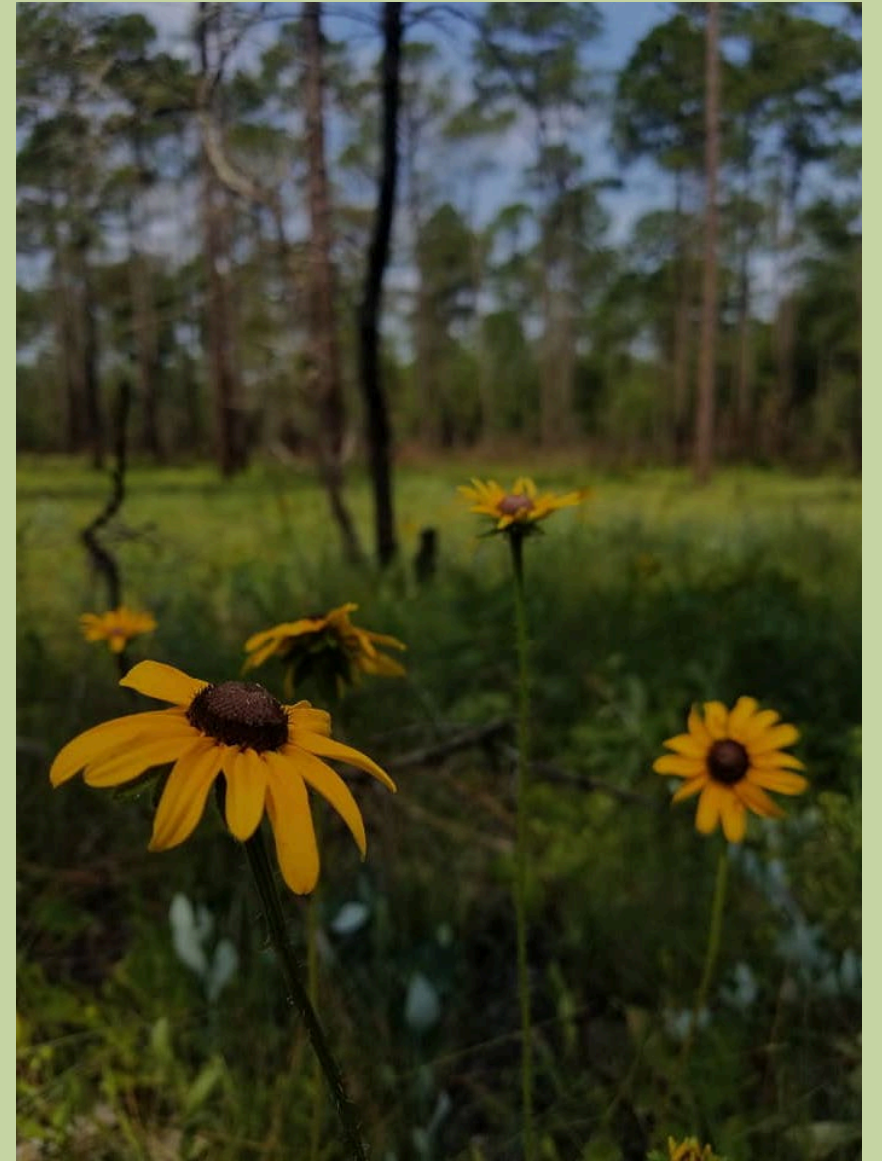


# Restoring and Managing Longleaf Understory

Jacob Barrett

Technical Assistant & Training Specialist



The Longleaf Alliance  
Longleaf 101 Academy

*Understory Restoration & Management*

# Objectives

- Why restore the understory?
- Site-prep
- Understory composition
- Source materials
- NWSG establishment
- Management



# Tree Restoration is Widespread



# Why Restore/Preserve an Intact Understory?



- Species Diversity
- Aesthetics
- Quality Habitat
- Recreation
- Economics
- Rx Fire



# Longleaf Specialists and Residents..just a few



# Floral Species Diversity

- Frequently burned sites have higher species number at small spatial scales
- Species Richness increases with higher soil moisture content
- Composition varies across the region as well as across moisture gradients



# Fine Fuels

- Understory species provide necessary fine fuels
- Grasses are especially beneficial
- Perennial species that are adapted to fire
- Some species require fire for blooming and seed set
- Pine fuel?





