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Wildland Fire in the Appalachians: Discussions Among Managers and Scientists

This conference is designed for anyone with an interest in wildland fire in the Appalachian Region. It promises to be unique in its approach to sharing information. First, it is a conference about wildland fire in the Appalachians that is held in the Appalachians. Second, and equally unique, is that the conference is not a research symposium and it is not a managers meeting; it is both. The objective of the Consortium of Appalachian Fire Managers and Scientists and the Association for Fire Ecology is for fire managers and researchers to learn from each other so they can better understand problems specific to the highly diverse Appalachian Mountains and to work together to solve those problems.

The conference includes three concurrent mini-conferences. Over 40 invited speakers will discuss research updates and management experiences. Researchers will discuss plant and wildlife ecology, fire history, invasives, season of burning, and other topics. Managers will share experiences on how to apply fire to the landscape, how to work with media and the general public, and updates to fire management tools such as smoke prediction models, LANDFIRE, and IFT-DSS. A highlight will be success stories from programs such as the Fire Learning Network, Prescribed Fire Councils, and interagency cooperation. The field trip will share managers' experiences in applying research results on the ground.

About AFE

AFE is a nonprofit organization dedicated to improving the knowledge and use of fire in land management. The AFE vision is a membership of respected professionals from around the world who together play a key role in wildland fire ecology research, education, management, and policy, to enhance our knowledge and management of fire as a fundamental ecological process. Every three years AFE organizes and hosts its International Fire Ecology and Management Congress, and hosts smaller fire ecology conferences on regional or topical themes annually. AFE publishes a peer-reviewed E-journal called *Fire Ecology*, recognizes outstanding fire ecologists with our Lifetime Achievement and Student Excellence awards, and provides formal certifications for wildland fire professionals and academic programs.

Our members include scientists, educators, students, managers, practitioners, policymakers, and other interested citizens. Anyone can become a member of AFE, and through active involvement in our events, programs, and projects can help shape the emerging profession and growing field of fire ecology. For more information visit AFE's website at www.fireecology.org.

About CAFMS

The Consortium of Appalachian Fire Managers and Scientists is a Knowledge Exchange Consortium funded by the Interagency Joint Fire Science Program. The primary objective of CAFMS is to form a widening network of fire managers and scientists to facilitate knowledge exchange and interaction among managers and scientists. This includes communicating what is known about natural fire and managing with prescribed burning in the Appalachian region, demonstrating techniques and results, and identifying remaining and emerging research questions.

The backbone of the consortium is a partnership between the fire managers involved in the two Appalachian region FLNs (Appalachian and Southern Blue Ridge) and scientists from the U.S. Forest Service Southern and Northern Research Stations and partner universities in the region. Other partners include additional federal agencies (National Park Service, U.S. Fish and Wildlife Service), nongovernmental organizations (The Nature Conservancy, the National Wild Turkey Federation, and others), and state natural resource and other departments. For more information visit the CAFMS website at www.cafms.org.

Special Recognition and Thanks Go to:

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Emily Summers, Auburn University
Robert Sumner, Blue Ridge Community College

Week at a Glance

Monday
10am-3:30pm: RT-130, Annual Red Card Fireline Safety Refresher Training
4-7pm: Registration opens

Tuesday
9am-5pm: Conference Day 1, see schedule page 4
Evening: Poster Session and AFE Banquet:

5-6:00	Poster Session and no-host cash bar, Roanoke Ballroom F
6-6:30	Break
6:30	AFE Awards Banquet Dinner starts and welcome Address by Brian Oswald, AFE Board President and the Joe C. Denman Distinguished Professorship in Fire Ecology, Silviculture and Range Management, Stephen F. Austin State University, Pocahontas Ballroom B.
7:00	Award Presentation: AFE Certification Program Recipients; Student Travel TREE Grant Recipients, Student Excellence Achievement Awards (Kristen Miller, Daniel Godwin, Jena Ferrarese), Stoddard Lifetime Achievement Award (Lane Green)
7:30	Banquet Guest Speaker Dr. David Van Lear, Professor Emeritus at Clemson University specializing in Silviculture and Forest Soils
8:20	Closing Remarks and End of Banquet

Wednesday
9am-5pm: Conference Day 2, see schedule page 5
Post Conference 5-6:30: Southern Blue Ridge & Appalachian Fire Learning Network Reception (Crystal Room B)

Thursday
8am-5pm: Field Trip. Leaves from Hotel Roanoke, lunch provided. This event is sold out.

Friday
Shortleaf Pine Initiative Meeting/Workshop, 8am – 4:30pm; Lunch provided. Free event at Hotel Roanoke.

