Florida Land Steward

Forest Recovery Webinar Series

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Florida Land Steward
Forest Recovery Webinar Series

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Forest Recovery Webinar Series

Agenda:

Webinar 1: September 10, 2020, 2 pm ET, Hurricane Recovery Assistance Update
Daniel Stevens, Cooperative Forestry Assistance Supervisor, Florida Forest Service
Elias Mathes, Block Grant Project Manager, contractor on behalf of the Florida Dept. of Emergency Management
Laura Bosworth, Director of Forestry and Regulatory Affairs, Florida Forestry Association

Webinar 2: September 17, 2020, 2 pm ET, Which Pine is Right for My Property?
Stan Rosenthal, UF/IFAS Extension Forestry Agent, Emeritus; Forest Advocate, Florida Wildlife Federation, Natural Resource Planning Services

Webinar 3: September 24, 2020, 2 pm ET, Keys to Success with Longleaf Pine and Enviva Biomass Partnership
Ad Platt, Vice President for Operations, The Longleaf Alliance
Ben Larson, Director of Sustainability, Enviva
Shawn Cook, Sustainability Forester, Enviva
Billy Clark, Commodity Manger, Enviva

Webinar 4: October 1, 2020, 2 pm ET, Invasive Species Identification and Control
Brian Pelc, Restoration Project Manager, The Nature Conservancy

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Please use the Q & A function to ask questions, not the Chat. Questions will be answered after all presentations are complete.

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Presentation slides and/or other reading materials for this series are available online at:

https://programs.ifas.ufl.edu/florida-land-steward/

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Forest Recovery Webinar Series

SAF Continuing Forestry Education Credits:

1.0 Cat. 1 CFE approved

Verification by registration and Zoom Webinar attendance log

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Forest Recovery Webinar Series

First, a little bit of information about you:

Storm impact?

Assistance received?

Moving forward with restoration?

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Webinar 2: Which Pine is Right for My Property?

Stan Rosenthal, UF/IFAS Extension Forestry Agent Emeritus and Forest Advocate, Florida Wildlife Federation, Natural Resource Planning Services

Your site(s) and management objectives should guide your choice of tree species to plant.

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Comparing Southern Pine Species for Forestry & Wildlife Objectives.

Stan Rosenthal
Florida Wildlife Federation, Forest Advocate
NRPS Senior Forester
UF/IFAS Extension Forestry Agent Emeritus

Southern Pines. . .

1. Loblolly
2. Slash (2 varieties)
3. Longleaf
4. Pond
5. Shortleaf
6. Spruce
7. Sand (varieties)

Two varieties of sand pine: Choctawhatchee & Ocala.

They differ appreciably in cone production, cone size, seed size, and several other characteristics. The majority of Ocala sand pine cones are serotinous whereas them majority of Choctawhatchee cones open when mature.

Why what pines are where. . .

Fire (frequency/intensity)

Soil (moisture/nutrients)

Reproduction Source (available seed/seed bed/competition/planting & site prep).

Slash Pine

PINUS ELLIOTTII

COMMON NAMES: YELLOW SLASH PINE, SWAMP PINE, PITCH PINE, SOUTH FLORIDA SLASH PINE, DADE COUNTY SLASH PINE, DADE COUNTY PINE, CUBAN PINE, HONDURAS SLASH PINE

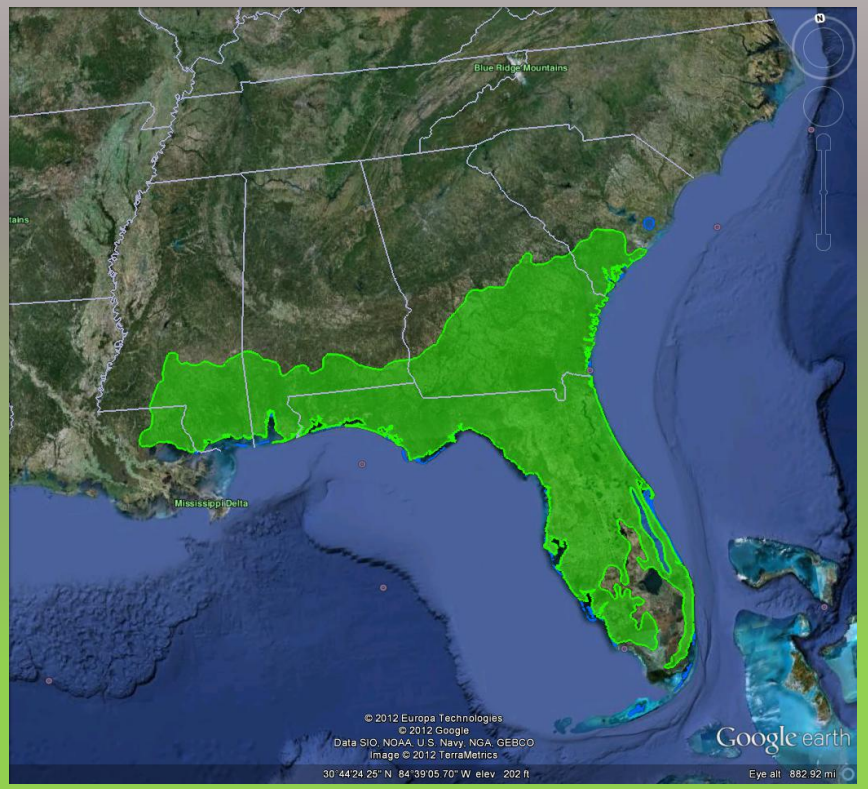
Variations

Pinus elliottii Englem. is divided into two geographic variations:

1. Pinus elliottii var. elliottii, North Florida slash pine

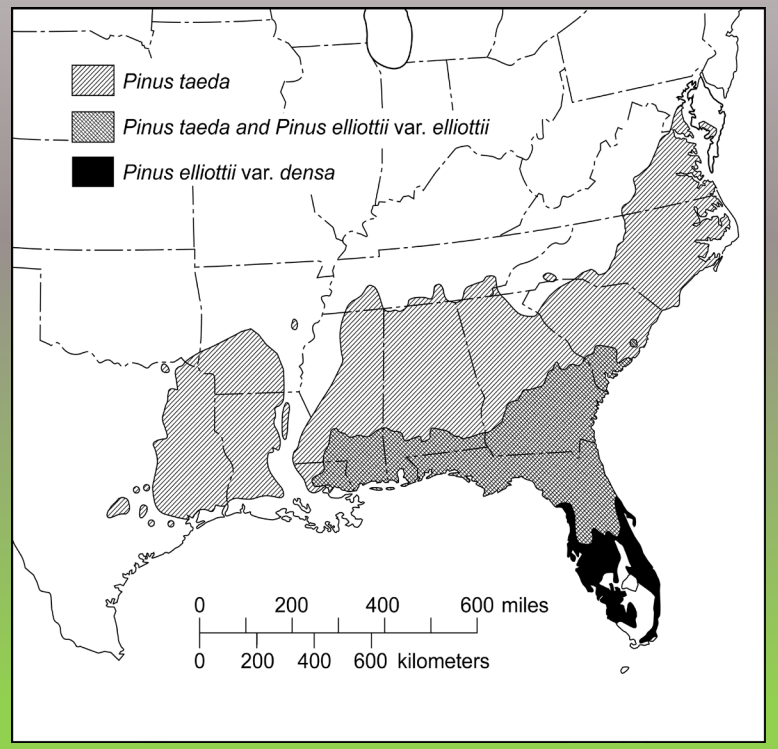
2. Pinus elliottii var. densa Little & Dorman, South Florida slash pine

Native Range



- Relatively small natural range
- Within natural range, original distribution was limited by seedling fire susceptibility
  - Was common along margins of streams, ponds and bays
  - With fire protection and plantation silviculture, is now widespread within range
  - Is planted in LA and TX
- Species range may be limited by minimum annual temperature

Native Range



Identification

Needles in bundles of two and three, 8-12 inches long.

Soils

- Spodosols - flatwoods
- Ultisols
- Entisols – sand hills
- Grows best on pond margins and drainages where soil moisture is ample but not excessive
- Growth is poor on sandhills and poorly drained savanna soils with high water tables

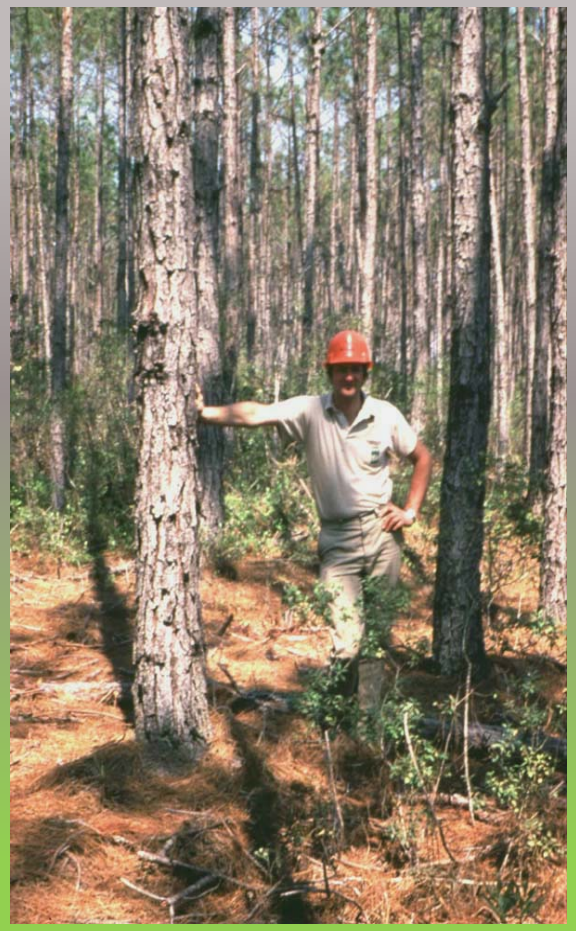
Ecology

- Is one of the four most important commercial conifers in the Southeastern US and has the smallest native range of the four major southern pines.
- With improved fire protection and heavy cutting of longleaf pine *(Pinus palustris),* slash pine has spread to drier sites, replaced longleaf pine in mixed stands, and invaded abandoned fields. This increase in acreage was possible because of slash pine's frequent and abundant seed production, rapid early growth, and ability to withstand wildfires and rooting by hogs after the sapling stage. Stands protected from fires are invaded and replaced by more tolerant hardwood species.
- Slash pine is a major component of three forest cover types including Longleaf Pine-Slash Pine, Slash Pine, and Slash Pine-Hardwood
- Slash pine makes rapid volume growth at early ages and is adaptable to short rotations under intensive management. .
- It is a shade-intolerant species and does not survive or grow well when suppressed.
- Slash pine seeds are eaten by a variety of birds and small mammals.
- Older slash pines with red heart rot are primary nesting trees for the redcockaded woodpecker.

Fertilizer Response of Slash Pine at Planting - 25 Years Later

Franklin Co., Florida

Control – 2043 ft^3/ac



50 lb/ac P – 4502 ft^3/ac

Slash pine growing in Florida??

