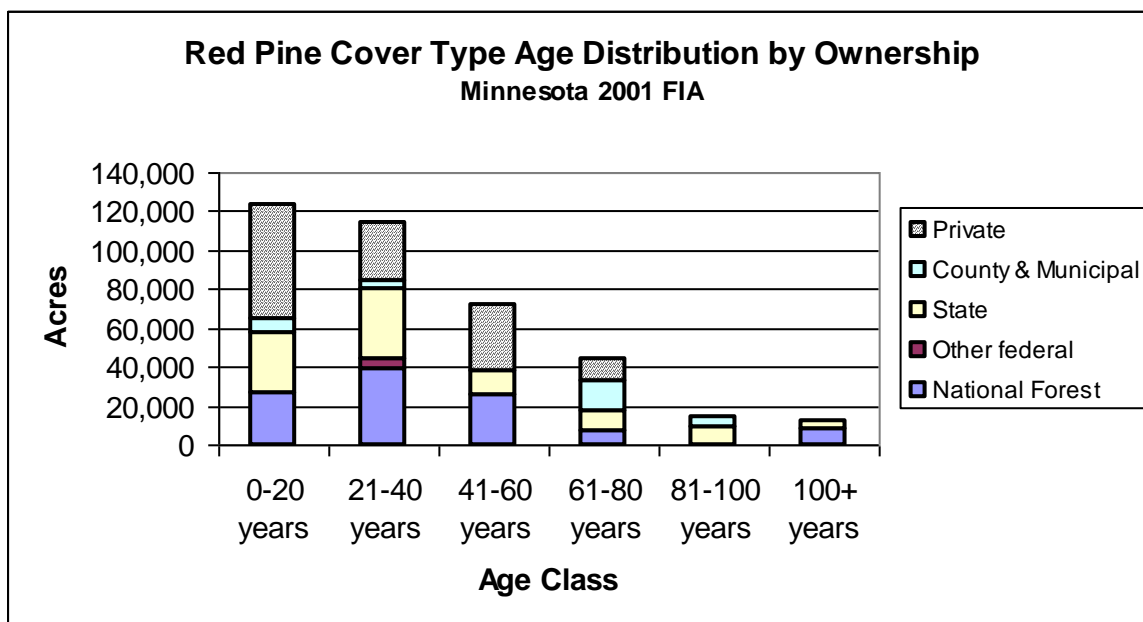
Red Pine

Annual Sustainable Harvest Volume

Minnesota Statewide, All Ownerships - Acres From 2001 Commo

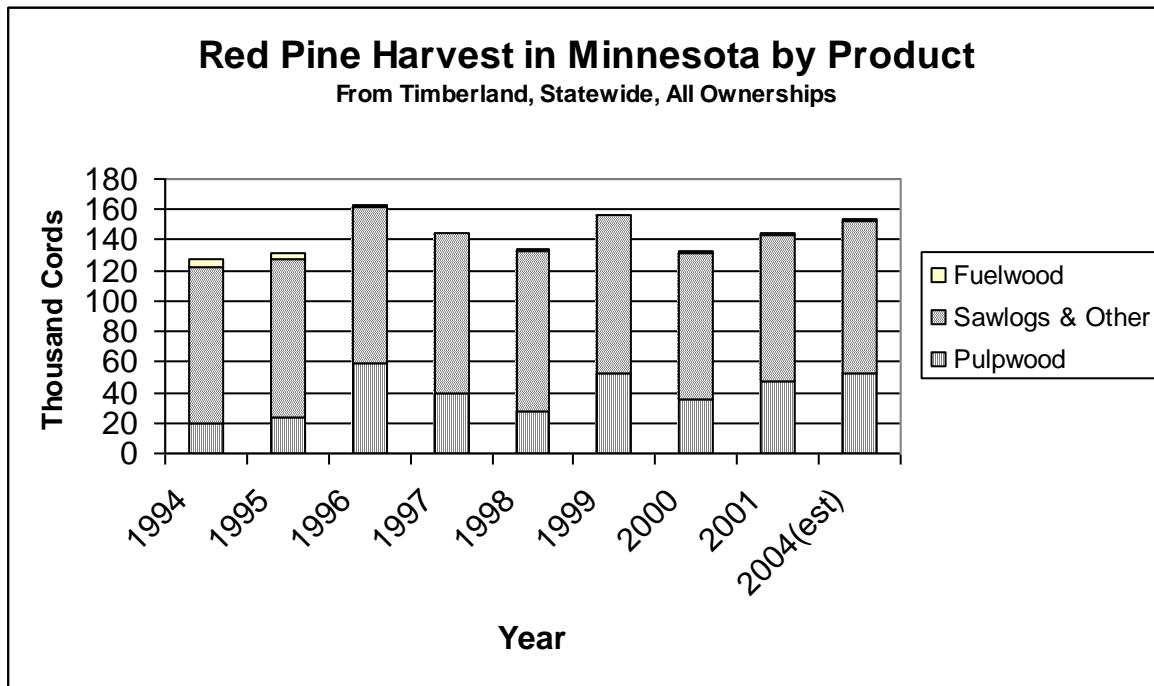


Source: MN DNR. Bottom segment of volume derived by DNR area regulation method. Middle and top segments derived by DNR thinning model.