CONFERENCE PROGRAM

Day 1-Tuesday, October 8, 2013						
8-9am	Registration/Meet and Greet (Roanoke Foyer)					
Opening Plenary Session: Sharing Experience and Knowledge for Everyone to Benefit (Roanoke Ballroom D)						
9:00am	Welcome and Goals of the Meeting. ***Tom Waldrop,*** Southern Research Station.					
9:20am	**Keynote Address**: Success Stories and Lessons Learned in Developing Manager and Researcher Collaborations. ***Dr. Andrea Thode***, Associate Professor, Fire Ecology and Management, Northern Arizona University; Principal Investigator and Chair, Southwest Fire Science Consortium.					
10:10am	Consortium of Appalachian Fire Managers and Scientists: Strategies and Success Stories. ***Helen Mohr,*** Director, CAFMS.					
10:30am	BREAK—Move to concurrent sessions					
	talk #	**Concurrent Session 1 (Roanoke Ballroom D) Moderator: Dan Yaussy**	**talk #**	**Concurrent Session 2 (Shenandoah Room B) Moderator: Tom Waldrop**	**talk #**	**Concurrent Session 3 (Pocahontas Room B) Moderator: Beth Buchanan**
11:00am	111	Forest Management, Fire, and Neotropical Migratory Songbirds in the Appalachians. ***Todd Fearer***, Virginia Tech.	121	Bird Response to Fire Severity and Repeated Burning in Upland Hardwood Forests. ***Joe Tomcho,*** NC Wildlife Resources Commission.	131	Fire and Bats in the Appalachians: Emerging Threats, Emerging Challenges. ***Susan Loeb,*** Southern Research Station.
11:30am	112	Bird Response to Fire Management and Yellow Pine Restoration in the Mountains of South Carolina***. Drew Lanham***, Clemson University.	122	Synthesis of the Effects of Fire on Southern Appalachian Fauna. ***Amber Pitt***, Bloomsburg University.	132	Water Chemistry of North Branch Simpson Creek and the Rich Hole Wilderness Fire. ***Dan Downey,*** James Madison University.
12:00pm	Lunch is in the Roanoke Ballroom F. Please visit the posters during lunch.					
1:00pm	113	American Chestnut (*Castanea dentata*) and Fire. ***Stacy Clark,*** Southern Research Station.	123	Three Centuries of Appalachian Fire History from Tree Rings. ***Charles Lafon,*** Texas A&M University.	133	Appalachian Fire History from Charcoal in Soils and Sediments. ***Sally Horn,*** University of Tennessee.
1:30pm	114	Oak Regeneration Hypothesis. ***Dan Dey***, Northern Research Station.	124	The National Fire and Fire Surrogate Study, 12 Years of Fuels Management Research in the Southern Appalachian Mountains. ***Tom Waldrop***, Southern Research Station.	134	Ailanthus and Prescribed Fire: Is it a Volatile Combination? ***Joanne Rebbeck,*** Northern Research Station.
2:00pm	115	Timing of Growing Season Burns and Their Effects on Sprouting of Shortleaf Pine Seedlings. ***David C. Clabo***, University of Tennessee.	125	Repeated Fires, Canopy Gaps, and Tree Regeneration in Appalachian Mixed-Oak Forests. ***Todd Hutchinson***, Northern Research Station.	135	Making Sense out of Confusion: A Review of the Fire-Oak Literature***. Pat Brose***, Northern Research Station.
2:30pm		Break		Break		Break
3:00pm	116	Landscape Prescribed Burning with Aerial Ignition: A Review and Discussion of Firing Techniques, Fuel Conditions and Short-Term Results. ***Sam Lindblom***, The Nature Conservancy.	126	Past, Present, and Future of the Monitoring Trends in Burn (MTBS) Severity Project. ***Josh Picotte***, USGS.	136	Red Oak Timber Product Value Loss Due to Fire Damage. ***Joe Marschall,*** University of Missouri- Columbia.
3:30pm	117	Don't Be Afraid to Make Headlines. ***Debbie Crane,*** The Nature Conservancy.	127	Conventional Wisdom vs. Reality: Public Views and Actions In Relation to Fire Management. ***Sarah McCaffery***, Northern Research Station.	137	Technology Transfer: Taking Science from the Books to the Ground at Bent Creek Experimental Forest***. Julia Kirschman***, Southern Research Station.
4:00pm		Discussion Panel		Discussion Panel		Discussion Panel
5:00pm	*End of Tuesday Concurrent Sessions.*					
5-6pm	**Poster Session** with authors in the Roanoke Ballroom F.					
6:30pm	**AFE Awards Banquet** begins at 6:30pm with **Dr. David Van Lear** as Guest Speaker. (Pocahontas Ballroom)					