IMPAC Experiment – Age 4 yrs (Gainesville, FL)

Fert+Herb

Control

Damaging Agents

Fusiform Rust

Pitch Canker

Tip Moth and Pitch Canker

Recommended Management

- Reasonable site preparation (chemical site prep, bedding on poorly drained sites) and reforestation with bareroot seedlings of good genetic stock will generally pay dividends
- Alleviate nutrient deficiency with fertilizer
- If raking pinestraw, pay special attention to fertilizer to avoid productivity declines
- Pay attention to stocking

Machine planting - Rayonier

Prescribed Fire

- Slash pine is intolerant of fire until it is 10-15 feet tall and the bark has thickened
- Up to 50% of live needles can be scorched (but not completely consumed) with good survival and minimal growth loss

Genetics Take Home

- Ask for improved genetics
  - Growth
  - Disease, esp. fusiform rust and pitch canker
  - Form

Products/Uses

- An important timber species, including pulpwood, plywood and veneer, lumber and other structural materials.
- Pine Straw
- In urban areas planted as an evergreen ornamental and as a screen.

Loblolly Pine

PINUS TAEDA

OLDFIELD PINE, NORTH CAROLINA PINE, YELLOW PINE, BLACK PINE, ARKANSAS PINE, SHORTLEAF PINE

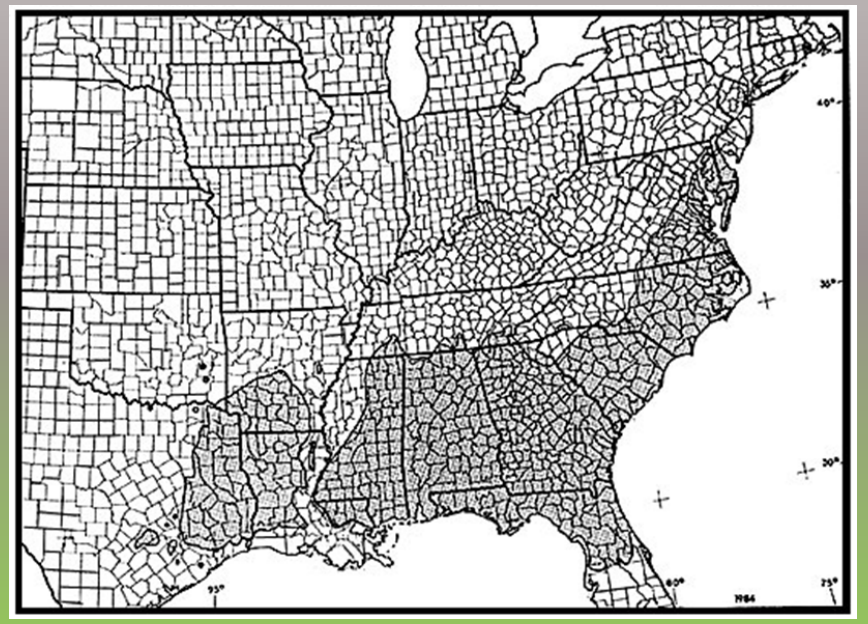
Identification


Pinus taeda

Cones in pairs. Needles in bundles of three and 6-9 inches long.


Pinus clausa

Native Range



The native range of loblolly pine extends through 14 States from southern New Jersey south to central Florida and west to eastern Texas.

History of Loblolly Pine

- Originally a minor associate in upland mixed hardwoods and longleaf pine stands; component of mixed river bottom hardwood stands
  - <5,000,000 ac prior to European colonization
- Coastal Plain
  - Grew best along stream margins/swamps not subject to long periods of flooding or serious fires
  - Could not compete well with longleaf in the uplands because of limited fire tolerance.

Ecology

- Is one of the four most important commercial conifers in the Southeastern US. Loblolly pine is an adaptable species that has been successfully planted along the periphery of its natural range and has been introduced on other continents.
- Loblolly grows in a vary wide variety of forest types from pure stand or mixed with other pines and hardwoods. Stands protected from fires are invaded and replaced by more tolerant hardwood species.
- Growth of loblolly pine stands is inherently good when compared to most hardwood competitors and on highly productive sites will triple the production of common associates and is adaptable to short rotations under intensive management. .
- Loblolly pine is moderately tolerant when young but becomes intolerant of shade with age. Its shade tolerance is similar to that of shortleaf and Virginia pines, less than that of most hardwoods, and more than that of slash and longleaf pines. Loblolly pine is most accurately classed as intolerant of shade.
- Natural loblolly pine stands as well as intensively managed plantations can provide habitat for a variety of game and nongame wildlife species depending on density and stage of stand development. Large tracts of mature timber with frequent openings and where prescribed burning is conducted are often the best.

Products/Uses

- Loblolly pine is the leading commercial timber species in the southeastern United States. 750,000 ac are harvested each year for lumber and pulpwood.
- Most harvested pines are under 50 years old.
- An important timber species, including pulpwood, plywood and veneer, lumber and other structural materials.
- Pine Straw
- In urban areas planted as an evergreen ornamental and as a screen.

Soils

- Best growth is on moderately acid soils with imperfect to poor surface drainage, a thick medium-textured surface layer, and a fine-textured subsoil.
-
- Poorest performance is on shallow soils, eroded soils, and very wet or waterlogged sites.

Damaging Agents

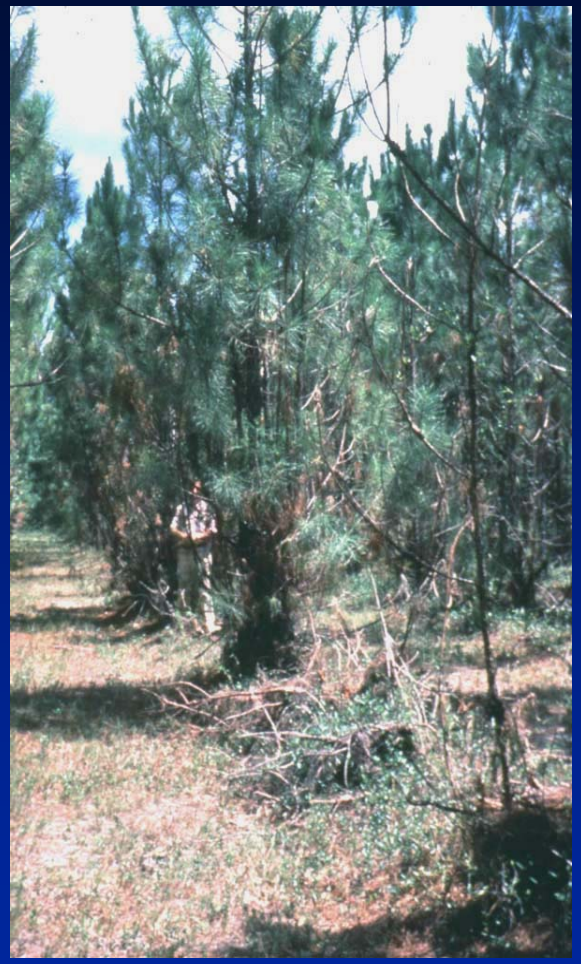
Fusiform Rust

Pitch Canker

Tip Moth and Pitch Canker

Genetic Resistance to Fusiform Rust

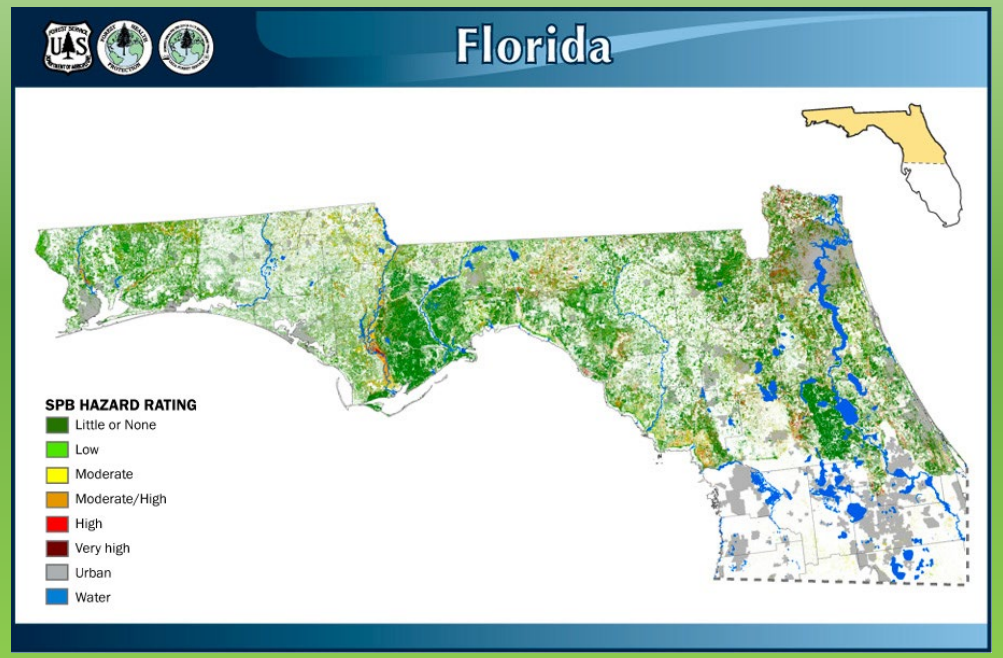
Resistant Family



Non-Resistant Family

Southern Pine Beetle

Thin to Reduce Risks from SPB



Annosus Root Rot

High hazard sites are well drained, sandy soils.

Fruiting body and mortality often develop 2nd or 3rd year following thinning.

Borax treatment of cut stumps within 24 hours prevents root transfer to healthy residual trees.

To Achieve High Yields, Integrated Silvicultural Systems Should Include:

- Clearly defined management objectives
- Site preparation
- High quality seedlings and proper planting
- Genetics (Species, Family, Variety)
- Competition control
- Nutrient management (throughout rotation)
- Pest Management

IMPAC Experiment – Age 19 yrs. (Gainesville, FL)

CONTROL

FERTILIZER + WEED CONTROL

IMPAC Experiment – Age 19 yrs (Gainesville, FL)

Fert + Weed Control

Control

Loblolly pine growing in Florida

Phosphorus deficiency on poorly drained clay soils

Lob or Slash?