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# Wildlife Habitat Enhancement

- Landowners have increased interest in achieving the historic look of longleaf system on property
- Greater diversity in the understory is proportional to diversity of wildlife
- Understand link between quality early successional habitat and conditions favorable for wild gamebird populations:
  - Quail
  - Turkey



# Rare Species Habitat Restoration

- Many of the rare species that occur in the longleaf system require good quality understory
- Landowners are managing lands to create good habitat
- Large private and government lands are especially involved in understory restoration to benefit rare species



# Components of a Longleaf Pine Understory

- Highest quality sites are maintained as early successional habitats with regular fire intervals
- Largest plant families represented are grasses, legumes, and composites
- Species are generally referred to as either grass or forb



Sundial Lupine

Lopsided Indiangrass

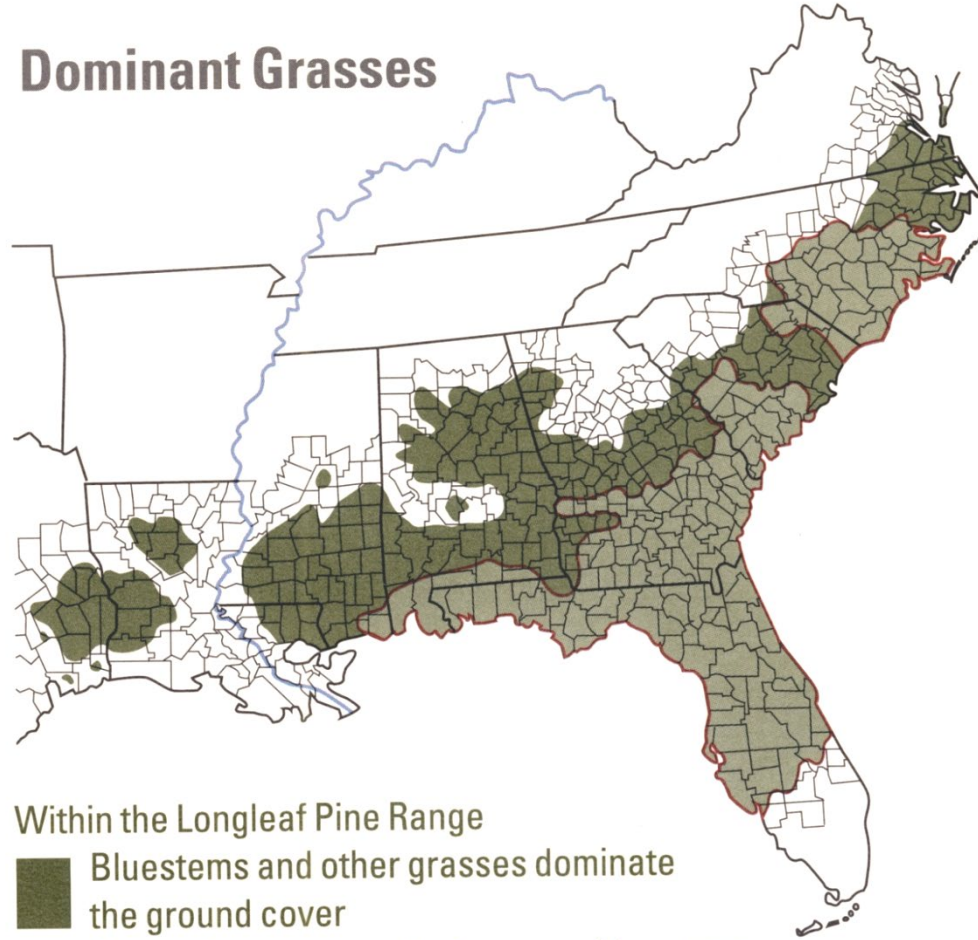


# What is a Native Warm-Season Grass?

- Active growth during spring and summer
- Maximum growth at 60°F and soil temperatures of 55°F
- Optimum temperatures for seed production - 85-95°F
- C4 grass (higher photosynthetic potential compared to C3)
- Can withstand harsh environmental conditions (drought, high temperatures, etc.)



## Dominant Grasses



Within the Longleaf Pine Range

■ Bluestems and other grasses dominate the ground cover

■ Approximate range of wiregrass. Bluestems may or may not be present



# Composites

## Asteraceae – Sunflower Family

- One of the largest flowering plant families (~1100 genera & 19,000 species)
- Many well adapted to temperate, montane, or dry regions
- Found from xeric to wet-mesic sites within the longleaf ecosystem
- Mostly herbaceous plants but a few are shrubs or trees
- Characterized by flowers arranged in a head subtended by bracts
- High pollinator value



# Importance of Legumes

- Important contributors to the overall diversity of the longleaf pine ecosystem
- Foliage of legumes is preferred forage for white-tailed deer, gopher tortoises, rabbits, and pocket gophers
- Seeds are a component of the diets of bobwhite quail, wild turkey, small mammals, and seed-eating songbirds
- Legumes can convert atmospheric nitrogen into forms usable by plants



# Where do I Start?

- “Well, it depends...”
- What is the current status of the land?
- Are desirable species present?
- Can restoration be achieved with fire and time alone?
- Do you have the time?



