Growing a Legacy: A Working Forest for the Long Run





11th Biennial Longleaf Conference November 1-4, 2016 Savannah Marriott Riverfront Savannah, GA





Welcome Longleaf Professionals and Landowners to the 11th Biennial Longleaf Conference!

This Conference is happening because of you. There would be no Conference without the sponsors and partners or without the private landowners, land managers, wildlife biologists, foresters, conservation groups, consultants, university researchers, agency and outreach personnel and staff who share a passion for the restoration of the longleaf pine ecosystem. It takes us all working together to restore this ecosystem and, to host a successful conference.

I am particularly excited about the Welcome Reception and *Longleaf Regenerated* art exhibit, and hope to see you there on Tuesday night. The show will be a celebration of the inspiration each artist draws from the longleaf forest and I know you will enjoy the art and the fellowship of the evening.

Dr. Reed Noss, Provost's Distinguished Research Professor at the University of Central Florida and President of the Florida Institute for Conservation Science will give our keynote address on Wednesday and then we break up to hear 48 experts discussing different aspects of longleaf management and restoration. There is too much to see, so pick carefully. The Poster Reception, sponsored by Dow Agrosciences, will have 27 posters to learn from and talk with the researchers and land managers.

The field trips on Wednesday to South Carolina and Georgia will showcase some beautiful working lands and then back to the hotel for a quick shower and over to the longleaf evening celebration at the Ships of the Sea Maritime Museum (Sponsored by CHEP; A Brambles Company). We might even learn something of longleaf's connection to the sea and the naval stores industry.

On Friday morning, you will be inspired by Lindsay Thomas, Former Congressman from Georgia and landowner and manager of longleaf, and Janisse Ray, writer, naturalist, activist and author of *Ecology of a Cracker Childhood*.

Please visit with the exhibitors and sponsors to learn their connection to longleaf forests and hopefully take home some one-of-a-kind gifts!

You are all making longleaf conservation happen on the ground, every day. Thank you for coming and I hope you enjoy yourself and learn something new.

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Robert Abernethy President, Longleaf Alliance

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Conference Sponsors



Conference Exhibitors

Advantage Forestry Container Pines

American Forests

Attack-One Management Service

Beaver Plastics Ltd.

Blanton's Longleaf Container Nursery

Bodenhamer Farms & Nursery

CHEP

Cox Industries

Dow Chemical

Ernst Conservation Seeds

Hancock

IAWF

International Forest Company

Meeks Farms Nursery

National Bobwhite Conservation Initiative

Pine Garden Baskets

Roundstone Native Seed

South Carolina Association of Certified Foresters

Southern Fire Exchange

Truax Company, Inc.

USDA - Natural Resource Conservation Service

US Fish & Wildlife Service

Whitfield Farms & Nursery

Conference Hotel Floorplans









REGENERATED

A show to celebrate the inspiration of the longleaf ecosystem

Savannah Riverfront Marriott Savannah, GA November 1-4, 2016

The Longleaf Alliance, with support from the US Fish & Wildlife Service, presents "Longleaf Regenerated", the inaugural art exhibit that will run concurrently with the 11th Biennial Longleaf Conference.

Join us for the Opening Night reception on the evening of November 1, 2016 from 6-8pm to kick off the exhibit and the conference.







Featured Artists: Brady Beck Betsy Cain Chris Carr Henry Dean Gayle Fichtinger Marv Graff Philip Juras Taylor Melzer Randy Tate Matt Toole Melanie Walter Matt Zbornik



2016 Conference Agenda

Tuesday, November 1, 2016

11:00am – 7:00pm	Longleaf Partnership Council Meeting – Savannah Ballroom DE		
Noon – 5:00pm	LLA Board Meeting (Invitation only) - Mercer		
4:00pm – 6:00pm	Early Registration Open – Atrium		
3:00pm – 5:00pm	Exhibitor & Poster Set-up & Silent Auction Donations Accepted - Atrium		
5:00 pm – 8:00pm	The Longleaf Alliance Store Open - Atrium		
6:00pm – 8:00pm	Longleaf Regenerated Art Exhibit & Reception – Plaza/Atrium		
8:00pm – 10:00pm	Hospitality Suite Open		
Wednesday, November	<u>2, 2016</u>		
7:30am – 7:00pm	Registration – Atrium		
7:30am – 8:30am	Continental Breakfast - Atrium		
7:30am – 6:00pm	Poster Set-up – Atrium		
7:30am – 8:00pm	The Longleaf Alliance Store Open - Atrium		
OPENING PLENARY S	<u>ESSION – Savannah Ballroom A</u>		
8:30am – 8:35am	Color Guard; Pledge of Allegiance; Moment of Silence		
8:35am – 9:00am	Welcome and Opening Comments:		
	Eddie DeLoach, Mayor of Savannah		
	Robert Abernethy, The Longleaf Alliance		
9:00am – 9:45am	Key Note Address: Reed Noss, University of Central Florida		
	The Antiquity of Fire and Pine Savanna in the Southeastern Coastal Plain, and Why it is Relevant to Restoration and Management		
9:45am - 10:00am	State of the Alliance – Robert Abernethy, The Longleaf Alliance		
10:00am – 10:30am	BREAK		
	Bidding Begins on First Silent Auction		
CONCURRENT SESSIC	<u>NA</u>		
10:30am – 12:00pm	1-A: PARTNERSHIPS: State of America's Longleaf Restoration Initiative (ALRI) - Johnson		
	Session Description: Hear from Longleaf Partnership Council leadership about the status of ALRI and future "Game Changers" to reach our 8 Million Acre Goal		
	Moderator: Kevin McIntyre, JW Jones Ecological Research Center at Ichauway		
	10:30 – 11:00 ALRI Accomplishments and Strategic Priorities and Actions		
	Clay Ware, U.S. Fish and Wildlife Service		
	11:00 – 11:30 State of the Initiative		
	Kyle Jones, Southern Region, U.S. Forest Service		

- 11:30 12:00 Getting to the Goal—Enhancing Opportunities for Restoration and Management of Longleaf Pine
 James M. Guldin, Ph.D., USDA Forest Service, Southern Research Station
- 2-A: INNOVATIVE TOOLS & TECHNIQUES: Outreach & Education Tools Forsyth

Session Description: Learn about the new tools that are available for reaching out to a wider audience

Moderator: Gail Westcott, UGA

- 10:30 11:00 Keep evaluation in the KAB: Tools and Techniques
 Kris M. Irwin, Ph.D., Warnell School of Forestry and Natural Resources, The University of Georgia
- 11:00 11:30 AFF's Landowner Engagement for Conservation Chris Erwin. American Forest Foundation
- 11:30 12:00 Put a Ring on it Get Them Engaged in Prescribed Fire Jennifer Evans Fawcett, North Carolina State University & Cheryl Millett, The Nature Conservancy

3-A: ECOSYSTEM RESTORATION: Fire Management - Franklin

Session Description: General discussions about using fire as a management tool in longleaf forests

Moderator: Randy Tate, The Longleaf Alliance

- 10:30 11:00 Considerations in Burning for Bobwhites
 Reggie Thackston, Tall Timbers Research Station & Land Conservancy
- 11:00 11:30 The Burning Question: Common Objectives for Burning in Longleaf and Tools to Accomplish Objectives

Erick Brown, The Nature Conservancy

- 11:30 12:00 *The Burning Question: Seasonality vs. Frequency* Shan Cammack, Nongame Conservation Section, Georgia DNR
- 4-A: WORKING FORESTS: Innovative Markets Oglethorpe AB

Session Description: Focus on non-traditional consumer markets that are tied to longleaf forests and their products

Moderator: Bobby Franklin, The Longleaf Alliance

- 10:30 11:00 Longleaf Forestry Opportunities in Carbon Markets Hunter Parks, Green Assets, Inc., hunter@green-assets.com
- 11:00 11:30 Protecting Working Forests with Bargain Sale Conservation Easements David Bishop, The Nature Conservancy (SC)
- 11:30 12:00 The Architectural and Design Uses of Reclaimed Wood (heart pine) Jeffrey L. Forbes, The Goodwin Co., Jeffrey@heartpine.com

12:00pm – 1:30pm	Recognition a Speaker: Phi Framed by Log	and Awards Luncheon – Savannah Ballroom A lip Juras goleaf: An Artist's Perspective		
1·30pm - 2:00pm	BREAK	Burg, 2 10 2 11 1 1 1 1 5 1 0 5 prover		
CONCURRENT SES	SION B			
2:00==== 2:20===	1 D. DADTA	IEDCUIDC, Tour Challenge and Opportunities, Johnson		
2:00pm - 3:30pm	Session Desc challenges an increasing co	ription: Discussion of Local Implementation Teams regarding d opportunities they are facing with conservation planning, llaboration, and long-term sustainability of partnerships		
	Moderator:	Moderator: Troy Ettel, The Nature Conservancy		
	2:00 - 2:30	Conservation Plan Prioritization & Mapping in two LITs		
		Brian Pelc, Florida Chapter of The Nature Conservancy & Colette DeGarady, SC Chapter of The Nature Conservancy		
	2:30 - 3:00	NRCS Collaboration with Local Implementation Teams		
		Luther Jones, USDA-NRCS		
	3:00 - 3:30	Long Term Sustainability of LITs		
		Vernon Compton, The Longleaf Alliance &		
		Dan Ryan, The Nature Conservancy North Carolina		
	2-B: INNOV Forsyth	VATIVE TOOLS & TECHNIQUES: Monitoring & Mapping - 1		
	Session Desc can be used t be discussed	ription: How innovative techniques for mapping and monitoring o keep track of your property and assess management practices will		
	Moderator: J	ohn Hogland, US Forest Service		
	2:00 - 2:30	Monitoring and mapping timberland with small $UAVs$		
		Clay Folk, Folk Land Management, Inc.		
	2:30 - 3:00	Longleaf Pine Effort and the Stand Level Database		
		John Gilbert, Solon Dixon Forestry Education Center, School of Forestry and Wildlife Sciences, Auburn University		
	3:00 - 3:30	Utilizing rapid assessment metrics to measure and report out conservation value of open pine stands		
		Rickie White, NatureServe		
	3-B: ECOSY	3-B: ECOSYSTEM RESTORATION: Groundcover - Franklin		
	Session Desc of longleaf fo	Session Description: Session will showcase the unique groundcover component of longleaf forests and some successful restoration examples		
	Moderator: (Craig Iversen, Florida Forest Service		
	2:00 – 2:30	Groundcover Restoration and Management on Private Lands with an Emphasis on Wildlife		
		M. Kyle Marable, Alabama Wildlife Federation		

2:30 – 3:00	Planning and Planting for Success: Methods for Groundcover and Understory Restoration (and bonehead things you just shouldn't do)
	John Seymour, Roundstone Native Seed
3:00 – 3:30	Rarity, Carnivory and Promiscuity: Characterizing Wetland Plant Communities in the Fall Line Sand Hills of West Central Georgia
	Michele Elmore, PhD., The Nature Conservancy &
	Julie Ballenger, PhD., Columbus State University
4-B: WORKI	NG FORESTS: Income/Landowner Benefits – Oglethorpe AB
Session Descr	iption: Focus on significant income opportunities that longleaf offers to landowners, and considerations for management.
Moderator: A	d Platt, The Longleaf Alliance
2:00 - 2:30	Conservation Easements: Preserving Working Landscapes and High Priority Habitats
	Kathleen 'Kat' Nelson, Esq., L.L.M., Georgia-Alabama Land Trust (GALT)
2:30 - 3:00	Overview of the Southern Yellow Pine Timber Markets in the U.S. South
	Richard W. Hall, Forest Investment Associates
3:00 - 3:30	Pine Straw Production and Management in Longleaf Stands
	David Dickens, PhD, University of Georgia, Warnell School of Forestry and Natural Resources

3:30pm – 4:00pm BREAK

CONCURRENT SESSION C

4:00pm - 5:30pm	1-C: PARTN	NERSHIPS: Team Challenges and Opportunities - Johnson
	Session Desc challenges an Longleaf Stev	ription: Discussion of Local Implementation Teams regarding ad opportunities they are facing with landowner outreach, the wardship Fund, and Prescribed Burn Associations
	Moderator: A	Andrew Schock, The Conservation Fund
	4:00 - 4:30	Landowner Outreach Efforts in two LITs (South Carolina Sandhills and East Texas)
		Charles Babb, LIT Coordinator, Sandhills Longleaf Pine Conservation Partnership (SLPCP) & Kent Evans, Coordinator, Texas Longleaf Implementation Team
	4:30 - 5:00	Longleaf Stewardship Fund: Emerging Trends and Priorities for 2017 and Beyond
		Jon Scott, National Fish and Wildlife Foundation
	5:00 - 5:30	NC Sandhills PBA Progress and Lessons Learned
		Jesse Wimberley, Sandhills Area Land Trust

2-C: INNOVATIVE TOOLS & TECHNIQUES: Apps - Forsyth

Session Description: There's an app for that! Mobile applications can be very useful tools for land managers. Learn about some of the latest in this session. Moderator: Anne Rilling, The Longleaf Alliance

	4:00 - 4:30	Mobile Apps for Prescribed Fire
		David R. Godwin, Southern Fire Exchange
	4:30 – 5:00	Taking what you learn in the field back to the office. Apps that can make life easier.
		Margaret Fields, The Nature Conservancy, North Carolina Chapter
	5:00 - 5:30	Mobile Apps for Forest Landowners, Foresters, and Other Natural Resource Professionals
		Roger F Bryant, Genesis Forest Management
	3-C: ECOSY	YSTEM RESTORATION: Wildlife - Franklin
	Session Desc wildlife speci	cription: From quail to gopher tortoises, learn more about the es that call the longleaf forest home
	Moderator:	Chris Jenkins, The Orianne Society
	4:00 - 4:30	Longleaf Ecosystem Management On an Active Army Installation
		Tim Beaty, U.S. Army – Fort Stewart, Georgia
	4:30 - 5:00	Gopher Tortoise Management: Saving a Keystone Species
		Jessica McGuire, Georgia Department of Natural Resources, Wildlife Resources Division, Private Lands Program
	5:00 - 5:30	The Longleaf Pine in Private Recreational Property Management
		Rans Thomas, Creative Land and Wildlife Solutions
	4-C: WORK	ING FORESTS: Passing it on – Oglethorpe AB
	Session Desc restoring and	cription: Panel discussion led by landowners who are actively landowners who are actively maintaining working longleaf forests for the generations to come -
	Moderator:]	Julie Moore, US Fish & Wildlife Service
	4:00 - 4:30	Successfully Managing Ownership Transition
	4:30 - 5:00	Barrett McCall, Larson & McGowin, Inc.
		Conservation Lessons Learned: How to Build a Successful Transition
		Kathleen 'Kat' Nelson, Esq., L.L.M., Georgia-Alabama Land Trust (GALT)
	5:00 - 5:30	Family Panel Discussion
		Dr. Salem Saloom & Lynda G. Beam
6:00pm – 8:00pm	Poster Recep	otion – Atrium
8:00pm	Dinner on Y	our Own
8:00pm – 10:00pm	LIT Coordin	ators Meeting - Johnson
8:00pm – 10:00pm	Hospitality S	uite Open

Thursday, November 3, 2016

7:00am – 8:00am	Registration Desk Open – Atrium
6:30am – 7:00am	Coffee and Bagged Breakfast Available - Atrium
FIELD TOUR	
7:00am	Load buses – Marriott Parking Lot
7:30am	Buses Depart- Water will be provided on buses throughout the day.
7:30am – 5:00pm Approximately 4:30pm	2 Concurrent Tours. Buses Return to Marriott
1:00pm – 6:00pm 5:30pm – 9:30pm 6:00pm – 9:30pm	Prescribed Fire Coalition Board Meeting – Chatham Shuttle Buses Provide Transportation To & From Party Party – Ships of the Sea Maritime Museum Dinner, Fellowship, & Silent Auction

Friday, November 4, 2014

7:30am – 12:00pm	Registration Desk Open – Atrium		
7:30am – 12:30pm	The Longleaf Alliance Store Open – Atrium		
BREAKFAST PLENARY	<u>SESSION</u> Savannah Ballroom A		
7:00am - 8:30am	Breakfast Served – Pre-Function A		
8:15am – 8:45am	The Forest with A Story		
	Lindsay Thomas - Landowner & Former Congressman		
8:45am – 9:20am	A Field Guide to Hope		
	Janisse Ray – Writer, Naturalist, & Activist		
9:20am – 9:30am	Conference Wrap-up		
	Robert Abernethy, The Longleaf Alliance		
9:30am – 10:00am	BREAK		
CONCURRENT SESSIC	N D		

1-D: PARTNERSHIPS: Prescribed Fire Partnerships - Johnson		
Session Description: Hear about what Rx Fire Councils across the country and locally in the Southeast are tackling and how partnerships are increasing Rx Fire capacity with innovative training programs, resource sharing MOUs, and Interagency Rx Fire Teams		
Moderator: David Godwin, Southern Fire Exchange		
10:00 – 10:30 Impacts of the Prescribed Fire Councils		
Jeremy Bailey, Chair Coalition of Prescribed Fire Councils		
10:30 – 11:00 Expanding Prescribed Fire Capacity Through Partnerships		
Jennifer Evans Fawcett, Department of Forestry and Environmental Resources, Extension Forestry North Carolina State University		
	 1-D: PARTNERSHIPS: Prescribed Fire Partnerships - Johnson Session Description: Hear about what Rx Fire Councils across the country an locally in the Southeast are tackling and how partnerships are increasing Rx Fi capacity with innovative training programs, resource sharing MOUs, and Interagency Rx Fire Teams Moderator: David Godwin, Southern Fire Exchange 10:00 – 10:30 <i>Impacts of the Prescribed Fire Councils</i> Jeremy Bailey, Chair Coalition of Prescribed Fire Councils 10:30 – 11:00 <i>Expanding Prescribed Fire Capacity Through Partnerships</i> Jennifer Evans Fawcett, Department of Forestry and Environmental Resources, Extension Forestry North Carolina State University 	

- 11:00 11:30 Longleaf Implementation Teams & Prescribed Fire Partnerships Randy Tate, Fort Stewart/Altamaha Longleaf Partnership, The Longleaf Alliance
- 2-D: INNOVATIVE TOOLS & TECHNIQUES: Communication Tools -Forsyth

Session Description: Learn about new ways of connecting with your audience and building support of the longleaf restoration mission

Moderator: LuAnn Craighton, The Nature Conservancy

- 10:00 10:30 Effective Landowner Engagement from Outreach to Outcomes
 Lindsay White, Sustaining Family Forests Initiative at the Yale
 School of Forestry & Environmental Studies
- 10:30 11:00 The Language of Conservation Brian Wills, The Nature Conservancy
- 11:00 11:30 *Mobile Phone Conservation Photography* Brady Beck, Brady Beck Photography
- 3-D: ECOSYSTEM RESTORATION: Longleaf Conversion Franklin

Session Description: Experiences will be shared on converting appropriate sites to longleaf

Moderator: Ryan Mitchell, The Longleaf Alliance

10:00 – 10:30 Use of Underplanting to Convert Loblolly Pine Plantation into Longleaf Pine Ecosystem

Joan Walker, US Forest Service

- 10:30 11:00 Using Herbicides Creatively to Restore the Longleaf Pine Ecosystem Nathan Klaus, Georgia Department of Natural Resources, Nongame Conservation Section
- 11:00 11:30 Herbaceous Weed Control to Establish Longleaf Stands
 David Dickens, PhD, University of Georgia, Warnell School of Forestry & Natural Resources
- 4-D: WORKING FORESTS: Landowner Technical Assistance Meet and Greet Oglethorpe AB

Session Description: Private landowners and all land managers are invited to join local natural resource experts from around the range of longleaf for a meet and greet session WHERE YOU CAN SEEK ANSWERS TO YOUR LAND MANAGEMENT QUESTIONS. Longleaf Alliance staff, private consultants, state forestry commissions, and the Natural Resources Conservation Service will be available to discuss and help with individual management issues.