- Site quality available – plant lob on higher quality sites
- Drainage – slash is more tolerant of somewhat poorly and poorly drained soils
- Rust hazard – slash is more susceptible to fusiform rust
- Management intensity – if you are hesitant to invest in fertilizer or weed control, slash is more tolerant of nutrient deficiency
- Products – slash (and longleaf) are preferred over lob for pinestraw production

Longleaf Pine

(*Pinus palustris*)

Longleaf – The Native Tree

Pre-settlement

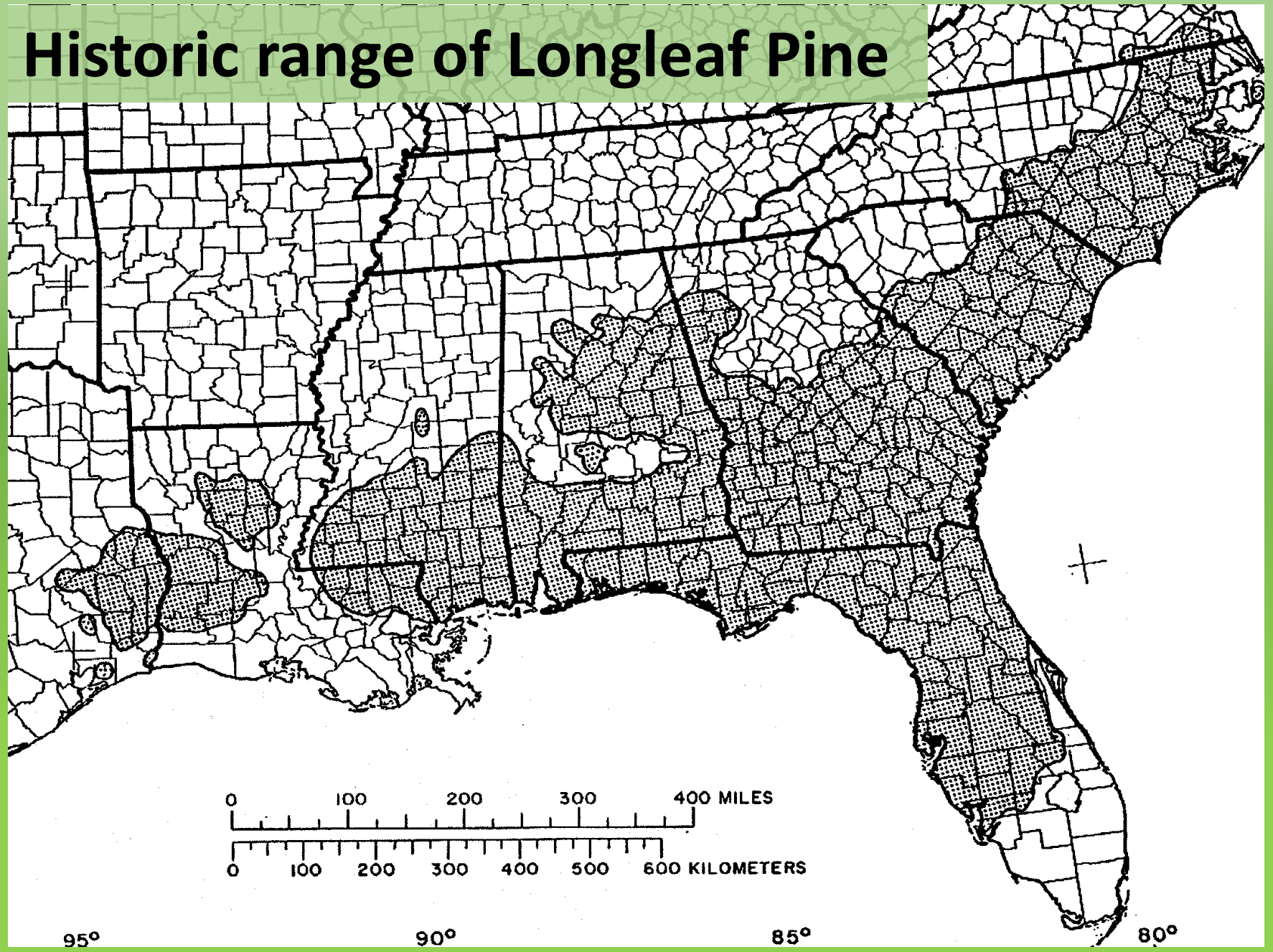
- Established on 90 million acres
- Dominant tree species on 60 million acres

Today **95% Reduction**

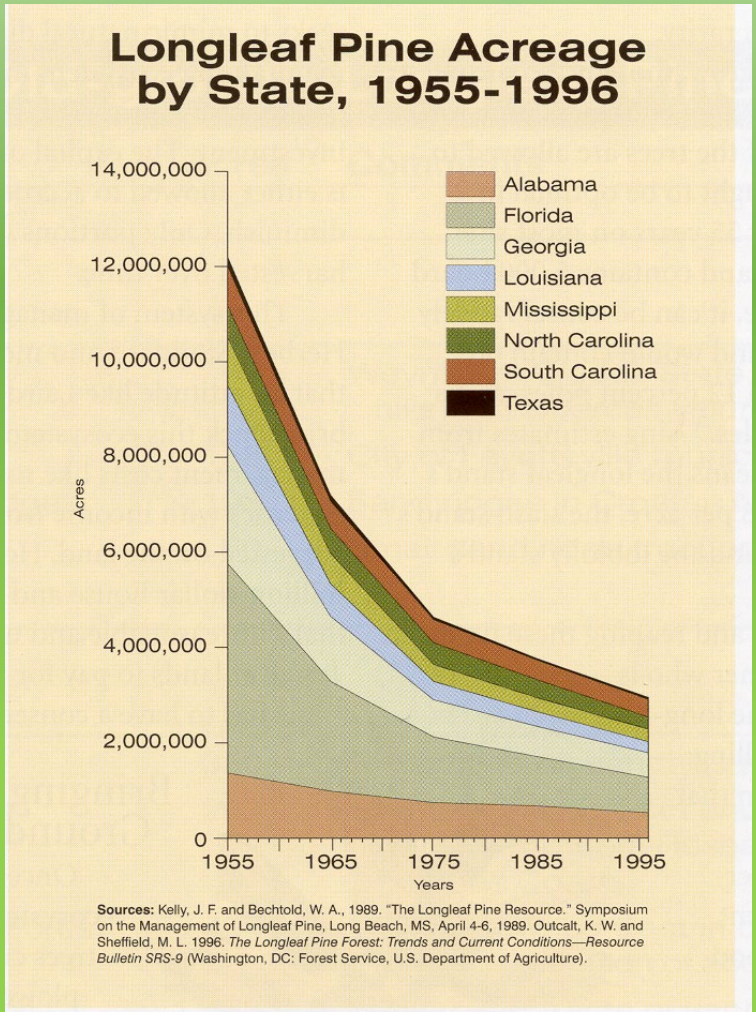
- 3 million acres

Longleaf pine takes 100 to 150 years to reach their full size of 100-120 feet, and can live to 400 years old!

Historic range of Longleaf Pine



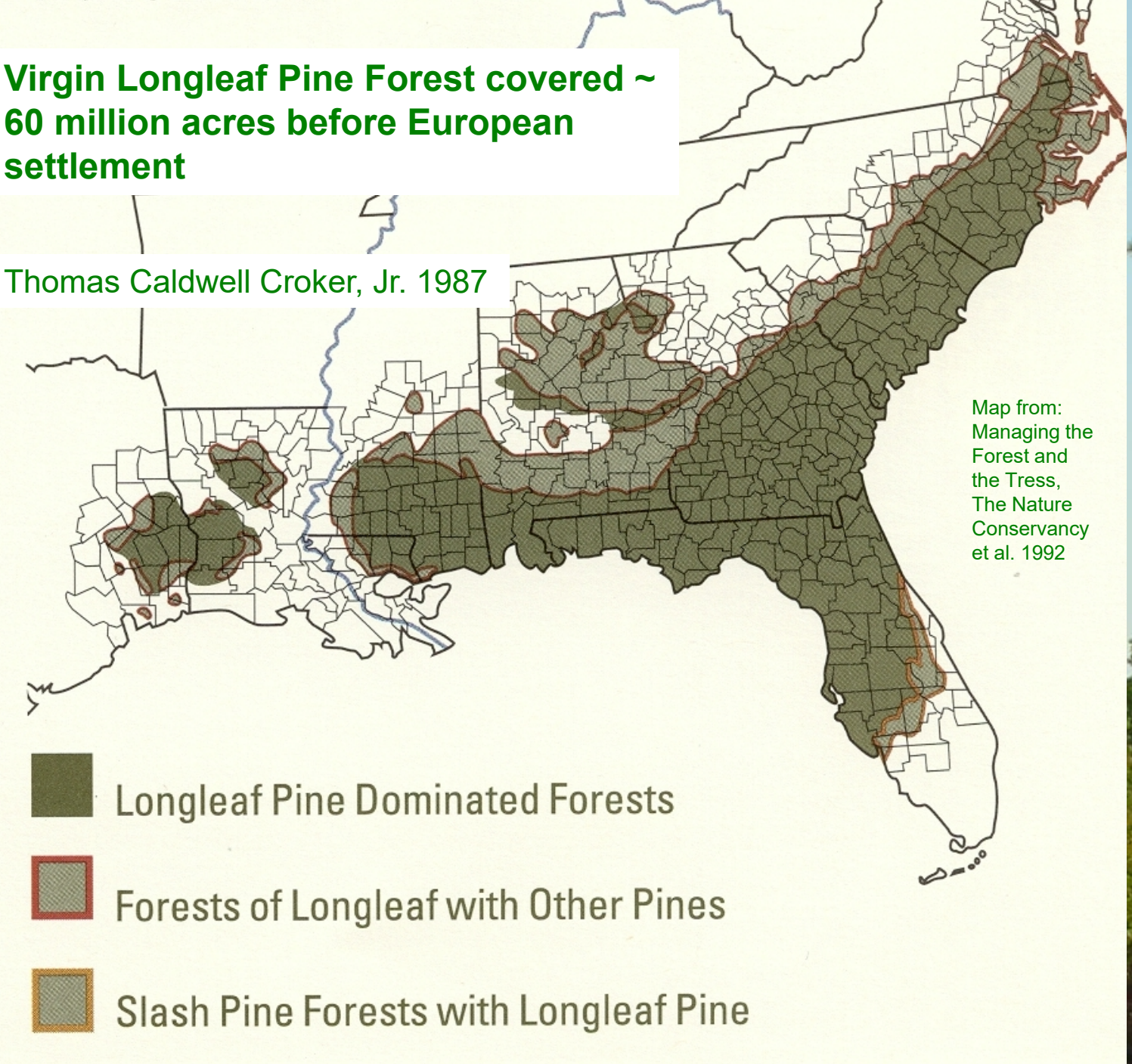
History of Longleaf Pine



- Virgin longleaf pine forest was almost completely eliminated by 1900
- Second forest was a result of haphazard self regeneration and covered 20 million acres in the 1930s
- Renewed interest = Hope

Virgin Longleaf Pine Forest covered ~ 60 million acres before European settlement

