

# Introduction to Longleaf Pine

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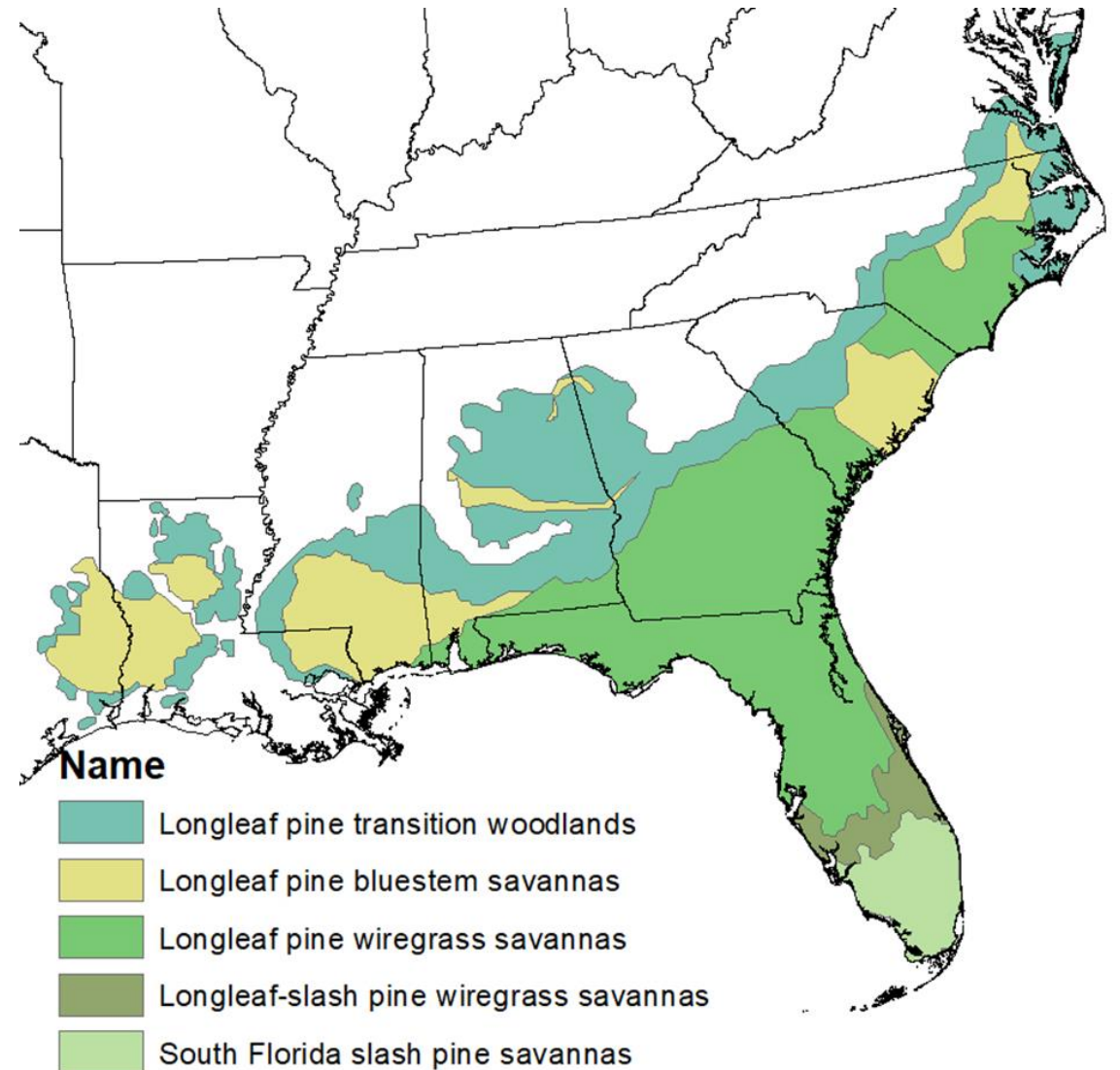


# Longleaf Pine

Longleaf pine forest once dominated the southeast, with 90 million acres.

Now, approximately 4 million acres exist because of species conversion, land conversion, and population expansion. One of the most diverse ecosystems on earth because of flora and fauna. Home of many wildlife species, like fox squirrels, red-cockaded woodpeckers, gopher tortoises, pine snakes, salamanders.

In South Carolina, longleaf pine can be found in the 2/3 of the state, many different soil types and ecotones.



