

Burning Longleaf

The Pine that Fire Built

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Longleaf Foundations





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Burning Longleaf

Arguably, the Most Fire-Adapted Tree in North America

- Highly resistant to fire in the grass stage
- Resprouts after fire
- “Rockets” quickly to height above most flame lengths
- Thick insulating bark
- Needles are primary carrier of fire
- Seeds need mineral soil to germinate



Remember that longleaf is fire resilient, not fire-proof



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





Benefits and Objectives of Fire in Longleaf

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



Cypress Fire- Angelina National Forest

February 2014



The
Long

ng Longleaf

Burning Young Longleaf

- First, decide why you should burn
 - Let your objective determine when
- Know and understand your fuels
- Avoid periods of active height growth (exposed candling)
- Avoid backing and intense ring fires; use grid ignition and strip-head fires instead



Young Longleaf

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



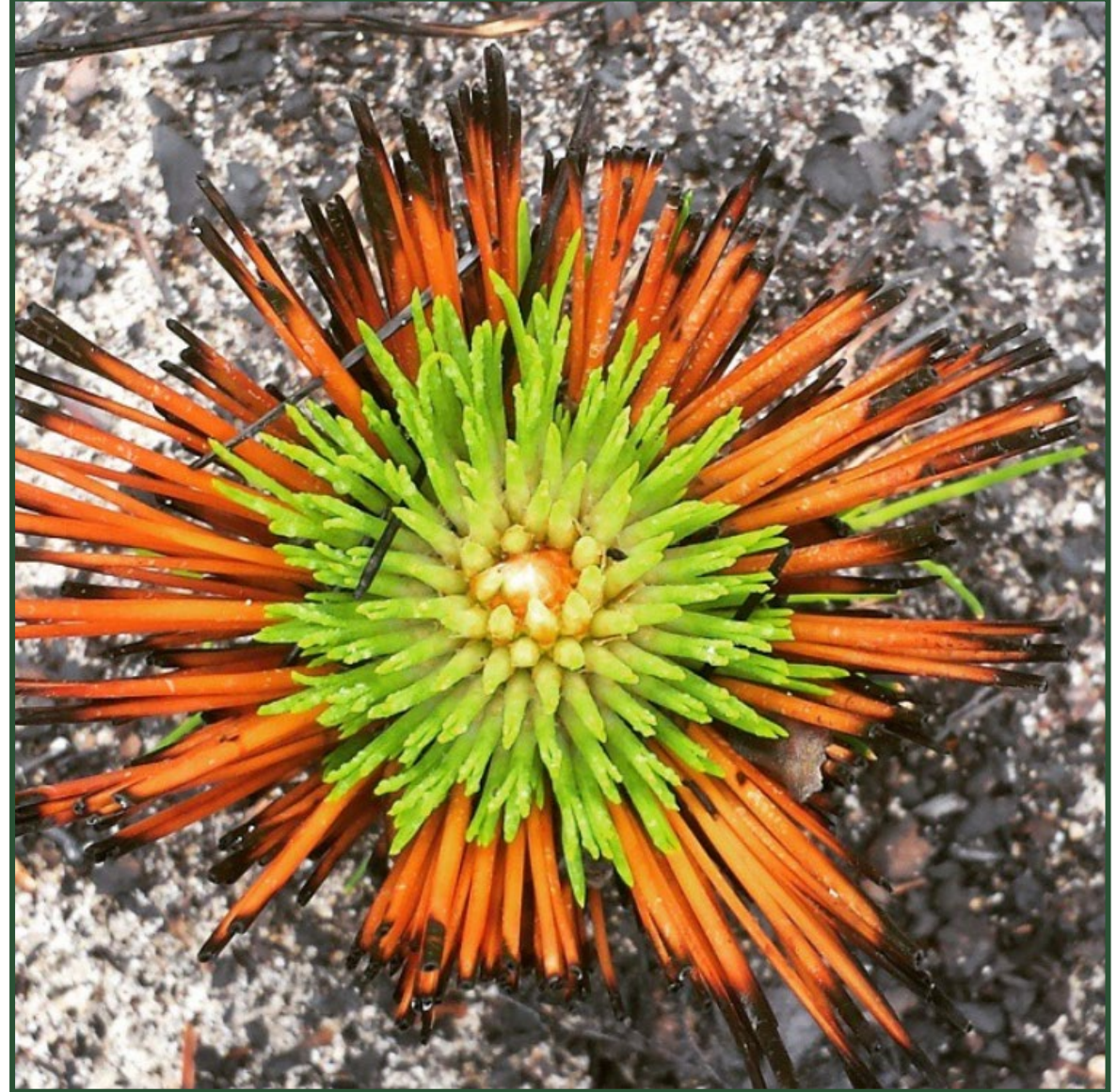
1 Year Old—Winter Burn



Resilience at the grass stage



Resprout at six-months post-burn





Longleaf vs. Loblolly



- Studied post-fire survival on study plots at the Solon Dixon Center, Andalusia, AL
- Planted Longleaf with seeded-in Loblolly
- Survival measured by height classes
 - **Grass Stage (longleaf)**
 - **<1" (loblolly)**
 - **1-3"**
 - **3-6 "**
 - **+6"**



What We Learned—

- **Longleaf out-survives Loblolly in all height classes**
