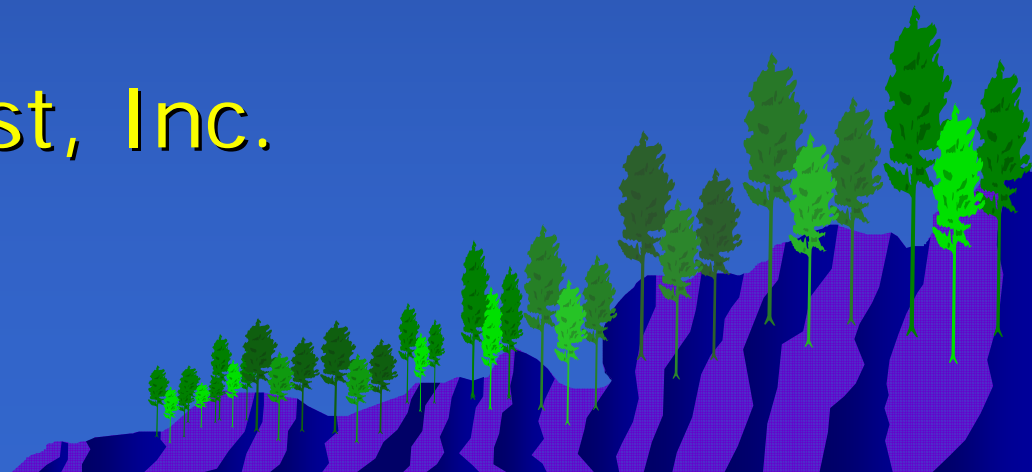


Wood Supply Study For Coos County

Haijin Shi, Joseph Taggart,
Robert Bradbury

LandVest, Inc.



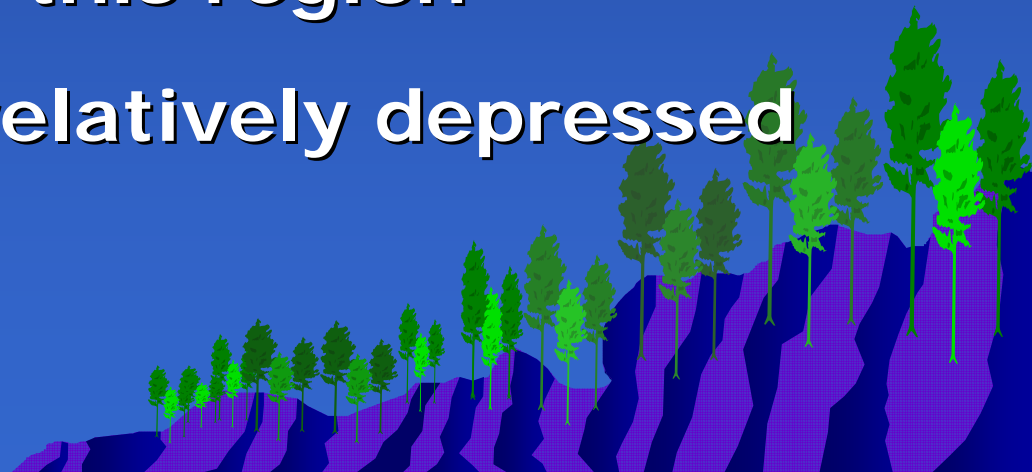
Outline

- ➡ **Current Situation**
- ➡ **Recent Studies**
- ➡ **Objectives**
- ➡ **Wood Basket**
- ➡ **Data Sources**
- ➡ **Timber Projection Model**
- ➡ **Results**
- ➡ **Available Low Grade Wood**
- ➡ **Conclusion**



Current Situation

- ◆ Coos County is the largest by land area in NH
- ◆ It accounts for 35% of the state harvest in 2006
- ◆ In recent years, traditional forest industries, especially paper companies have moved out of this region
- ◆ Local Economy is relatively depressed



Recent Studies

- ◆ **Biomass availability for Clean Power Solutions LLC (2008)**
 - 300,000 green tons of biomass per year within a 30 mile radius around Berlin, NH
- ◆ **Wood supply study for NH (2007)**
 - ~3 million green tons of roundwood per year in NH
- ◆ **Wood fuel supply study for VT (2007)**
 - 400,000-450,000 green tons of roundwood and tops and limbs per year in Coos County.



Objective

- ◆ To evaluate forest resource availability for potential and existing markets that incorporates an evaluation of the short and long-term timber supply in and around Coos County, New Hampshire.

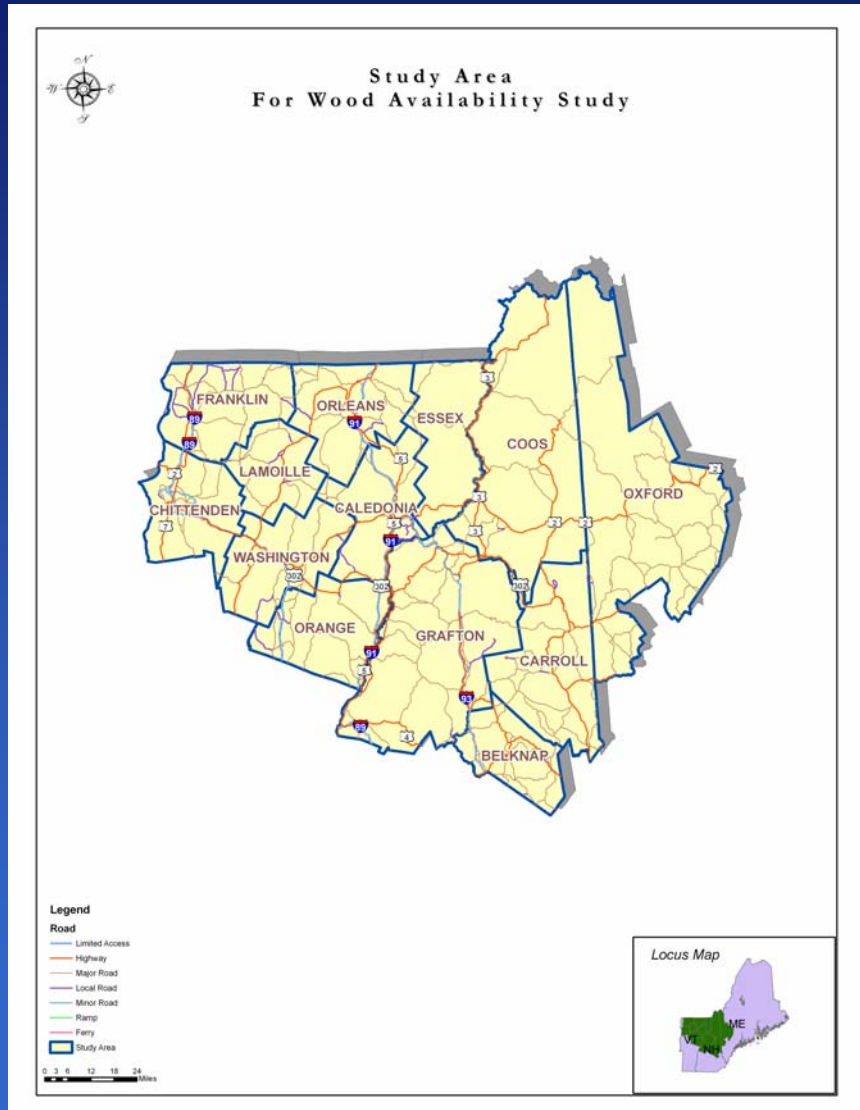


Wood Basket

- ◆ Berlin, NH was selected as the possible location for the facility
- ◆ Circles were drawn around pulpmills or power plants close to Berlin, NH
- ◆ Most overlapped areas were taken out



