

Our Roots Run Deep

10th Biennial
Longleaf Conference

And

9th Eastern Native
Grass Symposium

October 21 – 24, 2014

Renaissance Riverview Plaza Hotel

Mobile, Alabama



Co-hosted by The Longleaf Alliance

&

The Eastern Native Grass Alliance



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Welcome to the 10th Biennial Longleaf Conference and 9th Eastern Native Grass Symposium. The Longleaf Alliance is excited to return to Mobile after 20 years and to celebrate all of the significant accomplishments made over the past 2 decades. Much has happened since we last met in Nacogdoches, TX. Longleaf Implementation Teams have been established in all 17 Significant Geographic Areas, funding and accomplishments are growing and expanding, and longleaf has become an emphasis of timberland management all across the southeastern United States. For the first time in over a century, longleaf acreage has increased from an estimated 3 million acres to 4.4 million acres. These successes are a direct result of the work that you do every day.

However, even with these achievements, there is still much work yet to be done to conserve existing longleaf habitat and continue the positive trends in restoration. Take advantage of the opportunities presented at this conference to not only network with other landowners and natural resource professionals from the longleaf community but also to learn from experts that work in varying grassland habitats across the eastern US. Networking leads to partnerships and partnerships have resulted in the successes that we are celebrating this week. Have fun and welcome to Mobile!

A handwritten signature in black ink that reads "Robert Abernethy". The signature is written in a cursive, flowing style.

Robert Abernethy
President, The Longleaf Alliance

Conference Sponsors

The Longleaf Alliance

Old Growth

US Fish & Wildlife Service

Pole Stage

Poarch Band of Creek Indians

Rocket Stage

Forest Investment Associates

Joseph W. Jones Ecological Research Center at
Ichauway

Grass Stage

Alabama Treasured Forest Association

Dow AgroSciences

Roundstone Native Seed

Seedling Stage

Delaney Development

National Wildlife Federation

Resource Management Service

Sun Grant Initiative

Sustainable Forestry Initiative

Eastern Native Grass Alliance

Piney Dropseed

Ernst Conservation Seed

Wildrye

Mississippi Agricultural and Forestry Experiment
Station

Mississippi State Extension

Mississippi State University Department of Plant
& Soil Sciences

Prairie Creek Seed

Roundstone Native Seed

Rivercane

National Wild Turkey Federation

South Mississippi Electric Power Association



America's Longleaf Restoration Initiative 5 Year Anniversary Reception Sponsors



Conference Exhibitors

Ag-Renewal, Inc.

ArborGen

Beaver Plastics Ltd.

Berger

Blanton's Longleaf Container Nursery

Deep South Growers

Discovering Alabama

Dow AgroSciences

Ernst Conservation Seeds

Grasslander

International Forest Company

Meeks Farms Nursery

Prairie Creek Farms

Pine Garden Baskets

Rayonier

Roundstone Native Seed

Stuewe and Sons, Inc.

Truax Company

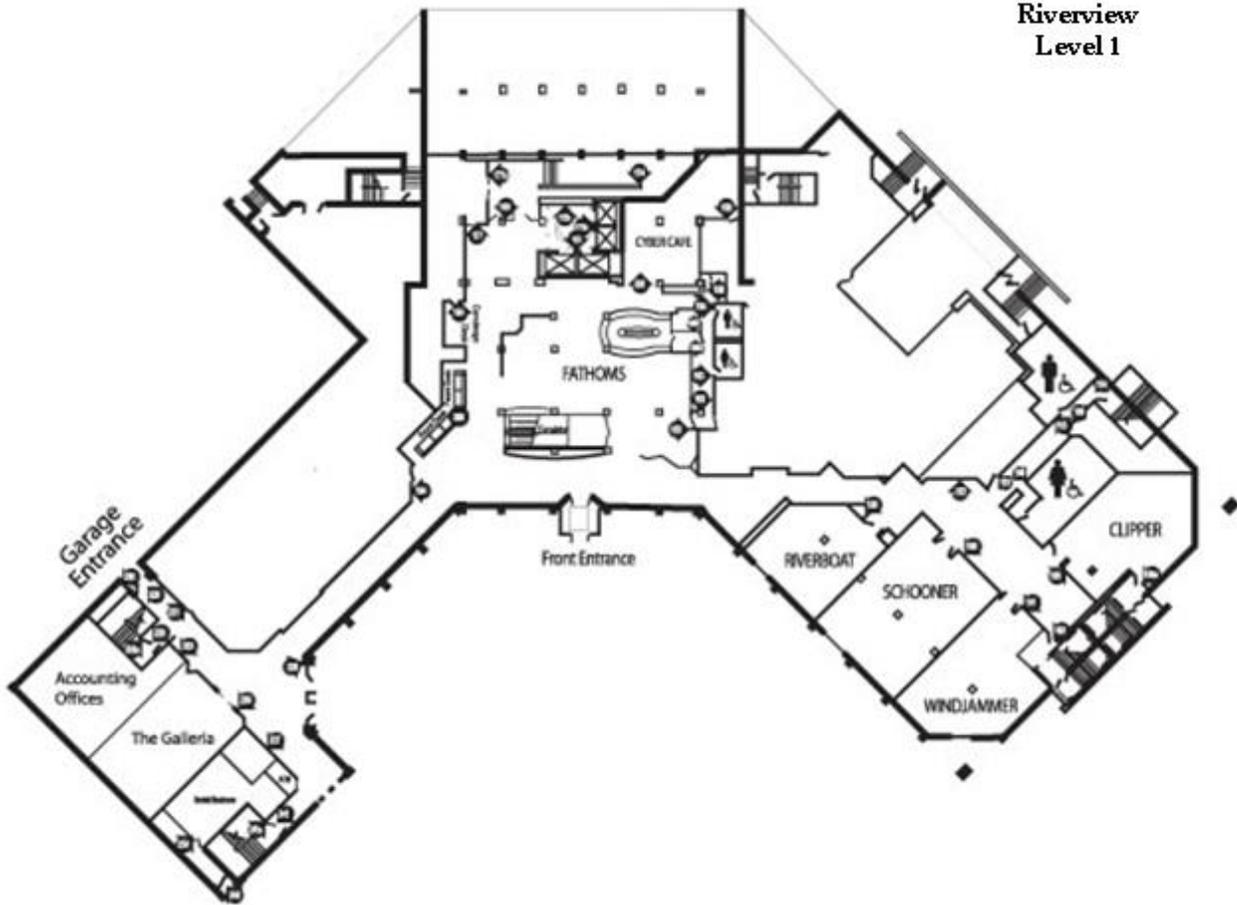
University of Florida

US Fish & Wildlife Service

Whitfield Farms & Nursery

Conference Maps

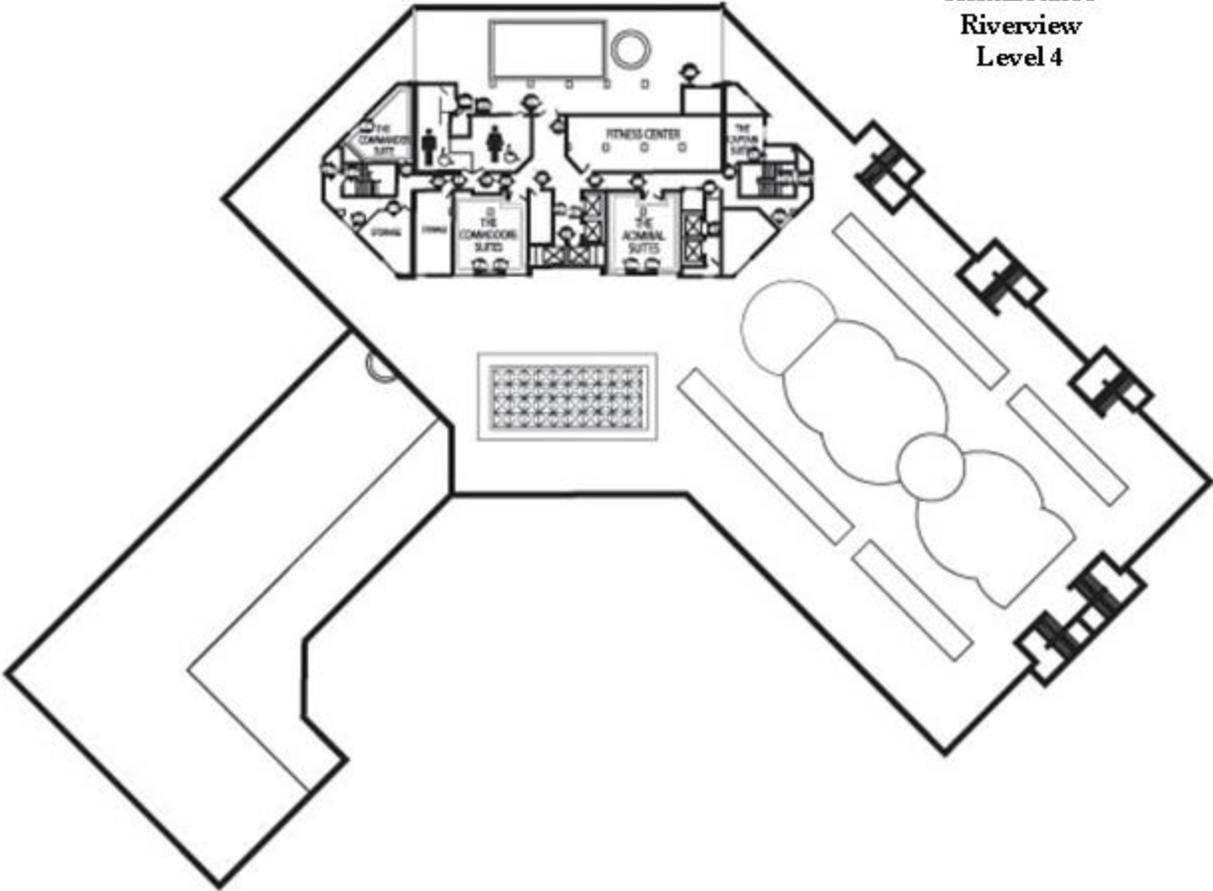
Renaissance
Riverview
Level 1



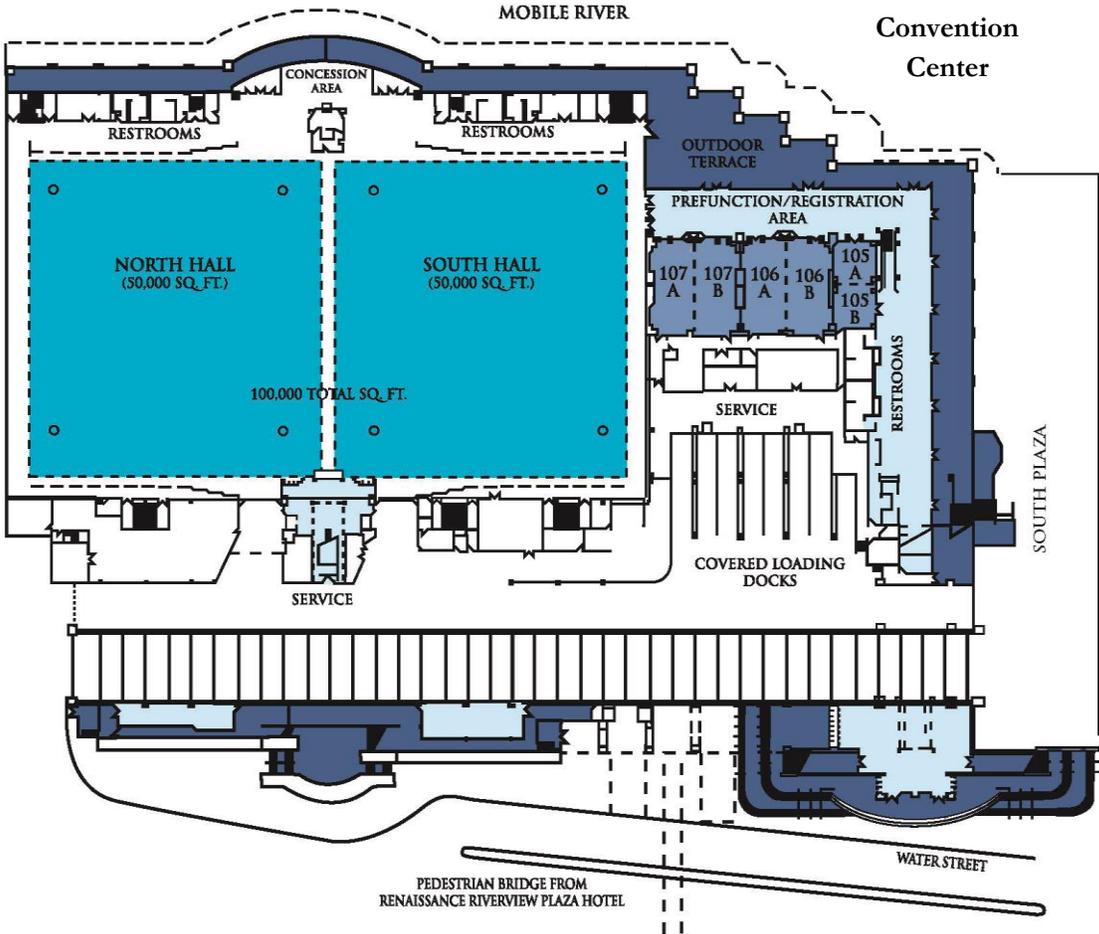
Renaissance
Riverview
Level 2



Renaissance
Riverview
Level 4



Arthur R. Outlaw
Mobile
Convention
Center



2014 Conference Agenda

Monday, October 20, 2014

1:00pm – 5:00pm **Longleaf Partnership Council Meeting – Mobile Bay II & III**
8:00pm – 10:00pm **Palustris Hospitality Suite Open**

Tuesday, October 21, 2014

8:00am – 5:00pm **Longleaf Partnership Council Meeting – Mobile Bay II & III**
8:00am – 5:00pm **Groundcover Meeting (Invitation only) – Grand Bay Ballroom**
Noon – 4:00pm **LLA Board Meeting (Invitation only) – Mobile Bay I**
4:00pm – 6:00pm **ENGS Board Meeting (Invitation only) - Schooner**
4:00pm – 8:00pm **Early Registration Open – Preconvene 2 Center**
4:00pm – 6:00pm **Poster Set-up – Bon Secour Bay Foyer**
Exhibitor Set-up - Preconvene 2 Center
The Longleaf Alliance Store Opens - Preconvene 2 Center
Silent Auction Donations Accepted - Preconvene 2 Center
Conference Contest Entries Accepted - Preconvene 2 Center
6:00pm – 8:00pm **America's Longleaf Restoration Initiative**
5 Year Celebration Reception - Preconvene 2 Center
Drinks, Appetizers, and First Silent Auction
8:00pm – 10:00pm **Palustris Hospitality Suite Open**

Wednesday, October 22, 2014

7:30am – 7:00pm **Registration – Preconvene 2 Center**
7:30am – 8:30am **Continental Breakfast - Preconvene 2 Center**
7:30am – 6:00pm **Poster Set-up – Bon Secour Bay Foyer**
7:30am – 8:00pm **The Longleaf Alliance Store Open - Preconvene 2 Center**
7:30am – 8:00pm **Conference Contest Entries Accepted - Preconvene 2 Center**

PLENARY SESSION

8:00am – 8:10am **Color Guard; Pledge of Allegiance; Moment of Silence**
Welcome & Introduction – Robert Abernethy, The Longleaf Alliance
8:10am – 8:45am **Welcome and Opening Comments:**
Sandy Stimpson, Mayor of Mobile
Brian Baldwin, Eastern Native Grass Alliance

- 8:45am – 9:30am **Key Note Address:**
 “William Bartram in the Deep South, Who is William Bartram and Why Should I Care?”
 John Hall, Black Belt Museum
- 9:30am – 10:00am **State of The Longleaf Alliance**
 Robert Abernethy, The Longleaf Alliance
- 10:00am – 10:30am **BREAK**
 Bidding Begins on Second Silent Auction
- 9:00am – 12:00pm **Optional Companion Tour:** Guided tour of historic Mobile homes. Additional fees are required for participation in this tour. See Registration Desk for more information.

CONCURRENT SESSION 1

- 10:30am - 12:00pm **1-A: Longleaf Partnership Council Panel Discussions - Schooner**
- Session Description: Momentum continues to build as the long decline that had occurred with longleaf forests across the range has been reversed. This exciting reversal would not have occurred without tremendous effort and investment of resources by those in both the public and private sector, including those working together through the Longleaf Partnership Council. This session will explore some of the public and private partner work and associated opportunities related to increasing restoration funding and management actions, and also cover the important role reporting of progress plays. Learn about the amazing turnaround occurring with longleaf pine forests that once dominated the southeastern United States.
- Moderator: Mike Black, Longleaf Partnership Council Chair
- 10:30 – 10:50 Jon Scott, National Fish & Wildlife Foundation
 Longleaf Stewardship Fund 2015: Program Overview and Outlook
- 10:50 – 11:10 James Tillman, Natural Resources Conservation Service
 Regional Conservation Partnership Program
- 11:10 – 11:30 Hank McKinley
 Promoting and Tracking of Prescribed Fire with Private Landowners.
- 11:30 – 11:50 Glenn Gaines, US Forest Service
 America’s Longleaf Restoration Initiative: Tracking Range-wide Partnership Accomplishments and Successes
- 11:50 – Noon Panel Discussion with Speakers

1-B: Longleaf & Grassland Research Presentations – Mobile Bay I

Session Description: This session will feature student presentations from their research on varying aspects of grassland and longleaf restoration.

Moderator: Vance Owens, North Central Sun Grant Center

10:30 – 10:50 Taylor Hannah, Mississippi State University

Influence of Landscape and Stand-scale Factors on Avian Communities in Open Pine Ecosystems

10:50 – 11:10 Rachel E. Conley, Auburn University

Successes and failures of Rivercane Macropropagation.

11:10 – 11:30 Katherine Hovanes, Louisiana State University

Dominant bunchgrasses occur in non-random spatial patterns in pine savanna groundcover plant communities.

11:30 – 11:50 Patrick Farrell, Auburn University

Local and Landscape Scale Habitat Effects on Grassland Bird Occupancy in the Upper East Gulf Coastal Plain

11:50 – Noon Additional Question & Answers with Speakers

1-C: Landowner 101: Economics – Mobile Bay II

Session Description: Your Land, Your Legacy, Your Lawyer - Family farmers spend time and money creating their special place, their legacy. At some point the families will need to pass the land to the next generation. What are the issues that need to be considered, discussed between generations, and decided upon? This session will highlight some of the options available for a successful transfer.

Moderator: Julie Moore, US Fish & Wildlife Service

10:30 – 10:50 Greg White, White & McClung, LLC

Tax Issues for the Timberland Owner/Timber Farmer

10:50 – 11:10 J. Robert Turnipseed, Ambrecht Jackson Lawyers, LLP

Estate Planning Issues for the Landowner

11:10 – 11:30 Katherine Eddins, Alabama Land Trust and Georgia Land Trust

Conservation Easements

11:30 – 11:50 Leslie Weeks, Helmsing, Leach, Herlong, Newman & Rouse

Successful Intergenerational Land Transfer: More than Just a Deed

11:50 – Noon Additional Question & Answers with Speakers

1-D: Landowner 201: Economics – Mobile Bay III

Session Description: Making \$ and Sense - This session will explore opportunities for the landowner to make income on their property. It will highlight traditional forestry – timber values and markets, non-timber such as grazing, and discuss unfamiliar opportunities for assistance to landowners. The goal is for the landowner to make sense of income opportunities.

Moderator: Rhett Johnson, The Longleaf Alliance Co-Founder

- 10:30 – 10:50 Barry Shiver, Smarter Forestry
Financial cost of managing longleaf plantations for pine savanna habitat vs timber.
- 10:50 – 11:10 Brian Williams, Mississippi State University
An economic analysis of native warm season grass cultivation for grazing.
- 11:10 – 11:30 Marc Walley, Forest Investment Associates
Are Better Times Coming? Supply and Demand Factors Impacting Southern Timber
- 11:30 – 11:50 Glenn Hughes, Mississippi State University Extension Service
Silver Lining of a Very Dark Cloud: Hurricanes as an Opportunity to Restore Longleaf Pine
- 11:50 – Noon Additional Question & Answers with Speakers

1-E: Wildlife & Grasslands – Grand Bay Ballroom

Session Description: Management of grasslands, and how it impacts bird nesting and den selection of gopher tortoise.

Moderator: Pat Keyser, University of Tennessee

- 10:30 – 10:50 Andy Vander Yacht, University of Tennessee
Avian Occupancy Response to Oak Savanna and Woodland Restoration in Tennessee.
- 10:50 – 11:10 J. Wesley Graham, South Mississippi Electric Power Association
Influence of Right-of-Way Maintenance on Gopher Tortoise Activity
- 11:10 – 11:30 Mike McCloy, University of Tennessee
Breeding Bird Nesting Success in Oak Savannah Restoration: Preliminary Results
- 11:30 – 11:50 Chris Lituma, University of Tennessee
Multi-Scale Assessment of Wildlife Sustainability in Switchgrass Biofuel Feedstock Production
- 11:50 – Noon Additional Question & Answers with Speakers

Noon – 1:30pm

Recognition and Awards Luncheon – Bon Secour Bay Ballroom
“Light in longleaf”

Bill Finch, Earthword Services

1:30pm - 2:00pm

BREAK

CONCURRENT SESSION 2

2:00pm - 3:30pm

2-A: State & Local Implementation Team Challenges - Schooner

Session Description: This session will host representatives from Local Implementation Teams (LIT) that are active in Texas, Mississippi, Georgia, and Florida. These speakers will discuss some to the most important challenges faced by organizations hoping to forward longleaf restoration and management across the natural longleaf range. Besides fire, mapping is consistently highlighted as an important function and challenge for Longleaf LITs. John Gilbert, from the Auburn University School of Forestry & Wildlife Sciences, will discuss his work mapping longleaf pine forests.

Moderator: Mark Hains, The Longleaf Alliance

- 2:00 – 2:20 Alan Dozier, Okefenokee/Osceola Local Implementation Team
Perspectives on Site Preparation "Bedding in the Flatwoods"
- 2:20 – 2:40 Jim Hancock, Mississippi Forestry Commission
Prescribed Fire: A Longleaf Restoration Priority in Mississippi.
- 2:40 – 3:00 John Gilbert, Auburn University
Mapping Longleaf Pine at the Stand Level: Lessons Learned and Future Goals
- 3:00 – 3:20 Kent Evans, Texas Longleaf Implementation Team
Longleaf Offers Benefits to Reduce Risk from Wildfire and other Challenges
- 3:20 – 3:30 Additional Question & Answers with Speakers

2-B: Longleaf & Grassland Research Presentations – Mobile Bay I

Session Description: This session will bring to light key questions in longleaf & grassland restoration. One important factor to consider in pine restoration is the composition of the understory. Presentations will focus on what the understory should be composed of and how certain site preparation methods may impact the preferred composition. Optimal planting and management strategies for longleaf will also be discussed.

Moderator: Michele Elmore, The Nature Conservancy

- 2:00 – 2:20 Kevin Robertson, Tall Timbers Research Station and Land Conservancy
Distinctive Floristic Composition of Longleaf Pine-Wiregrass, Shortleaf Pine-Oak-Hickory, and Old-field

- Plant Communities in Northern Florida and Southern Georgia.
- 2:20 – 2:40 Nathan Klaus, Georgia Department of Natural Resources
Is your choice of site prep helping or hurting your longleaf pine restoration?
- 2:40 – 3:00 Susana Sung, US Forest Service
Container Cavity Types Are Critical to Longleaf Pine Field Performance
- 3:00 – 3:20 Dave Haywood, US Forest Service
Longleaf Pine Straw Yields and Income Potential
- 3:20 – 3:30 Additional Question & Answers with Speakers

2-C: Landowner 101: Fire – Mobile Bay II

Session Description: Proper prescribed fire management is essential to establishing and maintaining longleaf pine. Whether you have a natural stand or longleaf planted through an NRCS program, frequent and appropriate prescribed fire is necessary. This session covers many aspects of prescribed burning from how to get started to the kind of fire needed for your specific objectives to the special case of reintroducing fire to long unburned stands. Additionally, the idea of combining resources to get your burning done is presented.

Moderator: Malcolm Hodges, The Nature Conservancy

- 2:00 – 2:20 Mark Melvin, JW Jones Ecological Research Center at Ichauway
Prescribed Fire: “How to get started”
- 2:20 – 2:40 John Stivers, Consulting Forestry
Selection of Ignition Techniques to Achieve Resource Objectives
- 2:40 – 3:00 Bennett Tucker, Hitchcock Woods Foundation
The Careful Return of Fire Back into a Fire Suppressed Longleaf Forest
- 3:00 – 3:20 John Weir, Oklahoma State University
Prescribed Burn Associations
- 3:20 – 3:30 Additional Question & Answers with Speakers

2-D: Landowner 201: Fire – Mobile Bay III

Session Description: Prescribed fire must be used wisely and the interactions between fire and other ecological forces considered when planning fire management. This session takes basic fire management further with presentations on season of fire, considerations for fire planning when duff is present, the interactions between fire and grazing practices and the growing use of prescribed fire in the Mid-South region.

Moderator: Mike Thompson, The Longleaf Alliance

- 2:00 – 2:20 Dwayne Elmore, Oklahoma State University
Fire and Grazing Interaction in Grasslands
- 2:20 – 2:40 Morgan Varner, Virginia Tech
Advances in understanding duff fires in longleaf pine forests
- 2:40 – 3:00 Craig Harper, University of Tennessee
Using Prescribed Fire in the Mid-South for Wildlife and Ecosystem Management
- 3:00 – 3:20 Ted DeVos, Bach and DeVos Forestry and Wildlife Services
Comparative discussion of the differences between growing season and dormant season prescribed fire
- 3:20 – 3:30 Additional Question & Answers with Speakers

2-E: Grassland Establishment – Grand Bay Ballroom

Session Description: Methods of enhancing and restoring grasslands and grassy understory, from seed collection to alternative species.

Moderator: Brett Rushing, Mississippi State University

- 2:00 – 2:20 John Seymour, Roundstone Native Seed
Growing a way to recreate what we have lost
- 2:20 – 2:40 Jeremy Hamlington, Roundstone Native Seed
Growing Ecotype Seed for Herbaceous Restoration on Cherokee National Forest
- 2:40 – 3:00 Pat Keyser, University of Tennessee
Switchgrass Yield and Stand Dynamics from Legume Intercropping
- 3:00 – 3:20 John Gruchy, Mississippi Dept. of Wildlife, Fisheries, and Parks
Lessons Learned Restoring and Managing Black Belt Prairie Plant Communities
- 3:20 – 3:30 Additional Question & Answers with Speakers

3:00pm – 3:30pm

BREAK

CONCURRENT SESSION 3

4:00pm - 5:30pm

3-A: State & Local Implementation Team Opportunities - Schooner

Session Description: This session will host representatives from Local Implementation Teams (LIT) that are active in Georgia, South Carolina, and Louisiana. These speakers will describe successes, opportunities, or techniques that enabled these LITs to further longleaf restoration and management t across the natural longleaf range. Besides the collaborative efforts of the LITs, Paul Trianosky will highlight successful case studies from the Sustainable Forestry

Initiative (SFI) Conservation and Community Partnership Grant Program.

