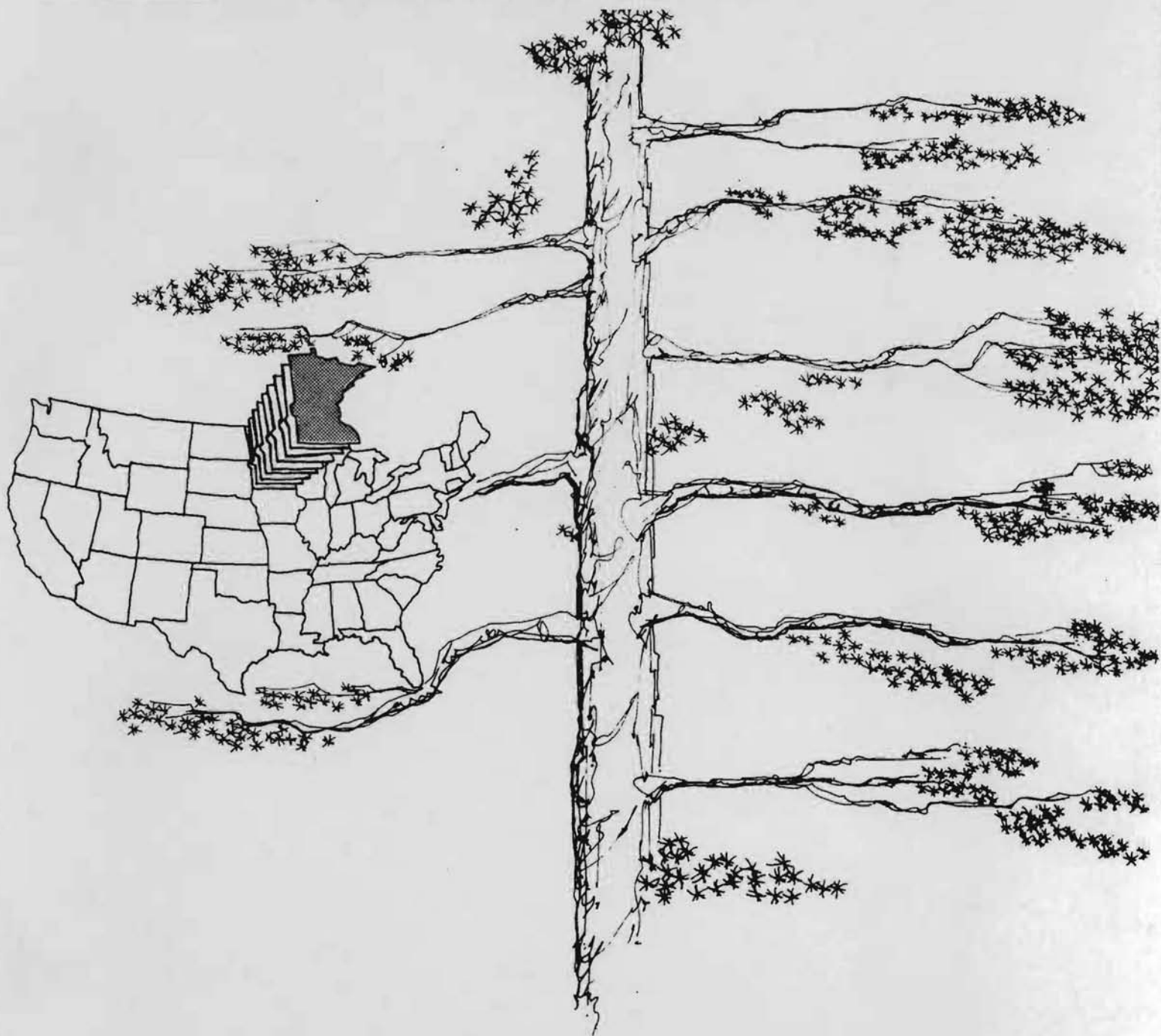


Minnesota's Forest Resources



Department of Natural Resources
Division of Forestry
Jan 1994

500 Lafayette Road
St. Paul, Minnesota 55155-4044

1990 Inventory Highlights

	1977	1990
Forest Acres	16.7 million	16.7 million
Timberland	13.7 million	14.8 million
Total Volume	145.0 million cds.	190.0 million cds.
% Sawlog Volume	34%	37%

Growth:

Average Annual (1977-1989)	4.6 million cds.
Current Annual (1990)	5.7 million cds.

Mortality:

Average Annual (1977-1989)	2.8 million cds.
Current Annual (1990)	2.6 million cds.

Removals:

Average Annual (1977-1989)	2.6 million cds.
Current Annual (1990)	3.4 million cds.

Annual Sustainable Harvest:

1977-1989	4.6 million cds.
1990-1999	6.1 million cds.

Summary of Minnesota's Forest Industry—1990

Total Acres in Minnesota: 54 Million

Total Forest Acres = 16.7 Million = 31%

Timberland Acres (available for harvest) = 14.8 Million = 27%

Volume of Timber Harvested:

Total = 3,448,600 cords*

Sawlogs = 254 million board feet

Veneer Logs (exported) = 4.4 million board feet

Chips (fuel & mulch) = 46,000 cords

Fuelwood = 535,200 cords from roundwood
(an equal volume of fuelwood was salvaged from
wood residues such as mill waste, dead trees,
logging slash)

Veneer = 10.2 million board feet

Posts & Poles = 16,090 cords

Shavings (animal bedding) = 55,200 cords

Pulpwood = 2,277,000 cords

Value of Timber Harvest:

Stumpage (value to landowner) = \$36,208,480[#]

At the Mill (value to logger) = \$193,178,806[#]

Christmas Trees, Wreaths, & Associated Products:

12 Million Trees/year

Estimated Total Sales (trees, wreaths, & other products) = \$25 Million

Gross Sales of the Industry: \$6.2 Billion

Total Payroll: \$2.2 Billion

Total Employment: 58,900

Secondary manufacturing = 31,900

Primary processing = 27,000

The pulp and paper industry is the largest consumer of wood in Minnesota (29%).

Window manufacturing generates the most dollars in sales (nearly 20%).

* Includes all timber products converted to cords.

These values do not include salvaged wood residues.

Minnesota Wood Industry - 1992

Economic Impact:

- ☆ Value of Forest Products Manufactured = \$7 Billion
- ☆ 4th Largest Manufacturing Industry in Minnesota
- ☆ Generates 16% of Dollars of all Manufacturing

Employment:

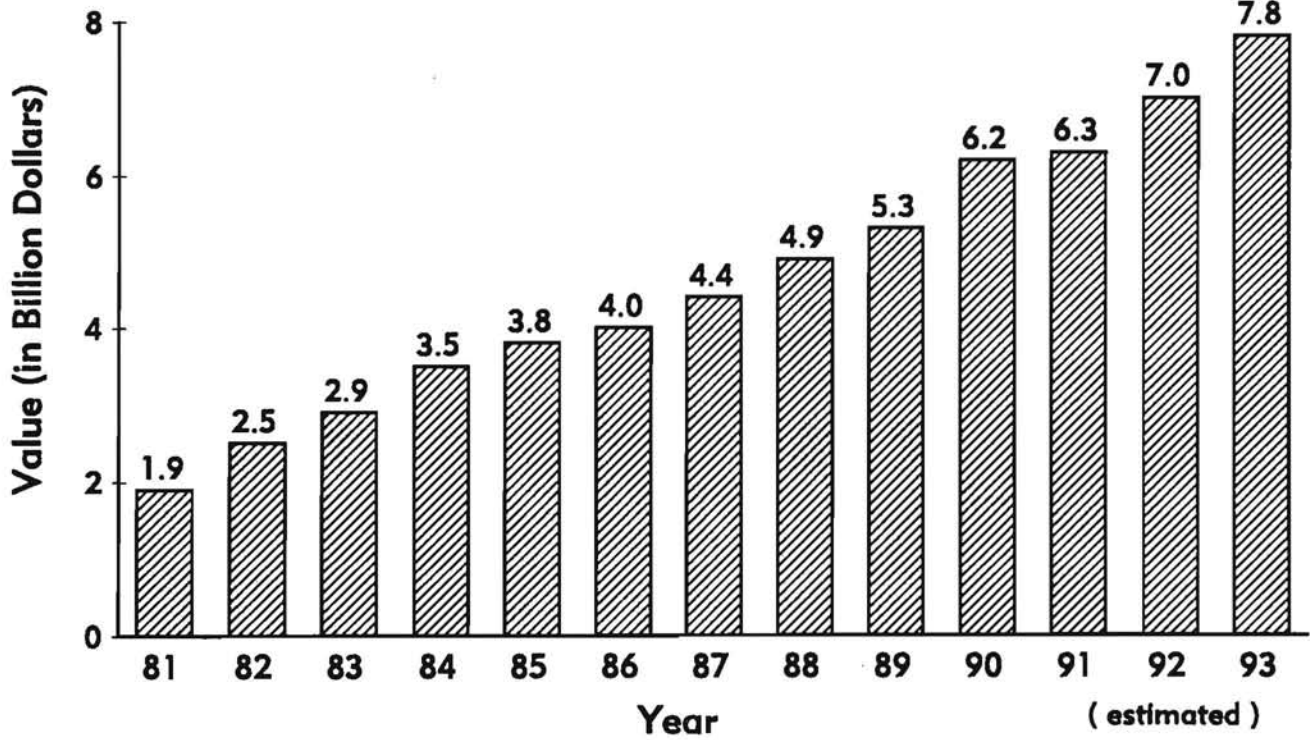
- ☆ 55,000 Employees
- ☆ \$2.1 Billion Payroll

Industry:

- ☆ 8 Pulp & Paper
- ☆ 4 Hardboard & Specialty
- ☆ 6 Oriented Strand Board
- ☆ 800 Sawmills
- ☆ 150 Associated Industries
- ☆ Over 850 Secondary

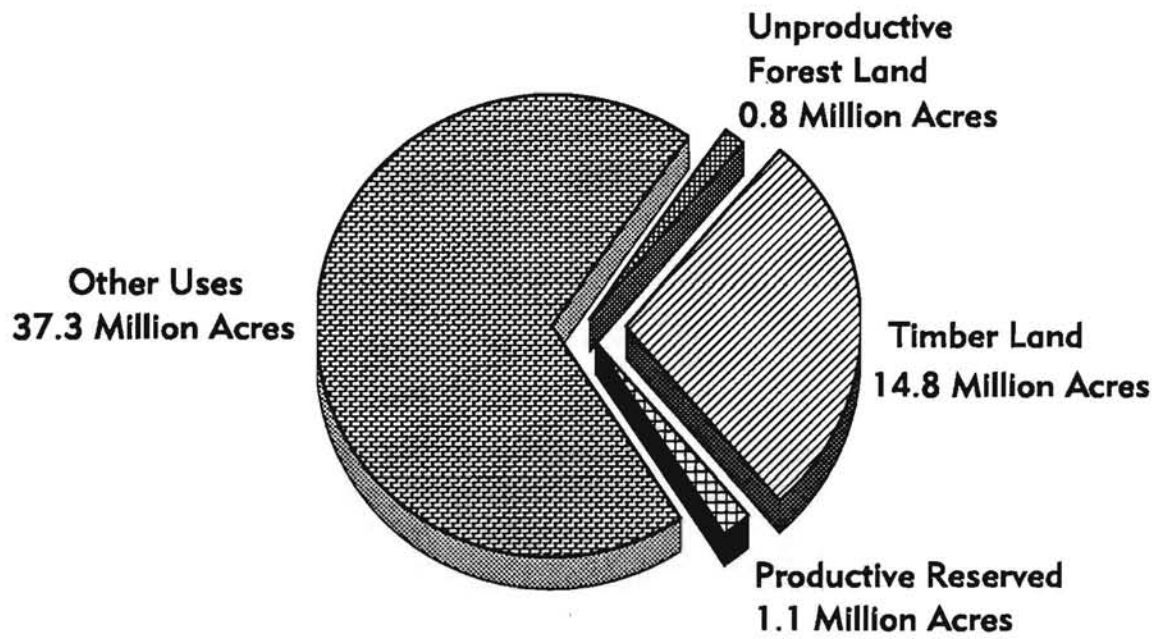
Value of Forest Products Manufactured

in Minnesota



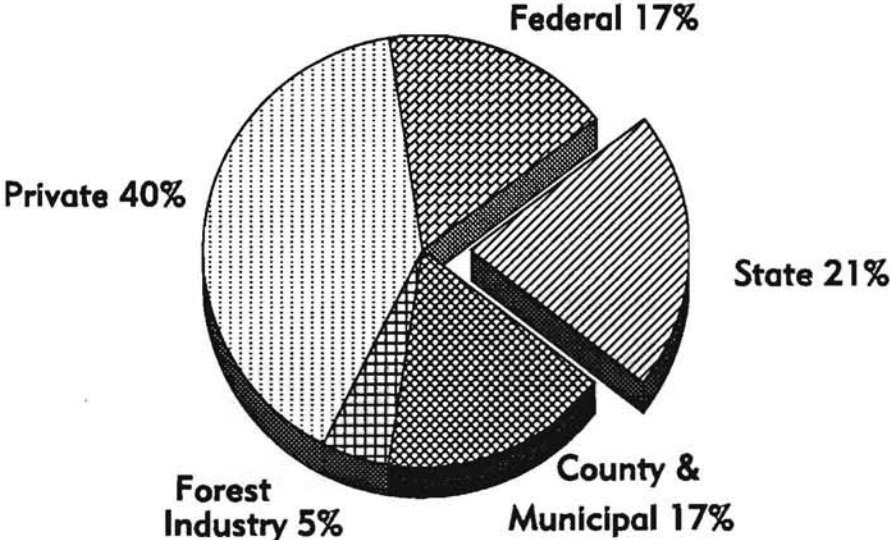
MINNESOTA LAND USE

- Total of 54 Million Acres -



MINNESOTA TIMBERLAND by OWNERSHIP

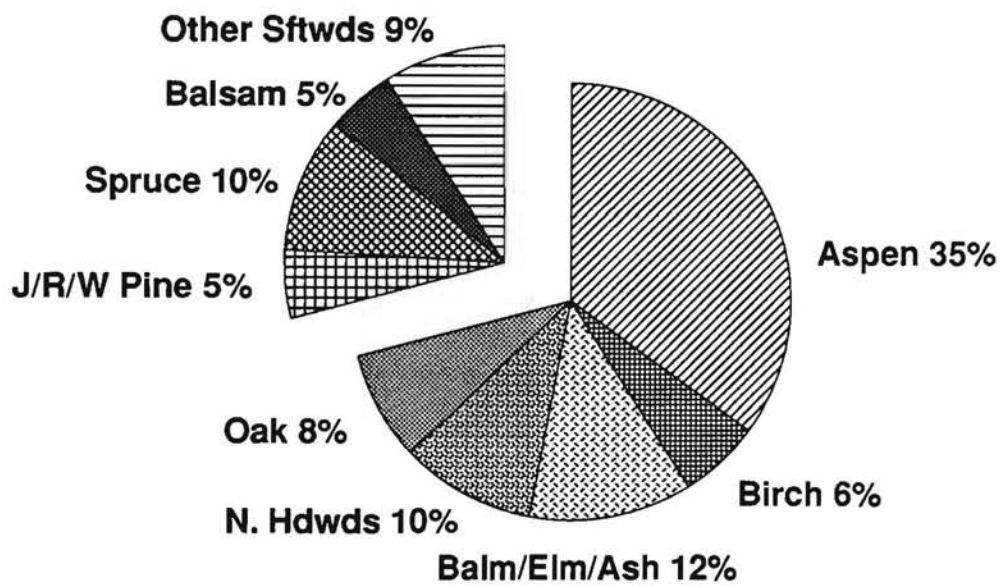
- 14.8 Million Acres -



Area of Timberland in Minnesota by Forest Type —1990—

Forest Type	Acres (000's)
Jack Pine	447.5
Red Pine	301.6
White Pine	63.2
Balsam Fir	734.3
White Spruce	93.8
Black Spruce	1,322.1
Cedar	680.5
Tamarack	705.1
Oak	1,184.3
Elm - Ash	1,291.5
Maple - Basswood	1,402.9
Aspen	5,114.2
Birch	835.8
Balm of Gilead	427.7
Non-Forest	168.9
Total All Types	14,773.4