Wood Basket cont'd



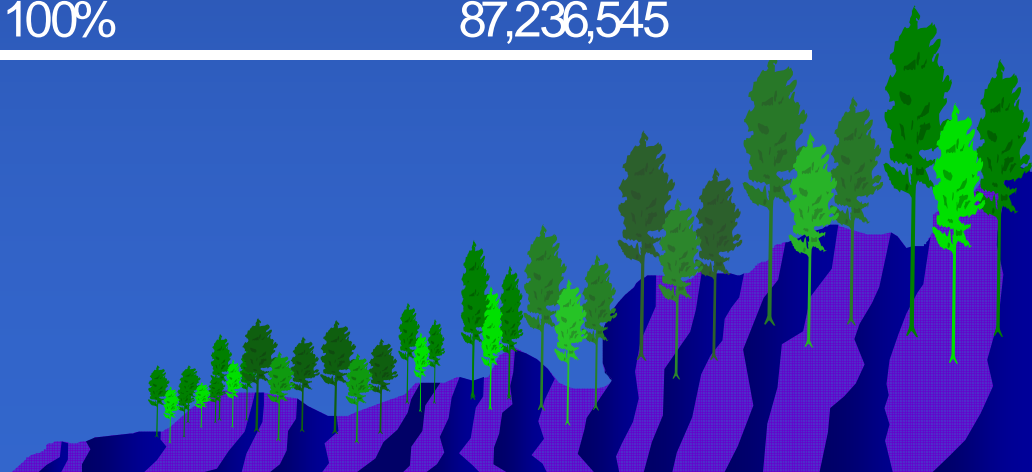
- Coos, Grafton, Carroll, and Belknap counties, New Hampshire
- Essex, Caledonia, Washington, Orange, Orleans, Washington, Chittenden, and Franklin counties, Vermont;
- Oxford county, Maine
- 6,335,219 timberland acres



Data Sources

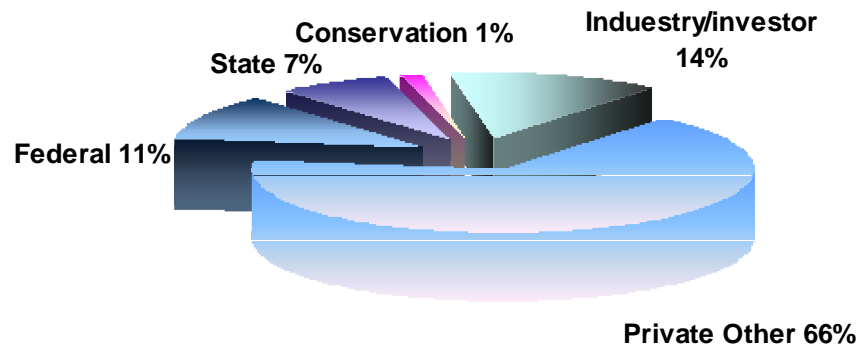
◆ Forest Resources

	Growing Stock (Green Ton)	Growing Stock Proportion	Top and Branches (Green Ton)
Federal	42,756,583	15%	12,514,122
State	21,715,386	7%	6,355,723
Private	233,586,225	78%	68,366,700
Total	298,058,194	100%	87,236,545

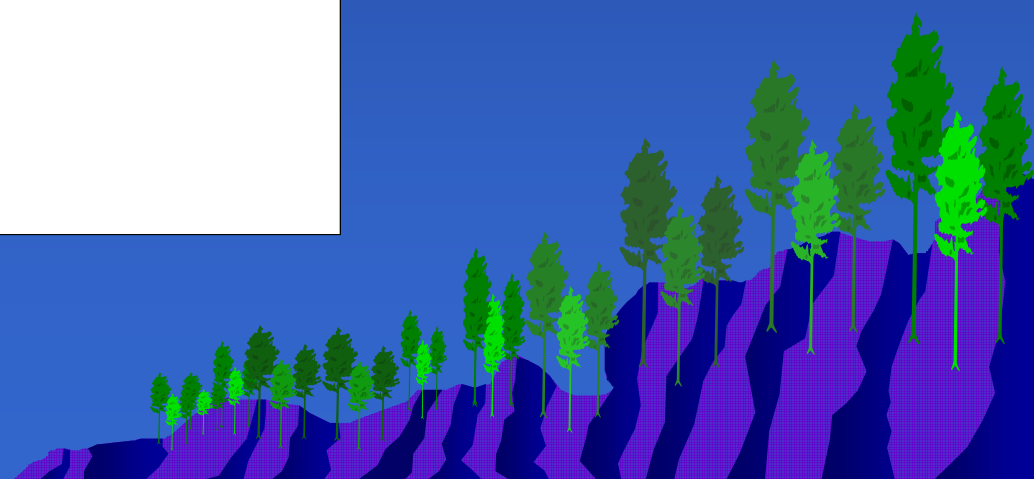


Data Sources

Source: USA Forest Service, Forest Inventory & Analysis, 2005
and James W. SeWall Ownership Data