Source: 2001 FIA Database provided by USFS, North Central Research Station

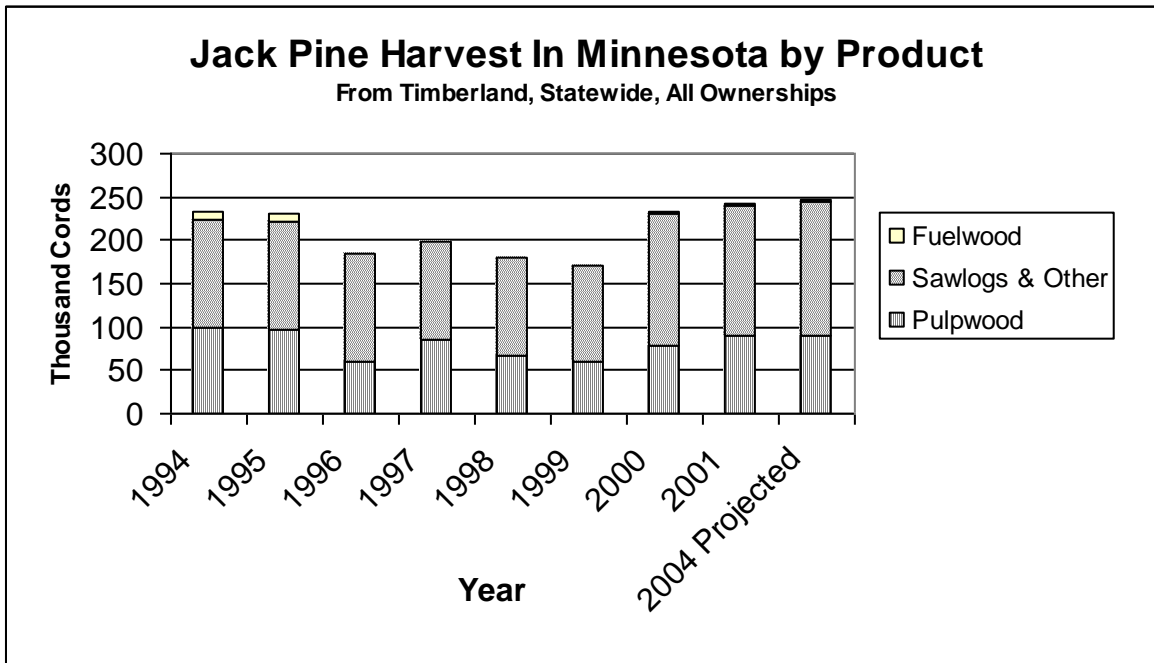
Red pine is a type dominated by young age classes, much of which is in the form of plantations in need of periodic thinning. Much of the resource is owned by the federal government and private landowners.



Source: North Central Forest Experiment Station Pulpwood Surveys, MN DNR Sawmill & Fuelwood Surveys.



Jack Pine

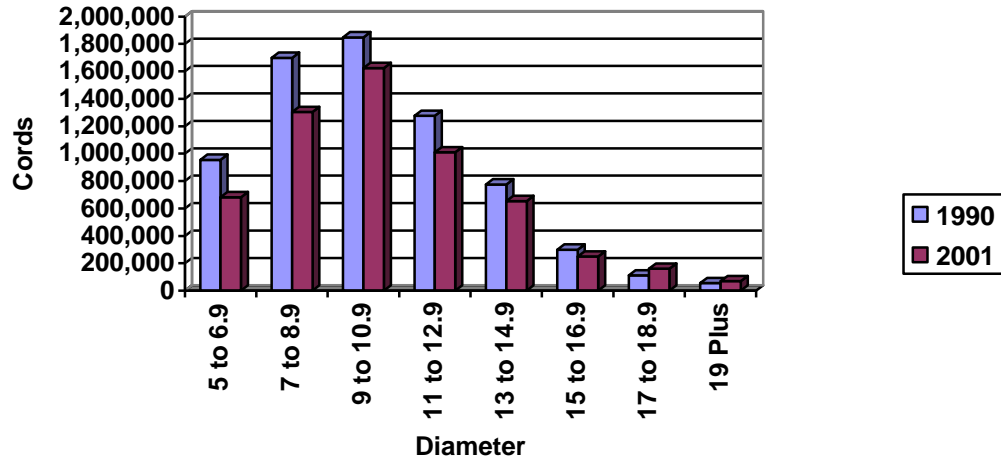


Source: North Central Forest Experiment Station Pulpwood Surveys, MN DNR Sawmill & Fuelwood Surveys.