% of TIMBERLAND by COVER TYPE
- State of Minnesota -
14.8 Million Acres

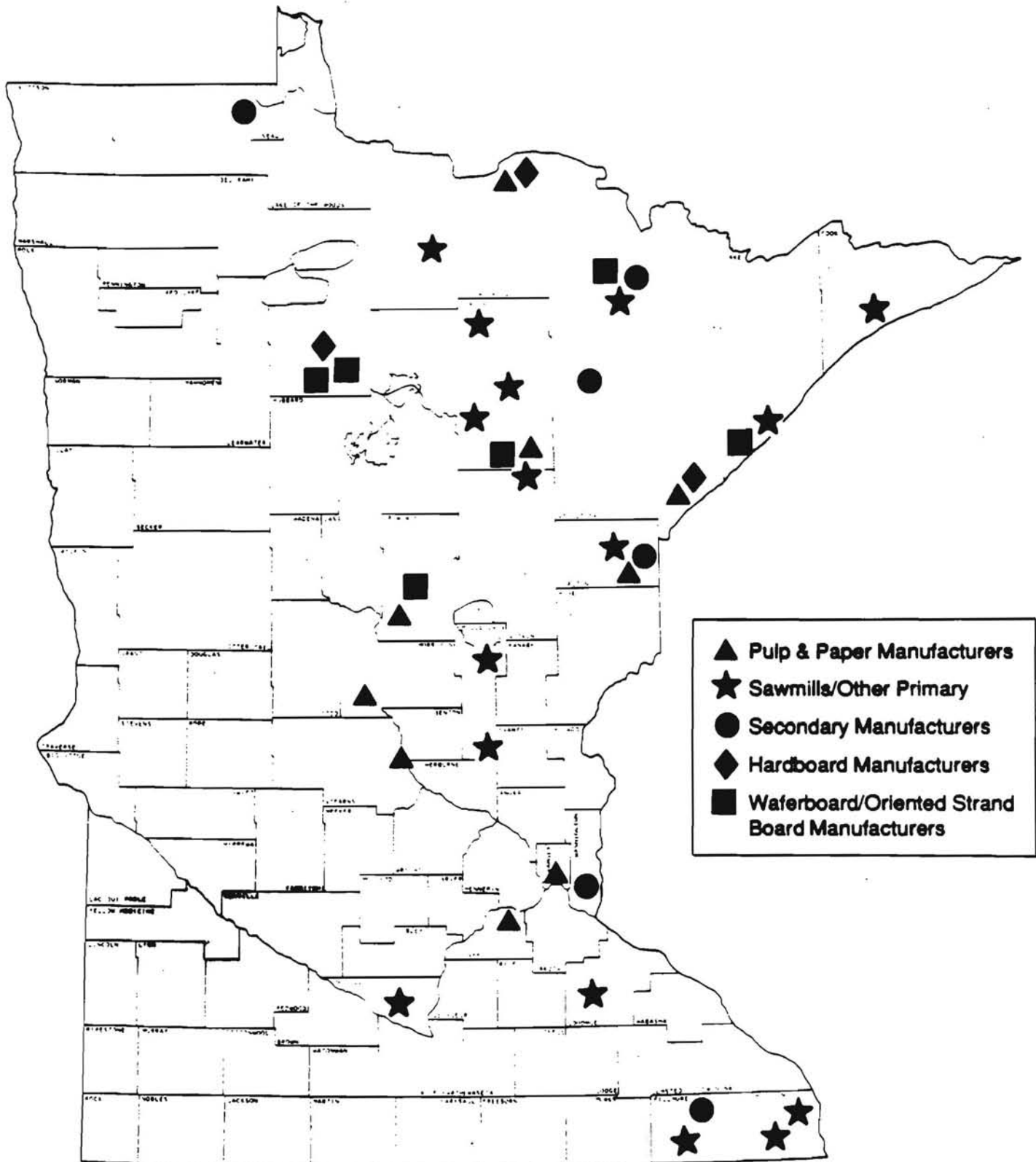


**Total Wood Harvest in Minnesota by Species
- Timberland -
1992
(in thousand cords)**

Species	Pulpwood	Sawlogs & Other	Fuel		Total
			Residential *	Commercial	
Aspen	1,984.8	224.8	46.0	9.6	2,265.2
Birch	25.0	55.0	79.4	2.7	162.1
Balm of Gilead	85.5	.4	—	—	85.9
Ash	3.1	18.5	52.9	—	74.5
Oak	—	89.8	191.4	.8	282.0
Elm	—	6.1	81.7	—	87.8
Basswood	3.7	34.0	2.2	—	39.9
Maple	11.7	6.5	47.1	.2	65.5
Cottonwood	—	7.6	—	—	7.6
Other Hardwoods	—	2.8	—	—	2.8
Sub-Total Hardwood	2,113.8	445.5	500.7	13.3	3,073.3
Pine					
Red Pine	22.4	107.0	4.4	.2	134.0
White Pine	4.8	29.3	2.0	—	36.1
Jack Pine	109.3	117.4	6.4	2.0	235.1
Spruce	146.3	16.6	2.0	—	164.9
Balsam	187.0	7.6	2.6	.4	197.6
Tamarack	1.4	.4	.5	—	2.3
Cedar	—	6.8	.7	—	7.5
Sub-Total Softwood	471.2	258.1	18.6	2.6	777.5
Total	2,585.0	730.6	519.3	15.9	3,850.8

* This is 50% of the total fuelwood burned and considered removed from growing stock trees.

Minnesota's Largest Forest Products Producers

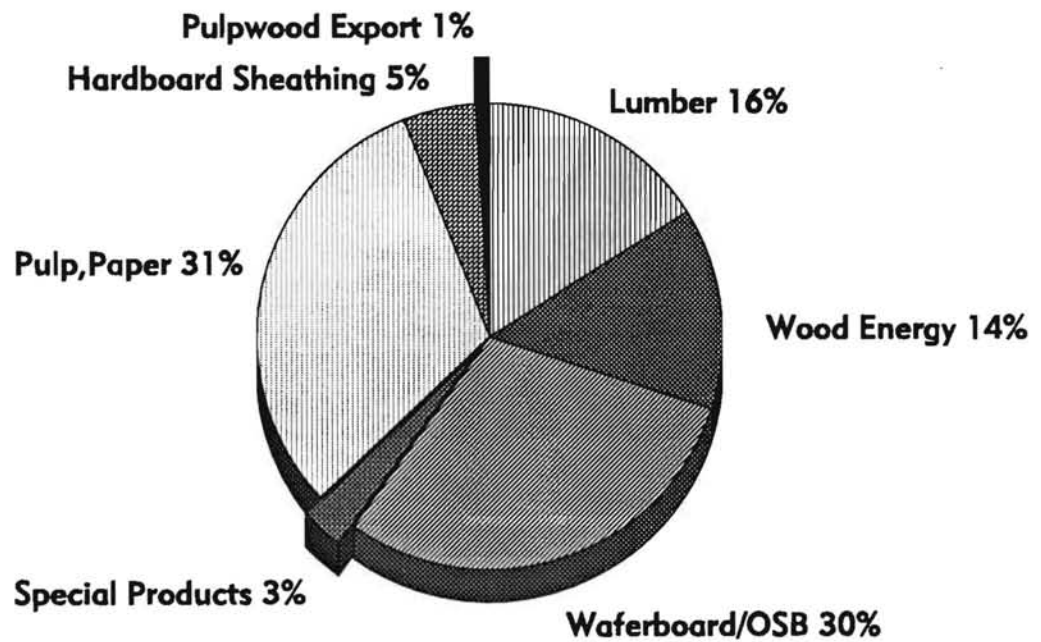


Source: DNR, Division of Forestry, 1988

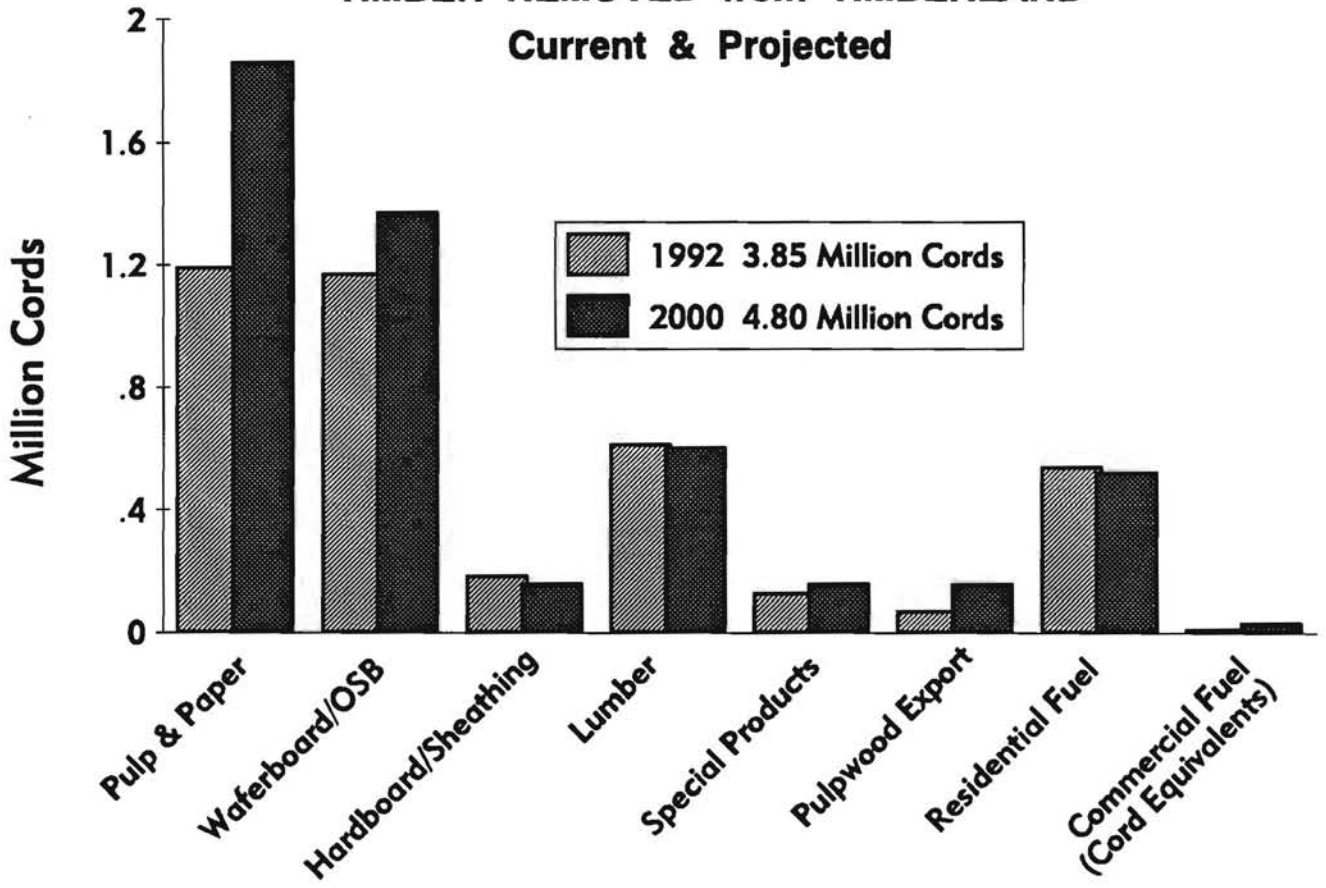
MINNESOTA TOTAL WOOD USE by PRODUCT - 1992

Harvest from Timberland

Total 3.85 Million Cords (Includes All Species)



**MINNESOTA WOOD HARVEST
TIMBER REMOVED from TIMBERLAND
Current & Projected**



Minnesota Pulp and Paper

—1992—

Firm	Wood Use (Cords)	Product
Blandin Paper Company Grand Rapids	185,000	Magazines, Catalogs
Boise Cascade International Falls	535,000	Business & Xerox
Hennepin Paper Little Falls	16,000 & Recycled Paper	Construction & Speciality
Champion International Sartell	145,600	Magazines, Catalogs
Lake Superior Paper Duluth	132,800	Advertising Supplements
Potlatch Corporation (2) Brainerd & Cloquet	336,700	Business & Printing
Waldorf Corporation St. Paul	Recycled Paper	Cardboard & Corrugated Boxes

1. These figures include some roundwood imported from Canada, Michigan, & Wisconsin.
2. These figures also include some purchased sawmill residues utilized for pulp & paper.

Minnesota Waferboard/OSB

—1992—

Firm	Wood Use (Cords)	Product
Potlatch Grand Rapids	264,100	OSB—"Potlatch Select"
Louisiana-Pacific Two Harbors	105,000	Waferboard—Siding "Inner Seal"
Northwood Bemidji	229,000	OSB—"Norbord"
Potlatch Bemidji	334,300	OSB—"Oxboard"
Potlatch Cook	185,400	OSB—"Oxboard"
Trus Joist MacMillan Deerwood	52,000	Timber Strand LSL

Minnesota Hardboard and Specialty

—1992—

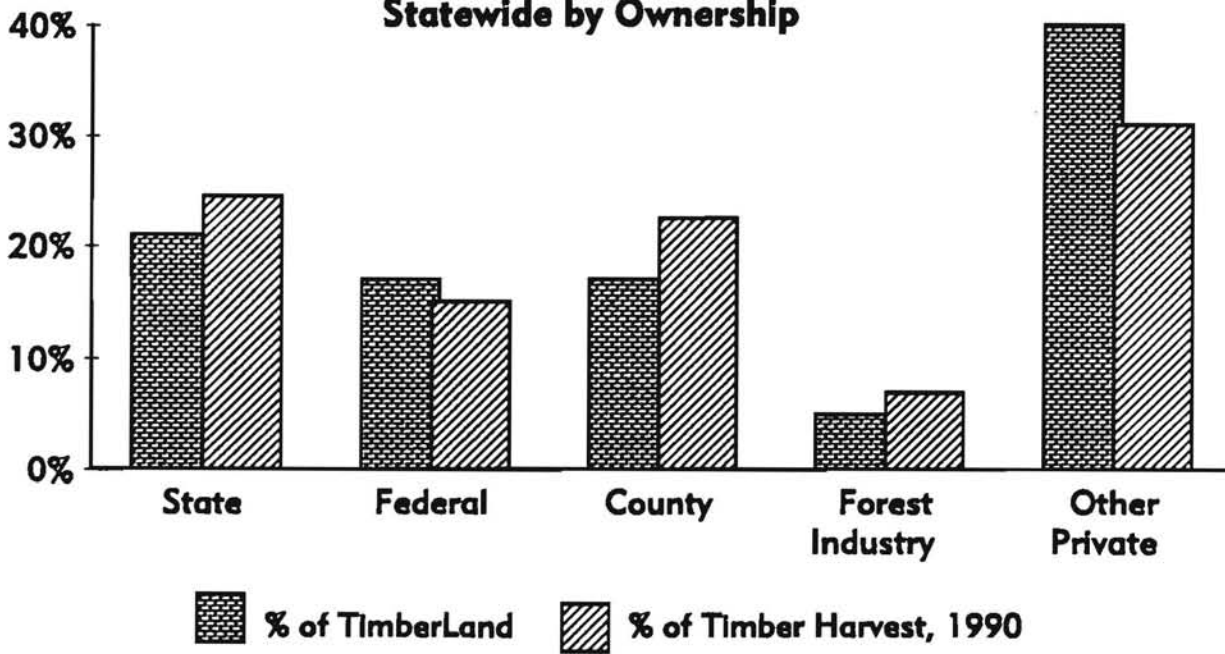
Firm	Wood Use (Cords)	Product
Certainteed Corporation Shakopee	30,000 & Recycled Paper	Roofing Felt
International Biltrite International Falls	16,200 & Recycled Paper	Sheathing
Superwood Corporation Duluth	100,000*	Industrial Hardboard
Superwood Corporation Bemidji	32,800	Industrial Hardboard

* Includes some roundwood and chips imported from Wisconsin.