Moderator: Mark Hains, The Longleaf Alliance

- 4:00 – 4:20 LuAnn Craighton, Chattahoochee Fall Line Conservation Partnership
Outreach Programs Along the Chattahoochee Fall Line Reach Diverse Audiences
- 4:20 – 4:40 Wayne Harris, US Fish & Wildlife Service
The Sandhills Longleaf Pine Conservation Partnership – A Model for Landscape Repairs
- 4:40 – 5:00 Rick Jacobs, The Nature Conservancy
Longleaf Outreach Activities - Can We Do Better?
- 5:00 – 5:20 Paul Trianosky, Sustainable Forestry Initiative
Sustainable Forest Management and Longleaf Conservation – Case Studies from SFI's Conservation and Community Partnership Grant Program.
- 5:20 – 5:30 Additional Question & Answers with Speakers

3-B: Pinestraw Research Presentations – Mobile Bay I

Session Description: The production of pine straw, especially from longleaf pine, has become a lucrative revenue source for landowners in recent years, with revenues in some instances even exceeding those produced from timber harvest. The increased market for pine straw has raised issues regarding best practices for pine straw production and how sustainable this production will be in the long-term, both for individual stands and across the region. This session will provide information about the use of herbicides in straw production, sustainability, pine straw certification, and production techniques with reduced site impacts.

Moderator: Steve Jack, JW Jones Ecological Research Center at Ichauway

- 4:00 – 4:20 Travis Rogers, Dow AgroSciences
Using Herbicides to Produce High Quality Pine Straw
- 4:20 – 4:40 Foster Dickard, Wildlife and Forestry Development
Certified Pine Straw – A Game Changer for Longleaf Forest Restoration
- 4:40 – 5:00 Mark Bailey, Conservation Southeast, Inc.
National Wildlife Federation's Best Management Guidelines for Pine Straw Raking.
- 5:00 – 5:20 Randy Browning, US Fish & Wildlife Service
Ecological Pine Straw Raking
- 5:20 – 5:30 Additional Question & Answers with Speakers

3-C: Landowner 101: Wildlife & Understory – Mobile Bay II

Session Description: Considerations for Promoting Diversity – This session is designed to address the how and why of managing habitat that promotes diversity and wildlife, and new information from research studies. Considerable assistance is available for anyone with wildlife or diversity in their goals and objectives. Successful techniques for restoring native warm season grasses will be presented. Management considerations and recommendations will be explored for bobwhite quail, gopher tortoises, and even the largest mammal of the longleaf ecosystem, the black bear.

Moderator: Tim Albritton, Natural Resources Conservation Service

- 4:00 – 4:20 Claude Jenkins, Alabama Wildlife Federation
Establishing Native Warm Season Grasses for
Wildlife: Factors to Consider
- 4:20 – 4:40 Reggie Thackston, Georgia Department of Natural
Resources
Bobwhite Management across Working Farms and
Forests
- 4:40 – 5:00 Deborah Burr, Florida Fish and Wildlife
Conservation Commission
Tools and Recommendations for Landowners Who
Manage Habitat for Gopher Tortoises
- 5:00 – 5:20 Daniel Powell, Alabama Black Bear Alliance
Black Bear in Longleaf Ecosystems.
- 5:20 – 5:30 Additional Question & Answers with Speakers

3-D: Landowner 201: Wildlife & Understory – Mobile Bay III

Session Description: Considerations for Restoration - This session will explore how to balance multiple, sometimes competing, objectives and operations in order to achieve your advanced management goals. Managing longleaf ecosystems creates a tremendous opportunity to emphasize biological diversity. Implications of management operations for optimizing this richness will be explored for flora and fauna. We will examine the very basis of diversity in the invertebrate world, and how easily we can improve it. We will explore implications for managing charismatic keystone mammals, and tradeoffs in management operations that might benefit this suite of creatures. Our final speaker will explore the vital role of reptiles in longleaf/grassland systems, and new understandings gained in the biology and ecology of maintaining or reintroducing reptiles, with particular focus on gopher tortoises and indigo snakes.

Moderator: Melanie Kaeser, Tyndall Air Force Base/The Longleaf Alliance

- 4:00 – 4:20 Reed Noss, University of Central Florida
The North American Coastal Plain, an Unrecognized
Global Biodiversity Hotspot
- 4:20 – 4:40 Jeff Thurmond, Natural Resources Conservation
Service
Promoting Healthy Longleaf Understory Supports
Diverse Pollinators and Wildlife
- 4:40 – 5:00 Holly Ober, University of Florida
Promoting Mammals in Longleaf Pine Forests
- 5:00 – 5:20 Craig Guyer, Auburn University
Conservation of Charismatic Vertebrates of Longleaf
Pine Forests
- 5:20 – 5:30 Additional Question & Answers with Speakers

3-E: Foraging & Grazing – Grand Bay Ballroom

Session Description: Economics and sustainability of grazing cattle
in pastures of native grasses.

Moderator: Brian Baldwin, Mississippi State University

- 4:00 – 4:20 Pat Keyser, University of Tennessee
Economics of Native Grass Forage Production
- 4:20 – 4:40 Pat Keyser, University of Tennessee
Season-Long Grazing with Native Grasses -
Preliminary Results.
- 4:40 – 5:00 James Martin
Economic and Conservation Implications of
Converting Exotic Forages to Native Warm-Season
Grass.
- 5:00 – 5:20 Pat Keyser, University of Tennessee
Grazing Eastern Gamagrass with Bred Heifers:
Preliminary Results
- 5:20 – 5:30 Additional Question & Answers with Speakers

6:00pm – 8:00pm

**Poster Reception – Preconvene 2 Center & Bon Secour Bay
Foyer**

7:45pm

Close out Second Silent Auction – Preconvene 2 Center

8:00pm

Dinner on Your Own

8:00pm – 10:00pm

Palustris Hospitality Suite Open

Thursday, October 23, 2014

7:00am

Registration Desk Open – Preconvene 2 Center

6:30am – 7:00am

Coffee and Bagged Breakfast Available

FIELD TOUR

7:00am

Load buses – Government Street Hotel Entrance

7:30am	Buses Depart – Water will be provided on buses throughout the day.
7:30am – 5:00pm	2 Concurrent Tours. Tour stops include Keville Larson’s private lands, the Mobile Botanical Garden, and Splinter Hill Bog. Lunch will be catered at the Mobile Botanical Garden. Keville Larson’s Private Lands: This site will showcase a landowner’s approach to multiple use management including invasive species control. Other topics that will be discussed include wood products, pinestraw raking, and managing for wildlife. Mobile Botanical Garden: In addition to enjoying a delicious lunch at this stop, attendees will also be toured through the Garden’s longleaf pine forest. This 27 acre area is managed with fire and is one of the last remaining longleaf forests within the city. Splinter Hill Bog: This stop of the field trip is a longleaf savannah/seepage bog community containing large pitcher plant bogs managed by The Nature Conservancy. Located in the headwaters of the Perdido River along Dyas Creek, this preserve and the surrounding landscape support numerous rare and declining species associated with seepage bogs, upland longleaf forest and coastal blackwater streams.
Approximately 4:30pm	Buses Return to Renaissance Hotel
9:00am -5:00pm	Optional Companion Activity: Self-Guided Walking/Driving Tour of Historic Downtown Mobile
6:00pm – 10:00pm	Waterfront Party – Arthur R. Outlaw Mobile Convention Center Room 106 Dinner, Music, & Final Silent Auction

Friday, October 24, 2014

7:30am – 12:00pm	Registration Desk Open – Preconvene 2 Center
7:00am – 8:00am	Continental Breakfast – Preconvene 2 Center
7:30am – 12:30pm	The Longleaf Alliance Store Open – Preconvene 2 Center

CONCURRENT SESSION 4

8:00am – 9:30am	4-A: Longleaf in Arts & Literature - Riverboat Session Description: Among North American ecosystems, the longleaf forests of the Southeastern US rank at the very top in diversity, history, and aesthetics. This session offers participants an opportunity to familiarize themselves with the art, sound, and imagery that captures this beauty and charisma. The Longleaf in Arts and Literature Session features a filmmaker/author, an artist/author, a playwright, and a basket-weaver. Their work has inspired thousands of people by highlighting the beauty and magic of our native longleaf. Moderator: Mark Hains, The Longleaf Alliance
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- 8:00 – 8:20 Melanie Walter, Pine Garden Baskets
Pine Needle Basketry: Art of the Longleaf Pine
- 8:20 – 8:40 Philip Juras
Is a Picture Worth a Thousand Fires?
- 8:40 – 9:00 Ray Owen
Bleeding Pines of Turpentine
- 9:00 – 9:20 Roger Reid
Why it Matters
- 9:20 – 9:30 Additional Question & Answers with Speakers

4-B: Longleaf Conversion Research Presentations – The Admiral

Session Description: With the increased interest in restoration of longleaf pine, many landowners (public and private) have existing forest stands they would like to convert to longleaf pine. This conversion can be accomplished through a one-step process of clearcutting and replanting, but many landowners find their objectives are better met through a more gradual or phased, multi-step conversion approach. This gradual conversion approach can be accomplished in many different ways, and this session will provide four case studies of phased species conversion from sites with differing objectives located across the natural range of longleaf pine.

Moderator: Kevin McIntyre, JW Jones Ecological Research Center at Ichauway

- 8:00 – 8:20 Colette DeGarady, The Nature Conservancy
Longleaf Restoration Techniques on TNC Lands: from Loblolly Production to Longleaf Habitat
- 8:20 – 8:40 Dann Childs, Tyndall Air Force Base
Two Phase Conversion of Slash Pine Plantations to Uneven Aged Longleaf and Slash Pine Flatwoods at Tyndall Air Force Base.
- 8:40 – 9:00 Stephen Pecot, Larson & McGowin
Longleaf Pine Community Restoration in Intensively Managed Pine Plantations on State Lands
- 9:00 – 9:20 Steve Jack, JW Jones Ecological Research Center at Ichauway
Underplanting for Species Conversion and Restoration - The Ichauway Example
- 9:20 – 9:30 Additional Question & Answers with Speakers

4-C: Landowner 101: Establishment & Conversion – Windjammer

Session Description: The longleaf ecosystem is more than a tree! Whether you are establishing native warm season grasses or longleaf pine seedlings, there are a myriad of factors to consider. This session

will include two presentations on native grass establishment and two presentations on key choices for longleaf pine establishment. On the grass side, presenters will discuss landowner, producer, and professional considerations. On the tree side, Bill Pickens will expand on planting techniques while Bobby Franklin delivers an in-depth examination on seedling selection.

Moderator: Vernon Compton, The Longleaf Alliance

- 8:00 – 8:20 Bill Pickens, NC Forest Service
Planting Longleaf Pine...There is More to It Than
“Green Side Up”
- 8:20 – 8:40 Robert Franklin, The Longleaf Alliance
Selection Criteria for Planting Sites & Seedlings.
- 8:40 – 9:00 J. Brett Rushing, Mississippi State University
Landowner's Perspective: Establishment Year
Successes and Pitfalls
- 9:00 – 9:20 Mark Fiely, Ernst Conservation Seeds
Potential Alternatives to Wiregrass, Switchgrass, And
Lark Partridge Pea For Longleaf Pine Understory
Plantings
- 9:20 – 9:30 Additional Question & Answers with Speakers

4-D: Landowner 201: Establishment & Conversion – Clipper

Session Description: This session hosts several leading experts in longleaf regeneration. Longleaf once comprised less than 3% of total planting in the Southeastern, US. Today, longleaf is the second most planted tree species in North America! Wayne Bell will discuss genetic improvements of longleaf pine. John Cox will relate his experience with establishing native warm season grasses and forbs. Dr. Pat Minogue will look at the increasingly complex demands placed upon herbicide applicators, who wish to reestablish and manage diverse forests. And Dr. David Moorhead will examine complicating factors and best management practices to minimize failures while establishing longleaf.

Moderator: Babe McGowan, McGowan Forestry

- 8:00 – 8:20 Wayne Bell, International Forest Company
Longleaf Genetic Improvement Current and the
Future.
- 8:20 – 8:40 David Moorhead, University of Georgia
Achieving the Site Prep Prescription
- 8:40 – 9:00 Pat Minogue, University of Florida
Use of Herbicides in Longleaf Pine Establishment
and Conversion

9:00 – 9:20 John Cox, Lolly Creek Ecological Land Management & Restoration

Successful Establishment of Native Grasses and Forbs

9:20 – 9:30 Additional Question & Answers with Speakers

4-E: Foraging & Grazing – Grand Bay Ballroom

Session Description: Economics and sustainability of grazing cattle in pastures of native grasses.

Moderator: Jesse Morrison, Mississippi State University

8:00 – 8:20 Pat Keyser, University of Tennessee

Native Grass Perceptions: Producer and Professionals Surveys in Tennessee

8:20 – 8:40 Allen Parrish, University of Illinois

Native Grass Production in Illinois for Sustainable Agriculture.

8:40 – 9:00 Eddie Jolley, Natural Resources Conservation Service

Native Warm Season Grass Considerations in Silvopasture

9:00 – 9:20 Chuck Simon, Alabama Extension Service

Initial Results from Range Study in Conecuh National Forest

9:20 – 9:30 Additional Question & Answers with Speakers

9:30am – 10:00am

PLENARY SESSION

10:00am – 10:30am

10:30am – 11:15am

11:15am – 11:45am

11:45am – 12:00pm

12:00pm

1:00pm – 5:00pm

BREAK

Bon Secour Bay Ballroom

Keynote Address

“New Landowner Involvement in Natural Resource Management”

Greg Pate, Alabama Forestry Commission

“The Next Generation”

Jerry Hesch, Berger Singerman LLP

Landowner Testimonial

Jon Gould, Forest Landowner and Consulting Engineer

Conference Wrap-up

Robert Abernethy, The Longleaf Alliance

Conference Adjourns. Have a safe trip home!

Prescribed Fire Council Post-Conference Meeting – Clipper

Speaker Bios

Mark Bailey. Mark is a consulting biologist specializing in conservation of southeastern species and ecosystems. His Auburn University zoology master's degree research on gopher frogs was conducted on TR Miller's natural longleaf holdings in Escambia County, Alabama. From 1989 to 1998 he was zoologist with The Nature Conservancy's Alabama Natural Heritage Program. Since forming his company, Conservation Southeast, Inc., Mark has frequently partnered with the Alabama Forest Resources Center in conservation easement projects, red-cockaded woodpecker restoration and management, and the development (for the Alabama Forestry Commission) of the Forest Legacy Assessment of Need and the 2010 statewide forest assessment. Mark was involved in developing both the 2005 and 2015 (in progress) State Wildlife Action Plans (SWAPs) for the Alabama Department of Conservation and Natural Resources, and he was lead co-author of *Habitat Management Guidelines for Amphibians and Reptiles of the Southeast*, a publication of Partners for Amphibian and Reptile Conservation (PARC). Mark lives with his wife and daughter on their property adjacent to Conecuh National Forest, where they are managing to restore that small piece of the longleaf ecosystem.

Wayne Bell. Wayne is currently the Chief Operating Officer for International Forest Company based in Moultrie, GA. He is a graduate of the Warnell School of Forestry at the University of Georgia. His career has spanned over 42 years in GA, AL, and FL which includes forest management, forest seed production, and nursery management. He started the first commercial container seedling nursery in the Southeastern U.S. in 1983. Wayne is a Certified Forester and fellow in the Society of American Foresters. He also serves on the board of directors for the Georgia Forestry Association, the Georgia Forestry Foundation, and is a member of several forestry associations throughout the Southeast.

Randy Browning. Randy received his Master of Science degree in Forestry with an emphasis in wildlife and a Bachelor of Science in Forest Game Management with a minor in Agriculture, both from Stephen F. Austin State University in Nacogdoches, Texas. Randy formerly worked for the Mississippi Department of Wildlife, Fisheries and Parks as a district biologist in the 10 Mississippi coastal counties. Randy has been employed with the U. S. Fish and Wildlife Service as a Private Lands Biologist under the Partners for Fish and Wildlife Program since 2001. Browning's position is a partnership between the Service and Wildlife Mississippi. Job duties include but are not limited to assisting private landowners in their longleaf restoration and management efforts as well as invasive species control.

Deborah Burr. Deborah is the Gopher Tortoise Program Manager for the Florida Fish and Wildlife Conservation Commission (FWC). At FWC, Deborah coordinates statewide efforts promoting gopher tortoise conservation through incentive-based programs, public-private partnerships, outreach and education, and by conserving and managing habitat for wildlife. She has a Bachelor in Geography and a Masters in Environmental Policy from Florida State University. Deborah has worked for domestic and international agencies on habitat restoration and management, wildlife conservation, and agro-forestry projects for more than 18 years.

Dann Childs. Dann graduated from Ben Eielson high school in Fairbanks, Alaska in 1982 and completed Forestry training at Alaska Vocational Technical Center in Seward, Alaska in 1984. Dann worked for the Florida Division of Forestry in the Florida panhandle from 1985 to 1992. He has worked at Tyndall AFB for 22 years, first as a Forestry Technician and currently as the Forester. Dann instituted a fundamental shift from commercial timber management to ecological forestry at Tyndall by developing and implementing a two phase longleaf restoration plan.

Rachel Conley. Rachel is a current M.S. student at Auburn University in Wildlife Sciences studying canebrake restoration as well as the Alabama wild pig population/distribution. She obtained her B.S. from N.C. State University in Fisheries, Wildlife, and Conservation Biology with minors in Forestry and Plant Biology. She is also a certified Type II wildland firefighter and avid naturalist.

John M. Cox. John is the Manager of Oakridge Farms, a privately owned Quail Hunting Plantation in South Georgia and President of Lolly Creek, a land management company specializing in Ecological Land Management and Restoration. He received his Associate's Degree in Forestry from Abraham Baldwin Agricultural College in Tifton, GA in 1987. John spent 18.5 years as Chief Ranger Sr. with the Georgia Forestry Commission working in Fire Control. He has 18 years working on a private quail hunting plantation in South Georgia and 10 years working with native grass research and restoration. John lives near Tifton, GA with his wife Loree and two children, Lauren and Jordan.

LuAnn Craighton. LuAnn works for The Nature Conservancy and serves as the Outreach Director for the Chattahoochee Fall Line Conservation Partnership (CFLCP). LuAnn is a biologist and the former Executive Director of The Preserve at Callaway Gardens. She has worked in the non-profit sector on land management and environmental education for over 20 years. She sits on the boards of Chattahoochee Valley Land Trust and the Georgia Forestry Foundation.

Colette DeGarady. Colette is the Senior Conservation Ecologist with the SC Chapter of The Nature Conservancy where she has worked for the past 11 years. She graduated from Clemson University with a BS in wildlife biology and holds a master's degree from Southern Illinois University in Zoology. She is an active board member of both the SC Native Plant Society and SC Exotic Pest Plant Council. Much of her work with The Nature Conservancy involves restoration and management of natural habitats and collaboration with partners and the public on conservation projects across the state. Colette is currently the coordinator for the Sewee Longleaf Conservation Cooperative longleaf implementation team located on the coast of South Carolina.

Ted DeVos. Ted has been Consulting Forester/Wildlife Biologist with Bach and DeVos Forestry and Wildlife Services for 10 years. He is an Alabama Registered Forester, Certified Wildlife Biologist, and a licensed Realtor. Ted has worked 25 years as a Wildlife Biologist and 13 years as a Forester. Ted earned his Associate degree in Wildlife/Forestry in Ontario, Canada, 1984. He then went on to earn his Bachelors in Forestry from Louisiana Tech University and his Masters in Wildlife from Auburn University.

In addition to his career positions, Ted also serves in the following positions:

- 2000-2006 Governor appointed as Commissioner on the Alabama Forestry Commission
- Currently serving on the Board of Directors and Past President of the Alabama Wildlife Federation
- Currently serving on the Board of Directors for the Alabama Forest Resources Center
- Currently serving on the Board of Directors for the Alabama Prescribed Fire Council
- Currently serving on the Board of Directors for the Alabama Quail Council
- Past chairman for deer management issues on the advisory subcommittee for the Alabama Conservation Advisory Board
- Past Natural Resource Committee Chairman for the Alabama Bankers Association Trust Division
- Served on steering and editorial committee for AWF's book Managing Wildlife

William Foster Dickard. Foster has a B.S in Forestry from Mississippi State University (1978) and a Master's of Wildlife and Forestry in Extension Education also from Mississippi State University (1979). Foster is a Certified Wildlife Biologist and has over 12 years of experience as a large industrial land management forester. He was a Wildlife Biologist and program manager for over 20 years on over 2 million acres of southern industrial forests. Foster has worked with the Forest Management Standards and Certification Program since 1992. He managed the forest certification portfolio for the largest FSC certification body in US while leading audit teams on FSC forest management and Chain of Custody audits on several million acres of FSC certified forests. Foster currently works with several groups of large and small landowners to acquire and maintain FSC certification in the southern US.

Alan Dozier. Alan is a Georgia native and currently lives near Milledgeville, GA. He and his wife, Arlene, recently celebrated their 35th wedding anniversary. He is a forester who is a 1977 graduate of Warnell at the University of Georgia. In 2012 Alan retired from the Georgia Forestry Commission following 32 years of service. During his tenure with the Georgia Forestry Commission he was extensively involved with the fire program, culminating his career as the State Fire Chief from 1999-2012. Alan was one of the founding committee members of the Georgia Prescribed Fire Council, he facilitated the inception and design of Georgia's Prescribed Fire Certification Program, was co-founder and chair of the Southern Wildfire Risk Assessment, committee member of the Visit My Forest campaign and website, chairman of the NWCG Wildland Urban Interface Working Team, chair of the Southern Group of Fire Chiefs, recipient of the 2010 Silver Smokey Bear award, and has been responsible for design and implementation of Georgia's programs for wildfire management, fire prevention, and prescribed fire. In November of 2013, Alan became a contractor for The Conservation Fund and began a new adventure as coordinator of the Okefenokee/Osceola local implementation team for America's Longleaf Restoration Initiative.

Katherine Eddins. Katherine has served as executive director of The Alabama Land Trust, Georgia Land Trust and The Chattowah Open Land Trust for more than thirteen years. Katherine graduated from The University of Alabama School of Law, Juris Doctorate, and subsequently received a master's degree in forestry from Auburn University, graduating summa cum laude. She has been published in the Journal of Forestry and has practiced law and natural resource management. Katherine is the chairman of the advisory committee for Auburn University School of Forestry and Wildlife Sciences, member of the Leadership Council for the Land Trust Alliance, co-chair of the Choccolocco Creek Watershed Alliance, board member for the Longleaf Alliance, and secretary of the board of the Holy Comforter Episcopal Day School where her daughter Julia Ann is a student.

Dwayne Elmore. Dwayne grew up in Tennessee where he attended the University of Tennessee to obtain his B.S. in Natural Resource Management. He then obtained a M.S. from Mississippi State University in Wildlife Ecology and a Ph.D. from Utah State University in Wildlife Biology. He is an Associate Professor, the wildlife Extension specialist, and a Bollenbach Chair in Wildlife Biology in the Department of Natural Resource Ecology and Management at Oklahoma State University. His position has both Extension and research responsibilities. Specific areas of interest include wildlife habitat management, fire ecology, upland game bird conservation, and thermal ecology.

Kent Evans. Kent was raised in Texas, mostly on small ranches north and west of Dallas/Ft. Worth. He earned BS and MS degrees from Texas A&M University where he met Debra, also a Texas Aggie and a native of College Station. Kent started federal service in New Mexico, with the Department of Interior, then transferred to the US Forest Service. He served in several Forest Service stations in Texas, Georgia, Tennessee and Alabama. He led ecosystem restoration projects involving prairies, riparian areas, and the Longleaf Pine/Fire system. He worked several resource management jobs

including 5 years as the District Ranger in Talladega, Al. He held many Incident Management qualifications including Rx Burn Boss, Safety Officer, and IC. His last assignment, before retirement in 2012, was serving as the Staff Officer of Timber and Fire Management for the National Forests in Texas. Some memorable projects included assisting with the investigation and prosecution of a violent white supremacist group. He received awards from the Department of Justice and the FBI for his work on the case. He supervised the special use permit and venue operations for the World Cup, US Team Trials, and the 1996 Olympic Whitewater Canoe Kayak events on the Ocoee River, Cherokee National Forest. While in Talladega, his District staff improved longleaf habitat on several thousand acres, then translocated red cockaded woodpeckers, which had been absent for over 25 years. Kent is under contract to The Nature Conservancy, and serves as coordinator of the Texas Longleaf Implementation Team.

Patrick Farrell. Patrick graduated with his Bachelor of Science in biology degree with a concentration in wildlife from Central Michigan University in 2012. While attending CMU, Patrick worked on several projects focused on predator tracking, white-tailed deer population surveys, neotropical avian migration, waterbird breeding, and stopover ecology. Currently Patrick is a graduate student at Auburn University pursuing his Masters of Science in Wildlife Sciences under Dr. Conor McGowan and Dr. James Grand. Patrick works with the Alabama Cooperative Fish and Wildlife Research Unit with research focused on local and landscape habitat associations of grassland birds in the southeast US. Specifically, this effort evaluates the importance of open habitat types and habitat distribution in relation to grassland bird breeding season occupancy. Another major goal of the project is using avian point count surveys developed for his project to help inform detection probabilities of large scale survey methods, including the North American Breeding Bird Survey, to evaluate similar habitat measures at a large scale.

Mark B. Fiely. Mark is a horticulturist with degrees from Penn State and the University of Arkansas, Fayetteville. He has more than 19 years' experience at Ernst Conservations Seeds, where he is involved in prospecting for new species, seed production, and seed mix design for wetlands, uplands, riparian sites, and more.

Bill Finch. Bill is a senior fellow and consultant with the Ocean Foundation, and is chief science and horticultural advisor for Mobile Botanical Gardens. He is primary writer for the critically acclaimed book, *Longleaf, Far as the Eye Can See*.

Finch helps southwest Alabama appreciate their environment through his popular weekly newspaper column, a Sunday morning radio show, a Friday television segment, and numerous magazine articles. He has served as executive director of the Mobile Botanical Gardens, as the Alabama conservation director for The Nature Conservancy, and as an editor and journalist with the Mobile Press-Register for 17 years, where he won numerous national awards for his environmental coverage.