Sustainable Harvest (DNR Method, not adjusted for restrictions): 219,000 cords, based on Minnesota 1990 FIA. Average net annual growth of jack pine growing stock: 139,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 21. Average annual mortality of jack pine growing stock: 130,000 cords, based on 1990 USDA FS Resource Bulletin NC-141, Table # 25.

Jack Pine Growing Stock Volume in All Type By Diameter 1990 to 2001

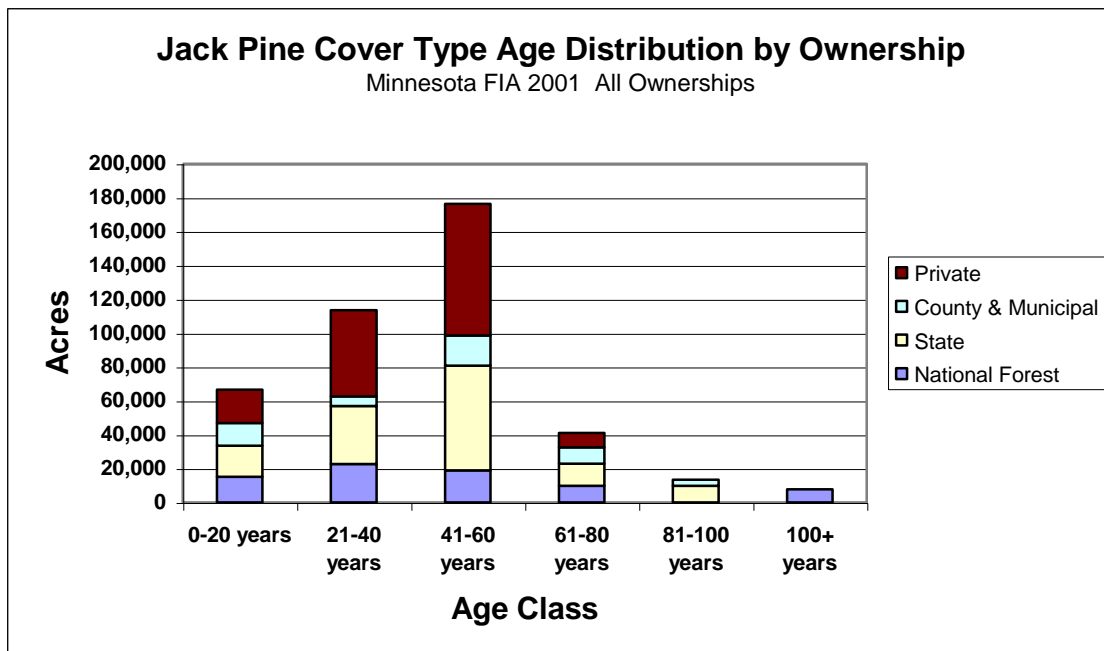
Minnesota FIA Timberland All Ownerships



Source: 2001 FIA Database provided by USFS, North Central Research Station

Jack pine total volume has rapidly declined since 1990. Total volume of jack pine growing stock has gone from 7,266,950 cords in 1990 down to 5,836,000 cords in 2001 – a nearly 20% decrease.

The vast majority of jack pine is under 15 inches in diameter.



Source: 2001 FIA Database provided by USFS, North Central Research Station

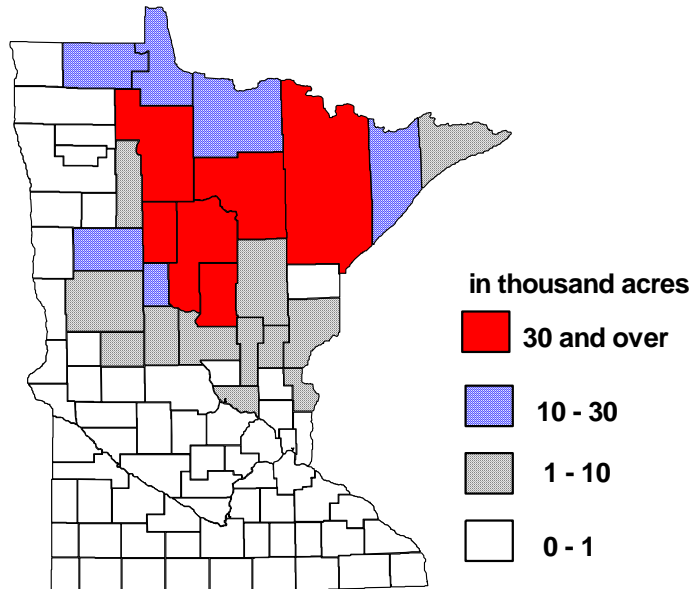
The jack pine resource is very heavily weighted to the 41 to 60 age class. Many of these older stands are in need of management at the present time.