Day 2-Wednesday, October 9, 2013						
8-9am	Registration (Roanoke Foyer)					
Morning Plenary Session: You See it Your Way, I See it My Way (Roanoke Ballroom D)						
8:30am	Managers Need Research–Researchers Need Questions: Introduction. ***Tom Waldrop***, Southern Research Station.					
8:40am	Management–Research Partnerships from a Scientist's Perspective. ***Pat Brose***, Northern Research Station.					
9:05am	Management–Research Partnerships from a Manager's Perspective. ***Dean Simon***, NC Wildlife Resources Commission.					
9:30am	SILVAH: Managers and Scientists Work Together to Improve Research and Management. ***Susan Stout***, Northern Research Station.					
10:00am	Research–Management Success Stories on the Daniel Boone National Forest. ***E.J. Bunzendahl***, R-8 Daniel Boone National Forest					
10:30am	BREAK—Move to concurrent sessions					
	talk #	**Concurrent Session 1 (Roanoke Ballroom D) Moderator: Helen Mohr**	**talk #**	**Concurrent Session 2 (Shenandoah Room B) Moderator: Patrick Brose**	**talk #**	**Concurrent Session 3 (Pocahontas Room B) Moderator: Maureen Brooks**
11:00am	211	Designation of the New EPA Primary Standard for PM2.5 and the Implications for Prescribed Burners in the Appalachians. ***Dan Stratton***, R-8 National Forest System.	221	Hemlock Wooly Adelgid and Large Fuel Pulses at Shenandoah National Park. ***Missy Forder***, Shenandoah National Park.	231	Smoke Prediction in Complex Terrain. ***Scott Goodrick***, Southern Research Station.
11:30am	212	An Assessment of the Ecosystems of Nantahala-Pisgah National Forest and Surrounding Lands: A Synthesis of the eCAP Methodology and LiDAR Vegetation Analysis, ***Josh Kelly***, Western NC Alliance.	222	LANDFIRE in the Appalachians: Current and Future. ***Jim Smith***, The Nature Conservancy.	232	Multi-Party Monitoring is a Valuable Tool in a Manager's Toolbox. ***Beth Buchanan***, R-8 National Forest System.
12:00pm	Lunch Break in the Roanoke Ballroom F.					
1:00pm	213	Inferring Fire Regimes from Data You May Already Have. ***Melissa Thomas-Van Gundy***, Northern Research Station.	223	The Shortleaf Pine Initiative: Developing an Institutionalized Framework to Restore an Imperiled Ecosystem. ***McRee Anderson***, The Nature Conservancy.	233	Using the Interagency Fuels Treatment Decision Support System to Support Fuels Treatment Planning. ***Mike Rauscher.*** Rauscher Enterprises, LLC.
1:30pm	214	Building a Landscape-Scale Fire Management Collaborative Partnership: the Warm Springs Mountain Restoration Project and Allegheny Highlands Fire Learning Network as a Case Study. ***Sam Lindblom***, The Nature Conservancy.	224	Effects of Fire Severity on Breeding Bird Communities in the Southern Appalachians. ***Nathan Klaus***, Georgia DNR.	234	Fire Severity Assessment in the Allegheny Highlands of Virginia. ***Nikole Swaney***, The Nature Conservancy and ***John Moncure***, USFS, GWJ National Forest.
2:00pm	215	Growing Season Burning in the Appalachians. ***Tom Ledbetter***, R-8 National Forest System.	225	Fire in Bogs: The State of our Understanding Based on Case Examples. ***Adam Warwick***, The Nature Conservancy.	235	Restoring Kentucky Barrens with Prescribed Fire. ***Joyce Bender***, Kentucky State Nature Preserves Commission.
2:30pm	216	The Southern Blue Ridge Fire Learning Network: A Collaborative Partnership to Restore Fire-Adapted Ecosystems and Build Resilient Forests and Communities. ***Margit Bucher***, The Nature Conservancy.	226	Prescribed Fire Councils: A Model for Success. ***Mark Melvin***, Jones Ecological Research Center.	236	Interagency Collaboration: A Key for Success. ***Nathan Klaus and Mike Haisten***, R-8 National Forest System and Georgia DNR.
3:00pm	BREAK—Move to plenary session					
Closing Plenary Session						
3:30pm	Summary, Opportunities					
4:30pm	Wrap up and Field Trip instructions					
5:00pm	*End of Wednesday Sessions.*					
5-6:30pm	**Southern Blue Ridge & Appalachian Fire Learning Network Reception,** cash bar and light refreshments. (Crystal Room B)					