Robert (Bobby) Franklin. Bobby is the South Lowcountry and ACE Basin (SoLoACE) Longleaf Partnership Coordinator. He earned a B.S. degree in forestry from Auburn University in 1978. He also received an M.S. degree in forestry from Auburn in 1985. He is a registered forester in both Alabama and South Carolina and a Society of American Foresters Certified Forester. Bobby worked as an Extension Specialist at Clemson University from 1985 until he retired in 2014. Prior to joining the Clemson University faculty, he worked as an Assistant County Agent with the Alabama Cooperative Extension Service in Escambia County and as a consulting forester and timber buyer in that state. Bobby has made a significant impact on landowners and natural resource professionals by organizing workshops, making site visits and producing educational materials. Among Franklin's publications are *Stewardship of Longleaf Pines: A Guide for Landowners* and *Introduction to Prescribed Fire*

which teach the benefits of prescribed burns for timber management, wildlife habitat improvement and aesthetics. He has been an advocate & volunteer for the Longleaf Alliance since the beginning of the organization. Franklin and his wife Barbara, who live in Walterboro, have three children – Mary Beth, Scott and Jess.

John Gilbert. John is a Research Associate in the School of Forestry and Wildlife Sciences at Auburn University, Alabama. He works in the Longleaf Pine Stand Dynamics Lab on numerous longleaf pine projects. Mr. Gilbert holds a Bachelor of Science in Forestry and a Master of Science in Forest Stand Dynamics with a Graduate Minor in Statistics from the School of Forestry and Wildlife Sciences at Auburn University. His major areas of interest are longleaf pine stand dynamics and restoration, GPS/GIS applications, and database development. In addition, Mr. Gilbert team teaches GIS applications in natural resources and various continuing education short courses.

Jon Gould. Jon was born in Orlando, FL, raised in Titusville, FL, and lives in Birmingham, AL. He is married to Carol Gould and together they have 3 grown children and 7 grandchildren. Jon received his B.S. and M.S. degrees in civil engineering from the University of Florida, served from 1968-70 as an officer in the U.S. Army Corps of Engineers at Ft. Belvoir, VA and the Republic of Vietnam, and has been a practicing geotechnical engineer for 44 years, still practicing part-time.

In addition to his engineering practice, Jon is a Certified Prescribed Burn Manager in Florida, serves on the Florida Forestry Assoc. Tree Farm Committee, is a Co-editor of the Florida Land Steward Newsletter, and has published many articles in various forestry and wildlife publications.

Jon and Carol are active members of Briarwood Church in Birmingham, and in several forestry and wildlife organizations, including The Longleaf Alliance (since 1996), Florida Forestry Association, American Forest Foundation, and Forest Landowners Association.

J. Wesley Graham. Wesley is the Transmission Field Biologist/Right-of-Way Supervisor for South Mississippi Electric Power Association in Hattiesburg, MS. He received both his M.S. and B.S. degrees from Mississippi State University and is a member of the Mississippi Vegetation Management Association where he served on the Board of Directors, and is a member of the Alabama Vegetation Management Association. Graham served as a commissioner for the Lamar County Soil and Water Conservation District and was the 2006 District Commissioner of the Year.

John Gruchy. John received undergraduate and graduate degrees in Wildlife and Fisheries Science from Mississippi State University and the University of Tennessee respectively. He has been employed by the Mississippi Department of Wildlife, Fisheries, and Parks for nearly eight years as a Private Lands Biologist and most recently as the coordinator of the private lands program. John's professional interests include managing early successional plant communities, integrating wildlife habitat in working agricultural landscapes, and restoration of unique plant communities such as Black Belt Prairies, pine-grasslands, and dry upland hardwood forests.

Craig Guyer. Craig is Scharnagel Professor of Biology at Auburn University and Curator of Herpetology at the Auburn University Museum. He teaches Vertebrate Biodiversity and Herpetology and oversees the premier collection of amphibians and reptiles for the state of Alabama. He attended Humboldt State University for his undergraduate training, went to Idaho State University for a masters, and completed doctoral work at the University of Miami. At Auburn, his research has centered on population and community ecology of amphibians and reptiles of the southeastern United States and Central America. He has authored over 100 research publications and authored or edited three books. Additionally, he has served key advisory roles in development of conservation legislation in the state of Alabama and has developed an extensive program of education outreach in eastern Alabama.

John C. Hall. John is Director of the Black Belt Museum, University of West Alabama, Livingston, Alabama, and former Director of Interpretation at The University of Alabama Museum of Natural History. He is coauthor of *Headwaters: A Journey on Alabama Rivers* with Beth Maynor Young and *Longleaf, Far as the Eye Can See* with Bill Finch, Beth Maynor Young, and Rhett Johnson.

Jeremy Hamlington. Jeremy has a Bachelor of Science degree in Wildlife and Fisheries Science from The University of Tennessee. He has worked as the production manager at Roundstone Native Seed, LLC in Upton, KY since 2012 where he harvests over 150 varieties of native wildflowers and grasses each year.

Jim Hancock. Jim is the Grants and Special Programs Manager for the Mississippi Forestry Commission. His duties include Chair of the Mississippi Longleaf Restoration State Implementation Team, Forest Legacy Program Coordination, Mississippi Invasive Plant Control Program Supervisor and Secretary Of the Mississippi Cooperative Weed Management Association.

Taylor Hannah. Taylor is currently a M.S. graduate assistant at Mississippi State University in the Department of Wildlife, Fisheries, & Aquaculture. Her research examines the influence of landscape and stand-scale factors on avian communities in open pine ecosystems. She hopes this will aid in the restoration of longleaf pine ecosystems within the historic range. Before working in open pine ecosystems, she graduated Magna Cum Laude with a B.S. in Natural Resources Management: Wildlife Biology from the University of Tennessee at Martin in December 2012. She has worked for the Gulf Coastal Plains and Ozarks LCC for the past 4 years. Her duties have included conducting Climate Change Vulnerability Assessments for West TN as well as writing a report of this for the TWRA State Wildlife Action Plan, bat habitat research and inventory for several wildlife refuges in the Southeast, and various refuge tasks such as feral hog eradication, annual bird point counts, waterbird surveys, and database management. Her current interests are landscape ecology, longleaf pine ecosystems, climate change, avian priority species, and bat ecology. After she completes her M.S., she plans on pursuing a Ph.D. in an area of her interest. She hopes to pursue a career in academia, ecology, or science-based conservation.

Craig Harper. Craig is a Professor of Wildlife Management and the Extension Wildlife Specialist at The University of Tennessee. Craig is responsible for developing wildlife management programs for UT Extension and assisting natural resource professionals and landowners with matters concerning wildlife throughout the state. Dr. Harper is a Certified Wildlife Biologist® and Certified Prescribed Fire Manager. He maintains an active research program, specializing in upland habitat management. Current research projects are investigating the effects of silviculture on habitat for white-tailed deer and wild turkeys, quality deer management strategies, hunter satisfaction, the effects of timing and frequency of prescribed fire, northern bobwhite ecology and management, and various food plot management strategies.

Wayne Harris. Wayne is a private lands biologist with the US Fish and Wildlife Service in Charleston. He works primarily in the Coastal Plain and Sandhills regions of South Carolina where he assists private landowners with restoration and maintenance of various wildlife habitats through both technical and financial support. A major part of his normal schedule is dedicated to promoting cooperation and information exchange between the three Longleaf Implementation Teams in South Carolina.

Since earning a BS in Fisheries and Wildlife Science from NC State University and a MS in Wildlife Science from the University of Tennessee, Wayne has worked for various State and Federal agencies and as a private consultant. Sixteen of his 20 years of professional wildlife biologist experience have been focused on restoring longleaf pine forests in South Carolina, Florida, Georgia, and Alabama.

Wayne continues his work to bring private landowners the resources they need to get the job done when managing wildlife habitat on their properties. His goals are to learn something new each day and most importantly to be a helpful, efficient public servant.

James D. (Dave) Haywood. Dave is a Supervisory Research Forester with the USDA Forest Service, Southern Research Station. He has been located in Pineville, Louisiana since 1978, and has a PhD in Forestry from Louisiana State University, Baton Rouge, Louisiana. His research on pine straw harvesting began in 1990 as part of an agroforestry project on the Palustris Experimental Forest. He is also involved in collaborative research to: (1) evaluate longleaf pine seedling container sizes and types, field nutrition trials, and influence of prescribed fire on seedling physiology; (2) assess the effects of prescribed fire, herbicide application, and fertilization on the growth and stand structure of young longleaf pine plantations; and (3) assess the effects of harvesting and regeneration practices on long-term productivity of pine stands through multiple rotations. This body of research is supporting the America's Longleaf Restoration Initiative to increase the acreage of longleaf pine across the South.

Jerome M. Hesch. Jerome is Of Counsel to Berger Singerman LLP in its Miami, Florida office and is Special Tax Counsel to Oshins & Associates in Las Vegas, Nevada and Jeffrey Verdon & Associates in Newport Beach, California. He is the Director of the Notre Dame Tax and Estate Planning Institute, on the Tax Management Advisory Board, a Fellow of ACTEC and the ACTC, has published numerous articles, Tax Management Portfolios, and co-authored a law school casebook on Federal Income Taxation, now in its fourth edition.

He has presented papers for the University of Miami Heckerling Institute on Estate Planning, the University Of Southern California Tax Institute, the Southern Federal Tax Conference, and the New York University Institute on Federal Taxation, among others. He participated in several bar association projects, including the Drafting Committee for the Florida Revised Uniform Partnership Act and preparing the ABA's comments on the IRS's proposed private annuity regulations. He was elected to the NAEPC Estate Planning Hall of Fame.

He received his BA and MBA from the University of Michigan and a JD from the University of Buffalo Law School. He was with the Office of Chief Counsel, Internal Revenue Service, in Washington, D.C. from 1970 to 1975, and was a full-time law professor from 1975 to 1994, teaching at the University of Miami School of Law and the Albany Law School, Union University. He is currently an adjunct professor of law, teaching courses at the Florida International University Law School, the Graduate Program in Estate Planning at the University of Miami, the Vanderbilt University School of Law and the On-line LL.M. program at Boston University School of Law. Having grown up in Buffalo, he remains a Buffalo Bills fan.

Katherine A. Hovanes. Katherine earned a B.S. in Biology from the University of Montevallo in Montevallo, AL before joining the Dauphin Island Sea Lab as an intern. Working in coastal salt marshes solidified Katherine's interest in ecology and especially plant communities. She is currently pursuing a Ph.D. in Biology at Louisiana State University with Dr. Kyle Harms. Her dissertation work focuses on the ecological role of bunchgrasses in pine savanna groundcover plant communities.

Glenn Hughes. Glenn is Extension Forestry Professor for the Mississippi State University Extension Service. He provides forestry-related programs to landowners, professionals, and others interested in advancing forest management and stewardship in southeastern Mississippi.

Glenn has written and spoken on many forestry topics including longleaf pine management, the Tree Farm System, forest certification, landowner education, forest history, emerging markets, and general forest management. Since joining MSU in 1996, Glenn's longleaf-related activities have included: developing and conducting numerous longleaf pine field days, developing a longleaf pine short-course

for landowners, writing “Longleaf Pine in Mississippi” (currently in revision), collecting and disseminating data after Hurricane Katrina illustrating longleaf’s resilience to hurricane force winds, giving numerous longleaf pine presentations to landowner groups and the general public, establishing longleaf pine planting demonstrations on pastureland, establishing a silvopasture demonstration area focusing on longleaf pine, and arranging 2 Longleaf Academies for professionals in 2011.

Glenn is a Forestry graduate from Mississippi State University, and has graduate degrees from the University of Wyoming and Texas A&M University. He taught previously at Penn State University. He is married, has 3 children, and lives in Ocean Springs, Mississippi.

Steve Jack. Steve is Conservation Ecologist for the Joseph W. Jones Ecological Research Center at Ichauway, a 29,000 acre preserve with extensive longleaf pine forests, near Newton, GA. In this position he is involved in the operational management of Ichauway, provides an interface between the research and resource management staffs, and conducts applied research on conservation-oriented management of longleaf pine for forest and wildlife objectives.

Rick Jacob. Rick is the Director of Conservation Forestry for the Louisiana Chapter of The Nature Conservancy, responsible for forestland acquisition, forest restoration activities, and statewide forestry issues. Rick is Project Coordinator for the West-Central Louisiana Ecosystem Partnership, and past Chairman of the Louisiana Society of American Foresters. Prior to joining The Nature Conservancy, Rick worked in paper mill wood procurement and in forestry consulting for private landowners. Rick has an M.S. in Forest Management and Economics from Louisiana State University.

Claude Jenkins. Claude is a certified wildlife biologist with the Alabama Wildlife Federation. His primary responsibility is to provide wildlife habitat conservation and management technical assistance to private landowners in Alabama. He is a graduate of Mississippi State University’s College of Forest Resources, and has over 15 years of experience working with private, non-industrial landowners to conserve wildlife habitat in forested and non-forested ecosystems.

Philip Juras. A native of Augusta, Georgia, Philip’s love for the landscape began on the many trips his family made to explore the forests and fields of the Southeast. In 1990 he received a Bachelor of Fine Arts degree in drawing and painting and in 1997 a Master of Landscape Architecture degree, both from the University of Georgia. His MLA thesis examined the pre-settlement savannas that once flourished across the southeastern Piedmont, a subject that has informed much of his artwork since then. Now living in Athens, Georgia, with his wife Beth Gavrilles, Philip focuses primarily on remnant natural landscapes that offer a glimpse of the Southeast before European settlement. He combines direct observation with the study of natural science and history to depict, and in some cases recreate, these landscapes in oil on canvas. The sensory impressions conveyed by his paintings invite the viewer to step through the picture plane and into the landscape beyond.

In 2011 Philip exhibited more than 60 paintings at the Telfair Museums in Savannah, Georgia, and the Morris Museum of Art in Augusta, Georgia, portraying the southern wilderness as William Bartram described it in the 1770s. In conjunction with the exhibit, the book *Philip Juras: The Southern Frontier, Landscapes Inspired by Bartram’s Travels* was published by the Telfair Museums and is distributed by the University of Georgia Press. In 2012 *The Southern Frontier* earned Philip the Georgia Author of the Year Award in the Specialty Book category from the Georgia Writers Association.

In addition to his work on Bartram and his ongoing work on fire adapted environments, Philip is preparing for a 2015 exhibit and book about the natural environments of Little St. Simons Island, Georgia – one of the South’s most pristine barrier islands. More information about Philip and images of his artwork can be found at www.PhilipJuras.com.

Nathan Klaus. Nathan grew up in the Loess Hills near Council Bluffs Iowa, among some of the best remaining examples of tallgrass prairie and oak savanna in the world. An early connection with this ecosystem has continued to shape him for decades, giving him a strong conviction about saving rare communities, and particular interest in the importance of natural disturbance and restoration of grassland and woodland habitats. He received a BS from University of Iowa where he studied the effects of isolation and patch size on reproduction of prairie plants. After working for the Iowa chapter of the Nature Conservancy for a time he moved to east Tennessee where he graduated from the University of Tennessee, Knoxville with a Master's in Forestry, Wildlife and Fisheries. His master's thesis examined the long-term effects of logging and natural disturbances on breeding bird communities in the Southern Appalachians. He has worked for the Georgia Department of Natural Resources Nongame Conservation Section for 15 years as a senior wildlife biologist, where he has authored numerous publications on songbirds and restoration ecology. He oversees management of nongame landbirds statewide, as well as restoration of longleaf pine, oak woodlands and prairies on state lands.

Chris Lituma. In 2005 Chris Lituma received his Bachelor of Science degree in Biology with a concentration in Ecology from Millersville University of Pennsylvania. In 2009 he received his Master of Science degree in Wildlife and Fisheries Sciences from Texas A&M University. His thesis research involved a comparison of avian communities between restored native warm-season grass fields and bermudagrass fields in the Blackland Prairie region of east-central Texas. He also evaluated dickcissel nesting success between field types. In 2014, he completed a Doctoral degree at the University of Tennessee in Knoxville where his research focused on assessing the effects of conservation practices on grassland and early successional bird populations across a 7-state region.

Currently, he is a postdoctoral researcher with the Center for Native Grasslands Management at The University of Tennessee with Dr. Patrick D. Keyser. His research focuses on how patch-burn grazing management for native warm-season grasses and establishment of switchgrass monocultures can impact avian communities and nest success. In the future, he would like to teach ornithology, conservation, and wildlife science at a university, while continuing to conduct research.

James Martin. James is an Assistant Professor at The University of Georgia. He studies animal ecology in managed ecosystems. He also strives to provide producers and landowners tools to make the best decisions to achieve their objectives.

Mike McCloy. Mike is a first-year Master's student with the Forestry, Wildlife, and Fisheries Department of the University of Tennessee and is studying how birds are responding to prescribed fire and timber harvesting in oak savanna restoration sites. Originally from North Carolina, he received his undergraduate degree from Western Carolina University in 2014 in Natural Resources Conservation and Management. His research focuses on evaluating the nesting success of several focal bird species at multiple oak savanna restoration sites in the mid-South.

Hank McKinley. Hank graduated from Auburn University in 1977 with a degree in Forest Management. He worked in the private forest industry for 17 years and then joined the Alabama Forestry Commission in 1991. He was promoted to NE Regional Forester in 2008 and then became NW Regional Forester in 2012. Hank also served in the Alabama National Guard for over 30 years before retiring in 2011 as a Command Sergeant Major. He has been a Certified Prescribed Burn Manager since 1996. Hank and his wife Sheryl have three children.

Mark Melvin. Mark is employed at the Joseph W. Jones Ecological Research Center at Ichauway, Inc. located in Newton, Georgia. Mark has 25 years of private land management experience in the south and approximately 250,000 acres of prescribed fire experience. At Ichauway, he works with

conservation management and education staff to promote the appropriate use of prescribed fire. Some of his outreach efforts include; prescribed fire short courses that provide “hands-on” experience, participation with numerous university courses for undergraduate and graduate programs, private landowner outreach, and partners with many natural resource management agencies.

Pat Minogue. Pat has more than 35 years of experience in agricultural, forestry and environmental research working with USDA ARS Beltsville, North Carolina State University, Auburn University, Cyanamid, BASF and as a private forestry and environmental consultant in the southeastern and western United States. He has been a licensed forester in Alabama and Georgia for many years, and was instrumental in developing herbicide technology for reforestation and improved productivity and health of southern pine and hardwood forests.

David J. (Dave) Moorhead. Dave is Professor of Silviculture at the University of Georgia’s Warnell School of Forestry and Natural Resources. A native of Louisville, KY, Dave received a B.S. in Forestry from the University of Kentucky, an M.S. in Silviculture/Soils from Mississippi State University, and his Ph.D. in Forest Ecophysiology from the University of Missouri-Columbia. He has been with the University of Georgia for 30 years providing statewide and regional outreach programs on, forest herbicides, invasive species and forest health, forest regeneration, prescribed fire, and forest management for county extension agents, private landowners, foresters and natural resource managers. He has extensive experience in vegetation management and pine regeneration with longleaf, slash and loblolly pine and was the recipient of the Southeastern Society of American Foresters 2009 Award of Excellence for Public Education & Technology Transfer.

Dr. Moorhead is Co-Director of The Center for Invasive Species and Ecosystem Health at the University of Georgia (see WWW.Bugwood.org) which works on all taxa of invasive species nationally & internationally. The Center (Bugwood) provides invasive species information, images, invasive mapping & reporting with our **Early Detection & Distribution Mapping System (EDDMapS)**, smartphone apps, and educational programming. Bugwood is a leader in developing database applications, training and support for Citizen Scientist activities across the U.S. and Canada for ID and mapping invasive species. These capabilities are being used to ID, report and map invasive plants, and animals in Florida, invasive plants throughout the U.S. and Canada, as well as certain regulatory insects. Center projects support invasive species programs for the U.S. Forest Service, National Park Service, U.S. Fish & Wildlife Service, and numerous state and provincial agencies. Through the Center, Dr. Moorhead has been involved in extensive program development in the area of invasive species awareness and management, and conducts workshops across the southeast on invasive plant identification, pathways of spread in forested/natural ecosystems, and management and control techniques. He serves on the board of the North American Invasive Species Management Association, and as advisor to the Georgia & the Southeast Exotic Pest Plant Councils.

Reed Noss. Reed is Provost’s Distinguished Research Professor at the University of Central Florida and President of the Florida Institute for Conservation Science. He received an M.S. degree in ecology from the University of Tennessee and a Ph.D. in wildlife ecology from the University of Florida. He has served as Editor-in-Chief of *Conservation Biology* and President of the Society for Conservation Biology. He is an Elected Fellow of the American Association for the Advancement of Science. He currently conducts research on vulnerability of species and ecosystems to sea-level rise; climate adaptation strategies; disturbance (e.g. fire) ecology; road ecology; ecosystem conservation; and changes in ecological processes and species assemblages along urban-rural-wildland gradients. He has nearly 300 publications, including seven books, and is rated as one of the 500 most highly cited authors in all fields worldwide. His latest book is *Forgotten Grasslands of the South: Natural History and*

Conservation (Island Press, 2013). He is currently writing books on disturbance ecology and fire ecology in Florida.

Holly Ober. Holly is an Associate Professor and Extension Specialist in the Department of Wildlife Ecology and Conservation at the University of Florida, stationed at the North Florida Research and Education Center. The focus of her research is to better understand mechanisms that explain the abundance, distribution, and diversity of forest dwelling wildlife. She serves as director of the Natural Areas Training Academy, co-director of CFEOR (Conserved Forest Ecosystems: Outreach and Research), chair of the Florida Bat Working Group, and Associate Editor of the *Wildlife Society Bulletin*. Holly has a Ph.D. in Wildlife Science and Forest Science from Oregon State University, an M.S. in Wildlife Ecology from the University of Arizona, and a B.S. in Biology from Duke University.

Ray Owen. Ray is a writer, historian, and conservationist who lives in Southern Pines, NC. He has been a contributing writer for *O. Henry* and *PineStraw* magazines, and his public service includes the Stewardship Council of The Cultural Landscape Foundation and Vice President of Friends of Weymouth.

Allen Parrish. Allen has been a biomass research specialist working for the Energy Biosciences Institute since 2009 with Dr. DK Lee. He received his Master's Degree in Crop Science in 2013 and his Bachelor's Degree in Technical System's Management in 2006 from the University of Illinois. His research interests are improvement and management of native grasses and forbs for biomass and seed production.

Greg Pate. Greg is a native of Anniston, Alabama. He received his BS in Forest Management from Auburn University in 1981. After several years in private sector forestry jobs, Greg began a 26 year career with the North Carolina Forest Service in 1988. Most of this career was spent in the longleaf pine range within the state. Early in his career, while working in the southeastern district of the state, he was instrumental in increasing the 'comfort level' of the field foresters in establishing new longleaf planting. Through the work in this district, executive management within the agency was convinced to expand containerized longleaf seedling production at the state nursery. Greg did such a 'good job' at selling this need to management that he was eventually put in charge of the state nursery and tree improvement at Goldsboro. During his tenure there, longleaf production facilities were expanded to produce over 5 million containerized longleaf and cultural practices were improved dramatically.

After other moves in his career, he was named as the 9th state forester of North Carolina in 2012. Though the decision to leave North Carolina and return to Alabama was a difficult one, home seemed to be calling him. He was appointed the 7th state forester of Alabama in February of 2014. He became the first native Alabamian and the first graduate of Auburn University to hold that position.

Stephen Pecot. Stephen is a Forest Analyst and Environmental Specialist with Larson & McGowin of Mobile, AL. He is originally from New Orleans and has a B.S. and M.S. in Forestry from Louisiana State University. Stephen worked for 10 years as a Research Associate at the Joseph W. Jones Ecological Research Center in Georgia conducting research on the longleaf pine-wiregrass ecosystem with Dr. Bob Mitchell. He was a GIS Analyst at Silvics Solutions before coming to Larson & McGowin in 2009. Stephen was also the Communications Director for a \$6.2 million statewide cogongrass eradication program in Alabama from 2009 to 2012. Stephen lives in Fairhope, AL.

Bill Pickens. Bill graduated from Penn State University in 1977 with BS in Forest Science. He has worked with the North Carolina Forest Service since 1988 with positions as a field forester, district forester, and nursery/tree improvement forester. In his current position as conifer silviculturist, he conducts applied forest research and provides technical assistance and transfer for conifer forest

management and forest herbicide application. Longleaf pine restoration and forest management has been a large part of his job and the NCFS for the last 20 years.

Daniel Powell. Daniel attended Auburn University from 1964 -1967 in Wildlife Science. He left school to serve in the U. S. Navy from 1967-71 where he was a Navy Diver stationed in the Republic of Vietnam from 1970-71. After attending the University of South Alabama from 1972-73, Daniel worked in the timber industry for various sawmills and pulp companies in procurement and land management from 1974 until 2003. He founded Quality Land Management, Inc. in 2003. His company offers landowners prescribed burning and invasive weed treatments services. Daniel has also served as the Director of the Alabama Wildlife Federation from 1986 to 1996, President of the Alabama Wildlife Federation 1996-1997, and Coordinator of the Alabama Black Bear Alliance 1996 until present.

Kevin Robertson. Kevin received his BS in Botany from Louisiana State University where he conducted fire ecology research in pinelands of Everglades National Park, southern Georgia, and Louisiana. He received his Ph.D. in Plant Biology at the University of Illinois where he studied the effects of river migration on floodplain forests along rivers of the southeastern U.S. He is currently the Fire Ecology Research Scientist at Tall Timbers Research Station. There he studies the plant community ecology of southeastern U.S. pine ecosystems, the natural history of the Gulf Coastal Plain, remote sensing of fire, fire regime effects on plant communities, soils, and fire behavior, and prescribed fire effects on air quality. He also advises graduate students, presents guest lectures, and provides extension and outreach related to these topics.

J. Brett Rushing. Brett is currently an Assistant Research/Extension Professor for Mississippi State University at the Coastal Plain Experiment Station in Newton, MS. He has a 50/50 research and extension appointment. His research program encompasses several arenas, including forage crops (particularly native warm-season grasses), herbaceous biomass feedstocks, and conservation plant materials. For extension, Brett's responsibilities lie in similar areas, however a majority of the producers he works with in the area are cattlemen and women. Having started just this past June, several projects are only in their infancy. These include: grazing studies assessing animal performance on native warm-season grasses, alternative soil amendments for bermudagrass and annual ryegrass production, the evaluation of native cool-season species in conjunction with annual clovers, and canola variety trial performance.

John Seymour. John is President and co-owner of Roundstone Native Seed LLC based out of Upton KY. Roundstone specializes in the production of native grasses, legumes, wildflowers and wetland species for seed and plug production. Roundstone's base farm is 1800 acres but also has production fields throughout the Southeast. Roundstone currently grows, harvests, cleans, conditions, processes, mixes and sells over 250 different native species. Roundstone also does custom design and establishment of all types of native plantings from meadows to wetlands to power lines to landscapes. John has developed much of the harvesting, cleaning and planting equipment and techniques that has enabled Roundstone to become one of the largest Native seed and plant companies in the East. John attended Western KY University where he studied agriculture. John is a past recipient of the Governor's Environmental Excellence Award for KY, Tree Farmer of the Year Award both state and regional finalist, and the 2013 recipient of the Alabama Wildlife Federation's Governor's Conservation Achievement Award for Conservation Organization of the Year. John resides on their farm in Hart Co., KY with his wife and two children.