# FIRST: Control Invasive Exotics Before Restoration

- Kudzu
- Cogon Grass
- Privet
- Autumn Olive
- Bicolor/Sericea
- JCF ?
- Etc..



# Thoroughly Remove Pasture Grasses on Agricultural Sites

- Bermudagrass
- Bahiagrass
- Fescue Grass



# Site Preparation



# Site Preparation

- Don't destroy an intact herbaceous layer during site preparation
- More intensive prep required if invasives or pasture grasses are an issue
- Use aggressive chemical treatments to manage invasive species
- Woody competition can be controlled with fire, mechanical, and/or chemical treatments



# Gopher Tortoise Burrows



# Complete Overhaul?



Credit: Texas A&M



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# Intensive Site Prep or Straw Plantation?

- Very Little to No Understory Composition
- Keep Fire in Rotation to Control Fuel Loading



# The Pieces Are There...

- Native Groundcover Species are Present
- No Barriers to Rx Fire
- Mechanical and/or Chemical Treatments?



# Maintenance Phase?



Rx Seasonal Diversity, but Mostly Growing Season Fires



# Plant Material Sources

- Obtain material from:
  - Commercial producers
  - State nurseries
  - Donor sites
- Planting options:
  - Live Material (plugs)
  - Seed Material
- Best to look for ecotype seed/plants that are locally sourced



# Planting Live Material

- Target density for wiregrass is  $\sim 3$  plants/m<sup>2</sup>
- Can be planted by hand or with mechanical tree planter equipment



# Planting Seed Material

- Good seed to soil contact
- No more than 1/4" deep
- Seeding Methods
  - Seed Drills
    - Allows for precise placement of seed
  - Broadcast seeding
    - Disked sites should be compacted prior to and following seeding
    - Use a carrier



# When to plant?

## *Season*

- Dormant season
  - Natural cold/moist stratification
  - Winter rains
  - Increase by 25%
- Spring
  - competition control

## *Timing*

- Still unsure of optimal order for planting (i.e. seeding before or after longleaf planting, planting grasses after first thinning, etc...)



# Steps to successful NWSG Establishment







Pure Live Seed = Purity X Germination





Clean seed is easy to recognize



# Steps to successful NWSG Establishment



# OLD FIELD WEEDS



# General Time-line of Site Prep

## July-October (summer before)

- Mow fields and allow weeds to re-sprout
- Spray 32-48 ozs of Chopper Gen II herbicide with 2-3 quarts of Methylated seed oil

## March-May 15

- Mow fields and allow re-sprout
- Spray 2-4 quarts of round-up with 3-4 ounces of Imazapic herbicide



# Steps to successful NWSG Establishment



1. SEED SELECTION
2. SITE PREPARATION
3. PLANTING METHODS

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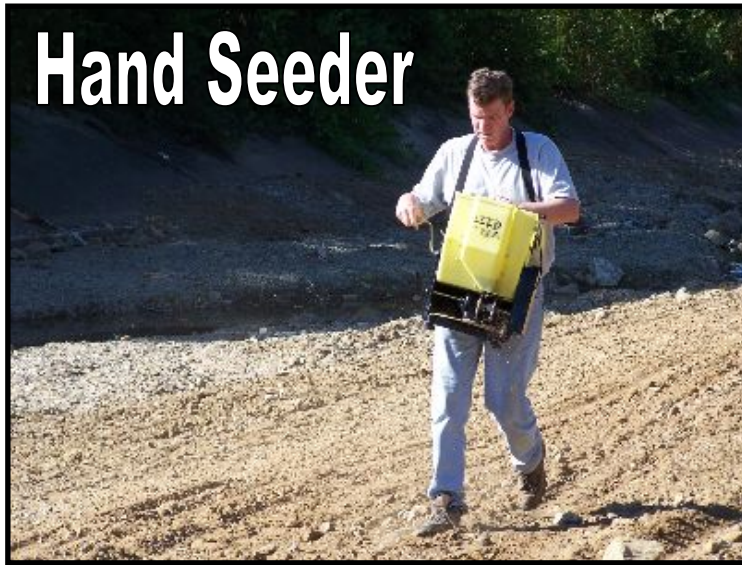
# Important Considerations Before Planting NWSG's

- High Quality Seed
- Firm Seedbed
- Even Seed Distribution
- Planting Depth  $\frac{1}{4}$ " max
- Moisture

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# Planting Methods



**Hand Seeder**



**Spreader**



**Native Grass Drill**



**Cultipacker**



# Planting Methods

## Conventional Drill



# Planting Methods

## No-Till Drills

### PROS

- No-Tillage
- Some are made for NWSG
  - Can do large areas
- Precise calibration of seed

### CONS

- Very expensive
- Some are difficult to calibrate
- May require large tractor
  - Transportation