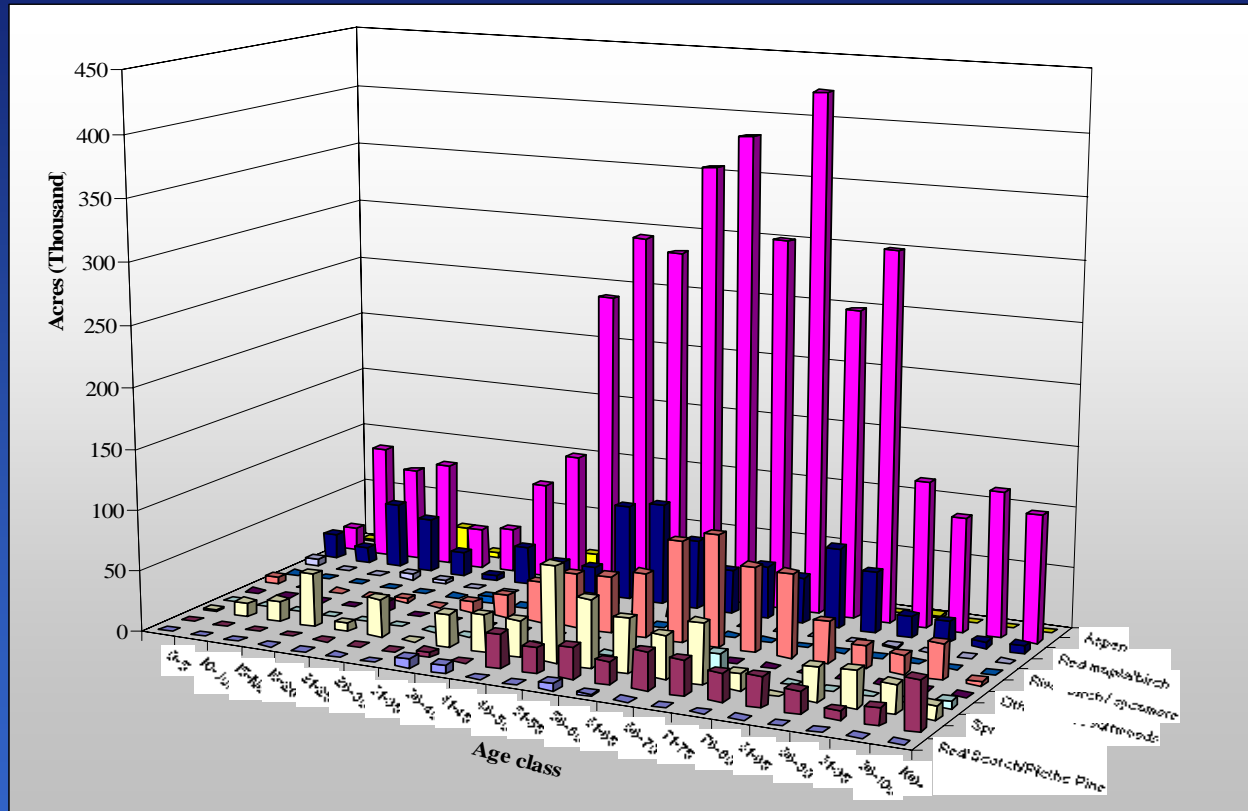
◆ Ownership



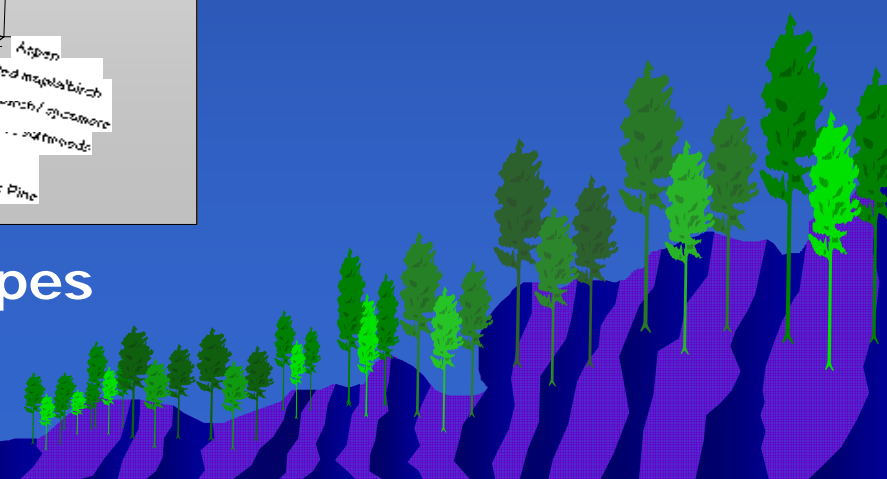
Data Sources

◆ Forest Resources

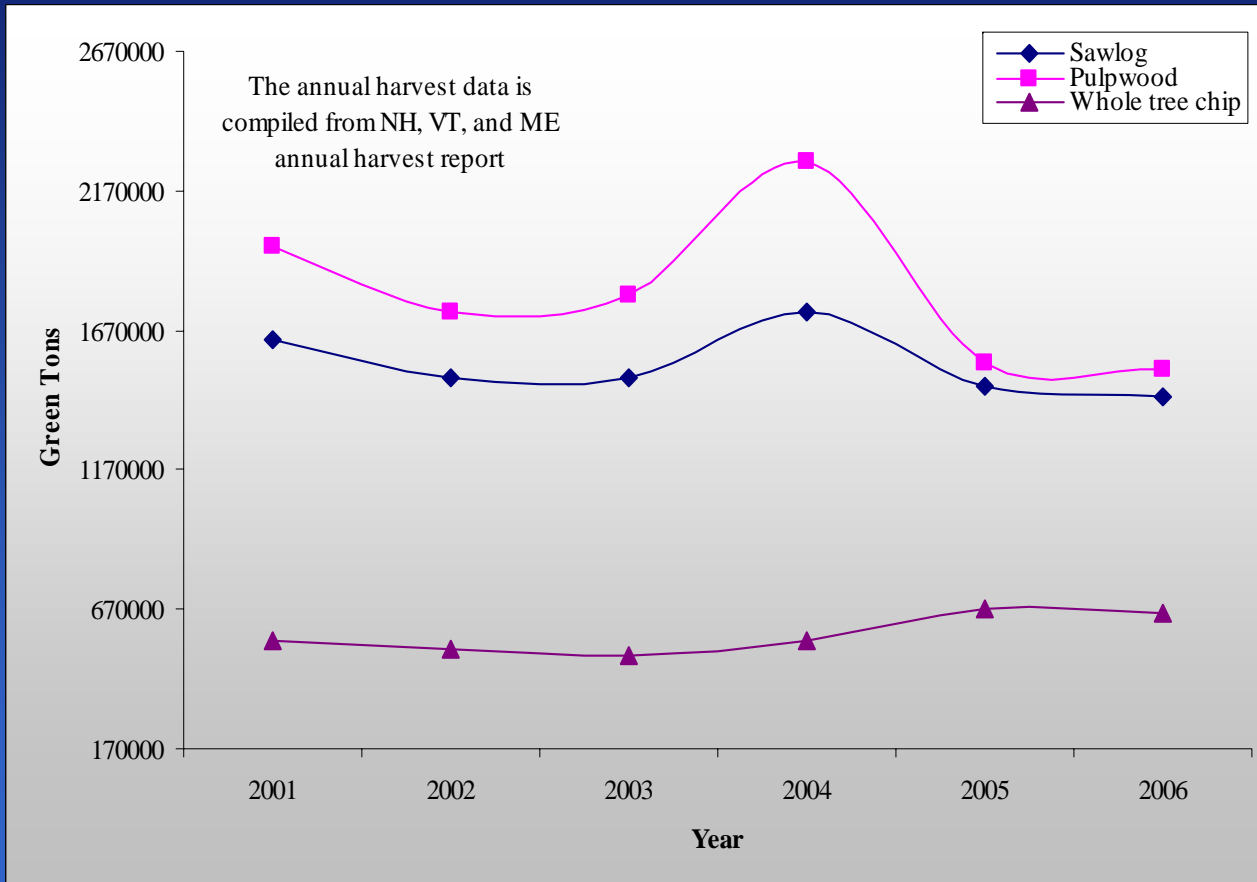
Sugar maple/ash type dominates the study area forest