**MINNESOTA TIMBERLAND OWNERSHIP
VS. AMOUNT of TIMBER HARVESTED**

(does not include fuelwood)

Statewide by Ownership



Minnesota—New and Expanding Large Wood Industries

		<u>Add'l. Wood Use</u>	<u>Capital Investment (millions \$)</u>
<u>1975-1985</u>			
Potlatch	Paper	30,000 cords	100
Potlatch	OSB	170,000 cords	40
Potlatch	OSB	170,000 cords	40
Northwood Panelboard	OSB	220,000 cords	45
Champion International	Paper	60,000 cords	250
Blandin (now Potlatch)	OSB	220,000 cords	50
Louisiana Pacific	Waferboard	90,000 cords	30
		<hr/>	<hr/>
		960,000 cords	\$555 million
 <u>1986-1989</u>			
Blandin	Paper	138,000 cords	350
Potlatch	Paper	None	100
Lake Superior Paper Ind.	Paper	130,000 cords	404
International Biltrite	Sheathing	25,000 cords	12
		<hr/>	<hr/>
		293,000 cords	\$866 million
 <u>1990-1992</u>			
Boise Cascade	Paper	340,000 cords	535
Trus Joist MacMillan	**PSL	135,000 cords	70
Potlatch	OSB	160,000 cords	35
Potlatch	Lumber	100,000 cords	22
		<hr/>	<hr/>
		735,000 cords	\$662 million
 <u>1993-2000</u>			
*Blandin #7	Paper	150,000 cords	300
*Lake Superior Paper Ind.	Paper	160,000 cords	505
*Potlatch	Paper	420,000 cords	400
*Champion International	Paper	60,000 cords	400
		<hr/>	<hr/>
		790,000 cords	\$1.605 billion

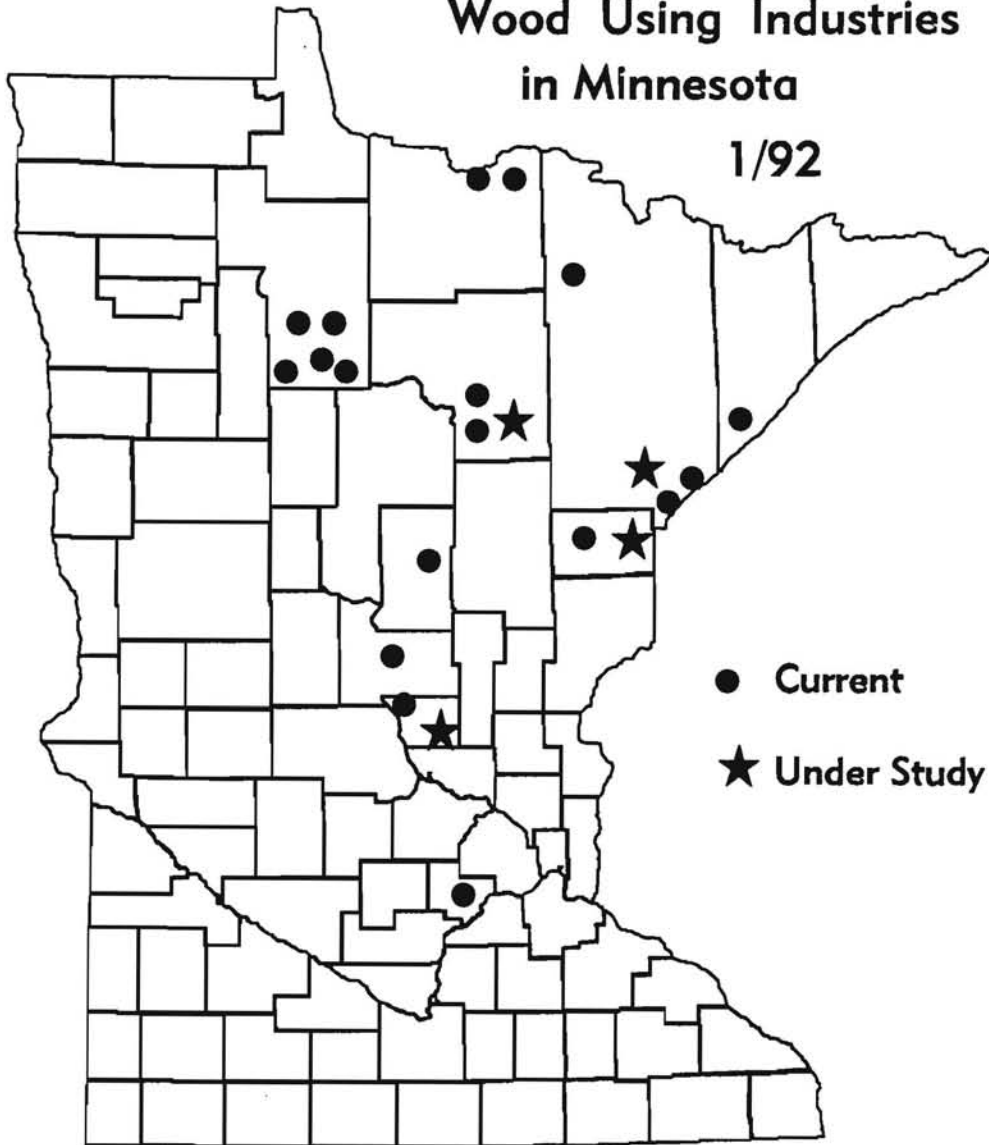
* Under study

** Parallel Strand Lumber

Source: MN DNR-Forestry
vp-u&m\forprod\mnwoodha.chp-pg4

Current & Projected Large Wood Using Industries in Minnesota

1/92



Minnesota

New & Expanding Wood Using Industries

<u>Period</u>	<u>Capital Investment (\$ millions)</u>	<u>Additional Wood Use</u>
1979-1985	\$555	1.0 million cords
1986-1990	\$866	.3 million cords
1991-1997	\$2,257	1.6 million cords
Totals	<u>\$3.678 billion</u>	<u>2.9 million cords</u>

World Class Minnesota Mills

Champion Int'l. Paper #4

Blandin Paper #7

Lake Superior Paper Industries #2

Potlatch Paper (1994)

Trus Joist MacMillan (PSL) (1991)

Boise Cascade Paper (1990)

Blandin Paper #6 (1990)

Lake Superior Paper Industries #1 (1987)

Champion International Paper #3 (1982)

Current and Projected Wood Harvest from Timberland —Minnesota Statewide—

(In Thousand Cords)		
Species	1992	2000
Aspen	2,265.2	2,520
Birch	162.1	365
Balm-of-Gilead	85.9	150
Ash	74.5	81
Oak	282.0	282
Elm	87.8	88
Basswood	39.9	146
Maple	65.5	147
Cottonwood	7.6	15
Other Hardwoods	2.8	3
Pine	405.2	463
Spruce	164.9	226
Balsam	197.6	341
Tamarack	2.3	10
Cedar	7.5	8
Total	3,850.8	4,845

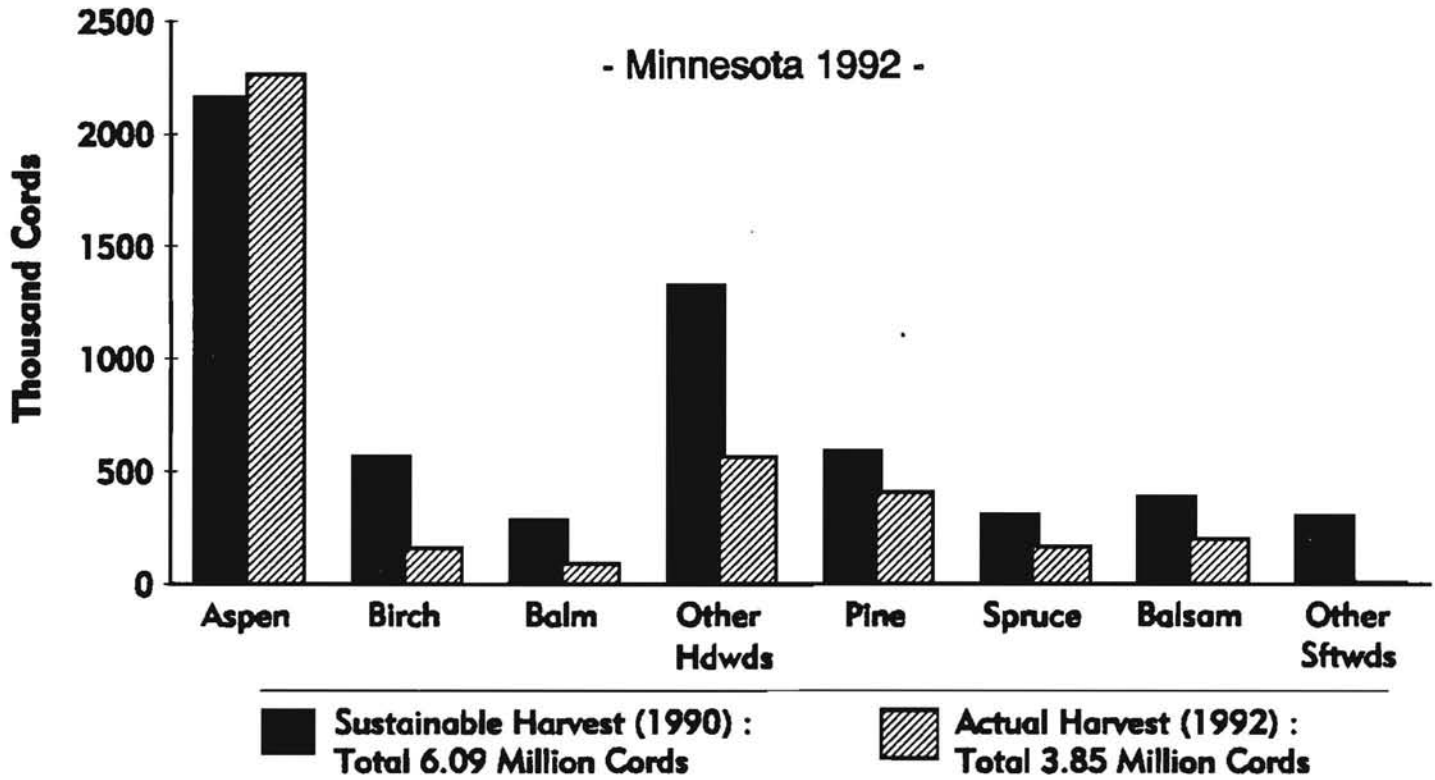
Minnesota Projected Demand Increases 1992-2000

- * Trus Joist MacMillan 80,000 cds.
- * Potlatch Corporation 420,000 cds.
- * Lake Superior Paper Industries 160,000 cds.
- * Blandin Paper Company 150,000 cds.
- * Champion International 60,000 cds.
- * Unannounced OSB 150,000 cds.
- * Sawlogs & Other 30,000 cds.

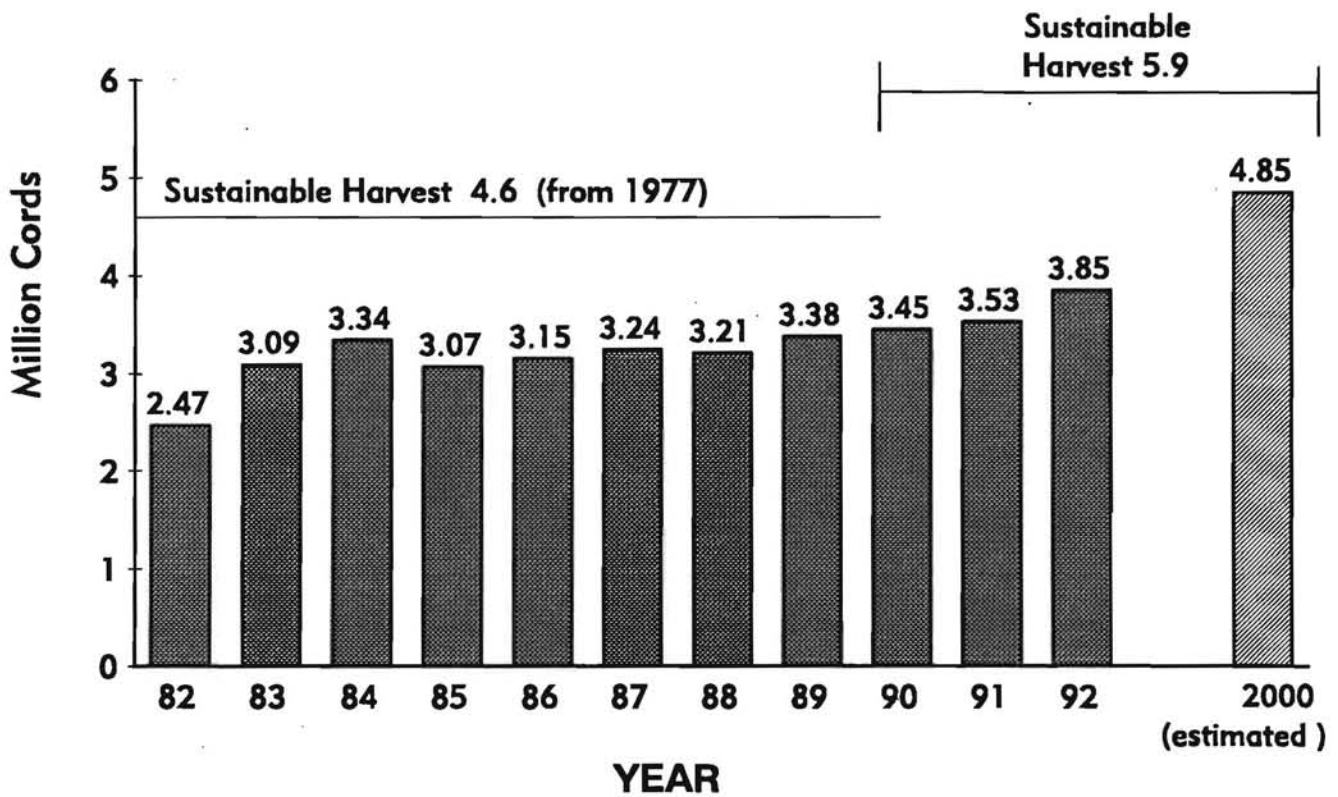
SUSTAINABLE HARVEST & ACTUAL HARVEST

From Timberland

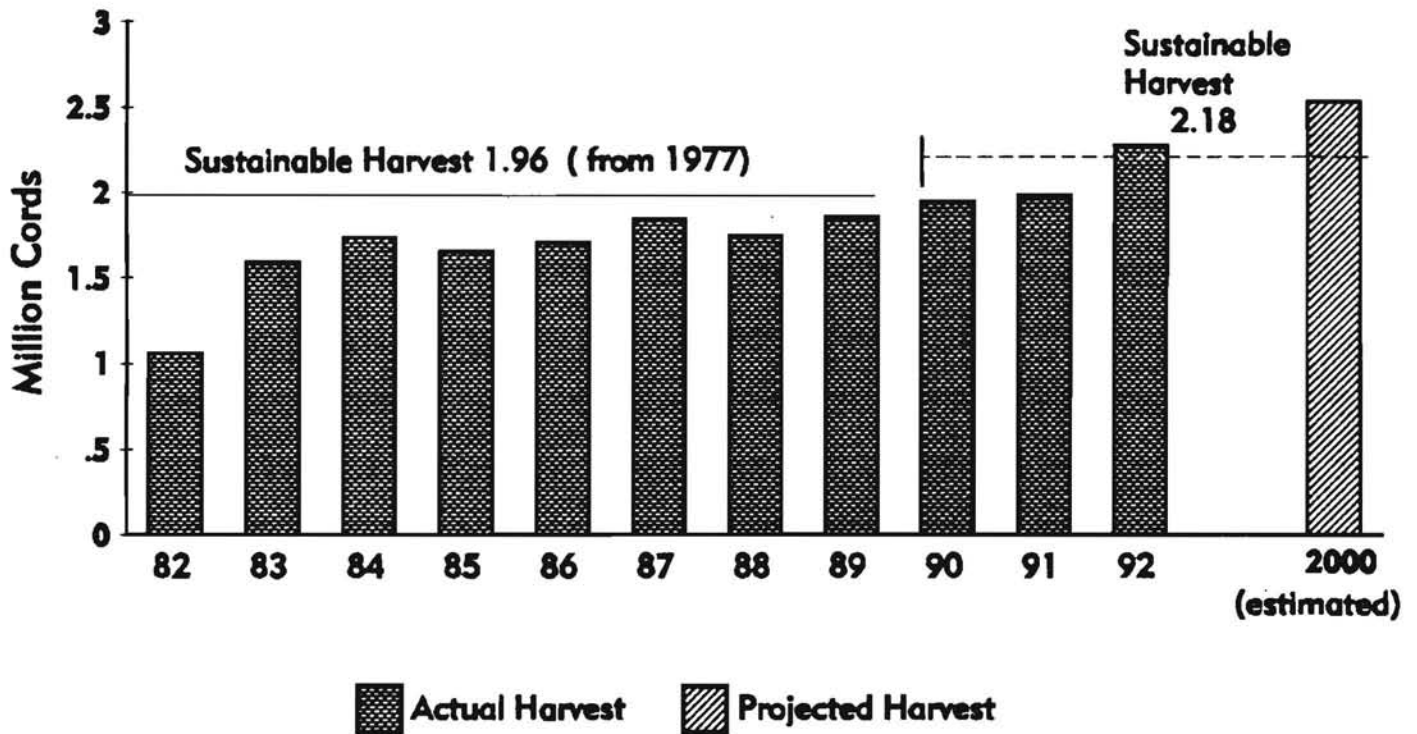
- Minnesota 1992 -



**ACTUAL & PROJECTED TIMBER HARVEST In MINNESOTA
 COMPARED to SUSTAINABLE HARVEST LEVELS
 - from Timberland -**



**ASPEN HARVEST In MINNESOTA : ACTUAL & PROJECTED
 COMPARED to SUSTAINABLE HARVEST LEVEL
 (Includes Pulpwood, Sawtimber, & Wood for Energy)**



Aspen

Present and Projected Demand

1992 Harvest..... 2,265,000 cds.

2000 Harvest..... 2,520,000 cds.

Major Changes:

- Blandin + 135,000
- BCC + 40,000
- Champion Int'l. + 20,000
- Potlatch (Paper) + 10,000
- Potlatch (OSB) - 50,000
- LP (OSB) - 10,000