- Even at the vulnerable 1-3”
- But loblolly survival was far worse at same height (1-3”)
- Grass stage longleaf, 3-6” and +6” did extremely well
- **At 6 feet tall**, both trees have comparable survival rates—
window has closed on loblolly control!



1-3' tall young longleaf—Winter Burn



Photo: R. Thompson



1-3' tall young longleaf—Winter Burn



Photo: R. Thompson



Longleaf vs. Loblolly Early Fire Studies from The Longleaf Alliance

The Takeaways—

- Advantage for burning longleaf early in grass stage where loblolly is going to be an issue. Longleaf can take some heat where loblolly will perish— **Exploit their differences.**
- Loblolly survival dramatically increases at **6 feet---** window closing to control with fire— **Burn Early.**
- Loblolly has many characteristics of a weed—repeated fires needed to kill and suppress germinants—**Burn Frequently!**



No burn (or not soon enough)?



Second Burn



General Guidance on Burning Young Longleaf Pine

Avoid Burning

- Trees have been in the ground < 1 year
- RCD < 0.4"
- Poor vigor
- Exposed candles



General Guidance on Burning Young Longleaf Pine

Avoiding Exposed Candles



General Guidance on Burning Young Longleaf Pine

Use Caution

- Air temp > 80°F, RH < 25%, or winds < 5 mph
- Reduced seedling vigor
- Seedlings out of grass-stage to 5' (< 2" RCD)
- Backing fire as primary ignition technique
- Headfires where flame height=seedling height
- Heavy fuel loads
 - Heavy slash and logging debris
 - Pasture grasses, invasives, dense native grasses



General Guidance on Burning Young Longleaf Pine

Head Fires

vs.

