

# Managing the right species on the right site

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## Reason for picking the right site

- More resilient forests
- Conservation minded landowners want long-term forestry
- Parts of the state with few timber markets
- Fewer wasted \$\$

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## Also:

### Expanded Timber Markets

- High-End Markets – Whisky Barrels, Mass Timber, Telephone poles
- Emerging Markets- Carbon Credits, Wood Pellets



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## Fun North Carolina Facts

Q1. What is the most common timber type in NC?

- Yellow-poplar
- Loblolly / shortleaf pine
- Oak/hickory
- Cypress/Gum

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## Q1 Answer

What is the most common timber type in NC?

Oak/hickory (38% of forest land)

Second – loblolly / shortleaf pine (32 %)

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## Question 2

Top species by stem count?

- Sweetgum
- Loblolly pine
- White oak
- Red Maple

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## Q2 Answer

Top species by stem count?

Loblolly pine (16%)

- Second- red maple (15%)
- Third- sweetgum (12%)

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## Land ownership

Q3- What Percent of NC forests is owned by Non-Industrial Private Landowners?

- o 12%
- o 50%
- o 65%
- o 90%

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## Q3 Answer

What Percent of NC forests is owned by Non-Industrial Private Landowners?

- 65% - NIPL Landowners
- 18% - Federal and State
- Rest- Industry, Non-profits

Source: State and Private Forestry Fact Sheet  
[https://apps.fs.usda.gov/nicportal/temp/pdf/sfs/naweb/nc\\_std.pdf](https://apps.fs.usda.gov/nicportal/temp/pdf/sfs/naweb/nc_std.pdf)

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## First Starts with a (Forest Management) Plan

- Plan outlines the timber types and management options-  
Contact a local forester for individual assessments
- Today we will start with a landscape view of the forests of NC
- Lots of options – Which one is right for you.

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## Outside considerations

-  Distance to market
-  Size of harvest
-  Who is giving advice
-  Budget

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## Step One: Evaluate the tract

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Current Species (overstory and understory)

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Timber quality – High/Medium/low

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Topography

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Soil Type

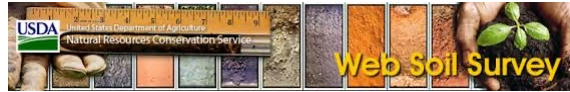
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Forest Accessibility

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## Tools to Evaluate Your Site

- Web Soil Survey



- USGS Topo Maps



- Forest measuring tools



- Knowledge of the area

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## Species to Focus on Today

- Mountains: upland oaks, yellow-poplar, and white pine
- Piedmont: upland oaks, yellow-poplar, loblolly pine, shortleaf pine
- Coastal plain: bottomland hardwoods, loblolly pine, longleaf pine, swamp species


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## Pines




loblolly



longleaf



shortleaf



white

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## Upland vs. Bottomland Hardwoods

**Upland**

- white and red oaks, hickory, yellow-poplar

**Bottomland**

- cherrybark oak, willow oak, swamp white oak, sweetgum, ash

**Swamp Species**

- tupelo, cypress




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## 3 regions

- Each region has unique challenges



<https://ancientnc.web.unc.edu/indian-heritage/by-region/>

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## Mountain Landscape

- Extremely varied
- Species dependent on:
  - Elevation
  - Aspect (the way the land faces)
  - Slope positioning (sheltered vs. exposed)
  - Soil type
  - Past land use – Disturbance History

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**SOIL MOISTURE BY REGION**

**TYPICAL SPECIES IN THE SOUTHERN APPALACHIANS BASED ON THE SLOPE ASPECT**

Red Spruce, Fraser Fir, Table Mountain Pine, Yellow Birch Sugar Maple, White Oak, Red Oak, Black Cherry, Yellow Poplar Yellow Poplar, White Pine	NORTHERN ASPECT	<b>TYPICAL SPECIES IN THE SOUTHERN APPALACHIANS BASED ON THE SLOPE ASPECT</b>	SOUTHERN ASPECT	Heath Bald Chestnut Oak, Black Oak, Scarlet Oak, Hickory, Shortleaf Pine Hemlock
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Aspect plays a large role

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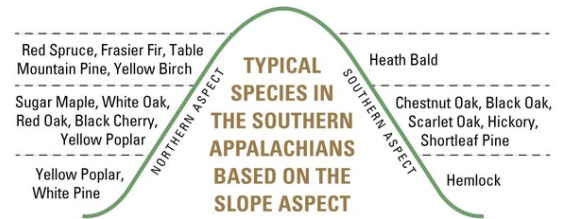
## Northern Slopes

- Less solar radiation = wetter conditions = better nutrients in soil
- Fast growing yellow-poplar dominates; after a harvest, oak present but usually not dominant
- White pine also an option in these areas
- Coves are divided between “rich” and “acidic”