Moderator: Bobby Franklin, The Longleaf Alliance

	5-D: Longleaf Mapping Project – Savannah Ballroom B
	Session Description: In this workshop, we will give a broad overview of the differing aspect of the "Cost- Effective Mapping of Longleaf Extent and Condition using NAIP Imagery and FIA Data: A Pilot Project in the Heart of the Longleaf". Join us as we discuss the results of this mapping effort, field protocols, new spatial tools, how to use the outputs to help in restoration planning and monitoring, and future recommendations.
	Session Leaders:
	Jason Drake, Forest Ecologist, USDA Forest Service, National Forests in Florida
	John Hogland, USDA Forest Service, Rocky Mountain Research Station
	Amy Knight, Florida Natural Areas Inventory, Florida State University
	Joseph St. Peter, University of Montana
11:30am	Conference Concludes. Have a safe trip home!
1:00pm – 3:00pm	Post Conference Workshop – Longleaf Mapping Project – Savannah Ballroom B
12:30pm – 5:00pm	Post Conference Meeting – Southeastern Prescribed Fire Councils – Savannah Ballroom D
5:00pm – 6:00pm	Southeastern Prescribed Fire Councils Reception – Prefunction Blue

2016 Regional Longleaf Award Recipients

Congratulations to the 2016 Regional Longleaf Award Recipients! These individuals and organizations make daily contributions and show unwavering dedication to furthering the cause of longleaf restoration across the southeastern United States.

Individual Awards & Award Recipients

The Bill Boyer Natural Resource Professional of the Year Award: recognizes a natural resource professional who has made outstanding contributions within the field of longleaf ecosystem conservation

Jerre Creighton, Virginia Department of Forestry

The Palustris Corporate Achievement Award: recognizes a corporation with long-standing commitment toward conservation of the longleaf ecosystem

F. Bennett Whitfield, Whitfield Farms & Nursery of Twin City, GA

The Gjerstad/Johnson Landowner of the Year Award: recognizes a private landowner for ensuring the future of the longleaf ecosystem on private land

Reese Thompson of Vidalia, GA

A True Longleaf Champion Award: recognizes a lifetime of dedication to the conservation and restoration of the South's iconic forest

Tim Beaty, DPW, Environmental Division, Fish and Wildlife Branch, Fort Stewart

Hervey McIver, The Nature Conservancy

Conservation Partner Awards & Award Recipients

Natural Resource Conservation Service Team Achievement Award: recognizes an NRCS team who has gone above-and-beyond the call of duty in delivering longleaf restoration for private landowners

NRCS Louisiana Team

Department of Defense Team Achievement Award: recognizes a DOD team who has gone above-andbeyond the call of duty in managing and restoring the longleaf ecosystem on Military Installations

Eglin Air Force Base, Natural Resource Team

US Fish and Wildlife Service Team Achievement Award: recognizes a USFWS team who has gone above-and-beyond the call of duty in managing and restoring the longleaf ecosystem for wildlife and the National Wildlife Refuge System

Carolina Sandhills National Wildlife Refuge

USDA Forest Service Team Achievement Award: recognizes a USDA FS team who has gone aboveand-beyond the call of duty in managing and restoring the longleaf ecosystem on and around the National Forest System

Vernon Unit, Calcasieu Ranger District, Kisatchie National Forest

Presenter Bios

Nell Allen. Nell has been working at the North Carolina Zoo since 2007, first as the Rare Plant Curator, then since January 2015, as the Associate Curator of Conservation and Research for regional programs. A large part of her job is acquiring, managing and preserving Zoo natural areas for native plants and animals. She conducts botanical work in the areas surrounding the Zoo, including Natural Heritage Program site surveys, monitoring rare and endangered native plant populations and improving habitat for rare plants. Her job now also covers the Zoo's research and conservation for animals in North Carolina. In this role she coordinates animal projects like hellbender research in the North Carolina mountains and wildlife camera research on Zoo grounds.

Nell has a BS in Biology (Environmental concentration) from University of North Carolina at Pembroke (2003) and a Master's of Natural Resources (Restoration Ecology technical option) with a Botany minor, from North Carolina State University (2007). While at NC State, her research focused on the creation and restoration of Piedmont prairies. Before working at the Zoo, she spent eight years in land conservation, as administrator for the Sandhills Area Land Trust, based in Southern Pines, NC. Nell is particularly interested in restoring fire-dependent ecosystems in the Piedmont (i.e. she is a fire bug) and in creating and preserving corridors and linkages to facilitate plant and animal dispersal across a fragmented landscape.

Lyne Askins. For the past ten years, Lyne has served as the Refuge Manager for the Carolina Sandhills National Wildlife Refuge, a 45,000-acre landscape dominated by the longleaf pine ecosystem and home to the U.S. Fish and Wildlife Service's (USFWS) largest population of red-cockaded woodpeckers. In prior positions, Lyne served as a refuge manager at the Savannah Coastal Refuges Complex, GA; Bon Secour National Wildlife Refuge, AL; and Lower Suwannee and Cedar Keys National Wildlife refuges, FL. Prior to joining the USFWS, Lyne was a biologist with the SC Department of Natural Resources. Her professional interests are longleaf pine restoration and management, prescribed fire advocacy, and natural resources leadership development. She is President of the SC Chapter of The Wildlife Society and the immediate past chair of the Sandhills Longleaf Pine Conservation Partnership, the Local Implementation Team for the Rangewide Conservation Plan for Longleaf Pine. Lyne is originally from Charleston, S.C. and received a B.A. from Furman University and a M.S. in Forest Resources from Clemson University.

Charles Babb. After nearly 36 years with the USDA-NRCS (Chesterfield County, SC), Charles Babb retired for one day before moving to a new desk to take the helm of the Sandhills Longleaf Pine Conservation Partnership (SLPCP). As the SLPCP coordinator, Babb is responsible for herding the SLPCP partners, while overseeing the administration of current grants paperwork. Charles works closely with the Chesterfield USDA-NRCS and the Soil and Water Conservation District to advance the restoration and management of longleaf on private lands in the SLPCP Focus Area. His past experience leaves few roads untraveled, and fewer fields unfamiliar. Babb can't be found at his desk during the rut, turkey season, or during televised Clemson football games.

Jeremy Bailey. Jeremy is the Current Chairperson for the Coalition of Prescribed Fire Councils, as well as serving on the steering committees for both the New Mexico and Northern California Prescribed Fire Councils. Jeremy has also been working to help the development of councils in Iowa, Minnesota, Nebraska, Nevada, Oregon and Washington. A career firefighter who has focused his efforts on promoting the use of beneficial fire and helping create enabling conditions for private and government burners- Jeremy has developed and leads an initiative called Training Exchanges which promotes an 'all hands-all lands' approach to prescribed fire.

Julie Ballenger. Julie is the Department Chair of Biology at Columbus State University where she teaches botany, plant taxonomy, evolution and a variety of ecology based study abroad courses. Julie is from Pella Iowa where she obtained her BA in Biology from Central College followed by an MS in Biology from Fort Hays State University where her research focus was Paleo botany. In 1992 she completed a PhD from Miami University with a dissertation on molecular and morphological speciation in the legumes. She continued her work on legume evolution as a postdoctoral research scientist at Cornell University in Ithaca New York. In

1995 she migrated south to Columbus GA and began her teaching career and plant research partnership with The Nature Conservancy with Michele Elmore.

Lynda Beam. Lynda is a forest landowner in South Georgia and was named, along with her husband Kirby, as the National Tree Farmers of the Year in 1994. She and Kirby owned and managed "Too Hollie Farm", located near Statesboro, GA, and Lynda has continued the exemplary stewardship of that forest land and remains involved in natural resource issues in Georgia and the region since Kirby's death in 2004. She was a Co-Founder of the Savannah Tree Foundation and is a Director Emeritus of that organization. Lynda is a longtime supporter of the Alliance and was the keynote speaker at our inaugural Biennial Regional Conference in 2006 in Mobile, AL. Her love of family and passion for passing the land and the stewardship of it on to her children and grandchildren is what has propelled her efforts all of these years.

Tim Beaty. Tim is a graduate of Abraham Baldwin Agriculture College and Georgia Southern College (now University). He began his conservation career as a forest technician at Fort Stewart in 1977, mostly marking timber for stand improvement thinnings and carrying a drip torch. In 1980 he moved to Fort Stewart's Fish and Wildlife Branch (FWB) and became involved with red-cockaded woodpeckers and other endangered species. Since 2005, Tim has served as Chief of the FWB, and he also manages the installation's Army Compatible Use Buffer (ACUB) program, working with neighboring private landowners to encourage them to keep their lands in conservation use. His involvement with managing natural resources on a landscape where conservation is not always the top priority, and his interaction with private landowners and other conservation organizations like the Longleaf Alliance have made Tim a great believer in the value of partnership and cooperation to achieve important conservation goals. Tim and his wife Carol have 2 children and 2 grandchildren, and they live in Sunbury, GA with their 2 dogs.

Brady Beck. Brady was born in West Lafayette, Indiana. He moved with his family to Raleigh, NC in 1986, and earned a B.S. in Wildlife Science from North Carolina State University in 1992. Since then he has worked as a biologist for several conservation groups in the Sandhills region of North Carolina and currently works as a land manager and Wildlife Biologist studying red-cockaded woodpeckers. Brady's photography interests grew out of a desire to capture on film the unique habitats and animals he saw throughout his daily field work. He is passionate about conserving the remaining longleaf pine ecosystem in the Sandhills, as well as educating others about the beauty and diversity of plant and animal life that rely on a healthy ecosystem. Visit his website at www.bradybeckphotography.com.

Seth Bigelow, PhD. Dr. Bigelow is a staff scientist at the Joseph W. Jones Ecological Research Center at Ichauway. He studies the use of fire and forestry to manage longleaf pine ecosystems. He uses spatial approaches to analyze and predict how silvicultural manipulations of longleaf pines and oaks affect fire intensity, understory openness and patchiness, and ecosystem response to climatic change. His research draws upon the disciplines of traditional silviculture, biodiversity and ecosystem function, maximum likelihood modeling, environmental physics, and resilience theory. His outreach activities engage natural resource managers in learning principles of ecological forestry.

David Bishop. David is the Project Director for the ACE Basin and South Lowcountry in South Carolina. David works with landowners and partners to protect great places, wildlife habitat, clean water, and working forests throughout the lowcountry. Prior to joining The Nature Conservancy, David was the regional invasive species biologist for the Northeast region of the U.S. Fish and Wildlife Service. He previously worked as the watershed program manager at Fort Carson, Colorado (Army) as well as the natural resources manager at Spring Island, South Carolina. David has a PhD in Wildlife Biology from Virginia Tech. David lives on his small family farm in Bamberg County with his wife and two daughters.

Erick Brown. Erick attended the University of Illinois studying forestry and earning a BS in Natural Resources and Environmental Sciences. Erick focused his studies on habitat management for rare species and began working with fire while in college restoring tall grass prairie habitat. He started his career with the Nature Conservancy in California working on fire management in the central valley and came to Georgia in the summer of 2001. Erick has been working as Land Steward for TNC in Georgia since and has been burning with a wide variety of Interagency Burn Team partners and private landowners across the southeast.

Roger Bryant. Roger is a Software Engineer and Consulting Forester from Smyrna, GA. He is currently the Manager of Productions Systems at REACH Health Inc., a Telemedicine software company, and owns Genesis Forest Management. Prior to joining REACH, Roger was a Lead Software Engineer for CareerBuilder.com. Roger has a Master's Degree in Computer Science from Southern Polytechnic State University and has a Bachelor of Science in Forestry from the Warnell School of Forestry and Natural Resources at the University of Georgia. Roger, a self-proclaimed gadget guy, enjoys blogging at ForestGeek.com, a blog focusing on forestry and technology news, product and service reviews, tips & tricks of the trade, and random musings with a forestry spin. Roger is a Registered Forester and has 20 years of experience in forest research, timber procurement, and land management.

Shan Cammack. Shan is a natural resource biologist and serves as the Fire Management Officer for the Nongame Conservation Section of the Georgia DNR, where she has worked for almost 20 years. With an intriguing background of a BA in English from a small liberal arts school and an MS in Botany from the University of Georgia, Shan moved to Georgia seeking new adventures. She found that in managing longleaf pine. She enjoys helping manage remarkable longleaf habitats across the state. Shan's focus is restoring rare species habitat through prescribed burning and she specializes in training ecoburners, a unique kind of wildland firelighter. Shan works closely with the Interagency Burn Team to achieve these conservation goals.

Boyd Christenberry. Boyd is the Southern Region Associate for the American Forest Foundation and oversees all of the projects for AFF between North Carolina and Texas. Before AFF, Boyd worked with landowners in Alabama through the Alabama TREASURE Forest Association and the Alabama Farmer's Federation. He holds a degree in Agricultural Economics and Business from Auburn University.

Vernon Compton. Vernon works for The Longleaf Alliance as Project Director of the Gulf Coastal Plain Ecosystem Partnership (GCPEP) is a voluntary public/private landowner partnership formed in 1996 that now sustains over 1,250,000 acres of diverse habitat within the longleaf pine range. The fifteen partners are the Department of Defense (Naval Air Station Pensacola and Whiting Field and Eglin Air Force Base), the Florida Department of Environmental Protection, the Florida Forest Service, the Florida Fish & Wildlife Conservation Commission, Gulf Power, The Longleaf Alliance, the National Park Service, the Northwest Florida Water Management District, National Forests in Alabama, The Nature Conservancy, Nokuse Plantation, Westervelt Ecological Services, Resource Management Service, Escambia County, FL, and the National Wild Turkey Federation. The partnership allows the partners to combine their expertise and resources to more effectively manage their individual properties and to meet the challenges of sustaining the larger longleaf pine ecosystem. Vernon has a Bachelor of Science in Forest Management from LSU and prior to joining The Longleaf Alliance worked for the Florida Chapter of The Nature Conservancy and the Florida Forest Service at Blackwater River State Forest. He has served as Project Director of GCPEP since 1998.

Phil Coppola. Phil is originally from the Pacific Northwest, graduating from Western Washington University. His Masters research focused on assessing food availability for snail kites in the Everglades. He also helped create a collaborative wintering waterfowl survey in Pensacola, FL. For his PhD he is studying the influence of forest management in the New Jersey Pine Barrens on bird populations, focusing on northern bobwhite translocation and songbird occupancy modelling.

LuAnn Craighton. LuAnn is Outreach Director for the Chattahoochee Fall Line Conservation Partnership. Her work focuses on presenting a diverse selection of programs encouraging stakeholders to actively conserve, restore and manage longleaf pine.

Jerre Creighton. Jerre has been the Forest Research Program Manager for the Virginia Department of Forestry in Charlottesville, VA since January of 2005. He conducts research and demonstration relating to tree establishment and growth across the state, including topics such as restoration of American chestnut, longleaf pine, and other diminished species; forecasting growth and yield of pine plantations; forest fertilization using either traditional fertilizers or biosolids; planting designs to maximize production of different forest products; biomass energy production; tree genetics; and best practices for regenerating hardwood stand of various species mixes. Prior to moving to Charlottesville, he was Manager of Silvicultural Best Practices for International

Paper in Savannah, GA and before that he served as Forest Health Program Manager for Champion International in Pensacola, FL. He was also Research Station Leader in Appomattox, VA and Research Forester in Rupert, WV - both for Westvaco (now WestRock). He received a B.S. in Forest Science from Penn State and a M.S. in Forestry from the University of Kentucky, followed by three years as a Research Associate at Auburn University with the Silvicultural Herbicide Research Cooperative.

Colette DeGarady. Colette is the Assistant Director of Science and Stewardship with the SC Chapter of The Nature Conservancy where she has worked for the past 12 years. She graduated from Clemson University with a BS in wildlife biology and holds a Master's degree from Southern Illinois University in Zoology. 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 has coordinated the Sewee Longleaf Conservation Cooperative (SLCC) longleaf implementation team located on the coast of South Carolina since 2012. The SLCC works with private and public land managers to restore longleaf pine.

John Diaz. John is an Assistant Professor and Extension Specialist at the University of Florida. His work in Longleaf focuses on increasing the collaborative capacity for the implementation of prescribed fire treatments at a landscape level. He has collaborated with such groups as the Southeast Regional Partnership for Planning and Sustainability, the Southeast Cohesive Strategy Committee, and the North Carolina Sentinel Landscape Partnership to evaluate regional approaches towards conservation in addition to working with landowners in priority areas for longleaf.

David Dickens, PhD. Dr. Dickens is a forest productivity professor with UGA Warnell School. He worked as a faculty member with UGA since 1999 and at Clemson University since 1988. He received a BA @ Furman Univ., a Forestry BS @ UGA, and a MS and PhD in Forestry @ Clemson Univ. His area of expertise is soils/site & species selection, fertilization, herbicides, economics, and water quality. He has written over 150 forest productivity articles and currently has 30 applied research & demonstration study areas in Georgia and South Carolina.

Jason Drake. Jason is a forest ecologist with the USDA Forest Service, National Forests in Florida where he manages the forest's botany and ecology programs. Since joining the NFs in Florida ecosystem management staff in 2006, Jason has helped develop geospatial tools to map the current ecological conditions of the forest and to prioritize treatments such as prescribed fire, mechanical fuels reduction and timber thinning. He has also helped to analyze habitat quality for federally listed threatened and endangered species including Harper's beauty, Florida skullcap, Florida scrub jays and red-cockaded woodpeckers. Prior to joining the Forest Service his research focused on applications of remote sensing and GIS for forestry and ecological applications.

Michele Elmore. Michele is the Director for The Nature Conservancy's Chattahoochee Fall Line Project in Georgia. Her primary duties include project oversight, coordination of the Chattahoochee Fall Line Conservation Partnership, implementation and technical support for ecological research, monitoring and conservation planning in the Fall Line region. Michele's passion for botany, plant cultivation and the environment led her to purse a BS degree in Environmental Horticulture and Soil and Water Science from the University of Arkansas. After holding field technician jobs with the National Park Service and the Nature Conservancy, she furthered her academic work earning a PhD in Forest Ecology from Auburn University. Michele's love for southeastern ecosystems especially longleaf pine and the Fall Line region steered her toward her current role with the Conservancy where she has served since 2007.

Chris Erwin. Chris is a veteran of the U.S. Air Force, with a B.S. in Biology from Troy University and a Masters of Forestry from Auburn University. He is a registered forester in the State of Alabama and a member of the Society of American Foresters. Chris has fifteen years of experience working in forest conservation, certification, professional development for foresters and loggers, and public environmental education. He works for the American Forest Foundation as the Director of Woodland Conservation for the South. He lives near Montgomery, Alabama with his wife Melanee and four children.