Alphabetical Listing of Speakers and Talk Number

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Bender	Joyce	235	Restoring Kentucky Barrens with Prescribed Fire
Brose	Patrick	PLN	Management–Research Partnerships from a Scientist's Perspective
Brose	Patrick	135	Making Sense out of Confusion: A Review of the Fire-Oak Literature
Buchanan	Beth	232	Multi-Party Monitoring is a Valuable Tool in a Manager's Toolbox
Bucher	Margit	216	The Southern Blue Ridge Fire Learning Network: A Collaborative Partnership to Restore Fire-Adapted Ecosystems and Build Resilient Forests and Communities
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Downey	Daniel	132	Water Chemistry of North Branch Simpson Creek and the Rich Hole Wilderness Fire
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Forder	Missy	221	Hemlock Wooly Adelgid and Large Fuel Pulses at Shenandoah National Park
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Horn	Sally	133	Appalachian Fire History from Charcoal in Soils and Sediments
Hutchinson	Todd	125	Repeated Fires, Canopy Gaps, and Tree Regeneration in Appalachian Mixed-Oak Forests
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Klaus	Nathan	224	Effects of Fire Severity on Breeding Bird Communities in the Southern Appalachians
Lafon	Charles	123	Three Centuries of Appalachian Fire History from Tree Rings
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Ledbetter	Thomas	215	Growing Season Burning in the Appalachians
Lindblom	Sam	116	Landscape Prescribed Burning with Aerial Ignition: A Review and Discussion of Firing Techniques, Fuel Conditions and Short-Term Results
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McCaffrey	Sarah	127	Conventional Wisdom vs. Reality: Public Views and Actions in Relation to Fire Management
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Rebbeck	Joanne	134	Ailanthus and Prescribed Fire: Is it a Volatile Combination?
Simon	Dean	PLN	Management–Research Partnerships from a Manager's Perspective
Smith	James	222	LANDFIRE in the Appalachians: Current and Future
Stout	Susan	PLN	SILVAH: Managers and Scientists Work Together to Improve Research and Management
Stratton	Daniel	211	Designation of the New EPA Primary Standard for PM2.5 and the Implications for Prescribed Burners in the Appalachians
Swaney	Nikole	234	Fire Severity Assessment in the Allegheny Highlands of Virginia
Thode	Andrea	PLN	Success Stories and Lessons Learned in Developing Manager and Researcher Collaborations
Thomas-Van Gundy	Melissa	213	Inferring Fire Regimes from Data You May Already Have
Tomcho	Joe	121	Bird Response to Fire Severity and Repeated Burning in Upland Hardwood Forest
Waldrop	Tom	124	The National Fire and Fire Surrogate Study, 12 Years of Fuels Management Research in the Southern Appalachian Mountains
Warwick	Jeffrey A	225	Fire in Bogs: The State of our Understanding Based on Case Examples

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Day 1-Tuesday, October 8, 2013

Tuesday Opening Plenary Roanoke Ballroom D

Andrea E. Thode

Success Stories and Lessons Learned in Developing Manager and Researcher Collaborations

Abstract: The Joint Fire Science Program has developed fourteen Knowledge Exchange Consortia around the country to bridge the gap between science and management. In particular, the goal of these consortia is to accelerate the awareness, understanding, and adoption of wildland fire science information through a national collaborative science delivery network. Developing manager and researcher collaborations is not only key to the success of the consortia, but to our ability to manage our landscapes. The value gained through such collaborations ranges from improving agency training and developing current students into new professionals, to applying current science, creating new applicable science and utilizing limited resources in new ways. Unique perspectives and common threads of successful collaborations from around the country will be presented.

Helen H. Mohr

Consortium of Appalachian Fire Managers and Scientists: Strategies and Success Stories

Abstract: The Consortium of Appalachian Fire Managers (CAFMS) is part of the Joint Fire Science Program's (JFSP) Knowledge Exchange Consortia Network. We work to connect fire managers and scientists throughout the Appalachian region. Sharing of information between scientists and managers has occurred only in small pockets across the region. Pre-funding was received in the summer on 2009 to assess the need for a consortium in the Appalachian region. The assessment identified a widespread need in the region for fire information sharing. Funding was granted by JFSP in the spring of 2010 to establish CAFMS. In the past few years CAFMS has worked to share information between managers and scientists through a web site, workshops, field trips, synthesis and publications. CAFMS strives to build a strong network of fire managers and scientists that we like to refer to as a community.