Thomas Caldwell Croker, Jr. 1987



Map from: Managing the Forest and the Tress, The Nature Conservancy et al. 1992

Longleaf – The Native Tree

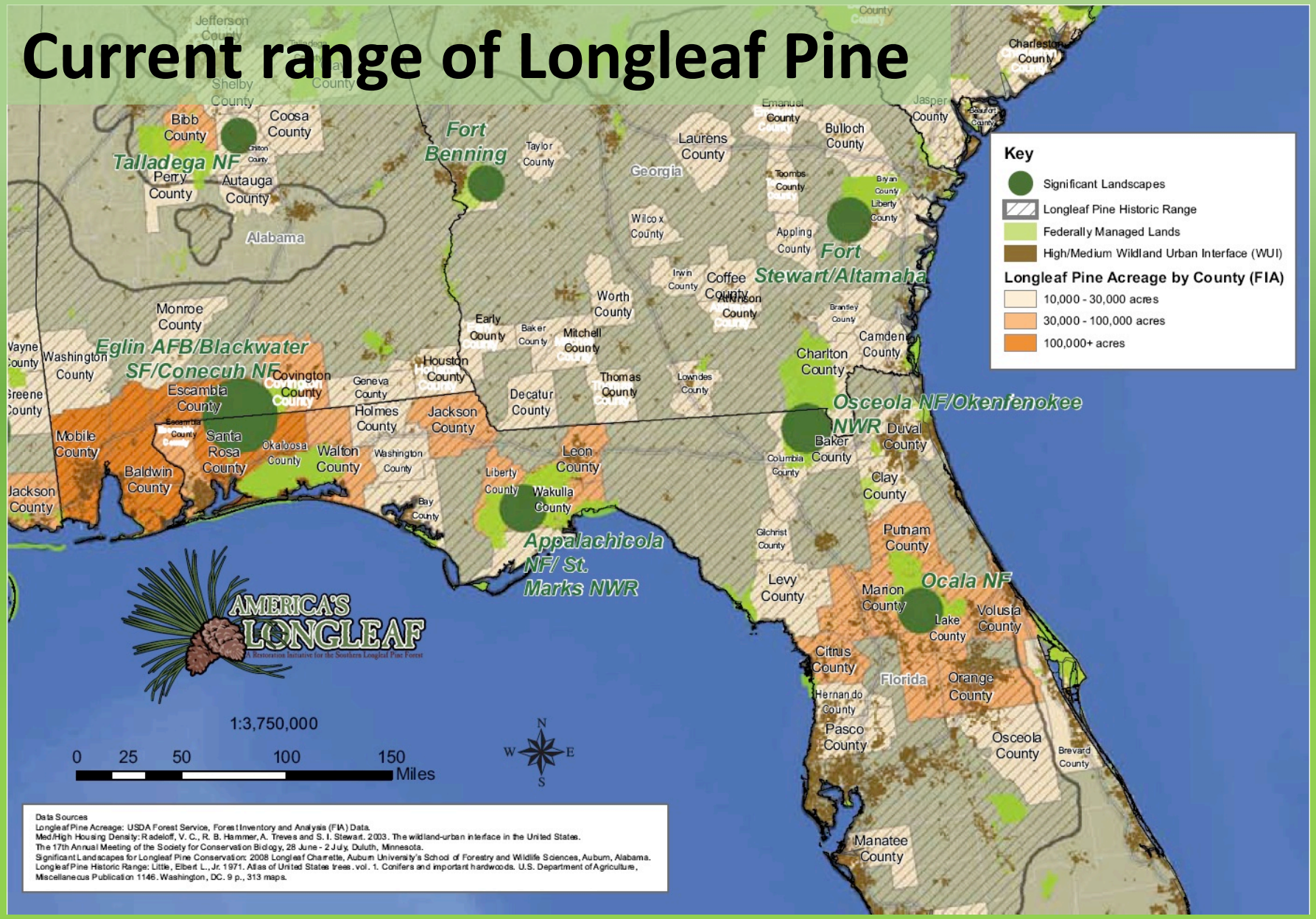
Due to development & fire control, regeneration on much of its original range is no longer possible

But, some areas can, and are, being restored

- **Timberlands**
- **Agricultural Lands**
- **Public Lands**

Joseph O'Brien, US Forest Service, Bugwood.org.

Current range of Longleaf Pine



Identification

Identification

Needles in bundles of three and 8-18 inches long.

Soils

- **Well suited to a wide range of environments**
  - **Upland – Coastal Plain Soils**
  - **Flatwoods – Spodic Soils**
  - **Sand Hills – Deep sands (Entisols)**

Stands of the longleaf pine-turkey oak communities are most common in the central portion of Florida north of Lake Placid, and the interior panhandle.

Example of Sandhill Longleaf Site in Northwest Florida

Example of Flatwoods Longleaf Site

Photo: Stolz, Gary M.
USFW – Nov. 5, 2001


Some longleaf pine seedling stay in a “grass stage” for 3 to 6 yrs; other even up to 25 years
Longleaf pine
Wiregrass
During “grass stage” longleaf pine seedling looks like a tuft of grass, and develops strong taproot

Longleaf – The Native Tree

- **Longleaf pine is highly resistant to most diseases and insects that infect other southern pines.**

Such as the Southern Pine Beetle…

Images Curtesy of : http://entnemdept.ifas.ufl.edu/foltz/eny3541/pbb/SPB_Info.htm

Longleaf – The Native Tree

…and Fusiform rust

Images Curtesy of http://www.sfrc.ufl.edu/Extension/FFSnl/ffsnl83.htm

Longleaf – The Native Tree, does have native pests.

Brown spot needle blight

Red headed sawfly.

Fire helps control some of these native pests.

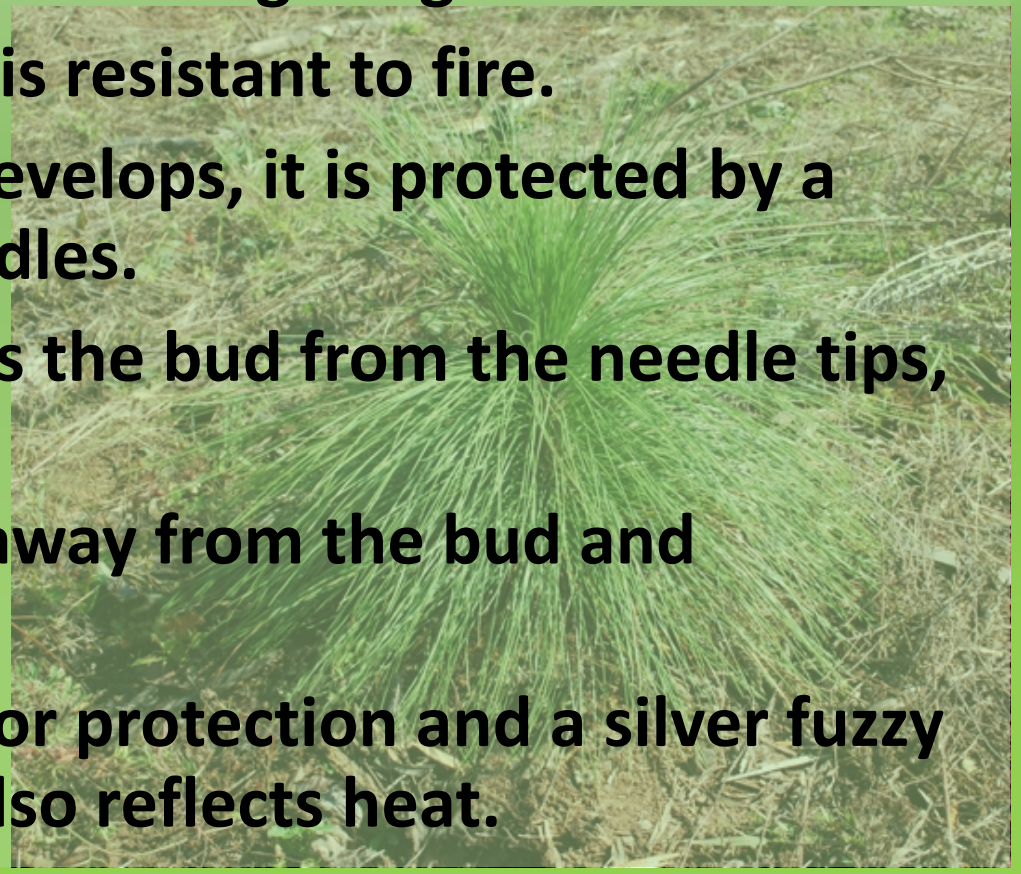
Longleaf – The Adapted Tree

- **Exceptionally well adapted to fire**

It is ideally suited to a high-frequency (every 2 to 5 years), low-severity surface fire regime, and seed will germinate on the mineral soil exposed by fire.

Longleaf – The Adapted Tree

- In reality they are fire dependent.
- Fire controls competition allowing Longleaf to thrive.
- The grass-stage seedling is resistant to fire.
- Once the terminal bud develops, it is protected by a moist, dense, tuft of needles.
- As the tuft burns towards the bud from the needle tips, water is vaporized.
- The steam reflects heat away from the bud and extinguishes the fire.
- The bud also has scales for protection and a silver fuzzy covering that probably also reflects heat.



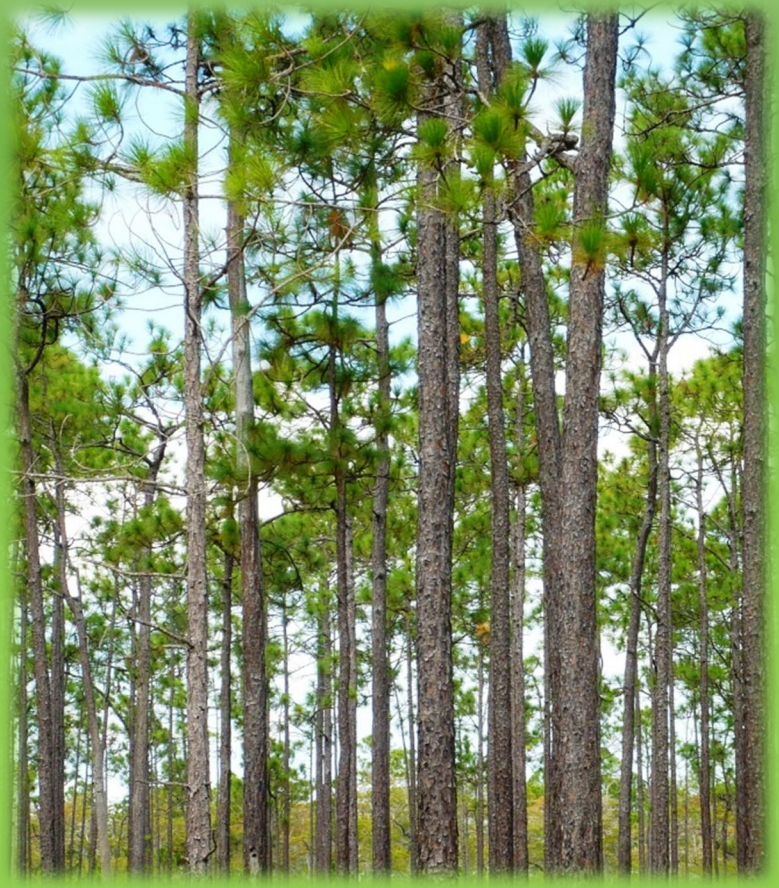
Joseph O'Brien, USDA Forest Service, Bugwood.org.

Longleaf – The Adapted Tree

The more adapted a species is, the safer an investment in the future it becomes.

As we've seen, Longleaf is adapted to a range of:

- **Soils**
- **Pest & Disease**
- **Weather**
- **Fire**



Longleaf –Economic Considerations

- Longleaf produces high value timber and non-timber products.
- Longleaf pine has clear, straight wood with few defects. It was used extensively in the past for timber and ship building.

Longleaf –Economic Considerations

The financial viability of Longleaf becomes more apparent over time

2 years old

3 years old

5 years old

Longleaf planted in January 2018. Pictures taken March 2020.

Longleaf survival very consistent throughout stand.

Ground cover (including wiregrass) appears in good condition. Gopher tortoises active.

Artificial Regeneration (more costly for seedlings and site preparation then other pine species)

Natural Regeneration

Whether natural or artificially regenerated, competition control is very crucial for longleaf regeneration.

Longleaf –Economic Considerations

- There are often a variety of opportunities available for financial assistance with the cost of establishing Longleaf.

Longleaf –Economic Considerations

- Thin 4 times from 17 to 45 years
- Leaving shelterwood for subsequent stands
- Subsequent stands can be established using natural regeneration and fire, virtually eliminating planting and site prep expense.

Longleaf –Economic Considerations

Longleaf pine straw

Longleaf pine straw is generally more desirable than other straw.