Kent Evans. Kent was raised in Texas, mostly on small ranches near McKinney, Weatherford and Stephenville. He earned BS and MS degrees from Texas A&M University in Wildlife/Fisheries Science and Range Science (Remote Sensing).

Kent started federal service as a Range Conservationist with the BLM, Roswell New Mexico with oversight of oil and gas development and in restoring the grasslands of eastern New Mexico. He transferred to the US Forest Service and worked in north Texas on the LBJ National Grasslands and in east Texas on the Sabine National Forest. He worked in the southern Appalachians for 17 years on the Chattahoochee National Forest and the Cherokee National Forest. He served 5 years as the District Ranger of the Talladega Ranger District in the mountains of eastern Alabama. His last duty was serving for the National Forests and Grasslands in Texas as the Timber and Fire Staff Officer.

Kent is currently under contract to Texas A&M Forest Service and serves as Coordinator, Texas Longleaf Implementation Team. This public/private initiative is focused on restoring the native Longleaf Pine / Fire Ecosystem to southeast Texas.

Jennifer Evans Fawcett. Jennifer is an Extension Associate in the Department of Forestry and Environmental Resources, Extension Forestry at North Carolina State University. Her primary responsibilities are to coordinate the Southeast Regional Partnership for Planning and Sustainability (SERPPAS) Prescribed Fire Work Group and to assist in implementing the actions within the SERPPAS "Comprehensive Strategy for Prescribed Fire." Prior to her current role, Jennifer provided data collection and management for a Department of Defense Strategic Environmental Research and Development Program longleaf pine restoration research project with the U.S. Forest Service, and worked at an environmental consulting firm in Southwest Florida. Jennifer received her B.S. degree in Animal Science from the University of Delaware and her M.S. degree in Forest Resources from Clemson University. She is a lifetime member of the North Carolina Prescribed Fire Council and an Advisory Board member for the Southern Fire Exchange.

Margaret Fields. Margaret has most recently worked on a spatial analysis of longleaf pine core habitats in North Carolina, helping inform protection priorities for The Nature Conservancy. She has also worked with the Southern Blue Ridge Fire Learning Network, analyzing fire-adapted natural communities and burn unit priorities of agencies in the network. She also works on invasive species issues across the state and occasionally manages to get out and burn the woods.

Clay Folk. Clay attended Horry-Georgetown Technical college then Clemson University for forestry. After active duty with the Marine Corps and then some time doing hiking trail maintenance in western states; he joined the family wildlife and forestry consulting business. Clay handles timber sales, marking, and inventorying; prescribed burning; collection of UAV imagery/video and post-processing; reforestation; and GIS. Folk Land Management also does wetland permitting, wildlife and wetland management.

Jeffrey L. Forbes. Jeffrey brings a wide range of experience and expertise to the Goodwin team. Jeffrey holds a B.A. in Anthropology from the College of William and Mary. Prior to joining Goodwin, Jeffrey spent 18 years in the roof truss industry. He has quite an affinity for distinct styling and unique architecture, admiring the work of esteemed architects, including his favorite, A. Hays Town. Jeffrey considers himself an avid student of all southern culture, literature, flora, fauna, architecture and history, and, most especially, food! Jeffrey is also an accomplished musician. He sings and plays guitar, dulcimer, mandolin and banjo. Jeffrey is a member of the Sweetwater Shapenote Singers. Jeffrey enjoys reading books by his favorite authors (William Faulkner, Thomas Wolfe, Marjorie Kinnan Rawlings and C.S. Lewis), traveling abroad (Germany, Denmark, Switzerland, Norway, France and Italy) and spending time with his lovely wife, Megan.

John Gilbert. John is the Assistant Director of the Solon Dixon Forestry Education Center in the Auburn University School of Forestry and Wildlife Sciences (SFWS). For 7 years, he worked in the SFWS as a Research Associate on numerous projects and as an instructor of GIS/GPS applications courses and various continuing education short courses. His major areas of interest are applied forest management, stand dynamics, longleaf pine conservation and restoration, GPS/GIS applications, and database development. 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 Auburn University.

Robert Gitzen PhD. Robert is an assistant professor in the School of Forestry and Wildlife at Auburn University. He has a B.S. in Fisheries and Wildlife from the University of Minnesota and M.S. and Ph.D. degrees in Wildlife Science from the University of Minnesota. He currently works with Auburn graduate students in several research projects relevant to longleaf pine ecosystems, including projects on southeastern pocket gophers, landscape ecology of gopher tortoise habitat, and responses by fire ant populations to habitat restoration efforts.

David Godwin. David has been the Program Coordinator for the Southern Fire Exchange, the regional branch of the Joint Fire Science Program Fire Science Exchange Network since 2013. Trained as a fire ecologist, he develops and leads wildland fire science outreach and communication programs that have connected with thousands of land managers across the Southeast. He has a B.S. from Florida State University and a M.S. and Ph.D. from the University of Florida. A native Floridian, he lives in Tallahassee with his family.

James M. Guldin. Jim is a Supervisory Research Ecologist and Project Leader for two of the southern pine research work units in the Southern Research Station: SRS-4158, Restoration and Management of Longleaf Pine, and SRS-4159, Ecology and Management of Southern Pines. Between the units, Guldin supervises 10 scientists and 20 professional and technical support staff in 9 subunit locations across the South. Jim describes himself as an "alleged" expert in silvicultural practices for managing naturally-regenerated southern pine stands, in the theory and application of uneven-aged silvicultural systems in southern pines, and in silvicultural approaches to restoration of southern pines--especially shortleaf pine in the Ouachita and Ozark Mountains, and longleaf pine on the lower Gulf Coastal Plain. He's a member of the Southern Station's "Century Triple-Triple" club—having provided more than 100 presentations, published more than 100 research papers, and led more than 100 field tours and workshops in his fields of interest to regional, national, and international audiences. He's an active member of the D2 Silviculture Working Group of the Society of American Foresters, the IUFRO 1.05.00 Uneven-aged Silviculture Working Group, the Science Advisory Council for the Pioneer Forest and L-A-D Foundation in the Missouri Ozarks, the ad hoc USFS Experimental Forests and Ranges Working Group, and the Longleaf Partnership Council for the America's Longleaf Restoration Initiative.

Richard Hall. As a Portfolio Manager for Forest Investment Associates, Richard Hall is responsible for strategic management of several client timberland portfolios. Prior to assuming his current position in 2013, Richard worked for Bank of America's U.S. Trust Private Wealth Management division for 8 years where he held a number of positions, including Southeast Regional Forest Manager and Acquisitions Manager. In addition to his experience at U.S. Trust, Richard also lived and worked in southern Brazil as a contractor for Farm and Forestry Management Services and served as business development manager for Forest Technology Group where he worked with a range of timberland investment managers to develop and implement various information systems. Richard also serves as an affiliate professor at Auburn University's School of Forestry and Wildlife Sciences.

Richard holds a B.S. in Forestry from Auburn University (cum laude / Honors program), and a J.D. / M.B.A. from the University of Alabama. He is a registered forester, a licensed attorney and a member of the Society of American Foresters.

Patricia Hartman. Patricia is a Reference Librarian and Liaison to Biological Sciences, Forestry, and Wildlife at Auburn University. Prior to becoming a librarian, she worked in the wildlife field and received her M.S. in Forestry & Wildlife at the University of Kentucky, where she studied habitat selection of a threatened forest songbird. She originally hails from Tallahassee and is excited to be working on a project that takes her back to her roots in the longleaf community.

John Hogland. John is a Biological Scientist with the US Forest Service, Rocky Mountain Research Station, in Missoula, Montana. As a Biological Scientist his research focuses on quantifying forest characteristics across broad landscapes at fine grained resolutions, developing new methodologies and applications that integrate machine learning and statistics modeling concepts into geographic information systems (GIS), and the creation of new data processing techniques to facilitate using large datasets.

Jean Huffman. Jean is a fire ecology researcher and land manager. She is currently focused on fire history research, establishing the Tall Timbers Research Station Southeastern Coastal Plain Tree-Ring Lab, highlighting

the importance of Florida's last old pines (and stumps!), and promoting the preservation and best management of Florida natural areas. In addition, she is working with a group studying fungi and fire in southeastern pine savannas. She has completed tree ring-based fire histories of two sites in the Panhandle and one in central Florida, and is currently working on several additional sites. For decades she has also worked with on-theground fire and land management in Florida, most recently as the manager of the St. Joseph Bay State Buffer Preserve, and previously as biologist at Myakka River State Park.

Kris M. Irwin, Ph.D. Dr. Irwin is a Senior Public Service faculty member at the Daniel B. Warnell School of Forestry & Natural Resources at the University of Georgia. Dr. Irwin has a diversity of experience in the areas of environmental education, outreach, and instructional design. He is a co-founder of the Advanced Training for Environmental Education in Georgia (ATEEG) Program, which is the first state environmental education certification program in the nation to receive accreditation from the North American Association for Environmental Education. Kris serves as the co-chair of the ATEEG Certification Advisory Board and teaches the required "Assessment and Evaluation" course. He has worked with individuals and organizations to create survey instruments that evaluate stakeholder needs, knowledge, attitudes, and behaviors. Clients include Athens-Clark County Water Conservation Program, Environmental Educator in 2002. Dr. Irwin teaches undergraduate and graduate courses at the Warnell School, and directs graduate students. He is co-author of, Science of Forestry Management (AAVIM, 2005), and this textbook is recognized as a primary reference for the national agricultural education forestry curriculum.

Kyle Jones. For the previous 17 years, Kyle has worked for the U.S. Forest Service in a variety programs advancing and protecting the longleaf pine ecosystem. He is currently serving as the Regional Longleaf Pine Restoration Coordinator for the Southern Region. He has a BS Degree in Real Estate and Finance from Florida State University and a Graduate Certificate in Natural Resource Management from Virginia Tech. Prior to joining the Forest Service, he worked for the Florida Department of Environmental Protection and The Nature Conservancy where he worked extensively with public and private entities on conservation and land protection within the longleaf range. He and his wife, Susan, live near the Apalachicola National Forest and have a 13-year old daughter and 7-year old son – both of which have a passion for the outdoors, especially hunting and fishing.

Luther Jones. Luther is a Natural Resources Specialist on the Landscape Conservation Initiatives Team with the Natural Resources Conservation Service (NRCS) located in Washington, D.C. He currently serves as lead coordinator for the Longleaf Pine Initiative and the Joint Chiefs' Landscape Restoration Partnership. He also serves on the USDA StrikeForce Initiative Team. Previously, Jones worked as State Public Affairs Specialist with Georgia NRCS and served as Georgia's USDA StrikeForce Lead Coordinator.

Jones started his career with the NRCS in 1980 and has held the positions of Soil Conservationist, District Conservationist, and Resource Conservation & Development (RC&D) Coordinator. Jones holds a B.S. degree in Agriculture from Fort Valley State University and received a M.S. in Agricultural Economics from the University of Illinois.

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.

Amy Knight. Amy is the GIS Program Specialist at Florida Natural Areas Inventory. One of her primary roles is conducting GIS analyses to inform a variety of state and regional conservation planning efforts, including development of decision support tools for Florida's environmental land acquisition program. She has been the FNAI lead on the Longleaf Pine Ecosystem Geodatabase, a joint project with Florida Forest Service to map the distribution and condition of longleaf in Florida. She also has expertise in species distribution modeling, reserve design analysis, and land cover mapping. Amy has a Master's degree in Zoology from the University of Florida.

Jim Landmeyer. Jim has been a research hydrologist with the U.S. Geological Survey, South Carolina Water Science Center, in Columbia, SC, since 1990. Landmeyer received his B.S. from Allegheny College in 1989, and his M.S. and Ph.D. from the University of South Carolina in 1991 and 1995, respectively. He has been the author or co-author of more than 90 peer-reviewed publications, and in 2011 authored the textbook "Introduction to Phytoremediation of Contaminated Groundwater". His research interests include the interaction between plants, microbes, and pristine and contaminated groundwater and surface-water systems.

Kyle Marable. Kyle received a B.S. in Wildlife Sciences from Auburn University and a M.S. in Wildlife and Fisheries Science from Mississippi State University. Between undergraduate and graduate schools, he facilitated the establishment of upland quail habitat as part of a Habitat Improvement Team in western Kentucky. Kyle's graduate research focused on movement, cause-specific mortality, and resource selection in Eastern wild turkeys. His passion for ecosystem establishment, restoration, and management led him to join the Alabama Wildlife Federation as a Resource Stewardship Biologist. He leads AWF's Longleaf Ecosystem Restoration Project and assists private landowners by providing research based, sustainable habitat management recommendations. When not working, Kyle enjoys hiking, fishing, hunting, and just spending time outdoors with his wife and son.

Barrett B. McCall. Barrett is President of Larson & McGowin, LLC. A native of New Orleans, McCall earned an undergraduate degree in economics from the University of the South and a Master of Forestry degree from Duke University.

McCall's expertise lies in land management operations and silviculture, large-scale property transactions and negotiations, strategic planning and forest economics.

He is a member of the Board of Directors of the Forest Landowners Association and serves as the Governmental Affairs Committee Chairman, he is past president of the Alabama Forestry Association and serves on the Alabama Advisory Board for Hancock Bank. Active in a number of other professional organizations, McCall is also an SAF Certified Forester, a Registered Forester in several states, and a member of the Association of Consulting Foresters.

Jessica McGuire PhD. Dr. McGuire is the program manager of the Private Lands Program in the Georgia Department of Natural Resources Wildlife Resources Division, Game Management. She received her Bachelor of Science and Master of Science from Northeastern University where she worked on small mammal, marine mammal, and moose projects. Jess received her Ph.D. in Forest Resources from the University of Georgia where she conducted research on gopher tortoise population health, wildlife management, and wildlife disease through the Warnell School of Forestry and Natural Resources, Southeastern Cooperative Wildlife Disease Study, and the J.W Jones Ecological Research Center. After completing her PhD, she worked as farm bill biologist where she was deeply involved with implementing Working Lands for Wildlife for tortoises in South Georgia. Prior to her current position, she was the Red-cockaded woodpecker biologist and oversaw RCW management and Safe Harbor program for the WRD Non-Game Conservation Section. Jess has a passion for private lands wildlife conservation and pine savanna ecosystem restoration. She is a board member of the Gopher Tortoise Council. She currently lives in Baker County, Georgia on a cattle farm with her husband, and two sons.

Cheryl Millett. Cheryl is a Biologist with the Florida Chapter of The Nature Conservancy at Tiger Creek Preserve. She leads partnership programs focused on land and invasive species management, including the Ocala Longleaf Local Implementation Team, Central Florida Lygodium Strategy, Heartland CISMA, and also led Python Patrol and Jay Watch.

Kathleen 'Kat' Nelson. Kat is the Director of Land Protection & Staff Attorney for the Georgia-Alabama Land Trust (GALT), and is a native of Savannah and based here. A graduate of the University of Georgia, and the University of Georgia School of Law, cum laude, Kat went on to receive her Master of Laws (L.L.M.) in Environmental Law, cum laude, from Vermont Law School before joining the Land Trust in August 2012 to facilitate donated conservation easement projects and support staff as an attorney. Prior to joining GALT, Kat worked with NOAA Grey's Reef National Marine Sanctuary, U.S. EPA: Region IV in Atlanta, Georgia River Network, Georgia River Basin Center, the National Wildlife Federation. As the Director of Land Protection, she works in both Georgia and Alabama to oversee and facilitate new conservation easement donations from start to finish.

Kat is also an active community member in Savannah, serving as a Board Member of the Savannah Tree Foundation, a member of the Technical Advisory Committee for the Chatham County Commission's Resource Protection Commission, the facilitator of the GALT-Liberty County Greenspace Cooperative Agreement, as an Advisory Committee member for the Savannah River Clean Water Fund.

Mary F. Nieminen. Mary is a forest research coordinator at the J.W. Jones Ecological Research Center at Ichauway in Newton, GA. Her focus is on growth and regeneration of upland pine stands in southwest Georgia. She obtained her BS in Environmental Science from Florida State University and a MS in Forestry from Mississippi State University.

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.

Hunter Parks. Hunter is the Founder and Chairman of Green Assets, Inc. He grew up in a North Carolina family passionate about promoting environmental stewardship, wildlife management and conservation values. After graduating from North Carolina State University, Hunter assumed responsibility for the management of his family's properties in eastern North Carolina and Louisiana. In a short time, Hunter began working through state and federal programs to create revenue while achieving his goals of environmental protection. During the early 2000's, Hunter developed a keen interest in the emergence of global carbon markets as a means to offset greenhouse gas emissions. As a result, he formed Green Assets in 2010 for the purpose of designing and implementing carbon offset projects for the newly established Air Resources Board in California. Since then, under Hunter's leadership, Green Assets has become an industry leader in the development of carbon offset projects. Among many accomplishments, Green Assets was awarded the first-ever compliance-grade Avoided Conversion carbon offset credits in the United States in early 2015.

An internationally recognized expert in carbon offset credit programs and sustainable land management practices, Hunter is a speaker and frequent participant in industry conferences and workshops. He has been invited to participate in every United Nations Framework Convention on Climate Change (UNFCCC) meeting since 2010. In addition, he was invited to speak on a panel for the 2013 Carbon Expo in Barcelona and at the most recent Navigating the American Carbon World (NACW 2015) conference in California.

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.

Thomas (Tommy) Patterson. Tommy is a Ph.D. Candidate in Geography and a member of the Carolina Tree-Ring Science Laboratory at the University of North Carolina at Greensboro. While completing his degree, he has published various dendroecological perspectives of Longleaf pine in The Professional Geographer, Natural Areas Journal, and Castanea. His dissertation investigates the influence longleaf pine cone crop (mast) has on annual, radial growth and its relationship with tick-borne diseases in the southeastern U.S. He is actively examining climate sensitivity and fire history of montane longleaf pine in the Uwharrie Mountains in central North Carolina.

Brian Pelc. Brian is Restoration Project Manager for The Nature Conservancy's North Florida Program. Within this role Brian is also the coordinator for the Apalachicola Regional Stewardship Alliance (ARSA) Local Implementation Team (LIT) for America's Longleaf Restoration Initiative. Partnerships and the direct conservation and restoration work that result from them are a fundamental foundation for much of the work in the North Florida Program, including the regional Cooperative Invasive Species Management Area, a Challenge Cost Share Agreement with US Forest Service for groundcover, isolated wetland and non-native invasive species management as well as regional prescribed fire strike team funding and deployment among ARSA partners. According to Pelc, "These partnerships are an exciting new way to tackle some of the most difficult technical, logistical and capacity issues that arise in large scale, cutting-edge habitat conservation, and they're a very satisfying way to see our work in the context of a larger land management community." Brian holds a Master's Degree in Applied Plant Ecology from the University of Minnesota and has worked for The Conservancy's North Florida Program, based in Bristol, for seven years.

Janisse Ray. Writer, naturalist, and activist Janisse Ray is author of five books of literary nonfiction and a collection of poetry. Her first book, Ecology of a Cracker Childhood, a memoir about growing up on a junkyard in the ruined longleaf pine ecosystem of the Southeast, was published by Milkweed Editions in 1999 and went on to win many awards. In 2014 Ray was awarded an honorary doctorate from LaGrange College in LaGrange, Ga., following one from Unity College in Maine in 2007. She holds an MFA from the University of Montana, where she was the William Kittredge Distinguished Visiting Writer 2014. She is a 2015 inductee into the Georgia Writers Hall of Fame.

