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## **An Overview of Results from the US Forest Service Grant *Appalachian and Foothills Wood Energy Markets***

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## **Appalachian & Foothills Wood Energy Markets Project**

- **3 year project aimed at investigating the potential for wood energy markets in the Western North Carolina**
- **Includes outreach and education, technical assistance, and investigation of financial realities for businesses interesting in participating in future markets**
- **This project is being completed within that larger framework**

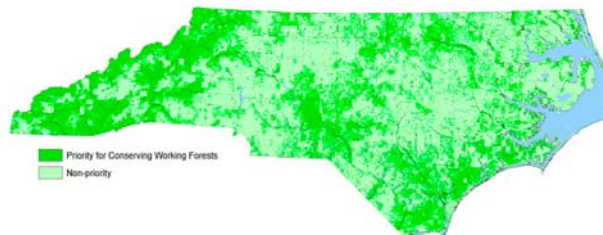
## Study Area

- 32 County region west of I-77
- 11 western piedmont counties, all of the 21 mountain counties
- Piedmont counties included to give full picture of the regional economy



## Resource Availability

- 66% regional area in 5.7 million acres of timberland, well above the statewide average
- Upland hardwoods, high elevation species dominate the mountains, hardwoods with mixed stands and loblolly pine in the western piedmont
- Large portions of the study region identified as state priority areas for conserving working forests



## Economic Need

- Recovery from the Great Recession has been slow and complicated by demographic shifts

	State Average	Western NC
Median Age	37	44
Median Household Income	\$46,000	\$38,000
Percent Below Poverty Line	16%	17%

**How do we create lasting economic development, based in sustainable use of forest resources?**

## Part I: Key Sector Net Linkage Analysis

## Industry “Multiplier” Effect

- These linkages are derived from a grid, or “matrix,” that shows relationships between all sectors in the regional economy

For every \$1 MM increase in final sales in Industry 1, Industry 2's sales increase by \$590K

	Industry 1	Industry 2	Industry 3
Industry 1	1.249	0.117	0.308
Industry 2	0.59	1.239	0.254
Industry 3	0.199	0.472	1.329
Multiplier	<b>2.038</b>	<b>1.828</b>	<b>1.891</b>

## Key Sector Analysis: A Different Approach via Net Linkages

- Net linkages take into account additional information-how much of a sector's output is to final "users", as opposed to intermediate "users"
  - For forest products, generally in the form of Exports
- Sectors with a high ratio of these "final sales" to output (or gross sales) are those which are better able to generate immediate growth
  - Initiators of intra-regional activities by interacting with the rest of the world (RoW)
  - Bring "new" money into the region

## Construction of Net Linkages

	Industry 1	Industry 2	Industry 3
Industry 1	1.249	0.117	0.308
Industry 2	0.59	1.239	0.254
Industry 3	0.199	0.472	1.329

 $\times$ 

	Industry 1	Industry 2	Industry 3
Industry 1	30	0	0
Industry 2	0	90	0
Industry 3	0	0	55

Multiplier Matrix

Matrix of "Final Sales"

Industry 2 Exports \$90 to RoW

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### Net Linkage Matrix

	Industry 1	Industry 2	Industry 3	Row Total
Industry 1	37.5	10.5	16.9	<b>64.9</b>
Industry 2	17.7	111.5	14.0	<b>143.2</b>
Industry 3	5.97	42.5	73.1	<b>121.6</b>
Column Total	<b>61.1</b>	<b>164.5</b>	<b>104.0</b>	

Industry 1's Gross Sales

Industry 1's Export Base Sales: total sales required of all industries to meet Industry 1's export demand

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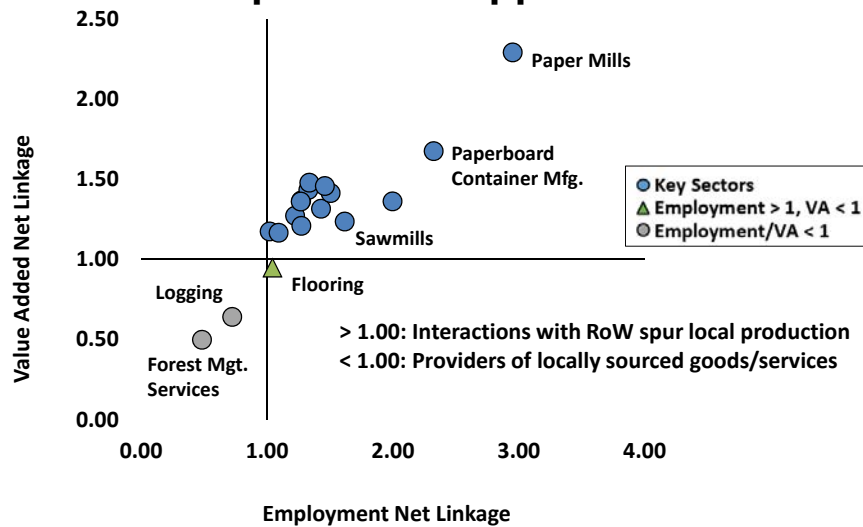
### Final Calculation