Longleaf –Economic Considerations

Early raking, age 6 - low yields

- 50 to 75 bales per acre

Age 10 – higher yields

- between 125 to 200 bales per acre

Age 15 - maximum yield

- 200 to 300 bales per acre

Prices per bale: $.50 - $1.00

Recommend raking no more than 5 times during the life of the pine plantation (the rotation). Also soil test & fertilization recommended.

Longleaf – The Ecologically Important Tree

- A wide variety of wildlife depends on the longleaf pine-turkey oak ecosystem.
- Endangered species such as red-cockaded woodpeckers and indigo snakes are threatened by the loss of longleaf pine habitat.

(Photo by Chuck Hess)

(Photo courtesy Dirk Stevenson)

Longleaf – The Ecologically Important Tree

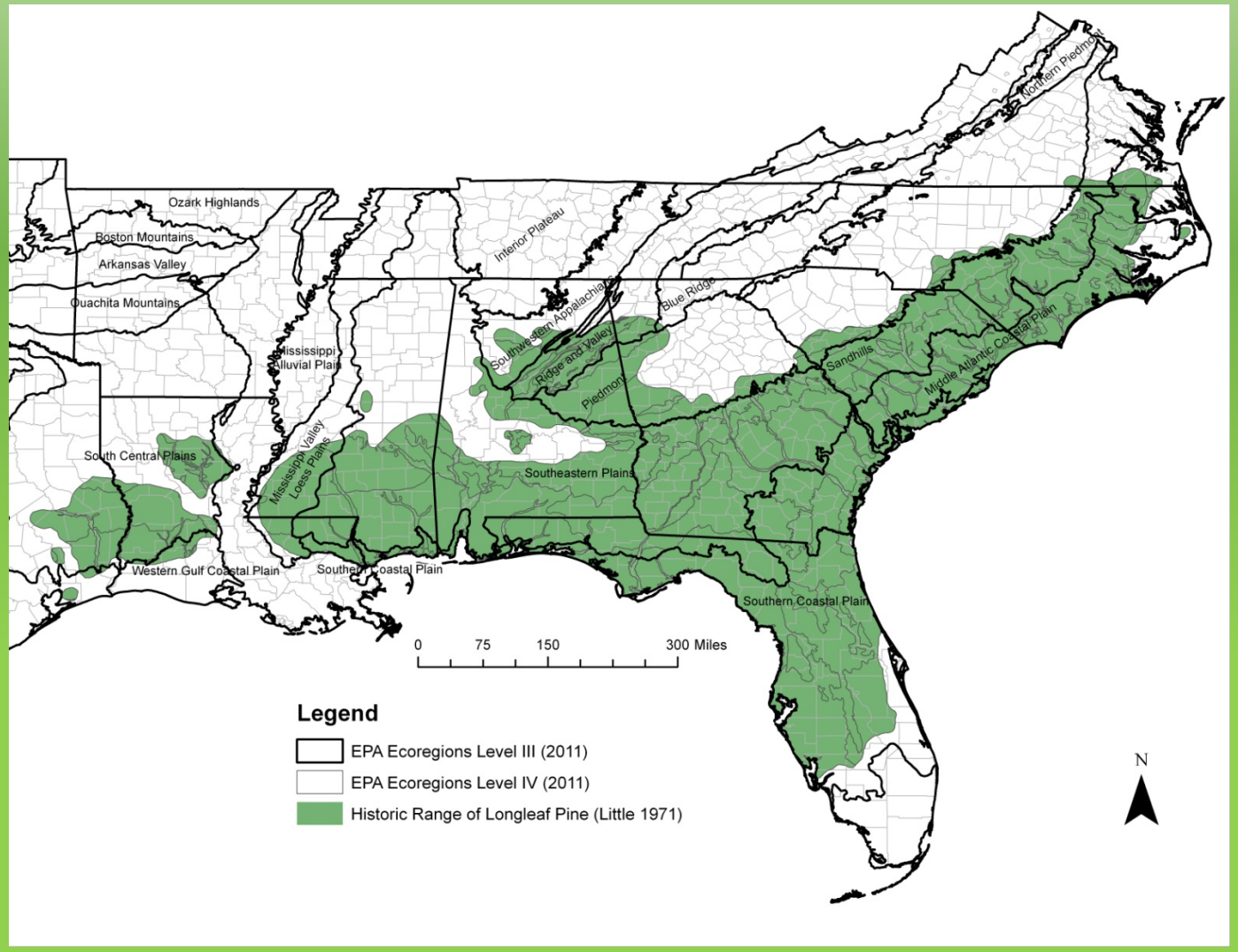
Sixty-eight bird species use longleaf pine forests.

The seeds are an excellent food source for many species.

Gopher tortoises, Florida mice, gopher frogs, and eastern diamond-back rattlesnakes are among the native animals in the ecosystem.

Red Cockcaded Woodpeckers

Longleaf Range



Components of a Longleaf Pine Understory

- Highest quality sites are maintained as early successional habitats with regular fire intervals. Very diverse understories.
- Largest plant families represented are grasses, legumes, and composites

Basic Concept. . .

Longleaf pines leaf and branch structure will allow more light penetration to the understory and this can promote and maintain a diverse understory and benefit many species of wildlife.

Frequent low intensity (growing season) fires increases this effect.

Some Longleaf Resources:

US Forest Service
http://www.fs.fed.us/database/feis/plants/tree/pinpal/all.html

Forest Stewardship Program-UF/IFAS
http://sfrc.ufl.edu/extension/florida_forestry_information/additional_pages/forest_stewardship_program.html

FDACS Florida Forest Service
http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service

University of Florida-UF/IFAS
http://solutionsforyourlife.com/

The Longleaf Alliance
http://www.longleafalliance.org/

United States
Department of
Agriculture

Forest Service

Agriculture
Handbook 654

Silvics of North America

Volume 1: Conifers

Click here for Table of Contents

Volume 1: Conifers - PDF Version

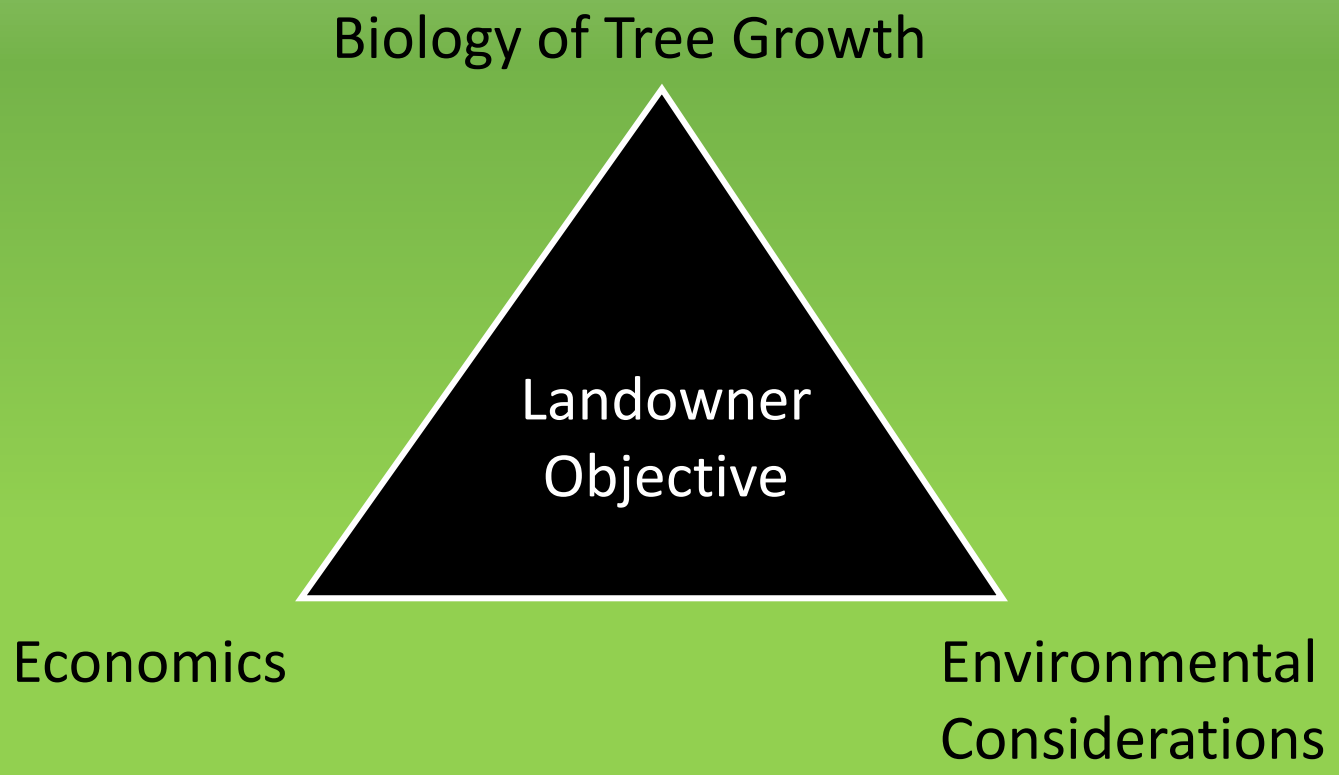
Volume 2: Hardwoods

Click here for Table of Contents-html

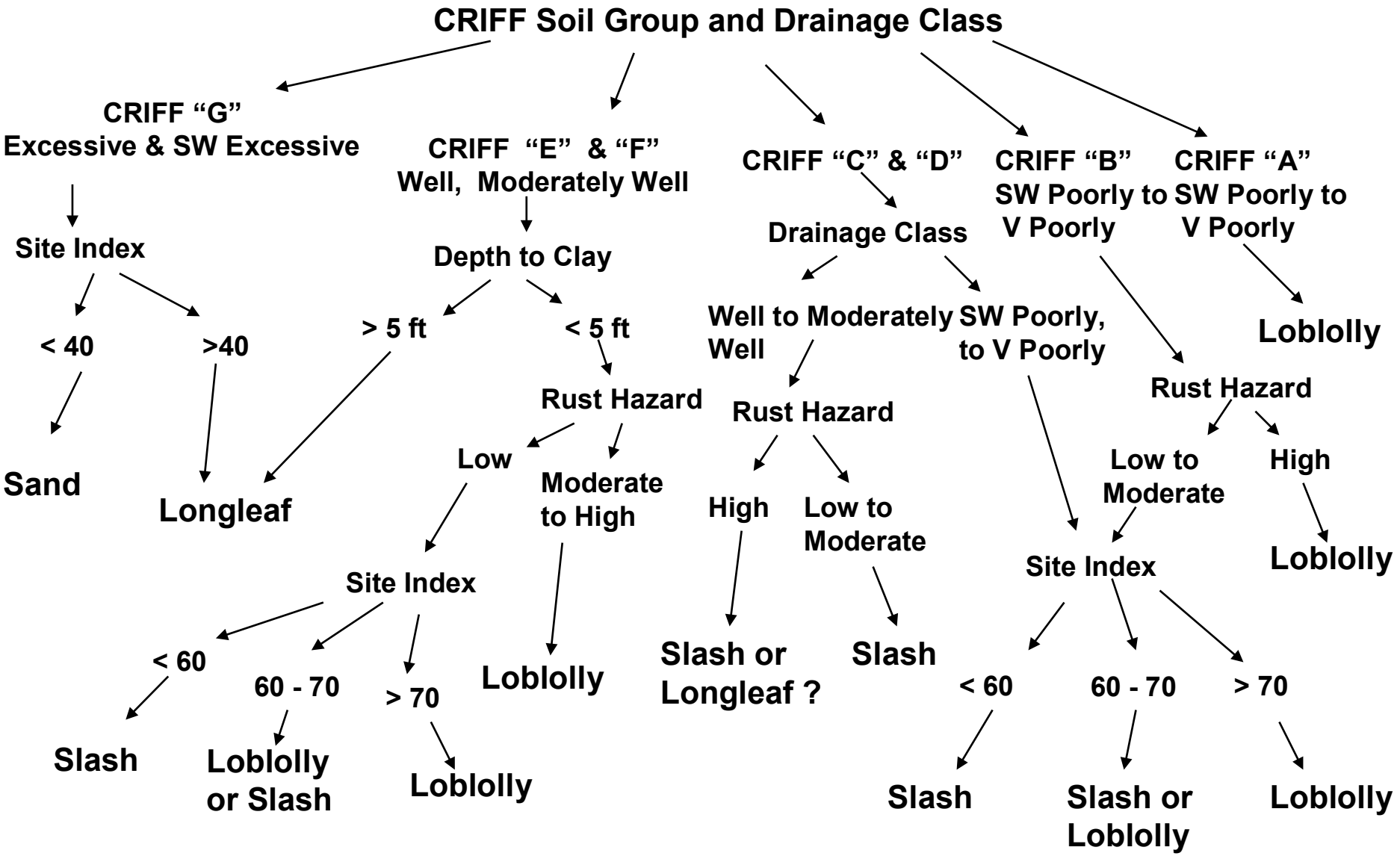
Volume 2: Hardwoods - PDF Version

http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm

The goal of forest management is to meet landowners objectives within existing environmental, economical & social constraints