# Why is Longleaf Special? Wildlife Diversity



# Why is Longleaf Special? Habitat Diversity



# Why is Longleaf Special? Wind Strong/ Resiliency

## Katrina Impacts by Species

Species	No Damage	Snapped	Leaning	Blown Over
Loblolly	16.3%	75.9%	5.7%	2.0%
Slash	52.4%	38.1%	7.8%	1.7%
Longleaf	64.0%	8.9%	16.9%	10.2%

Mississippi, Age 22

Ice Storm 2014 damaged timber in SC



Ice Storm Damage SC 2014	Mortality	Heavy Damage
PCT Stands	25%	11%
Stands	40%	16%



# Why is Longleaf Special? Quality Products



# Economics

## The Economics of Longleaf Pine Management



## A Road to Making Dollars and Sense



The Longleaf Alliance  
NRCS Fire Training 2021



### THE ECONOMICS OF LONGLEAF PINE MANAGEMENT

The longleaf forest is noted for its aesthetic beauty and a rich diversity of plants and animals. But longleaf has many unique wood properties and biological characteristics that make it economically competitive, with other timber species. Longleaf pine naturally grows straighter, tapers less, and produces a stronger, heavier wood than loblolly pine. The superior wood quality brings top dollar for poles, pilings and grade sawtimber. While longleaf trees grow slow at first, they can catch-up on nutrient poor sites. Longleaf lives longer than other trees. Its long needles are preferred landscape mulch. It is resistant to disease and insect injury and wind damage from hurricanes. Longleaf pine makes dollars and sense for many landowners.

"Longleaf pine grows value faster than it grows wood"

Longleaf Alliance

#### Superior Timber

Longleaf pine has the potential to return more profit compared to loblolly pine, thanks to its superior wood qualities. Through improvements in planting and growing longleaf seedlings, issues of slow growth rates and difficulty of regeneration have been solved. These trees grow as well as other southern yellow pines on most sites after height growth is initiated (usually 2 to 3 years). On poor sites, longleaf pine often out grows loblolly in 7 to 8 years. On better sites, longleaf pine does take a few years longer to reach commercial size, but it can grow a more valuable product. Longleaf pine produces poles, the highest valued timber product, in proportions far exceeding other pine species. By age 40 and 50, half of all trees in a longleaf stand may meet the standards for utility poles. In one study, 72 percent of the longleaf pine trees were of pole quality. Typically, stands of loblolly contain less than 15 percent pole quality trees. Longleaf pine wood is stronger, straighter, and produces more growth rings per inch than other pines – characteristics favored for high grade sawtimber. Because of its higher wood density and less taper, longleaf pine weighs more than loblolly pine, bringing higher value at harvest. To realize its greatest value, longleaf stands are better managed on long rotations.

Pole prices are 40% higher and maintain their value better than sawtimber

#### Pine Straw

The sale of pine straw provides a valuable and consistent source of income. Longleaf pine needles are considered the premium landscape mulch because of their superior characteristics. Longleaf pine's longer needles are easy to bale, retain a distinguished reddish color and deteriorate slower than other mulches. Longleaf pine straw's earthy texture and color is attractive in many landscapes and aesthetically pleasing to homeowners. A pinestraw raking schedule of every 2-3 years can generate \$100-\$200 of income per acre.

#### Potential Profits

Can a landowner make money if they plant and manage longleaf pine on a long rotation? The following table is an example of potential gains from a longleaf stand. It represents a longleaf plantation that is intensively managed for pine straw and high value poles and grade lumber. Forestry investments have high upfront cost, greater risk, and realize late returns on investment. Financial returns are improved with cost share establishment programs and annual rental payments available for longleaf. The analysis shows that longleaf is a profitable investment and generates consistent and frequent income.

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Longleaf Pine Plantation Financial Analysis		
Management Scenario	Net Present Value @ 4.5%	Internal Rate of Return
Timber only	\$197	6%
Timber + 50% cost-share (@ establishment)	\$282	7%
Timber + pinestraw	\$894	11%
Timber + CRP rental payment	\$787	29%
Timber + pinestraw + CRP rental payment	\$1317	30%

Adapted from "The Economics of Longleaf Pine Management: A Road to Making Dollars and Sense", Longleaf Alliance publication

#### Supplemental Sources of Income

Wildlife leases, mitigation opportunities and carbon trading all have potential to become profitable for longleaf forests. Opportunities to mitigate adverse impacts on threatened or endangered species in return for additional revenue streams are in development at this time. Emerging markets in ecosystem services, such as open space, clean water, clean air and biodiversity maintenance favor managed longleaf pine forests.