Continued

Aspen

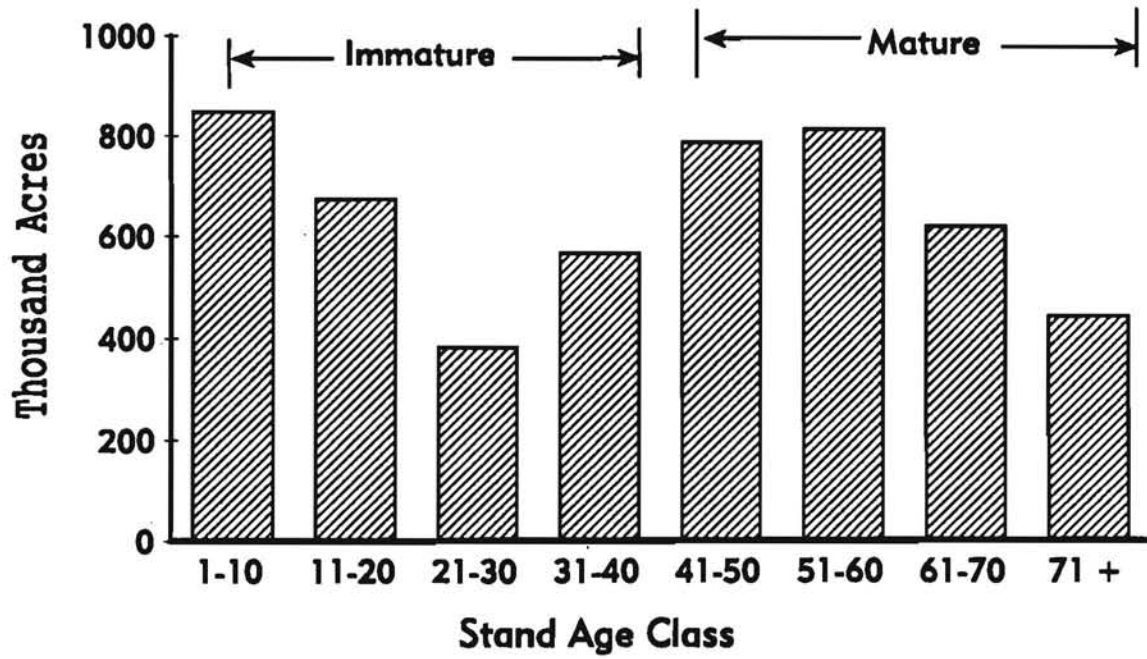
Present and Projected Demand

Major Changes: Continued

- Northwood (OSB)+ 5,000
- T J MacMillan + 70,000
- Int'l. Bilrite - 15,000
- Superwood - 25,000
- Export + 25,000
- Sawbolts - 50,000
- Unannounced (OSB) +100,000

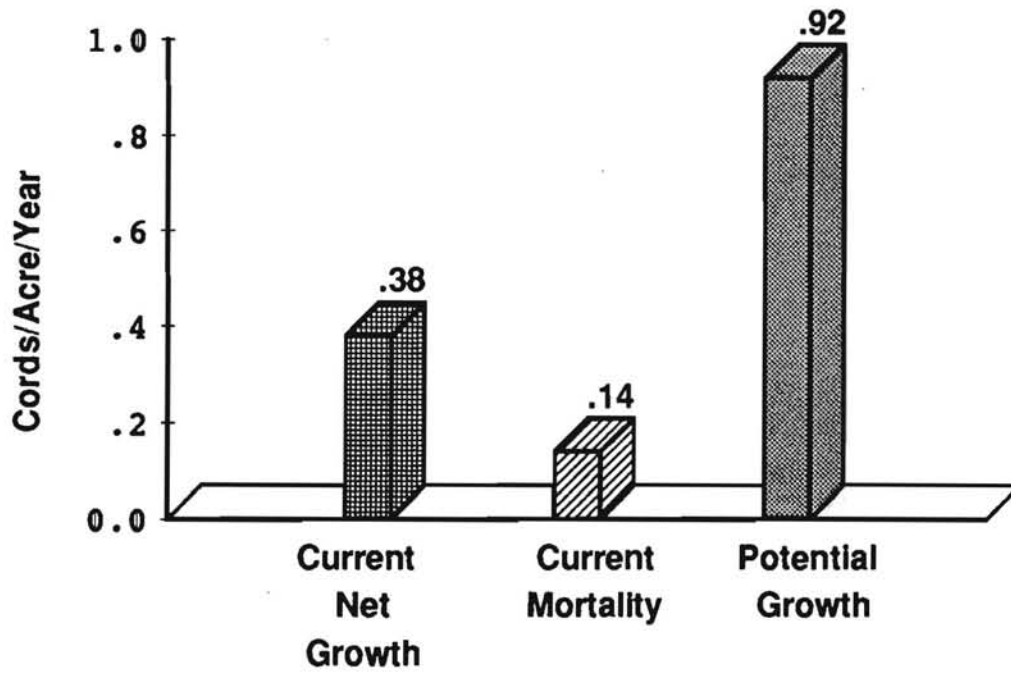
ASPEN AGE DISTRIBUTION - (1990)

Minnesota Statewide



CURRENT & POTENTIAL GROWTH of ASPEN TYPE

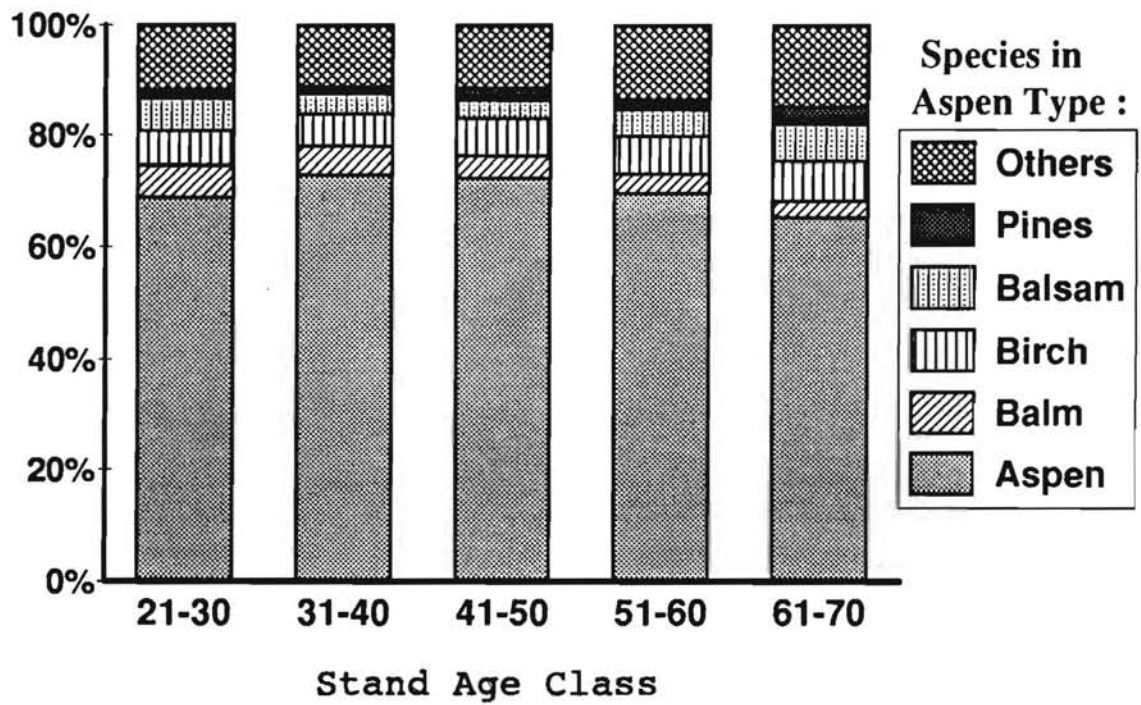
Minnesota Statewide



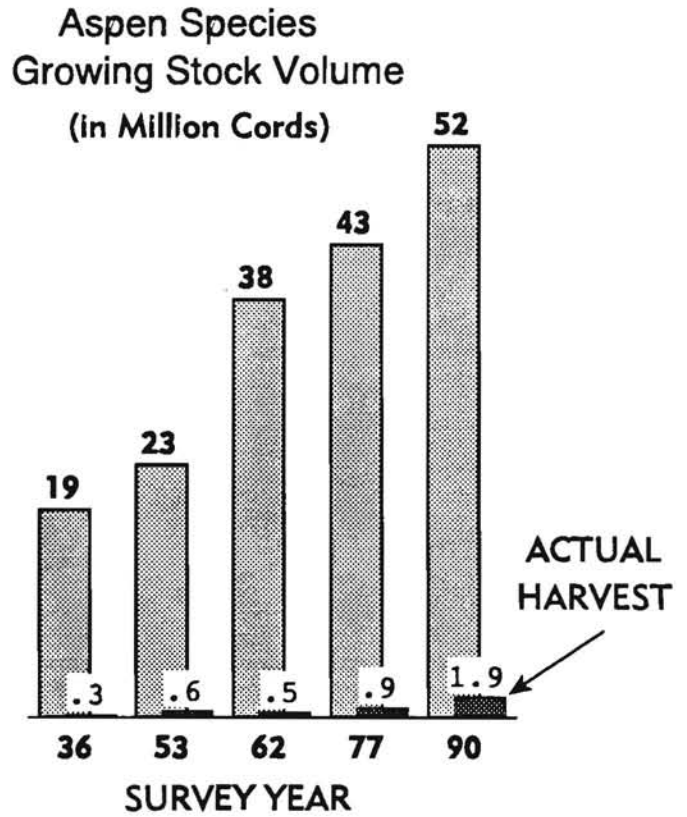
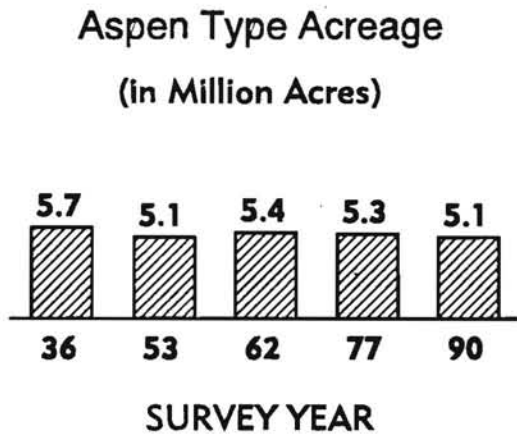
9/90

% of SPECIES VOLUME in ASPEN TYPE

Based on State Land

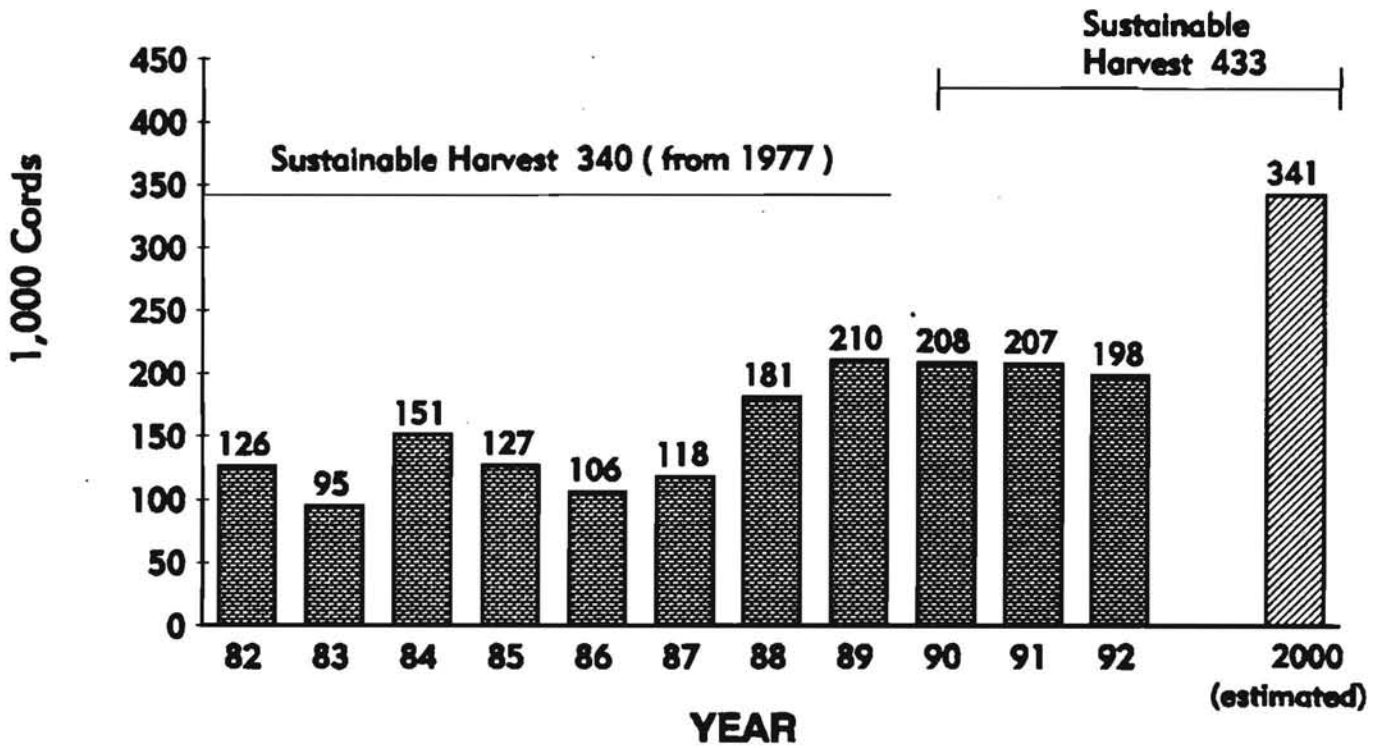


ASPEN TYPE ACREAGE & ASPEN SPECIES VOLUME & HARVEST Minnesota Statewide



BALSAM FIR HARVEST In MINNESOTA : ACTUAL & PROJECTED COMPARED to SUSTAINABLE HARVEST LEVEL

- from Timberland -



Balsam Fir

Present and Projected Demand From Minnesota

1992 Harvest198,000 cds.

- * Minnesota Pulpwood Industries . 184,000 cds.
- * Pulpwood Export 3,000 cds.
- * Sawlogs & Other 11,000 cds.

2000 Harvest340,000 cds.

- * Minnesota Pulpwood Industries . 315,000 cds.
(Expansions at Blandin, Lake Superior Paper Industries, Champion International)
- * Pulpwood Export 15,000 cds.
- * Sawlogs & Other 10,000 cds.

Balsam Fir

☉ Projected demand to increase

☉ Gross surplus still exists

1992	235,000 cds.
2000	93,000 cds.

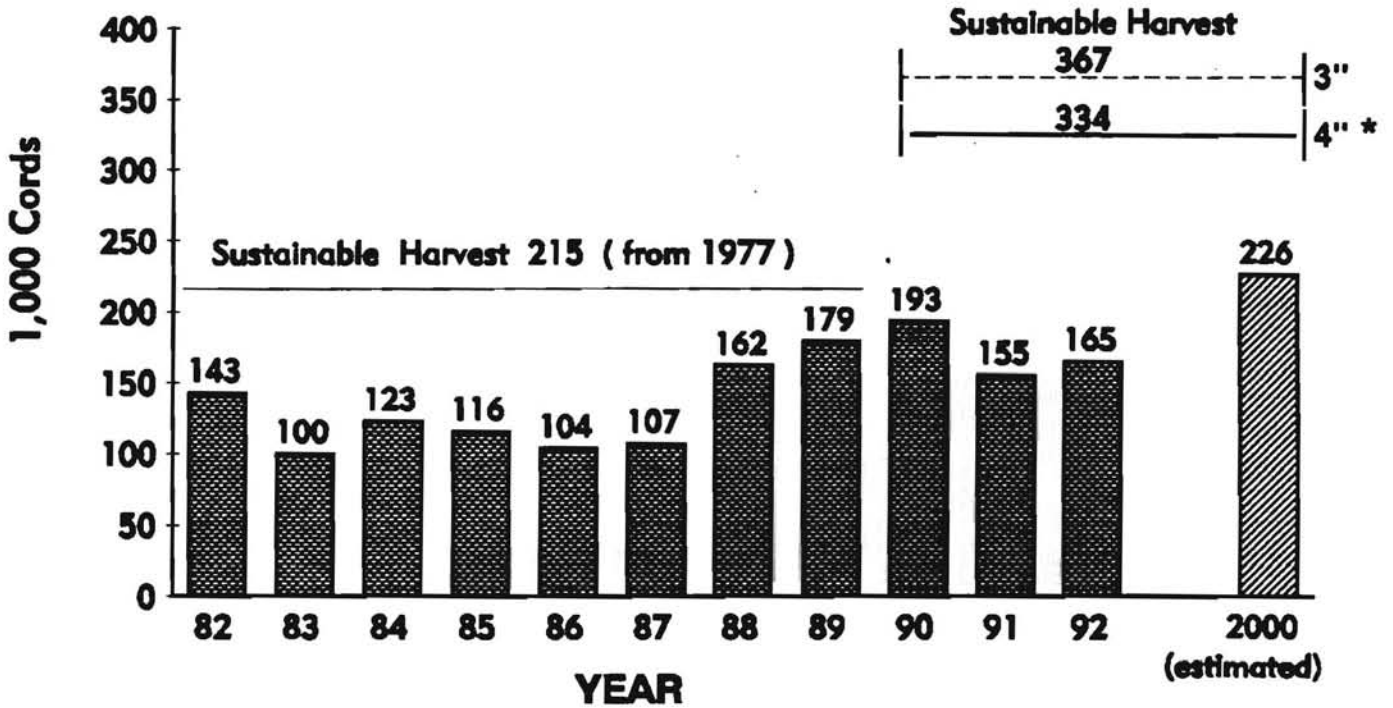
☉ Concerns:

- * Balsam availability dependent upon 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.