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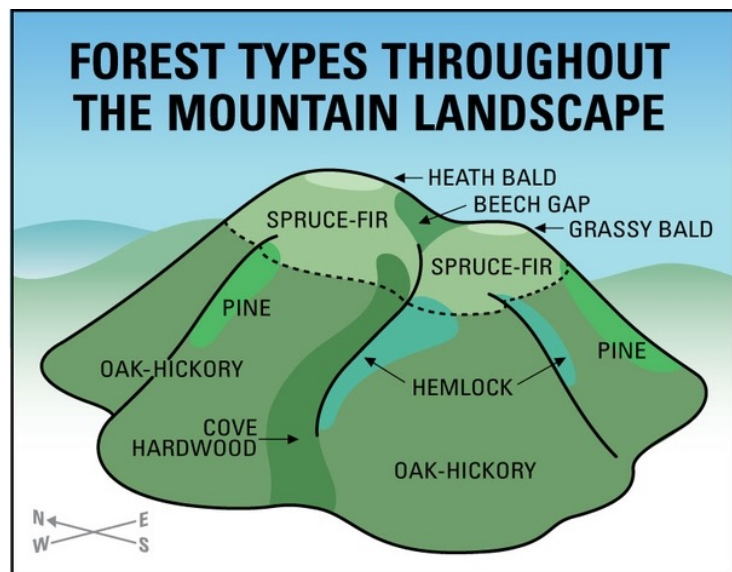
## Southern Slopes

- Usually rocky, poor-quality soils
- Higher solar radiation levels
- Oak is much more competitive



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- The entire landscape matters
- Sheltered areas vs. unsheltered areas



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## Tree Productivity

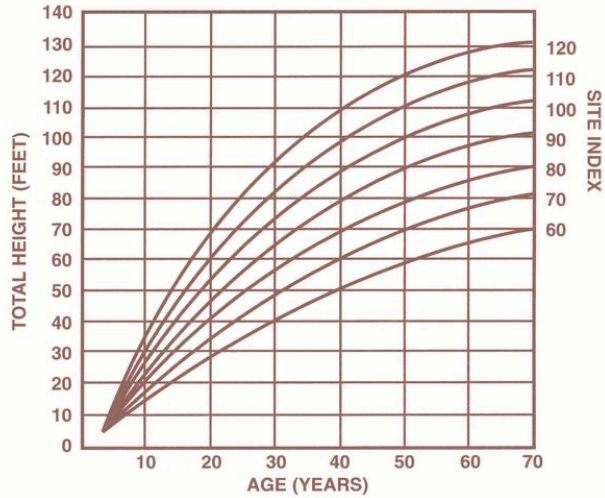
### Site Index

#### What is it?

Height of trees at a certain age. For comparison, all site indices will be at year 50.

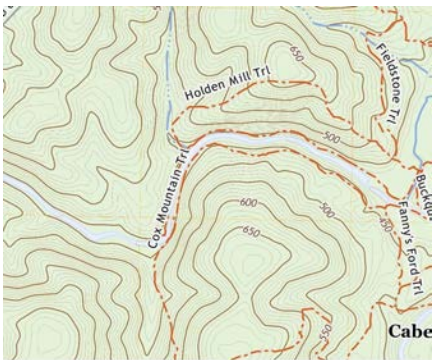
#### How to Use it?

Compare how different species grow on the same site.



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## Soils and Terrain- USGS and Web Soil Survey



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ch	Chewacla loam, 0 to 2 percent slopes, frequently flooded	8.1	3.0%
GeB	Georgeville silt loam, 2 to 6 percent slopes	52.3	19.4%
GeC	Georgeville silt loam, 6 to 10 percent slopes	20.0	7.4%
HrB	Herndon silt loam, 2 to 6 percent slopes	7.9	2.9%
TaD	Tarrus silt loam, 8 to 15 percent slopes	36.2	13.4%
TaE	Tarrus silt loam, 15 to 25 percent slopes	136.8	50.8%
W	Water	8.1	3.0%

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## Species to manage

Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber <i>Cu ft/ac/yr</i>	
Ch—Chewacla loam, 0 to 2 percent slopes, frequently flooded				
Chewacla, frequently flooded	American sycamore	97	116.00	American sycamore, Green ash, Loblolly pine, Sweetgum, Yellow-poplar
	Green ash	78	46.00	
	Loblolly pine	95	142.00	
	Sweetgum	100	138.00	
	Willow oak	90	86.00	
	Yellow-poplar	96	100.00	
GeB—Georgeville silt loam, 2 to 6 percent slopes				
Georgeville	Hickory	—	—	Loblolly pine, Shortleaf pine, Yellow-poplar
	Loblolly pine	86	123.00	
	Longleaf pine	67	72.00	
	Scarlet oak	70	52.00	
	Shortleaf pine	71	112.00	
	Southern red oak	72	54.00	
	Virginia pine	—	—	
	White oak	72	54.00	