Tuesday Concurrent Session 1: Roanoke Ballroom D

111: Todd M. Fearer

Forest Management, Fire, and Neotropical Migratory Songbirds in the Appalachians

Abstract: The Appalachian Mountains Joint Venture (AMJV) is one of 18 habitat Joint Venture partnerships in the United States. It is comprised of state and federal government agencies, non-governmental organizations, universities, and industries that work together to prioritize and coordinate conservation activities while building upon scientific knowledge. Through communication, planning, and conservation delivery, the AMJV works to ensure the long-term sustainability of native bird populations in the Appalachian Mountains. The AMJV focuses on bird species in the greatest need of conservation attention, such as those that have large percentages of their populations within the AMJV region but with limited ranges, small population sizes, declining population trends, or use unique or highly degraded habitats. Most present-day Appalachian forests developed in the wake of extensive land clearing that took place in the late 19th and early 20th centuries. Though they exist in large tracts, forests today are very different from those that existed prior to the 19th century. Present-day forests are very uniform with densely packed trees and closed canopies that lack the variety of overstory and understory habitat structure required by many songbirds. Many of our priority bird species, whether they prefer early successional habitat or are mature forest obligates, require habitat structure that is best created and maintained by some form of forest disturbance. Historically, wildland fire was a key source of forest disturbance in the Appalachians, and its use in forest management today provides a critical tool for enhancing and maintaining forest habitat for many bird species.

112: Joseph Drew Lanham, Curtis Walker

Bird Response to Fire Management and Yellow Pine Restoration in the Mountains of South Carolina

Abstract: To assess the impacts of fire disturbance management on the avian community at Jocassee gorges in the mountains of South Carolina, a total of 1000 10-minute, 50 m radius point counts were conducted in treatment and control plots during the spring breeding seasons of 2011 and 2012. Comparisons of avian communities were made between the burned treatment sites and reference control sites to examine community and priority species response to

prescribed fire. Values of species diversity, species richness, and total number of individuals were found to be significantly higher in the burned treatment plots than in the control plots as a result of differences in structural complexity and the distribution of resources. The occurrence of focal species, as well as other species, was found to vary between sites. Species associated with early successional and more open habitats, such as eastern wood-pewees (Contopus virens) and indigo buntings (Passerina cyanea) were observed more often in burned sites, while species that require shrubbery and broad-leaved foliage on which to forage, such as black-throated green (Dendroica virens) and hooded warblers (Wilsonia citrine), were observed more often in control sites. Models created using structural vegetation data identified characteristics of vegetation and landform that were found to be useful in predicting the occurrence of 6 of the 7 priority species at Jocassee. Differences in the occurrence of nesting and foraging guilds were related to differences in complexity of habitat structure and composition. This research suggests that fire management can be a useful tool to create wider variation across the landscape, providing increased opportunities for nesting and foraging resources for an array of bird species.

113: Stacy L. Clark, Ethan D. Belair, Michael R. Saunders

American Chestnut (*Castanea dentata*) and Fire

Abstract: The American chestnut (Castanea dentata) was a dominant species in upland hardwood forests of eastern North America for thousands of years until the 20th century. The species was extirpated by two exotic diseases: ink disease (casual agent - Phytophthora cinnamomi) and chestnut blight (causal agent - Cryphonectria parasitica). The role of fire in American chestnut reproductive biology and forest stand dynamics is unclear, and no studies have empirically examined the response of American chestnut to fire. Historical and early forestry literature indicates American chestnut seedlings and saplings were easily killed by fire, but prolifically sprouted from the root collar after burning. Seeds did not typically survive burning and could desiccate without a litter layer. Fire often injured overstory American chestnut trees and introduced pathogens that lowered wood quality and tree vigor. We examined fire effects on American chestnut and northern red oak (Quercus rubra) in studies located in Indiana and in Tennessee. In Indiana, American chestnut and northern red oak seedlings sprouted vigorously after being top-killed by surface fires. American chestnut sprouts had lower maximum heights compared to northern red oak sprouts. The sprouting capability and size of sprouts of both species was significantly affected by the size of the original stem. In Tennessee, American chestnut and northern red oak seedlings responded similarly to fire. Both species survived fire through stem dieback and sprouting, but American chestnut had taller sprouts following fire compared to oak; seedlings of both species were significantly larger in unburned areas compared to burned areas. The role of fire in restoration of American chestnut should be approached with caution because trees bred for blight-resistant are extremely valuable, representing decades of research. Fire could cause injury and allow easy entry for pathogens, such as the chestnut blight disease, and will probably retard growth.