Barry Shiver. Barry is Professor Emeritus from the Warnell School of Forest Resources at the University of Georgia. While at the university he specialized in silviculture and modeling growth responses to silvicultural treatments, inventory, mensuration, and timber management. He spent several years as the CEO of ForesTech International and is currently the President of Smarter Forestry (www.smarterforestry.com).

Charles M. Simon. Charles has been the County Extension Coordinator for the Covington County Extension Office for the last 25 years. He graduated from Tuscaloosa High School in 1972. He earned a B.S degree in biology from Jacksonville State University in 1976, a B.S. in Animal and Dairy Science from Auburn University in 1982 and a M.S. in Agriculture Economics in 1990.

Mr. Simon is a member of the State Committee of the National Review Board with the Alabama Historical Commission. He is also a board member in the Covington County Cattlemen Association, Covington County Forestry Committee, State Tree Farm Committee and the Extension sponsor of the Covington County Master Gardeners. He has a published article in the *Tributaries, Issue No. 9, 2006* on the subject of Southern Range (Pineywood) Cattle and several articles for the Alabama Gardener Magazine.

Mr. Simon resides in Andalusia and is married with 3 children.

John R. Stivers. John is a consultant forester and performs an array of resource management services for approximately 30 clients in AL and GA. He has unique expertise in conservation easements, stream & wetland mitigation banking, Safe Harbor program, geographic information systems (GIS), endangered species, federal and state cost share areas, and carbon sequestration. Additionally, he instructs 6-8 sessions each year in AL for prescribed burn manager certification and recertification classes for the Alabama Forestry Commission. John is a prescribed fire planning specialist, type I burn boss on all complexities of prescribed fire, is certified in all areas of fire suppression including working on Type I incident management teams. In total, he has experience on 2,000+ prescribed fires involving over 800,000 acres in numerous states in the SE as well as experience on over 1,000 wildland suppression fires in 30 states.

John is an Arkansas native and attended North Arkansas Community College from 1978-1979. He went on to earn a BS degree in Forest Management in January 1982 from University of Arkansas @ Monticello (UAM).

Professional Organizations and Certificates include:

- Society of American Foresters (SAF) member since 1978
- Certified Forester #548 with SAF since 1995
- Registered Forester in AL (#1889) since 1985
- Registered Forester in GA (#2232) since 1994
- Association of Consulting Foresters 2009
- Member of AL, MS, GA Prescribed Fire Councils
- Steering Committee member and past Chairman, AL Prescribed Fire Council
- Certified Prescribed Fire Manager in AL (1985) and GA (1998)
- Certified Tree Farm Inspector
- Advisory board member for Southern Fire Exchange

Susana Sung. Susana is a Research Plant Physiologist with the US Forest Service Southern Research Station's "Restoring and Managing Longleaf Pine Ecosystems" Unit at Pineville, Louisiana. She earned her PhD from Auburn University and worked at the University of Georgia for several years before she joined the Forest Service in Athens, GA in 1990. Dr. Sung has been conducting research

on the artificial regeneration of longleaf pine forests since 2005. Her research topics include seedling nursery protocols and seedling quality; seedling and sapling field performance; and the morphological and physiological aspects of longleaf pine. The main thrust of her research in recent years has been the relationship between the root system architecture and the physical instability or toppling of longleaf pine saplings, especially in the hurricane-prone areas. Dr. Sung is also experienced with the artificial regeneration of loblolly pine and various oaks in the south.

Reggie E. Thackston. Reggie is a native Georgian who received his Bachelor's (1976) and Master's (1978) Degrees in Forest Resources from the University of Georgia. He is certified by The Wildlife Society as a Wildlife Biologist and is a member of the Society of American Foresters. He and his wife Wendy live in Forsyth GA. His hobbies include managing land, including longleaf, for wildlife. He owns and trains bird dogs and is an avid quail and turkey hunter.

He serves as the Georgia Department of Natural Resources, Wildlife Resources Division (WRD) Private Lands Program Manager and Bobwhite Quail Project Leader. Reggie has worked over 34 years in wildlife conservation, including six years with the Oklahoma Department of Wildlife Conservation, three years with the South Carolina Department of Natural Resources, and 26 years for Georgia WRD. His primary work experience has been with integrating management for bobwhite quail, eastern wild turkey and white-tailed deer into working farm and forestlands. He has worked with Farm Bill and Forestry policy, program and practice development at the national and state levels; and with implementation and monitoring at the local level.

Reggie has authored or co-authored well over 25 technical publications and more than 50 popular articles on wildlife management; including co-authorship of the book "Deer and Turkey Management Beyond Food Plots" by K. Kammermeyer and R. Thackston.

Jeff Thurmond. Jeff is the State Staff Wildlife Biologist on the NRCS Staff in the Alabama State Office in Auburn. He is a member of the Wildlife Society and is a Registered Forester in Alabama as well as a Certified Wildlife Biologist.

A native of Watkinsville, Georgia, Jeff attended the University of Georgia where he graduated in 1991 with a dual degree in forest management and wildlife biology. Prior to being hired with NRCS, he worked as a county forester with the Alabama Forestry Commission in Cleburne County. He also previously served as an Area Forester and an Area Wildlife Biologist with NRCS in Mississippi.

Paul Trianosky. Paul is Senior Director, Conservation Partnerships for Sustainable Forestry Initiative (SFI). He supports SFI by acting as the principle liaison with conservation and research organizations, seeking to maintain existing partnerships and grow the network of conservation organizations involved in the SFI Program and working with SFI Program Participants. Paul also manages the Conservation and Community Partnerships Grant Program and monitors conservation research developments to identify opportunities to further the SFI Program and activities of SFI Program Participants. Paul brings nearly thirty years of experience in forestry, non-profit management, forest certification, building collaborative partnerships, and strategizing to achieve landscape-scale conservation. He has a B.S. in Forest Resource Management from Virginia Tech, and a Masters of Environmental Management from Duke University.

Bennett Tucker. Bennett was born and raised in Aiken, South Carolina. He graduated from Christ School in Arden, NC and went on to Erskine College in Due West, SC where he graduated with a BS in Business Management in 2006. While in college, Bennett became a volunteer firefighter with the Due West Fire Department and after moving back home, he became a volunteer firefighter with the Aiken Department of Public Safety. Bennett has many structural and wildland firefighting certifications that lend benefit to the Hitchcock Woods Foundation's prescribed burning program.

After becoming the woods superintendent with the Hitchcock Woods Foundation, Bennett became a South Carolina Certified Prescribed Fire Manager in the Fall of 2006. He has been around prescribed fire ever since he was in elementary school and remembers the first years of prescribed fire reintroduction in the Hitchcock Woods as he would often go out on burn days to watch the fire crews after he got out of school. Bennett is a product of The Longleaf Alliance's Longleaf Academies and has developed a passion for the Longleaf Pine Ecosystem and restoration of this special forest.

Robert Turnipseed. Robert is a 1993 graduate of Auburn University, where he received a Bachelor of Arts degree in English, with a concentration in Technical and Professional Communication. He received his law degree in 1996 from the Cumberland School of Law at Samford University, and thereafter received an L.L.M. in Taxation from the University of Alabama School of Law, graduating with High Honors. He served as a law clerk for Justice Reneau Almon of the Alabama Supreme Court in 1996, and has been in private practice since 1997, now as a partner with the firm of Armbrecht Jackson LLP in Mobile, Alabama.

Robert's practice focuses primarily on the areas of trusts and estates, business succession planning, mergers and acquisitions, business formations and transactions, bankruptcy, business tax planning and probate. He is currently Chair of the Closely Held Business Committee of the Section of Taxation of the American Bar Association, and has been a speaker or panel participant both locally and nationally on a variety of tax and business planning topics. Robert is a member of the Estate Planning Council of Mobile and is a current member and past vice chair of the Probate Section of the Mobile Bar Association. He is currently serving as a Council Member of the Section of Taxation for the Alabama State Bar Association, and is a member of Class 6 of the Alabama State Bar Leadership Forum (2009). Robert was recognized as a 'Rising Star' by Alabama Super Lawyers in 2011.

Robert is licensed to practice in all state and federal courts in Mississippi and Alabama, as well as the Fifth and Eleventh U.S. Circuit Courts of Appeal.

Andy Vander Yacht. Andy is a PhD student at the University of Tennessee under Dr. Pat Keyser and is associated with the Center for Native Grasslands Management. He received a BS in Biology with minors in Chemistry and Environmental Science at Hope College (Holland, MI) and his MS in Wildlife Science with a minor in Statistics at the University of Tennessee. He is currently researching the effects of savanna and woodland restoration in the mid-south using variations in fire-season and overstory disturbance on shortleaf pine and oak regeneration, fuel load dynamics, and herbaceous understory development.

Morgan Varner. Morgan is Assistant Professor of Forestry at Virginia Tech. His research and teaching focus on fire ecology, fire behavior, fuels management, and forest ecology. He serves as the Chair of the Coalition of Prescribed Fire Councils, an international organization representing prescribed burners and their needs. He serves on the Editorial Boards of the journals Forest Science and Fire Ecology.

Marc Walley. Marc graduated from Auburn University with a degree in Forest Management in 1985. He started his forestry career with Scott Paper Company in Mobile, Alabama and has been with Forest Investment Associates (FIA) since 1994 where he is Executive Vice President and a member of the Executive and Investment Committees. FIA is a Registered Investment Advisor that acquires and manages timberland for institutional investors. The firm operates in 21 states and Brazil managing approximately 2.5 million acres with a market value exceeding \$4 billion. Marc is Chairman of the Auburn School of Forestry and Wildlife Sciences Development Committee and a member of the Board of Directors of The Longleaf Alliance. He is married to Penny, also an Auburn grad. They have two daughters, Adrienne and Madison, and reside in Milton, Georgia.

Melanie Walter. Melanie discovered the lost art of pine needle basketry in the early 1990s, when she bought a house that had over 100 long leaf pine trees on its property. She soon developed her own pine needle basket making style, incorporating many natural materials in her work. More recently, she began adding clay components to her work, and is excited about the new direction this is taking her. Her work is currently located in 60+ galleries and shops throughout the country.

Melanie has won three Regional Artist Grants from the Wilmington and Fayetteville Arts Councils in North Carolina, has been a four-time Finalist for the prestigious Niche Award, and was featured in Our State Magazine's October 2009 Issue entitled, "The Beauty of the Pines," by Liz Biro. She also was interviewed on Time Warner Cable's "Made in the Carolinas," television program in March 2014, and in a segment with WECT-TV's Bob Townsend in, "Carolina in the Morning," also in March 2014.

She is a member of the North Carolina Art Council's Teaching Artist Directory, and the South Carolina Arts Commission's Approved Artist Roster for Arts in Education. She is a member of The Longleaf Alliance and a supporter of the sustainable future for the longleaf pine ecosystem.

Leslie G. Weeks. Leslie is a tax and corporate lawyer with a focus on estate and gift planning and taxation, charitable planning, pre and post nuptial planning, estate and trust administration, and general corporate representation. She received her BA and JD from the University of Alabama and an LL.M. in taxation from New York University. Leslie is a member of the Estate Planning Council of Mobile, and serves on the Board of the Weeks Bay Foundation and the Children's & Women's Hospital Development Council. She has been with the firm of Helmsing Leach Herlong Newman & Rouse, PC since 2000.

John Weir. John grew up in Oklahoma, attended Cameron University in Lawton, OK and received a BS in Plant Science (1986). He then attended Texas Tech University and received a MS in Range Science (1990). He became the superintendent of the Oklahoma State University Research Range in Stillwater, OK, a position he held for 16 years. In 2007, he joined the faculty of the newly formed Natural Resource Ecology and Management Department at Oklahoma State University where he is now a research associate. Since 2000 he has taught two prescribed fire courses, conducts fire ecology research and has extension responsibilities relating to prescribed fire training and prescribed burn associations. He has assisted with forming over 30 prescribed burn associations in OK, TX, CO, KS, NE, and MS. In the past 24 years he has conducted over 980 prescribed burns in every season of the year and in vegetation ranging from shortgrass prairie to Oak-Pine forest in five states. He has authored numerous fact sheets and research articles on fire and in 2009 he authored the book *Conducting Prescribed Fires: A Comprehensive Manual*.

Greg White. Greg is a CPA and received his Bachelor's Degree from Evangel University in Springfield, Missouri in 1977. He has been providing public accounting and income tax services for 30 years in Andalusia, Alabama. His firm – White & McClung, LLC – serves clients in many sectors, including small business owners, nonprofits, farmers, landowners, and other individuals.

Brian Williams. Brian is an Assistant Extension Professor in the Department of Agricultural Economics at Mississippi State University. Brian's research and extension interests include commodity marketing, crop and livestock production, risk management, farm management, and policy analysis.

Oral Presentation Abstracts

OPENING PLENARY SESSION

Keynote:

William Bartram in the Deep South, AKA, Who is William Bartram and Why Should I Care?

John Hall, Black Belt Museum Project, JHall@uva.edu

Trace the important visit of Botanist/Artist William Bartram to the South, 1773-77, where after he wrote the first book of Southern natural history: *Bartram's Travels*. John will review who Bartram is, his British sponsors, his route through the south, his contacts with the Indians, plants he discovered and his remarks on the old growth forest of the south.

CONCURRENT SESSION 1

1-A – Longleaf Partnership Council

Longleaf Stewardship Fund 2015: Program Overview and Outlook

Jonathan Scott, National Fish and Wildlife Foundation, Jonathan.Scott@NFWF.ORG

The National Fish and Wildlife Foundation will provide an overview of the Longleaf Stewardship Fund and upcoming Request for Proposals for the 2015 grant cycle. The presentation will provide a high level summary of the program and accomplishments to date, funding priorities for 2015 and key considerations for potential applicants.

The Longleaf Stewardship Fund is a landmark public-private partnership that expands, enhances and accelerates longleaf pine ecosystem restoration across longleaf pine's historical range. The National Fish and Wildlife Foundation administers the Fund, which is supported by the U.S. Department of Agriculture's (USDA) Forest Service and Natural Resources Conservation Service, the Department of Defense (DoD), the U.S. Fish and Wildlife Service (FWS) and private funding from Southern Company and International Paper's Forestland Stewards Initiative.

Regional Conservation Partnership Program

James Tillman, USDA Natural Resource Conservation Service, James.Tillman@wdc.usda.gov

One new and exciting tool to help us strengthen the partnership and increase longleaf pine acreages on private and public lands is the newly authorized Regional Conservation Partnership Program (RCPP). RCPP aims to further the conservation, restoration, and sustainable use of soil, water, wildlife, and related natural resources on eligible land on a regional or watershed scale. This program presents new opportunities for NRCS to work with numerous partners to accelerate conservation activities on private lands. We designated the longleaf pine range as a critical conservation area under RCPP to increase the voluntary participation of private landowners in restoration activities. RCPP can help us seek new partners, fund innovation projects and leverage partner funding.

Promoting and Tracking of Prescribed Fire with Private Landowners

Hank McKinley, Alabama Forestry Commission, Hank.McKinley@forestry.alabama.gov

Prescribed fire is a key action in the restoration and management of longleaf forests on private and public lands. As such, promotion of this action is imperative. Promotion and tracking of success with private landowners is even more important as the majority of the land in the historic range of

longleaf pine is privately owned. One way to improve the dependability of prescribed fire data is through the burn permitting process. Alabama is considering a modification to their burn permit that will better track prescribed burning occurring in longleaf forests. This modification may be useable by others trying to improve their data collection related to longleaf and prescribed burning.

America's Longleaf Restoration Initiative: Tracking Range-wide Partnership Accomplishments and Successes

Glen D. Gaines, U.S. Forest Service, ggaines@fs.fed.us

Since the release of the *Range-wide Conservation Plan for Longleaf Pine* in 2009, a strong partnership of agencies and organizations has coalesced around longleaf conservation in an effort referred to as the America's Longleaf Restoration Initiative (ALRI). The Longleaf Partnership Council (Council) formed in 2011 to promote effective communication and collaboration between the many involved partners. The Council and its 33 members provide the needed leadership to advance the range-wide restoration goals.

In 2012, the Council developed *Strategic Priorities and Actions 2013-2015* that highlighted four areas of needed focus, with measurable goals, and identified related actions for the short-term to move toward achieving range-wide restoration goals for longleaf pine. In 2013, the Council released the first *ALRI Range-wide Accomplishment Report* to track how the partnership was achieving the strategic priorities. The collective work of the many involved partners resulted in 1.38 million acres of on-the-ground restoration work accomplished, that included 1.1 million acres of critical prescribed burning. Approximately 75% of this work occurred within the recognized Significant Geographic Areas. Based upon the Report's findings, six areas of priority were identified for the ALRI partnership to focus in 2014-15. Work is now underway to develop the 2014 Accomplishment Report.

1-B: Longleaf & Grassland Research Presentations

Influence of Landscape and Stand-scale Factors on Avian Communities in Open Pine Ecosystems

Taylor Hannah, Mississippi State University, thannah@cfr.msstate.edu

Identifying species occurrence and community composition in priority ecosystems is especially important in the context of modern landscapes. This study investigates how stand-scale factors such as forest structure and tree species composition and landscape-scale factors such as urban density and stewardship affect avian communities in longleaf pine (*Pinus palustris*) ecosystems. Longleaf pine historically occurred across the Atlantic and Gulf Coastal Plains of the United States but today remains in only ~ 4% of this historic range. Conservation and restoration of longleaf ecosystems is now considered a high priority by a number of organizations. However, increasing the acreage of longleaf habitat alone may not translate to a proportional increase in species occurrence, abundance, or diversity. Species such as Bachman's sparrow (*Pencaea aestivalis*), red-cockaded woodpecker (*Picoides borealis*), and northern bobwhite (*Colinus virginianus*) have been identified as priority species in open pine ecosystems. Incorporating geospatial analysis and field sampling, this study will investigate how landscape and stand-scale factors relate to the distribution of priority avian species, selected to reflect "high quality" longleaf ecosystems, defined here as resemblance to historic conditions. Predictions for the occurrence of these priority species include a negative relationship with distance to urban center and a positive relationship to source population densities. Findings will serve to identify areas on the landscape of greatest potential value for longleaf restoration. The landscape and stand-scale factors that are found to support priority bird species can be used to develop and evaluate best management practices for the restoration and conservation of longleaf ecosystems.

Successes and Failures of Rivercane Macropropagation

Rachel E. Conley, *Auburn University School of Forestry and Wildlife Sciences, rec0004@auburn.edu*

Canebrakes, monotypic stands of native bamboo commonly known as rivercane, (*Arundinaria* spp.), are critically endangered ecosystems in the United States. This ecosystem has declined precipitously since the early 1800's to merely 2% of its former range due to overgrazing by livestock, conversion to agriculture or forests, and land fragmentation. Although canebrake restoration and conservation has become a priority for many state and federal agencies throughout its range, restoration of canebrakes hinge upon the availability of propagative material. Our objectives were to further refine methods of macropropagation using rhizome cuttings from mother plants and to examine the effects of various shade levels, mulch, and fertilizer on infield growth and survival of propagules. Macropropagation was conducted in March 2013 and 2014 at Roundstone Native Seed in Upton, Kentucky. In 2013, two planting methods were used during propagation: horizontal rhizomes in 4-inch pots and vertical rhizomes in 25-cell plug trays. Propagules grew from March-September under 60% shade cloth and overwintered outdoors. In 2013, we harvested 7,296 propagules (\bar{x} = 15.68 per mother plant), with 2,264 living propagules in September, 2,264 of which were actively sprouting (32.7% survival/31.3% sprouting success). In 2014, we harvested 4,186 propagules (\bar{x} = 4.97 rhizomes per mother plant). More detailed propagation results from 2014 are forthcoming. Rivercane sprout yields from 2013 macropropagation were planted in western Tennessee and lower Alabama in 2014. Optimized rivercane macropropagation and out-planting techniques from this study and related studies could result in more practical, large-scale canebrake restoration efforts in the future.

Dominant Bunchgrasses Occur in Non-random Spatial Patterns in Pine Savanna Groundcover Plant Communities

Katherine A. Hovanes, *Louisiana State University, khovan1@lsu.edu*

Dominant species are important drivers of community assembly. In communities of sessile organisms, individuals are most likely to interact with other individuals in their immediate neighborhood. The spatial pattern of dominant species at the local scale indicates which pair-wise interactions are likely to occur most frequently, and thus, which interactions likely affect community assembly. Longleaf pine savannas of the southeastern United States have hyperdiverse groundcover plant communities dominated by several bunch-forming grass species. We wished to determine the spatial pattern of dominant bunchgrasses at the plant-neighborhood scale in pine savannas to gain insights into species interactions governing community assembly. We surveyed three 9m² plots in each of six pine savanna sites across the southeastern United States (18 plots total). Each site was dominated by one of three bunchgrass species. We characterized the spatial pattern of large bunchgrasses (>5.0 cm basal diameter) at multiple spatial scales. Large bunchgrasses were overdispersed (regularly spaced) for all sites and species. The scale of overdispersion ranged from a radius of 0.4–1.0 m around focal bunches. These results suggest that mechanisms are operating to prevent individual bunches from growing directly adjacent to one another. Furthermore, these results indicate significant spatial structure at the scale of near-neighbor interactions. This suggests that dominant bunchgrasses are likely frequently interacting with subordinate species that occupy space between regularly spaced bunchgrasses. The ubiquity of overdispersed spatial patterns of dominant bunchgrasses indicates that these dominant bunchgrasses likely play an important role in community assembly of groundcover plant communities in pine savannas.

Local and Landscape Scale Habitat Effects on Grassland Bird Occupancy in the Upper East Gulf Coastal Plain

Patrick Farrell, *Auburn University, pdf0002@auburn.edu*

Grassland birds are among the most imperiled groups of avian species in North America and declining population trends have been observed in the Southeastern U.S. Important local and

landscape scale habitat associations important for grassland birds in this region are unknown and these may be important issues for conserving these declining populations. We estimated the relationship between occupancy and land cover composition for northern bobwhite (*Colinus virginianus*), eastern meadowlark (*Sturnella magna*) and dickcissel (*Spiza americana*) within the upper East Gulf Coastal Plain Joint Venture region using multi-season occupancy modeling in the Unmarked package within program R. We utilized roadside point count surveys at 102 sites in Alabama, Mississippi and Tennessee. Amount of core habitat had a positive effect on bobwhite initial occupancy. The extent of agricultural, hay and pasture land cover (%) had a positive effect on eastern meadowlark initial occupancy. The extent of agriculture, grasslands, hay, and pasture land covers (%) showed positive effects on dickcissel initial occupancy. Our findings suggest that managing the landscape configuration and composition of agriculture, hay, pasture, and grassland land cover types can benefit grassland bird populations in the Southeastern U.S. Additionally, conservation actions should focus on local and landscape scale habitat features to benefit this group of grassland birds.

1-C: Landowner 101: Economics

Tax Issues for the Timberland Owner/Timber Farmer

Greg White, White & McClung, LLC, gbwcpa@andycable.com

Since the first federal income tax Form 1040 appeared in 1913, many timber tax provisions have been added to encourage management and stewardship of private woodlands. The addition of these laws might've been with the best of intentions – and often they do provide favorable tax treatment for the landowner. But, often, they represent a minefield for the landowner and his accountant to navigate. Do you have Personal property, Investment property, or Business property? These and other questions should be considered early in the game.

Estate Planning Issues for the Landowner

J. Robert Turnipseed, Ambrecht Jackson Lanyers, LLP, jrt@ajlaw.com

Due to the increase of the Unified Credit to \$5 million per person in 2012, many people are under the impression that the threat of estate and gift taxes has been greatly diminished. While that is true for many people, estate and gift taxes still pose a major threat to landowners of farm and timber land, for many reasons inherent to the industry and especially due to the lack of liquidity faced by most landowners. Proper consideration of this threat may require either basic or more complex estate planning techniques or both, including certain techniques that are particular to owners of large tracts of land. It also involves succession planning for small family businesses to assure the survival of the business as well as the preservation of the land itself.

Conservation Easements

Katherine Eddins, Alabama Land Trust and Georgia Land Trust, Katherine@galandtrust.org

Katherine Eddins will provide an overview of conservation easements including an introduction to conservation easements on working forest lands. The overview will include a review of IRS and State rules related to tax incentives for donated conservation easements.

Successful Intergenerational Land Transfer: More Than Just a Deed

Leslie Weeks, Helmsing Leach Herlong Newman & Rouse, lgn@helmsinglaw.com

Sure, a deed is required to transfer land. However, to maximize the odds of a successful intergenerational land transfer, the grantor(s) and the grantee(s) should act (prior to executing the deed) to establish a practice of regular communications about the land and about the management and financial goals and expectations of the parties.

1-D: Landowner 201: Economics

Financial Cost of Managing Longleaf Plantations for Pine Savannah Habitat vs Timber

Barry D. Shiver, Smarter Forestry, bshiver@smarterforestry.com

Pine savannah habitat has been declining in the southeastern U. S. since the 1960's and with it species such as bobwhite quail, Bachman's sparrow, gopher tortoise, and others that use the habitat. While savannah is typically associated with natural stands, savannah habitat can be simulated with longleaf plantations managed at low densities. Federal subsidies such as CRP payments, burning subsidies, and enrollment payments have been used to motivate landowners to plant longleaf, burn, and otherwise manage to simulate natural pine savannah. Simulations were run to quantify the financial penalty of managing for savannah as opposed to managing for timber and to determine whether the various subsidies are enough to repay landowners for the lower economic return. Combinations of the subsidies currently available did adequately compensate landowners to change their management from timber returns to savannah habitat. Though pine straw raking is not allowed with subsidies, simulations demonstrated that the ability to rake and get paid, even if only for a few years, is very effective in raising financial returns for longleaf plantation management to values equal to or greater than timber returns alone. Simulations indicated that the cost of burns every two years as well as extending rotation ages from mid to low 40's depending on site quality to 50 years lowered financial returns by \$100-\$200/ac on low sites and by \$150-\$500/ac on higher sites.

An Economic Analysis of Native Warm Season Grass Cultivation for Grazing

Brian Williams, Mississippi State University, brw174@msstate.edu

Research has shown that there are many benefits to establishing native warm-season grasses for grazing. Input costs such as fertilizer are typically lower than non-native varieties, native grasses are usually more drought tolerant, yields can be higher, and native grasses have been shown to be more beneficial to wildlife. Despite all these benefits, producers are often reluctant to make the switch from non-native grasses to native grass. One of the biggest reasons for producers' hesitancy to switch is that establishment can be more difficult than non-natives such as Bermuda grass, sometimes requiring one to two years to establish. Native grasses also require a certain degree of management; grazing too short will inhibit root growth while allowing it to get too tall will result in the grass becoming "stemmy" and losing nutritional value. This paper explores the economics behind establishing native warm-season grasses by weighing the advantages of lower input costs and improved yields against the increased costs of establishment and the inability to utilize the forage during the first year. We look at the payback period for establishing native warm season grasses and make comparisons to non-native grasses.