#### Risk Aversion

Longleaf pine is more resistant to loss from natural disasters, damaging insects or harmful disease than other southern pines. This is an undervalued and underappreciated aspect of longleaf pine stands. Longleaf pine's deep root system, sparse crowns and strong wood reduces the amount and type of damage caused by hurricane winds. A survey after Hurricane Katrina documented a majority of longleaf trees were not damaged and far fewer snapped off compared to loblolly pine. Due to a strong resin flow longleaf is resistant to southern pine beetle infestation, seldom suffering significant losses. It is less likely to succumb to fusiform rust disease. And lastly, longleaf tolerates fire allowing the tree to withstand catastrophic damage during most wildfires.

#### Cost Share

A wide range of cost-share funding sources are available to private landowners to reduce costs and/or provide early income from longleaf establishment, management and restoration. The federal Conservation Reserve Program, or CRP, reimburse landowners for up to 90 percent of the cost of planting longleaf on cropland and provide an annual rental payment. The NRCS programs EQIP and WHIP reimburse landowners for establishment and management costs and favor longleaf. The Partners for Fish and Wildlife program of the U.S. Fish and Wildlife Service provides funds for longleaf establishment and management. Check with your local forest ranger for potential cost-share opportunities as well as the Private Landowner Network at [www.private-landowner-network.org/grant-programs](http://www.private-landowner-network.org/grant-programs).

#### Reference

The Longleaf Alliance (2011) *The Economics of Longleaf Pine Management: A Road to Making Dollars and Sense*.

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## Introduction to Longleaf Pine

# Conventional and Emerging Markets

## Conventional Markets:

- **Timber: Poles, Sawtimber, Chip n' Saw**
- **Pine Straw: Market Premium for Longleaf**
- **Hunting Leases: Premium for “attractive” or wildlife-rich**
- **Real Estate: Pretty land with big timber sells at premium**

## Emerging Markets:

- **Carbon: Milliken the example at 2018 Conference**
- **Water Yield or Quality: Developing in GA, SC, FL with Conservation Easements**
- **Mitigation Banking: Milliken, Westervelt examples; with Conservation Easements**
- **Sustainable Restoration x Market Sourcing: Enviva Projects**
- **Engineered Wood – Glulam, CLT, Mass Timber construction of mid-story buildings**



# Is Longleaf Right For You?



**What are your objectives?**

**Wildlife, Income, Legacy, Diversity,  
Conservation**

**What are the soil conditions?**

**Sandy, Loamy, well-drained,  
droughty**

**What is the situation?**

**What are you starting with?**

**Species Conversion?**

**Potential Risks?**

**Are you willing and able to use fire?**

**Smoke Sensitive Concerns?**



# How is Longleaf different from other pines?

**Grass stage, takes advantage of multiage management system**

**Diverse understory**

**Can grow well on many different soils**

**Resistant to insects, disease, fire**

**Is Longleaf a Slow Grower?**

**Slow Starter: On poor sites, longleaf pines can produce more volume in 7-8 years. It takes longer on better soils.**

**Yet produces quality poles faster, yielding higher value.**



# Longleaf Pine- Grass Stage

- The growing bud of the tree is protected by a thick arrangement of needles at ground level.
- The grass stage may last anywhere from 1 to 7 years depending on the degree of competition (resource availability).

## Management:

- Burn early to establish a frequent fire regime.
- Introduce a cool-season fire as early as conditions are met (fine fuels, RCD, vigorous growth)
- Control competition with herbicide as alternative or complementing treatment to fire.