Backing Fires



@scbobwhites



ALPFC



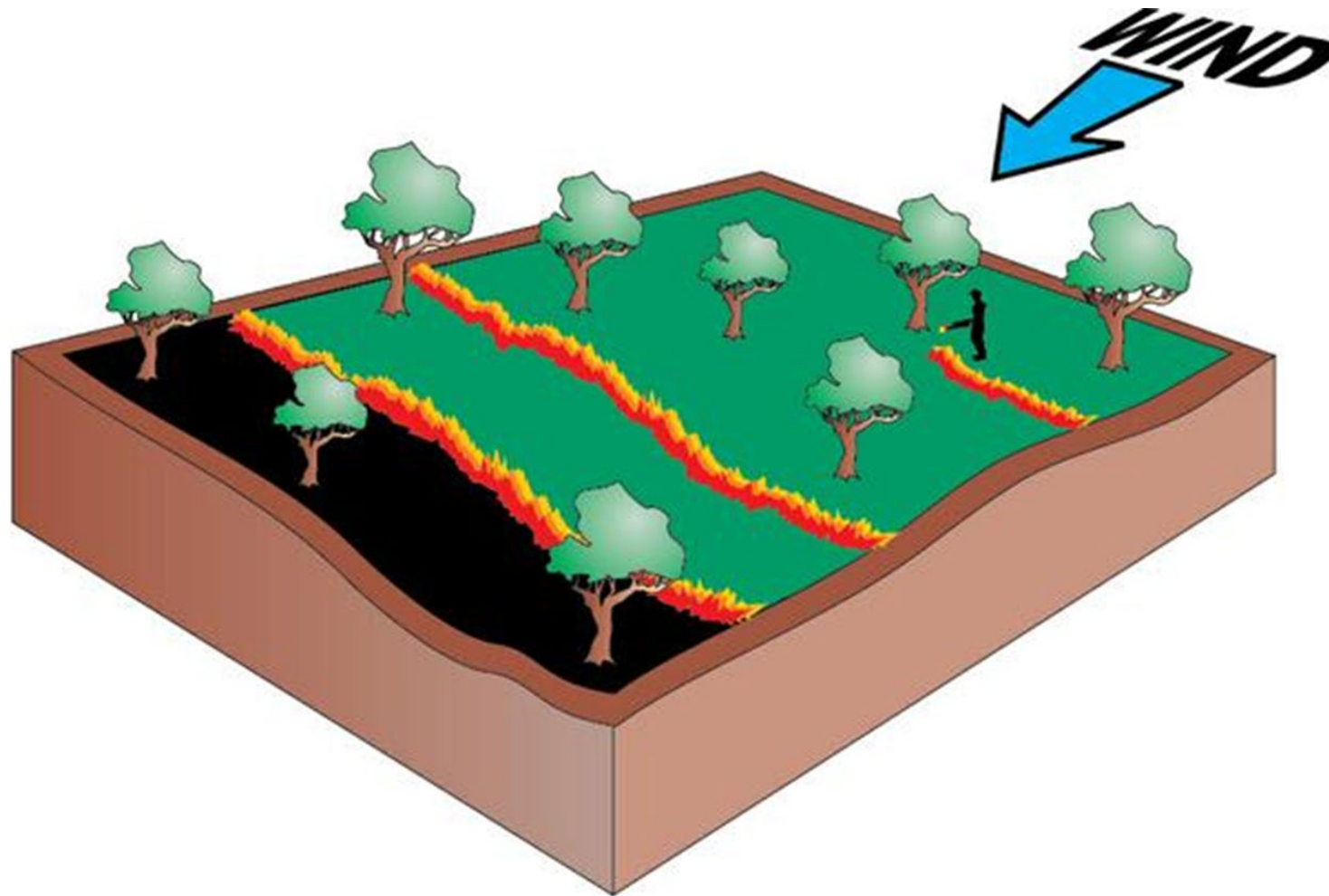
General Guidance on Burning Young Longleaf Pine