Are Better Times Coming? Supply and Demand Factors Impacting Southern Timber

Marc A. Walley, Forest Investment Associates, mwalley@forestinvest.com

The Great Recession that was sparked by the sub-prime mortgage crisis and the financial crisis in 2007-2008 impacted all aspects of the global economy. In particular, the U.S. housing market and forest products industry suffered disproportionately compared to other parts of the economy. As housing starts plummeted, demand for lumber collapsed and prices for southern saw logs spiraled downward. An unprecedented period of under-building of new homes ensued. Current demographics suggest there is substantial pent-up housing demand and that overall supply/demand factors may portend a much brighter future for the forest products industry and southern timberland owners.

Silver Lining of a Very Dark Cloud: Hurricanes as an Opportunity to Restore Longleaf Pine

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Hurricanes will continue to affect southern forest ecosystems. According to NOAA, most coastal counties along the Gulf of Mexico have return intervals for major hurricanes (Category 3+) of every 30 years or less. Major hurricanes cause the most extensive damage, and are responsible for catastrophic timber and economic losses. Hurricane Katrina in 2005 caused \$888 million in timber losses in Mississippi, with 80% of this loss occurring within 60 miles of the Gulf. Longleaf pine demonstrated greater resistance to hurricane force winds than loblolly pine, particularly in thinned stands, and landowners and foresters alike have a heightened awareness of longleaf pine as a result. Data from federal, state, and other financial assistance programs for landowners planting longleaf in Mississippi were compiled from 2001 to 2013. Analysis revealed an almost 6-fold increase in longleaf pine acres planted post-Katrina, compared with the 5 years before Katrina. This is reflected in a significant increase in longleaf pine acreage in Mississippi as determined by the Mississippi Institute for Forest Inventory. We contend that hurricanes represent an opportunity to increase longleaf pine acreage, as landowners are focused on ways to reduce risk from future catastrophic events. The window of opportunity after a hurricane is narrow as damaged areas are salvaged and replanting decisions are made in a short and chaotic time. Informing landowners of the risk from hurricanes, as well as providing information and resources to landowners after such a catastrophic event, will likely increase longleaf pine acres across the South.

1-E: Wildlife & Grasslands

Avian Occupancy Response to Oak Savanna and Woodland Restoration in Tennessee

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Declining disturbance has resulted in succession of open vegetation types throughout the Mid-South into mesic, closed-canopy forests, with negative impacts on disturbance-dependent avian species. Restoration of savannas and woodlands could ameliorate trends, but habitat manipulation effects on avian communities are poorly understood. Therefore, we implemented an experiment on the Cumberland Plateau (TN) with a factorial combination of growing- or dormant-season fire and high (60 ft² ac⁻¹) or low (30 ft² ac⁻¹) residual basal area and unmanaged controls. We conducted repeated fixed-radius point counts (n=40, 3 visits/year, 2010-2012) and performed multiple-season, robust design occupancy modeling for 20 species. We then used mixed-model polynomial regression to define relationships between occupancy and yearly measures of live and dead basal area, midstory density, and herbaceous groundcover. We observed increased avian abundance, species richness, and early successional species occupancy related to live basal area (negatively), dead basal area (positively), and herbaceous groundcover (positively). Trends in occupancy related to midstory density were species specific. Generally, forest species were constant in occupancy over habitat parameter ranges, except for ovenbirds (*Seiurus aurocapilla*), which declined as disturbance increased. For both early successional and forest species, herbaceous groundcover was the best predictor of occupancy, meriting its consideration during restoration planning and evaluation. Managing for 20-40 ft² ac⁻¹ of live basal area and 40% herbaceous groundcover will maximize early successional occupancy while mitigating negative forest species impacts. Our results can be used to enhance conditions for specific target species, or in the development of management plans maximizing multiple species.

Influence of Right-of-Way Maintenance on Gopher Tortoise Activity

J. Wesley Graham, South Mississippi Electric Power Association, wgraham@smepa.coop

South Mississippi Electric Power Association (SMEPA) maintains approximately 2735 km of transmission right-of-way (ROW) across 56 counties in Mississippi. This equates to more than 10,107

ha of utility ROW that must be managed to maintain reliable power to 11 member-owner power associations. Vegetation is responsible for approximately 80% of SMEPA sustained outages. Therefore, maintenance programs are essential in minimizing disruption. Mowing, side-trimming, and herbicide applications are utilized in the management process. However, some techniques have negative impacts on natural resources and wildlife habitat. In 2008, SMEPA began judicious use of herbicide on ROWs to reduce undesirable growth of woody species, convert the ROW to a more herbaceous environment, and minimize the amount of mowing necessary to maintain vegetation clearance. An important indicator species, the gopher tortoise (*Gopherus polyphemus*) is listed as threatened. Their range includes 15 counties in which SMEPA maintains ROWs. During the last seven years, gopher tortoise populations on ROWs have been identified and monitored using GIS techniques. Since the inception of the herbicide program there has been an increase in the populations along the ROWs indicating a more suitable habitat. Also, den openings that were present on ROWs before inception of the herbicide program have migrated from centerline to the ROW edge, suggesting herbicide management of ROWs has allowed for increased mobility, food, desirable cover, and burrow options. Migration from centerline has minimized line crew/gopher tortoise interaction and maximized operational clearances.

Breeding Bird Nesting Success in Oak Savanna Restoration: Preliminary Results

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Oak savannas occupy only a fraction of their former range. As part of an oak savanna restoration study, prescribed fire has been introduced in conjunction with timber thinning at Catoosa Wildlife Management Area (TN) and thinning only at Green River Gamelands (NC). The response of avifauna, particularly nesting success, to these management practices has been poorly studied. We studied nesting success of four species representative of different stages of oak savanna restoration, prairie warbler (*Setophaga discolor*; PRAW), field sparrow (*Spizella pusilla*; FISP), red-headed woodpecker (*Melanerpes erythrocephalus*; RHWO), and ovenbird (*Seiurus aurocapilla*; OVEN). We systematically searched for nests, monitored those we found until fledging or failure, noted brood parasitism, and sampled vegetation for nest sites. Due to equipment limitations, we did not monitor RHWO nests. We found 12 PRAW, 5 FISP, 3 OVEN, and 6 RHWO nests during May – July 2014. Six of the PRAW nests were found after completion of nesting and therefore were only useful for evaluating nest site selection. Mean PRAW clutch size was 2.83 with an average of 2.5 chicks successfully fledged per nest. Only one PRAW nest failed to fledge any young. Mean clutch size of FISP was 3.8, with all chicks successfully fledged. Two of 4 OVEN nests (only 1 successful) fledged an average of 2 chicks per nest, from an average clutch size of 3.5. One nest was prematurely abandoned during the nest-building stage and the fate of the remaining nest was unknown. Instances of brood parasitism by brown-headed cowbird (*Molothrus ater*) were absent.

Multi-Scale Assessment of Wildlife Sustainability in Switchgrass Biofuel Feedstock Production

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Switchgrass (*Panicum virgatum*), a native warm-season grass that is the leading model for production of sustainable biomass for biofuel, is forecasted to eclipse >30 million acres in the USA based on a 2006 analysis. At this scale, biomass production could have a substantial impact on imperiled grassland bird populations, but to date, there have been few field studies examining responses of nesting birds to this production system. Therefore, we initiated a study to directly assess differences in avian density and nest success between switchgrass biomass fields, and matrix fields representative of the

surrounding landscape. We conducted distance-based point counts and nest searching in 10 biomass and 5 matrix fields in western Kansas, and 10 paired biomass and matrix fields in northwestern Pennsylvania and eastern Tennessee, from May-July 2013 and 2014. In 2013 in KS, we detected 103 grasshopper sparrows (GRSP; *Ammodramus svannarum*) and 292 western meadowlarks (WEME; *Sturnella neglecta*) on matrix fields compared to 23 GRSP and 128 WEME on biomass fields. However, in TN we detected 7 GRSP and 1 eastern meadowlark (EAME; *Sturnella magna*) on matrix fields compared to 13 GRSP and 10 EAME on biomass fields. Conversely, we detected 991 red-winged blackbirds (RWBL; *Agelaius phoeniceus*) on KS biomass fields and 13 on TN biomass fields compared to 4 RWBL on KS matrix fields and 1 on TN matrix fields. We will also present analyses of density, occupancy, and species assemblage structure. Results will inform management for biomass production fields, and their potential impacts on grassland birds.

CONCURRENT SESSION 2

2-A: State & Local Implementation Team Challenges

Perspectives on Site Preparation "Bedding in the Flatwoods"

Alan Dozier, Okefenokee/Osceola Local Implementation Team "O2LIT", alandozier54@gmail.com

America's Range wide Conservation Plan for Longleaf Pine brings to light that "Success in conserving and restoring longleaf ecosystems will depend on it being an economically viable, socially acceptable, and otherwise practical option for private and public land stewards alike." Quite possibly no other landscape exhibits such stark differences in forest management philosophy as exists between the public and private holdings of the Okefenokee National Wildlife Refuge, Osceola National Forest and the encompassing private, mostly commercial forests. The understanding of these varying perspectives has resulted in strong public/private partnerships which recognize and accept these differences.

Across the vast privately held pine landscape, which includes much more than the Okefenokee/Osceola Significant Geographic Area, the economically viable, socially acceptable and otherwise practical option for establishment of pine forest traditionally demands extensive soil cultivation. This practice is commonly referred to as "bedding" in preparation for tree planting. Once again, differences arise. In this case, between commercial forest establishment proponents and those for ecosystem restoration. Extensive cultivation increases both tree survival and growth but also postpones the desired ecological forest understory component of the longleaf ecosystem.

The challenge for the longleaf initiative is to develop an approach, both short and long term, that will give an acceptable approach to site preparation and foster a partnership favoring longleaf restoration with the most capable and influential forest steward on the landscape.

Prescribed Fire: A Longleaf Restoration Priority in Mississippi

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The Mississippi Longleaf Implementation Team has determined one of the greatest issues concerning longleaf restoration is the present lack of existing management with prescribed fire. Local natural resource professionals need to develop a plan for following up with landowners that now need to manage their stands with prescribed fire to improve tree growth, understory composition, wildlife habitat, and overall ecosystem health. Furthermore, there are an inadequate number of prescribed fire managers to meet the demand for prescribed fire across the longleaf native range. One potential solution may be to train more private landowners as certified prescribed fire managers to alleviate the burden of demand from this small pool of prescribed fire vendors. Additionally, the message of

prescribed fire must be clear and chorused among partners: Prescribed fire hosts a number of benefits, including hazardous fuel reduction, wildlife habitat and timber stand improvement, and ecosystem health maintenance.

One approach that has shown some success in delivering prescribed fire on private land in Mississippi has been the “Fire on the Forty” initiative. This program was designed to promote prescribed burning on private lands by providing cost share assistance to private landowners as well as educational programs in designated focal areas. “Fire on the Forty” has led to expanding partnerships, funding opportunities, expansion across the landscape, outreach and training, and opportunities for private burn vendors.

Mapping Longleaf Pine at the Stand Level: Lesson Learned and Future Goals

John Gilbert, Auburn University, gilbejo@auburn.edu

In response to increasing interest in conservation and restoration of functional longleaf pine ecosystems, the Longleaf Pine Stand Dynamics Lab and The Longleaf Alliance, Inc. have been working together for the past few years with numerous partners on an effort to develop a GIS database of existing longleaf pine stand level data. The GIS database is being constructed by collecting and compiling existing available spatial data about longleaf pine stands across the historic range. The database will serve as a baseline of knowledge about available spatial data for longleaf pine stands by showing locations and some description of condition. Many lessons have been learned over 6 years of data collection about the ability to find and gain access to data, data quality, data sensitivity, and merging datasets into a working database. There are common misconceptions and barriers to collecting and displaying existing data that need to be addressed and overcome in the future. Alternative ways to showcase or display “fuzzed” data with privacy issues and improved forms of information transfer can help improve data collection in the future and provide more opportunities for others to use the database. Without a suitable conservation planning tool and map that can be updated periodically to show the extent and condition of existing longleaf pine forests, various restoration efforts continue in a scattered approach across the historic range, where the impact of the restoring functioning landscape scale longleaf pine ecosystems continues to be an unknown.

Longleaf Offers Benefits to Reduce Risk from Wildfire and Other Challenges

Kent Evans, Texas Longleaf Implementation Team, 99kevans@gmail.com

In the last 25 years Texas piney woods have suffered significant losses from southern pine beetles (SPB), hurricane winds, drought, and wildfires. Available planning tools and lessons learned can daylight the benefits of a well-managed longleaf stand growing on its historic sites in east Texas. Landowners can review SPB hazard rating maps and identify high risk stands characterized with high density mature loblolly. Post hurricane evaluations show higher rates of damage in loblolly and slash stands than in longleaf stands. Air photos during the 2011 Texas drought documented damage from extreme fire behavior in un-thinned, un-burned loblolly stands. An example of a well-managed longleaf stand, hit by wildfire in these extreme conditions, suffered very low mortality.

2-B: Longleaf & Grassland Research Presentations

Distinctive Floristic Composition of Longleaf Pine-Wiregrass, Shortleaf Pine-Oak-Hickory, and Old-Field Plant Communities in Northern Florida and Southern Georgia

Kevin M. Robertson, Tall Timbers Research Station and Land Conservancy, krobertson@ttrs.org

Upland longleaf pine-wiregrass native plant communities occurring on Ultisols of the southeastern U.S. Coastal Plain are known for their distinctive flora and high native plant diversity, including many species sensitive to soil disturbance, fire exclusion, and light limitation. Less well known is the species composition of shortleaf pine-oak-hickory native plant communities, which also occur on Ultisols of

the Coastal Plain. The purpose of this research was to compare these three community types to 1) identify species representative of each to assist with identification in the field and assess their contribution to regional biodiversity, 2) identify species which are not likely to recolonize heavily soil-disturbed areas and therefore have special conservation status, and 3) determine if floristic differences can be explained in part by soil characteristics. Eighty-four 100 m² plots were inventoried for all vascular plant species within the three community types distributed over three properties. Multivariate and indicator species analysis showed that the three community types were distinctive in their overall species composition, although many species were held in common and composition varied some among properties. Lists of indicator species for each community type were compiled. Soil characteristics also varied among community types, with the depth of sand and coarseness of soil decreasing and soil fertility increasing from longleaf to shortleaf to old-field communities. Results can be applied to identification, conservation, and restoration of longleaf pine-wiregrass and shortleaf pine-oak-hickory native plant communities within the region.

Is your Choice of Site Prep Helping or Hurting your Longleaf Pine Restoration?

**Nathan Klaus, Georgia Department of Natural Resources, Nathan.Klaus@dnr.state.ga.us*

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Restoration of longleaf pine often includes the unfortunate use of broad spectrum herbicides. While this results in excellent establishment of longleaf pine it often appears to do severe and lasting damage to herbaceous groundcover. This groundcover includes the incredible diversity of plants found within the longleaf pine ecosystem and supports wildlife that make longleaf famous. Destroying groundcover diversity while ‘restoring’ longleaf pine is a restoration failure, and is especially tragic because it often happens despite the best intentions of the land owner.

The Georgia Department of Natural Resources Nongame Conservation Section has conducted 5 years of research into this problem, both to guide their own restoration efforts and to assist others. Three research areas across the state (montane longleaf, sandhills and Red Hills) were treated with 15 different combinations of herbicides. Plant surveys were conducted before and after the application and compared to controls. Several widely available herbicides (metsulfurin, triclopyr, Velpar-L on a grid and possibly ULW) appeared to conserve much of the groundcover and encourage key grasses on our sites. These treatments may have resulted in a slight to moderate reduction in longleaf planting success but had much higher planting success than untreated controls. Treatments with the highest longleaf pine survival (tank mixes that included imazapyr and glyphosate or moderate to high rates of imazapyr alone) did the greatest damage to groundcover. These treatments diminished the quality of wildlife habitat and made prescribed fires difficult to execute on our study sites due to high weedy cover and low grass cover. Furthermore, some imazapyr plots experienced substantial increases in woody cover due primarily to increases in blackberry cover, which in turn made plots difficult to burn.

The use of broad spectrum herbicides for site prep trades lasting damage to groundcover for moderately greater chance of planting success. For landowners interested in ecological restoration and wildlife habitats there are viable alternatives.

Container Cavity Types Are Critical to Longleaf Pine Field Performance

**Shi-Jean Susana Sung, USDA-Forest Service-Southern Research Station, ssung@fs.fed.us*

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Mary Anne Sayer, USDA-Forest Service-Southern Research Station, msword@fs.fed.us

In December 2009, a study was established on the Palustris Experimental Forest (PEF, Louisiana) and the Escambia Experimental Forest (EEF, Alabama) to compare various longleaf planting stock types. The severe drought of 2010 resulted in 15 and 45% first year survival for the bareroot stock at the

PEF and EEF, respectively; whereas 78 to 88% of the container seedlings survived. The fourth year total seedling volume of the EEF container seedlings was two- to three-fold that of the PEF seedlings. At the EEF, seedlings cultured in copper-lined cavities of 164 and 108 ml had greater volume compared to those from the non-copper lined cavities. At the PEF, the copper-lined 108 ml cavity seedlings had the greatest seedling volume. In general, the copper cavities-grown seedlings had less lateral root deformity and higher percent of lateral roots egress from the top 10 cm of the plugs. In December 2013, a study comparing seedlings cultured in side-air-vent cavities (VT, International Forest Company Tray 128[®]) and solid-wall cavities (SW, IPL-Ridged Pots 110[®]) was established at the PEF. The VT and SW seedlings allocated 28 and 43% of their biomass to the root systems, respectively. The VT seedlings had larger taproot and smaller fine root biomass than the SW seedlings. Both type of seedlings had the majority of their lateral roots egress out of the bottom 2 cm of root plugs eight months after planting. Relationships of root system architecture and sapling physical stability will be discussed based on the findings of these studies.

Longleaf Pine Straw Yields and Income Potential

James (Dave) Haywood, USDA Forest Service, Southern Research Station, dhaywood@fs.fed.us

Longleaf pine produces the highest quality straw of all the southern pines. Income potential from the harvesting of longleaf pine straw depends on many factors including tree age, stand stocking, site quality, management practices, and markets. Straw yields peak at about age 15 years but should remain fairly constant until age 35 years. As both site quality and stand stocking increase, straw yields will increase as well. Planting from 545 to 907 longleaf pine seedlings per acre is recommended for future straw production depending on other management objectives. Fertilization with nitrogen, phosphorus, potassium, calcium, and magnesium has been recommended when straw harvesting will continue for several years. However, the percentage gain in yields may depend on site quality. Local and regional markets are very important in determining the worth of a bale of straw to the landowner. I will present research results on longleaf straw yields, how management can affect yields, and income potential from a series of straw harvests in Louisiana, Mississippi, Georgia, and South Carolina. In these research studies, income from a single raking can range from \$35 to \$222 per acre depending on the aforementioned factors. Under moderate conditions, income over a 9-year period can total about \$1,000 per acre.

2-C: Landowner 101: Fire

Prescribed Fire: “How to Get Started”

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Prescribed fire is a versatile and cost effective land management tool and a necessity for managing longleaf pine ecosystems. But, for the new land owner or novice burner “Where do I start?” can be a daunting question; in fact, even knowing when to burn can be a challenge. Proper planning is the solution. There are many steps in the planning process and often, conducting the burn is simpler than planning and preparing for it. A wide range of factors from fuel loading and weather to liability and state laws must be considered to implement a successful prescribed burn. Determining the objective(s) is a critical first step and will help guide the decision making process. Knowing when and how to apply fire can provide many essential benefits including reducing hazardous fuels; maintaining wildlife habitat, plant species composition and forest structure; and improving water and soil quality. Another essential aspect is being properly trained, since burns should only be carried out by qualified burners. Longleaf landowners and managers can get a head start by attending their respective state forestry agency’s prescribed burn manager certification course. These courses are typically less than one week and are a great way to receive a foundation in fire behavior, physics, and weather; personal

safety; liability; and smoke management. Although the degree of difficulty for an individual burn is most often defined by location and complexity, careful planning and execution are the key ingredients to prescribed fire implementation.

Selection of Ignition Techniques to Achieve Resource Objectives

John R. Stivers, ACF, RF, CF

One of the key ingredients to achieving success using prescribed fire is the selection of the appropriate applied ignition technique given a set of fuel and weather parameters on a burn unit. Too often, inexperienced fire practitioners overlook the importance of manipulating the “technique” of how fire is actually applied.

There are a variety of “resource objectives” or reasons for burning including but not limited to pre-marking, site preparation, hazard fuel reduction, insect & disease control, agriculture, range improvement, habitat improvement for threatened & endangered species, and timber stand improvement-control of undesirable species. Understanding fire regimes, seasonality, and condition class are also important in determining the intended fire effects.

Once the resource objective is defined, the next step should be determining “fire objectives”. These include month, season of the burn, flame length, rate of spread, residence time, heat per unit area, fireline intensity, KBDI index, temperature, relative humidity, 1-10-100 hour fuel moisture, mid flame wind speed, direction, and probability of ignition.

Ignition methods include backing, flanking, head fire, strip-head using continuous line firing or spots, ring fire, center ring fire, ridge ignition and chevron. Ignition can be done by hand using drip torch, mechanized firing off ATV, aerial with either external helitorch or delayed ignition (plastic spheres), terra torch, pin flares, or delayed ignition devices using hand held or ATV platforms.

The Careful Return of Fire Back into a Fire Suppressed Longleaf Forest

Bennett Tucker, Hitchcock Woods Foundation, btucker@hitchcockwoods.org

Fire on the southern landscape disappeared largely, shortly after the turn of the 20th century due to the thought that fires were harmful to forests, when in fact, fire is a naturally occurring force of nature that the longleaf pine ecosystem depends on for the survival of the native flora and fauna. Decades later, the realization was made by many that excluding fire from the longleaf pine forest was not healthy. This presentation will cover techniques and how to carefully restore prescribed fire back onto the landscape based on 25 years of experience in returning prescribed fire back to the Hitchcock Woods, a 2100 acre urban Longleaf Pine forest in Aiken, South Carolina.

Prescribed Burn Associations: Landowners Effectively Applying Fire to the Land

John R Weir, Oklahoma State University, John.weir@okstate.edu

Landowners usually give four reasons why they do not burn when asked about conducting prescribed fires, they are liability, lack of training, lack of equipment and lack of labor. There are several ways these obstacles can be overcome, but more often than not it makes prescribed burning more costly or unattainable venture. Through the formation of local prescribed burn associations in Oklahoma, many private land managers are able to overcome these barriers, and at the same time safely and effectively apply fire to their land. Getting interested citizens involved from the surrounding community, then having local state and or federal agency employees provide technical assistance to the group. The association elects leaders, sets goals and guidelines, along with an area to work in. One of the main attributes of a prescribed burning association is its neighbor helping neighbor approach. It also gives people hands-on experience along with organized training. When a group of like-minded citizens band together into an association there is more land that can be safely burned and it creates an organization that has strength in numbers when it comes to promoting fire or finding

funding for equipment. Currently, there are 21 burn associations in Oklahoma, covering 34 counties, with over 300 members. We have also formed the Oklahoma Prescribed Burn Association, a 501(c)3 not-for-profit organization to assist the current associations with training, funding, equipment needs and other issues that arise, as well as work to form new associations across the state.

2-D: Landowner 201: Fire

Fire and Grazing Interaction in Grasslands

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Fire and grazing are the primary disturbances that historically shaped grasslands globally. While ample research has been conducted on how these ecological processes function independently, more recent work has focused on the interaction between them. Data overwhelmingly indicates that the interaction between fire and grazing is unique compared to the results of independent disturbance actions. In contemporary times, both processes have been significantly altered or in some cases eliminated from many grasslands. Decoupling the interaction of fire and grazing has consequences to biodiversity and ecological function. For each grassland system, it is important to understand the historical disturbance patterns that shaped the floristic and faunal communities so that managers can make realistic recommendations to meet land objectives.

Advances in understanding duff fires in longleaf pine forests

J. Morgan Varner, Virginia Tech, Dept. of Forest Resources & Environmental Conservation, mvarner@vt.edu

Many longleaf pine stands across the range have suffered decades of fire exclusion, leading to declines in plant and animal biodiversity and complicating restoration and management efforts. Recent research on this topic has focused on the physiological response of overstory longleaf pines and the fuel characteristics of the surrounding forest floor. In small-scale and operational prescribed fires, post-fire pine mortality is tightly linked to basal duff (lowermost fermentation and humus forest floor horizons) consumption and, where present, crown scorch. Pines with substantial duff consumption suffered coarse root carbohydrate drain, a decline in sap flux, and reduced leaf chlorophyll content. Duff consumption in prescribed fires has been linked to duff moisture content, a difficult to predict variable in prescribed fire planning. Duff moisture varies tremendously across the forest floor and within typical burn units. Basal duff dries more rapidly than within-stand conditions. This heterogeneity in duff characteristics is further complicated by the presence of ignition vectors in the forest floor, including woody fuels and intact pine cones. When pine cones are present, ignition of underlying duff is facilitated well beyond assumed moisture thresholds of these fuels. Operational prescribed burns in long-unburned sites should focus efforts on balancing duff consumption with the need to retain overstory longleaf pines.

Using Prescribed Fire in the Mid-South for Wildlife and Ecosystem Management

Craig Harper, University of Tennessee, charper@utk.edu

The use of prescribed fire among natural resource professionals in the Mid-South is increasing. Objectives for burning are most often related to ecosystem restoration and wildlife management. Prescribed fire may be used to alter plant structure and composition in hardwood forests, restore or maintain woodlands, savannas, and grasslands, and maintain or enhance early successional communities for various wildlife species. Prescribed fire is used differently depending on current conditions and objectives. Fire intensity, frequency, and timing are critical considerations when managing vegetation communities in the Mid-South (as in other regions), but the approach may differ from that in other regions. The effect of burning various vegetation types in the Mid-South and how burning may be used to enhance habitat for various wildlife species will be discussed.

Comparative Discussion of the Differences Between Growing Season and Dormant Season Prescribed Fire

Ted DeVos, Bach and DeVos Forestry and Wildlife Services, Tdevos1@charter.net

Comparative discussion of the differences between growing season and dormant season prescribed fire. The presentation will focus on the wildlife and vegetative impacts of growing season fire. Discussion includes techniques and practical illustrations of growing season burns.

2-E: Grassland Establishment

Growing a Way to Recreate What We Have Lost

John Seymour, Roundstone Native Seed, LLC, john@roundstoneseed.com

Understory plant and seed production. How, why, and from where species are chosen for understory habitat creation and restoration. From collection and increase, to commercial production to restoration.