☉ Available surplus:

1992	155,000 cds.
2000	55,000 cds.

**SPRUCE HARVEST In MINNESOTA : ACTUAL & PROJECTED
 COMPARED to SUSTAINABLE HARVEST LEVEL
 - from Timberland -**



10/93

* Black Spruce 202,600 cords. White Spruce 131,700 cords.

Spruce

Present and Projected Demand From Minnesota

1992 Harvest165,000 cds.

- * Minnesota Pulpwood Industries . 113,000 cds.
- * Pulpwood Export 33,000 cds.
- * Sawlogs & Other 19,000 cds.

2000 Harvest225,000 cds.

- * Minnesota Pulpwood Industries . 155,000 cds.
(Expansions at Blandin and
Lake Superior Paper Industries)
- * Pulpwood Export 45,000 cds.
- * Sawlogs & Other 25,000 cds.

Spruce

☉ **Projected demand to increase**

☉ **Gross surplus still exists**

1992	170,000 cds.
2000	110,000 cds.

☉ **Utilization to 3" top increases availability by at least 10%**

☉ **Thinning white spruce plantations could increase availability by 5%**

☉ **Concerns:**

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

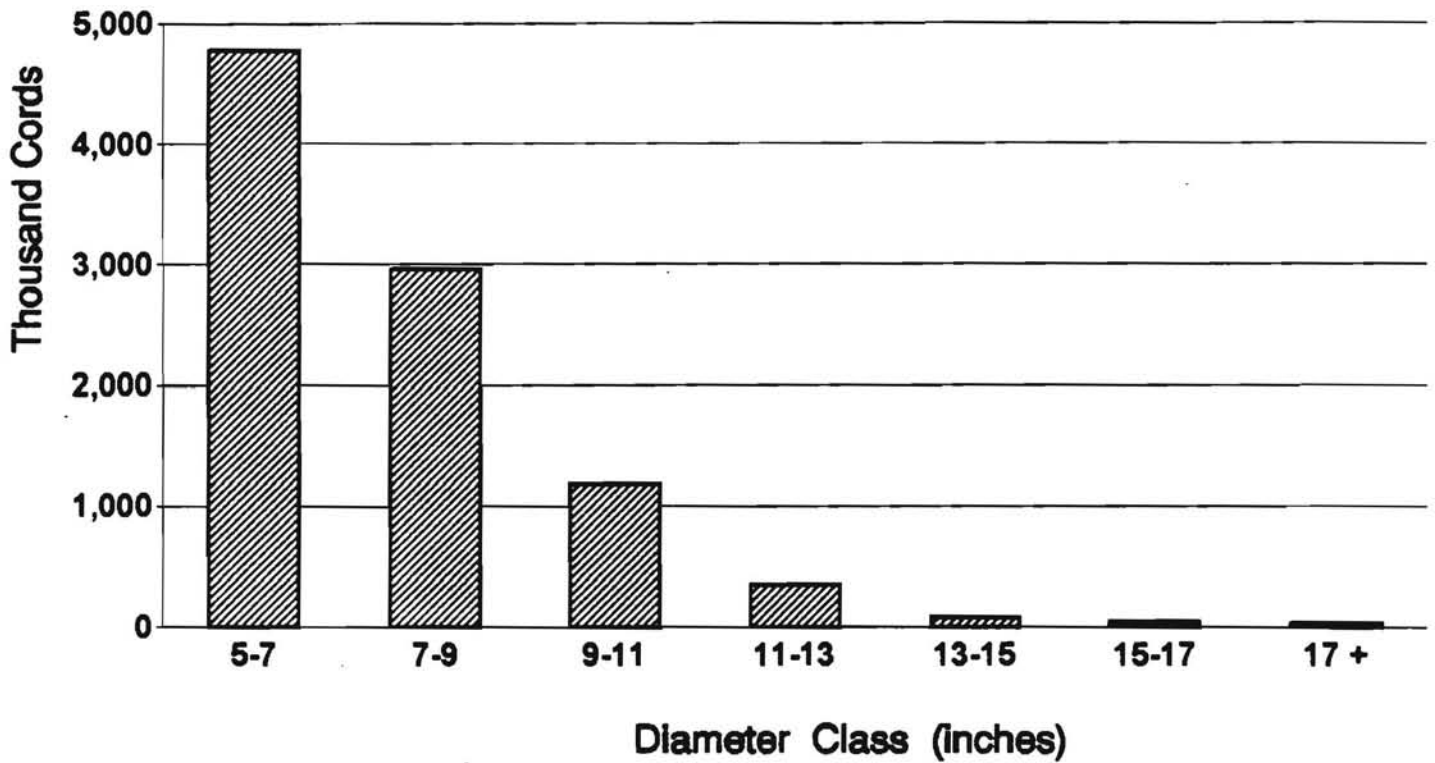
☉ **Available surplus:**

- * Available in summer virtually none
 - * Winter access
- | | |
|----------------|--------------|
| 1992 | 110,000 cds. |
| 2000 | 50,000 cds. |

BLACK SPRUCE SPECIES NET VOLUME by DIAMETER CLASS

Timberland in Minnesota, all Ownerships

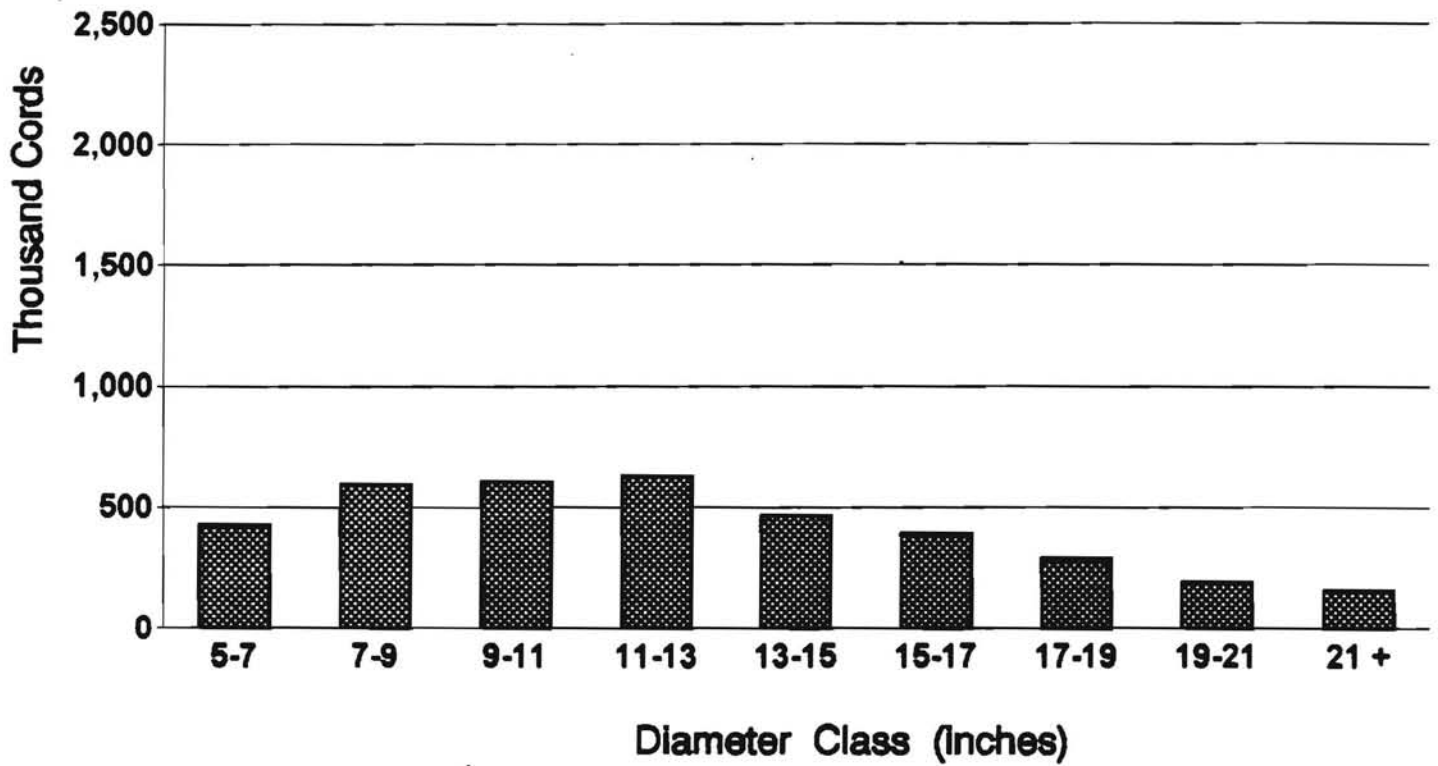
- Forest Survey, 1990 -



WHITE SPRUCE SPECIES NET VOLUME by DIAMETER CLASS

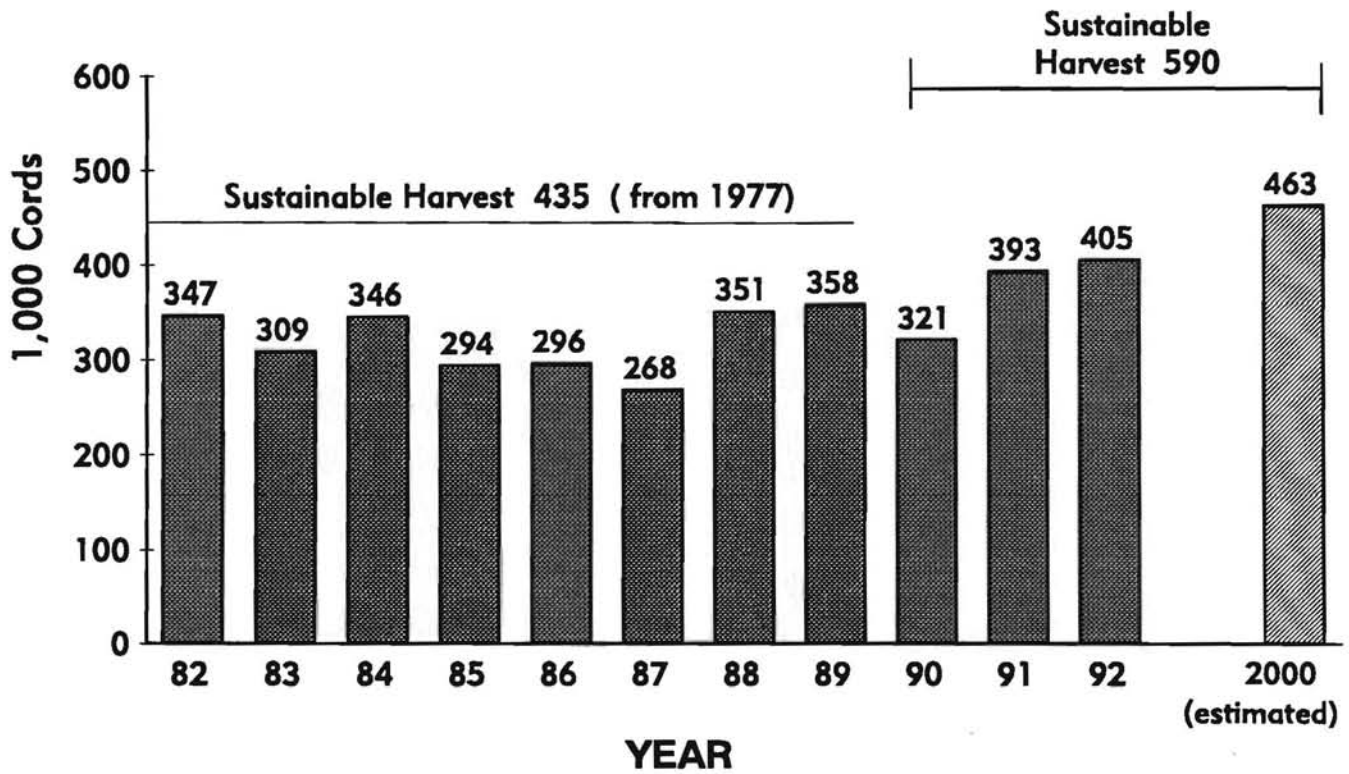
Timberland in Minnesota, all Ownerships

- Forest Survey, 1990 -



**PINE HARVEST In MINNESOTA : ACTUAL & PROJECTED
COMPARED to SUSTAINABLE HARVEST LEVEL**

- from Timberland -



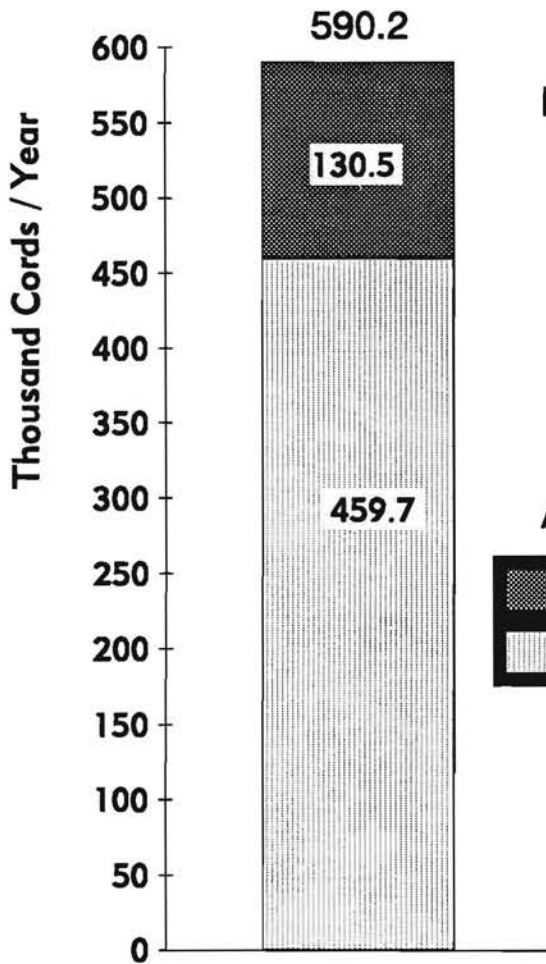
PINE SUSTAINABLE HARVEST

(1990 - 2000)



Minnesota Statewide, all Ownerships

- Based on 1990 Survey -

from all Cover Types



Annual Sustainable Harvest (Net Volume) :

-  Volume Available from Thinnings (Age 31-100)
-  Growing Stock & Other Live Trees

Pine

Present and Projected Demand

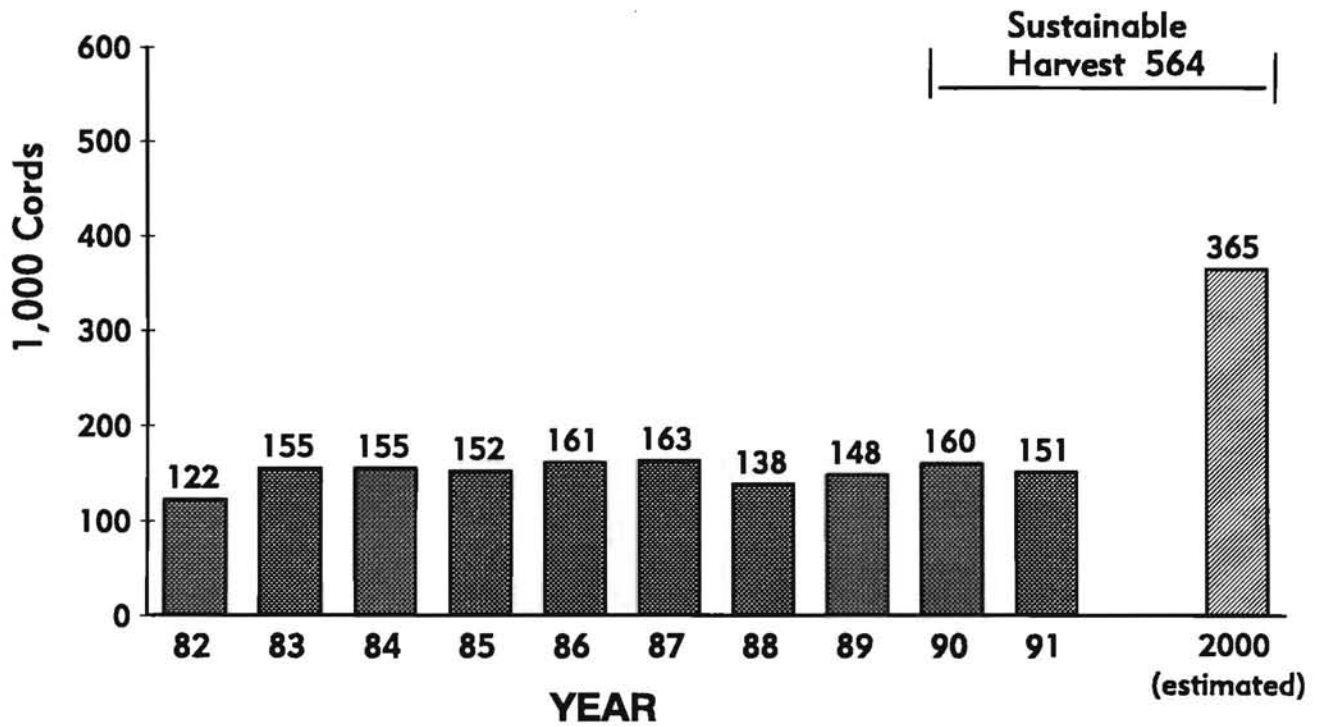
1992 Harvest..... 405,000 cds.