Much of the resource is owned by the state of Minnesota and by private landowners.

Jack Pine Type Acreage Distribution by County

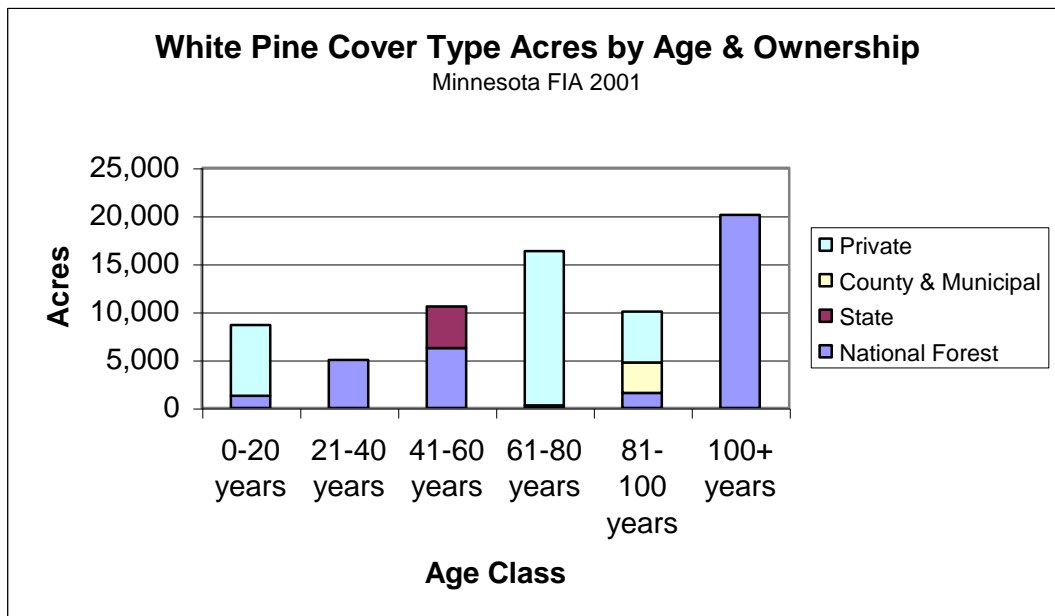
Based on MN FIA 90, Statewide, All ownerships