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## Oak vs. Something else

- Poor sites (<65) - Oak is favored but planted pine may grow better
- Medium Sites (65-80 Site Index) – Sweet spot for oak
- Productive Sites (80+) – Other trees are more competitive

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## Yellow Poplar vs. Something else

- Site Indices 80 – 100 – Yellow poplar and white pine perform equally
- Over 100- Yellow poplar outperforms most natural pine and hardwoods (Mountains and Piedmont)

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## When to manage white pine

Indicator Species	Indicator Species Site Index	Performance Comparison with Other Species
White Pine (Mountains)	60+	White Pine outperforms Virginia pine and red oaks
	60+	White pine outperforms shortleaf pine and white oak
	60-90	White pine outperforms all other mountain species
	90-100	White pine and yellow-poplar perform about equally
	100+	Yellow-poplar outperforms white pine

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## White Pine

- Can be used to replace degraded hardwoods on medium sites
- Need to be managed! (sprayed, thinned and harvested)

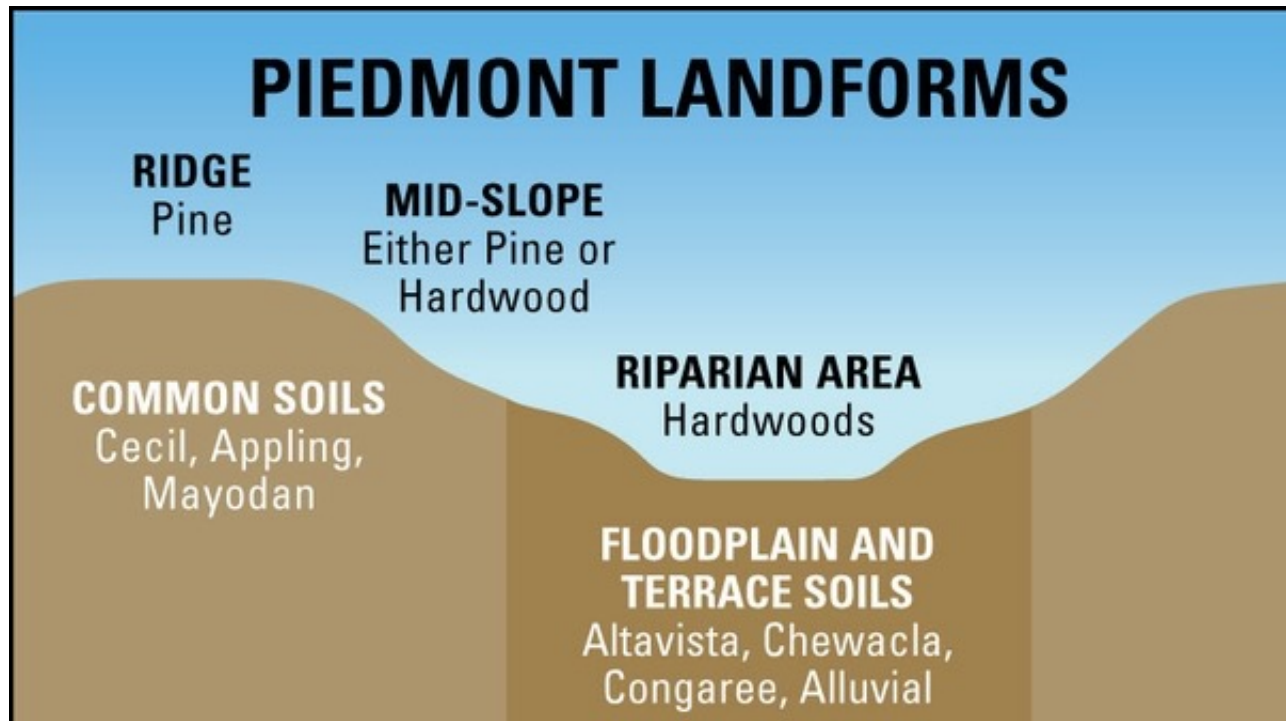
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## Piedmont Landforms

- Focus is on accessibility and productivity
- Many piedmont soils are highly eroded with little topsoil



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## Upland Sites

- Provide the highest opportunity for pine management
- Usually are easily accessible
- Naturally have lower quality timber i.e. Virginia pine
- Options: Loblolly or Shortleaf pine