114: Daniel C. Dey

Oak Regeneration Hypothesis

Abstract: The regeneration potential of oak is determined by the density and size structure of oak reproduction that occurs collectively as seedlings, seedling sprouts and stump sprouts. Sustaining oak forests requires periodic recruitment of oak into the overstory. Both of these processes, i.e., regeneration and recruitment, are affected by fire. The use of fire to sustain oak forests is predicated on a historic association between fire and oak that resulted in the widespread dominance of oak in eastern North America. Oak has many silvical traits that make it well adapted to a regime of periodic fire such as it preferentially invests in root growth, produces nuts desired by animals that cache seed in the soil, and it has high sprouting capacity, drought tolerance, and thick bark development. The suppression of wildfire has effectively eliminated fire from many oak ecosystems, which has led to the mesophication of oak forests and succession to other species. Prescribed fire is increasingly being used to promote oak regeneration with mixed results. Depending on the life stage in an oak forest, fire can promote oak regeneration and its dominance, or it can act to reduce oak regeneration, promote competing vegetation, and retard oak recruitment into the overstory. Fire can prepare a receptive seedbed for acorns by reducing thick litter and duff layers. It can reduce the density and size structure and hence the regeneration potential of competing woody vegetation. Fire can increase light availability to shade intolerant oak seedlings in forest understories by reducing canopy cover. It can also destroy acorns on the forest floor, cause high mortality of small oak seedlings, and even kill overstory oaks depending of fire intensity. Fire is a tool that can be used to sustain oak forests if it is applied judiciously with knowledge of oak forest ecology and stand dynamics.

115: David C. Clabo, Wayne K. Clatterbuck

Timing of Growing Season Burns and Their Effects on Sprouting of Shortleaf Pine Seedlings

Abstract: Shortleaf pine (Pinus echinata Mill.) is one of the few pine species in North America capable of resprouting after the stem is killed while in the seedling or sapling stages. This sprouting ability of the species might be used as an aid to favor the species silviculturally during forest management. Information is limited on the effects of burning at different periods of the growing season on shortleaf pine seedling survival and growth. The results presented are part of a larger study focused on determining how shortleaf pine seedlings respond to disturbances such as burning and cutting at different ages and at different periods of the growing season. The study was established on the Cumberland Plateau in east Tennessee with 1-0 stock bareroot shortleaf pine seedlings planted in late winter of 2011. Seedlings were planted on a 1x1' spacing in plots which contained 50 seedlings each. Replicated treatments in a randomized block design included an early growing season burn (April), a mid-growing season burn (July), a late growing season burn (November), and an untreated control. Fuel type and volumes were controlled to reduce variation in burns, and burn temperatures and duration were monitored. Data were recorded during January 2013, one full growing season after treatments were applied in 2011. Measurements used as dependent variables included: survival, height of the tallest sprout, and sprout number. Results showed statistical differences in survival among treatments and sprout number with maximum burn temperature as a significant covariate in the sprout number analysis. There were no significant differences in sprout height. Late growing season burns appear to result in greater survival and more sprouts after one full growing season, yet no significant differences in height growth in one-year-old seedlings were found. Sprout development will continue to be monitored.

116: Sam G. Lindblom, Steve Croy

Landscape Prescribed Burning with Aerial Ignition: A Review and Discussion of Firing Techniques, Fuel Conditions and Short-Term Results

Abstract: With the recent increase in the use of large-scale, aerially ignited prescribed burns, many practitioners struggle with designing effective ignition patterns aimed at restoring open canopy conditions without substantial canopy mortality. Additionally, federal, state, and non-government managers are tasked with increasing the amount of both late-successional, open canopy forests and early-successional habitats; both at the expense of late-successional, closed canopy forests, the dominant successional state of the most of our Appalachian forests. Through interviews and several case studies, we present a series of possible tools and observations aimed at simplifying these decisions. Case studies included site visits, reviews of conditions, ignition techniques, and remote sensing. Given a range of weather and fuel conditions, as well as a range of ignition options, managers are faced with balancing short burn windows, increasing smoke management concerns, and challenging fuel and conditions making the achievement of desired conditions problematic. The objective of this session is to generate discussion and a community of practice and information sharing on the topic of aerial ignition to help achieve the restoration of desired forest conditions.

117: Debbie Crane

Don't Be Afraid to Make Headlines

Abstract: Many fire practitioners avoid the news media. Some are afraid of reporters. They fear that the media won't do a good job of telling the story – that an attempt to contact the media will backfire. Others don't contact the media because they don't think the media will be interested. In fact, what you do is very interesting, and the media can do a very good job or promoting controlled burning. Learning how and when to contact the media is crucial to gaining public support for controlled burning.

Tuesday Concurrent Session 2: Shenandoah Room B

121: Joe Tomcho, Thomas A. Waldrop**,** Aimee Livings Tomcho, Ross J. Phillips, Dean Simon