# Longleaf Pine- Rocket Stage

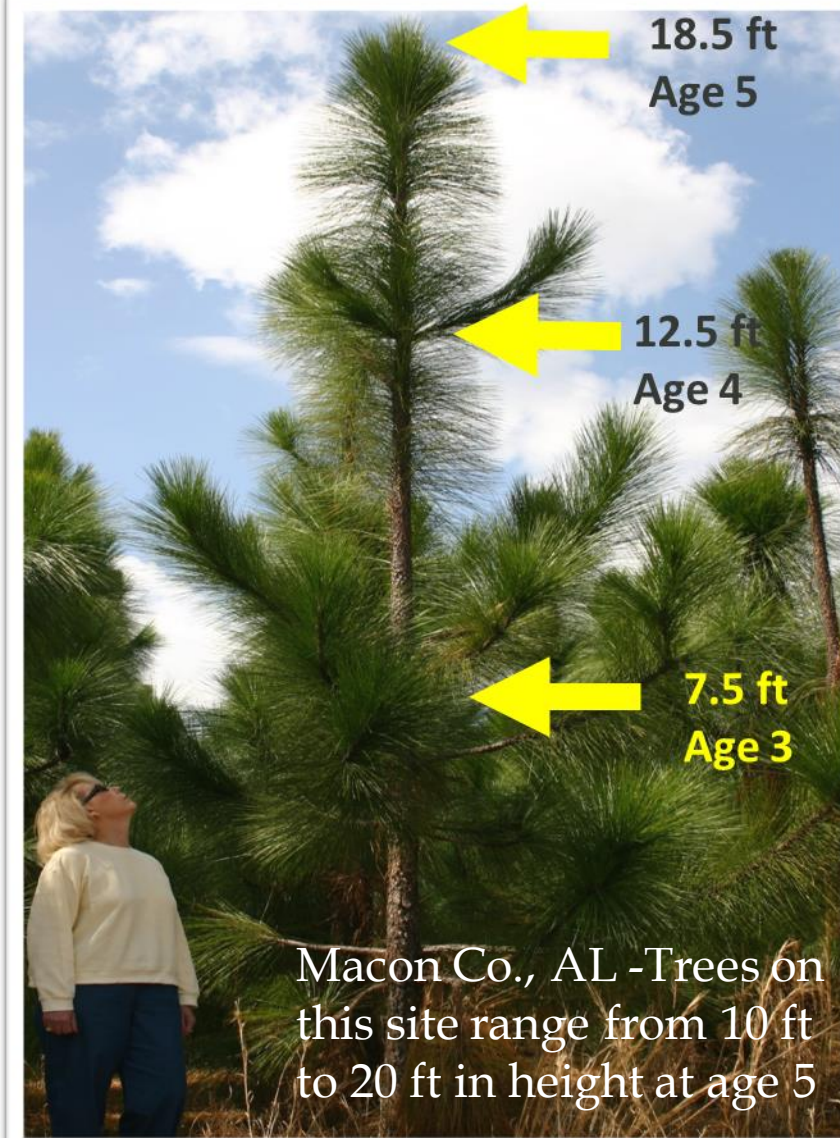


**Begins once root collar diameter  
(RCD) = 1"**

*Also depends on the availability of  
light, water and nutrients*



# Longleaf Pine- Rocket Stage



Macon Co., AL -Trees on this site range from 10 ft to 20 ft in height at age 5



# Longleaf Pine-Sapling or Juvenile Stage

Lateral branches begin to emerge.  
Diameter increases and bark thickens modestly;  
continues to grow in height at roughly of 3' per  
year.  
As the tree grows taller and the bark becomes  
thicker, it becomes less susceptible to fire.  
Once it reaches 8 feet in height and about 2  
inches in diameter, it becomes rather robust and  
is rarely killed by fires of moderate intensity.  
The tree will remain in this stage for several  
years.