	Industry 1	Industry 2	Industry 3
Column Total	61.1	164.5	104.0
Row Total	64.9	143.2	121.5
Net Linkage (Column Sum/Row Sum)	<b><u>0.941</u></b>	<b><u>1.149</u></b>	<b><u>0.856</u></b>
Original Multiplier	<b>2.038</b>	<b>1.828</b>	<b>1.891</b>

## Practical Meaning

- Unlike traditional linkage analysis via multipliers, net linkages are an *index*, not a direct measurement of impact
- A net linkage  $> 1.0$  indicates the sector is capable of bringing new money (jobs) to the region, a key means of economic growth
- Sectors with net linkages  $< 1.0$  are **not unimportant**, but rather contribute to the regional economy through import substitution, *preserving* jobs and income in the region

## Key Sectors of Western NC: An Export Base Approach

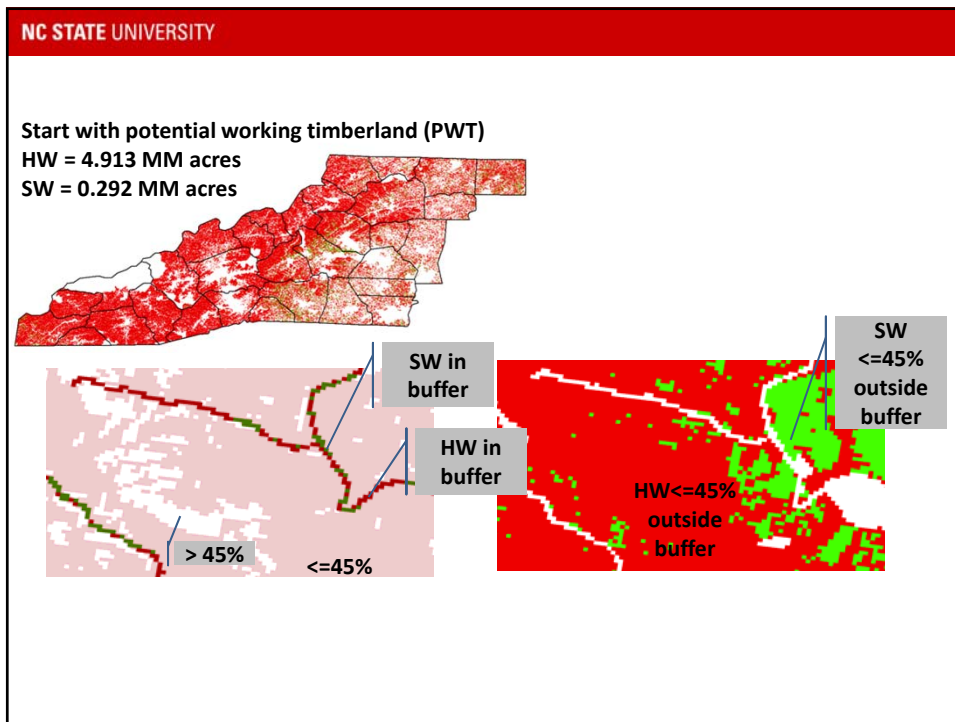


## **Part II: Fiber Supply Assessment**

### **Assessment Goals**

- **Remove undesirable harvest areas from potential working timberland, and calculate percent reduction by county of FIA categories**
- **Develop county and region level timber volume, growth, and removal tables from FIA data using the percent reduction**
- **Develop an area proportion productivity chart**