2000 Harvest..... 463,000 cds.

Major Changes:

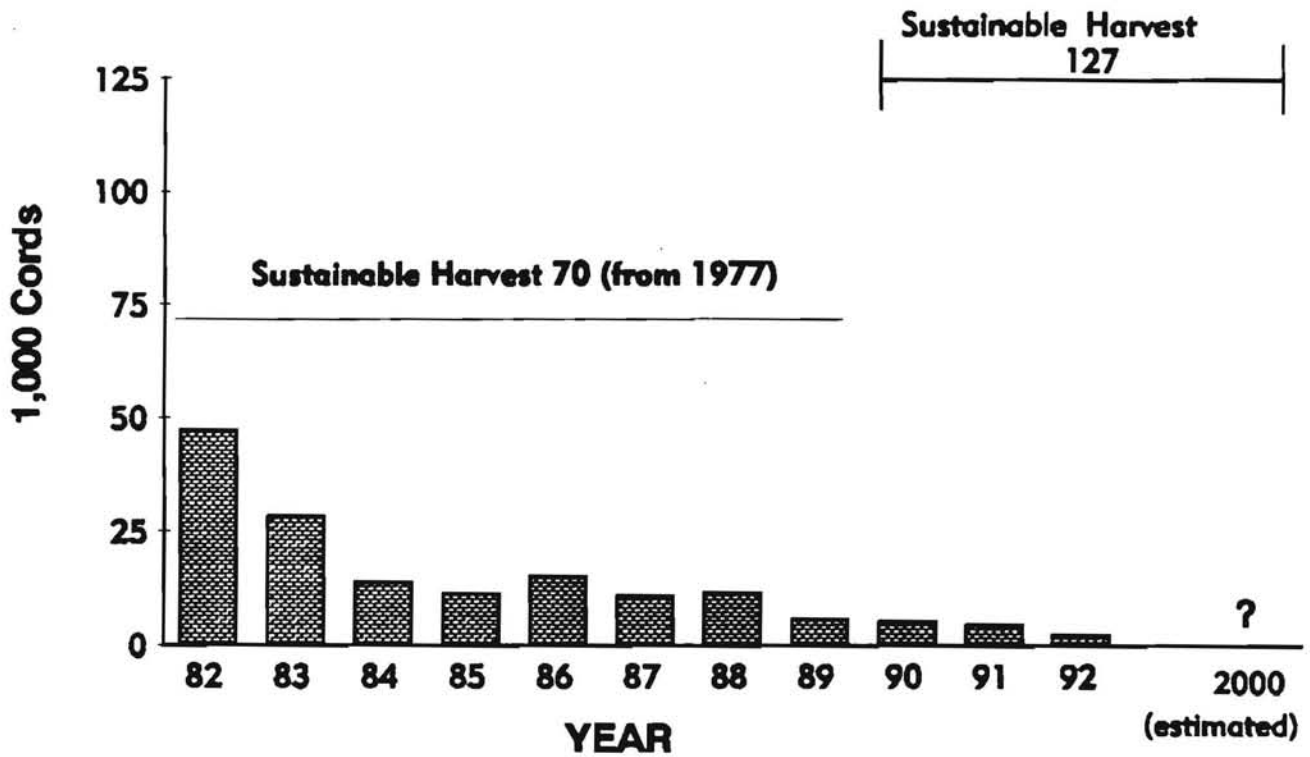
- BCC - 35
- Potlatch (Paper) + 70
- Potlatch (OSB) + 10
- Export + 5
- Sawbolts + 5

**BIRCH HARVEST In MINNESOTA : ACTUAL & PROJECTED
COMPARED to SUSTAINABLE HARVEST LEVEL
- from Timberland -**



TAMARACK HARVEST In MINNESOTA : ACTUAL & PROJECTED COMPARED to SUSTAINABLE HARVEST LEVEL

- from Timberland -



10/93

Tamarack

Present and Projected Demand From Minnesota

1992 Harvest2,300 cds.

- * Minnesota Pulpwood Industries —
- * Pulpwood Export 1,400 cds.
- * Sawbolts & Other 900 cds.

2000 Harvest10,000 cds.

- * Minnesota Pulpwood Industries . . . 5,000 cds.
- * Pulpwood Export 2,000 cds.
- * Sawbolts & Other 3,000 cds.

Tamarack

☉ **No known demand increases**

☉ **Gross surplus**

1992	125,000 cds.
2000	117,000 cds.

☉ **Concerns:**

- * Volume tied up in types not harvestable
- * Forest types with low volume/acre of tamarack
- * Some small, poor site stands
- * Winter access only

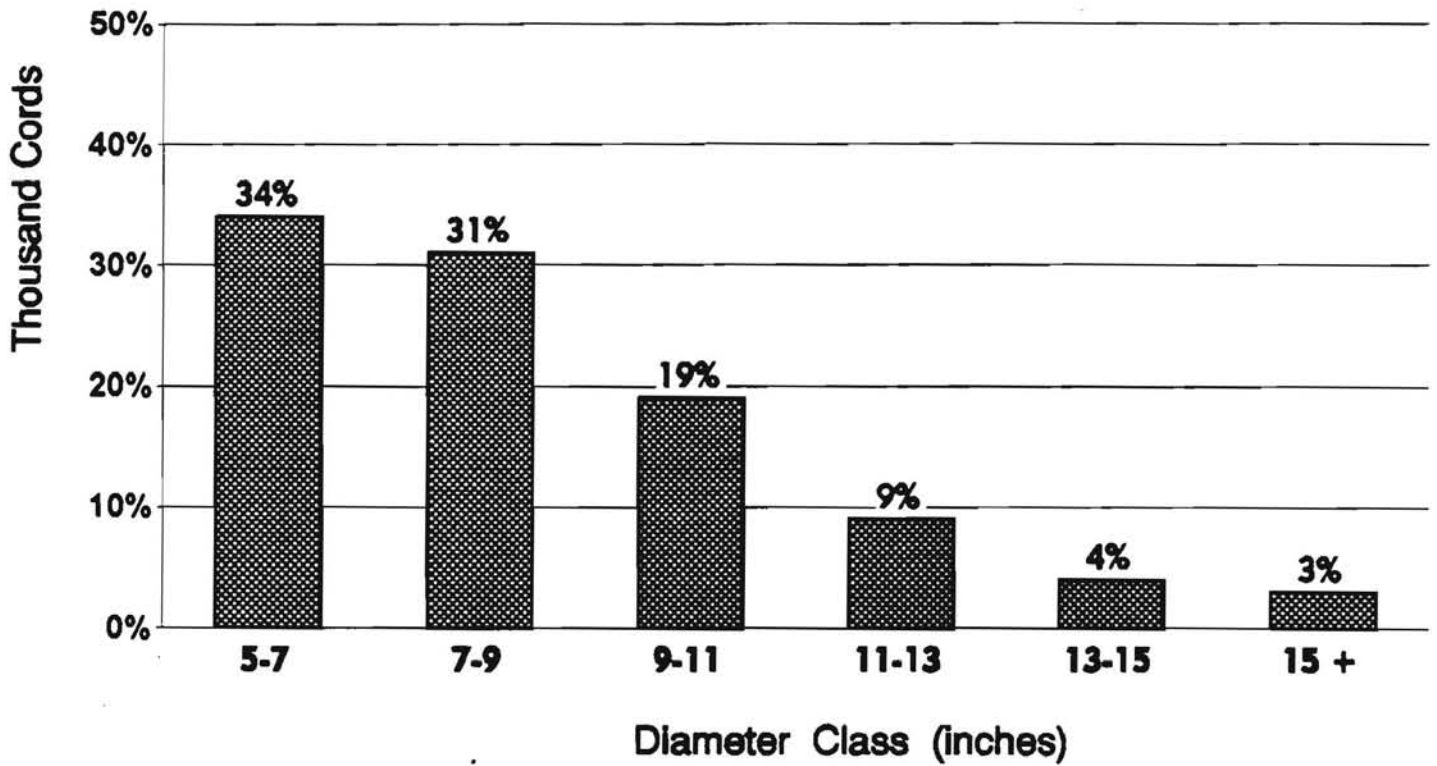
☉ **Available surplus:**

1992	73,000 cds.
2000	65,000 cds.

TAMARACK SPECIES NET VOLUME by DIAMETER CLASS

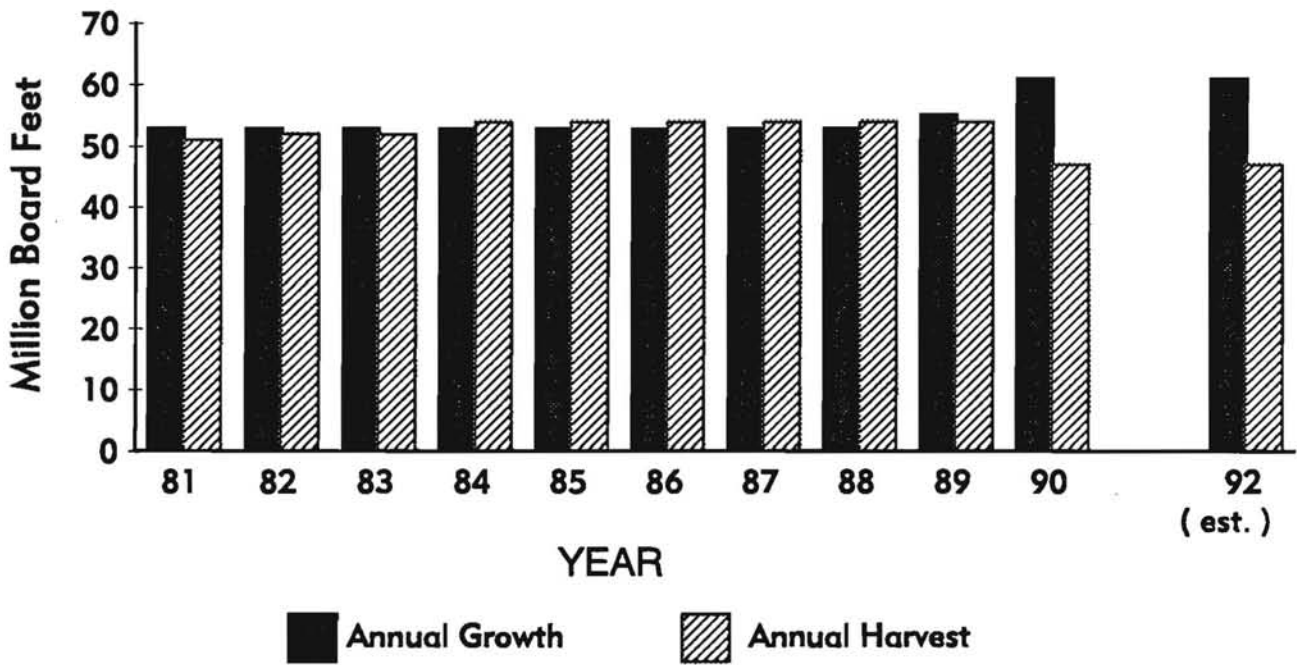
Timberland in Minnesota, all Ownerships

- Forest Survey, 1990 -



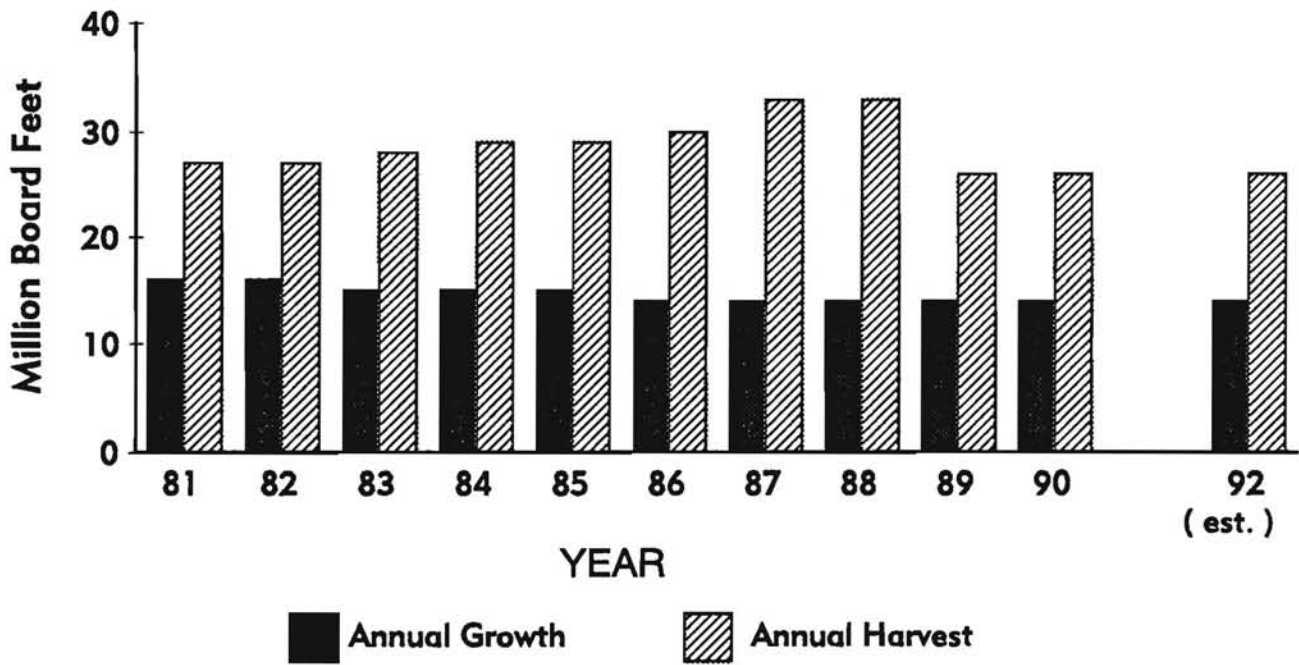
RED OAK SAWTIMBER HARVEST & GROWTH

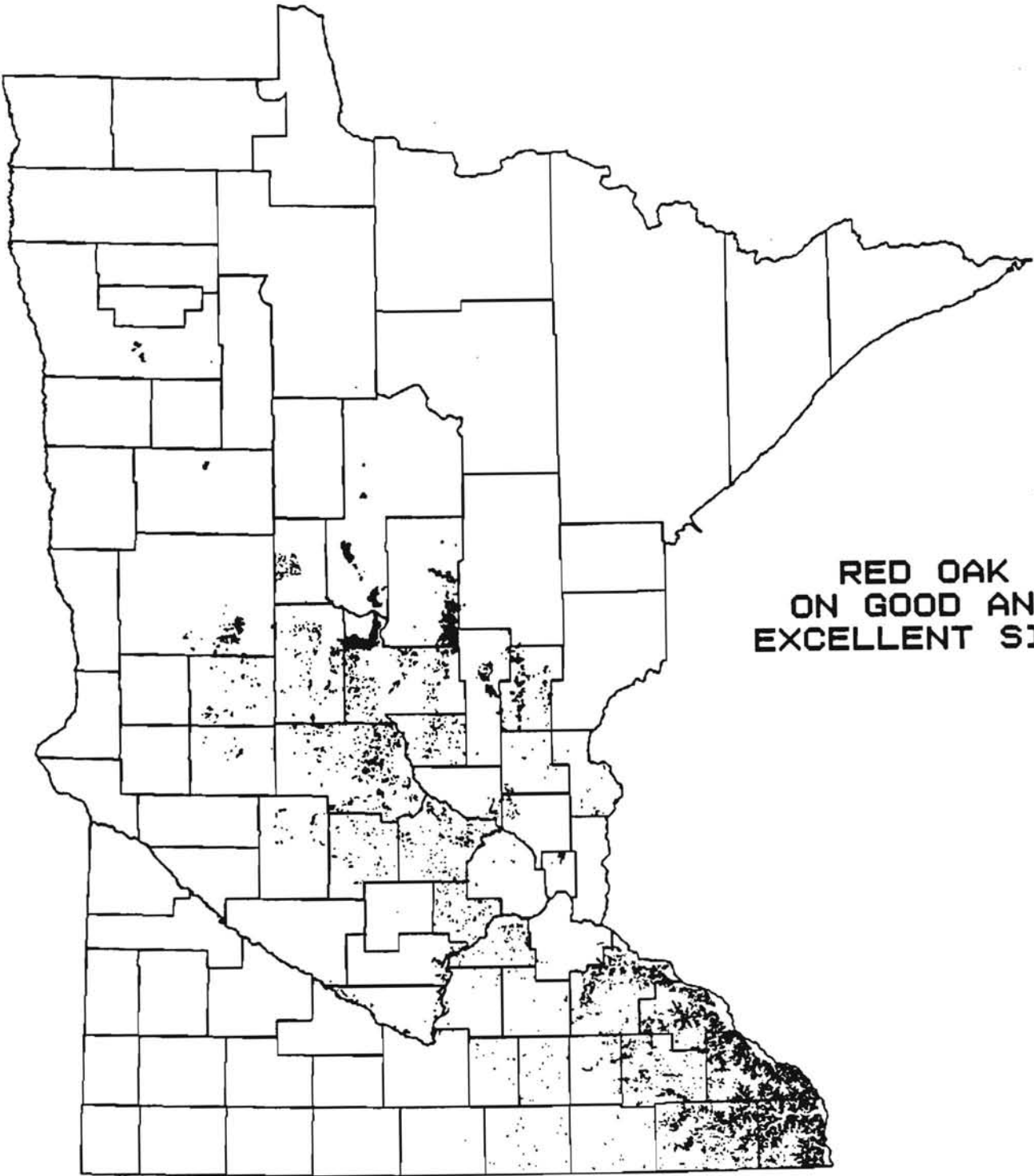
- Minnesota Statewide -



RED OAK SAWTIMBER HARVEST & GROWTH

- Southern Minnesota -





**RED OAK
ON GOOD AND
EXCELLENT SITES**

Minnesota Alternative Species—1992 & 2000 (In 000 cords)