# No-Till Drills



**\$12-20,000**



Truax      Sukup      Hay Buster

Crust Buster      Kasco

Grasslander      Tye      Great Plains



# Grasslander Drills

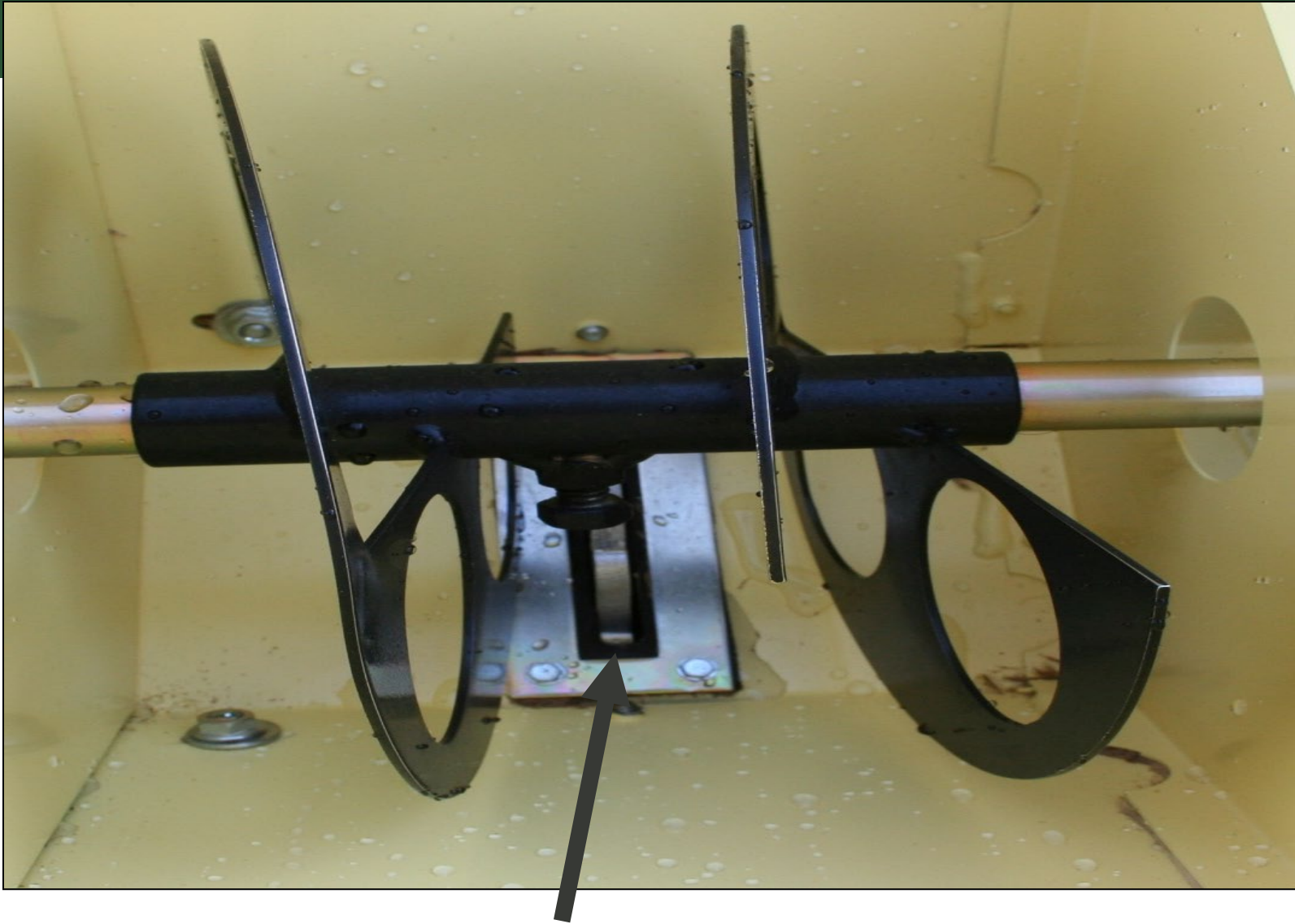
Built to Plant NWSG



# Truax Drills

Built to Plant NWSG





Picker Wheels



# No Groundcover, No Habitat, No Food, No Fuel, No Ecosystem



# Examples



- Webb, AL





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# Understory Restoration Resources:

## Seed Suppliers:

Roundstone Native Seed – [www.roundstoneseed.com](http://www.roundstoneseed.com)

Native American Seed – [www.seedsource.com](http://www.seedsource.com)

Ernst Conservation Seed – [www.ernstseed.com](http://www.ernstseed.com)

## Restoration Contractors:

Lolly Creek – [www.lollycreek.com](http://www.lollycreek.com)

## Technical Advice:

The Longleaf Alliance – [www.longleafalliance.org](http://www.longleafalliance.org)

State Agencies (Forestry Commission, DNR)