Bird Response to Fire Severity and Repeated Burning in Upland Hardwood Forest

Abstract: Fire management for wildlife conservation requires understanding how species respond to burning at different frequencies, severities, and over time. In an earlier study, we experimentally assessed how breeding bird communities and species responded to fuel reduction treatments by mechanical understory reduction, low-severity prescribed fires, or mechanical understory reduction followed a year later by high-severity prescribed fires in upland hardwood forest. Here, we assess longer-term response to the initial mechanical treatment (M), and a second low-intensity burn in twice burned (B2) and mechanical + twice burned (MB2) treatments and controls (C). Initial (2003) high-severity fires in MB2 created open-canopy structure with abundant snags, resulting in much higher species richness and density of breeding birds compared to

other treatments. Relative density and richness remained much higher in MB2 after a second burn, but few changes were evident that were not already apparent after one burn. The initial (2003) burn in B2 had cooler, low-severity fires that killed few trees. Delayed tree mortality occurred in both burn treatments after one burn, and continued in both after a second low-intensity burn. In B2, this resulted in gradual development of a "perforated," patchy canopy structure with more snags. Abundance of total birds and most species in B2 was similar to C, but several additional species associated with open-forest conditions occurred at low levels, increasing richness in B2. In both burn treatments, burning temporarily reduced habitat suitability for ground-nesting birds. Results indicate that hot fires and repeated burning can create and maintain young forest conditions or heterogeneous canopy structure, increasing breeding bird relative abundance and richness by attracting disturbance-adapted species. Alternatively, one or two low-intensity burns with patches of hotter fire may result in gradual, subtle changes to canopy cover and structure and increased bird species richness over time.

122: Amber L. Pitt, Robert F. Baldwin, Joseph J. Tavano, Thomas A. Waldrop, Ross A. Phillips
Synthesis of the Effects of Fire on Southern Appalachian Fauna

Abstract: Fire has been a powerful force structuring ecosystems for millennia, and in recent decades the use of prescribed fire for ecosystem management has received much research attention. There is no consensus however, as to how fire influences fauna; beyond those species of animals that are known associates of particular plant communities, there is little concrete, generalizable evidence for how fire itself influences populations and persistence. We reviewed the effects of prescribed fire on wildlife in the Southern Appalachians and placed our results in the context of regional, national, and global studies of prescribed fire. We conducted a web search of peer-reviewed literature and technical reports to evaluate the number of prescribed fire studies pertaining to geographical regions and taxonomic groups. A total of 851 relevant, unique, studies were obtained. The majority of studies came from North America (n=578), followed by Australia (n=130), Europe (n=64), Africa (n=36), South America (n=30), and Asia (n=12). Worldwide, the most studied taxonomic group with respect to prescribed fire effects was birds, followed by herpetofauna, mammals, and invertebrates. Within the U.S., most studies were conducted in the Southeast (n=186), followed by the Southwest (n=100), Midwest (n=98), Pacific (n=86), Rocky Mountain (51), and Northeast (n=10) regions. While most U.S. studies came from the Southeast region, the majority were in association with coastal plain/ longleaf pine ecosystems. Relatively few studies examined the effects of prescribed fire on fauna in the southern Appalachians (n=22). Our review of the 22 papers specific to prescribed fire in the Southern Appalachians revealed no strong signals. Effects of fire on fauna were consistent across the studies, in that there was an absence of strong, negative effects, while a number of studies indicated positive, short-term effects. The fact that no strong signals that can be generalized across taxa or ecosystems have been detected in the Southern Appalachians may be due to the localized and/or species-centric character of the studies. By focusing new research on extended spatial and temporal scales, we may gain a better understanding of how fire has influenced distribution of habitats, which when combined with fine-grained field analyses of behavioral and population-level effects, such as the 22 studies from the S. Appalachians, powerful, multi-scale inference could be achieved. Understanding more about how prescribed fire can maintain disturbance and diversity in the context of anthropogenic change could inform landscape-scale, ecosystem-based management.

123: Charles W. Lafon, Henri Grissino-Mayer, Serena Aldrich, Georgina DeWeese, Will Flatley, Lisa LaForest, Jennifer Flatley
Three Centuries of Appalachian Fire History from Tree Rings

Abstract: Many researchers and resource managers advocate an increase in fire use to restore fire regimes similar to those under which Appalachian vegetation developed. Restoring fire implies a need to establish historical reference conditions. It is not clear, however, whether the fire regime that prevailed immediately before the fire exclusion era represents an appropriate restoration target. That period, ca. 1880–1930, witnessed industrial logging and extensive burning that may not have typified earlier fire regimes. We have developed dendroecological (tree-ring) reconstructions of fire history and forest dynamics for a network of sites in the Appalachian Mountains of Virginia, North Carolina, and Tennessee. We sampled living and dead fire-scarred pines to assemble a record of burning—annually resolved—dating back to the 1700s and, at two sites, the 1600s. Based on the record of all fires recorded at each site, fire typically returned at intervals of 2–5 years. More conservative estimates, such as the frequency of major fires scarring at least 25% of all trees at a site, indicate such fires occurred at 4–12 year intervals. The land use changes that accompanied aboriginal depopulation, European settlement and expansion, and logging and mining had minimal effect on fire frequency. Burning occurred at a relatively steady level through all these land use episodes until the early twentieth century. Fire activity thereafter plummeted with the onset of organized fire prevention and suppression, and has remained low ever since. Tree age data that we collected for the study sites illuminate vegetation responses to the shift in fire regime, including encroachment of species such as red maple, white pine, black gum, and mountain laurel into xerophytic stands.