Acres by Age Class and Habitat Types

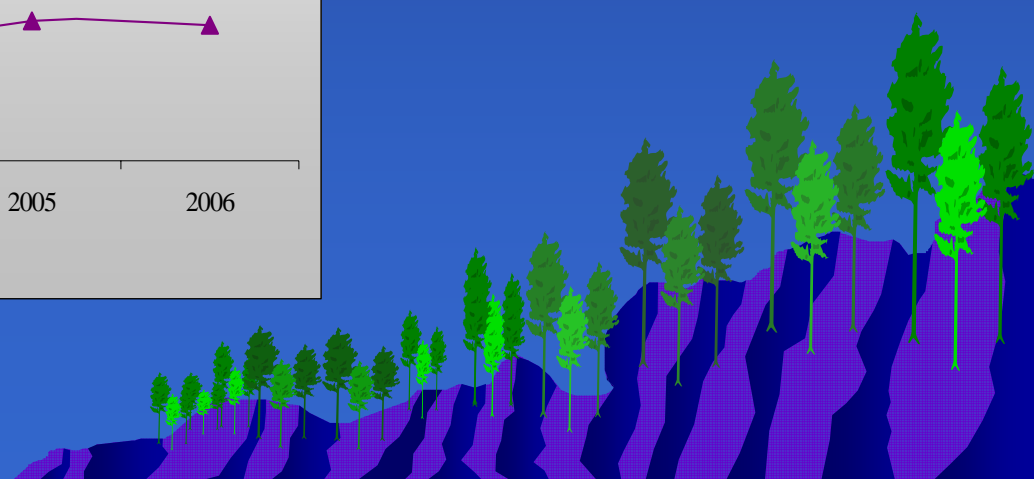


Data Sources



Recent Harvest

Averaged approximately 3.9 million green tons per year



Data Sources

- ◆ Inoperable/Inaccessible Timberland
 - Steep slopes and mountain tops
 - wildlife habitat, such as a deer yard
 - Acreage within watersheds and/or riparian areas
 - Some areas may be too remote.
 - Some areas are prohibited from harvesting



Data Sources

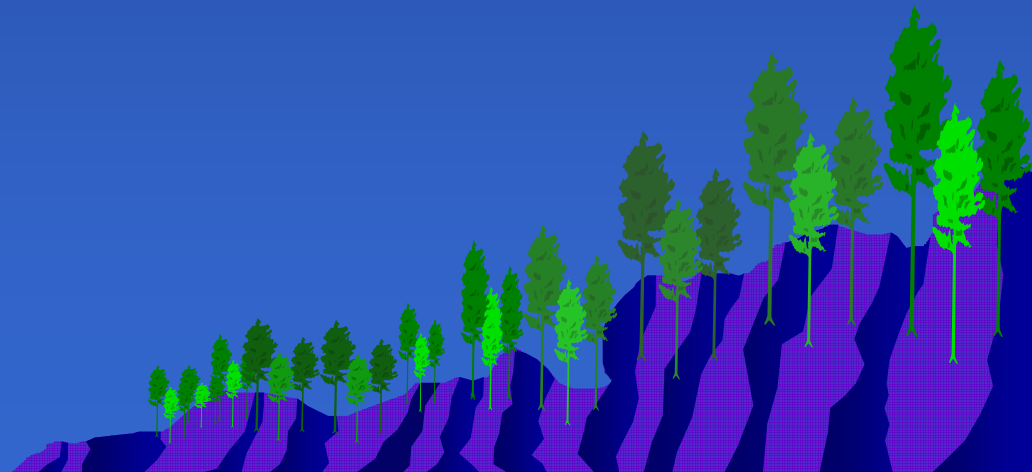
◆ Management Options

- Partial Cut

- 0-30%
- 31-50%
- 51-80%

- Clearcut

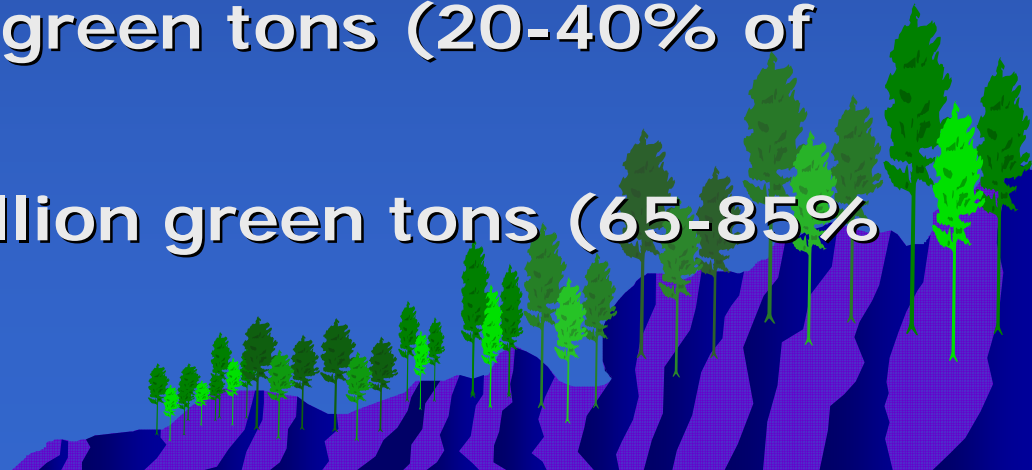
- 81-100%



Data Sources

◆ Harvest Intensity

- Federal – 112,000 Green Tons
- State – 352,000 Green Tons
- Industry/Investor – 705,618 green tons (85%-120% of growth)
- Conservation – 20,353 green tons (20-40% of growth)
- Private Others 2.88 million green tons (65-85% of growth)



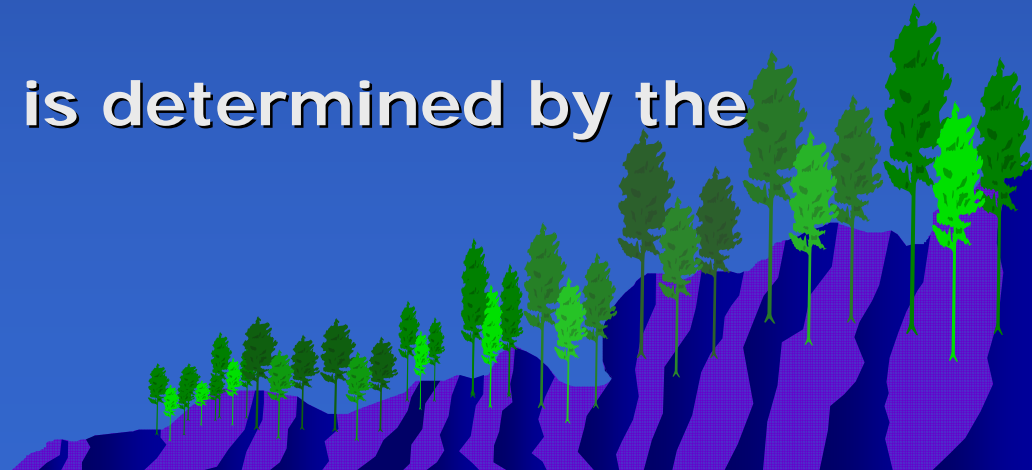
Timber Projection Model

- ◆ Aggregated Timberland Assessment System (ATLAS)
 - Northeast State Foresters Association (2001)
 - New Hampshire Wood Supply (2005)
- ◆ Subregional Timber Supply (SRTS)