Kevin Robertson PhD. 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 Program Director at Tall Timbers Research Station and Land Conservancy. 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, effects of fire regime on plant communities, soils, and fire behavior, and prescribed fire effects on air quality. He also provides extension and education regarding the use of prescribed burning in fire-dependent ecosystems of the southeastern U.S.

Monica Rother. Monica is a fire ecologist at Tall Timbers Research Station & Land Conservancy in Tallahassee, Florida. She is interested in prescribed fire and wildfire and its influence on plant communities. She is currently collaborating with Dr. Jean Huffman and Dr. Kevin Robertson to develop tree-ring based reconstructions of fire in longleaf pine ecosystems in southern Georgia and various parts of Florida. She earned her Master's degree from the University of Tennessee under Dr. Henri Grissino-Mayer. Her thesis uses a tree-ring based approach to uncover fire history and fire-climate relationships in the Zuni Mountains, New Mexico. Her PhD is from the University of Colorado, where she was advised by Dr. Thomas Veblen. Her dissertation focused on patterns of post-fire tree regeneration following wildfires in the Colorado Front Range, in the context of changing climate conditions.

Darrell Russell. Darrell is a senior sales specialist for Dow AgroSciences with over 26 years of industry experience in vegetation management and chemical manufacturing, from various sales to management positions. He has covered aquatic, forestry, utility and turf markets from Virginia to Florida. Darrell currently covers GA, working the Forestry and VM markets. Darrell is a past President and Treasurer of the Georgia Vegetation Management Association. He has also served as Treasurer of the Florida Vegetation Management Association Board. Darrell holds a Bachelor of Science degree from the University of Dayton and a Masters from Washington University. He and his family reside in Roswell, Georgia.

Dan Ryan. Dan Ryan is a conservation practitioner with experience in domestic and international communitybased conservation, environmental policy, and program development. Dan has been working within the longleaf ecosystem as a staff member of The Nature Conservancy since 2007. Dan is part of a team that focuses on land acquisition, habitat restoration, prescribed fire and enabling the success of formal collaboratives across the longleaf ecosystem in North Carolina.

Salem Saloom. Salem, wife Dianne, and son Patrick own and manage Saloom Properties, LLC, awarded the National Outstanding Tree Farmers of the Year in 2010. Saloom Properties has been transitioning into longleaf since Hurricane Ivan in 2004; and as of end of 2016 will have planted 1000 acres into longleaf. Their 2200-acre tree farm is located near Evergreen, Alabama. As a general surgeon, Salem and Dianne serve as short-term surgical/medical missionaries in developing countries overseas. Saloom Properties has hosted numerous educational field days where longleaf is the centerpiece for large and small woodland owners. They annually participate in Forest in the Classroom/Classroom in the Forest educational 5th grade program where school children visit their Tree Farm. Other numerous larger educational field days have been hosted by the Salooms. Salem sits on the 7-member Governor appointed Alabama Forestry Commission Board. He has been a past chair of the Woodland Operating Committee for the American Forest Foundation and serves on the AFF Board of Trustees as well as on the Board of the Longleaf Alliance. With his experience on the AFF's National Public Affairs Committee, Salem has organized and facilitated the first two of Alabama's Grassroots Advocacy Workshops in 2012 and 2013. He is a member of Congresswoman Martha Roby's Agriculture Advisory Committee. He was awarded the 2010 Alabama Governor's Forest Conservationist Award and the 2011 National Wild Turkey Federation's National Woodland's Conservation Award.

Peter Schafran. Peter is a doctoral student at Old Dominion University in Norfolk, VA. He is assistant manager at the Blackwater Ecological Preserve, site of the northernmost extant Longleaf Pine community, and has worked there for 5 years. Research interests include propagation of Longleaf Pine community associates in Virginia, orchid--mycorrhizal ecology, and molecular systematics of *Pinus palustris* and *Isoetes*.

Jon Scott. Jon is Manager of the Southern Regional Office for the National Fish and Wildlife Foundation (NFWF) where he assists with strategic planning and implementation of the Longleaf Stewardship Fund,

Cumberland Plateau Stewardship Fund and other Southern U.S. conservation grant programs. Prior to joining the NFWF team, he worked in various capacities with land trusts in North Carolina and Virginia to conserve important wildlife habitat and working lands. Jon holds a bachelor's degree in wood products and masters of natural resources degree from N.C. State University.

John Seymour. John is President and co-owner of Roundstone Native Seed in Upton KY, where he resides with his wife Leslie and their five children. John grew up on the family farm there in Hart County, KY. He attended Western KY University in Bowling Green where he studied Plant Science and Ag Mechanics. John started his farming career as a beef cattle and tobacco farmer as well as a logger. Having always had a passion for conservation and all things wild instilled in him by his mentor, partner, and father, Randy. The two found an opportunity to diversify into a business that allowed them to still farm, as well as make a significant impact on the conservation landscape. 21 years ago the two went out with five gallon buckets and started hand picking native seed from remnant prairies in KY and putting them into production for sale in restoration and conservation plantings. Having replicated this process in other areas, John now farms around 2,000 acres of over 250 different native species all over the southeast, with production or wildland harvest in KY, TN, SC, GA, FL, AL, VA, MS, AR, and WV.

Phil Sheridan, PhD. Dr. Sheridan is President and a Director of Meadowview Biological Research Station. Phil has a Ph.D. in Ecological Sciences from Old Dominion University and B.S. and M.S. degrees in Biology from Virginia Commonwealth University. He established the non-profit 501 (c)(3) conservation organization Meadowview Biological Research Station in 1995. The mission of Meadowview is to preserve and restore the longleaf pine/pitcher plant ecosystem in Virginia. The mission is accomplished through a unique five step process of discovery, propagation, research, reintroduction and education. Meadowview also has a long term plan of developing a series of nature preserves to protect this system in perpetuity. Two nature preserves have been developed to date totaling 250 acres and plans are to enlarge these preserves to over 2000 acres. Virginia is the northern limit of the longleaf pine ecosystem.

Kaili Stevens. Kaili is a Coastal Georgia native that pursued her undergraduate degree in Wildlife Biology at the Warnell School of Forestry and Natural Resources. After graduating, she began working as a field technician on bobwhite research projects in Oklahoma and North Carolina which eventually led to her current Masters research on bobwhite translocation through the University of Delaware. Ideally, Kaili would like to return to the south to work in the management and research field of pine ecosystems after completing her degree.

Johnny P. Stowe. Johnny is a private longleaf pine landowner and hard-core pyrophylliac. In the last 20 years, in his job as forester, wildlife biologist and heritage preserve manager for the SC Department of Natural of Resources, he has specialized in restoring longleaf savannas and woodlands for their ecological, cultural and economic values. He began burning the woods half-a-century ago in his native montane longleaf firelands in NW Georgia and NE Alabama. Since 2010, through the International Association of Wildland Fire, he has been Sharing the Flame with fellow fire-lovers in the Canadian Rockies and Pacific Northwest, working to restore the transcontinental, deep-time, people-fire connection. Through his sahyinidra yoga classes, interdisciplinary writing and speaking, and field trips he strives to connect people with local and global landscapes.

Joe St. Peter. Joe is a remote sensing analyst and cooperator with the USFS Rocky Mountain Research station (RMRS). He has spent the last year working with the RMRS on the Longleaf Mapping Project helping to produce new tools to build high quality spatial data. Joe has expertise in spatial modeling, statistics, remote sensing software, programming and machine learning algorithms. His thesis work at the University of Montana used machine learning algorithms to spatially model landscape vegetation growing seasons and their meteorological drivers in rangelands of the western United Sates. He is interested in researching the intersections of human activity and landscape level environmental processes.

Stribling Stuber. Stribling is the research coordinator in the Ecohydrology Lab at the Joseph W. Jones Ecological Research Center in Newton, Georgia. She began her career as a field research ecologist conducting vegetation surveys in longleaf pine communities. Her graduate research focused on the condition of isolated

wetlands embedded within the longleaf pine uplands and in the surrounding agricultural landscapes. Currently, she is excited to be working with Dr. Steven Brantley in the Ecohydrology Lab to better understand how longleaf pine restoration and management (e.g. prescribed fire) can affect water yield at local and landscape scales.

Randy Tate. Randy works for the Longleaf Alliance coordinating the Ft. Stewart/Altamaha Partnership, one of the Local Implementation Teams established under America's Longleaf Restoration Initiative. He lives and works in Savannah, GA. He formerly worked for the Georgia DNR as the Natural Resource Program Manager for Georgia State Parks and Historic Sites Division. In that role he administrated a program for natural resource management, interpretation and volunteer management for all Georgia State Parks and Historic Sites. Before joining GA DNR, Randy worked for TNC for 20 years in four different positions from the FL Keys to Rhode Island. The last 10 years with TNC, Randy was Director of Science and Stewardship for the Georgia Chapter. He has a Master's degree in Biology from U Mass Boston. His thesis was on the breeding ecology of the Short-eared Owl and its competitive interactions with Northern Harriers on Nantucket, Island, MA. He has participated in prescribed burning throughout his career and is an RxB2 Burn Boss.

Reggie Thackston. Reggie is a native Georgian, receiving his Bachelor's and Master's degrees in Forest Resources from the University of Georgia in 1976 and 1978, respectively. He is a TWS Certified Wildlife Biologist. He and his wife Wendy live in Forsyth and have two daughters and two granddaughters. He owns and trains bird dogs and is an avid quail and turkey hunter.

He currently serves as Regional Game Bird Biologist with Tall Timbers Research Station & Land Conservancy. He oversees the TTRS Carolina Regional Quail Project with primary focus on technical guidance to private landowners in the intensive management of pine savanna and associated habitats to benefit Northern bobwhites and other game and non-game species. He serves on the Tall Timbers Board of Trustees as Vicechair of the Science and Land Management Committee. He also serves on the SC Quail Council and Quail Technical Committee.

Reggie retired in November 2015 from the Georgia Department of Natural Resources, Wildlife Resources Division (WRD) as Private Lands Program Manager, which included leading the implementation of Georgia's Bobwhite Quail Initiative.

He has worked over 37 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 27 years for Georgia WRD. His primary expertise and work experience is with integrating management for bobwhite quail, eastern wild turkey and white-tailed deer into working farm and forestlands; and into Farm Bill and forest policy. Reggie has authored or co-authored well over 30 technical publications and more than 60 popular articles.

Lindsay Thomas. Lindsay is a graduate of the University of Georgia where he received his AB Degree in 1965. Following graduation, he worked in commercial banking as a Stock Broker from 1965-1973. Lindsay then returned to Southeast Georgia where he took up farming from 1973-1982. He was then elected as a member of Congress 1st District Georgia and served in that capacity from 1983-1993. His district included the entire Georgia Coastline. From 1993-2009, he served as Government Relations for the 1996 Olympic Committee, President and CEO of the Georgia Chamber, and Senior VP Government Relations for AGL Resources. Lindsay is also a Leadership Georgia Graduate and Graduate of the Institute of Georgia Environmental Leadership.

Lindsay is living now on Grace Acres Farm in Wayne County where he is restoring Long Leaf Pine Forest and managing a one-thousand-acre tract in Oconee River in Montgomery County for wildlife and environmental concerns and conversion to Long Leaf Forest. He is also a consultant to Southern Ionics Inc., Involved in heavy mineral extraction in the South East Georgia Counties of Charlton and Brantley.

Rans Thomas. Rans is from Athens, GA and received duel A.A.S. degrees in Forestry & Wildlife from Abraham Baldwin Agricultural College and a B.S. from the University of Georgia in Wildlife Management. He worked at 5 premier hunting plantations in the southeast from 1991 to 2004 including General Manager of 23K Acre Groton Plantation in the S.C. low country. A professional land & wildlife consultant since 2005

individually working with well over 100 clients on nearly 1MM acres of private hunting lands & recreational real-estate projects across the US. He has represented outdoor industry icons Tecomate Wildlife Systems & Cabela's in Sr. Management roles including product R&D. Consulting clients include celebrities, corporate execs & high net-worth landowners involved with projects that span the recreational property spectrum. He is also a recognized outdoor TV personality having appeared on many prime time network & web shows. Rans is a resource author, speaker and recipient of the coveted Quality Deer Management Association (QDMA) Professional Deer Manager of the Year Award. He currently operates his own consulting business Creative Land and Wildlife Solutions.

Tia Tyler. Tia is a PhD student in the Department of Environmental Horticulture at the University of Florida. She is interested in the variability of native seed quality and establishment. She is a Florida native who holds an MS in Environmental Horticulture from the University of Florida and BA from The Evergreen State College.

Joan Walker, PhD. Dr. Walker is Research Plant Ecologist for the Southern Research Station of the US Forest Service, and Adjunct Professor at Clemson University, Clemson, S.C. She received her Ph.D. in Biology from the University of North Carolina. Dr. Walker is studying the population dynamics, breeding system, habitat requirements of, and fire effects on rare plants in longleaf pine communities. She is also working in the fall-line sandhills of South Carolina to develop strategies for restoring structure and composition in the ground layer vegetation of altered longleaf pine communities. Sandhills work includes evaluating the effects and interactions of mechanical treatments and prescribed fire on midstory reduction, and describing life histories and establishment requirements for common sandhills herbs.

Clay Ware. Clay is the US Fish and Wildlife Service Longleaf Pine Recovery Coordinator. He received a BS degree in Forestry from Mississippi State University and an MS degree in Ecological Restoration from North Carolina State University. He cut his teeth on longleaf pine management at Carolina Sandhills National Wildlife Refuge, where he served as Forester from 2001-2005. Upon leaving that position, Clay turned his focus to coordinating DoD forestry and hunting/fishing programs, first at the Army Environmental Command and subsequently as the U.S. Forest Service Liaison to the Air Force. In 2012, he returned to the FWS for his current position, which he performs out of the Regional Office in Atlanta.

Lindsay White. Lindsay is a Master of Forestry candidate at the Yale School of Forestry & Environmental Studies, focusing on natural resource management policy and the conservation of non-industrial private forests in the United States. Lindsay grew up outside of Boston and attended Duke University where she received her BA in English. Prior to attending Yale, she lived in San Francisco and Petaluma, California, where she worked in development, most recently for the Golden Gate National Parks Conservancy.

Rickie White. Rickie White (BS, MS, UNC-Chapel Hill) has worked as an ecologist for NatureServe for the past 16 years. Along with Carl Nordman (NatureServe), Clay Ware (USFWS), Catherine Rideout (USFWS), and Randy Wilson (USFWS), he helped to develop and finalize rapid assessment metrics for open pine.

Brian Wills. Brian is Senior Associate Director of Development for The Nature Conservancy in Georgia. Before joining the staff of The Nature Conservancy in 2008, he spent 20+ years marketing and advertising with numerous organizations including Gart Sports (The Sports Authority) and the Rocky Mountain News. He has a BA in Communication Studies from Baylor University and a MA in Journalism from the University of Colorado in Boulder, with a research focus in global media theory. Brian currently live in Darien, GA.

Rebecca Wilson. Rebecca earned a B.S. in Environmental Science from Mary Washington College and an M.A. in Natural Resources from Virginia Tech. For nine years she worked seasonally as a biological technician/wildland firefighter for the National Park Service, and since 1999 she has been with the Department of Conservation and Recreations Natural Heritage Program, serving first as a Stewardship Assistant, then as the Chesapeake Bay Region Steward. Currently, she is the Longleaf Pine Restoration Specialist and the Eastern Fire Manager and Regional Supervisor. She lives her husband and two crazy-cute dogs in big old drafty house in Petersburg, Virginia. She enjoys reading, kayaking, searching for vintage plates in thrift stores, and catching the woods on fire.

Jesse Wimberley. Jesse is a fourth generation landowner from Moore County. For the past 30 years he has been engaged in restoring his family's 1870 home and longleaf forestlands. Lighterwood Farm has developed into an outdoor classroom for local school and civic groups where Jesse teaches the cultural, ecological and economic significance of the Sandhills. Over these 3 decades, Jesse has engaged hundreds of people in the use of prescribed fire on his own land. His latest project focuses on six Sandhills counties helping other landowners accomplish their management goals. At the core of this project is the development of the Prescribed Fire Association, which helps landowners overcome barriers and gain self-sufficiency in the management of their longleaf forestlands, particularly in the use of prescribed fire.

CONCURRENT SESSION A

1-A – PARTNERSHIPS: State of America's Longleaf Restoration Initiative (ALRI)

Hear from Longleaf Partnership Council leadership about the status of ALRI and future "Game Changers" to reach our 8 Million Acre Goal

ALRI Accomplishments and Strategic Priorities and Actions

Clay Ware, Longleaf Pine Recovery Coordinator, U.S. Fish and Wildlife Service, clay_ware@fws.gov

The America's Longleaf Restoration Initiative (ALRI) was formally established after the 2009 release of the Range-Wide Conservation Plan for Longleaf Pine (Plan). This comprehensive Plan called for development of annual accomplishment reports to enable ALRI to track the range-wide progress made toward the eight-million-acre goal. In 2013, a three-year step-down plan, Strategic Priorities and Actions 2013-2015, was developed to identify and prioritize short-term actions needed to reach the long-term goals of the larger Plan. In Spring of 2016, both the 2015 Range-Wide Accomplishment Report and an updated Strategic Priorities and Actions 2016-2018 were released. Clay Ware, who coordinated the preparation of both, will discuss the development process and the content of these documents.

State of the Initiative

Kyle Jones, Regional Longleaf Pine Restoration Coordinator, Southern Region, U.S. Forest Service, krjones@fs.fed.us

Seven years ago (Year 2009), the Range-Wide Conservation Plan for Longleaf Pine (Conservation Plan), supported by 22 organizations, was released outlining an "all-lands approach" to longleaf conservation. In 2010, the momentous national Memorandum of Understanding was signed at America's Great Outdoors listening session by the Departments of Agriculture, Defense, and Interior pledging support and committing to implementation of the Conservation Plan. Immediately following, the Federal Coordinating Committee was created tasked with providing federal coordination, direction, and support. With great anticipation, high energy and expectation, the Longleaf Partnership Council was birthed in 2011. It's been 7 years since release of the Conservation Plan.

Getting to the Goal—enhancing opportunities for restoration and management of longleaf pine James M. Guldin, Ph.D., USDA Forest Service, Southern Research Station, jguldin@fs.fed.us

In 2010, the America's Longleaf Restoration Initiative raised the red flag as to the demise of longleaf pinedominated ecosystems, and proposed a recovery from roughly 4.3 million ac in 2009 to 8 million acres by 2025. Five years into the effort, Forest Survey data show that recovery of longleaf pine-dominated ecosystems lags behind the rate needed to attain the 8-million-acre goal. Plans are underway to expand the scale and scope of the restoration effort. Key elements of those plans are to expand restoration of longleaf pine on public lands, to bring new landowners—especially, large corporate landowners--into the picture on private lands, to expand the urgency and importance of the message for longleaf pine restoration, to link longleaf pine restoration to larger efforts associated with restoration along the Gulf of Mexico, to increase support for the application of prescribed fire on both public and especially on private lands, and to increase support for land protection associated with strategically significant tracts. The implications of these changes on management, planning, and policy will be discussed.