Species Deployment Decision Key for Southern Pines the Coastal Plain of Georgia, Florida and Alabama



Note: Soils in CRIFF Group H are generally not well suited for pine management

Sweeping Generalizations. . .

For Wildlife. . . except in natural stands of other species. . .

Longleaf on uplands, (shortleaf in red hills can be added) slash is 2nd best.
Wetlands, loblolly, pond and slash pines ok.
Lower pine densities.

For Production

Sand pine on dry sandy sites.
Loblolly on red hills sites (slash produces better quality wood).
Slash on moister sandy sites.

Note loblolly and slash respond to fertilizer if soil test indicates the need.

The more spent on site preparation – the more production of pine trees and less of other plants – lower diversity.

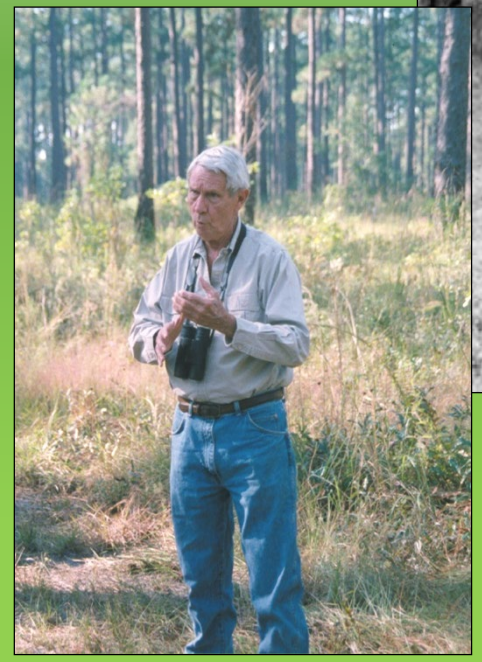
Ecological Adaptations

Species	Seedling tolerance to fire	Mature tree tolerance to fire	Minimum cone bearing age (yrs)	Shade tolerance	Soil moisture regime
Longleaf	High	High	20	Intolerant	Very dry to moist
Slash	Low	Moderate	7	Intolerant	Moist to wet
Loblolly	Low	Moderate	5	Intolerant to moderate	Moist

The Stoddard-Neel Approach

- Developed by Herbert Stoddard in 1930-40's
- Refined and adapted by Leon Neel since 1950's
- Developed through their work on shooting plantations with objectives of aesthetics, wildlife management & hunting, and timber production

Herbert Stoddard

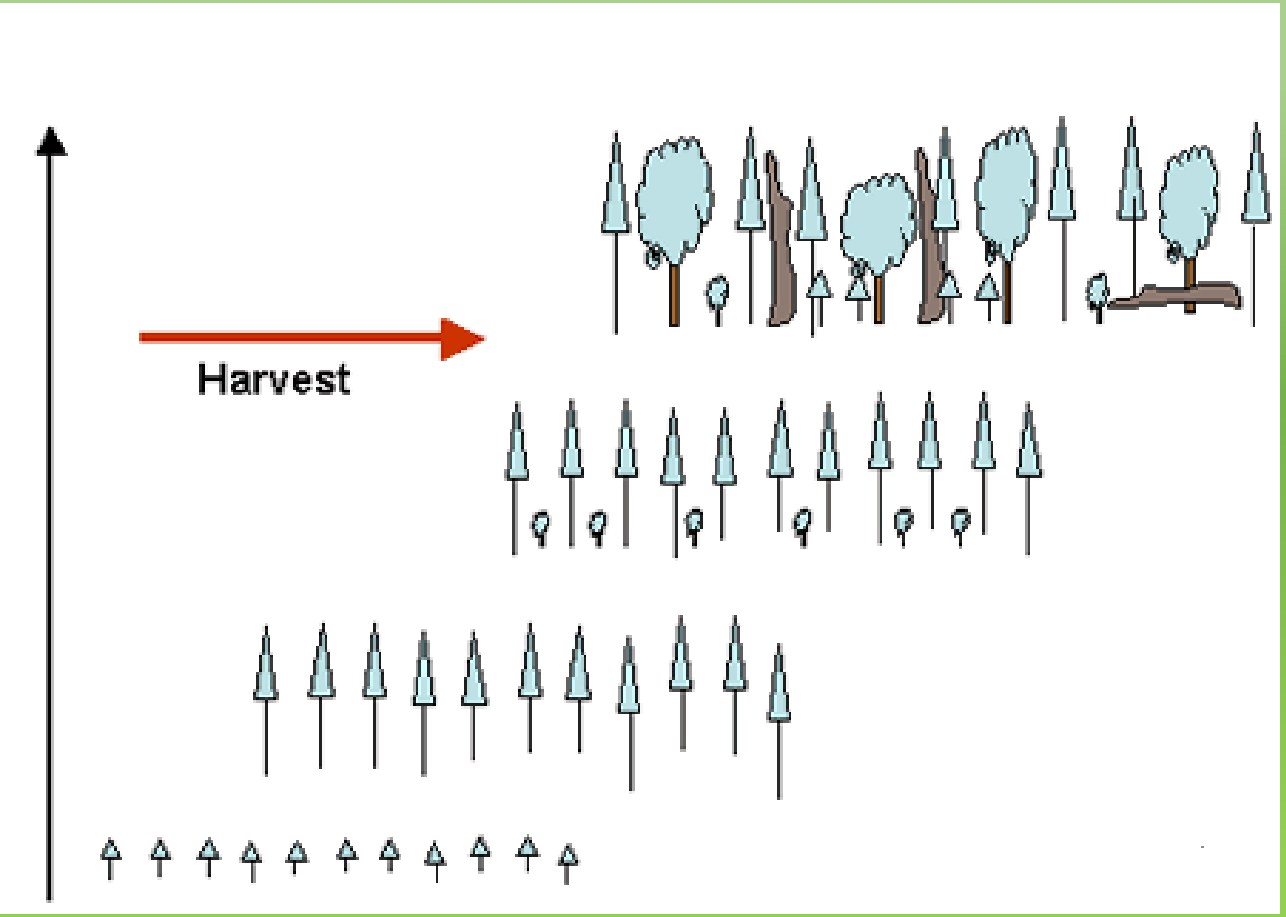


Leon Neel

Central Tenets of the Stoddard-Neel Approach: A Summary

- The resources come first; i.e., the primary goal is to maintain and perpetuate the resources (though resource utilization and income are encouraged and expected)
- The forest is never terminated
- Be patient and think long-term – the process cannot be hurried
- Heterogeneity embraced, not eliminated
  - In structure, spacing, tree characteristics, species

Ecologically-focused Management System



Stylized representation of the development of structural complexity during stand development. In traditional forest management, stands are harvested prior to significant levels of complexity developing.

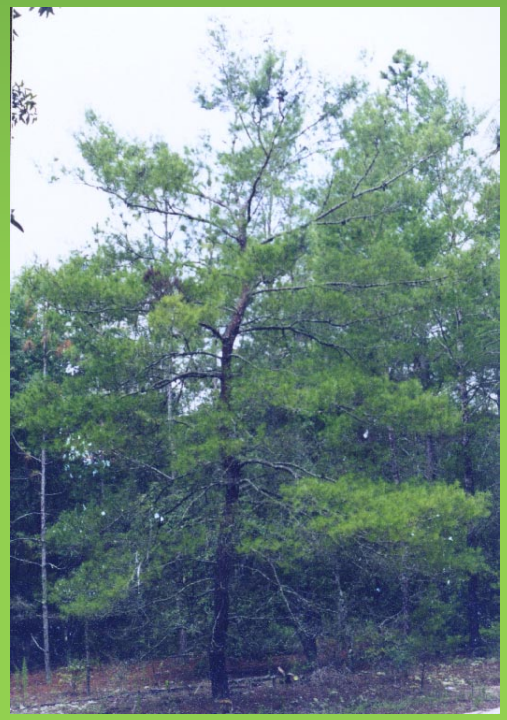
Use Prescribed Fire to Control Understory Vegetation , Fuel Load Build-up & provide wildlife habitat for key species.

Questions?

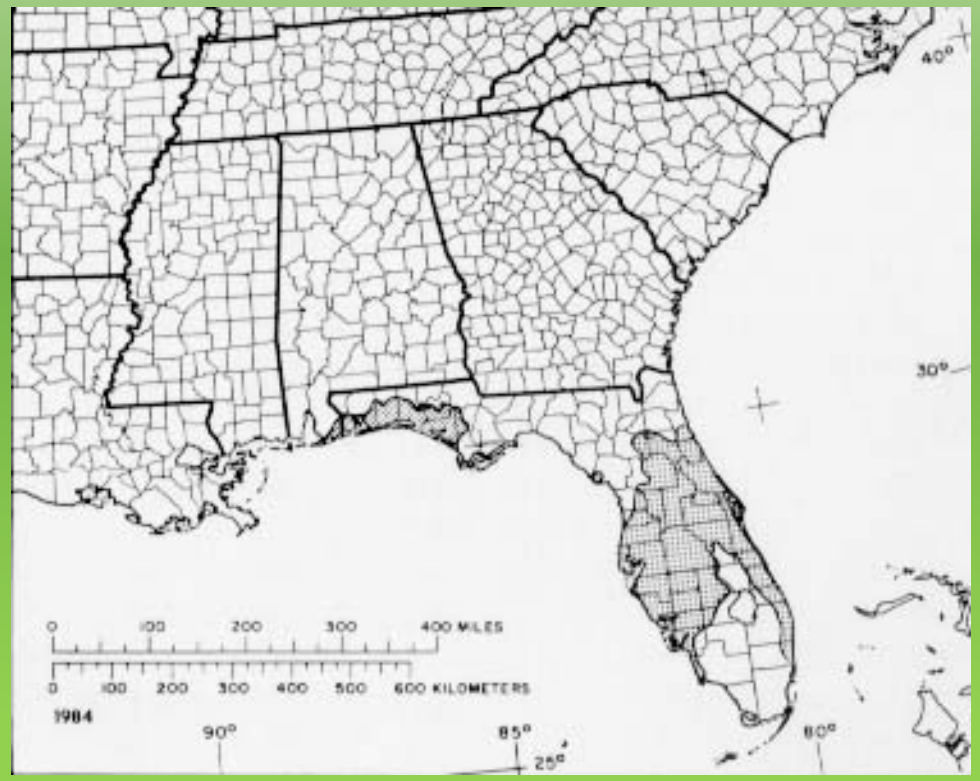
Sand Pine

(Pinus clausa)

scrub pine, spruce pine, Ocala pine and Choctawhatchee pine.