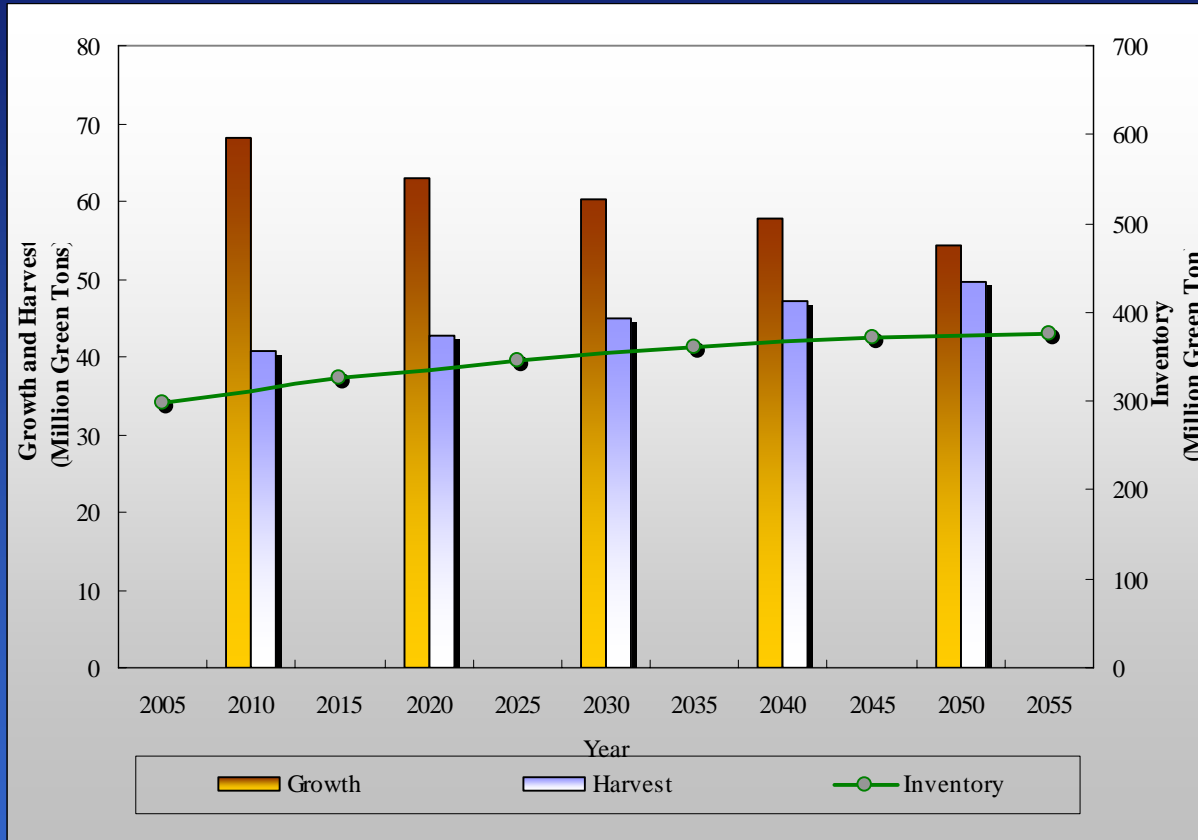


Base Model Assumptions

- ◆ The timber price and logging infrastructures
- ◆ No land use change.
- ◆ The initial inventory for the year 2005 is based on the most recent FIA data.
- ◆ The management option is either partial cut or clearcut
- ◆ The simulation just focuses on timberland.
- ◆ We assume the demand is determined by the market



Results



◆ Base Model

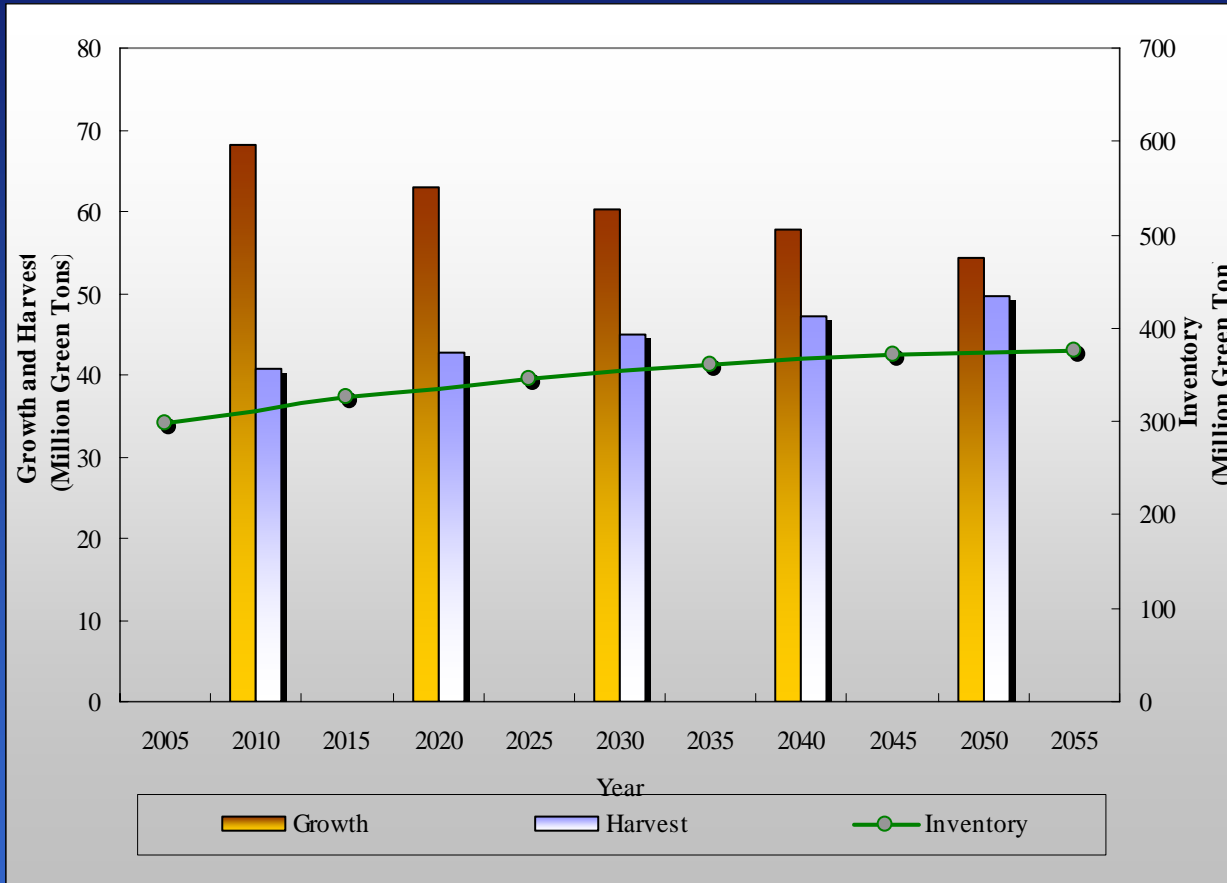
The net growth rate = 0.96 green tons/acre/year