2-A: INNOVATIVE TOOLS & TECHNIQUES: Outreach & Education Tools

Learn about the new tools that are available for reaching out to a wider audience

Keep evaluation in the KAB: Tools and Techniques

Kris M. Irwin, Ph.D., Warnell School of Forestry and Natural Resources, The University of Georgia, kirwin@uga.edu

When planning events and presentations, evaluation is often either overlooked or completely avoided. Proper evaluation of participants' knowledge, attitudes, or behaviors regarding the content of the event takes time and, for some, adds a layer of complexity. While time is required to prepare and collect meaningful evaluation data, it is time well spent. Evaluation data is a powerful tool that can be used to improve the quality of future education outreach events, promote your program's impact, and serve as supporting evidence when submitting grants. The key to successful evaluation is using the right evaluation tool and techniques.

AFF's Landowner Engagement for Conservation

Chris Erwin. American Forest Foundation, cerwin@forestfoundation.org

Family forest owners in the U.S. South play an important role in most any conservation organization's goals for forest conservation, such as America's Longleaf Restoration Initiative annual establishment of longleaf pine on 150,000 acres of private lands. Designing an effective campaign to move landowners towards desired outcomes can be a challenge because in the South over 134 million acres are owned by 1.8 million individuals and families with unique goals and levels of experience.

The American Forest Foundation has begun working in landscapes in the South such as restoring shortleaf pine on the Cumberland Plateau of Alabama or longleaf pine in the Piney Woods of south Mississippi and Alabama. There are some best practices when designing marketing, education and outreach campaigns for specific conservation outcomes.

This program will review those best practices including setting goals that all partners can contribute towards; segmenting your audience in order to engage landowners in their interest and knowledge level, developing sustaining strategies that keep landowners moving towards the desired outcomes, and developing tools for measuring your progress with landowners.

Put a Ring on it - Get Them Engaged in Prescribed Fire

Jennifer Evans Fawcett, North Carolina State University, <u>jlevans3@ncsu.edu</u> & Cheryl Millett, The Nature Conservancy, cmillett@tnc.org

Private landowners face many challenges in utilizing prescribed fire as a land management tool. Reaching landowners effectively and building a positive peer-to-peer network that supports prescribed burning efforts is essential to protect the ecological and economic value of their land. In recent years, several prescribed fire field days have been conducted across the South to not only introduce private landowners to the importance of burning, but to engage them in the process. Key to engaging private landowners to implement prescribed fire is understanding who the landowners are and what is important to them. During a recent Tools for Engaging Landowners Effectively (TELE) workshop, family woodland owner survey data was used to create outreach tools to targeted landowners to increase effective prescribed fire use. Communicating a fire message with the public is, likewise, an increasingly important aspect of prescribed fire management. Fire festivals have begun serving that purpose in recent years, as they seek to emphasize the benefits of prescribed fire to the general public, and bring the culture of fire that is so rooted in southern forestry, into the mainstream. Fire fests aim to bridge the gap of understanding of prescribed fire management to a broad audience of all ages and backgrounds. A well-planned and supported event can showcase the many ecological, economic, and aesthetic benefits of prescribed fire to the local community. Examples of past efforts, lessons learned and possible strategies to engage both the general public and private landowners in prescribed fire will be provided.

3-A: ECOSYSTEM RESTORATION: Fire Management

General discussions about using fire as a management tool in longleaf forests

Considerations in Burning for Bobwhites

Reggie Thackston, Tall Timbers Research Station & Land Conservancy, rthackston@ttrs.org

Northern bobwhites and longleaf forests have much in common. Both are icons of the South, both have experienced precipitous declines and both are fire adapted and somewhat fire dependent. In fact, longleaf has

been referred to as the "tree that fire built" and bobwhites dubbed as the "Firebird". And without question the long-term reduction in fire across the Southeastern landscape has contributed to the decline of both species. However, not all burning is created equal, especially when it comes to managing open pine systems for bobwhites. Research and experience show that particular consideration should be given to the frequency, scale and season of fire where bobwhite restoration and management is a primary objective. This presentation discusses these attributes as they relate to the application of prescribed fire in restoring and sustaining bobwhites to huntable densities.

The Burning Question: Common objectives for burning in longleaf and tools to accomplish objectives *Erick Brown, The Nature Conservancy, erick_brown@tnc.org*

This program will take a look at the wide variety of reasons to burn longleaf pine and explore different methods to achieve different objectives. A focus will be given to some common ecological and safety objectives associated with burning in longleaf pine and demonstrate some useful tools for smoke modeling and fire behavior modeling. Information will be presented on the complexities of burning with competing and occasionally contradictory objectives and tools for landowners to help in prioritizing objectives.

The Burning Question: Seasonality vs. Frequency

Shan Cammack, Nongame Conservation Section, Georgia DNR, Shan.cammack@dnr.ga.gov

Managers of longleaf pine strive to do the very best kind of fire management they can. They look to fire research and the solid wisdom of veteran prescribed fire practitioners and apply that knowledge to their own unique situations. A long debated question is that of seasonality versus frequency. Is it more important to frequently burn longleaf or more important to burn it in a certain season? This presentation will touch on the science, look at the unique issues related to longleaf pine ecosystems, and probe the benefits of burning at different times of the year.

4-A: WORKING FORESTS: Innovative Markets

Focus on non-traditional consumer markets that are tied to longleaf forests and their products

Longleaf Forestry Opportunities in Carbon Markets

Hunter Parks, Green Assets, Inc., hunter@green-assets.com

Southeastern longleaf forests produce marketable environmental benefits, some of which can be monetized if developed correctly. Green Assets, Inc. is an industry leader in the development of highly marketable forest carbon offset credits on southeastern forests. The market for such credits is well-demonstrated and the demand for forest carbon offset credits is ever-increasing with a limited supply of such credits. This presentation will provide a brief history of Green Assets establishment, a general overview of the market mechanism which creates the demand for forest carbon offset credits, discuss the types of forest carbon projects and their cobenefits, and provides examples of successful forest carbon offset projects monetized by Green Assets.

Protecting Working Forests with Bargain Sale Conservation Easements

David Bishop, The Nature Conservancy (SC), dbishop@tnc.org

Conservation easements can be a great tool for unlocking value tied up land. The resulting cash and tax benefits from a working forest easement can help landowners retain ownership and keep forests intact. South Carolina has been successful at protecting large landscapes by matching federal, state, and local money to finance bargain-sale conservation easements within certain focus areas. The SC task force model has worked well to create collaborative neighborhood standards for easements and payment rates as well as build trust between landowners and conservation professionals. The success of the South Carolina Conservation Bank has led to the creation of a new water fund, which is focused on protecting forests and clean drinking water in the Savannah River.

The Architectural and Design Uses of Reclaimed Wood (heart pine)

Jeffrey L. Forbes, The Goodwin Co., Jeffrey@heartpine.com

Sustainably harvested and reclaimed wood continues to be increasingly specified by architects; designers and building professionals looking for sustainable design products with which to appoint their projects. Heart pine is among the most popular of these woods. From residential and commercial to institutional and cultural to historic preservation; architecture in the early twenty first century seeks to incorporate and highlight wood once lost to the river bottoms of the South, demolition and disposal or harvested from lightning damaged or excessive burning of old-growth. Antique, reclaimed heart pine provides the more 'rustic' looks often specified while design professionals are increasingly enthusiastic about application of old-growth to provide a wider range of looks including products from former waste stream shorts. In this brief program learn about the rich history of this antique wood and the future of great American design with sustainably harvested longleaf products.

CONCURRENT SESSION B

1-B: PARTNERSHIPS: Team Challenges and Opportunities

Discussion of Local Implementation Teams regarding challenges and opportunities they are facing with conservation planning, increasing collaboration, and long-term sustainability of partnerships

Conservation Plan Prioritization & Mapping in two LITs

Brian Pelc, Florida Chapter of The Nature Conservancy, <u>bpelc@tnc.org</u> & Colette DeGarady, SC Chapter of The Nature Conservancy, cdegarady@tnc.org

In a climate of limited funding and endless opportunity to improve habitat restoration and management across the southeast United States, there is a need to prioritize primary (aka Key Conservation Outcomes, or Fundamental Objectives) and secondary (aka Desired Ecological Benefits and Desired Human Well-Being Benefits) goals. Local Implementation Teams (LITs) across the longleaf pine historical range are working to define those goals and use available 1) spatial data, 2) local expert knowledge, 3) other pertinent environmental, social and economic patterns and 4) conservation planning tools to identify key areas where resources can be used to restore, improve and maintain the most longleaf acres while also accomplishing the highest priority benefits for nature and people. Two examples of these priority mapping efforts, in the Apalachicola River region of Northern Florida and Francis Marion National Forest region of coastal South Carolina, will be briefly described by the respective LIT coordinators, two of the 17 LITs that are responsible for implementing America's Longleaf Restoration Initiative. Both the Sewee Longleaf Conservation Cooperative and the Apalachicola Regional Stewardship Alliance are partnership-driven, regionally focused initiatives that will use the prioritized maps and associated longleaf conservation plans to accomplish the locally vetted primary and secondary longleaf goals.

NRCS Collaboration with Local Implementation Teams

Luther Jones, USDA-NRCS, Luther.Jones@wdc.usda.gov

To support the implementation of the America's Longleaf Restoration Initiative (ALRI) Conservation Plan which calls for roughly doubling the acres of longleaf pine to 8 million acres, efforts should continue to target private landowners. It is estimated that 80 percent of the overall longleaf pine forest increases will have to occur on private lands and 50 percent of the increases should be within Significant Geographic Areas or stateidentified significant sites. To continue the support of ALRI, NRCS has aggressively targeted its longleaf pine restoration efforts on private longleaf pine acres. NRCS has established a goal that 90 percent of the Longleaf Pine Initiative's (LLPI) restoration activities will focus in the identified priority areas or counties. The LLPI States have identified the high priority counties where there are large forest blocks. These priority areas offer greater benefits than creating or restoring more isolated stands. NRCS recognizes the importance of working with partners to improve the delivery of USDA conservation programs especially in targeted areas. In this session, NRCS and Local Implementation Teams will discuss opportunities for better collaboration.

Long Term Sustainability of LITs

Vernon Compton, The Longleaf Alliance, <u>vernon@longleafalliance.org</u> & Dan Ryan, The Nature Conservancy North Carolina, dryan@tnc.org

Vernon Compton

A key component LIT success is the ability to increase effectiveness and efficiency utilizing limited longleaf restoration and management funds. Partners in the Gulf Coastal Plain Ecosystem Partnership (GCPEP) are celebrating 20 years of collaboration that has had a tremendous positive impact in the landscape. Funding to sustain those efforts is a continuous challenge, but lessons can be learned from how those obstacles have been addressed. Sharing insights from a long standing partnership can help others as they work together to address similar conservation challenges and opportunities.

Dan Ryan

Effective coordination of restoration tactics amongst partners is vital in maximizing impact. This is a strategy being effectively implemented across the range under the guise of Local Implementation Teams (LIT). To ensure sustainability of these groups, we should make a conscientious effort to look beyond the short-term funding that is currently subsidizing most LITs. North Carolina has three longleaf partnerships that have been active a decade or longer and have evolved under different circumstances and governance models. These examples can serve as models as similar LITs advance beyond the formative years.

2-B: INNOVATIVE TOOLS & TECHNIQUES: Monitoring & Mapping

How innovative techniques for mapping and monitoring can be used to keep track of your property and assess management practices will be discussed.

Monitoring and mapping timberland with small UAVs

Clay Folk, Folk Land Management, Inc., clay@folklandmanagement.com

Inexpensive, small UAVs have made it possible to collect high resolution imagery on small scales that are useful for land management purposes. Specialized post-processing software and powerful desktop computers have provided the ability to post process the collected photos into a orthomosaic photos, digital elevation models, 3D models, and point clouds. These final products can be used in GIS for decision making purposes. While being low cost, imagery can be collected quickly and repeatedly and final products used for monitoring. Previously, what was cost prohibitive is now affordable at much higher resolutions than was feasible with manned aircraft, although not the scale manned aircraft are capable of. Some tasks can be done faster, cheaper, and better than traditional methods. Seedling survival counts, pine beetle surveys, and vegetation surveys are examples. Other uses are now in reach were either cost prohibitive or not possible are digital elevation models, 3D models, and imagery at resolutions of millimeters per pixel can now be obtained for tracts of all sizes. Natural resource uses for small UAVs include:

-Seedling survival counts

-Pre and post herbicide assessment

-Oyster bed monitoring and measurements

-Feral hog damage assessment and monitoring

-Post fire damage assessment

-Vegetation surveys

-Crop monitoring

-Plant health assessments

-Timber stand monitoring for: wind and ice damage, pine beetles, and, lightning strikes

Longleaf Pine Effort and the Stand Level Database

John Gilbert, Solon Dixon Forestry Education Center, School of Forestry and Wildlife Sciences, Auburn University, gilbejo@auburn.edu

There has been a surge of interest in longleaf pine over the past two decades with momentum continuing to build today. In response to increasing interest in conservation and restoration of functional longleaf pine ecosystems, the Auburn University School of Forestry and Wildlife Sciences and The Longleaf Alliance, Inc. have been working together since 2008 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. With over 3 million acres of longleaf pine data collected, the Longleaf Pine Stand Level Database serves as a baseline of knowledge about available spatial data for longleaf pine stands by showing locations as points or polygons with some description of condition. Many lessons have been learned over 8 years of data collection about the ability to find and gain access to data, data quality, data sensitivity, and merging datasets in to a working database. Although there continue to be misconceptions and barriers to collecting and displaying existing data, 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. This effort has many opportunities to be expanded and to complement other efforts across the range to create dynamic conservation planning tools for restoring longleaf pine.

Utilizing rapid assessment metrics to measure and report out conservation value of open pine stands

* Rickie White, NatureServe, rickie_white@natureserve.org Co-authors: Carl Nordman (NatureServe), Clay Ware (USFWS), Randy Wilson (USFWS), Catherine Rideout (East Gulf Coastal Plain Joint Venture)

After years of steady decline in acreage and quality, the remaining examples of southern open pine ecosystems are a patchwork of existing and restored tracts. In order to restore the function of this formerly grand ecosystem and to fully protect the species that rely on the ecosystem, we must first understand the amount of land that is currently providing high quality habitat to our target species. Rapid assessment protocols help us at two different scales:

At the finest scale, these protocols give land managers with a conservation focus a powerful, efficient tool that allows them to collect data and quickly understand whether stands are in good or excellent condition (providing priority wildlife species' habitat) or not.

At larger scales, these protocols can contribute to our understanding of the overall condition of open pine ecosystems regionally and allow us to more precisely plan for a better future for this ecosystem.

3-B: ECOSYSTEM RESTORATION: Groundcover

Session will showcase the unique groundcover component of longleaf forests and some successful restoration examples

Groundcover Restoration and Management on Private Lands with an Emphasis on Wildlife

M. Kyle Marable, Alabama Wildlife Federation, kmarable@alabamawildlife.org

The key to restoring longleaf pine ecosystems is the restoration of ecosystem associated groundcover. The Alabama Wildlife Federation's Land Stewardship Assistance Program specializes in providing technical assistance to non-industrial private landowners. Longleaf ecosystem restoration on private lands is essential to improving the quality and overall acreage of the longleaf pine ecosystem throughout its range, whilst also providing landowners opportunities to meet their wildlife and property management objectives.

Groundcover restoration may take the form of natural or artificial restoration depending on the specific site conditions. When possible, groundcover restoration should begin before trees are planted. Choices made during site preparation affect the groundcover conditions once trees are planted. Upon longleaf establishment, options for groundcover restoration may change, requiring adjustments in management techniques. Prescribed fire is the most common management technique and is vital for longleaf pine ecosystems to develop quality groundcover communities. However, site conditions may dictate the use of alternative restoration and

management techniques such as herbicides and mechanical removal of undesirable species. If the seed bank contains desirable plant species, proper restoration and management techniques should elicit a response once applied. However, artificial restoration may be needed if the seed bank is depleted of desirable species. No matter the methods used, the benefits provided by proper groundcover restoration and management are appreciated by landowners, wildlife, and the entire longleaf pine ecosystem.

Planning and Planting for Success: Methods for Groundcover and Understory Restoration (and bonehead things you just shouldn't do)

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

Great strides have been made and continue to progress in the restoration of the longleaf ecosystem across its natural range. This success is allowing for more focus to be given to the native understory and ground cover that make up the diversity needed for the native habitat, that comprises a true long leaf stand. Now that there are commercial sources of native seeds available for these restoration efforts, it poses the question: how do we plant, seed, manage and maintain these areas to ensure that they are successful and functional? There are several methods to successfully establish groundcover but many variables have to first be taken into consideration. These considerations include current site conditions, existing vegetation, historic and current land use, equipment availability for planting and maintenance as well as the landowner's desired goals. Whether on a large scale or small scale the same principles apply; therefore, it becomes a matter of designing a plan of action that fits your site.

Rarity, Carnivory and Promiscuity: Characterizing Wetland Plant Communities in the Fall Line Sand Hills of West Central Georgia

Michele Elmore, PhD., The Nature Conservancy, melmore@tnc.org & Julie Ballenger, PhD., Columbus State University, ballenger_julie@columbusstate.edu

The Fall Line Sandhills physiographic province of west central Georgia is known for its unique plant communities and rare, often disjunct, plant populations due to the region's distinct geologic history. Embedded within xeric longleaf pine uplands are unusual wetland plant communities, with composition and dynamics driven by fire and water. Little is known about these wetland habitats. This project seeks to better characterize, classify, and rank these wetland communities, provide new elemental occurrence information, and outline conservation and management needs. Here we present preliminary results from 11 sites. All sites were sampled using the Carolina Vegetation Survey, including soil and landscape characteristics. Nine carnivorous species were found and 15 species are considered rare (S1/S2) in Georgia. Nearly all 15 rare species are new elemental occurrences for Georgia some of which were documented at multiple sites. Using ordination analysis, four sites appear to represent a distinct and undocumented plant community type for Georgia similar to the globally critically imperiled (G1) East Gulf Coastal Plain muck bog associations described by NatureServe. At least three sites exhibit apparent and extensive introgressive hybridization between the rare Sarracenia rubra and S. psittacina. Leaf tissue samples were collected for isolation of DNA and sequencing of the rbcL gene region to determine the magnitude of hybridization for Sarracenia species. In addition, samples were collected from upland and wetland plants to set up a DNA barcode library of the Sandhills flora. Preliminary results and discussion of these rare, carnivorous, and promiscuous plant communities will be presented.

4-B: WORKING FORESTS: Income/Landowner Benefits

This session will focus on significant income opportunities that longleaf offers to landowners, and considerations for management.

Conservation Easements: Preserving Working Landscapes and High Priority Habitats

Kathleen 'Kat' Nelson, Esq., L.L.M., Georgia-Alabama Land Trust (GALT), knelson@galandtrust.org

Conservation Easements are a flexible tool for landowners and their advisors. This discussion will focus on the development of workable conservation easements, ideally benefiting the landowner in multiple ways. The landowner retains ownership and management of their land, but the donation may also allow them to take advantage of tax benefits and to achieve other land, family and estate planning goals. Each Conservation Easement is unique, they are tailored to the land and to the landowner. Land trusts work with landowners to

protect working forestland and farmland, wildlife habitats, river and creek corridors, wetlands, historic and cultural resources, areas under urban development pressure and scenic vistas. Protection through a conservation easement does not mean that you cannot use the land anymore. It does not mean you cannot retain the use of buildings, or potentially construct new buildings. It does mean that the "conservation values," whether they be the continued use of prime farm soils for food and fiber production or the preservation of a high priority habitat, are protected in perpetuity, which the IRS deems in the public interest and thus may result in federal and state tax savings.