Total : 441.5 thousand acres



Source: FIA Database provided by USFS, North Central Research Station

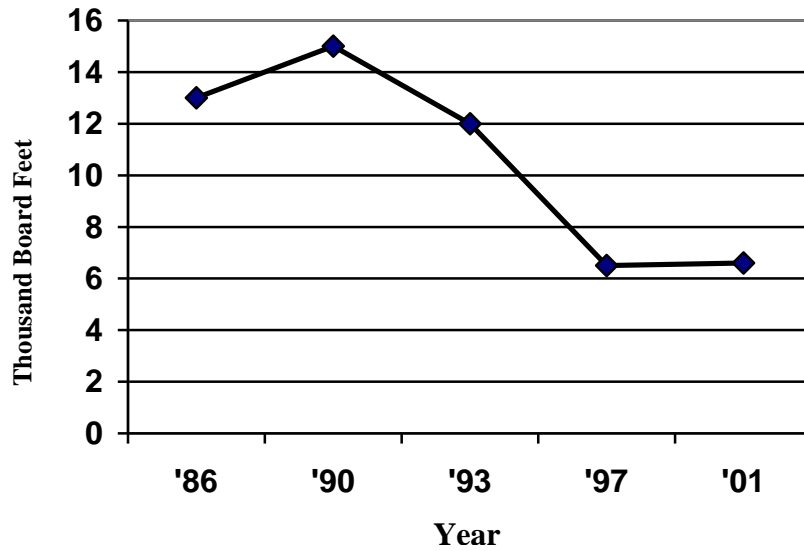
White Pine



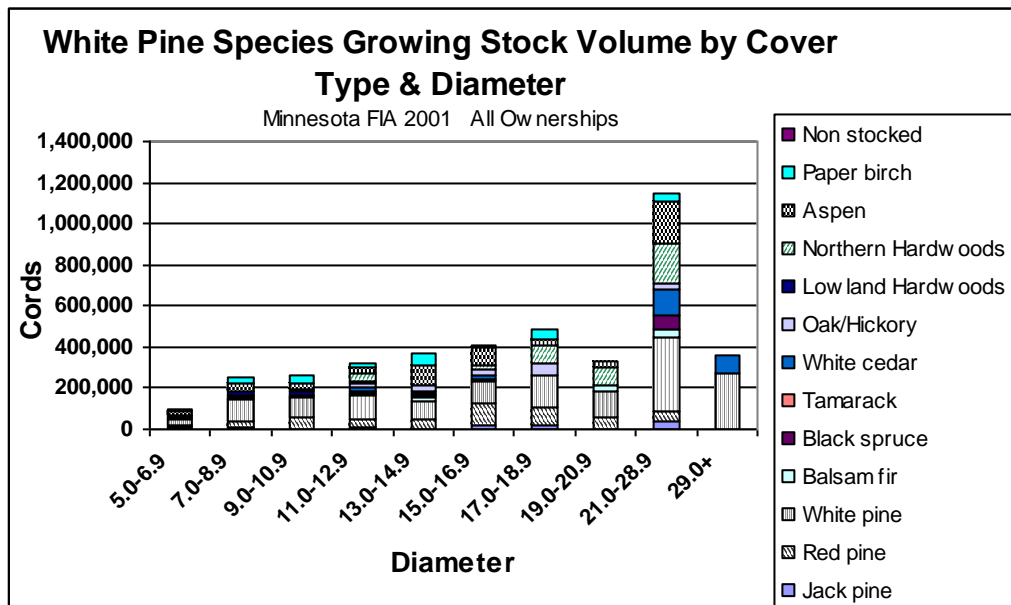
Source: 2001 FIA Database provided by USFS, North Central Research Station

White pine is a small enough cover type that figures such as those in the chart above are bound to change as we get more inventory completed. We can say the following with some confidence, though: National forests and private landowners are by far the predominant ownership groups for white pine, and the white cover type on timberland is heavily weighted towards age 60 plus.