Distribution



From: Silvics of North America

Two geographic races have been distinguished on the basis of cone characteristics:

1. Ocala (var. *clausa*) from northeastern to south Florida

2. Choctawhatchee (var. *immuginata* D. B. Ward) in northwest Florida and Baldwin County, AL

Identification

- This Florida native may grow to 80 feet although it is more common at 25 to 30 feet. The open crown of a mature tree may be rounded or flattened.

- The leaves are needle-like, in pairs, 2.0–3.9 in long.

The bark is smooth and gray when young, becoming thick, scaly and reddish-brown with age.

Identification

- **Cones are closed, 1 - 3 inches in length and unlike other pines may persist on the tree for years.**

- **Ocala sand pine produces mostly *serotinous* cones which can remain closed for years opening only after a fire, occasionally very high summer temperatures on the surface of the sand on which the cones fall will open them.**

- **Choctawhatchee sand pine has mostly non-serotinous cones.**

Soils

- **Well-drained to excessively drained, infertile, acid to strongly acid sandy soils.**

- **This sand is of marine origin, much of which was deposited in terraces developed during the Pleistocene.**

Ecology Continued

Sand pine is moderately intolerant of competition and intermediate in shade tolerance

Sand pine burns only infrequently (60-80 years) and then often with high intensity. After these fires it reproduces well.

It also survives on soils without fire on poor quality and unstable soils.

Further it invades longleaf pine communities if fire is restricted. Often these areas are intentionally planted to sand pine.

Management

- Stressed trees are more susceptible to beetle attack. Keep trees healthy.

- Fire can be very destructive if fuels are high.

- Frequent low intensity fire will favor southern yellow pines over sand pine if control of sand pine is desired.

Products/Uses

- Sand pine is generally used for pulpwood, fuelwood or biomass plantations.
- The tree is highly drought and salt-tolerant. Tends to produce more biomass per acre on droughty infertile soils than other pines.
- Grown for sale as a Christmas tree.

Pond Pine

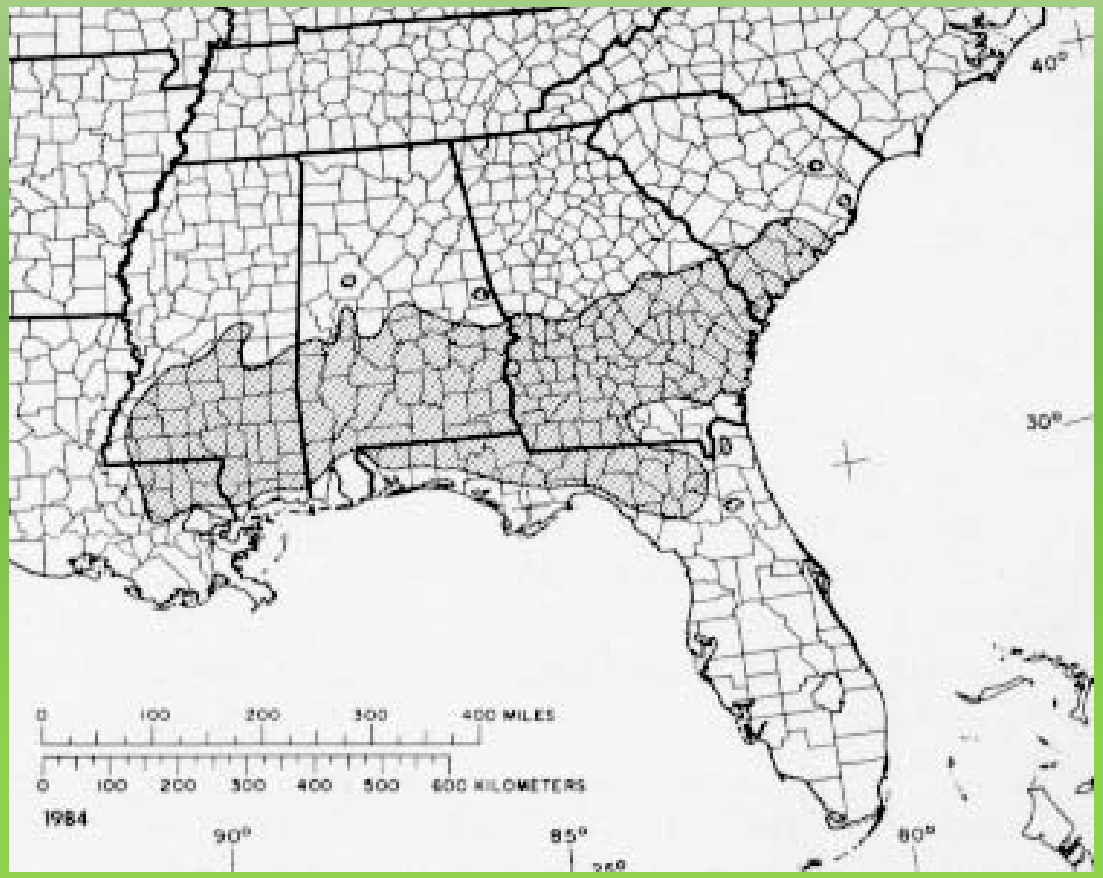
(Pinus serotina)

marsh pine, bay pine, and pocosin pine

Identification

Needles: fascicle of 3 or sometimes 4 and 4-8” long. Often sprouting of the trunk.
Cones: cones are egg-shaped 2-3” long with small prickles on the scales. They are serotinous and thus can remain closed on the tree for many years opening gradually over several years or being opened by the heat of a fire.
Form: often has a crooked growth pattern and an irregular top
Height: 60-70 feet in height, DBH: 1-2 ft Form: often has a crooked growth pattern and an irregular top

Distribution/Soils



From: Silvics of North America

- Pond pine is most frequently found on poorly drained lands in the Coastal Plain of the Southeastern United States.

The soils are sandy, organic, oxygen deprived with low available nitrogen.

Ecology

- **Fires** recurring at intervals of 20 to 40 years is common for pond pine. During drought periods, the fire hazard of pond pine sites is extremely high because of the heavy fuel accumulation in the dense understory. Large areas of unbroken pond pine forests can make fire control extremely difficult. Very intense fires consume not only the trees, shrubs, and litter, but the peat soils as well.

hooded pitcher-plant (Sarracenia minor)

Food: Deer eat on the sprouts and seedlings. Birds and rodents eat the seeds.
Habitat: Pond pine stands provide nesting for the red-cockaded woodpeckers and also provide for many wetland species.

Damaging Agents

- The most serious disease of pond pine is red heart *(Phellinus pini).*

Pond pine is subject to both fusiform rust (*Cronartium fusiforme)* but less so than loblolly pine.

Pond pine is also attacked by the southern pine beetle *(Dendroctonus frontalis),* the black turpentine beetle *(D. terebrans),* and engraver beetles *(Ips* spp.).

Management

- While pond pine shows good growth rate on upland soils it grows more slowly on the wet and infertile soils where it is found. No tree would do better in this situation so manage more extensively than you would a planted upland pine stand on fertile soils.

Products/Uses

- The wood is very resinous and heavy and used for lumber and pulpwood.

Shortleaf Pine

PINUS ECHINATA

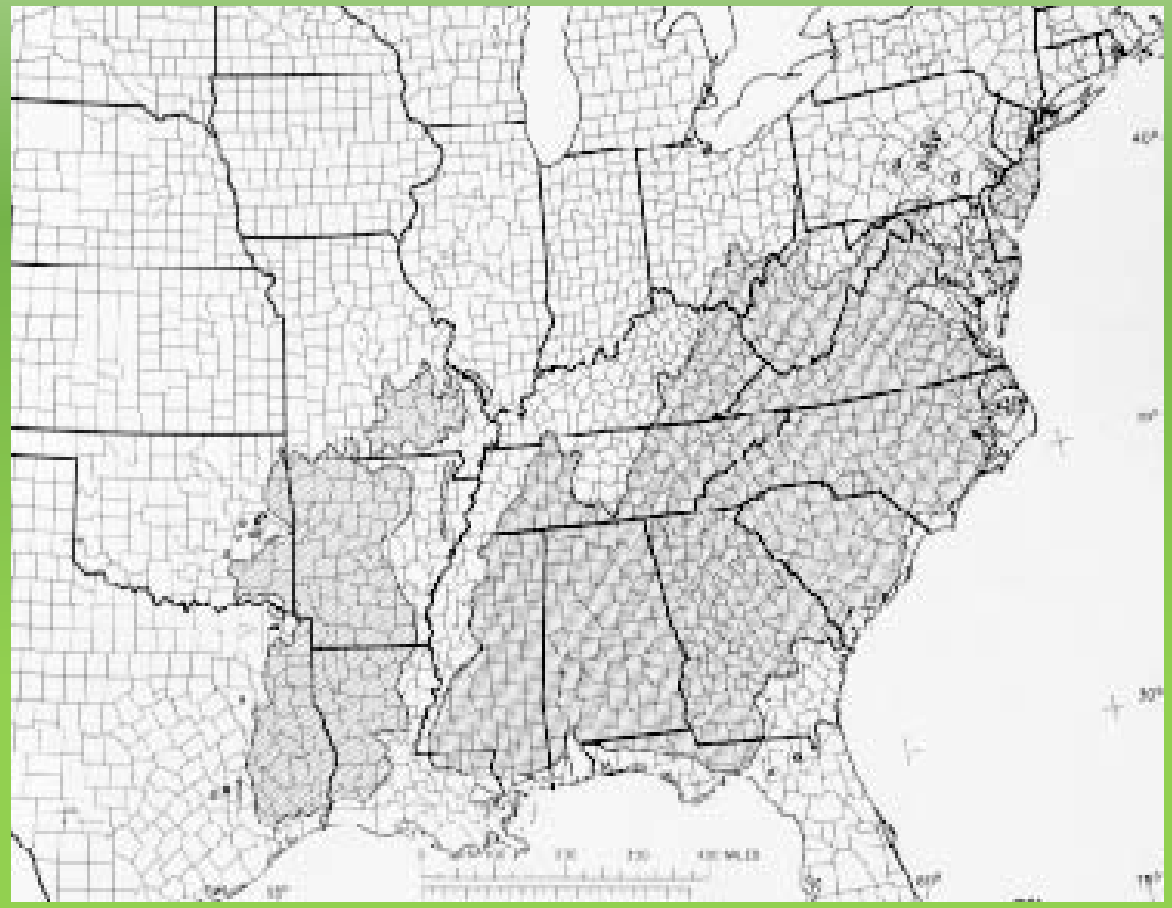
SHORTSTRAW PINE, SOUTHERN YELLOW PINE, OLDFIELD PINE,

ARKANSAS SOFT PINE

Description

Needles: 2 or sometimes 3/fascicle,
2 ¾ - 4 ½ inches long
Cones: single or 2-3/cluster, 1 ½ -2 ½ ”, egg shaped, shed seeds, but remain on branches many years.
Bark: reddish-brown, with large irregular flat scaly plates.
Lifespan: 140 yrs.
Full grown: 70 years
Height: 70-100 ft
DBH: 24 to 36 in.