Overview of the Southern Yellow Pine Timber Markets in the U.S. South

Richard W. Hall, Forest Investment Associates, rhall@forestinvest.com

The difference between the average southern yellow pine sawtimber price and the average southern yellow pine pulpwood price has narrowed dramatically over the last 10 years. In the fourth quarter of 2005, the average southern yellow pine sawtimber price was approximately 6 times higher than the average southern yellow pine pulpwood price. In 2015, the average price for southern yellow pine sawtimber was only about 3 times higher than southern yellow pine pulpwood. Multiple factors, both global and regional, have contributed to this convergence in pricing for larger and smaller diameter southern yellow pine timber in the southeast U.S. over the last 10 years. This pricing dynamic has significant implications for forest management plans, harvest scheduling and timber sale strategies for commercial southern yellow pine timber prices, both sawtimber and pulpwood, as well as an overview of key factors that are likely to influence southern yellow pine timber prices going forward.

Pine Straw Production and Management in Longleaf Stands

David Dickens, PhD, University of Georgia, Warnell School of Forestry and Natural Resources, ddickens@uga.edu

Pine straw, the upper layer of the forest floor, called the litter layer consisting of fresh pine needles, can be raked, piled, baled and sold as a landscape and mulch material. Selling pine straw generates income prior to the first thinning. Longleaf pine straw (needles) has historically been the favored pine species to rake due to their long needles, somewhat glossy appearance, and slow decomposition rate compared to loblolly and slash pine. The annual economic income to forest landowners in Georgia from pine straw sales has been estimated at \$60 to \$80 million since 2008. Longleaf pine stands are typically raked from canopy closure (age 10-12 years old) to first thinning (age 17-23 years-old) when not in a Conversation Reserve Cost-Share Program. Pine straw can be sold by the acre or by the bale. Each sale method has advantages and disadvantages. A pine straw sale contract is highly recommended. Where native grasses and other beneficial native vegetation is present in the understory and the landowner places a high priority on wildlife, pine straw is often not raked or if raked, then "fluff" raked with pitchforks to minimize native ground cover disturbance. This presentation will address longleaf stand management for pine straw, the economic benefit, the added stress factor that annual intensive pine straw raking can have on some soils, and types of raking based on landowner objectives and the presence or absence of desirable native groundcover.

CONCURRENT SESSION C

1-C: PARTNERSHIPS: Team Challenges and Opportunities

Discussion of Local Implementation Teams regarding challenges and opportunities they are facing with landowner outreach, the Longleaf Stewardship Fund, and Prescribed Burn Associations

Landowner Outreach Efforts in two LITs (South Carolina Sandhills and East Texas)

Charles Babb, LIT Coordinator, Sandhills Longleaf Pine Conservation Partnership (SLPCP), charlesbabb81@gmail.com & Kent Evans, Coordinator, Texas Longleaf Implementation Team, 99kevans@gmail.com

Landowner Outreach in the Sandhills Longleaf Pine Conservation Partnership

The South Carolina SLPCP was formed in 2010, and compared to other LIT's, weighs in at the flyweight class of 466,000 acres. It was formed because of a need to prioritize private-land longleaf expansion surrounding the area's 110,000 acres of public lands which are extensively managed for longleaf. It is estimated that there are 225,000 acres within the focal suitable for conversion to longleaf. By selecting a small focus area, the Partnership's 13 members have prioritized longleaf efforts in the areas which will produce the most immediate impact to expand the existing longleaf already in place on public lands. In five years, the Partnership has obtained over 1 million dollars in grant funds, and leveraged \$2.3 million in cost-share assistance via farm bill programs. This translates directly into assisting over 250 private landowners convert over 15,000 acres into quality longleaf habitat. The success has been due to many reasons, primarily an excellent relationship with USDA offices (FSA and NRCS), and other state and federal agencies. The Partnership has a vested interest in education and outreach, averaging one popular press article a month, two field days annually, in addition to giving talks to schools, clubs and other citizen-interest groups. Through selfless dedication of individual members, the Partnership's accessibility via our community presence has allowed us to experience exponential growth and success. Continued educational programs and outreach is reaching next generation landowners concerning the values of prescribed fire on the landscape, restoring the native understory, and maintaining a complete longleaf ecosystem.

Outreach to private landowners and timber investment companies for longleaf restoration in east Texas.

The Texas Longleaf Taskforce was formed to accelerate longleaf restoration in its historic range in east Texas. Longleaf forests once covered 2.9 million acres of the state but now occupy 48,000 acres, half of which is on National Forests. Pine forests on the historic range are dominantly in short rotation loblolly production and managed by large institutional investment companies. The Taskforce and its leadership steering committee, known as the Texas Longleaf Implementation Team are using a variety of outreach methods to recruit landowners and timber investment organizations to restore longleaf. Workshops and field days are developed on topics significant to local needs such as controlling yaupon with fire and herbicides. TLIT leadership includes Campbell Global and Resource Management Service (RMS) which provide workshop participants with longleaf restoration experiences from large institutional management companies. The TLIT also brings functional assistance teams to landowner project sites so that multiple skill sets are provided to owners wanting to know more about longleaf establishment issues. The TLIT recently completed the Yale University outreach workshop "Tools for Engaging Landowners Effectively". Outreach methods will be enhanced as the TLIT incorporates new information from the TELE workshop.

Longleaf Stewardship Fund: Emerging Trends and Priorities for 2017 and Beyond

Jon Scott, National Fish and Wildlife Foundation, jonathan.scott@nfwf.org

Since 2012, the Longleaf Stewardship Fund (LSF) has awarded more than \$18.6 million to support on-theground projects that will restore and enhance more than 830,000 acres of longleaf pine habitat on public and private lands. As this public-private partnership enters its sixth year of grant-making, NFWF and our funding partners seek to continue supporting high-quality longleaf restoration projects, while also advancing strategic conservation planning that will inform future grant investments through LSF, sustain and grow funding for longleaf conservation, and help position the overall longleaf effort for continued success in anticipation of the pending administration change. This presentation will highlight funding priorities for the 2017 Longleaf Stewardship Fund grant cycle, outline expectations for completion of LIT conservation plans, and examine emerging trends as NFWF and the America's Longleaf Restoration Initiative look ahead to 2025 and what is needed to achieve the 8-million-acre goal established in the Range-wide Conservation Plan.

NC Sandhills PBA Progress and Lessons Learned

Jesse Wimberley, Sandhills Area Land Trust, jesse@sandhillslandtrust.org

This presentation will examine the process of assembling a team of agencies who have the technical and outreach capacity to work with a wide range of landowners of varying longleaf management interests, backgrounds, and capabilities. We will also examine the strategy to move landowners from interest to action in using prescribed fire as a tool for their management, resulting in the standing up of a prescribed burn association (PBA). We will also talk about the educational materials developed by the team to help landowners navigate their options and opportunities for cost-share, management plans, prescribed burning, and longleaf establishment. We will be unveiling the new PBA video and brochure which have been developed as promotional materials for this initiative. Our goal is to share these lessons learned with similar organizations that may wish the replicate the model of a PBA for their area's private longleaf management restoration.

2-C: INNOVATIVE TOOLS & TECHNIQUES: Apps

There's an app for that! Mobile applications can be very useful tools for land managers. Learn about some of the latest in this session.

Mobile Apps for Prescribed Fire

David R. Godwin, Southern Fire Exchange, Drg2814@ufl.edu

Mobile applications (apps) are software packages designed to work on mobile computing devices such as smart phones and tablets. In recent years, a suite of mobile apps has emerged that can be useful tools for planning, implementing, and documenting prescribed fires. While some of these mobile apps are not specifically designed for prescribed fire, they can provide prescribed burners with valuable information ranging from timely weather reports and lightning detections to custom GPS-enabled burn maps. This presentation will highlight some of these tools and demonstrate their potential application in prescribed fire management.

Taking what you learn in the field back to the office. Apps that can make life easier.

Margaret Fields, The Nature Conservancy, North Carolina Chapter, mfields@tnc.org

Smart phones are pretty standard equipment these days, and they, along with tablets, can help with data collection that integrates fairly seamlessly into your GIS workflow, improving documentation and analysis. We will discuss programs that require paid licenses as well as free and cheap apps.

Apps we will discuss: ArcGIS Collector, Avenza PDF Maps, Trimble Navigator Pro, Theodolite.

Mobile Apps for Forest Landowners, Foresters, and Other Natural Resource Professionals

Roger F Bryant, Genesis Forest Management, roger.bryant@genesisforestry.com

As of July 2015, 68% of U.S. adults own a smartphone, up from 35% in 2011, and tablet computer ownership has increased to 45% according to data released by the Pew Research Center. As mobile device adoption has grown, so has the usage of mobile applications. It is estimated there are currently 2.2 million apps available in the Android Google Play Store and over 2 million in Apple's App Store. With so many apps, here's a look at a few apps that forest landowners, foresters, and natural resource professionals will find interesting.

Mapping

Smart (Android) is a free GPS collection app. With the app, users can GPS roads, stands lines, and areas (like harvest areas, food plots, ponds, etc.). GIS Kit (iOS) a full featured GIS app but comes with a price tag of \$99 (great app for an iPad). Other mapping apps worth considering include, Wolf GIS, Avenza PDF Maps, ESRI ArcMap, iCMTGIS 2, iGIS, and GISRoam.

Navigation

Waze is an app for everyone that drives. This app will guide you to your destination, let you know if of hazards on the road like accidents and construction, help find the cheapest gas, and will even tell you if police are nearby. The app gives you route options, will dynamically change your route if a faster route is found, and will alert you when there is traffic ahead.

Miscellaneous

Other apps worth looking into include GeoCam Free (Android), LeafSnap (iOS), Theodolyte Pro (iOS), VaTech Tree ID (Android), Plot Hound, Forest Metrix (iOS), MileBug, RxBurnTracker, and more. A list of apps compiled by the Southern Regional Extension Forestry website can be found at http://www.sref.info/resources/mobile-apps.

3-C: ECOSYSTEM RESTORATION: Wildlife

From quail to gopher tortoises, learn more about the wildlife species that call the longleaf forest home

Longleaf Ecosystem Management On an Active Army Installation

Tim Beaty, U.S. Army – Fort Stewart, Georgia, timothy.a.beaty2.civ@mail.mil

At 270,270 acres, Fort Stewart is the largest Army installation east of the Mississippi River. It is also one of the largest remaining longleaf forests, recognized in the America's Longleaf Initiative as part of the Fort Stewart-Altamaha Significant Geographic Area. The forest supports the state's largest red-cockaded woodpecker population, along with 6 other federally listed threatened or endangered species, and more than 20 other species of concern. The Army is proud of Fort Stewart's conservation value, but the installation's primary mission is to train the Soldiers of the 3RD Infantry Division and other units to be ready to fight and win the nation's wars. Carrying out conservation programs on a military installation therefore presents special challenges, but it also presents unique opportunities. This presentation will discuss ways that installation natural resource managers have been able use partnership, cooperation, collaboration, innovation, education, and compromise to achieve conservation goals, maintain compliance with The Endangered Species Act, and improve opportunities for realistic combat training at the installation. Central to the success of these efforts is the nation's largest prescribed burning program, burning over 120,000 acres annually to maintain ecosystem health, improve visibility and maneuverability for training, and reduce wildfire risks on the installation's live fire ranges.

Gopher Tortoise Management: Saving a Keystone Species

Jessica McGuire, Georgia Department of Natural Resources, Wildlife Resources Division, Private Lands Program, Jessica.mcguire@dnr.ga.gov

The Gopher Tortoise (*Gopherus polyphemus*) is one of five remaining land tortoises in North America. It is a long lived species (60+years) that creates extensive subterranean burrows up to 40 feet in length and 10 feet deep. These burrows can provide refuge to more than 360 other species. The gopher tortoise is still widespread throughout much of the southeast, but populations have drastically declined. Most of its original habitat has been lost to due to urbanization and conversion to agriculture. As a result, the gopher tortoise is currently federally listed in 3 states: Louisiana, Mississippi, and West of the Tombigbee and Mobile Rivers in Alabama. It is a candidate species for federal listing in Georgia, Alabama, Florida, South Carolina, and Alabama. The conservation of the tortoise is going to rely on concerted management and restoration efforts between numerous partners including state and federal agencies, NGO's and, most importantly, private landowners. Management priorities include stand thinning, invasive species management, and prescribed fire.

The Longleaf Pine in Private Recreational Property Management

Rans Thomas, Creative Land and Wildlife Solutions, rthomaslandwildlife@gmail.com

Unique in many characteristics among the southern yellow pine group the Longleaf pine (*Pinus palustris*) is manageable and profitable in ways that can make it appealing to the goals of the sportsman landowner. Private recreational property acquisition, management and utilization has surged over the past few decades. Many of these landowners seek multi-use systems involving a variety of high value sporting aspects along with optimizing revenue from timber, agriculture and other natural resources. While the highly pyrophytic longleaf pine is strongly associated with the Northern bobwhite quail (*Colinus virginianus*) in a holistic management system creative integration of longleaf can benefit multiple game and non-game species as well as offer long-range, sustainable income. Understanding the establishment, life cycle, physiology, environmental tolerance, merchantability, controlled response and best management of longleaf is of great importance in developing a

recreational property management plan. It is of equal importance to understand long-range wildlife utilization, wildlife population response and hunting strategies relative to longleaf pine stands.

4-C: WORKING FORESTS: Passing it on

Panel discussion led by landowners who are actively restoring and maintaining working longleaf forests for the generations to come

Successfully Managing Ownership Transition

Barrett McCall, Larson & McGowin, Inc., bmccall@larsonmcgowin.com

An important event in the life of the forest is when the ownership changes. McCall will share his experience with the challenges and opportunities in transitioning ownership within the family. Topics will include strategic planning, hold/sell decisions, divisions and governance (i.e.: how to reach consensus).

Conservation Lessons Learned: How to Build a Successful Transition

Kathleen 'Kat' Nelson, Esq., L.L.M., Georgia-Alabama Land Trust (GALT), knelson@galandtrust.org

Estate planning for landowners is vital to successful transitioning of land. This discussion will focus on lessons learned from passing on land, the good, the bad and the ugly; what makes long-term planning successful versus unsuccessful? Discussing real world examples from conservation easements, both the stumbling blocks and the truly thoughtful, guiding mechanisms that made their way into the repute of long-term family land planning. You can never plan enough for life's biggest and most change worthy events, but the same adage would seem to apply here as to family planning and child rearing, 'try not to wait too long.' Key topics: estate planning, land management planning, conservation easements, example of successful land planning, examples of unsuccessful land planning, takeaways for family discussion and conservation easement development.

Family Panel Discussion

Dr. Salem Saloom, sawbonz@saloom.net & Lynda G. Beam, lyndagbeam@gmail.com

The family panel discussion will focus on the areas of concerns these families have dealt with in planning for the long term.

CONCURRENT SESSION D

1-D: PARTNERSHIPS: Prescribed Fire Partnerships

Hear about what Rx Fire Councils across the country and locally in the Southeast are tackling and how partnerships are increasing Rx Fire capacity with innovative training programs, resource sharing MOUs, and Interagency Rx Fire Teams

Impacts of the Prescribed Fire Councils

Jeremy Bailey, Chair Coalition of Prescribed Fire Councils, jeremy_bailey@tnc.org

The first Prescribed Fire Councils developed in the Southeast where the ethos and traditions of burning remains strong. However, in recent years numerous other States have developed Prescribed Fire Councils and have been applying, with surprising effectiveness, the lessons learned by these early trail blazing States. These newest additions of Prescribed Fire Councils are making local political gains in the wake of devastating wildfire seasons, applying a thoughtful and direct approach to changing State policies, pulling together Fire Management Agreements and Memorandums of Understanding based on examples from the Southeast, and incorporating culturally relevant fire use practices from Native American Tribes and decedents of European settlers who have maintained a practice of using fire. In this presentation by the Chairperson of the Coalition of Prescribed Fire Councils, there will be an opportunity to learn about and share experiences that are defining success among Prescribed Fire Councils.

Expanding Prescribed Fire Capacity Through Partnerships

Jennifer Evans Fawcett, Department of Forestry and Environmental Resources, Extension Forestry North Carolina State University, jlevans3@ncsu.edu

More prescribed fire is needed across the historic longleaf pine range, however, studies have shown that several impediments are hindering increased prescribed fire use. Lack of capacity has been consistently identified as a major barrier to increasing prescribed fire use in the public and private sectors both nationally and within the Southeast. In many areas, this deficiency appears to include not only a shortage of trained prescribed fire managers, but also an insufficient amount of private contractors, experienced private landowners, and partnerships. Additionally, there is a need for more practical experience, training, and educational opportunities for both the public and private sectors. In an attempt to build capacity for more qualified burners, programs such as the Prescribed Fire Training Exchange (TREX) and the Interagency Prescribed Fire Training Center (PFTC) have created multi-day training sessions that provide opportunities for agency personnel and others to gain hands-on prescribed burning experience and classroom instruction on foundational topics. In addition, Prescribed Burn Associations (PBAs) have been formed to expand capacity among private landowners. PBAs are partnerships between a group of landowners and other local citizens, and have been extremely effective at increasing the amount of burning being conducted on private lands. PBAs and Local Implementation Teams have also been successful in developing training opportunities and in requesting additional state Certified burner courses to be held for members. Several examples as to why partnerships are a critical component to the success of expanding capacity for prescribed burning will be provided.

Longleaf Implementation Teams & Prescribed Fire Partnerships

Randy Tate, Fort Stewart/Altamaha Longleaf Partnership, The Longleaf Alliance, randy@longleafalliance.org

As the range-wide plan (America's Longleaf Restoration Initiative) for the conservation and restoration of longleaf pine forests matures, many Local Implementation Teams (LIT) are in place and increasingly implementing fire management. Several LITs have formed partnerships across agencies and organizations to accomplish their fire management goals and these partnerships take various forms. This presentation will look at the various partnerships that have been formed and then go into depth regarding the GA Interagency Burn Team, a long-standing fire management partnership that is unique in its breadth and scope. The presentation will also examine what makes an effective prescribed fire program or partnership.

2-D: INNOVATIVE TOOLS & TECHNIQUES: Communication Tools

Learn about new ways of connecting with your audience and building support of the longleaf restoration mission

Effective Landowner Engagement - from Outreach to Outcomes

Lindsay White, Sustaining Family Forests Initiative at the Yale School of Forestry & Environmental Studies, lindsay.white@yale.edu

Two of the biggest challenges to improved stewardship and conservation on private lands are 1) getting the attention of the landowners (outreach) and 2) getting them to take action (outcomes). Both require focused, targeted effort to understand the landowners - their attitudes, values, needs and priorities - and getting a good match between stewardship and conservation program objectives and the needs and desires of the landowners. The most efficient and effective outreach programs target their efforts towards the landowners who are most likely to engage in the desired behavior and (or) to those who have the greatest impact on the program goals. A successful outreach program focuses on key motivations of the target audience and addresses ways to overcome the most obvious barriers in order to persuade landowners to take action. Presenting research from the Sustaining Family Forests Initiative and landowner data from the Southeast region of the U.S., we will discuss landowner characteristics, objectives, and potential messaging around longleaf pine restoration. This presentation will include a case study to illustrate how key changes to outreach materials can deliver a strong and targeted message to your intended audience, spurring action and helping you to reach your goals.