White Pine Sawtimber Harvest in Minnesota 1986 to 2001

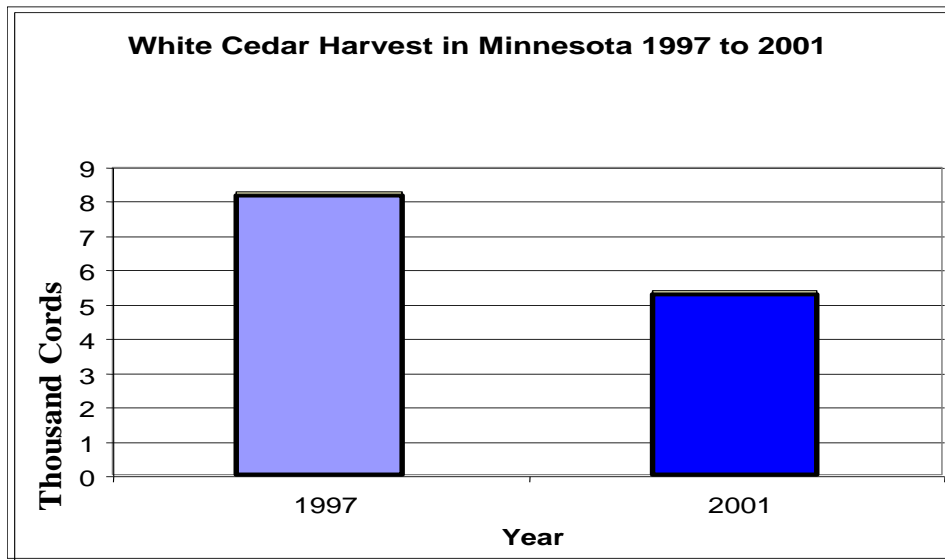


Source: DNR – Division of Forestry. Based on DNR Sawmill Surveys

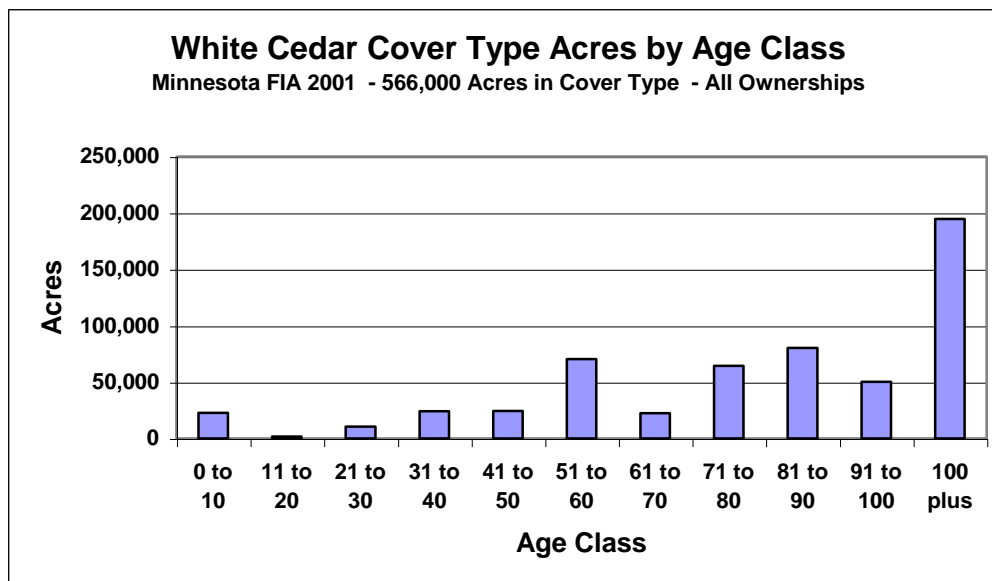


Source: 2001 FIA Database provided by USFS, North Central Research Station
 Most white pine volume occurs in the white pine, red pine, aspen and birch cover types.
 There is a relatively high proportion of white pine total volume in large diameter classes.

Minnesota's White Cedar Resource



Source: North Central Forest Experiment Station Pulpwood Surveys, MN DNR Sawmill & Fuelwood Surveys. Net annual growth for white cedar is 186,700 cords, according to the 1990 FIA inventory and harvest is less than 10,000 cords, so there is obviously a great deal of potential in the resource for more utilization and management, if the regeneration issue can be solved.



Source: 2001 FIA Database provided by USFS, North Central Research Station

Issues:

- White cedar has been somewhat of a “neglected” resource for many years. Probably the single biggest reason for this is an inability to consistently regenerate it on many sites. Cedar is in need of greater research efforts in regeneration techniques.
- There is no pulpwood market for cedar. The modest amount of utilization in Minnesota is entirely for sawtimber, specialty products and a small amount for fuelwood.
- Cedar has tremendous importance for wildlife habitat and ecological diversity.
- Cedar is very long-lived, but doesn't often regenerate naturally

Timber Price Information

\$\$\$\$

**Average Prices Received for Stumpage Sold
by Public Land Agencies in Minnesota: 1994-2002**

Pulpwood (\$'s per cord)

Species	1994	1995	1996	1997	1998	1999	2000	2001	2002
Aspen	14.82	18.69	16.09	19.20	20.54	23.40	25.28	28.76	27.36
Balm	12.73	16.48	13.24	13.76	16.95	14.13	25.27	32.06	27.53
Birch	5.45	3.52	7.52	7.88	7.53	7.66	7.69	8.31	8.16
Ash	3.42	4.46	5.00	4.46	5.51	2.28	4.09	3.91	5.86
Oak	5.27	4.51	4.37	5.64	8.98	10.76	9.27	7.74	5.77
Basswood	---	4.85	4.01	4.27	4.88	5.67	5.68	5.48	6.51
Balsam Fir	15.15	18.76	14.35	12.65	14.12	12.09	14.84	14.61	13.99
W. Spruce	15.66	26.18	19.06	12.8	19.18	26.62	32.63	29.90	30.51
B. Spruce	20.54	23.65	22.90	18.40	21.16	20.61	22.23	29.17	27.05
Tamarack	4.90	7.73	7.25	6.71	7.29	5.79	5.67	6.40	4.11
White Cedar	9.92	10.48	10.55	11.27	7.31	6.83	8.46	6.74	7.06
J. Pine	24.81	32.08	23.48	23.59	24.72	24.32	21.94	21.63	22.18
R & W Pine	24.57	17.49	21.18	23.35	15.63	17.02	18.61	20.79	20.99

Average prices based on those reported by Minnesota Counties, Chippewa and Superior National Forests, Bureau of Indian Affairs, and Minnesota DNR-Forestry.