Growing Ecotype Seed for Herbaceous Restoration on Cherokee National Forest

Jeremy Hamlington, Roundstone Native Seed, LLC, Jeremy@roundstoneseed.com

When deciding to return the landscape to an earlier successional stage, or when re-vegetating disturbed areas, planting native species from a local source is the best choice. However, it is often difficult to find commercially available seed sources near a restoration site. The Cherokee National Forest located in eastern Tennessee encountered this dilemma several years ago and chose to collect seed by hand from 11 common native wildflower and grass species from five surrounding states. Soon, the demands for regionally native seed surpassed the supply and the US Forest Service sought assistance from other entities. There are now two production facilities growing species for the US Forest Service at the Cherokee National Forest, Warren Wilson College in Asheville, North Carolina and Roundstone Native Seed in Upton, KY. Species in production include: deer tongue grass (*Panicum clandestinum*), narrowleaf silkgrass (*Pityopsis graminifolia*), partridge pea (*Cassia fasciculata*) Maryland golden aster (*Chrysopsis mariana*), large coreopsis (*Coreopsis major*), yellow wild indigo (*Baptisia tinctoria*), Virginia wild rye (*Elymus virginica*), purple top (*Tridens flavus*), indian grass (*Sorghastrum nutans*), and little bluestem (*Schizachyrium scoparium*). Roundstone Native Seed, LLC established 5 ac of these species in irrigated plastic mulch production rows in August 2013. Harvest yields after one year of growth will be reported.

Switchgrass Yield and Stand Dynamics from Legume Intercropping

A.J. Ashworth, F.L. Allen, P.D. Keyser, D.D. Tyler, A.M. Saxton, A.M. Taylor. *Center for Native Grasslands Management, University of Tennessee, pkeyser@utk.edu*

Interseeding legumes may reduce fertilizer inputs and enhance sustainability of forage and feedstock production, but this approach is largely untested in switchgrass (*Panicum virgatum*) systems. Our objective was to evaluate three cool-season and two warm-season legumes, and their required densities to influence yield and supply nitrogen (N) compared to three inorganic-N levels (0, 33, and 67 kg N ha⁻¹) at three locations in Tennessee (Knoxville, Crossville, and Milan). Fall 2010 seeded, cool-season legumes (red clover [*Trifolium pretense*], hairy vetch [*Vicia sativa*], ladino clover [*Trifolium repens*]) and spring 2011 seeded, warm-season legumes (partridge pea [*Chamaecrista fasciculata*], and arrowleaf clover [*Trifolium vesiculosum*]) were interseeded into switchgrass at three (high, medium, and low) seeding rates each in two experiments. Harvest treatments were annual single, post-dormancy biofuel (Experiment One) or integrated forage-biofuel (pre-anthesis and post-dormancy; Experiment Two). Year one yield impacts were minimal; in general, yields for 33 and 67 kg N ha⁻¹ did not differ from those for red clover, hairy vetch, ladino clover, or partridge pea ($P < 0.05$). During the second

harvest year, legumes increased yield versus Yr-1. Forage biomass yields were generally more responsive to legumes ($P < 0.05$) than post-senesce harvests. Arrowleaf clover yields were not different than 0 kg N ha^{-1} . Legume persistence after 3-yrs was generally greatest for ladino clover and partridge pea. Forage quality (switchgrass only) was generally positively influenced by legume treatments, notably hairy vetch and partridge pea ($P < 0.05$). Intercropping selected legumes in switchgrass can enhance forage quality and yield while reducing fertilizer costs and carbon-positive inputs.

Lessons Learned Restoring and Managing Black Belt Prairie Plant Communities

John Gruchy, Mississippi Dept. of Wildlife, Fisheries, and Parks, johng@mdwfp.state.ms.us

The Black Belt Region of Mississippi and Alabama once held more than 350,000 acres of herbaceous prairies. Many of the native plant communities in the region have been converted to production agriculture or significantly degraded by the presence of non-native grasses and invasive native woody plants. Initial efforts to restore prairie plant communities, primarily consisting of planting native grasses and forbs, often produced grasslands that lacked the diversity and structure of native prairie remnants, resulting in marginal habitat for target species such as bobwhites and wintering sparrows. Over time the effort evolved, borrowing from a wide range of academic and technical natural resource professionals. Sharing of information and resources through the Black Belt Prairie Restoration Initiative has resulted in a greater understanding of the prairie biota, improving the ability of field personnel to deliver restoration practices. Information gathered from 10 years of trial and error managing Black Belt Prairies using techniques such as prescribed burning, herbicide applications, planting, and mechanical brush control will be discussed.

CONCURRENT SESSION 3

3-A: State & Local Implementation Team Opportunities

Outreach Programs Along the Chattahoochee Fall Line Reach Diverse Audiences

LuAnn Craighton, Chattahoochee Fall Line Conservation Partnership, lraighton@tnc.org

Outreach programs are an integral component of the Chattahoochee Fall Line Conservation Partnership's (CFLCP) efforts to conserve and restore longleaf pine in west central Georgia and east Alabama. Our proximity to both rural and urban audiences has provided us with a variety of opportunities to "tell the longleaf story" and to collaborate with both traditional and non-traditional groups in our outreach activities.

The Sandhills Longleaf Pine Conservation Partnership – A Model for Landscape Repair

Wayne Harris, US Fish and Wildlife Service, billy_harris@fws.gov

Today's reality for successful restoration of longleaf pine at the landscape scale is heavily dependent on both functioning partnerships and active private landowner participation. The Sandhills Longleaf Pine Conservation Partnership, since its formation in 2010, has evolved from a small initial gathering of local public and private land managers to a well-established Longleaf Implementation Team with a full-time coordinator and 291 cooperating private landowners. In this session, I will summarize the many opportunities used to develop a cohesive, results-oriented partnership in a portion of the Fall Line Sandhills ecoregion of South Carolina.

Longleaf Outreach Activities – Can we do Better?

Rick Jacob, The Nature Conservancy, Louisiana Chapter, rjacob@tnc.org

Outreach efforts to encourage longleaf pine restoration are common activities for local implementation teams (LITs). Teams have conducted many successful events to date, including large landowner field days, Longleaf Academies, and publicity activities. But questions remain about the effectiveness of these various approaches – how do we define and measure success, and are there other approaches that may enhance or complement our current efforts? This session will describe the types of activities typically conducted by LITs, look at promising new approaches for targeting landowners and conducting events, and discuss how we can tell if our efforts have been successful.

Sustainable Forest Management and Longleaf Conservation – Case Studies from SFI's Conservation and Community Partnership Grant program

Paul Trianosky, Sustainable Forestry Initiative, Inc., Paul.Trianosky@sfiprogram.org

Healthy markets for forest products can help to motivate conservation actions on family-owned forestlands by giving landowners the incentive to manage, and to maintain their ownership. Learn about the connections between healthy markets, forest certification, sustainable forest management, and longleaf restoration. Participants will hear about how SFI's Conservation and Community Partnership Grants program helps partner organizations engage private landowners in three states, using creative approaches that break down barriers to longleaf restoration and forest management.

3-B: Pinestraw Research Presentations

Using Herbicides to Produce High Quality Pine Straw

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Pine straw production and sales can be big business especially for longleaf pine owners. Herbicides are often an essential tool used for managing unwanted vegetation in longleaf pine straw production stands. As demand for longleaf pine straw continues to grow, learn how and which herbicides can be used to effectively increase the quality and quantity of pine straw produced per acre.

Certified Pine Straw – A Game Changer for Longleaf Forest Restoration

Foster Dickard, Wildlife and Forestry Development, fdickard@gmail.com

Longleaf-pine-ecosystem restoration has been a primary conservation focus for the Southeast for decades. While millions of longleaf trees are planted in old fields and pastures on private lands, very few of these plantations are in a prescribed burning program or management plan sufficient to meet most longleaf ecosystem objectives. The cost of implementing a regular burning program is the major challenge even for the most willing of these landowners.

An often overlooked income source to offset the cost of burning is pine straw. Pine straw is quickly becoming a lucrative cash crop on longleaf plantations with annual payments ranging from \$75 to over \$200/acre. While the good news is that pine straw income can make the difference for enabling forest landowners to pay for these ecosystem management practices, there is also an alarming trend developing where longleaf plantations are becoming short-rotation cash cows in areas of strong pulp and straw markets and falling short on contributing to ecosystem restoration goals.

While some longleaf pine straw is harvested from forests with credible longleaf restoration goals and practices, it is a small fraction of the market and until now, there has not been a way to certify and promote this pine straw in the market place. In 2013, the first third-party certification for pine straw was approved by the Forest Stewardship Council under a landowner group certificate. Forest landowners that manage for longleaf are a good fit for this certification. These landowners can directly benefit from the group certification program that markets their straw and other forest products to a growing segment of buyers who have green-purchasing policies requiring or preferring products proven to be responsibly sourced.

National Wildlife Federation's Best Management Guidelines for Pine Straw Raking

Mark Bailey, Conservation Southeast, Inc., mbailey@conservationsoutheast.com

In the summer of 2014 the National Wildlife Federation commissioned the development of best management guidelines (BMGs) regarding small-scale longleaf pine straw raking operations and native plants, mammals, birds, reptiles, and amphibians. Working with a small group of technical experts, best management guidelines were drafted that:

- Address small-scale (hand and maybe also mechanical raking) operations in longleaf pine stands
- Cover impacts on plants, mammals, birds, reptiles, and amphibians
- Include a wide range of management techniques
- Address issues related to site productivity, fertilization, and environmental impacts

Ecological Pine Straw Raking

Randy Browning, USFWS/MFWF, Randy_Browning@fws.gov

Forest economics tend to favor other pine species when compared strictly on timber value. On the other hand, longleaf can fare favorably when pine straw revenue is added to the equation. However, intensive / mechanical pine straw management can degrade wildlife habitat by damaging or destroying understory vegetation. Forest revenue from longleaf stands can be increased while maintaining a healthy and diverse understory when an ecological approach is used in the pine straw operation.

3-C: Landowner 101: Wildlife & Understory

Establishing Native Warm Season Grasses for Wildlife: Factors to Consider

Claude Jenkins, Alabama Wildlife Federation, cjenkins@alabamawildlife.org

Native warm season grasses (NWSG), and associated forbs and legumes, provide an abundance of food and cover resources that benefit a wide range of wildlife species. Historically, NWSGs were common in fire-maintained habitats such as prairies and longleaf pine forests. However, because of land-use changes and fire exclusion, many of the native grasses have been eliminated from the landscape. Landowners, managers, and conservation professionals recognize the value of NWSGs and are making attempts to re-introduce these grasses for wildlife habitat and grazing for livestock. Unfortunately, there have been many failures to restore NWSGs despite earnest attempts. Reasons for the failures vary, but the most common include inadequate site-preparation, inadequate weed control post-planting, and the lack of patience. NWSG establishment decisions should be site-specific and goal-driven. Knowledge of species (plant and wildlife) adaptations is required for successful NWSG establishment, and ecological knowledge is required when selecting a NWSG species or a mix of species to establish for wildlife habitat.

Tools and Recommendations for Landowners who Manage Habitat for Gopher Tortoises

Deborah Burr, Florida Fish and Wildlife Conservation Commission, Deborah.Burr@MyFWC.com

Approximately 80% of all remaining potential gopher tortoise habitat occurs on privately-owned lands. Therefore, active habitat management programs to maintain high quality gopher tortoise habitat and improve or restore degraded habitat is critical to ensuring that gopher tortoise populations continue to persist throughout its range. An overview of the habitat characteristics for natural communities that support gopher tortoises and how to set management strategies and desired conditions will be included. Managing for gopher tortoises can be compatible with other land use practices such as hunting and timber harvest. Implementing common management tools such as prescribed fire, mechanical treatment, and herbicide application that are necessary to ensure gopher tortoises are sustained on the landscape can be easily applied during routine management. Finally,

best management practices, including when and how to avoid burrow impacts and impacts to juvenile tortoises, will be covered in this presentation.

Bobwhite Management Across Working Farms and Forests

Reggie Thackston, Georgia DNR, Wildlife Resources Division, reggie.thackston@dnr.state.ga.us

Across the southeast northern bobwhites (*Colinus virginianus*) have declined by more than 5% per year since 1966. This decline is primarily due to changes in landuse that have fragmented bobwhite habitat thereby reducing reproduction, survival and population sustainability. The good news is that within suitable landscapes, huntable numbers of bobwhites can be restored through judicious planning and management at appropriate scales and intensities. Working through the National Bobwhite Conservation Initiative (NBCI) 20 state wildlife agencies and conservation partners have identified and prioritized landscapes for bobwhite restoration. Native fallow field buffers, field corners and hedgerows, and/or heavy thinning and frequent prescribed burning of pine woodlands are practices that can be used within these landscapes to effectively restore bobwhite populations. Additionally, these practices benefit numerous other wildlife species and improve overall environmental quality. This presentation addresses considerations of landscape context and the application of management practices on farm and forest lands where bobwhites are a natural resource management objective. Examples will be provided of bobwhite management success stories.

Black Bear in Alabama's Southern Coastal Plain

Daniel Powell, Alabama Black Bear Alliance, Powelldd65@gmail.com

Much has been written about America's black bear in the mountains of the southern United States, but, largely under the radar, the species has thrived in the Southern Coastal Plain. Using tannin stained black water creeks and branches as corridors and feeding on the longleaf ridges that border these areas, black bear managed to survive pressures that our other big predators couldn't handle.

Now, as human activities have changed, they are faced with another threat. These longleaf ridges are often being converted from natural areas to subdivisions. Well-intentioned people who questioned timber management practices are finding that bears can live in a clear cut, but can't live in a subdivision. Bears are often the victims of these changes as they increasingly interact with humans moving into their habitat.

I'll address this subject and ask, "Where do we go from here?"

3-D: Landowner 201: Wildlife & Understory

The North American Coastal Plain, an Unrecognized Global Biodiversity Hotspot

Reed F. Noss, University of Central Florida, Reed.Noss@ucf.edu

Biodiversity hotspots, areas where conservation values are concentrated, are priorities for conservation action. To qualify as a global hotspot, a region must meet two criteria: at least 1500 species of endemic vascular plants and at least 70% loss of historic vegetation. Although the North American Coastal Plain has not been recognized internationally as a biodiversity hotspot, recently compiled information shows that the region contains 6200 native vascular plant taxa, of which 1816 (29%) are endemic. Amphibians, reptiles, and freshwater fish also show exceptional endemism. Coastal Plain endemics occur mostly within pine savannas and embedded communities, and include many ancient lineages. New analyses show that some 76% of all historic vegetation and 94% of pine savannas in the Coastal Plain have been converted to anthropogenic vegetation or are highly departed from natural condition. This region has not been formally recognized as a global hotspot due to several myths and misconceptions about its ecology and history. These fallacies include: 1) young age of the Coastal Plain and its submergence during high sea level stands; 2) climatic and environmental

homogeneity; 3) closed forest as the climax vegetation; and 4) fire regimes that are mostly anthropogenic. Conservation priorities for the Coastal Plain include (1) increased field biological surveys and taxonomic determinations; (2) more research on potential climatic refugia within the region; and (3) immediate actions to establish new protected areas, and (4) science-based restoration and management (especially prescribed fire and experiments with grazing) across the spectrum of natural and semi-natural lands in the region.

Promoting Healthy Longleaf Understory Supports Diverse Pollinators and Wildlife

Jeff Thurmond, USDA Natural Resources Conservation Service, Jeff.Thurmond@al.usda.gov

The beautiful diversity of longleaf pine understories depends on many intimate connections, including visits to flowers by bees and many other pollinators. By protecting natural longleaf habitat, enhancing the diversity of longleaf pine understory plantings, utilizing fire to invigorate plants, and avoiding deep tillage and pesticide use, we support pollinating insects. Pollinators, in turn, support the natural communities and agricultural systems we depend on, and drive these systems. This program will highlight native pollinator diversity and habitat needs, as well as incentives and resources available to improve land management for pollinators and wildlife that follows. With attention to pollinators, landowners can make a significant impact regardless of scale.

Conservation of Charismatic Vertebrates of Longleaf Pine Forests

Craig Guyer, Auburn University, guyercr@auburn.edu

Gopher Tortoises and Eastern Indigo Snakes are two charismatic vertebrates endemic to longleaf pine forests. These two species are also of conservation concern because of habitat loss, habitat fragmentation, and increased mortality associated with human activities on remaining lands. In this talk, I summarize current efforts to conserve these species. In the case of gopher tortoises, accumulating field data suggest that tortoise populations consist of approximately 250 individuals. Survey efforts in Alabama, Florida, and Georgia over the next 5-10 years should clarify where aggregations of this size currently exist and, therefore, where conservation efforts might be focused to ensure long-term viability of these populations. Additionally, efforts to generate populations that are likely to be viable by moving individuals to managed reserve areas have been enhanced by improved knowledge of what constitutes a tortoise population. Recent analyses of the social structure of gopher tortoises indicate that monitoring of behavioral organization of these animals on conservation lands will be vital to maintaining population viability.

The eastern indigo snake, an important predator of longleaf pine forests, has become scarce in the western portion of its geographic range and the species has been extirpated from some areas. A collaborative project designed to repatriate these snakes to the Conecuh National Forest in Alabama is currently under way and preliminary data suggest that the repatriated population has taken hold. The goal of the project is to release 30 snakes each year over a ten-year period, and the first five years have been completed. Repatriated snakes select habitat in ways that are similar to snakes from the source populations in Georgia. Penning of snakes before their release increases, when compared to unpenning snakes, the degree to which male snakes remain at the release site and overlap home ranges of females. Therefore, penning should improve population viability as evidenced by production of eggs by females as soon as two years after release. Gopher tortoise burrows are important refuges used by these snakes to overwinter and likely form a key component to eastern indigo snake home ranges. This feature suggests that conservation efforts for the two species should overlap in geographic space. Preliminary data suggest that, as eastern indigo snake populations are recovered in the western portion of its range, the structure of local snake communities will change because of predation by indigo snakes on other snake species.

Promoting Mammals in Longleaf Pine Forests

Holly K. Ober, Ph.D., University of Florida, Holly.ober@ufl.edu

Mammals are an integral component of longleaf pine forests, providing essential functions in food webs as herbivores, granivores, frugivores, insectivores, and carnivores. Mammals influence ecosystem services such as seed dispersal, nutrient cycling, and pest control. Their ecological effects are large, in part because the total biomass they contribute to longleaf forests is higher than that of other vertebrate taxa. The number of species of mammals that call the longleaf pine ecosystem home is also greater than the number of species of birds, reptiles, or amphibians. This diversity in species translates into great variety in habitat needs among species; blanket habitat management recommendations for mammals in longleaf forests are not possible. Rather, a management approach that incorporates appreciation of the variety of food/shelter needs among species and the variety of disturbance regimes that can promote these resources is the best prescription for maintaining and enhancing mammalian diversity in longleaf forests. Consideration should be given to vital habitat features (i.e., dead wood, hardwoods, burrows), spatial configuration of resources across the landscape, and timing of forest management actions.

3-E: Foraging & Grazing

Economics of Native Grass Forage Production

C. Boyer, J. Lowe, J. Waller, P. Keyser, and G. Bates. *Center for Native Grasslands Management, University of Tennessee, pkeyser@utk.edu*

During 2009 – 2013, we evaluated native grass forages by themselves and as a component of integrated forage-biomass systems. Using standard production budgets and the results of these studies, we conducted economic evaluations. The first of these studies, an evaluation of two native forages with and without legumes and grazed by bred dairy heifers, demonstrated that i) legumes were not economically justified, ii) switchgrass (SG) was cheaper (\$0.38/AUD) than a big bluestem/indiangrass blend (BBIG; \$0.65/AUD), and that forages were much cheaper than commodity rations (\$1.89 - \$3.06/AUD) providing comparable performance. A second trial examining performance of beef steers on the same two grasses plus eastern gamagrass all grazed for 90 days during the summer indicated that in terms of lb beef produced/ac (503 lb/ac) and net return (\$431/ac), SG outperformed the other forages. A second component of that same study evaluated 30-day early season grazing followed by biomass production for the balance of the growing season. A break-even price of biomass was calculated that would justify cessation of grazing. Depending on location (i.e., management), biomass prices of \$37 and \$105/ton (SG), would justify biomass production over grazing. The third study examined the same integrated forage-biomass approach but in the context of hay production. This study demonstrated that i) earlier hay harvests (boot vs. seedhead) were more profitable (\$62 vs. \$76/ton, respectively, for SG breakeven price), ii) SG alone was preferable to BBIG and SG+BBIG, and iii) a single dormant-season harvest was preferable to either two-cut system in terms of producing cheaper biomass.

Season-Long Grazing with Native Grasses

P. Keyser, G. Bates, and T. Mulliniks. *Center for Native Grasslands Management, University of Tennessee, pkeyser@utk.edu*

Past research has demonstrated high gains from grazing big bluestem (BB) and indiagrass (IG) blends. To determine the feasibility of continuous grazing, we conducted a pilot study in 2014. Using two 23.5 ac pastures and weaned beef steers (582.5 lb starting weight), we evaluated two grazing treatments (one per pasture), continuous (CONT) with 1.53 (n = 36) steers/ac (896 lb/ac) and “heavy early” (HEAVY) with an initial stocking of 1.91 (n = 45) steers/ac (1,119 lb/ac) that was reduced on

June 25 to 1.15 (n = 27) steers/ac. This second treatment was designed to take advantage of the natural growth pattern of these grasses. Grazing was initiated on May 15 and terminated on August 7 (84-d) for both treatments. Steers removed from HEAVY on June 25 were “run of the chute” and not selected based on weight. For CONT, steers gained 1.87 lb/day (ADG), accumulated 129 steer grazing days, and produced 241 lb beef/ac. For HEAVY, steers gained 2.21 lb/day (ADG), accumulated 127 steer grazing days, and produced 274 lb beef/ac. The 28-d gains were higher under CONT than HEAVY (2.80 vs. 2.22 lb/day) indicating greater selectivity in the more lightly stocked pastures; however, lighter subsequent stocking allowed HEAVY steers to compensate through the balance of the season achieving higher season-long gains. Canopy heights for BB were reduced quickly and to much lower levels than IG indicating substantial cattle preference. Post-grazing canopy recovery has been substantial indicating plant vigor was not compromised by the low grazing heights on BB.

Economic and Conservation Implications of Converting Exotic Forages to Native Warm-Season Grass

James Martin, University of Georgia, martinj@warnell.uga.edu

We investigated the economic and wildlife implications of converting exotic forages to native warm-season grass (NWSG). We established an operational-scale grazing study at the Mississippi State University Prairie Research Unit. Treatments included an exotic grass pasture of Bermudagrass (*Cynodon dactylon*) and Tall fescue (*Schedonorus arudinaceus*), an Indian grass (*Sorghastrum nutans*) monoculture, and native grass polyculture of Indian grass, little bluestem (*Schizachyrium scoparium*) and big bluestem (*Andropogon gerardii*). Each treatment was replicated three times among 9 pastures (range = 6.4 – 10.5 ha). During 2011 and 2012 we grazed each pasture with fall-born steer calves from May-August and estimated average daily gain. We also monitored nesting Dickcissels (*Spiza americana*), a grassland obligate bird. In spite of unfavorable growing conditions due to drought, cattle grazing NWSG consistently outperformed conspecifics on exotic grass forages. Partial budget analysis indicated that NWSG pastures yielded up to 36% marginal rates of return despite establishment costs. Native grass pastures also increased Dickcissel (*Spiza americana*) productivity (fledglings/ha) relative to exotic grass pastures, primarily through greater nest site availability. These results suggest NWSG can benefit avian species such as Dickcissels while offering a competitive alternative to exotic forages, resulting in net benefits for both conservationists and producers.

Grazing Eastern Gamagrass with Bred Heifers: Preliminary Results

P. Keyser, C. Lituma, G. Bates, and T. Mulliniks. *Center for Native Grasslands Management, University of Tennessee, pkeyser@utk.edu*

Increasingly frequent and severe summer droughts, coupled with fescue toxicosis impacts to cattle production make development of a reliable summer forage option for the “fescue-belt” a high priority. One option, that has not been well-studied, is eastern gamagrass (EG). We initiated a grazing trial to evaluate EG and compare it to a widely-used summer annual, sorghum X sudangrass hybrid (Sudex); no nitrogen (N) was supplied during the study. Using bred yearling heifers on 6 ac (EG) and 9 ac (Sudex) pastures, each subdivided into 3 paddocks, we evaluated rotational grazing of these forages. Forages were maintained at 25 – 40” and 15 – 30” for EG (2013 and 2014, respectively) and 25 – 50” for Sudex. Stocking for EG was approximately 1,500 (2013) and 2,200 (2014) lb/ac. Forage samples indicated EG quantity (>2,200 lb/ac) and quality (CP = 10.4-12.8% and NDF >65% for much of the summer) of available forage (>8” canopy) were adequate. For EG, ADG was 0.73 (2013) and 1.26 (2014) lb, heifer grazing days were 209 (2013) and 217 (2014), and total beef/ac 121 (2013) and 274 (2014) lb. Increased ADG in 2014 contributed to improved EG outcomes the second year, likely due to improved management (less mature sward). By comparison,

Sudex was more consistent for ADG (1.46 and 1.40 lb), grazing days (85 and 91 days), and beef produced (126 both years). With proper management, EG provides moderate performance, high stocking, and good gains without N inputs suggesting it can be a useful perennial summer forage complement for the fescue-belt.

CONCURRENT SESSION 4

4-A: Longleaf in Arts & Literature

Pine Needle Basketry; Art of the Longleaf Pine

Melanie Walter, Pine Garden Baskets, pgb@pinegardenbaskets.com

Pine needle basketry, Native American in origin, has been in existence throughout the country for centuries. Although introduced to the modern world in the 1860s, it has been a lost art for many decades.

In this presentation, Melanie Walter discusses the history of the craft, her personal discovery of the longleaf pine, as well as her growth in the art of pine needle basketry. Using photographs of her work, she describes her creative journey during the last 20 years.

Is a Picture Worth a Thousand Fires?

Philip Juras, philip@philipjuras.com

Nineteenth century portrayals of America's frontier landscapes by artists such as Thomas Moran and Albert Bierstadt played an important role in the development of an American conservation ethic. Their dramatic images of untamed nature and the awesome forces that shaped it fed an American conceptualization of wilderness that has influenced a century of private land use and public policy. Wildland fire, though certainly one of the powerful forces that forged the landscapes these artists depicted, was generally missing from their perspectives. Meanwhile, wildland fire across North America was being portrayed in a decidedly negative light in popular media ranging from nineteenth century illustrated weekly magazines to twentieth century movies. Without the knowledge of fire ecology that we have today, creative works of the last two centuries would prove to be detrimental to the American public's understanding and appreciation of fire dependent ecosystems. My own artwork stands in contrast to this. Informed by history, natural sciences, and volunteer time spent on controlled burns in my home state of Georgia, I offer a southeastern view of the effects those artists missed. These paintings depict active fires such as "Heading Fire" on the Wade Tract of Arcadia Plantation in Thomasville, Georgia, as well as the Eden-like landscapes they produce, pictured in "Longleaf Glade" on nearby Greenwood Plantation. It is my hope that in presenting scenes from these fire managed old growth longleaf pine stands, and many other pyric environments from across the Southeast, I can contribute to a healthier public view of wildland and prescribed fire. In this way, a picture may indeed be worth a thousand fires.