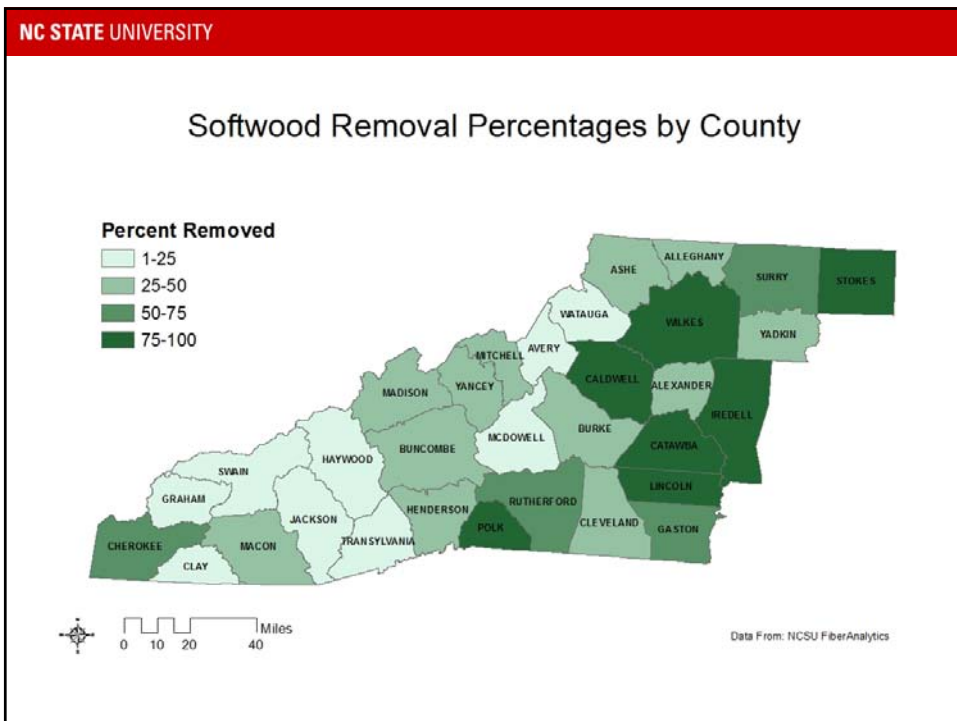
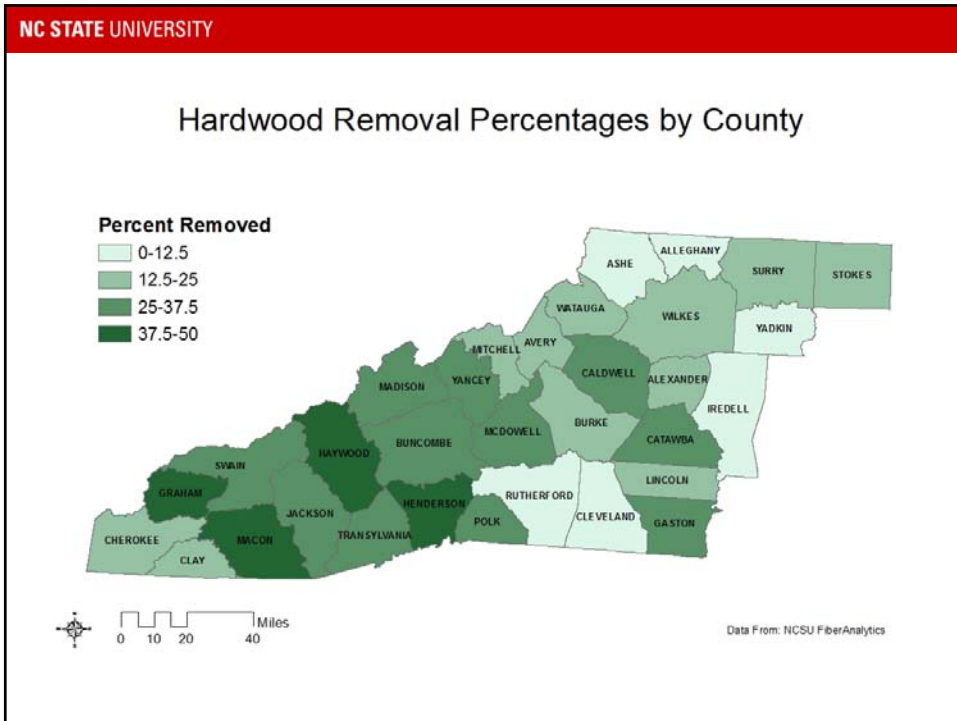