Figures compiled by Doug Ford, Timber Sales Program Supervisor, DNR-Forestry

**Sold as Pulp & Bolts in Combination
(\$'s per cord)**

Species	1994	1995	1996	1997	1998	1999	2000	2001	2002
Aspen	17.16	20.59	19.05	22.85	25.39	26.35	28.66	34.33	30.80
Balm	13.23	16.96	15.48	16.01	19.51	18.04	25.41	32.57	28.35
Birch	7.51	5.48	9.51	9.03	9.40	8.97	9.45	10.40	10.18
Ash	23.95	28.76	28.65	26.70	18.45	7.09	10.01	11.52	10.01
Oak	20.34	32.82	35.48	30.71	24.58	34.00	25.35	24.33	32.32
Basswood	21.70	29.80	18.69	30.17	17.80	17.65	17.00	18.87	16.94
Balsam Fir	16.03	19.26	15.68	14.97	17.49	15.60	19.87	24.01	20.53
W. Spruce	17.04	29.57	26.51	27.78	26.56	29.83	34.25	33.84	34.88
B. Spruce	22.45	23.76	23.03	19.05	21.16	21.28	23.04	30.01	27.65
Tamarack	5.36	8.00	7.78	6.96	8.18	6.97	6.60	7.37	4.55
White Cedar	12.28	11.73	12.53	12.05	9.29	10.24	8.32	8.68	7.91
J. Pine	34.26	39.21	31.27	31.97	33.83	32.78	30.39	37.95	36.76
R & W Pine	50.60	53.05	44.78	44.71	48.81	57.93	53.35	43.89	40.01

A *bolt* is defined as a short log, usually 100" length, with a specific minimum diameter and generally sawn for lumber

Average prices based on those reported by Minnesota Counties, Chippewa and Superior National Forests, Bureau of Indian Affairs, and Minnesota DNR-Forestry.

Figures compiled by Doug Ford, Timber Sales Program Supervisor, DNR-Forestry

**Average Prices Received for Stumpage Sold
by Public Land Agencies in Minnesota: 1994-2002**

Species	Sawtimber (\$ per Thousand Board Feet)								
	1994	1995	1996	1997	1998	1999	2000	2001	2002
Aspen	64.67	68.93	71.22	93.83	100.54	85.09	102.28	114.11	103.19
Birch	43.12	50.67	52.31	36.60	39.78	36.12	43.17	50.48	55.87
Ash**	132.52	151.28	147.18	108.93	97.09	48.70	71.39	81.97	66.85
Elm	50.68	47.02	60.08	107.20	53.31	56.50	---	44.10	69.00
Oak*	110.67	156.88	177.30	155.97	140.20	146.00	109.53	118.72	151.77
Basswood	90.60	120.91	105.37	107.07	81.15	74.77	70.25	81.24	80.43
Balsam Fir	52.95	55.10	61.49	71.61	88.30	80.82	120.65	144.20	136.32
W. Spruce	72.45	77.79	73.47	83.23	78.34	81.91	90.00	91.27	94.95
White Cedar	37.59	38.55	42.58	37.00	38.64	39.13	19.96	30.46	29.43
J. Pine	120.51	136.55	108.37	115.46	121.84	124.00	114.86	154.35	155.76
R & W Pine	183.95	171.55	163.64	174.34	161.01	198.99	176.01	170.13	153.78

*Oak sawtimber prices mainly from public lands in northern Minnesota

**Black ash includes veneer

Salvage from July 1999 windstorm included in price for stumpage in 1999 and 2000.

Average prices based on those reported by Minnesota Counties, Chippewa and Superior National Forests, Bureau of Indian Affairs, and Minnesota DNR-Forestry.

Figures compiled by Doug Ford, Timber Sales Program Supervisor, DNR-Forestry

Forest Certification



Forest Certification

Forest certification is becoming an increasingly important factor influencing forest management. Certification is a means of affirming that responsible forestry practices that enhance and protect environmental values of forests are being practiced. Forest certification provides an independent, third-party assurance that a forestry operation meets standards set by a certification program. Companies and landowners apply voluntarily. The market demand for certified wood products is currently quite modest, but is strongest in western Europe and the United States.

Forest certification is intended to influence wood purchasing decisions by assuring consumers that certified products are sourced from sustainably managed forests. Some large buyers of wood products such as Home Depot and Time Warner have announced policies to give preference to certified wood.

The certification process is reliant on forest owners and managers submitting their timberlands and management plans to a third-party audit process. It is likely to become an increasing market share advantage to industry to operate from states or countries with high proportions of certified land base.

Current Status of Certification in Minnesota

Minnesota forestlands that are certified use one or more of the available certification systems, including the Forest Stewardship Council (FSC), Sustainable Forestry Initiative® Program (SFI®), International Standards Organization (ISO 14001) and Tree Farm systems. Minnesota currently has approximately 840,000 acres of publicly and privately owned forests third party certified under FSC, and 520,000 acres third party certified under SFI. Some of these lands are certified under both FSC and SFI. SFI licensees (self-audited) account for approximately 1.5 million acres.