The average harvest = 4.62 million green tons/year

Base model run: Inventory, Growth and Harvest



Results

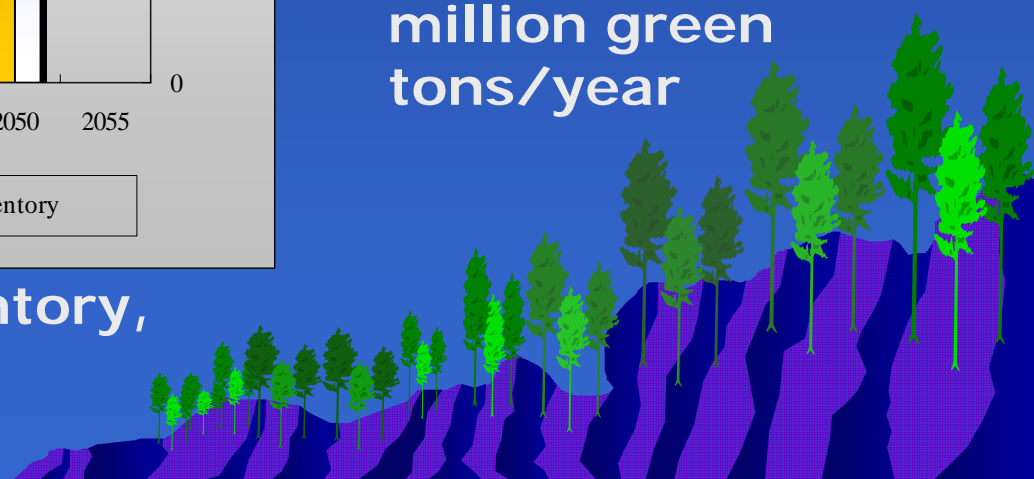


◆ Low Supply Model

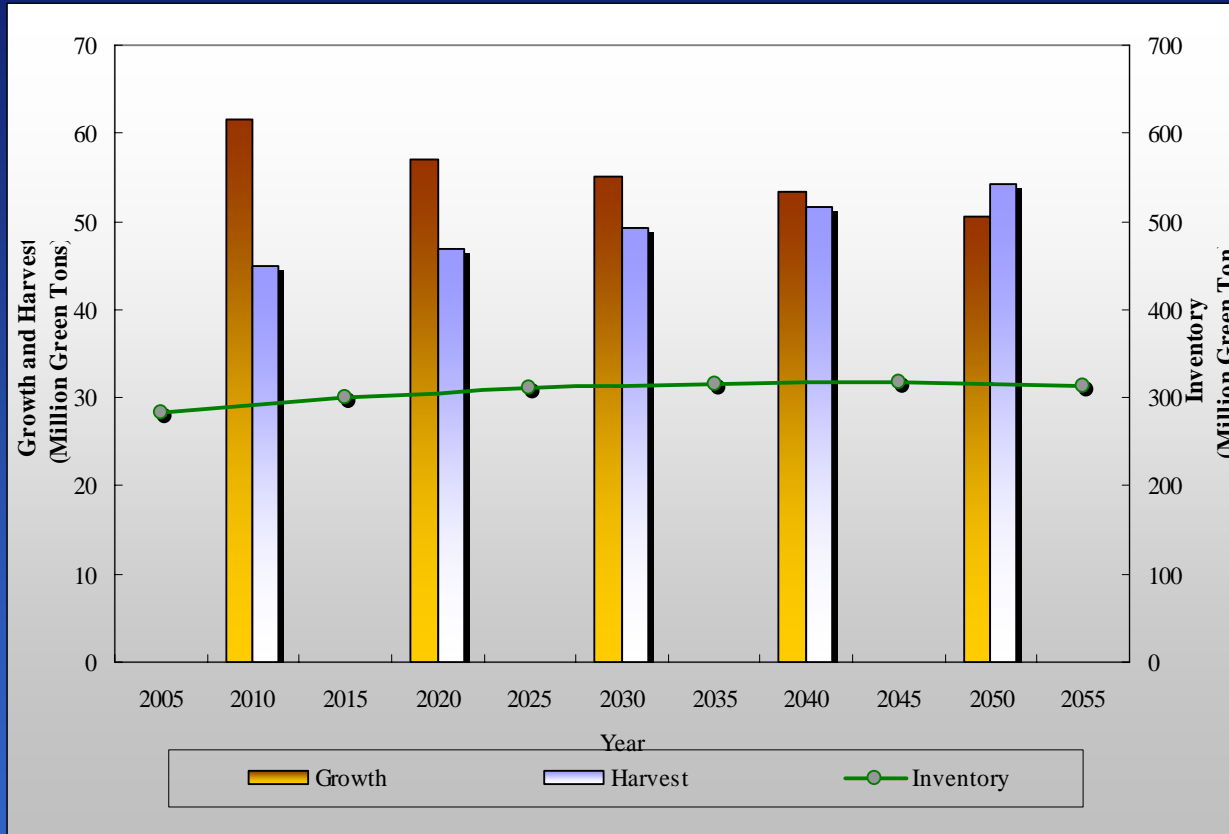
The net growth rate = 1.03 green tons/acre/year

The average harvest = 4.15 million green tons/year

Low Supply model run: Inventory, Growth and Harvest



Results

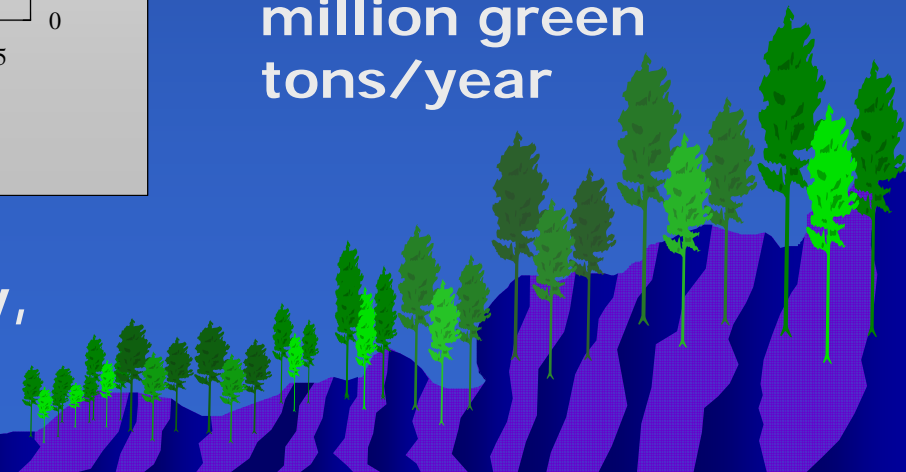


◆ High Supply Model

The net growth rate = 0.87 green tons/acre/year

The average harvest = 5.08 million green tons/year

High Supply model run: Inventory, Growth and Harvest

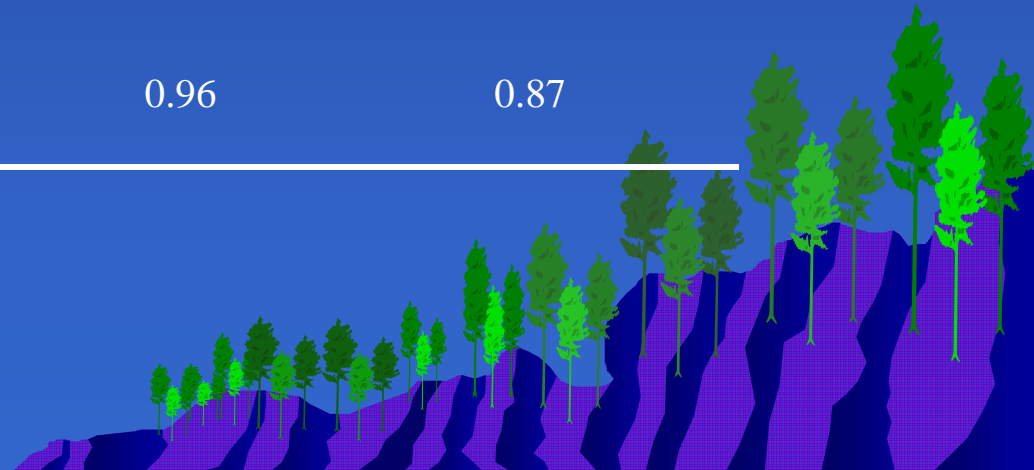


Results

◆ Model Simulations

Annual harvest from the model simulations (Unit: million green tons)