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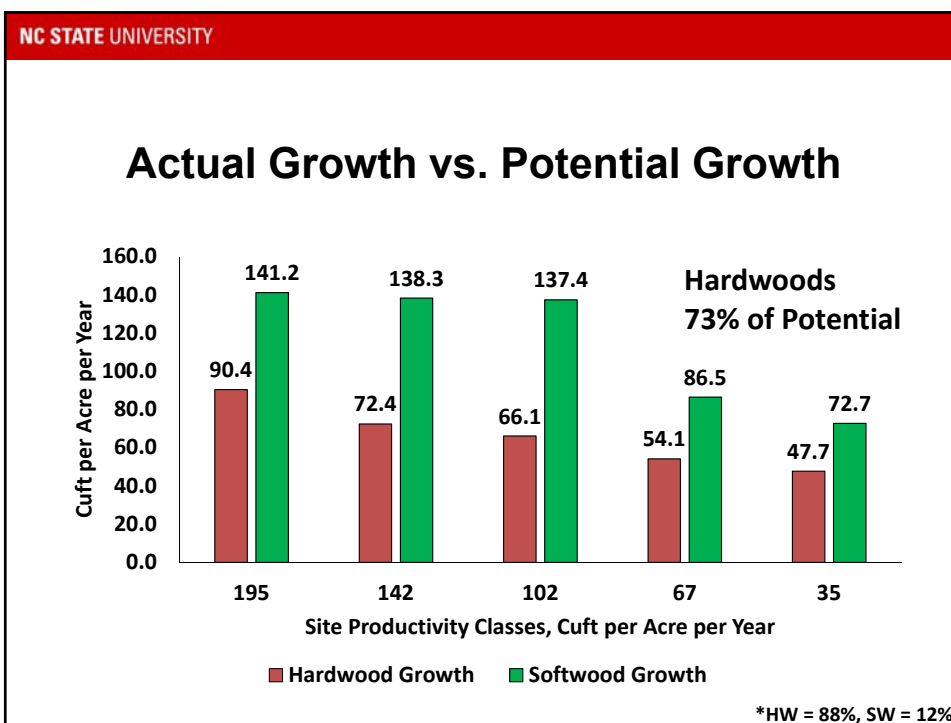
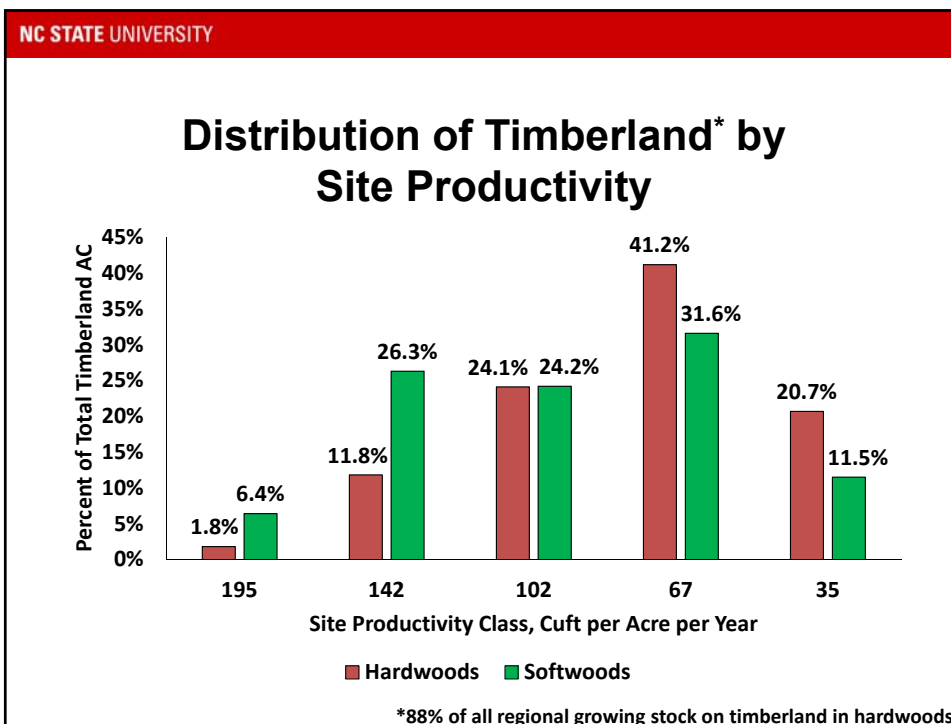
### Calculating Reduction Levels

PWT timberland	PWT Acres With Slope and Buffer Removed	FIA Timberland	% Reduction
Hardwood	3,642,915	4,873,896	25%
Softwood	280,540	508,140	45%



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<b>Pulpwood &amp; Sawtimber Availability</b>		
	Pulpwood (Green Tons)	Sawtimber (Green Tons)
Net Live Trees	93,000,000	302,000,000
Net Growing Stock	<b>72,000,000</b>	<b>275,000,000</b>
Growth Live Trees	1,600,000	10,000,000
Growth Growing Stock	<b>1,000,000</b>	<b>9,000,000</b>
Removal Live Trees	1,000,000	3,000,000
Removal Growing Stock	<b>900,000</b>	<b>3,000,000</b>

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<b>Biomass Availability</b>	
	Green Tons
Biomass Unmerchantable (1''-4.9'')	<b>31,000,000</b>
Biomass Pulpwood (5''-8.9'')	<b>129,000,000</b>
Biomass Sawtimber (9''+)	<b>373,000,000</b>



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