Species	Sustainable Harvest 1990-2000	Harvest 1992	Annual Surplus 1992	Harvest 2000	Annual Surplus 2000
Balm-of-Gilead	283	86	197	150	133
Birch	564	162	402	365	199
Tamarack	121	2	119	10	111
Pine	590	405	<u>185</u>	463	<u>127</u>
			903		570

MINNESOTA : ANNUAL RECOMMENDED HARVEST

(1990 - 2000)

Based on 1990 Survey, Statewide all Ownerships

5/13/92

Draft

(in 1,000 cords)

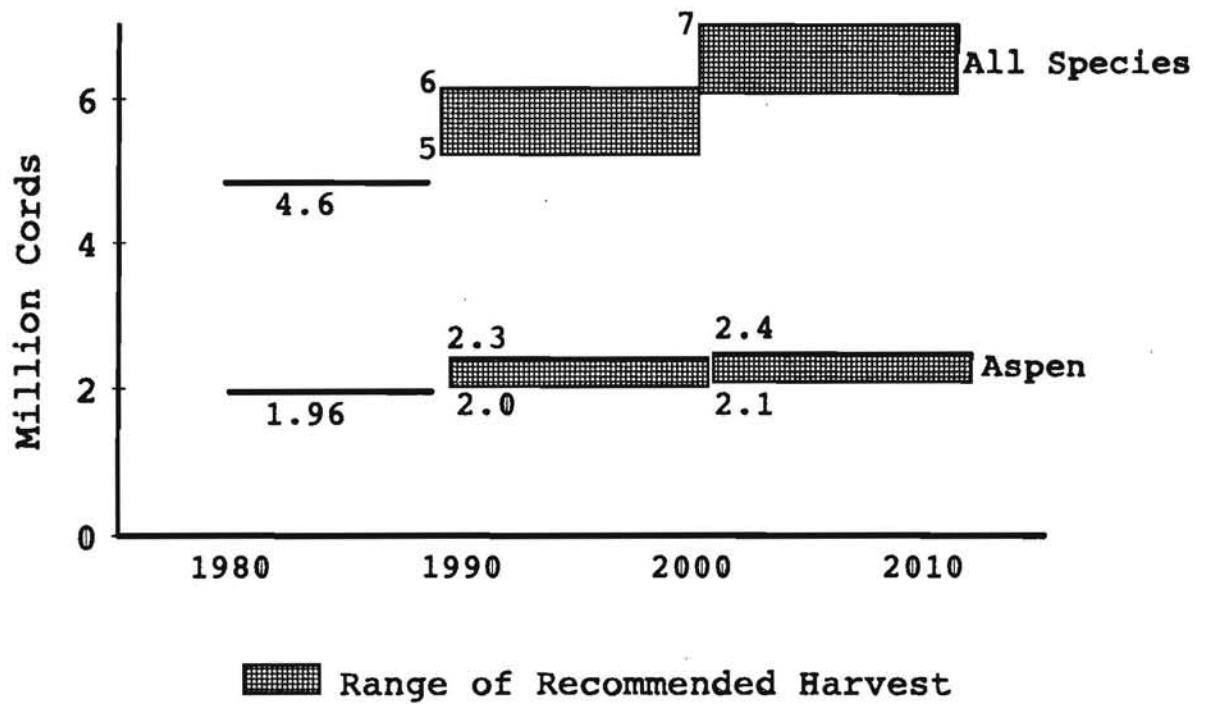
Major Species	(Live Trees)		Subtotal	Adjustment	Total
	Growing Stock	Nongrowing Stock			
Jack Pine	201.2	7.0	208.2	8.7 #	216.9
Red Pine	169.1	1.7	170.8	112.0 #	282.8
White Pine	77.2	3.4	80.6	9.8 #	90.4
White Spruce	114.7	1.6	116.3		116.3 132
Blk Spruce	185.3	3.0	188.3		188.3 203
Balsam Fir	376.4	8.3	384.7		384.7 433
Tamarack	114.4	6.5	120.9		120.9 127
Cedar	150.7	28.2	178.9		178.9
Other Softwds	1.1		1.1		1.1
White Oak	163.7	51.4	215.1		215.1
Red Oak	213.9	37.9	251.8		251.8
Basswood	174.5	20.9	195.4		195.4
Hard Maple	99.4	32.3	131.7		131.7
Soft Maple	114.1	36.9	151.0		151.0
Elm	71.3	15.3	86.6		86.6
Ash	182.0	17.8	199.8		199.8
Aspen	1,928.7	235.3	2,164.0		2,164.0
Birch	573.0	53.9	626.9	-62.7 **	564.2
Balm	266.3	16.8	283.1		283.1
Other Hardwoods	91.9		91.9		91.9
Total	5,268.9	578.2	5,847.1	67.8	5,915.0

Volume available from thinning red pine stands (age 31-100 years).

** Birch : 10% volume decline due to the recent mortality.

CURRENT & PROJECTED RECOMMENDED HARVEST LEVELS

- Minnesota Statewide -



Total Minnesota Hardwood Harvest by Species by Year From Commercial Forestland (Thousand Cords)

Year	Aspen	Birch	Balm/ Gilead	Ash	Oak	Elm	Bass- wood	Maple	Cotton- wood	Other Hard- woods	Total Hard- woods
1980	982.2	133.5	46.5	49.4	250.3	91.5	12.1	43.1	6.0	?	1,614.6
1981	1,084.1	129.4	51.7	49.2	250.3	91.2	12.2	42.8	6.0	?	1,716.9
1982	1,148.7	121.7	55.0	52.3	250.5	91.3	12.1	42.7	6.0	?	1,780.3
1983	1,655.9	154.8	69.6	81.7	327.8	195.6	14.3	41.4	9.7	?	2,550.8
1984	1,793.2	154.2	63.1	81.8	327.8	195.7	14.3	41.4	9.7	?	2,681.2
1985	1,625.5	152.2	49.2	81.6	327.8	195.6	14.3	41.3	9.7	?	2,497.2
1986	1,733.4	160.7	48.0	81.4	327.8	195.5	14.3	41.0	9.7	?	2,611.8
1987	1,842.4	163.4	43.1	81.4	327.8	195.5	14.3	40.9	9.7	?	2,718.5
1988	1,737.5	137.4	46.9	73.1	299.6	97.8	32.3	64.1	7.3	2.2	2,498.2
1989	1,846.4	147.5	47.8	71.0	299.6	97.8	32.3	64.7	7.4	2.2	2,616.7
1990	1,938.5	159.8	53.4	71.5	282.0	87.8	36.3	73.4	7.6	2.8	2,713.1
1991	1,978.1	150.6	69.9	71.4	282.0	87.8	36.2	74.3	7.6	2.8	2,760.7
1992	2,265.0	162.0	86.0	75.0	282.0	88.0	40.0	66.0	8.0	3.0	3,075.0

(Includes pulpwood, sawtimber, and fuelwood.)

Total Minnesota Softwood Harvest by Species by Year From Commercial Forestland (Thousand Cords)

Year	Spruce	Balsam	Tamarack	Cedar	Red Pine	White Pine	Jack Pine	Total Soft-Woods
1980	180.0	131.1	45.0	26.4	79.7	20.3	220.0	702.5
1981	137.5	120.8	32.5	26.4	81.1	24.8	210.6	633.7
1982	143.3	125.9	47.1	26.4	84.0	27.3	237.2	691.2
1983	100.4	95.9	28.4	16.2	103.2	41.4	156.6	542.1
1984	123.0	151.4	13.8	16.2	122.1	39.2	188.2	653.9
1985	116.3	127.6	11.3	16.2	105.4	30.2	162.5	569.5
1986	103.7	106.8	15.2	16.2	112.4	33.8	153.4	541.5
1987	106.6	118.2	10.8	16.2	102.5	30.5	138.6	523.4
1988	162.2	181.9	11.5	8.2	133.6	43.5	170.7	711.6
1989	179.4	209.8	5.7	8.2	136.8	44.0	177.3	761.2
1990	192.5	207.9	5.3	11.9	105.0	35.9	177.0	735.5
1991	154.6	207.4	4.5	7.5	121.5	32.7	238.3	766.5
1992	164.9	197.6	2.3	7.5	134.0	36.1	235.1	777.5

(Includes pulpwood, sawtimber, and fuelwood.)

**Total Minnesota Wood Harvest
of Hardwoods and Softwoods
by Year
From Commercial Forestland
(Thousand Cords)**

Year	Hardwoods	Softwoods	Total
1980	1,614.6	702.5	2,317.1
1981	1,716.9	633.7	2,350.6
1982	1,780.3	691.2	2,471.5
1983	2,550.8	542.1	3,092.9
1984	2,681.2	653.9	3,335.1
1985	2,497.2	569.5	3,066.7
1986	2,611.8	541.5	3,153.3
1987	2,718.5	523.4	3,241.9
1988	2,498.2	711.6	3,209.8
1989	2,616.7	761.2	3,377.9
1990	2,713.1	735.5	3,448.6
1991	2,760.7	766.5	3,527.2
1992	3,073.3	777.5	3,850.8

**Minnesota 1989 Fuelwood Harvest
From Commercial Forest Land
(Thousand Cords)**

Species	Survey Unit				Total
	I	II	III	IV	
Oak	9.4	40.9	123.5	17.6	191.4
Birch	32.5	16.2	23.4	7.3	79.4
Ash	8.2	8.2	12.2	24.3	52.9
Elm	1.3	9.3	50.1	21.0	81.7
Maple	12.0	6.8	23.2	5.1	47.1
Aspen	12.2	20.4	10.4	3.0	46.0
Basswood	.1	1.0	.9	.2	2.2
Sub-Total Hardwoods	<u>75.7</u>	<u>102.8</u>	<u>243.7</u>	<u>78.5</u>	<u>500.7</u>
W. Pine	.4	1.0	.5	.1	2.0
R. Pine	.9	2.3	1.1	.1	4.4
J. Pine	1.4	3.3	1.5	.2	6.4
Spruce	.1	.3	.4	.1	2.0
Balsam Fir	.8	.5	1.2	.1	2.6
Tamarack	--	.1	.3	.1	.5
Cedar	--	.2	.5	--	.7
Sub-Total Softwoods	<u>4.2</u>	<u>7.7</u>	<u>6.0</u>	<u>.7</u>	<u>18.6</u>
Total	<u>79.9</u>	<u>110.5</u>	<u>249.7</u>	<u>79.2</u>	<u>519.3</u>

STUMPAGE VALUE OF MINNESOTA'S 1990 TIMBER HARVEST

	CDS(M) PULPWOOD	PRICE /CD	PULPWOOD VALUE	MBF SAWLOG	PRICE /MBF	SAWLOG VALUE
R. PINE	18.7	\$13.04	\$243,848	40,426	\$93.55	\$3,781,852
W. PINE	4.6	\$13.04	\$59,984	14,440	\$93.55	\$1,350,862
J. PINE	114.2	\$11.34	\$1,295,028	28,787	\$62.83	\$1,808,687
SPRUCE	179.7	\$12.09	\$2,172,573	5,268	\$54.34	\$286,263
B. FIR	197.3	\$6.49	\$1,280,477	4,128	\$20.54	\$84,789
TAM.	4.4	\$4.61	\$20,284	188	\$19.18	\$3,606
CEDAR	4.4	\$9.76	\$42,944	3,381	\$29.63	\$100,179
ASPEN	1,711.1	\$6.03	\$10,317,933	119,664	\$23.34	\$2,792,958
BIRCH	22.7	\$3.69	\$83,763	29,621	\$20.87	\$618,190
R. OAK	0			37,220	\$73.40	\$2,731,948
W. OAK	0			7,759	\$73.40	\$1,569,511
WALNUT	0			1,181	\$900.00	\$1,062,900
MAPLE	19.6	\$5.58	\$109,368	3,378	\$37.48	\$126,607
BASS.	0.1	\$5.58	\$558	16,811	\$37.48	\$630,076
ELM	0			2,985	\$38.77	\$115,728
ASH	0.1	\$3.82	\$382	9,103	\$49.44	\$450,052
COTWD	0			3,749	\$14.64	\$54,885
FIREWD	535.2	\$5.00	\$2,676,000			
OTHER	0			6,151	\$54.34	\$334,245
TOTAL	2,812.1		\$18,305,142.00	334,240		\$17,903,338.00
GRAND TOTAL			3,448,600 CDS.*			\$36,208,480.00

Prices from 1990 Public Stumpage Price Review - Walnut & Firewood prices estimated
 - Cottonwood price assumed to be the same as that reported for Balm of Gilead
 - Balm of Gilead volume is combined with Aspen

* - Total of pulpwood & sawlogs (1 MBF = 2 CDS)

Mill Delivered Value of Minnesota's 1990 Timber Harvest

	Pulpwood			Sawtimber		
	Harvest Pulpwood (000 cords)	Price Per Cord	Pulpwood Value	Harvest Sawlogs (MBF)	Price Per MBF	Sawlog Value
Red Pine	18.7	\$53.15	\$993,905	40,426	\$164	\$6,629,864
White Pine	4.6	\$53.15	\$244,490	14,440	\$171	\$2,469,240
Jack Pine	114.2	\$53.15	\$6,109,700	28,787	\$127	\$3,655,949
Spruce	179.7	\$76.15	\$13,684,155	5,268	\$144	\$758,592
Balsam Fir	197.3	\$64.10	\$12,646,930	4,128	\$116	\$478,848
Tamarack	4.4	\$55.20	\$242,880	188	\$125	\$23,500
Cedar	4.4	\$55.20	\$242,880	3,381	\$97	\$327,957
Aspen	1,711.1	\$42.20	\$72,208,420	119,664	\$90	\$10,769,760
Birch	22.7	\$34.25	\$777,475	29,621	\$116	\$3,436,036
Red Oak	0.0			37,220	\$238	\$8,858,360
White Oak	0.0			7,759	\$154	\$1,194,886
Walnut	0.0			1,181	\$3,000	\$3,543,000
Maple	19.6	\$34.25	\$671,300	3,378	\$116	\$391,848
Basswood	0.1	\$34.25	\$3,425	16,811	\$135	\$2,269,485
Elm	0.0			2,985	\$130	\$388,050
Ash	0.1	\$34.25	\$3,425	9,103	\$137	\$1,247,111
Cottonwood	0.0			3,749	\$90	\$337,410
Fuelwood	535.2	\$70.00	\$37,464,000	0		
Other	0.0			6,151	\$125	\$768,875
Total	2,812.1		\$145,292,985	334,240		\$47,885,821
Grand Total			3,448,600 CDS*			\$193,178,806

Prices from 1990 Price Report—Walnut & Firewood prices estimated.