Bleeding Pines of Turpentine

Ray Owen, fullsky@nc.rr.com

"Bleeding Pines of Turpentine," a lyric narrative by Ray Owen, is being developed into an orchestral suite for the North Carolina Symphony by composer David Ludwig, Curtis Institute of Music Dean of Artistic Programs. The story is based upon the actual account of the woman who in 1904 saved one of the last stands of virgin longleaf pines after encountering former slaves bleeding the trees for turpentine. Known today as Weymouth Woods, located in Southern Pines, NC, the forest encompasses America's oldest longleaf pines, many of the trees bearing scars from the V-shaped cuts

made by the former slaves. The symphony hopes to perform the piece statewide, particularly in schools, bringing the message of conservation to a wider audience while focusing attention on the resource that caused North Carolina to be known as the Land of the Longleaf Pine and the Tar Heel State.

Why it Matters

Roger Reid, University of Alabama & Discovering Alabama, reidroger@mac.com

We give ourselves many pragmatic reasons for restoring the longleaf. There are economic as well as ecological benefits, we tell ourselves. We don't want our children to grow up in a world without turkey and quail, we say. We find all sorts of good reasons to regenerate longleaf for the future. Yet in our minds and hearts—and some would say our souls—we know it matters for you and me, right here and right now. Celebrate the nature and the art of today's longleaf forest with author and *Discovering Alabama* producer, Roger Reid.

4-B: Longleaf Conversion Research Presentations – The Admiral

Longleaf Restoration Techniques on TNC Lands: from Loblolly Production to Longleaf Habitat

Colette DeGarady, The Nature Conservancy, cdegarady@tnc.org

The South Carolina Chapter of The Nature Conservancy (SCTNC) has prioritized longleaf habitat protection and management for many years. In the past 5-10 years, SCTNC has initiated several longleaf restoration projects. The projects evolved from a strategy to acquire former timber company lands, converting those stands from loblolly to longleaf, and then transferring the properties to the USFS to add land to the adjacent Francis Marion National Forest. Pre-restoration stand conditions and site moisture were strong drivers of restoration techniques and sequencing. This presentation will give examples of some of these restoration projects including: the property starting conditions, actions taken to harvest timber, site prep, prescribed burning, and longleaf planting to meet an ecological goal of a future intact longleaf habitat.

Two Phase Conversion of Slash Pine Plantations to Uneven Aged Longleaf and Slash Pine Flatwoods at Tyndall Air Force Base

Daniel Childs, Tyndall AFB, Daniel.childs@tyndall.af

Through wide scale deforestation at the turn of the twentieth century, nearly all of the longleaf pine once occupying Tyndall Air Force Base (AFB) was eliminated. Reforestation did not take place until the 1960's during which time slash pine was planted exclusively in stands across 7,760 acres of the property. Stand size range is 5-500 acres and age range is 12-50 years. In 2006, Tyndall Natural Resources began a phased longleaf restoration which uses two treatments applied at 20 year intervals. This approach was designed to gradually re-establish longleaf pine, while still maintaining diverse stand structure and preserving ecosystem function. The scheduled completion date is 2046 with 517 acres targeted annually.

The first treatment entails harvesting approximately 50% of each stand through a row gap cut. Following the harvests, the gaps are rollerchopped and hand planted with containerized longleaf pine. The second treatment is scheduled to begin in 2021 with another series of harvests (removing most of the remaining slash overstory), rollerchopping the gaps, and hand planting longleaf. It is not expected that all of the planted longleaf pine will survive since some of the areas on the property have supported slash pine, but this method will re-establish longleaf pine at a landscape level with the understanding that slash pine will recruit naturally as well. The end result will be forests comprised of widely spaced mature slash pine, two cohorts of longleaf pine, and uneven aged slash pine with an understory composed of desirable native warm season grasses, shrubs, and forbs.

Longleaf Pine Community Restoration in Intensively Managed Pine Plantations on State Lands

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We recently completed a project for the Florida Fish & Wildlife Conservation Commission (FFWCC) to guide the conversion of a portion of the Apalachicola River Wildlife and Environmental Area (ARWEA) from a former intensively managed forestry property to a diverse array of communities more representative of the historical natural landscape. About 80% of the project area (10,137 acres ±) is to be restored to functional longleaf pine ecosystems and associated communities, with the remaining 20% to wet prairie communities. This restoration is being taken through careful, integral steps founded in science that gradually restore target diversity, structure, and function.

The starting point of the project area is typical of many properties currently under intensive plantation management. Slash and loblolly pine plantations abound with interspersed natural and mixed pine-hardwood stands. Some sites have already been underplanted with longleaf pine, while others are understocked. In addition, several RCW clusters are scattered across the property.

The plan outlined the initial 10-year period by which the project area will be modified with a suite of silvicultural operations, regeneration, and prescribed burning. Judicious use of prescribed fire will play an intrinsic role in the success of this restoration effort. In addition, we present methods and justification through which critical components of longleaf pine's impact on the area at large may be restored. Using this management plan as a guide will enable those tasked with implementation to begin the gradual conversion to a natural assemblage of endemic communities across the landscape.

Underplanting for Species Conversion and Restoration – The Ichauway Example

Steve Jack, J.W. Jones Ecological Research Center at Ichauway, steve.jack@jonesctr.org

Interest in conserving and restoring longleaf pine forests has dramatically increased in recent years, and many acres formerly in agriculture or other forest types have been planted with longleaf seedlings. However, when other pine species are present on historic longleaf sites, especially in even-aged plantations with commercial value, a frequently recommended practice to restore longleaf is to clearcut the “offsite” pines, followed by site preparation and planting of longleaf pine. But, this “remove and replant” approach eliminates the existing overstory structure and pine needles that provide fine fuels for prescribed fire, and existing ground cover plants are potentially lost for an extended period of time. An alternative approach tested at Ichauway in southwest Georgia is to thin existing plantations of undesired pine species and create canopy gaps into which longleaf seedlings are underplanted, thereby mimicking natural longleaf regeneration spatial patterns and dynamics. This gap-based underplanting process is repeated through multiple harvest entries until most individuals of the original canopy species have been harvested and the stand is converted to a multi-cohort longleaf pine forest. This gradual conversion approach was first implemented in a 250 acre slash pine plantation that was 60 years old at initiation. Specific lessons learned through implementation relate to the appropriate size and layout of gaps created for underplanting, control of woody competition in the gaps, the rate at which the conversion can take place, and how ground cover plants respond. These insights were utilized to modify the approach when implemented in several younger slash pine plantations.

4-C: Landowner 101: Establishment & Conversion – Windjammer

Planting Longleaf Pine...There is More to It Than “Green Side Up”

Bill Pickens, NC Forest Service, bill.pickens@ncagr.gov

Unlike the other southern pines, longleaf seedlings require adherence to specific planting guidelines. Proper care and handling is essential to ensure you plant a healthy seedling. Care includes refrigerated transportation and storage before planting, storage in a cool shady area at the site, and no exposure to sun or heat. It is best to plant bareroot seedlings within 3 days and no longer than 10 days after lifting while containerized seedlings can be stored for two to four weeks in cold storage. As long as there is adequate soil moisture one can plant both bareroot and container seedlings from October through March. Generally, bareroot seedlings survive better if planted in the dormant season of December through February. Container-grown seedlings exhibit good survival and increased growth if planted in the fall. Proper planting depth is critical for survival and growth. Planting seedlings too deep, delays early height growth initiation and increases mortality. Bareroot seedlings do not tolerate shallow planting. Conversely, we can plant container-grown seedlings as much as 1-2 inches above the ground with no decrease in survival. Longleaf pine is successfully hand or machine planted. Most container-grown seedlings are hand planted with cylinder-type or modified flat-type dibble bars. Bareroot seedlings are best machine planted or hand planted with a shovel or large dibble bar. Foresters recommend planting 450 to 800 seedlings per acre depending on management goals. Hiring an experienced tree planter is often the difference between success and failure.

Selection Criteria for Planting Sites & Seedlings

Robert M. Franklin, The Longleaf Alliance, bobby@longleafalliance.org

This presentation will discuss selection of planting sites, seedling quality & selection criteria for longleaf pine seedlings. Criteria for quality bare root & container seedlings will be covered, as well as seed source for seedlings.

Landowner's Perspective: Establishment Year Successes and Pitfalls

J. Brett Rushing, Mississippi State University, brushing@pss.msstate.edu

Claude Jenkins, Alabama Wildlife Federation, cjenkins@alabamawildlife.org

Establishing native warm-season grasses (NWSG) can often be a difficult process. These species have been lauded for their ability to provide excellent cover for ground nesting birds, and for providing drought tolerant, low input feedstuffs for forage production. Extensive planning and preparation are required prior to planting new areas with NWSG. For several private land owners, the time, effort, and expertise in conquering this task is often times lacking, ultimately leading to unsuccessful stands, money and time wasted, and frustration to the point of giving up on these wildlife habitats or grazing systems. Landowners (20) across Alabama were surveyed based on their experiences with NWSG. Survey questions dealt with prior knowledge about NWSG, establishment site history, property goals (wildlife habitat creation, forage production, or aesthetics) site preparation (weed control, tillage, tree removal, etc.), species planted, services used (consulting, contract applicators/planters, etc.), weed problems, and opinions or recommendations for future planting opportunities. The most common issues pertaining to the establishment process dealt with site preparation (improper weed control), planting method (conventional planters) and impatience. Nearly all (>90%) landowners would recommend establishing NWSG to other landowners. However, numerous deterrents or concerns were shared that could possibly prevent others from choosing to plant NWSG, namely seed costs, slow germination and seedling development, and site profitability. Hopefully, these experiences, both positive and negative, can help prepare private landowners considering establishing NWSG, steer future research programs assessing establishment methods, and enhance management protocols.

Potential Alternatives to Wiregrass, Switchgrass, and Lark Partridge Pea for Longleaf Pine Understory Plantings

Mark B. Fiely, Ernst Conservation Seeds, hortpatb@ernstseed.com

Fire is an integral part of the ecology of longleaf pine (*Pinus palustris*) ecosystems. Two grasses commonly used as components of understory plantings are wiregrass (*Aristida* spp.) and switchgrass (*Panicum virgatum*). Wiregrass produces less biomass per acre and burns at a cooler temperature than current cultivars of switchgrass. Consequently, fewer seedlings of longleaf pine are killed by prescribed burns when wiregrass is the understory grass than when switchgrass is the understory grass. At this time, wiregrass production is only economically viable as a wild harvest, thus limiting potential supplies of the crop. Alternative grass species produced in commercial production fields, at an affordable price, should be considered for understory plantings. Among the grass species warranting investigation for use in longleaf understory plantings are: winter bentgrass (*Agrostis hyemalis*), bushy bluestem (*Andropogon glomeratus*), purple bluestem (*Andropogon glomeratus* var. *glaucopsis*), splitbeard bluestem (*Andropogon ternarius*), slender woodoats (*Chasmanthium laxum*), virginia wildrye (*Elymus virginicus*), bigtop lovegrass (*Eragrostis hirsutus*), pink muhly (*Muhlenbergia capillaris*), beaked panicgrass (*Panicum anceps*), little bluestem (*Schizachyrium scoparium*), slender indiagrass (*Sorghastrum elliotii*), indiagrass (*Sorghastrum nutans*), lopsided indiagrass (*Sorghastrum secundum*), pineywoods dropseed (*Sporobolus junceus*) and purpletop (*Tridens flavus*).

For the benefit of wildlife, longleaf understory plantings are frequently supplemented with a legume. When switchgrass is the understory grass, partridge pea (*Chamaecrista fasciculata*) 'Lark' accession is typically planted as the legume. In some locations, 'Lark' has grown taller or more aggressively than desired. Some alternatives to 'Lark' include regional ecotypes of partridge pea, sensitive pea (*Chamaecrista nictitans*) and slender bushclover (*Lespedeza virginica*).

4-D: Landowner 201: Establishment & Conversion

Longleaf Genetic Improvement: Current and Future

Wayne Bell, International Forest Company, wbell@internationalforest.co

A review of current genetics work underway with longleaf and the opportunities to advance the genetics work for the future will be presented. The potential impact of genetics on the longleaf forest will be discussed as well.

Achieving the Site Prep Prescription

Dr. David Moorhead, University of Georgia, moorhead@uga.edu

This talk will highlight what I consider "Red Flag" conditions, to use prescribed fire vernacular, that can seriously impact successful longleaf establishment." Focus will be placed on the evaluation of site conditions/limitations including soil conditions, competing vegetation, anticipated timing of planting etc., that are essential to achieving the site prep prescription.

Use of Herbicides in Longleaf Pine Establishment and Conversion

Pat Minogue, University of Florida, pminogue@ufl.edu

Fire and herbicides are used to manage competition in longleaf pine stand establishment and habitat restoration. These tools arrest succession to hardwood species and maintain longleaf ecotypes. Competition control is important to ensure successful longleaf regeneration and has been shown to improve planted seedling survival and to bring seedlings out of the grass stage sooner. The use of herbicides to prepare sites for planting, to selectively control competing herbaceous plants, shrubs and hardwoods in established stands, and to promote desirable associated vegetation such as native warm season grasses will be reviewed.

Successful Establishment of Native Grasses and Forbs

John Cox, Lolly Creek Restoration and Land Management, lollycreek@icloud.com

This presentation focuses on the restoration of the diverse understory component in longleaf forests. A guide will be provided for seed source selection, pre-planting site preparation, recommended planting equipment and techniques, and stand maintenance.

4-E: Foraging & Grazing – Grand Bay Ballroom

Native Grass Perceptions: Producer and Professionals Surveys in Tennessee

P. Keyser, S. Schexnayder, A. Willcox, G. Bates, and J. Waller. *Center for Native Grasslands Management, University of Tennessee, pkeyser@utk.edu*

During summer 2011, we conducted a mail survey of 1,620 beef cattle producers and in Feb 2014 we surveyed 312 professionals in Tennessee. Few producers intentionally grew NWSG (5%) and familiarity was low, 66.7% “not at all familiar”; for professionals this figure was 5%. In response to specific questions about key attributes of NWSG important for forage production, producers did not know/no opinion 67.3% - 79.1% of the time; those with an opinion tended to underestimate quality, yield, ability to produce gain, drought tolerance, stand persistence, and likelihood of spreading and overestimate fertilizer requirements. Professionals’ knowledge regarding these same attributes was accurate but they tended to overestimate producer knowledge and underestimate producer perceptions regarding NWSG. Producers indicated that they were somewhat interested (30.4%), interested (30.7%), or very interested (22.2%) in improving summer forage quality; professionals tended to overestimate this interest. Willingness to spend (out-of-pocket costs) to establish “quality, perennial, summer forage that would persist over a ten-year period” met or exceeded actual costs for 37.4% of producers; professionals tended to overestimate this willingness to spend. Professionals considered issues related to establishment to be the most important barrier to adoption of NWSG and that reduced fertilizer costs and improved gain and production were most likely to motivate adoption by producers. These results indicate most producers are not familiar with NWSG. They also suggest that based on interest in improving summer forage, willingness to spend to establish summer forages, and willingness to increase management intensity, there is a prospective role for NWSG on beef farms. Professionals have a sound foundation for improving producer knowledge regarding native forages.

Native Grass Production in Illinois for Sustainable Agriculture

Allen Parrish, University of Illinois, aparrish@illinois.edu

Farming systems integrated with grasses have been an integral part of American history, culture and economy that spans generations and sustain the world with food, fiber, and fuel. Changes in agriculture adapt with consumer demands, advances in technology, environmental stewardship, and governmental emphasis and the University of Illinois looks to answer those challenges. The Energy Bioscience Institute Farm was established in 2007 to help develop solutions for the bioenergy industry. Our area of research has been focused on the development of native prairie grasses and other crops for bioenergy feedstock production as a part of existing conventional cropping systems to maximize system productivity and environmental services. Management practices for feedstock production will be of great importance to producers, especially in the Midwest where corn and soybeans dominate the landscape. Prairie cordgrass was identified as a high biomass yielding species on marginal landscapes reducing the demand for prime cropland. A nursery with over 100 populations was established, a high yielding line has been released and work is underway to make further improvements. This research and experience will help future biofuel producers provide the feedstocks needed to fuel a biofuel industry.

Native Warm Season Grass Considerations in Silvopasture

Eddie Jolley, NRCS, Eddie.Jolley@al.usda.gov

This presentation focuses on key elements to successful inclusion of native warm season grasses in grazing systems within silvopastures. It will give an overview of how and where native warm season grasses are suitable and specific grazing management guidelines that should be followed. The presentation will focus on key considerations for successful native warm season grass establishment and management in silvopasture systems. Management considerations for wildlife purposes are imbedded in the presentation.

Initial Results from Range Study in Conecuh National Forest

Charles Simon, Alabama Cooperative Extension Service, simoncm@aces.edu

During the 2014 growing season, several study plots were established in a newly burned area of Compartment 54 located in the Conecuh National Forest. Monitoring and sampling these plots from March to the present provided data as to the quantity and quality of existing longleaf pine understory as to its feasibility as cattle range grazing. Cattle are being re-evaluated as a tool for forest understory management when burning may not be an option, control of many invasive plants and the first step in correcting a severely overgrown forest understory before an initial herbicide and/or burn treatment.

CLOSING PLENARY SESSION

New Landowner Involvement in Natural Resource Management

Greg Pate, State Forester, Alabama Forestry Commission, greg.pate@forestry.alabama.gov

There are an estimated 440,000 landowners in Alabama who own more than 10 acres of forested land. The Alabama Forestry Commission and other natural resource agencies are successful in helping give landowners advice and techniques for managing the natural resources on their property. Many of the landowners we work with annually are the same landowners we assisted the previous year. How do we reach and involve new landowners in the management of their natural resources? We are attempting some new and revamping some older methods in Alabama to reach these landowners.

The Next Generation: Income Tax Planning is Just as Important as Estate Planning

Jerome Hesch, Berger Singerman LLP, jhesch@bergersingerman.com

With the permanence of the large exemptions from the estate and gift tax, fewer families will need to use sophisticated estate planning techniques. However, all families are interested in reducing their income taxes. The presentation will first describe an income tax savings technique designed for families who intend to sell their business or investment assets in the future for cash so that the gain that would otherwise be taxable at the time of the sale can be postponed to a future date far in the future with the result that the payment of the income taxes on that gain can be postponed. The ability to postpone the reporting of the gain and the resultant payment to of the income taxes on the gain is the practical equivalent of a 90% reduction in the income tax rate. So, the effective rate for a gain taxable at 30% would be reduced to 3%.

For families who intend to pass the family business or family investments on to the next generation, the presentation will then describe an estate planning technique that allows the senior family members to retain the income from the income-producing asset for the rest of their lives and completely shelter that income-producing asset from the estate tax.

If time permits, we will briefly cover some other income tax savings techniques that are designed for families of modest means.

Our Longleaf Journey

Jon H. Gould, Forest Landonner and Consulting Engineer, gouldjb@bellsouth.net

In the early 1950s our family planted our first pine seedlings on Merritt Island, which were destroyed by a wildfire. A few years later my dad and I hand planted 15 acres of slash pines that became a beautiful stand of pines. In 1955, Dad was recognized as one of Florida's first Tree Farmers. In the early 1960s the U.S. Government purchased the Tree Farm, as they expanded their ownership of Merritt Island during the growing Space Program. At that time our family purchased a large tract of timberland on the west coast of Florida and owned and managed it for several years. Eventually, that land was sold and several tracts of timberland were purchased in the Florida Panhandle in the 1960s. Dad managed much of this land for many years, and it provided a significant amount of his income until his death in 2009 at the age of 95. During the mid-1990s my wife Carol and I started purchasing some of Dad's land and purchasing additional timberland. We now own 640 acres of forestland which includes planted pine plantations, natural pine stands, and natural mixed pine and hardwood stands. We have planted several hundred acres of pine seedlings, including about 67 acres of longleaf. Our support of The Longleaf Alliance began 18 years ago when we realized that we needed educational assistance with the purchasing and planting of seedlings and the management of these growing stands of longleaf, some of which are now 17 years old. We have learned much about growing longleaf and have started teaching our children and grandchildren. We hope they will eventually own and manage our timberland and establish many more acres of longleaf.

Poster Presentation Abstracts

Breeding Bird Response to Stem Removal and Prescribed Burning to Restore a Longleaf Pine Grassland on the Talladega National Forest, AL

Robert Carter, Department of Biology, Jacksonville State University, rcarter@jsu.edu

The Coleman Lake area of the Talladega National Forest is managed for the red-cockaded woodpecker and to restore a mountain longleaf pine grassland. Mid-story removal and prescribed fire from 2010-2014 has created more parklike conditions. To determine the relationship between forest structure and bird populations, 30 sites were monitored to determine breeding bird assemblage and tree and sapling basal area, tree and sapling density, and midstory densities at 0, 2.5, and 5 m above the ground. Pearson's correlation analysis showed a strong relationship between tree, sapling, and midstory density and bird habitat preference. Yellow-breasted chat and yellow-throated warbler showed strong negative relationships with tree basal area but sapling density. Northern bobwhite and prairie warbler showed a negative relationship with increasing midstory density. Bird species composition homogenized as the area treated to midstory reduction increased resulting in fewer species requiring closed canopy conditions. The population of Bachman's sparrow declined despite the increase in parklike conditions.

Conservation Progress on the Chattahoochee Fall Line

LuAnn Craighton, Chattahoochee Fall Line Conservation Partnership, lcraighton@tnc.org

Geoff Sorrell, The Nature Conservancy, gsorrell@tnc.org

The Chattahoochee Fall Line Conservation Partnership (CFLCP) is the Local Implementation Team (LIT) working in west Georgia and east Alabama to conserve the longleaf pine ecosystem. The CFLCP launched in 2011 and since that time significant strides have been made in land protection, land stewardship, landowner outreach and forging new cooperative relationships in the region. The CFLCP is working to encourage the protection, restoration and management of up to 40,000 acres around Fort Benning explicitly for conservation purposes by the year 2020. This 'conservation corridor' will provide a buffer of natural lands between active military training and daily life outside the installation while protecting the unique natural heritage of the region. Currently, over 27,300 acres are under permanent conservation protection - including a new Wildlife Management Area. In the CFLCP region, land stewardship activities including: planting longleaf, prescribed fire, timber stand improvement, invasive species removal and understory restoration continue to expand. In August 2014, through a cooperative partnership among Georgia DNR, The Nature Conservancy (TNC) and the U.S. Army at Fort Benning the 10,800 acre Chattahoochee Fall Line Wildlife Management Area (CFL WMA) opened providing new opportunities for public hunting and outdoor recreation near Columbus, Georgia. The CFL WMA is co-owned and co-managed by Georgia DNR and TNC. To generate future opportunities for additional land protection and increased land stewardship activities a broad-based landowner outreach program is underway including: technical workshops, community events, volunteer activities, field tours, civic presentations and the creation of demonstration forests.

Laws, Liability and the Importance of Prescribed Burning in Longleaf Pine States

Corey Sugerik, Extension Forestry, North Carolina State University, cjsugerik@ncsu.edu

**Jennifer Evans, Extension Forestry, North Carolina State University, jlevans3@ncsu.edu*

Prescribed fire is one of the most cost-effective and efficient forms of natural resource management, especially in Longleaf pine forests where fire is essential to the long term success of the ecosystem. Unfortunately, prescribed burning involves a certain amount of risk for which landowners and consultants must take responsibility. Liability for damages caused by escaped fires and smoke is one of the primary deterrents that many individuals have cited as reasoning for not conducting prescribed

burns. The balance between holding individuals accountable and compensating for uncontrollable mishaps is crucial. Understanding the laws and policies regarding prescribed burns and taking the necessary actions to reduce liability and legal consequences are key to encouraging successful, safe and responsible prescribed burning. Becoming a Certified Burner and obtaining prescribed fire insurance are examples of some preliminary steps that can be taken towards reducing liability. By reducing liability concerns, there is a greater potential for an increase in prescribed burning as a land management tool in Longleaf pine ecosystems throughout the Southeast region.

Association between Climate and Changing Life History Traits in Red-cockaded Woodpeckers

**Victoria Garcia, Department of Biological Sciences, Virginia Tech, vgarcia@vt.edu*

Jeffrey R. Walters, Department of Biological Sciences, Virginia Tech, jrwalt@vt.edu

As with other species, Red-cockaded Woodpeckers (*Picoides borealis*) show a pattern of earlier laying in recent decades, possibly in response to climate change (Schiegg et al. 2002). We wanted to determine whether this trend is continuing, and to also examine whether other traits are changing in response to climate change. We used long-term data (1980-2013) to examine whether laying date, variance in laying date, clutch size, partial brood loss, hatching asynchrony, and number of fledglings produced each year were associated with changes in temperature and rainfall at two study sites in North Carolina. The local climate variables used were early spring (Feb-Mar) means of the daily means, maximums, and minimums for temperature, and sum of daily precipitation. We found that some traits show clear linear patterns of changing in ways predicted by climate change (e.g., earlier laying, larger clutches). We also found that local annual temperature and rainfall affected these traits in consistent patterns each year. These results show how climate is affecting this endangered species in the northern end of its range, where conditions might be expected to differ from the southern parts of the range. These results also provide insight into how Red-cockaded Woodpeckers may respond to climate change.

Longleaf Pine Mapping Effort and Stand Level Database Update

John Gilbert, Auburn University, gilbejo@auburn.edu

The Longleaf Pine Stand Dynamics Lab (LPSDL) and The Longleaf Alliance, Inc. have been working together for the past few years with numerous partners on an effort to develop a GIS database of existing longleaf pine stand level data. Thanks to your continued support and interest, this effort has continued. The GIS database is being constructed by collecting and compiling existing available spatial data about longleaf pine stands. Sources include natural and planted stands from all types of land ownership. Spatial data have been received in various forms from coordinates for a single point within a stand to polygons with attributes like acreage, density, fire history, etc. Through support from an anonymous donation, a product from the database will now be completed for public release. The collected data and GIS datasets are being merged and integrated into a working database. Sources from across the range have provided data and support across all levels of stakeholders with promises of continuing support. Data are still being received, and your assistance is needed to help provide the best picture of longleaf pine possible. The database will serve as a baseline of knowledge about current existing and available spatial data for longleaf pine stands by showing not only locations of stands but also some description of condition. This GIS database helps assess the extent and condition of available spatial data on longleaf pine forests, which provides a building block in the restoration of the longleaf pine ecosystem.