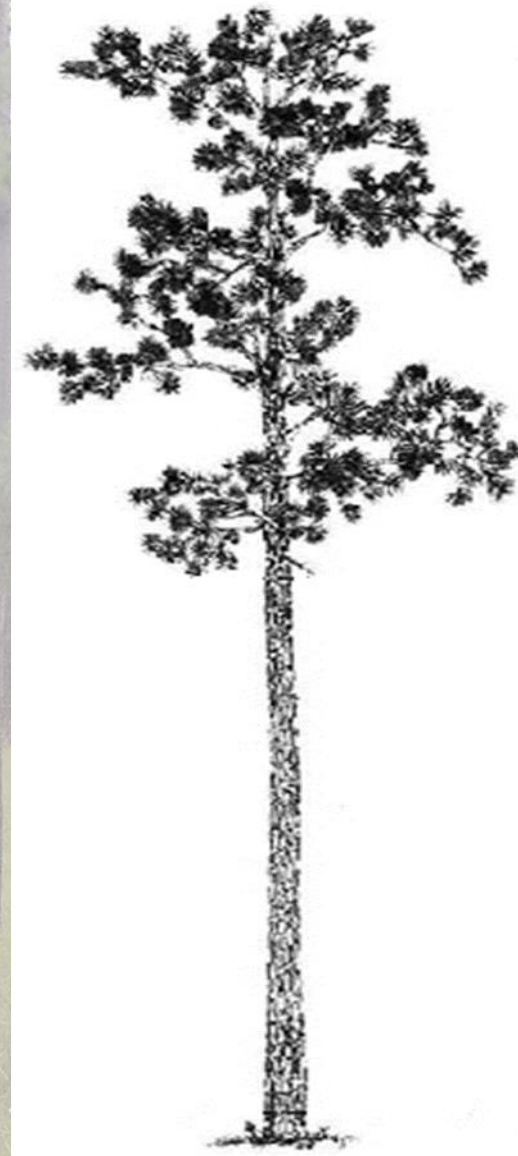


# Longleaf Pine- Mature Stage

- Marked by sustained growth and cone production
- Lower limbs may be shed or pruned off by fire. The trunk is relatively straight, first branches beginning high above the ground level.
- On more fertile soils, the tree may continue to grow in height up to 110 feet. On poorer soils, the tree may only grow to 60 feet.

## Management:

- Continue frequent fire, varying season of burn
- Harvesting to meet landowner objectives and income potential
- Pole and sawtimber markets may become available
- Increasing value for wildlife habitat
- Ecosystem services of a long-lived tree and ecosystem
- Monitor for pest and pathogens, deal with appropriately and swiftly.



# Longleaf Pine

- The longest-lived of the southern pine species. Throughout most of its range, individual longleaf pines can reach 250 years in age (with trees in excess of 450 years old having been documented).
- Although a longleaf forest looks like and is often defined as an "old-growth" stand, it still has approximately 2/3 of its trees less than 50 years old.



## In longleaf restoration...

- Good site prep should:

- Assist with the successful establishment of longleaf pine
- Control hardwood competition
- Conserve keystone species
- Allow Rx fire soon after planting
- Maintain botanical diversity or allow it to quickly recover
- Discourage weeds

- Bad site prep may:

- Prevent the successful use of Rx fire
- Encourage weeds such as dogfennel, climbing fern, rattlebox and blackberry that compete with longleaf and deteriorate wildlife habitat
- Eliminate much of the botanical diversity that makes longleaf pine forest the beautiful places that we enjoy