The Language of Conservation

Brian Wills, The Nature Conservancy, buills@TNC.ORG

Find out which terms and phrases resonate with audiences, and which don't.

Whether you've worked in conservation for 20 years or two weeks, you probably have a handle on how to talk about the great work you do, but do you know how well your language resonates?

The Nature Conservancy recently commissioned a bi-partisan research project to provide a list of good and bad ways to communicate our messages and effectively build support for conservation. The Language of Conservation: Updated Recommendations on How to Communicate Effectively to Build Support for Conservation provides a list of easy-to-follow and broad "rules" for communicating the work we do. Some of these rules reinforce long-standing communication guidelines we have tracked over time, while others were tested to reflect today's changed political and economic context.

Mobile Phone Conservation Photography

Brady Beck, Brady Beck Photography, bradybeckphoto@gmail.com

Mobile phones and their integrated cameras can be a powerful tool for sharing our conservation message. Learn basic photography tips as well as suggestions for improving your social media presence. We will discuss phone apps that can help you edit your photos and video to help reach a wider audience.

3-D: ECOSYSTEM RESTORATION: Longleaf Conversion

Experiences will be shared on converting appropriate sites to longleaf

Region-specific Impacts of Cultural Treatments in Conversion for Longleaf Restoration

Joan Walker, US Forest Service, joanwalker@fs.fed.us

Co-Authors: Geoff Wang, Benjamin O. Knapp, Huifeng Hu

Land managers in the southeastern United States are interested in converting existing stands of loblolly pine (*Pinus taeda* L.) plantations to longleaf pine (*Pinus palustris* Mill.) ecosystems to meet multiple conservation and restoration objectives for upland pine forests. We designed a replicated, split-plot experiment to test the effects of harvesting treatments (i.e., variable retention and distribution of residual loblolly pine trees at main-plot level) and cultural treatments (i.e., control, herbicide, and herbicide + fertilizer treatment at sub-plot level) on the establishment of planted longleaf pine seedlings and the responses of plant community. The experiment was installed in two different states, Georgia and North Carolina, to compare response patterns at two ecologically distinct regions within the historical longleaf pine native range. We monitored survival and growth of planted longleaf pine seedlings and plant community for five years. Our results indicated more unique than common responses between the two regions. Our study illustrates that, although some generalizations may be drawn regarding treatment effects, management prescription must be region-specific in order to successfully achieve overall restoration objectives.

Using Herbicides Creatively to Restore the Longleaf Pine Ecosystem

Nathan Klaus, Georgia Department of Natural Resources, Nongame Conservation Section, Nathan.Klaus@dnr.state.ga.us

Herbicides are widely used in longleaf pine restoration. There are several herbicides that dominate today's forestry market: glyphosate, imazapyr, metsulfuron methyl, triclopyr, and hexazinone. Combinations of these herbicides at various rates give land managers a bewildering variety of choices and very different outcomes. Site prep decisions can dramatically affect the future of the stand, both in terms of longleaf pine establishment, woody control and residual herbaceous cover, including groundcover. While many forest industry studies have examined herbicide effects on pine establishment and woody control, primarily for use in loblolly pine crops, there are no comprehensive studies of the effects of chemical site prep on longleaf groundcover. Thus restoration has largely been a guessing game and longleaf groundcover has often been sacrificed in the process of reestablishing longleaf pine, with long-lasting consequences. Our research examined the effects of the most common forestry herbicides on longleaf pine survival and groundcover composition. We found that imazapyr, probably the most commonly used herbicide for site prep, did the most damage to longleaf pine groundcover and made using prescribed fire difficult for the decade following its use. Other herbicides such as hexazinone,

triclopyr and metsulfuron methyl left a more intact groundcover plant community and allowed prescribed fires to be used much sooner.

Herbaceous Weed Control to Establish Longleaf Stands

David Dickens, PhD, University of Georgia, Warnell School of Forestry & Natural Resources, ddickens@uga.edu

The most difficult phase in the life of a longleaf stand is the establishment phase (Boyer 1972). Herbaceous weeds are typically the main competitors in the first three years of the establishment phase. Proper pre-plant site preparation is very important to help ensure good longleaf planting survival. Post-plant herbicides can be used to control herbaceous weeds (hence herbaceous weed control) soon after planting to further aid in longleaf survival and early growth. This presentation will discuss the labeled herbicides and dosages for over-the-top applications in newly planted longleaf stands, the survival and growth of planted longleaf to labeled herbicides, the effect of herbicide application timing on longleaf survival and growth and a pre-plant + post-plant herbicide combination that will control woody vegetation and broadleaf weeds but keep native grasses in the row middles and give longleaf seedlings a free-to-grow micro-environment in the rows.

4-D: WORKING FORESTS: Landowner Technical Assistance Meet and Greet

Private landowners and all land managers are invited to join local natural resource experts from around the range of longleaf for a meet and greet session WHERE YOU CAN SEEK ANSWERS TO YOUR LAND MANAGEMENT QUESTIONS. Longleaf Alliance staff, private consultants, state forestry commissions, and the Natural Resources Conservation Service will be available to discuss and help with individual management issues.

5-D: Longleaf Mapping Project Workshop

In this workshop, we will give a broad overview of the differing aspect of the "Cost-Effective Mapping of Longleaf Extent and Condition using NAIP Imagery and FIA Data: A Pilot Project in the Heart of the Longleaf". Join us as we discuss the results of this mapping effort, field protocols, new spatial tools, how to use the outputs to help in restoration planning and monitoring, and future recommendations.

Session Leaders:

Jason Drake, Forest Ecologist, USDA Forest Service, National Forests in Florida, jasondrake@fs.fed.us John Hogland, USDA Forest Service, Rocky Mountain Research Station, jshogland@fs.fed.us Amy Knight, Florida Natural Areas Inventory, Florida State University, aknight@fnai.fsu.edu Joseph St. Peter, University of Montana, jstpeter@fs.fed.us

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Longleaf pine at the edge of its range, investigating and restoring the longleaf pine ecosystem in the Piedmont of North Carolina

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The North Carolina Piedmont is often overlooked in the discussion about preserving and restoring longleaf pine. However, the longleaf ecosystem was once more extensive in this region than many realize and its distinctive understory composition and the breadth of conditions under which it occurred make it worthy of more attention. A surprising amount of longleaf pine is found in small patches in the North Carolina Piedmont. The North Carolina Zoo and its partners have been mapping these remnants and working to restore some of them through the application of prescribed fire. We have also been examining soil types where remnants are found, to help locate suitable sites for longleaf Pine Preserve, which has longleaf pines up to 280 years old, trees with turpentine scars, and large trees that have grown since the turpentine era. Two prescribed burns have begun the restoration of this site, which was long fire-suppressed. At other Piedmont longleaf sites with a longer restoration history, prescribed burning is starting to bring back the former diversity of understory species. Although the Piedmont is beyond the range of wiregrass, patches of little bluestem, annual wiregrasses and others carry fire very well in upland areas. Reintroduction of fire in wetter areas brings out pitcherplants, ferns and orchids along with grasses. Many plant species thought to be more typical of the adjacent Sandhills predominate with the return of fire.

Longleaf Pine: Resiliency and Collaboration in the Wildland Urban Interface

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The Wildland Fire Resilient Landscapes (WFRL) program is a new approach to achieve fire resiliency goals across landscapes between the Department of the Interior (USDI) and other partners. The WFRL program places priority on landscapes at elevated risk posed by wildfire, where fire risk could be mitigated, along with re-establishing the ecological function of fire for enhancing or protecting critical natural resources and watersheds. In the South Atlantic geography, longleaf pine is identified as a resilient landscape where significant gains could be achieved investing in prescribed fire to reduce fuels, decreasing the potential for catastrophic wildfires. While treating hazardous fuels is the primary objective, increased ecological function and improved habitat for fire-dependent species associated with longleaf pine are beneficial outcomes.

Epicenters for the South Atlantic Longleaf Pine Resilient Landscapes project include St. Marks National Wildlife Refuge (NWR) in Florida, Okefenokee NWR in Georgia and Florida, and Carolina Sandhills NWR in South Carolina. Fire managers from these refuges are working collaboratively with neighbors to implement prescribed fire treatments.

The Resilient Landscapes program is a five to ten-year investment by the USDI to holistically manage these landscapes. The return on investment will be a landscape resilient to the effects of wildfire and the high costs associated with controlling unplanned ignitions. This program has multiple beneficiaries including the dozens of species thriving in a highly functioning longleaf pine ecosystem. However, the ultimate beneficiaries are our neighbors in the wildland urban interface, whose property will have increased resiliency due to these collaborative treatments.

Does Retaining Trees Increase Hardwood Topkill in Longleaf Stands Managed with Group Selection?

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Group selection is a silvicultural alternative to single-tree selection for management of natural longleaf pine stands, but there are concerns that prescribed fire temperatures in large (e.g., ¹/₄ acre) openings may be too cool

to kill back competing hardwoods. Retaining large pines within openings has been proposed as a way of mitigating these undesirable effects of group openings. We measured flame temperatures and post-fire hardwood resprouting seven years after harvest in a silvicultural experiment in second-growth upland longleaf pine forest in southwest Georgia that contrasted single-tree, group, and group selection with retention treatments. We placed thermocouples across the entire size range of natural and silvicultural openings and measured flame residence time and temperature during the fourth post-treatment prescribed fire, seven years after harvest. Hardwood height and resprouting status were measured in 900 randomly located 2-m radius plots. Flame temperature declined with increasing distance from trees, and hardwood density and incidence of resprouting from the crown were significantly less in group selection with retention than group selection treatments. We conclude that retaining trees within group selection openings provides improved hardwood control as well as offering some flexibility for preserving exemplary trees. Group selection with retention may prove a useful adjunct for uneven-age management of longleaf pine forest.

Evaluating the Efficacy of Using Translocation to Recover Bobwhite Populations in the New Jersey Pine Barrens

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Northern Bobwhite (Colinus virginianus) have been experiencing precipitous range-wide declines since the 1960's, largely attributed to habitat deterioration and changes in land use. Attempts to augment bobwhite populations have been relatively successful using translocation, whereby individuals are relocated to areas with favorable habitat prior to breeding season. The objective of this on-going project is to evaluate the efficacy of intensive forest management regimes including prescribed burning, forest thinning, and roller chopping to reestablish early successional pine habitat suitable for bobwhite. Additionally, it examines the plausibility of translocation as a means to restore bobwhite populations at the periphery of their range in sites where no conspecifics were present prior to translocation. The study site is the largest (6,800 hectares) privately owned land tract in New Jersey. It is a mix of shortleaf pine (Pinus echinata), pitch pine (Pinus rigida), scrub oak (Quercus ilicifolia), and early successional grasses. For three consecutive years (2015-2017) prior to breeding season, 80 radio-collared bobwhites are being translocated from wild populations in southwest Georgia. These individuals are radiotracked 3-5 times per week year round to monitor summer (pair) and winter (covey) habitat use, survival, and reproductive success. A subset of points will be used for microhabitat measurements to characterize canopy, basal area, and ground-level vegetation. Survival will be estimated using staggered-entry Kaplan Meyer analyses and a Cox proportional hazard model in R to determine covariates of daily mortality. This project will contribute to the current state of knowledge on bobwhite population recovery via forest management and translocation.

Conservation Progress on the Chattahoochee Fall Line

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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 has made significant strides 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 40,000 acres around Fort Benning 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. In this Army Compatible Use Buffer (ACUB) area over 27,000 acres are under permanent conservation protection including the new Chattahoochee Fall Line Wildlife Management Area (CFL WMA). The CFL WMA is co-owned and co-managed by the Georgia Department of Natural Resources and The Nature Conservancy. Stewardship activities on this tract

focus on longleaf conservation. Located near Columbus, Georgia, the CFL WMA has provided new opportunities for public hunting, youth hunting education and outdoor recreation. Across the entire CFLCP landscape, diverse stewardship and monitoring activities designed to expand the acres of longleaf, enhance forest health and track ecosystem response to management are on-going. To generate future opportunities for land protection and increase stewardship activities on private lands, a broad-based landowner outreach program is underway. The CFLCP has achieved longleaf conservation progress along the Fall Line and is poised to produce additional results moving forward!

Effects of Planting Month (Sep – May) on Survival of Containerized Longleaf Pine Seedlings in Virginia

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Longleaf pine planting efforts in Virginia have expanded greatly in the last decade, and with that increased activity has come uncertainty regarding optimum planting timing at this northern limit of the species' natural range. Concerns over winter temperature extremes and fall / spring rainfall patterns have generated debate as to the recommended season for planting containerized seedlings. Therefore, in both the 2014-2015 and 2015-2016 planting seasons we have installed a study to compare the survival of containerized seedlings planted at mid-month from September through May in ten-tree plots replicated six times. The study is located at Lone Star Lakes City Park near Suffolk, Virginia. Seedling survival has been tallied monthly or bi-monthly on all of the plots.

Since the source seedlings for all planting dates were grown at the same time, seedling age at time of planting is not consistent – for example, the seedlings planted in May of a given year are 9 months older from seed than those planted in September. But this would also be the case in an operational scenario. Results thus far suggest that survival is excellent in any month except January-February (when cold temperatures are limiting) and May (when either seedling age of summer temperatures may be limiting). The most recent survival data from both years of this study will be presented. Because of potential concerns over nursery lifting or storage constraints, the conclusion from these plots is that fall planting (October – December) should be recommended for containerized longleaf pine in Virginia.

Ten-year performance of longleaf pine from eight geographic sources planted in southeast Virginia *Jerre Creighton, Virginia Department of Forestry, jerre.creighton@dof.virginia.gov & Billy Apperson, Virginia Department of Forestry

A longleaf pine provenance test was planted in the spring of 2006 in southeast Virginia. Seed from Mississippi, Florida, Alabama, Georgia, South Carolina, North Carolina (2 lots) and Virginia was used to propagate containerized seedlings in a greenhouse facility at the Virginia Department of Forestry's New Kent Forestry Center. The seedlings were planted in 49-tree plots replicated twice at each of three locations: the Garland Gray Forestry Center (in Sussex County), the New Kent Forestry Center (in New Kent County), and Sandy Point State Forest (in King William County) – a total of six replications. Because the population of known native Virginia longleaf pine trees has diminished to fewer than 200 individual trees (from original estimates of more than one million acres present at the time of European settlement), this study is important for documenting the relative performance of this genotype from the northern limit of the species' range. Periodic measurements of total height and diameter have been completed 3, 5, 7, 9, and 10 years after planting.

Age three results from the study showed a significant advantage of the Virginia seedlings over other sources in survival and rate of emergence from the grass stage. By age ten, the individual tree growth (height and dbh) averages were similar among sources from Virginia and North Carolina. Our conclusion is that the few remaining individual trees of the native Virginia source are better adapted to local conditions than more remote provenances, and therefore merit continued efforts to preserve and propagate the genotype.

Increasing Landowner Capacity Through Experiential Learning: Evaluations of Prescribed Fire Field Days Across the Southeast

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The ability to maintain and enhance longleaf pine ecosystems across the Southeast rests on the ability to effectively manage private lands with prescribed fire. Unfortunately, landowner capacity has been identified as a significant impediment for the appropriate use of prescribed fire across the region. Typically, a lack of knowledge and experience among landowners results in overwhelming concerns regarding liability that impede on their desire and ability to burn. Effective outreach efforts must be developed for landowners that focus on increasing both knowledge and experience to build the necessary capacity to burn. Prescribed fire field days are being used as a means for overcoming these capacity issues by leveraging experiential education techniques that allow landowners to engage in the practice of burning. Recently, members of the Southeast Regional Partnership for Planning and Sustainability Prescribed Fire Workgroup conducted several prescribed fire field days collaboratively with other agencies and organizations in various state across the longleaf region (Alabama, Louisiana, Mississippi, North Carolina, Texas, and Virginia) to educate and train private landowners in prescribed fire. Formal evaluations were conducted to understand the effectiveness of this experiential approach for overcoming the aforementioned impediments. Our results show that by creating prescribed fire field days that leverage a multi-faceted approach predicated on experiential learning, it provides the necessary knowledge and experience needed by landowners to promote active burning on private lands. By understanding the overall approach utilized and its ability achieve meaningful outcomes, it can help to provide a useful and replicable model.

Communication Strategies to Increase Prescribed Fire Use on Private Lands

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Private landowners in the United States face many challenges in utilizing prescribed fire as a land management tool. With as much as 87% of forest land under their ownership in the Southeast, reaching them effectively and building a positive network that supports prescribed burning efforts is essential to protect the ecological and economic value of their land. However, communication issues and other factors contribute to challenges facing prescribed fire goals on private lands. In addition, private landowner perceptions of prescribed fire as a land management tool can have a significant impact in achieving goals. To ensure that landowner perceptions support desired objectives, significant efforts must be made to communicate the benefits of prescribed fire. Landowner concerns that have been found to inhibit their use of prescribed fire will be provided, along with suggested mechanisms to address negative perceptions. Current communications literature suggests that landowners within the United States respond best to peer-to-peer approaches and interpersonal communication with experts. Examples of how these forms of communication can be encouraged and developed to promote outreach success will be provided. In addition, seven best practices for communicating with landowners about prescribed fire were developed during the July 2015 "Putting Fire to Work for Working Forests and Landscapes: Best Practices for Communication and Delivery of Prescribed Fire Messaging"

The Sandhills Longleaf Pine Conservation Partnership (SLPCP) Prescribed Fire Rental Trailer

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The SLPCP is an LIT primarily located in Chesterfield, SC with a 365,000-acre focus area surrounding 101,000 acres of public lands. Formed in 2010, the SLPCP initially focused on education and outreach promoting the importance of longleaf while offering cost-share assistance for longleaf establishment.

Five years and collectively over 12,500 acres of planted longleaf later, the Partnership is now introducing the importance of longleaf management, and in this instance, the use of prescribed fire.

Area residents are used to seeing active prescribed fire management in use on the surrounding public lands, but lack the skills and knowledge to apply fire on their own land. In 2014, the Partnership added a "Learn and Burn" educational series where attendees participate in an annual prescribed fire on a private tract.

Because many landowners lack the appropriate equipment to safely outfit a burn "crew", funds were used from the Partnership's third National Fish and Wildlife Foundation grant to build and stock a prescribed fire rental trailer. Additionally, the trailer is wrapped with eye catching graphics which include a burner overlooking a fire, quail and a stand of mature longleaf with native understory.

The trailer is a key tool in the private landowner management toolbox. Outfitted with drip torches, water storage tanks, sprayers, fuel storage cans, fire rakes, flaps, shovels, axes, radios, gloves and road signs, the trailer gives landowners additional tools for safer burning.

Eight landowners rented the trailer during in the 2015-16 winter burn season.

Using Historical Citizen Science to Understand Wildlife Species Abundance and Distribution in the Longleaf Pine Ecosystem

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Museum records and formal scientific information are essential, but not always sufficient, to adequately document the historical distribution, abundance, and cultural traditions associated with wildlife species. Though we know many species of conservation concern associated with the longleaf pine ecosystem, including gopher tortoises, southeastern pocket gophers, and indigo snakes, have declined alarmingly over the last 100 years, historical information on their distribution and abundance within this range is limited. Similarly, little scientific evidence is available for how or whether populations of these and other species such as northern bobwhite quail respond to longleaf pine restoration efforts on public and private lands. Such information does exist, however, in the observations and memories of non-expert area residents such as hunters and private landowners. This kind of firsthand knowledge is a largely untapped source of wildlife information. In an attempt to record it, we have been interviewing longstanding area residents and natural resource professionals about historical occurrence of longleaf-associated wildlife species in Alabama and adjacent areas. In this poster, we report on the data obtained from these interviews as well as how it will be used to inform wildlife management efforts for species of concern. Our research is ongoing, and we are currently recruiting members of the public to participate as interviewees in is this unique approach to wildlife management through historical citizen science.