*Total of pulpwood & sawlogs (1 MBF = 2 CDS)

Average Prices Received for Stumpage Sold by Public Land Agencies in Minnesota: 1985-1993

(Compiled by Doug Ford, Forest Economist, DNR-Forestry)

Pulpwood (\$'s per cord)

Species	1985	1986	1987	1988	1989	1990	1991	1992	1993 ^a
Aspen	\$3.44	\$3.32	\$3.35	\$3.55	\$4.53	\$6.09	\$6.61	\$7.25	\$9.28
Balm	2.00	2.33	2.72	2.31	2.88	3.35	3.58	4.51	6.43
Birch	2.18	1.46	1.68	1.96	2.64	3.69	2.95	4.19	3.23
Ash	3.26	2.96	2.81	3.05	3.76	3.82	4.19	3.96	3.60
Oak	5.32	3.72	3.46	3.88	4.66	4.89	3.79	3.57	5.24
Mixed Hardwoods	3.00	3.10	2.96	2.37	2.77	5.58	3.34	4.32	6.35
Balsam	2.97	2.47	2.72	3.49	4.15	6.49	6.69	8.09	10.36
W. Spruce	10.25	7.42	6.35	9.29	10.61	12.42	13.27	16.46	12.16
B. Spruce	9.29	10.21	9.90	9.39	9.72	11.88	12.32	12.78	11.96
Tamarack	4.85	4.72	4.85	4.67	4.50	4.61	4.13	4.29	4.38
Cedar	7.01	7.62	7.01	6.83	7.76	9.76	9.39	9.98	8.37
J. Pine	9.49	7.56	8.60	9.69	9.75	11.34	12.79	14.65	15.99
R. & W. Pine	9.28	7.97	7.34	7.48	14.79	13.04	14.06	8.14	10.39

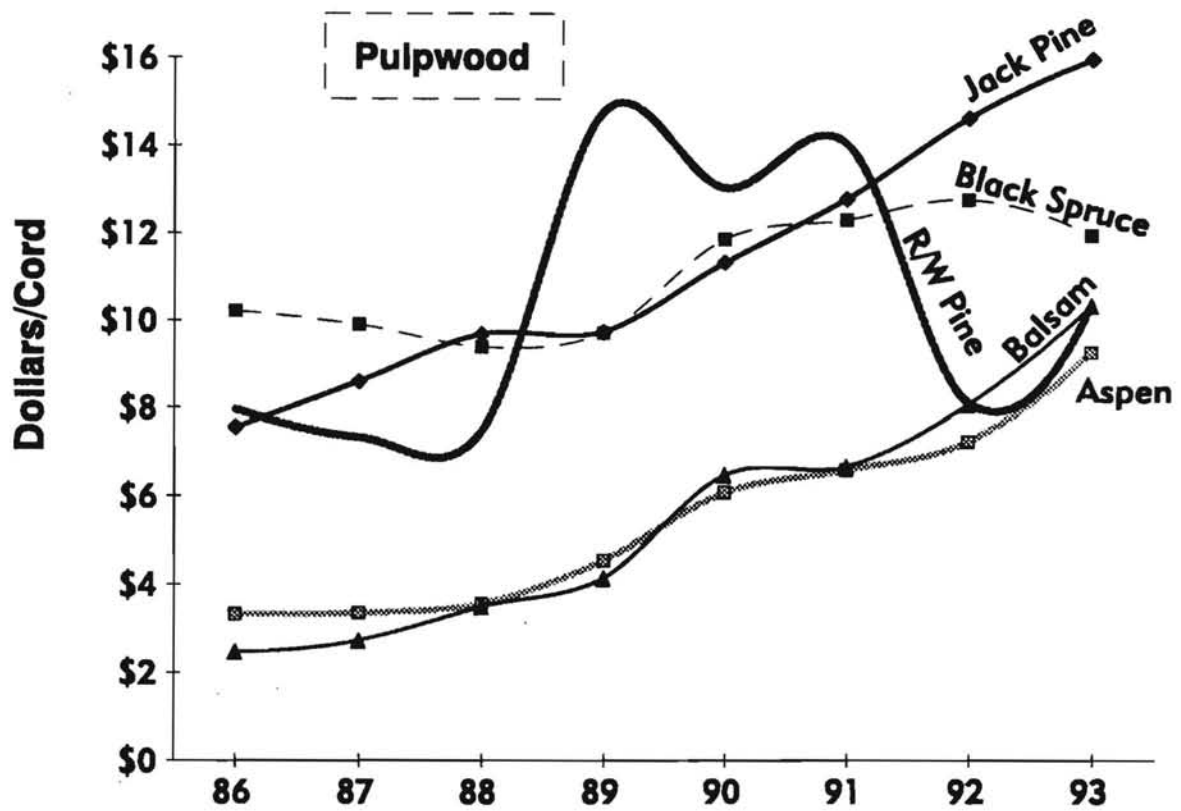
Sawtimber (\$'s per MBF)

Species	1985	1986	1987	1988	1989	1990	1991	1992 ^a	1993
Aspen	\$13.79	\$14.94	\$16.51	\$15.90	\$17.83	\$23.34	\$23.66	\$28.53	\$37.20
Birch	9.90	11.92	16.74	18.70	18.87	20.87	24.24	26.38	26.34
Ash	25.74	30.61	38.01	38.75	36.52	49.44	63.37	90.63	106.62 ^c
Elm	35.37	27.10	28.41	34.25	35.12	38.77	36.26	36.93	48.90
Oak ^b	59.59	60.19	57.37	60.50	74.11	73.40	64.45	73.99	91.69
Mixed Hardwoods	21.36	19.74	21.07	30.10	31.49	37.48	33.40	40.27	38.61
Balsam	16.61	15.05	13.90	11.80	16.97	20.54	23.29	25.39	34.30
W. Spruce	35.74	23.80	23.93	35.65	38.94	54.34	42.58	45.48	48.04
Cedar	25.13	23.92	26.93	25.50	25.32	29.63	33.19	29.69	33.88
J. Pine	39.04	33.06	38.27	43.50	53.43	62.83	62.72	72.96	83.59
R. & W. Pine	62.34	52.95	57.70	66.85	88.90	93.55	101.13	108.84	132.83

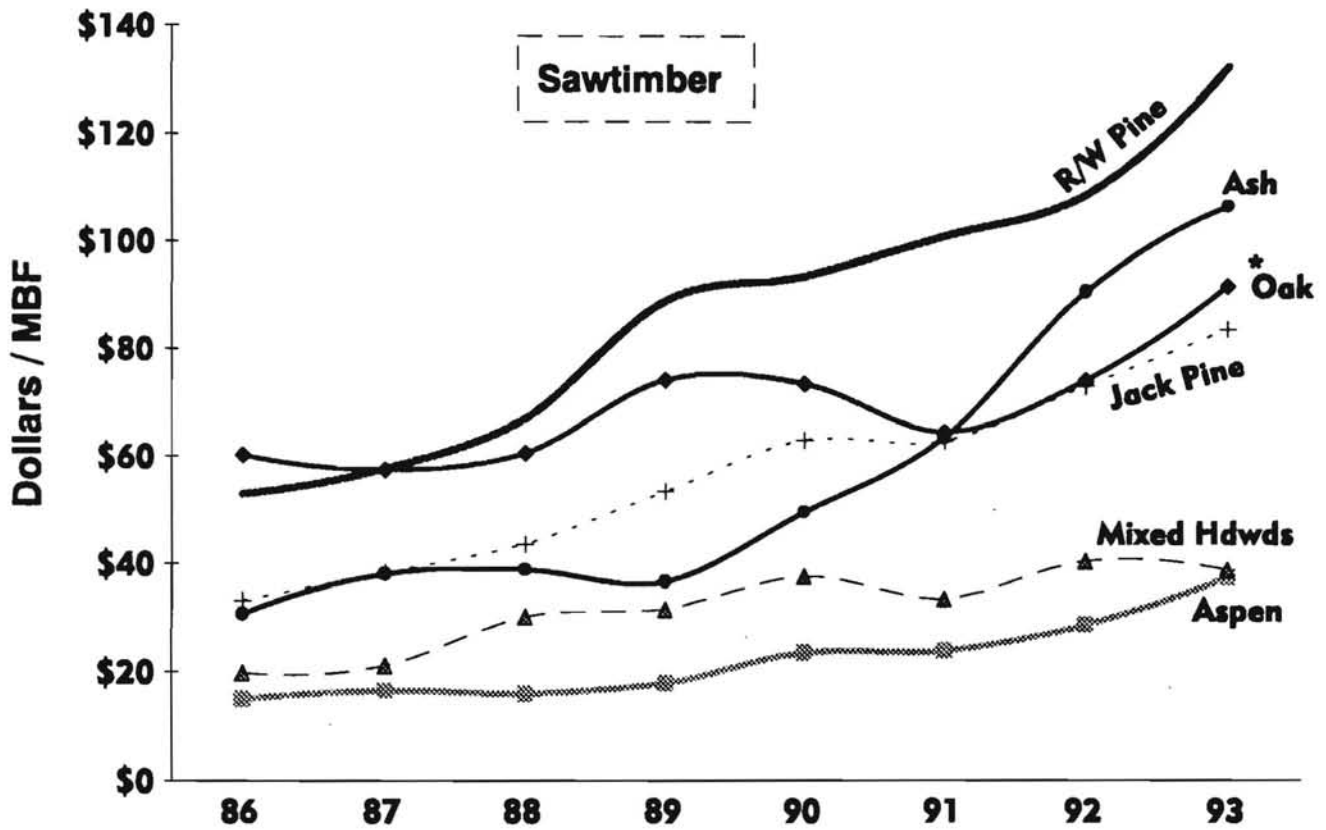
^a Pulpwood prices based on 1.3 million cords sold; sawtimber based on 152 MMBF.
^b Oak sawtimber prices mainly from public lands in northern Minnesota.
^c Black ash: includes veneer.

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

**AVERAGE PRICES RECEIVED for STUMPAGE SOLD by
PUBLIC LAND AGENCIES in MINNESOTA : 1982 - 1993**



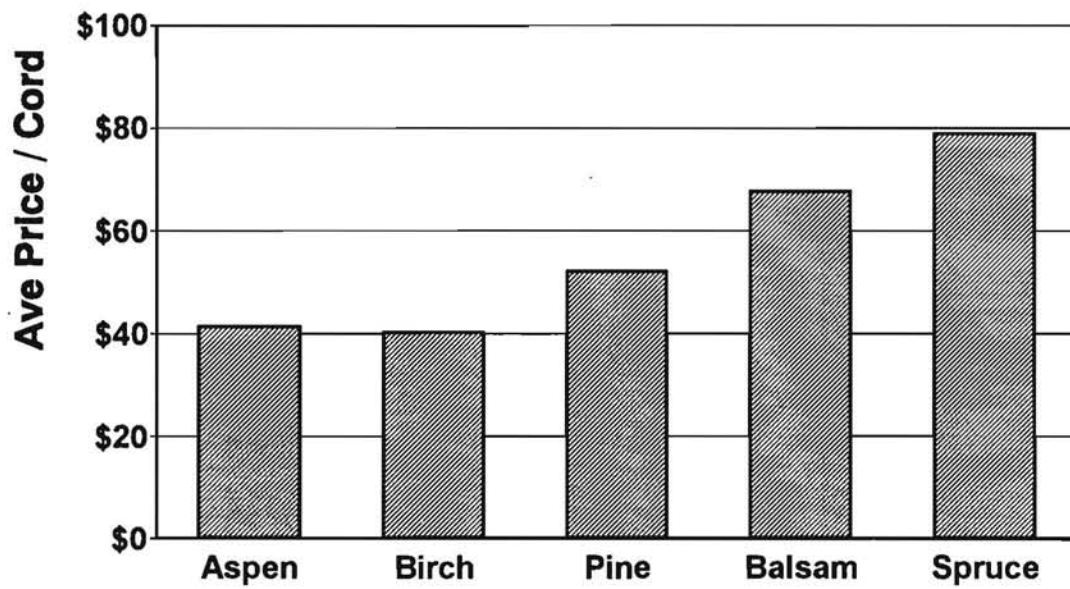
**AVERAGE PRICES RECEIVED for STUMPAGE SOLD by
PUBLIC LAND AGENCIES In MINNESOTA : 1982 - 1993**



* Oak sawtimber prices mainly from public lands in northern Minnesota.

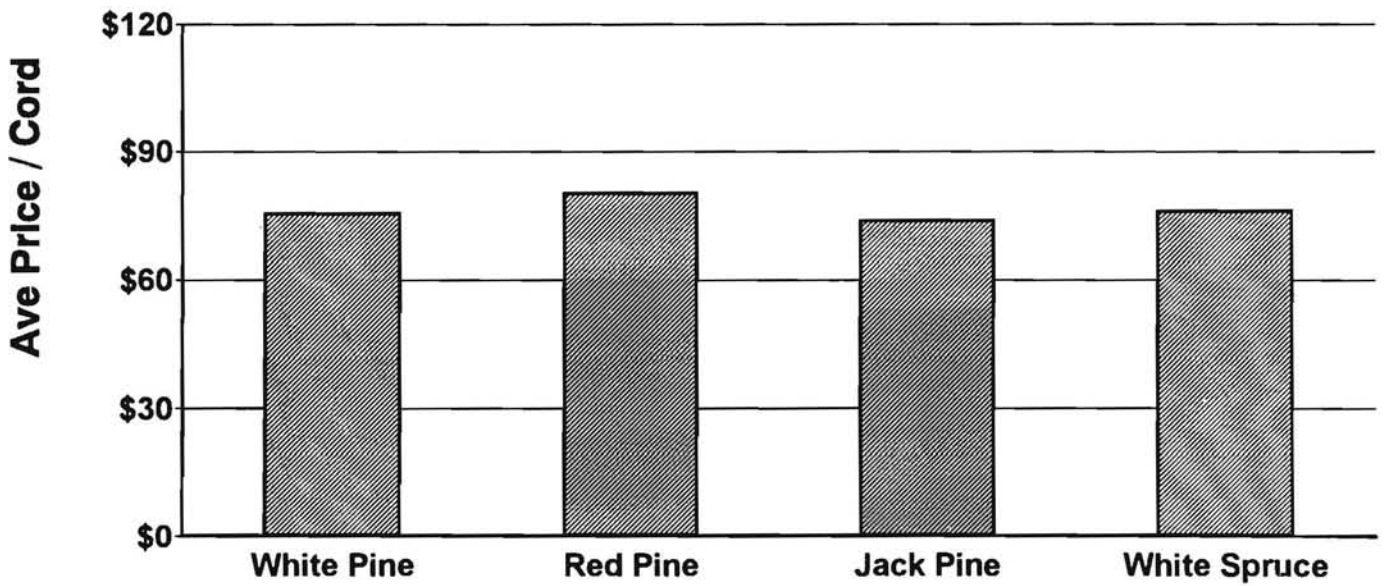
DNR-Forestry

**AVERAGE PRICES PAID for 100" PULPWOOD
DELIVERED to MINNESOTA MILLS
- 1992 -**



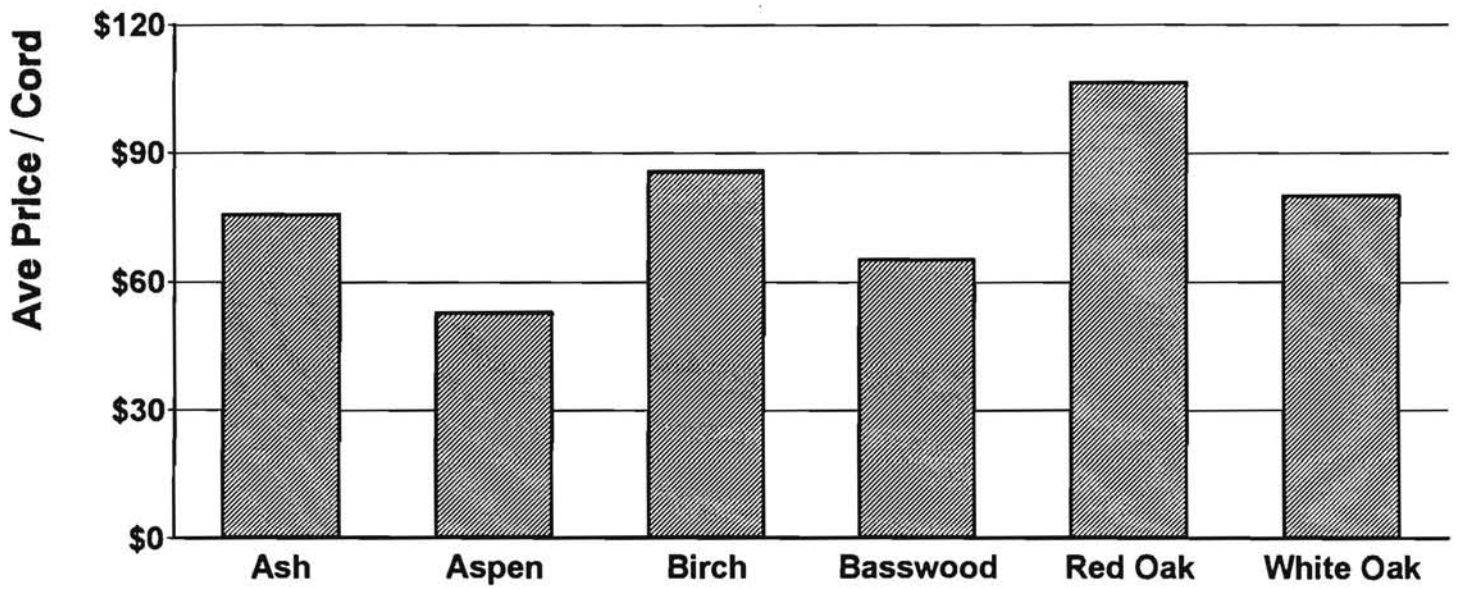
(Based on 53 respondents representing 1.7 million cords)

**AVE PRICES PAID for 100" SOFTWOOD SAWBOLTS
DELIVERED to MINNESOTA MILLS
- 1992 -**



(Based on 22 respondents representing 143,000 cords)

**AVE PRICES PAID for 100" HARDWOOD SAWBOLTS
DELIVERED to MINNESOTA MILLS
- 1992 -**



(Based on 35 respondents representing 38,000 cords)