# What are the Objectives?



# Establishment



Hand Planting



Machine Planting



# Establishment

2 years old-  
Fire only

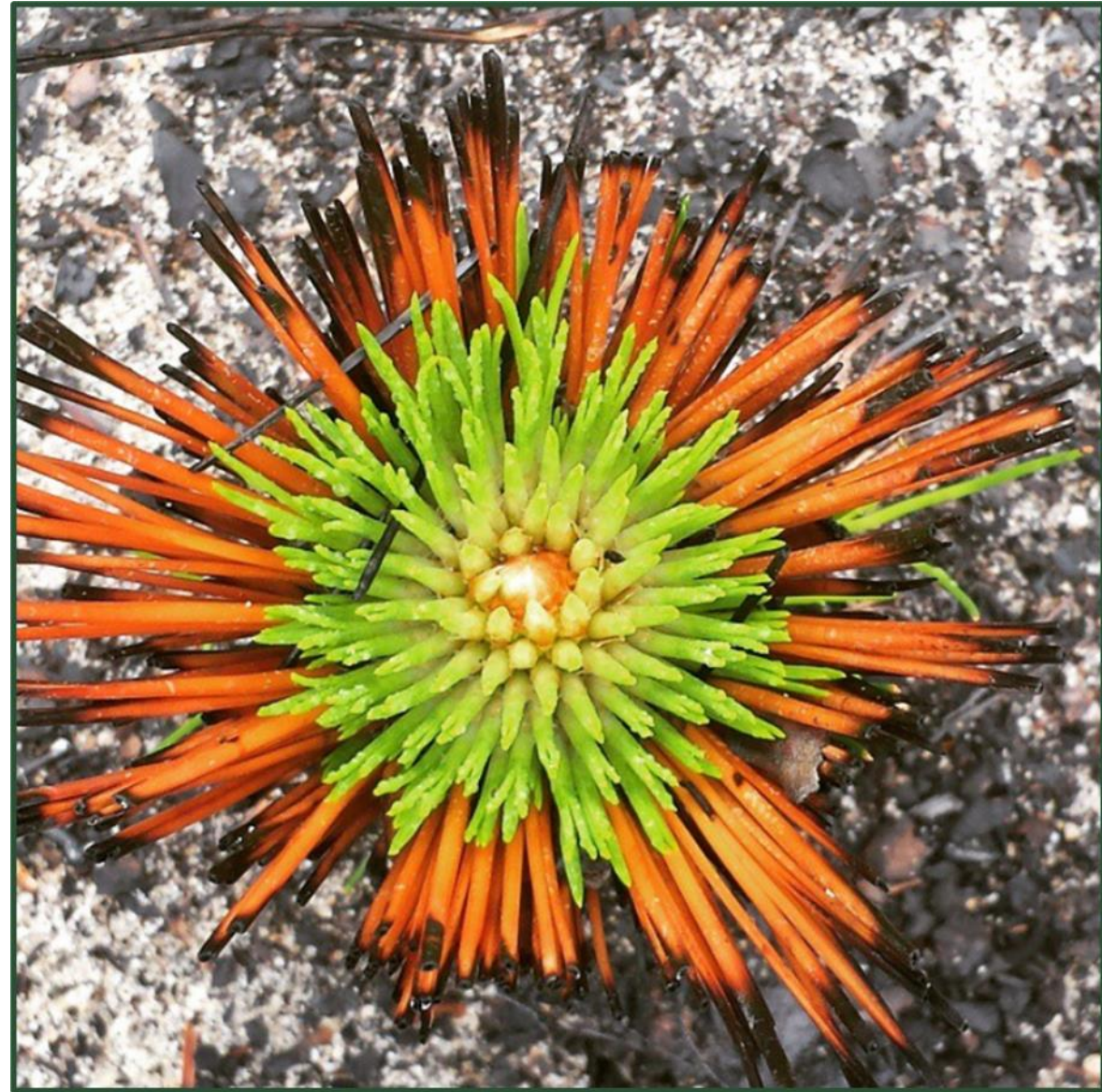


# When can we burn?

- Plan to burn as soon as enough fine fuel are present to carry the fire
- Vigorous grass stage seedlings
- At least 0.4" RCD



# Resilience at the grass stage



# Remember that longleaf is fire resilient, not fire-proof



Mortality will occur, no matter how carefully fire is applied.  
What is your acceptable loss?





*The Longleaf Alliance*  
*NRCS FireTraining 2021*

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# Arguably, the Most Fire-Adapted Tree in North America

- Highly resistant to fire in the grass stage
- Resprouts after fire
- Rapid growth to height above most flame lengths
- Thick insulating bark
- Needles are primary carrier of fire
- Seed need mineral soil to germinate



# Benefits and Objectives of Fire in Longleaf

- Brownspot Control
- Hardwood Control
- Pine Control
- Maximize sunlight
- Encourage & Sustain Groundcover Plant Community
- Create Conditions for Future Fires
- Wildlife Habitat
- Aesthetics
- Regeneration
- Risk Reduction
- Promote tree form



# Consult with a Forester

- A forester will help landowners to protect their resources (land, forest products, time, and money).
- Advise landowners of various options for forest management, tax implications, cost share/incentives, future planning.
- Assist with a preparing a timber sale; including cruising, marking timber, protecting sensitive areas, road layout, site prep, reforestation, burning, and cost share applications.



# Landowner Incentives

Program	Agency/Organization	Contact
Conservation Reserve Program	USDA Farm Service Agency	Local County Office
Environmental Quality Incentives Program	USDA Natural Resources Conservation Service	Local County Office
Forest Renewal Program & Southern Pine Beetle	South Carolina Forestry Commission	Local County or Regional Office
Partners for Fish and Wildlife (T&E Species)	USDI Fish & Wildlife Service	<a href="mailto:bretbeasley@fws.gov">bretbeasley@fws.gov</a>
Sandhills (Chesterfield, Darlington)	Sandhills Longleaf Pine Conservation Partnership	<a href="mailto:jlisenby@chesterfieldswcd.com">jlisenby@chesterfieldswcd.com</a> 843-623-2187
SLCC (Charleston, Berkeley, Williamsburg, Georgetown)	Sewee Longleaf Conservation Cooperative	<a href="mailto:jennie@longleafalliance.org">jennie@longleafalliance.org</a> 864-710-8089
SoLoACE (McCormick, Edgefield, Aiken, Orangeburg, Barnwell, Bamberg, Allendale, Hampton, Colleton, Beaufort and Jasper)	SoLoACE Longleaf Partnership	<a href="mailto:jennie@longleafalliance.org">jennie@longleafalliance.org</a> 864-710-8089



# The Longleaf Alliance

The mission of The Longleaf Alliance is to ensure a sustainable future for the longleaf pine ecosystem through partnerships, landowner assistance, and science-based education and outreach.