Distribution/Soils



- Adaptability to a great variety of site & soil conditions partly account for its wide distribution
- Between dry, rocky soils and alluvial bottom land (moist lowland soil)
- Grows best on deep, well-drained soils having fine sandy loam or silty loam textures

Ecology

- Has the widest range of any pine in the Southeastern United States.
- Is one of the four most important commercial conifers in the Southeastern US.
- It is considered a major component of three forest cover types: Shortleaf pine, Shortleaf Pine- Oak, and Loblolly Pine-Shortleaf Pine.
- Grows slower during the early years compared to the other big four Southern yellow pine
- Seedlings develop a persistent J-shaped crook near the ground surface, auxiliary and other buds form near the crook and initiate growth if the upper stem is killed.
- Younger trees (up to 6” to 8” diameter) can sprout vigorously at the root collar if the crown is killed or badly damaged.
- It is a shade-intolerant species and does not survive or grow well when suppressed.
- Source of food for wildlife including bobwhite quail and squirrels, who eat the seeds.
- Older shortleaf pines with red heart rot are primary nesting trees for the redcockaded woodpecker.

Damaging Agents

- Littleleaf disease is the most serious pathological threat
- The young and old trees are moderately susceptible to attack by *Heterobasidion annosum (*a root rot)
- It is generally fire resistant and considered to be windfirm.
- Possible insects and diseases:
  - Nantucket pine tip moths have become a major pest in the Eastern US causing loss of height growth
  - Redheaded pine sawfly is the most destructive sawfly and shortleaf pine is one of its preferred species
  - The southern pine beetle, Ips, and black turpentine beetle also occasionally cause great losses
  - Reproduction weevils are the most serious insect pest of seedlings

Management

- Stressed trees are more susceptible to beetle attack. Keep trees healthy.

- Prescribed burning helps control multiple pests and diseases.

- Tallahassee Red Hills is southern most range, so growth rates may not be as desirable as other three pines.

Products/Uses

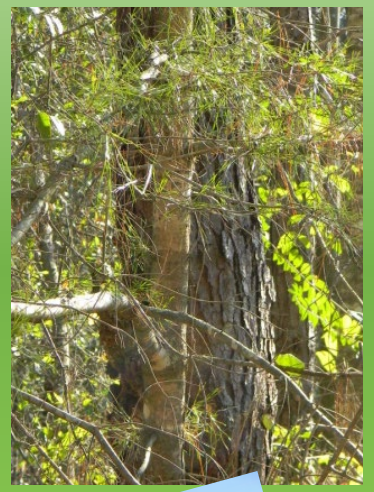
- An important timber species, including pulpwood, plywood and veneer, lumber and other structural materials.
- It’s genes have been used in breeding programs to develop more fusiform rust resistance into other pine species.
- Use as a Christmas tree
- In urban areas planted as an evergreen ornamental and as a screen.
- Medicinally it had been used historically to treat worms, induce vomiting, sooth back pain and swelling, and to build canoes.

Spruce Pine

Pinus glabra

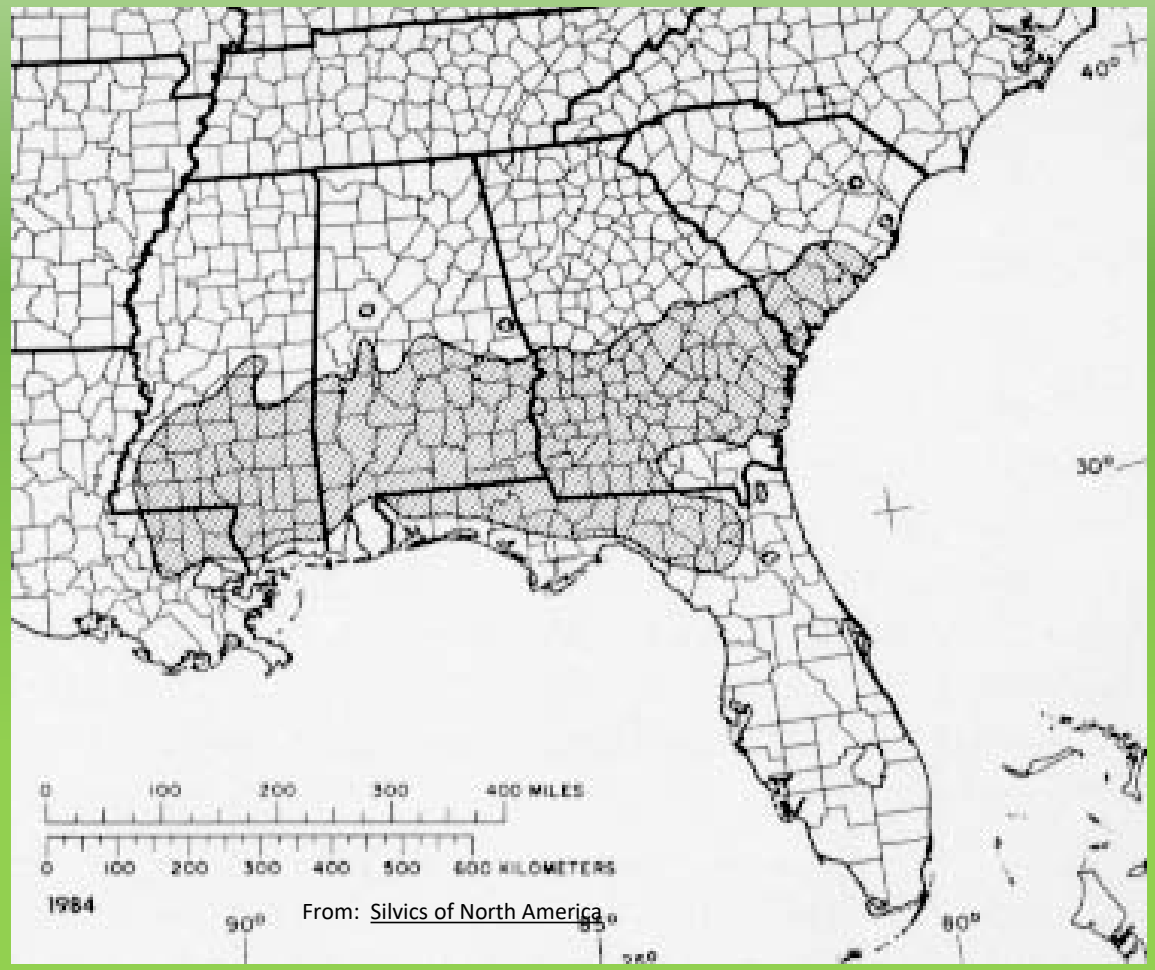
ced pine

Description



Needles: 2/fascicle, 2-4” twisted
Cones: single or 2-3/cluster, 1-2.5”, egg shaped, shed seeds, but remain on branches 3-4 yrs.
Bark: not plated (resembles southern red oak) smooth, light gray on immature, becoming darker w/shallow fissures & ridges which become scales on mature boles
Lifespan: 113 yrs.
Full grown: 60 to 75 years
Height: 90-120 ft (open grown: 30-50ft)
DBH: 24 to 36 in.
Pruning: Self-pruning up to 60 ft in stand

Distribution/Soils



From: Silvics of North America

- acidic sandy loam soils (spodosols & entisols)
- high organic matter
- between dry sandy soils and alluvial bottom land (moist lowland soil)
- often poorly drained areas/high water table
- often along stream banks or on rich moist hummocks

Ecology

- Most shade-tolerant species of southern pine
- Rarely occurring in pure stands (singly or small groves)
- Grows slowly
- Climax species, but can grow well in disturbed areas in sun
- Often establishes in the shade of hardwoods such as magnolia, gum, hickory, beech, and oak (live, cherrybark, or swamp chestnut), and may eventually overtop them
- Scattered throughout the southeast in mixed pine hardwood stands growing in limited numbers in swamps, river valleys, on hummocks, and along river banks
- Commonly associated with Loblolly Pine, Shortleaf Pine, Slash Pine, elm, holly, cherry, hawthorn, fringetree, sweetgum, sassafras, red maple, yellow-poplar, pondcypress, loblolly-bay, southern redcedar, flowering dogwood, sourwood, redbay, sweetleaf, beautyberry, southern bayberry, inkberry, sweet pepperbush, Alabama supplejack, blueberry, poison-ivy, greenbriar, blackberry, and grape.
- When invading old/cleared fields often established in the shade of loblolly and shortleaf pines
- Provides some habitat for wildlife including songbirds, owls, turkeys and hawks all use the trees for cover, roosting or nesting.
- Source of food for wildlife including bobwhite quail and squirrels, who eat the seeds.

Damaging Agents

- Highly susceptible to fire because of its thin bark
- Less susceptible to insect and disease damage than are the other southern pines
- Immune/resistant to infection by Fusiform rust (*Cronartium quercuum* f. sp. *fusiforme)*
- Planted outside its native range:
  - *Cronartium comandrae*
  - Nantucket pine tip moth *(Rhyacionia frustrana)*
  - Gall mite *(Trisetacus floridanus),* attacks terminal shoots and causes the formation of galls and shortening of the shoot. No control is known for this insect.
- In urban/landscape areas:
  - Pine blister rust and borers
  - Canker diseases may occasionally cause dieback
- Other Possible insects and diseases:
  - Sawfly larvae (rapid defoliation)
  - Pine needle miner (yellow and dry needles)
  - Pine needle scale
  - Pine tortoise scale
  - Pine spittle bug (relatively harmless)
  - Spruce mites (older needles become yellowed/stippled)
  - Adelgids (white cottony growths on the bark)
  - European Pine shoot moth (young shoots to fall over/exude resin)
  - Bark beetles

Management

- Canker diseases may occasionally cause dieback of landscape Pines. Keep trees healthy and prune out the infected branches.
- Stressed trees are more susceptible to beetle attack. Keep trees healthy.
- May be planted as Christmas trees
- Grows best without grass competition

Products/Uses

- Wood is brittle, close-grained, nondurable, low in strength, warps easily, and is of limited commercial importance (good quality lumber, Duncan)
- Can be used for pulping operations (2/3 fiber length of other southern pines)
- Use as a Christmas tree (productivity is ½ the popular Virginia pine)
- Use as a windbreak, large-scale screen, or specimen
- Bonsai
- Has been used experimentally as a rootstock for loblolly pine

QUESTIONS?

- **Please use the Q&A function for questions**

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Please fill out the Evaluation for this Webinar
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Forest Recovery Webinar Series

Next Webinar: September 24, 2020
2:00 pm ET (1:00 pm CT)
Keys to Success with Longleaf Pine and Enviva Biomass Partnership

Ad Platt, Vice President for Operations, The Longleaf Alliance
Ben Larson, Director of Sustainability, Enviva
Shawn Cook, Sustainability Forester, Enviva
Billy Clark, Commodity Manger, Enviva

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