Southern Fire Exchange: Putting Fire Science on the Ground

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Leda Kobziar, University of Florida, lkobziar@ufl.edu

The Southern Fire Exchange (SFE) is a regional program for fire science delivery, funded by the Joint Fire Science Program (JFSP) as part of the national Fire Exchange Network. The SFE is directed through a partnership among the University of Florida, North Carolina State University, Tall Timbers Research Station, and the USFS Southern Research Station. The SFE seeks to translate relevant science that can support management activities and decisions within the southern pine ecosystems across thirteen southern US states. SFE activities focus on three programmatic areas: 1) a ‘first-stop’ web-based resource center (www.southernfireexchange.org) that consolidates southern fire information and links to a wide variety of additional resources; 2) science translation through the bimonthly *Fire Lines* newsletter, relevant two-page fact sheets, research summaries and presentations; and 3) direct communication between scientists and fire managers through webinars, workshops, and training events. All SFE programs rely on a wide variety of partners who assist with program delivery and SFE governance. Details about each of these program components will be presented in the poster.

Promoting a Florida Seed Source of Splitbeard Bluestem for Use in Longleaf Pine Plantings in the Deep South

Janet M. Grabowski, USDA, Natural Resources Conservation Service, Brookville Plant Materials Center, janet.grabowski@fl.usda.gov

Splitbeard bluestem (*Andropogon ternarius* Michx.) is a native bunch grass that can be found growing on dry, sandy or gravelly soils in the southeastern US. It is generally not a major component of the understory community in southern pine forests within its native range. However, it is known for its ability to effectively colonize disturbed sites. This should make it an ideal candidate for use on longleaf pine (*Pinus palustris* Mill.) restoration sites, especially those with dry soils that are being converted from former cropland or pasture, where other less competitive native understory species may not be capable of establishment from seed. However, limited commercial availability of splitbeard bluestem seed is one factor that hampers its use on these sites. Staff at the USDA, Natural Resources Conservation Service, Brooksville Plant Materials Center (PMC) in Brooksville, Florida recognized this need and collected seed from a population of splitbeard bluestem in Citrus County, Florida in 1995. It was released under the name Fort Cooper Germplasm in 2008. Foundation seed has been distributed to a small number of seed growers; however, we are looking for additional producers that are interested in growing Fort Cooper Germplasm. The PMC also has limited quantities of seed that can be distributed to researchers wishing to plant small demonstration plantings on longleaf pine restoration sites in Florida, Georgia, and Alabama, to field test its establishment potential on these sites and document its range of adaptation. Please contact the author for further information.

Successful Longleaf Conservation Partnerships in South Carolina

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Efforts to restore longleaf pine and its associated understory have been ongoing on a large scale since the late 1990’s. Results from many successive years of applied research have made longleaf ecosystem restoration techniques increasingly more efficient and effective throughout the range, from North Carolina to Texas. As part of a range-wide strategy for restoring longleaf pine habitat, three Local Implementation Teams were developed in South Carolina. The Sandhills Longleaf Pine Conservation Partnership, the Sewee Longleaf Conservation Cooperative, and the SoLo-ACE Longleaf Partnership together cover all or portions of 15 counties in the Sandhills and Coastal Plain ecoregions of the state. Through effective partnering and fortunate funding acquisitions, these three teams are making a

noticeable difference in the quantity and quality of longleaf stands in the landscape of South Carolina. This poster recognizes the focal areas where we work, identifies more than a dozen leading partners, and summarizes the continuing accomplishments of each of team.

Longleaf Pine Ecosystem Restoration and Connectivity in the Southeastern Plains & Southern Coastal Plain Ecoregions

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Opportunities for longleaf pine ecosystem restoration and connectivity are emerging along the Gulf Coast of Alabama and northwestern Florida. Properties under private ownership and under forest management are becoming available for conservation easements and for strategic additions to longleaf pine forest inventories. Successful integration into long term restoration management and connectivity will require collaboration between universities, state and federal agencies, nonprofit organizations, industry, and private landowners. That effort is underway using tools like participation in the Gulf Coast Cooperative Ecosystem Study Unit and an overarching white paper circulating among potential partners laying out the case for a landscape level initiative. Together these locations form a core for a broader multi-state longleaf pine ecosystem corridor. Strategically positioned properties in south Alabama, northwest Florida, and southeast Mississippi have recently become the subjects of longleaf pine restoration or conservation efforts. These tracts bracket a region critical for longleaf pine ecosystem recovery and connectivity. Existing longleaf pine patches across the focal area include Eglin Air Force Base, Conecuh National Forest, Apalachicola National Forest, Blackwater River State Forest, Desoto National Forest and numerous state and private lands. Many remnant longleaf tracts also offer connectivity and key ecosystem support to adjacent large-scale wetland conservation areas within the region, including Northwest Florida Water Management District corridors on all Florida Panhandle rivers, the Mobile-Tensaw Delta in Alabama, and the Pascagoula River basin, Wolf River and Pearl River basins in Mississippi.

Ocala Longleaf Local Implementation Team: Opportunities and Challenges in Year 1

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The Ocala Longleaf Local Implementation Team is one of the newest and furthest south (in central Florida). The Ocala LIT shot out of the gate before being awarded funding, in fall 2013, provided a boost by pre-existing relationships through the on-the-ground work of the Northeast Florida Ecosystem Restoration Team and the North Central Florida Prescribed Fire Working Group MOU that frames that work. This year has involved: working with partners to create a list of protection priorities and needs for successful longleaf pine work, sharing information about resources on public and private lands, conduct longleaf restoration and maintenance on public lands, rolling out a landowner incentive program with the Florida Forest Service for work on private lands, creating a media plan for outreach with NRCS, learning from other LITs and the different organizing entities focused on longleaf pine, participating in the 5th anniversary of America's Longleaf Restoration Initiative, and starting work on developing resources and a conservation plan for the future. The appearance of opportunities, and challenges, has been fast and furious. The key elements that have fed and challenged success will be reviewed, some of which may be still on the horizon. There is a lot of variability among different LIT regions that means a cookbook to successfully creating an LIT is impractical, but are there key ingredients in common?

Apalachicola Regional Stewardship Alliance Local Implementation Team Concept and Execution

Brian Pelc, The Nature Conservancy, bpelc@tnc.org

World class longleaf pine restoration, conservation and management requires cooperation. Between sharing restoration equipment or providing staff to assist on a prescribed fire, the 10 Florida Panhandle land management agencies who have signed onto the 2010 ARSA MOU benefit from significant cost savings and land management efficiencies. Several members are currently receiving funding for new longleaf establishment and on-going fire management through a NFWF Longleaf Stewardship Fund grant. In 2012, ARSA members joined forces, crossed property lines and accomplished 118,000 acres of management. In 2013, the ARSA NFWF grant funded nearly 700 acres of new longleaf stands. The goals of America's Longleaf Restoration Initiative are lofty, but ARSA can serve as a model to other LITs and areas within the longleaf range not covered by a "Significant Geographic Area" to get more acres restored and manage existing acres more effectively and efficiently. Looking to the future, ARSA plans to continue funding longleaf work by exploring new grants and maintaining relationships with funding partners. An SGA-wide conservation plan for the ARSA region is also in development that will help guide outreach, restoration and land acquisitions strategically. And, as always, ARSA members will continue to share knowledge and resources that maximize longleaf in the Florida Panhandle.

Reptile and Amphibian Survey with Focus on Fossorial Snakes of Mountain Longleaf Habitat in Cleburne County, Alabama

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Seven small "fossorial" snake species may be found in east-central Alabama: The Southern Ringneck Snake (*Diadophis punctatus*), the Dekay's Brown Snake (*Storeria dekayi*), the Northern Red-bellied Snake (*Storeria occipitomaculata*), the Southeastern Crowned Snake (*Tantilla coronata*), the Rough Earth Snake (*Virginia striatula*), the Eastern Smooth Snake (*Virginia valeriae*), and the Eastern Worm Snake (*Carphophis amoenus*). These smaller, secretive snakes and their roles in the herpetofaunal communities are often overlooked by larger or more dangerous species. This study, which began in April of 2014, focuses on a population survey on these seven species at Boy Scouts of America's Camp Sequoyah (a 1387 acre property) in Cleburne Co, Alabama. Pitfall traps, drift fences, and coverboards have been placed atop a small longleaf pine habitat to sample for these fossorial snake species. All species of reptiles and amphibians recorded as "by-catch" during this survey will be recorded and used to update state and county records of this understudied region of Alabama.

Demonstration of a Multi-Use Sawtimber-Biomass Management System Using Longleaf and Loblolly Pine

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Longleaf pine's slow early growth and high establishment costs reduce economic returns making it a less attractive investment option compared to loblolly or slash pine. Income early in a management rotation can make longleaf more economically attractive. A biomass component provides an opportunity for early income. The purpose of our study is to evaluate techniques and identify obstacles of a non-conventional mixed sawtimber-biomass forest management system. The system objective is to provide forest landowners early income that increases overall profits while establishing a longleaf pine forest. We will grow two timber products, a short rotation loblolly crop for biomass and long rotation longleaf crop for saw-timber and other values of a longleaf forest. Longleaf pine is well suited for long-term management goals. It is valued for superior wood qualities preferred for sawtimber and poles markets. Its long needles are favored landscape mulch. The rich diversity of a longleaf forest provide excellent wildlife habitat. Alternatively, fast growing loblolly is well suited to short rotations. In a multi-use management system the loblolly pine can be harvested early in the rotation as a biomass product and provide an early cash flow. In the multi-product management

design, establishing longleaf pine can be more profitable, offer a hedge against uncertain markets, and provide environmental value to the landowner.

Identifying Potential Opportunities for Longleaf Pine Management on Private Lands Using GIS

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Nonindustrial private forest landowners own approximately 78 percent of North Carolina's timberland (2007), yet few landowners have a written management plan or have received technical or financial assistance to actively manage their forestland. Participation by private landowners in the restoration and management of longleaf pine is essential to the success of the range-wide conservation plan but is not as easily achieved as participation by public entities. Private landowners frequently have multiple objectives for their land which are often driven in part by financial considerations not faced by public entities. Expansion of longleaf forests on private lands is more likely to occur in areas where the opportunity cost of longleaf management is low compared to other agricultural and forest land uses. To identify these areas using GIS, NRCS SSURGO soil map units for our model area were placed into four suitability categories based on 1) the difference between the site index for loblolly pine and the site index for longleaf pine and 2) whether the soil has a high or low capability to produce common cultivated crops without deteriorating over time. Areas where the longleaf pine site index is greater than or close to the loblolly pine site index and the soil has a low capability to produce common cultivated crops were rated as high opportunity for longleaf pine management. To identify landowners for outreach, the average suitability category for each tax parcel was calculated. Additional work is underway to determine if this GIS procedure accurately identifies low opportunity cost areas.

An Evaluation of Direct Effects of Heavy Equipment Use on Gopher Tortoise Burrows

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Gopher tortoises (*Gopherus polyphemus*) occur in open canopy habitats on well-drained sandy soils, where they construct extensive burrows that offer protection from thermal extremes, fire, and predators. Tortoise burrows vary in length and depth depending on soil characteristics and depth to the water table, but burrows generally have only one entrance at the soil surface and the width of the burrow is correlated with the size of the tortoise. Forestry management practices such as thinning and hardwood removal benefit gopher tortoises by creating a more open canopy and encouraging growth of herbaceous food plants. However, harvesting, site preparation, and use of heavy equipment associated with these activities can directly impact burrows. In particular, operation of heavy equipment in proximity to burrows can cause burrows to collapse and there is concern about loss of shelter and potential stress or injury to gopher tortoises from burrow collapse. The distance from a burrow entrance at which heavy equipment is likely to cause collapse has not been investigated. In this study, we explicitly tested the distance at which three different types of commonly-used heavy equipment vehicles caused unoccupied gopher tortoise burrows to collapse. We found a critical distance of 2.45 m (8.04') from burrow entrance to initiate collapse regardless of equipment type.

The Influence of Plant-Plant Interactions on *Aristida stricta* Performance Across a Complex Environmental Gradient

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Plant-plant interactions have been shown to influence individual plant performance and shape community composition and structure. Consensus as to how these interactions vary in type or intensity with different abiotic factors or along environmental gradients remains elusive. To explore

the interactions occurring along a complex moisture and soil resource gradient, I conducted neighbor removal experiments surrounding focal *Aristida stricta* (wiregrass) individuals (n=96) along the sandhill-seepage slope gradient of longleaf pine habitat at Eglin AFB, FL, USA. After neighbor removals (heterospecific, homospecific, or total) that followed fire, I monitored each individual's first growing season change in growth (Δ in basal diameter) and potential reproductive output (no. of flowering culms x average no. of flowers/culm). Preliminary analyses indicate that total neighbor removal significantly reduced individuals' potential reproductive output ($P < 0.0015$). Other removals had no significant effect on individuals' reproductive output, and removals did not significantly affect post-fire growth ($P = 0.9270$). Although preliminary, these results suggest that facilitation, rather than competition, may be a key interaction occurring along this moisture and soil resource gradient. This finding contradicts the results of many studies that have reported intense competition along other gradients, but aligns well with previous theory concerning plant-plant interactions in high-stress environments.

Science and Monitoring at Carolina Sandhills National Wildlife Refuge Poster Collection: Celebrating the Refuge's 75th Anniversary and its Contributions to Longleaf Pine Ecosystem Management

Presented by Allyne Askins, CSNWR Refuge Manager, allyne_askins@fws.gov

Carolina Sandhills National Wildlife Refuge, established in 1939 and managed by the US Fish and Wildlife Service (USFWS), contains 46,000 acres of rolling sandhills dominated by the longleaf pine-wiregrass ecosystem. This ecosystem provides for the needs of more than 190 species of birds, 42 species of mammals, 41 species of reptiles, 25 species of amphibians, and more than 800 species of plants. Since 1970, more than 50 research projects have been conducted in this living laboratory of longleaf management and restoration. To commemorate the 75th Anniversary of the refuge, we invited researchers from 1970 to submit posters of projects conducted on the refuge. The posters represented in this collection specifically relate to longleaf pine habitat, species assemblages and management. The entire exhibit (18) rotated through three South Carolina universities and four high schools between March and October 2014. While the public is familiar with refuge recreational opportunities, many people are not aware of the monitoring and research studies that have occurred here. Additionally, an emphasis area for the USFWS is youth engagement in the natural sciences. To that end, this traveling exhibit may stimulate pursuit of academic study or career selection in natural resources management or research from students that previously were unaware of these opportunities.

This collection features 10 posters specifically related to the longleaf pine ecosystem:

Pine Barrens Treefrog Survey

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The Pine Barrens Treefrog (*Hyla andersonii* Baird) is listed as a threatened species in South Carolina. Carolina Sandhills National Wildlife Refuge supports numerous colonies of the Pine Barrens Treefrog and is home to the second largest concentration of this species in the state. Baseline surveys are needed to discern population trends and assess effects of habitat (seeps) management. The survey utilizes Wildlife Acoustics, Inc. Songmeter Model SM2 and SM2+ bioacoustic monitoring equipment to determine presence/absence of anuran (i.e., frog and toad) species during the period of March 14, 2013 - August 31, 2013. Data were analyzed utilizing Wildlife Acoustics, Inc. Song Scope Analysis Software. In total 16 sites were surveyed and 509 hours of data were collected and analyzed. Pine Barrens Treefrogs were documented at nine of the 16 sites surveyed. To better assess population trends, the North American Amphibian Monitoring Program (NAAMP) unified protocol was utilized

to assign an index value to recordings containing Pine Barrens Treefrog vocalizations. Average NAAMP index values ranged from 0-2.40. In addition to the Pine Barrens Treefrog, 12 additional anuran species were documented. Of special interest was the River Frog (*Rana beckescheri*), a species not previously documented at the refuge and thought to have been extirpated in North Carolina. Water chemistry data was also collected at 7 sites to provide baseline water quality information and to further investigate what constitutes suitable breeding habitat for the Pine Barrens Treefrog.

A Survey of Amphibian and Reptile Diversity in a Longleaf Pine Forest Ecosystem

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Four sites representing four different habitats were sampled during 1996-1997 on the Carolina Sandhills National Wildlife Refuge. Nocturnal road surveys were also conducted along Wildlife Drive to sample snakes. The habitats sampled included upland longleaf pine, riparian forest, a vernal pond and a permanent pond. Sites were sampled using drift fences with pitfall and funnel traps, wood and metal artificial cover objects, pvc pipe tree frog retreats, time constrained searches and turtle traps where appropriate. All specimens were identified to species and marked for further identification. Species diversity (H'), community evenness and capture rate were calculated for each site. I obtained 363 captures of 37 species of amphibians and reptiles. Species richness was greatest (22 species) for the temporary pond and lowest (7) for the longleaf pine site. Species diversity was highest for the permanent pond (2.32) and lowest for the longleaf pine site (1.75). Community evenness was highest for the longleaf pine site (0.899) and lowest for the riparian forest (0.573). Capture rates were highest for the longleaf pine site (4.86 captures/100 trap days) and lowest for the permanent pond (2.20 captures/100 TD). Thirteen species of snakes were documented on 13 nights of road cruising on Wildlife Drive. A total of 42 species of herpetofauna were documented on the refuge in this study and included 19 species of amphibians and 23 species of reptiles.

Bees (Anthophila) of Carolina Sandhills National Wildlife Refuge

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From 2006 through 2009, I sampled for *Anthophila* species at the Carolina Sandhills National Wildlife Refuge. Prior to initiating this study, little information existed for the sandhills region of the Carolinas. Activities consisted of setting out sets of 5 florescent yellow, 5 florescent blue, and 5 white bowls 5 meters apart along rural roads and some hand-netting during the middle of the day. Sampling efforts of two days in 2006, six days in 2007, three days in 2008, and three days in 2009 yielded 5 Families, 35 Genera, 167 species and 4799 specimens with more than 50 state records (previously undescribed). The important habitats were either sand barrens or burned grasslands. Many of the native solitary bee species captured are sand specialists and analogous to bee communities in coastal dune systems. Several of the species found on the refuge are known or suspected pollen specialists. Managing the refuge for longleaf pine appears to create high quality native bee habitat.

Population Density Mediated Space Use by Red-cockaded Woodpeckers

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The rapid progression of methods to quantify patterns of space use has stimulated research of ecological processes that influence animal space-use at various spatiotemporal scales. Space use can vary with population density and spatial organization of individuals, but emerging research suggests unique local conditions can account for considerable variation in space use.

We examined effects of varying local population density on space use by neighboring red-cockaded woodpeckers (*Picoides borealis*; RCW) to evaluate standardized foraging partitions to manage foraging habitat. Space use by RCWs has been reported to vary among populations as a function of neighboring group density and spatial structure, but supporting empirical evidence is inconsistent. We visually tracked 10 neighboring RCW groups in each of low, medium, and high local density conditions twice a month from April-June 2013. Utilization distributions and overlap indices were used to estimate size and overlap, respectively, of home ranges and core-use areas. Neighboring RCW groups used more space in low density conditions compared to medium; space use by high-density groups was not significantly different from low or medium conditions. Home-range overlap increased with density, but home ranges were largely exclusive. Standard partitions offer a practical approach to manage RCW foraging habitat, but inconsistent relationships between neighboring group density and space-use estimates suggests standard partitions may not adequately represent foraging habitat routinely used by RCWs.

Bachman's Sparrow Occupancy and its Relationship to Fire Management and Vegetation Structure on the Carolina Sandhills National Wildlife Refuge

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Some of the birds associated with longleaf pine (*Pinus palustris*) ecosystems in the southeastern U.S. have undergone widespread population declines in recent decades (Hunter *et al.*, 2001). One species that is experiencing an especially precipitous decline are Bachman's Sparrow (*Peucaea aestivalis*), a pine-grassland specialist. In South Carolina, where Carolina Sandhills National Wildlife Refuge (CSNWR) is located, Bachman's Sparrows (BASP) are ranked Highest Priority for Conservation in the South Carolina Department of Natural Resource's Comprehensive Conservation Plan (SCDNR 2005). Current monitoring programs, such as the Breeding Bird Survey, may fail to detect a declining species sufficiently. In addition, a monitoring program combined with habitat data can provide information for land managers about the effects habitat management actions have on the targeted species. In 2012 and 2014, CSNWR conducted a targeted playback survey focusing on BASP. Calls were played at 65 random points throughout the refuge; points were visited 3 (2012) and 4 times (2014) during the breeding season. Habitat structure data (pine and hardwood basal area, midstory shrubs, groundcover, fire frequency, and snags) was collected at each random point in 2012. BASP were detected at 28% of the points in 2012 and at 58% in 2014; sparrow occurrence probability rates were best predicted by increased fire frequency and pine basal area of 40-70 ft². While this poster focuses on BASP, the targeted playback methodology is also being used to monitor occurrence rates of other critical pine-grassland species on the refuge, such as Brown-headed Nuthatch and Northern Bobwhite.

Habitat and Landscape Correlates of Southern Flying Squirrel Use of Red-Cockaded Woodpecker Clusters

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Southern flying squirrels (*Glaucomys volans*) can have significant negative impacts on redcockaded woodpecker (*Picoides borealis*) reproductive success and group size. Although direct control of southern flying squirrels may be necessary in small red-cockaded woodpecker populations (<30 groups), creation of high quality habitat through landscape management is the preferred method for managing larger woodpecker populations. We determined the habitat and landscape factors within 100 m, 400 m, and 800 m of cluster centers that were related to southern flying squirrel use of red-cockaded woodpecker cavities at the Carolina Sandhills National Wildlife Refuge, South Carolina. At all spatial

scales, the number of cavities in the cluster was the most influential variable determining use by southern flying squirrels. At the 400-m and 800-m scales, the amount of stream length was also positively associated with the presence of flying squirrels. The proximity and amount of hardwoods surrounding clusters were not related to southern flying squirrel use at any spatial scale; thus, removal or conversion of hardwood stands surrounding red cockaded woodpeckers may not be necessary for reducing cavity kleptoparasitism by flying squirrels. However, when establishing recruitment clusters, areas with streams should be avoided and addition of artificial cavities to existing clusters should be done judiciously to minimize the number of excess cavities.

Carolina Pygmy Rattlesnake Growth and Age at Reproductive Maturity

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Growth and age at reproductive maturity are life history attributes that play an important role in the development of proper management strategies. The Carolina Pygmy Rattlesnake (*Sistrurus m. miliarius*; CPR) is one of two dwarf rattlesnake species. The subspecies ranges from eastern North Carolina to nearly the southern tip of South Carolina and into the northeastern portion of Georgia. In North Carolina, where the species' status is of Special Concern, fragmentation and land development have destroyed most of its historic range. Carolina Pygmy Rattlesnakes are difficult to study due to their elusive behavior; thus, little is known about their life history. We used mark-recapture data collected over 6 yr from a north-central South Carolina study population to assess CPR growth patterns. We fit growth interval data (total length, TL) to von Bertalanffy and logistic growth models to examine growth (asymptotic size) and estimate age at reproductive maturity. Males and females reached asymptotic size at 46.7 cm (42.3–51.5 cm) and 45 cm (36.4–53.7 cm) and reached maturity in 2.7 yr and 2.4 yr, respectively. These results demonstrate that, similar to its congeners, the CPR exhibits an accelerated life history, especially as compared to other pit vipers. Insight into these aspects of CPR life history is essential for managing populations of this declining species.

Priority Amphibian and Reptile Conservation Areas (PARCAs): The Northern Sandhills of South Carolina

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In the summer of 2013, we conducted herpetological surveys at select areas that we identified as Priority Amphibian and Reptile Conservation Areas (PARCAs). The Carolina Sandhills National Wildlife Refuge was included in the Northern Sandhills PARCA because of its herpetological diversity. Our goals were not only to attempt an updated inventory of the refuge, but also to evaluate the effectiveness of rapid surveys for inventory. Our methods include a mix of 100 meter transects, dipnetting wetlands, road driving, and anecdotal observations. Across the sandhills PARCA, we searched a total of 64 transects and wetlands. In sum, we detected 17 different species across all methods, with 37 observations just at transects or wetlands. Proportion of surveys in which at least one individual was observed was 34%. Of the 34% successful surveys, the average number of unique species observed per transect was 0.77, with 1.68 average observations per successful survey. Species accumulation curves demonstrated that our survey effort was not sufficient to sample a large proportion of the herpetological diversity. Furthermore, a species equitability plot demonstrates that most species were only observed once, which is another sign that more survey effort is needed to inventory the diversity present. Thus, our results demonstrate that, at least for standardized transects

and wetland surveys, number of surveys probably need to be much greater than 64 and ideally at least a few hundred. As a future direction, repeat surveys to assess detectability would be useful as well.

The South Carolina Longleaf Pine Ground-layer Common Garden Study

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The lack of ecologically suitable plant materials for groundcover restoration represents a formidable barrier to achieving range-wide restoration goals for longleaf pine. There is a clear need for developing sources for plant materials that will survive and thrive in the restored setting. In addition to selecting the “right” species for a project, it is also important to consider the source of materials. Botanists, foresters, and geneticists recognize variations within a species. Variation can be associated with the source location and related to adaptations for success in different conditions. A key to selecting suitable plant material lies in understanding the species’ genetics through common garden studies. Our study includes 3 common garden sites, located in separate ecoregions: the Sandhills, Mid-Atlantic Coastal Plain, and South Atlantic Coastal Plain. Seed used to propagate the plants in the study were collected in the wild from 23 locations in North Carolina, South Carolina, and Georgia, including several sites at the Carolina Sandhills National Wildlife Refuge. Our objective is to establish plant material transfer zones that will protect natural genetic diversity and increase the likelihood of successful restoration. We also hope to foster opportunities for private sector vendors to develop economically viable seed production for restoration efforts and other uses.

Patchy Understory Vegetation in the Carolina Sandhills: Effects on Fire Behavior and Wiregrass Seedling Establishment

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Mature longleaf pine stands in the xeric sandhills region have a variable understory vegetation layer, creating several fuel complexes at the within-stand scale (20 m²). The frequent fires typical of the longleaf pine ecosystem in the south-eastern USA are carried by live understory vegetation and pine litter. We identified three fuel complexes found in frequently burned stands on the Carolina Sandhills National Wildlife Refuge. Study plots were dominated by either turkey oak or wiregrass in the understory, or lacked understory vegetation and contained only longleaf pine litter. We used prescribed fire to test whether distinct sets of fire conditions were associated with each fuel complex, and in the next growing season, we seeded and planted wiregrass to test for effects of vegetation structure and below-ground competition on wiregrass seedling establishment. Turkey oak-dominated plots had the highest fuel loads, and during burns they had higher total net heat flux than wiregrass- or longleaf pine litter-dominated plots, and longer burn durations than wiregrass-dominated plots. Our results show that the patchy understory vegetation within longleaf pine stands will create heterogeneous fires, and areas dominated by turkey oak may have increased fire intensity and soil heating compared with the other two fuel complexes. We were unable to identify any difference in wiregrass seedling establishment among the vegetation complexes, but we did find a significant effect of root competition on wiregrass establishment. Excluding competing roots (regardless of vegetation complex) had a positive effect on wiregrass seedling establishment and increased soil moisture at wiregrass planting sites.