FSC certified lands in Minnesota: State lands in Aitkin County, county lands in Aitkin and Cass Counties, The Audubon Center of the North Woods, and the forests of St. John's Abbey. There are also 3,000 to 4,000 acres of private forest lands certified under FSC.

Sustainable Forestry Initiative® Program Participants in Minnesota: St. Louis, Carlton, Beltrami, Itasca, Koochiching and Lake Counties, Industry lands of Potlatch, Boise and UPM-Blandin. The U of M Cloquet Forestry Center is also a SFI® participant.

Tree Farm certified lands in Minnesota: There are many thousands of acres of private lands certified under the Tree Farm system, which is mutually recognized by SFI.

ISO-14001 certified lands in Minnesota: UPM-Blandin and Potlatch lands have been dual certified through SFI and ISO-14001

To meet anticipated demand for certified wood, the state of Minnesota is beginning the process of third party certification for all state-owned forestland.

Glossary

BIA – Bureau of Indian Affairs

Cover Type - A classification of forest land based on the species forming a plurality of live tree stocking.

CSA – Cooperative Stand Assessment. This is the inventory system used on state-owned land. Different vegetative stands are mapped using aerial photography and ground checks. Variable radius sample plots are distributed throughout each cover type and measured on the ground. A variety of information on stand condition is collected. Things like timber volumes, species mixes and insect and disease damage for the state forest and wildlife management areas can be determined using CSA data

Cull – Portions of a tree that are unusable for industrial wood products because of rot, form, missing or dead material, or other defect.

FIA – Forest Inventory & Analysis. In this inventory, permanent plots are remeasured periodically. Field remeasurements were last completed in 1977 and 1990. A recent change is that after completion in 2004, the inventory will be updated continually, with approximately 20% of the plots revisited each year. Minnesota has recently completed year three of a five-year effort to update its FIA, which is a cooperative effort between the USDA Forest Service and Minnesota DNR. The inventory will be complete in early 2004.

FIA provides extremely important information on the condition of the forest resource. Things like timber volumes, species mixes, and changes to the forest resource over time can all be determined using FIA data. It is the only way to track condition and changes over time for non-industrial private woodlands and is the only way to get comprehensive data across all ownerships.

Growing Stock Trees- Live trees of commercial species excluding cull trees.

MAI – Mean Annual Increment. the average annual increase in volume of a stand at a specified point in time. MAI changes with different growth phases in a tree's life, generally being highest in the middle ages & decreasing with age. The point at which MAI peaks is sometimes used as a guide to identify biological maturity and a stand's readiness for harvesting.

NCFES – North Central Forest Experiment Station. This is where the FIA unit of the USFS is located. These are the folks that, in cooperation with state DNR, accomplish the FIA inventory and Timber Product Output surveys. Without them, very little of the information in this book would be available.

NIPF – Non-Industrial Private Forest Land. Forest land owned privately by people or groups not involved in forest industry.

Pulpwood – Wood that is harvested and used by primary mills that make products from reconstituted wood fiber. In addition to wood pulp, this includes particleboard and engineered lumber products made from chips, shavings, wafers, flakes, strands and sawdust.

Rotation Age - Age at which a stand is generally considered mature and ready for harvest.

Sawtimber - For our purposes, this is wood that is harvested and used by sawmills.

Glossary (continued)

Sustainable Harvest Levels (DNR) - DNR sustainable harvest levels are an indication of *potential* wood available on an annual sustainable basis. They are calculated based on available “timberlands” only, but they are still not the same as “*available*” harvest levels. Lands where harvesting is restricted by policy or low site productivity are excluded from the calculation, but the figures are not further adjusted downward for potential timber supply restrictions that can apply to timberlands (such as riparian, access, operability, extended rotation & other). Therefore actual *available* timber is likely to be somewhat lower than indicated by the long-term *sustainable* figures.

Sustainable harvest levels are annual figures averaged over an entire rotation. Generally therefore, for cover types with old age-class imbalances, current timber availability is likely to be *above* long-term sustainable levels. This is due to a need to manage many old stands on timberlands before their health and available timber volume deteriorates. For cover types with young age-class imbalances, current timber availability is likely to be *below* long-term sustainable figures.

Timberland – Forest land that is producing, or is capable of producing, more than 20 cubic feet per acre per year of industrial wood crops, that is not withdrawn from timber utilization by policy.

USDA – United States Department of Agriculture.

USFS – United States Forest Service.