Good Conditions

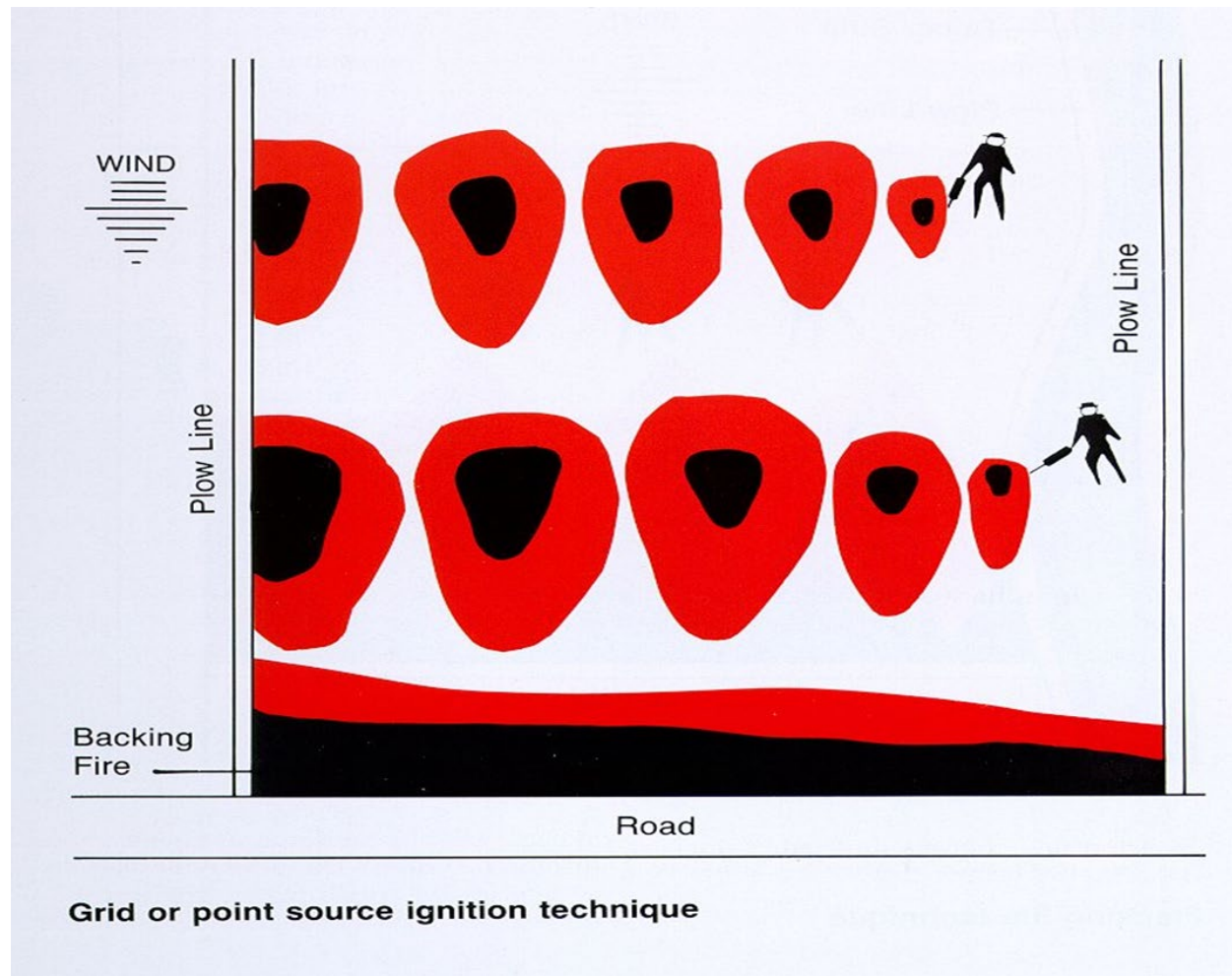
- Seedlings in grass-stage or 5'+
- Air temperature 40s and 50s
- Reliable wind forecasted
- Fuels are in moderation
- Strip-head fire and point-source ignition are used as primary techniques



Strip-head Fire Ignition



Point-source Ignition



8 year old, ag field longleaf—Winter Burn



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Burning Longleaf

Plantation Longleaf—winter burn in high humidity



Photo: J. Hatcher



Fire plots at the Escambia Experimental Forest (USFS)

Mix of dormant & growing season burns

(Photo taken in March)



A

all photos by Becky Estes



B

Mix of dormant & growing season burns

(Photo taken in July)

Primarily dormant season burns

(Photo taken in March)



C



D

Primarily dormant season burns

(Photo taken in July)



“Pyrodiversity Begets Biodiversity”



Painting by Philip Juras



ADVANCES IN UNDERSTANDING DUFF FIRES IN LONGLEAF PINE FORESTS



**Kevin Hiers, Morgan Varner,
Jesse Kreye, and Joe O'Brien**



**Restoration of Fire to
Long-Unburned
Longleaf Pine Forests**



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Burning Longleaf

Longleaf Forests Without Fire

Decline in
herbaceous
biodiversity

Increase in litter
accumulation &
cultivation of duff

Increase in fire
severity

Change of
composition toward
fire-inhibitive species



Approaching prescribed fires more deliberately in duffy areas



Consequences can be grim...



And delayed.