What do Landowners Think About Longleaf and What Are They Doing on their Land?

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During the summer of 2015, we surveyed landowners in the South about their attitudes and behaviors around longleaf conservation. Our audience included Tree Farmers with larger acreage throughout historical longleaf counties and non-Tree Farmers in Southern Mississippi. We found that Tree Farmers own more acres and have restored twice as many to longleaf when compared with the non-Tree Farmers. And they are somewhat to extremely knowledgeable about longleaf. For non-Tree Farmers, almost one third have no knowledge of longleaf. For those landowners who have conserved longleaf, they see the top benefits as wildlife, tolerance to disease, pests and wind, valuable products and aesthetics.

For the Tree Farmers who have not taken an action around longleaf conservation, their barriers are around the belief that longleaf isn't right for them. This belief is due to misperceptions (around economics, funding, site condition) and not understanding all the benefits. Non-Tree Farmers from MS don't understand the benefits of longleaf or the funding opportunities available. Therefore, promoting the benefits and trying to mitigate the cons around restoring longleaf would be important for both audiences. Non-Tree Farmers who want to restore longleaf need additional tools and resources to move them from acceptance to taking an action.

Landowners in general need a better understanding of the agencies providing assistance around longleaf restoration. We found low knowledge of the different funding agencies from both audiences, even though more Tree Farmers reported receiving financial assistance.

The Sources of Water Used by Longleaf Pines

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Longleaf pines successfully inhabit xeric environments. It is natural, therefore, to wonder where the water used by the trees comes from. Potential sources include precipitation, soil moisture, shallow and deep groundwater, and surface water. During 2015–2016, we compared the stable isotopes of water contained in longleaf pines of different sizes with the stable isotopes of various water sources, such as seasonal changes of precipitation, shallow and deep groundwater, and nearby surface water at a study site at the Carolina Sandhills National Wildlife Refuge near McBee, South Carolina. This poster will present the preliminary results of this study, and should have important implications to the forward management of longleaf pines.

Longleaf Restoration Efforts on National Forest Lands

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National Forests in the Southeastern United States (Region 8) are home to over 800,000 acres of longleaf pine, which serves as critical habitat for numerous species, including the Red-Cockaded Woodpecker. Annually over 5 million longleaf pine seedlings are planted and approximately 500,000 acres are prescribed burned. Maintaining/improving the existing longleaf pine ecosystem is a priority as well as restoring lands that were once primarily longleaf pine. As climate change is upon us, new planting zones are being developed across the longleaf range in anticipation of longleaf pine being suitable further north than its historic range. Current genetics efforts are focused on DNA fingerprinting of longleaf pine in the seed orchards and seed banks to ensure pure longleaf seed. Recent concern over hybridization with loblolly may present the opportunity to look at impacts to National Forest Lands from adjacent landowners, though most hybrids would likely not survive the frequent prescribed burning program. Steadily the USFS is making progress towards restoration of longleaf pine on the landscape.

A Fire Legacy on Longleaf Pine Regeneration

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A complex series of conditions must be realized for natural longleaf pine (Pinus palustris Mill) regeneration to become established in a mature longleaf pine forest. The use of prescribe fire greatly assists in pine establishment, enabling the germination of seeds on bare mineral soil and aiding its persistence within the understory, midstory, and overstory. In 1986, prior to an expected longleaf pine mast year in Fall of 1987, land managers at Ichauway, a 29,000 acre preserve in southwest Georgia, established 100 circular plots (0.03 ha) throughout the property to monitor establishment of longleaf pine seedlings and to follow their survival and growth over time. Fifty plots were burned and fifty plots left unburned prior to seedfall. After initial seedling establishment, all plots were burned on a biennial cycle. Seedling survival, root collar diameter, height and new seedling recruitment were measured within plots in 2004, 2005, 2006, and 2015.

The average number of seedlings per hectare was significantly greater in burned plots for all years measured (all p-values ≤ 0.01). Mortality related to seedling density was greater in burned plots than in unburned plots; however, relative mortality rate was greater in unburned plots with approximately 58% of the initial seedling cohort having died as of 2015 compared to 43% of initial seedlings in burned plots. These results are indicative of long-lasting effects of fire on natural regeneration in a mature longleaf pine forest that can be detected several years after a seedfall event.

Observations of Montane Longleaf Pine in the Uwharrie Mountains of Central North Carolina

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Montane longleaf pine (*Pinus palustris*) forests are rare and no detailed inventories exist that document stands in North Carolina. We have thoroughly (casually) inventoried one (two) forests with steep sloped, old-aged

longleaf pine in the Wood Run and Badin macrosite regions of the Uwharrie Mountains in central North Carolina. At The Gold Mine Branch site, we inventoried all longleaf pine trees (n = 403) growing in a 24-ha remnant montane longleaf pine forest to (1) map their location, (2) document age/height/diameter characteristics, and (3) determine special ecological features of this rare montane population. This stand contained a variety of growth-stage categories, but was dominated (63%) by mature-stage trees growing on south- and southwestern-facing slopes, while nearly all regeneration-stage trees (i.e., grass and juvenile) occurred on northwest-facing slopes, suggesting environmental conditions conducive to establishment have changed. Median (maximum) tree age at 0.3 m height was 116 years (272 years), and at least seven trees were greater than 150 years old, with four trees establishing in the 18th century. The Fraley stand (~12 ha) contained ~200 longleaf pine trees in all growth-stage categories with the oldest (200+ yrs.) trees located near ridgetop. Near the Dutchman Creek Trail, dispersed pockets exist (~100 trees over 40 ha.) containing the oldest montane tree we have found (>279 yrs.). We conclude that the abundance of trees of various ages including old-growth, occurring principally on steep, southerly slopes warrant "montane" longleaf pine forest status in North Carolina.

Using Dendrochronology to Reconstruct Fire Regimes of Longleaf Pine Ecosystems in the Southeastern Coastal Plain

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Dendrochronology is the branch of science that is focused on the analysis of tree rings. One application of dendrochronology is the study of past fires. By analyzing fire scars found in annual rings, researchers can learn about the past frequency, seasonality, and sometimes extent and severity of fires. Few tree-ring based reconstructions of fire in longleaf pine (Pinus palustris) ecosystems of the U.S. Southeastern Coastal Plain exist, in part due to unique challenges of working with this species and in this region. We present field methods that improve the likelihood of locating fire-scarred longleaf pine. We are currently using these methods to develop fire histories for several sites in Florida and Georgia. Dendrochronological reconstructions of past fire can inform land management aimed at the restoration of longleaf pine ecosystems by providing direct evidence of historic fire activity.

Restoration and Maintenance of the Northernmost Longleaf Pine Community, Blackwater Ecological Preserve, Isle of Wight Co., VA

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The Blackwater Ecological Preserve encompasses the northernmost extant assemblages of Longleaf Pinesavanna and Longleaf Pine-Turkey Oak communities. Since the acquisition of the property in 1984, regular prescribed fires have greatly increased the population size and quality of the pyrophytic communities. In addition to naturally reproducing Longleaf Pines, the area supports many state-rare plants. We have cultured several of the rare plants with an emphasis on orchids. Additionally, the Preserve harbors archaeological relics from the naval stores industry, believed to be the only remaining tar kilns and turpentine stumps in Virginia, and of great historical impact in the development of shipbuilding in Hampton Roads. In summer 2016 we conducted a census of all Longleaf Pines on the property and collected spatially-referenced data on individual tree diameter and height. Dendrochronology data from a random subset of trees was used to examine relationships between age, diameter, and height. These data will be analyzed in ArcGIS to test hypothesized correlations between tree density, diameter, and height, and non-random seedling production across the landscape. Future endeavors include examining the relationship between Longleaf Pine seedling age and survival after burning, and identifying a genetic barcode for the Longleaf Pine ecotype found in southeastern Virginia and adjacent North Carolina.

The Center for Biodiversity at Joseph Pines Preserve

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The Center for Biodiversity is a 1.5-acre parcel with a 3000 square foot building adjacent to Meadowview's 232acre Joseph Pines Preserve. The Center supports the conservation, protection, and restoration of the endangered longleaf pine/pitcher plant ecosystem in Virginia. The Center allows Meadowview staff to train students and the general public about the need and value of rare plant and animal conservation, support ongoing scientific research and restoration efforts at the Joseph Pines Preserve, and demonstrate how a sustainable lifestyle can support habitat restoration. The Center property is part of a conservation plan to acquire over 2000 contiguous acres and provide one of the largest and best managed examples of a longleaf pine ecosystem in a multi-state area. This property represents the northern limit of the known range of the longleaf pine ecosystem. Habitat restoration has included mechanical clearing, chemical site treatments, prescribed fire, and controlled reintroductions of 18 indigenous rare plant taxa (including one federally endangered species). Habitat is also provided for one federally endangered bird species (red-cockaded woodpecker), one state threatened bird species (Bachman's sparrow), and one endangered fish species (blackbanded sunfish).

Challenges in Propagating the Pinelands Nerveray, Tetragonotheca helianthoides L.

Richard Curzon & *Philip M. Sheridan, Meadonview Biological Research Station. meadonview@pitcherplant.org

Tetragonotheca helianthoides is an extremely rare plant in Virginia with one extant occurrence and ranked S1 by the Virginia Dept. of Conservation and Recreation. *Tetragonotheca helianthoides* is part of a rare plant reintroduction program at our Joseph Pines Preserve in a longleaf pine ecosystem restoration project. Therefore, the seed ecology of pinelands nerveray needed to be understood for successful propagation and reintroduction of this rare species. Due to the limited number of indigenous seeds available for research, adaptive research was employed to determine an effective way to produce seedlings for restoration purposes. We found that *Tetragonotheca* seedlings were highly susceptible to fungal pathogens and the thick seed coat inhibited germination. We devised a seed coat sterilization and seed extraction technique that allowed us to get seedlings into the second year of growth, including winter dormancy. *Tetragonotheca* continues to be a challenging plant to raise and the many hurdles we face in its cultivation may explain its rarity in the wild.

Prescribed Fire Increases Plant Species Richness in Restored Virginia Longleaf Pine Habitats.

Philip M. Sheridan, Meadonview Biological Research Station, meadonview@pitcherplant.org & Alex Petzke, Department of Environmental and Forest Biology, State University of New York College of Environmental Science and Forestry

Longleaf pine forests are known for high plant species diversity. A number of research studies in the southeastern U.S. support the hypothesis that high plant species diversity in longleaf pine forests is enhanced by disturbance provided by frequent fire. We were interested in determining whether this hypothesis was supported in longleaf pine restoration sites in Virginia, when Virginia longleaf pine habitats might rival plant diversity found in southeastern U.S. longleaf pine habitats, and if herbicide had a negative effect on plant diversity. We collected data on two longleaf pine nature preserves in Sussex and Prince George County, VA (Cherry Orchard Bog Preserve and Joseph Pines Preserve) and found that plant diversity increased over time with prescribed fire. We predict that Virginia longleaf pine forests, managed with regular prescribed fire, could achieve 50 species/m2 within 48 years and rival diversity found in their southeastern counterparts. We also found that herbicide application did NOT have a negative effect on plant diversity.

Restoring Groundwater Hydrology in a Virginia Pitcher Plant Seepage Wetland

Philip M. Sheridan, Marissa Merhout, Dennis Jewell, & Brennen Ferris, Meadowview Biological Research Station, meadowview@pitcherplant.org

Pitcher plant habitats in southeastern Virginia are typically located on 0 order headwater seepage wetlands with marine deposits of sandy to sandy loam soils. Frequent fire is important in keeping pitcher plant habitats open and preventing the encroachment of competing vegetation. We initiated a longleaf pine/pitcher plant ecosystem habitat restoration program at our Joseph Pines Preserve in Sussex County, VA that included an aggressive assault on competing woody plant species. We observed an increase in groundwater in our seepage bogs after treatment of woody plant competitors and conducted graduate and intern research to measure the

effects of woody plant control on groundwater hydrology at our preserve. We found that conversion of a dense mixed oak/pine forest to longleaf pine savanna resulted in a 25% reduction in evapotranspiration, or a retention of almost 4 million gallons of water/year on a 24-acre watershed. We also found that seepage bog pore water was potable and met state certified lab criteria as drinking water with a total dissolved solids level of 9. We found that rainfall enters the ground water column within two days of a rain event. These results indicate that Virginia pitcher plant wetland hydrology is very sensitive to woody plant invasion, pitcher plant seepage water is very clean, and that surface activities could quickly contaminate the aquifer.

Fire Tales, Poems, and Paintings: The Southland Pyroparadigm Gains Transcontinental Traction *Johnny Stowe, South Carolina Department of Natural Resources, stowej@dnr.sc.gov*

Fire is an ancient, symbolic and resonating part of human ecology, and tends to elicit polarized passions. Show me your fire literature and art, and I'll know if you love to love fire, or love to hate fire. Similarly, show me how you tell the world about your emotional experience with fire, and I will know if you mostly love to light fires, or mainly love to fight fires. Granted, this is a nuanced phenomenon; some people, policies and programs reside in both camps. But even so, there seems to be a pronounced, diametric predilection to either embrace prescribed fire, or battle wildfire. This is strikingly evident in the way fire is portrayed in the humanities in western North America vis-à-vis the Southland (Southeastern North America). Western fires tend to be portrayed as an enemy to sally forth and fight, whereas in the Southland, fire tends to be revered as a partner, tool and beloved "friend of the forest." The "Southland Pyroparadigm" is healthy and spreading, while the often-pathological, paramilitary-industrial, command-and-control, anti-wildland fire paradigm often fails. Fire prevention and suppression are often ineffective, as well as ecologically and economically unsound. Their role in public safety is often debatable. The Southland model is not universally applicable, in part because "natural," transcontinental fire regimes vary from frequent, low-intensity, small fires, to infrequent, high-intensity, large-scale fires. But the practice and policy of prescribed fire are gaining traction outside the Southland. The culture will follow.

Don't Forget to Look in the Creeks!

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Longleaf pinelands and prescribed fire go hand-in-glove across the Southland, with attention rightly-centered on interconnected public safety, economics, culture and ecology. The ecological aspect has productively focused on game species like bobwhite quail, and other animals and plants -- whose habitats range from highdry sandhills and rocky ridges to seasonally-wet flatwoods and wetlands. These frequent-fire dependent species are iconic, endemic, rare, keystone, or in some other way "special." Bill Boyer once urged longleafers to pay special attention to the "embedded ecosystems" within the longleaf pine landscape. These include fireoak groves, cane-brakes and -savannas, Atlantic white cedar swamps; and Carolina Bays, cypress stringers, sag ponds and other isolated freshwater wetlands. We highlight another taxa and habitat to add to the mix -i.e. a freshwater mussel, the federally-endangered Carolina heelsplitter (Lasmigona decorata), which is found in only a few piedmont creeks - in the Carolinas. Only 154 Carolina heelsplitters are known to remain in the wild. Part of this mussel's critical habitat, including Flat Creek -- which runs through the SC Department of Natural Resources' Forty Acre Rock Heritage Preserve in Lancaster County -- overlaps with longleaf pine firelands. Restoring heelsplitter populations on and near the preserve will be interwoven with prescribed fire restoration of longleaf and shortleaf pine, fire-oak and canebrake communities, with emphasis on protecting water quality and temperature of Flat Creek. This new nexus adds one more nuanced wonder to the longleaf biome ... one more fascinating facet of Carolina biodiversity and aesthetic wonder to North America's most spectacular landscape.

Can Longleaf Pine Restoration Help Mitigate Water Scarcity in the Southeastern U.S.?

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Water supplies have come under increasing stress in the southeastern U.S. in recent decades due to population growth, climate variability, and land use change. Conflicts over water and projections of water scarcity suggest a growing need to evaluate land management options focused on improving water quantity. Our goal was to determine the effects of land cover change on evapotranspiration (ET) in the Ichawaynochaway Creek watershed, a 500 km2 basin in southwest Georgia, and suggest land management options that might improve water yield (precipitation - evapotranspiration). We hypothesized that expansion of irrigated agriculture and changes in forest management practices were the dominant cause of declining water yield. We compiled published annual ET values for major land cover types in the basin and used these values to scale ET to the watershed using landcover data. We validated our scaled ET estimates using historic water yield values from the USGS gauge at Milford, GA. Irrigated agricultural crops, wetlands, and timber plantations had the highest annual ET estimates among major land cover types. Restored, fire-maintained longleaf pine had the lowest ET of any vegetated land cover type in the watershed. Estimated annual watershed ET in 2007 was ~829 mm, which is an estimated 13% decline in water yield since 1968. We estimate that 70% of the cumulative change in ET was from center-pivot irrigation systems, with the remaining change due to expansion of timber plantations. These results suggest that restoring longleaf pine savanna in the region could reduce watershed ET and improve water yield.

Rudbeckia hirta Seeds Harvested in June have Lower Vigor and Viability than Seeds Harvested in August

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Wild species often flower and produce seed over an extended period of time. Collection of mature seeds may occur in multiple seasons, but performance of those seeds may be different. Our objective was to compare vigor and viability of mature *Rudbeckia hirta* var. *angustifolia* seeds that were harvested in June 2014 and August 2014. Vigor tests were conducted using saturated salt accelerated aging, a procedure which subjects seeds to stressful conditions of high temperature and humidity followed by germination testing. Final germination was lower for seeds harvested in June (46-68%) than in August (70-82%). Furthermore, seeds harvested in June germinated later and more erratically than seeds harvested in August after exposure to any level of stress. Non-stressed and stress-treated seeds harvested in August had no significant difference in germination. Based on the vigor differences between the seed lots, we would expect seeds harvested in June to have lower field establishment and shorter storage potential than August seeds.

Longleaf Pine Restoration Efforts in Virginia

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Longleaf pine once covered over one million acres in southeastern Virginia forming the northern stronghold for the longleaf pine ecosystem. The tree was a prized resource for, supplying pitch for the naval stores export industry as well timber production. By the 1860's, unsustainable use of the species use had led to a virtual collapse of Virginia's longleaf forest and in 2000, this once prolific species was reduced to fewer than 200 individual trees across several isolated tracts.

Efforts to protect the state's remnant longleaf and to begin the process of longleaf restoration began in the early 1990s with the establishment of a sandridge preserve situated along the Blackwater River in Isle of Wight County. Since then, over 2,500 acres of land across a 5-county area have been protected by public agencies and private groups for the primary purpose of longleaf restoration. The sites encompass the largest remaining population of native longleaf pines and the state's sole occurrence of the federally endangered Red-cockaded woodpecker. Restoration activities are coordinated through the Virginia Longleaf Cooperators group, one of the Local Implementation Teams established across southeastern US to foster interagency collaboration. The Cooperators group's shared goals are to accelerate the pace of longleaf establishment and use of prescribed fire on public lands and encourage recovery efforts on privately owned lands. While Virginia's original million acres can never return, large and healthy longleaf forested areas are a viable and inspiring vision for restoring Virginia's natural heritage.