Simulation	Low Supply Model	Base Model	High Supply Model
Annual Harvest (Million Green Tons)	4.15	4.62	5.08
Net Growth Rate (Green Tons/Acre/Year)	1.03	0.96	0.87

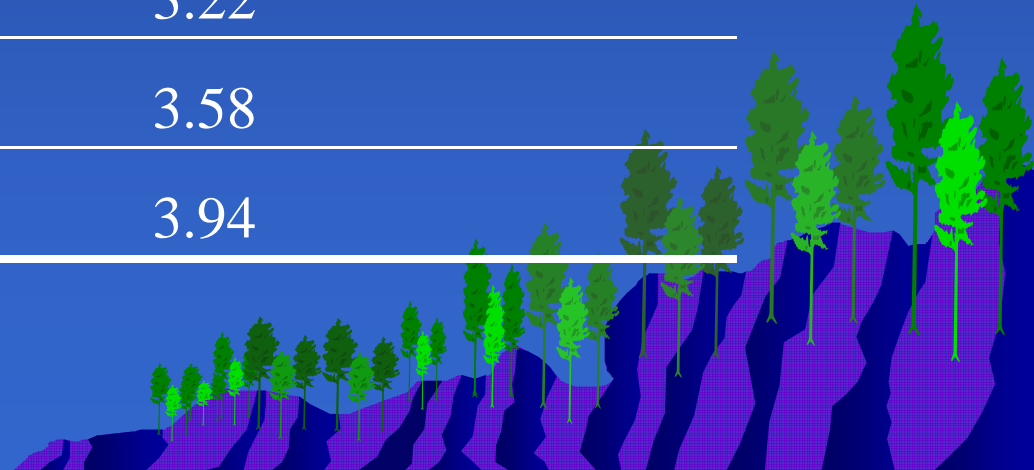


Available Low Grade Wood

◆ Low grade wood

Available Low Grade Wood from Model Simulations
(Unit: million green tons)

Simulation	Low Grade Wood (Pulpwood + 50% of Top and Branch)
Low Supply Model	3.22
Base Model	3.58
High Supply Model	3.94

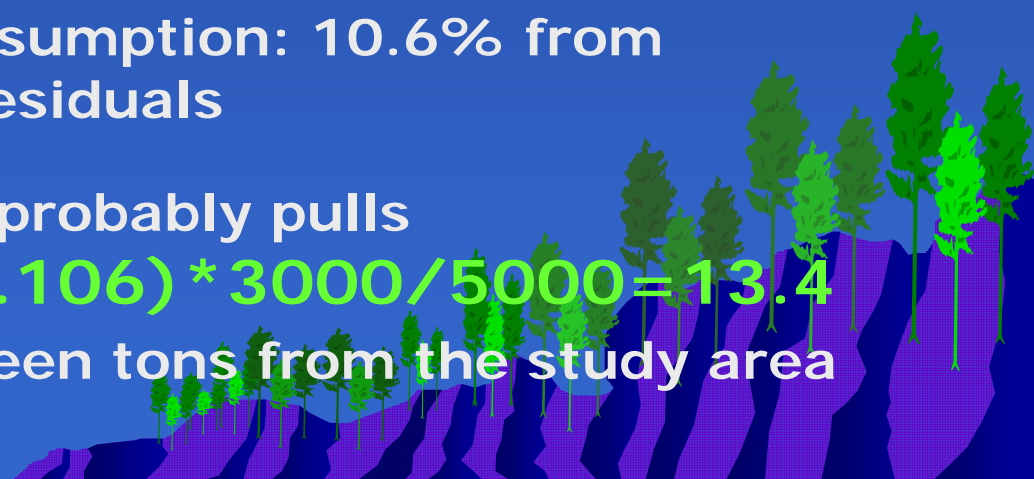
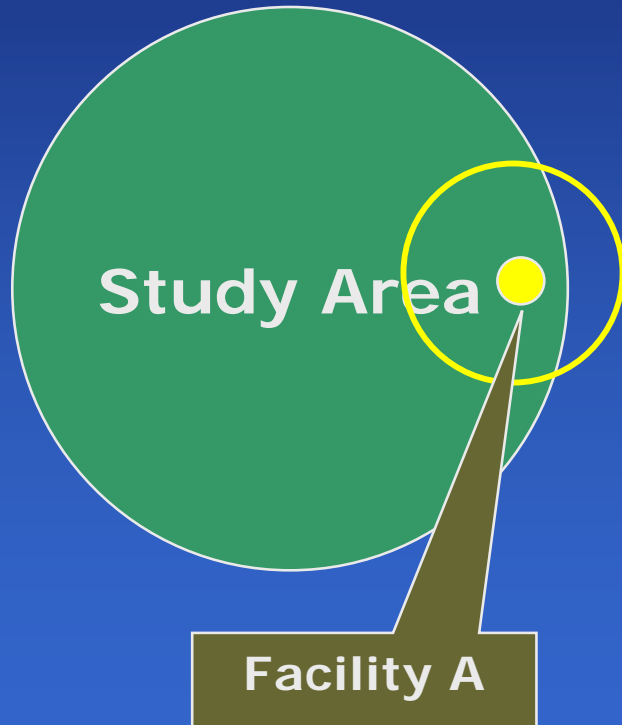


Available Low Grade Wood

◆ Method

Example: Facility A

- Within a 100 mile radius of A, there are 5000 acres of timberland
- 3000 timberland acres are located in the study area
- Facility A annually consumes 25 million green tons of low grade wood
- Wood consumption: 10.6% from Sawmill residuals
- Facility A probably pulls $25 * (1 - 0.106) * 3000 / 5000 = 13.4$ million green tons from the study area