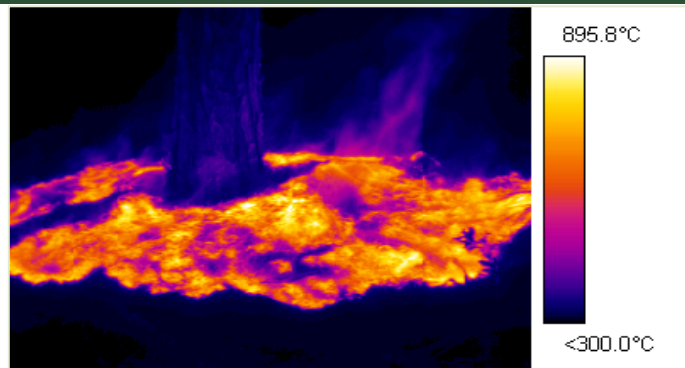


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A Look at Smoldering Fire

5 Minutes
Post-Ignition

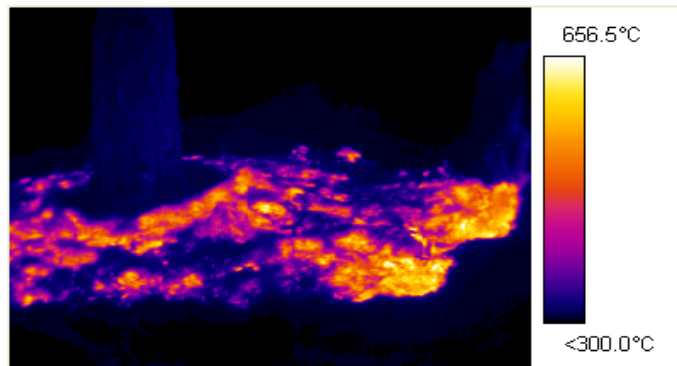


895 C= 1643 F

300 C= 572 F



8 Minutes
Post Ignition

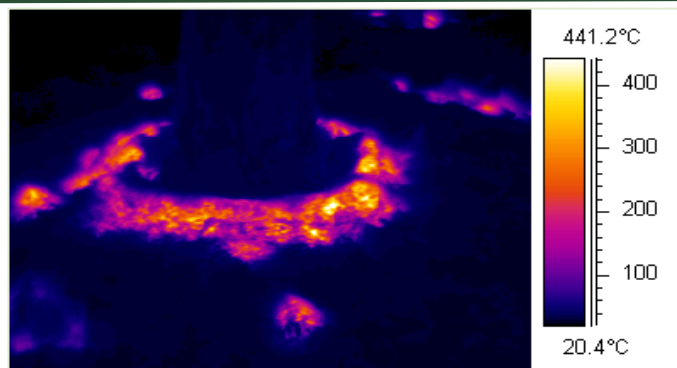


656 C= 1212 F

300 C= 572 F



110 Minutes
Post-Ignition



441 C= 825 F

20 C= 68 F



Slide by Kevin Hiers



What we've learned

Pine Mortality:

- Impacts from duff consumption may be delayed over 2+ yrs.
- Mortality may be extensive (>70%).
- Destruction of roots caused cascade of insults leading to tree death with <30% consumption

Safe Burning Conditions:

- Are identifiable.
- More conservative than thought.
- Varies seasonally and inter-annually.



Slide from Kevin Hiers



...through trial and error

- Burn when the duff layer is moist to the touch and only the litter layer is dry.
- Cumulative rainfall is key!
- Use fast moving, close strip headfires
- Minimize crown scorch
- Don't try to remove several decades of fuel accumulation in one or two fires – be patient



Litter and duff monitoring



Other Considerations



- Mop up smoldering duff when feasible
 - Don't try to rake duff back from tree boles
 - Removing woody fuels doesn't help much
 - Be prepared for some mortality
- It will take several careful fires to reach a point where normal fire regimes can be re-introduced and understory and fuel conditions return to "normal"



If you burn.....

- Become a Certified Burner!
- Burn (volunteer) with more experienced individuals
- Use quality gear
- Learn about weather and forecasting tools
- Develop a written burn plan and prescription
- Clearly state objective(s) and owner's intent
- Team up with others – don't go it alone



.....or if you contract

- Seek out one with experience burning longleaf, of all age classes
- Talk over your objectives; make sure they are heard
- Right burn day vs. “everyday is a burn day”
- Gain training and experience in order to make informed decisions—Certified Burner, Longleaf Academies, field days, PBAs or PFCs





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The Longleaf Tree: A Natural History

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