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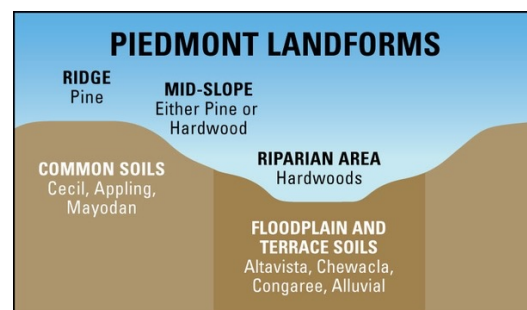
## Side slope

- Option for pine, will depend on slope and terrain
  - Reminder: More slope = More difficulty
  - >30% slope creates equipment issues
- Usually eroded or have high potential to erode

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## Bottomland- Piedmont

- Can grow high-quality hardwoods
- Occasionally Flooded
- Can be difficult to access
- May consist of yellow-poplar, sweetgum, oaks



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## Coastal Plain



- Highly variable based on small changes in elevation and location

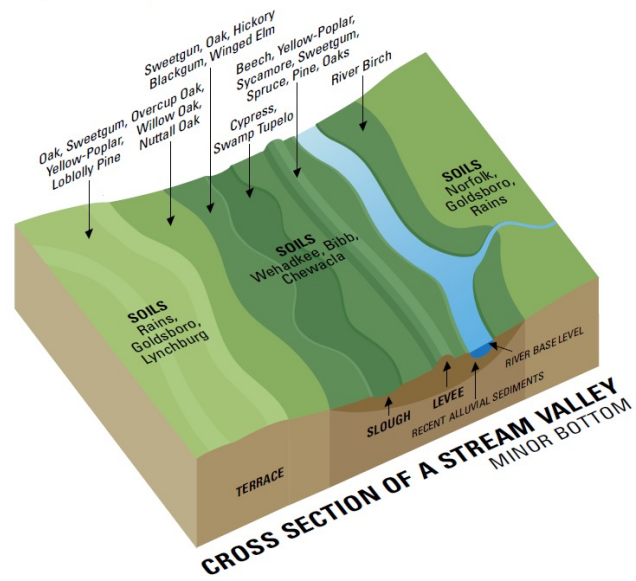
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## Coastal Plain Sites

- Soil Texture Matters! Sandy, Mineral, Organic
- Upland vs. Bottomland Sites



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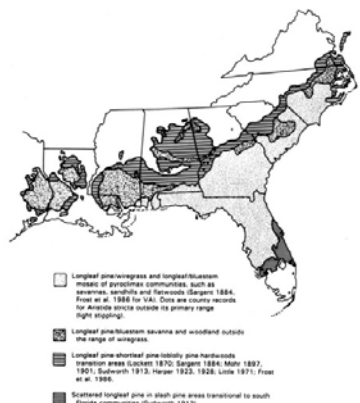
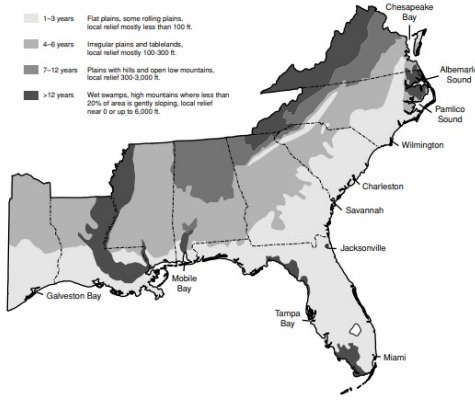
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## Coastal Plain

- Historical focus on loblolly pine- Increasing interest in longleaf
- Some of the most productive land in the world on the best sites
- Many high-quality bottomland species

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## Longleaf vs. Loblolly

- Longleaf will outperform on deep sand and regularly burned sites

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## Where to manage loblolly pine?

Indicator Species	Indicator Species Site Index	Performance Comparison with Other Species
Loblolly Pine (Piedmont and Coastal Plain)	<60	Longleaf outperforms loblolly pine
	60-65	Loblolly and Longleaf pine perform equally where both species naturally occur together
	60+	Shortleaf pine site index is about 80-90% of loblolly pine site index
	<85	Loblolly pine outperforms all hardwood species
	85-95	On similar sites, loblolly pine and yellow poplar perform about equally
	90-100	Loblolly pine outperforms sweetgum and bottomland oaks

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## Resources – Cooperative Extension

North Carolina Extension Gardener Plan Toolbox

<https://plants.ces.ncsu.edu/>

Forestry Extension Webpage

<https://forestry.ces.ncsu.edu/>

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## Additional Resources

- NC Forest Service- List of offices and local resources  
<https://ncforestservice.gov/>
- NRCS- Contact your local county office  
<https://www.nrcs.usda.gov/conservation-basics/conservationby-state/north-carolina>
- White Oak Initiative <https://www.whiteoakinitiative.org/>

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## Contact

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