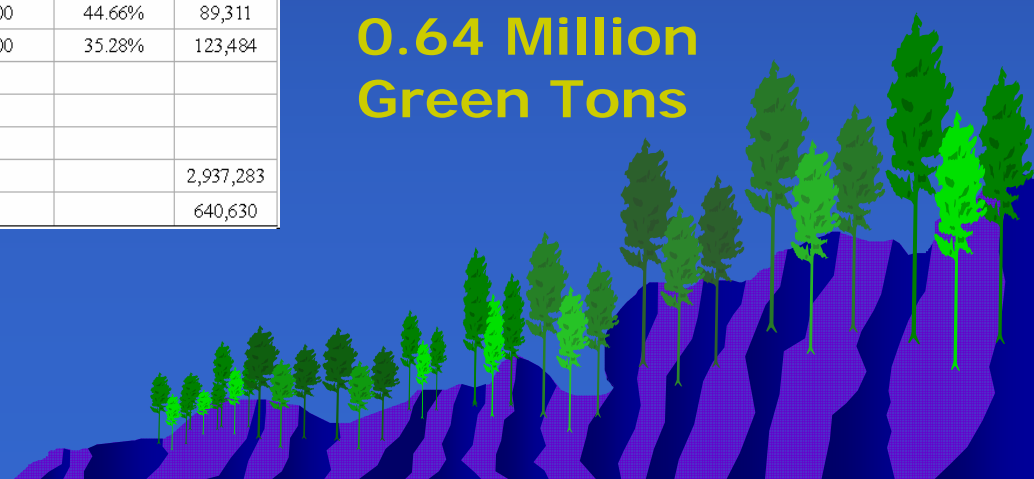
Available Low Grade Wood

Plant Name	State	Location	Type	Radius	Consumption (Green Ton)	Adjusted consumption	Geographical Analysis	Wood Assigned
Androscoggin Mill	Operating	Jay, ME	Pulp	125	1,645,000	1,470,630	34.36%	505,281
Madison Paper Industries	Operating	Madison, ME	Pulp	50	250,000	223,500	11.19%	25,004
Masonite Corp.	Operating	Lisbon Falls, ME	Pulp	25	100,000	89,400	4.44%	3,971
Newpage Corp.	Operating	Rumford, ME	Pulp	125	1,300,000	1,162,200	37.00%	430,025
Sappi Fine Paper	Operating	Skowhegan, ME	Pulp	125	1,900,000	1,698,600	25.53%	433,687
Bridgewater Power	Operating	Bridgewater, NH	Power plant	75	225,000	225,000	46.43%	104,457
Whitefield Power and Light	Operating	Whitefield, NH	Power plant	50	187,000	187,000	99.54%	186,135
Pine Tree Power	Operating	Bethlehem, NH	Power plant	75	230,000	230,000	73.85%	169,854
Hemphill Power	Operating	Springfield, NH	Power plant	75	208,000	208,000	37.21%	77,400
PSNH Schiller Station	Operating	Portsmouth, NH	Power plant	75	450,000	450,000	23.72%	106,761
Finch, Pruyn, & Co., Inc.	Operating	Glens Falls, NY	Pulp	100	638,000	570,372	11.24%	64,122
International Paper Co.	Operating	Ticonderoga, NY	Pulp	100	750,000	670,500	12.53%	84,003
Joseph C. McNeil Station	Operating	Burlington, VT	Power plant	75	380,000	380,000	44.69%	169,823
Ryegate Power Station	Operating	Ryegate, VT	Power plant	75	260,000	260,000	72.65%	188,900
Pine Tree - Tamworth	Operating	Tamworth, NH	Power plant	75	300,000	300,000	58.35%	175,064
Alexandria - Power	Operating	Alexandria, NH	Power plant	75	200,000	200,000	44.66%	89,311
Borelex - Livermore Falls	Operative	Livermore Falls, ME	Power plant	75	350,000	350,000	35.28%	123,484
Laidlaw EcoPower	Proposed	Berlin, NH	Power plant		750,000			
Greenova Wood Pellets	Proposed	Berlin, NH	Wood Pellets		400,000			
North Country Renewable Energy	Proposed	Groveton, NH	Power plant		1,200,000			
Total					8,523,000			2,937,283
Available wood					3,577,913			640,630

◆ Wood consumption estimation

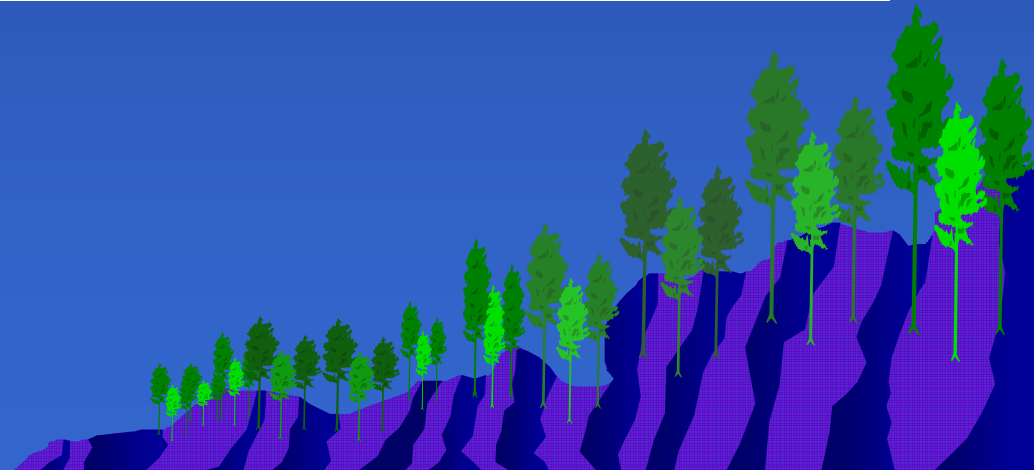
Circles were drawn according to their annual wood consumption

0.64 Million Green Tons



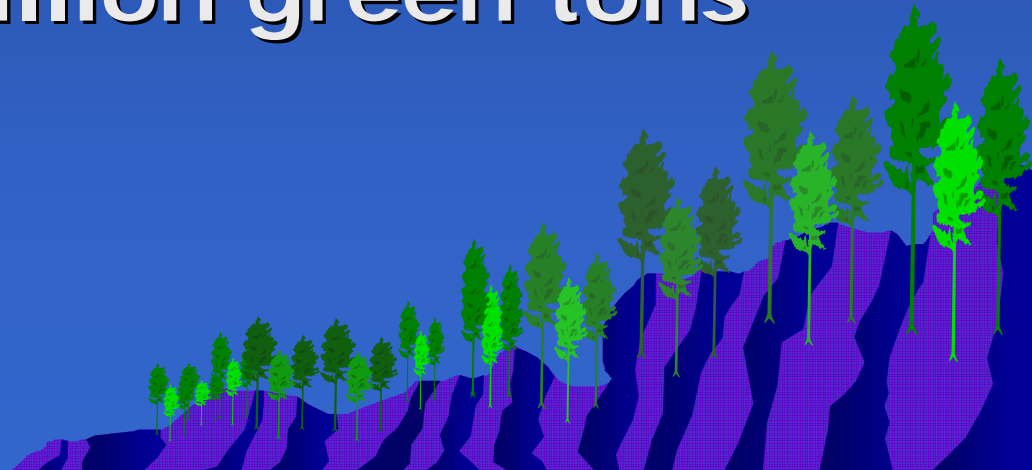
Available Low Grade Wood

	Low Grade Wood (MGT)	Available Low Grade Wood (MGT)
Low Supply Model	3.22	0.28
Base Model	3.59	0.64
High Supply Model	3.94	1.00



Conclusion

- ◆ Low limit: 0.28 million green tons
- ◆ Base: 0.64 million green tons
- ◆ High limit: 1.00 million green tons



Acknowledgement

- ◆ North Country Council, Inc.
- ◆ Philip Bryce, Fountain Forestry, Inc.
- ◆ Susan Francher, NH Division of Forests and Lands
- ◆ Matt Tansey, NH Division of Forests and Lands
- ◆ Ken Laustsen, Maine Forest Service
- ◆ Robert De Geus, VT Dept. of Forests, Parks and Recreation
- ◆ Patricia Garvin, North Country Council, Inc.
- ◆ Robert Turner, R.J. Turner Company
- ◆ John Mills, Forest Service



LandVest, Inc.

Thank You