124: Tom Waldrop, Helen Mohr, Ross Phillips, Dean Simon

The National Fire and Fire Surrogate Study, 12 Years of Fuels Management Research in the Southern Appalachian Mountains

Abstract: Four fuel reduction/restoration treatments were applied to forests of the Southern Appalachian Mountains in 2002 and 2003 as a component of the National Fire and Fire Surrogate Study. Each treatment impacted forest structure differently after an initial entry, after repeated treatments, and over time. Compared to the untreated controls, the burn only treatment reduced overstory density and either increased or decreased understory cover depending on the time since treatment; the mechanical-only treatment increased overstory density and reduced understory cover; the combined mechanical and burn treatment greatly decreased overstory density and either increased or decreased understory cover depending on the time since treatment. Each treatment produces significantly different canopy openness as measured by analysis of hemispherical photographs. The amount of sunlight reaching the forest floor impacts many variables including bird habitat, insect abundance, predicted wildfire intensity, vegetation abundance, vegetative composition, and others. Repeated treatments (burning 2003, 2006, 2012 and mechanical 2002 and 2012) either push forests toward the goal of open woodlands or push them farther away. This presentation will discuss multiple benefits from using fuel reduction treatments for restoration objectives.

125: Todd F. Hutchinson, Robert P. Long, Joanne Rebbeck, Elaine Kennedy Sutherland, Daniel A. Yaussy

Repeated Fires, Canopy Gaps, and Tree Regeneration in Appalachian Mixed-Oak Forests

Abstract: Oak dominance is declining in the central hardwoods region as canopy oaks are being replaced by shade-tolerant trees that are abundant in the understory of mature stands. Although prescribed fire can reduce understory density, oak seedlings often fail to show increased vigor after fire, as the canopy remains intact. We studied the response of tree regeneration to a sequence of 3-5 low-intensity prescribed fires followed by canopy gap formation, in southern Ohio mixed-oak forests. We recorded tree regeneration (stems >1′ tall) in 52 gaps that formed in a white oak decline event, 13 years after fires began and 5 years after gaps formed. Twenty-eight gaps were located in three burned stands and 24 gaps were in three unburned stands. Unburned gaps were being filled by shade-tolerant saplings and poles, and were heavily-shaded (7% full sun). By contrast, shade-tolerant saplings had been greatly reduced in the burned gaps, which averaged 19% full sun. Larger oak and hickory regeneration (>2′ tall), was much more abundant in burned gaps, as was sassafras, while shade-tolerant stems were equally abundant in burned and unburned gaps. White oak was the most abundant oak in the burned gaps. Our results suggest that the regeneration potential of oak, particularly that of the relatively shade-tolerant white oak, may be improved with multiple prescribed fires, followed by the creation of moderate-sized canopy gaps.

126: Joshua J. Picotte, Steve Howard, Michael Coan

Past, Present, and Future of the Monitoring Trends in Burn (MTBS) Severity Project

Abstract: Beginning in 2006, the Monitoring Trends in Burn Severity (MTBS) program has generated over 17,000 Landsat-based maps and assessments of wildland and prescribed fires that occurred in the United States since 1984. These products support local, regional, and national assessments of fire effects, emissions, risks, regimes, and post fire fuels inventories. Currently, MTBS relies upon state and federal fire occurrence data (FOD) to guide Landsat scene selection. Analysts manually review Landsat low resolution browse images to select the best scenes to assess each fire. This process is labor intensive and the FOD suffers from spatial and omission errors. To address these issues, we developed a process to automatically identify burned areas on Landsat imagery. From these burned/no burn (BNB) classifications we create fire perimeters and label them with a start date. BNB images are created using CUBIST derived models that use MTBS training data to classify burned areas in Landsat scenes. Hazard Mapping System (HMS) fire detection data is incorporated by using a series of geospatial queries in PostgreSQL to assign fire start dates to the burn perimeter based its proximity to the HMS fire detection. Subsequent automated processes 1) use the fire start date to determine and order many candidate Landsat pre- and post-fire scenes, 2) clip the Landsat scenes to the area around fire perimeter, and 3) bundle all the clipped imagery into easily viewable package. These high resolution image clips are reviewed by analysts to determine the best pre- and post-fire scenes. Successive automated procedures will create differenced Normalized Burn Ratio (dNBR), relativized dNBR (RdNBR), and thresholded burn severity images. These outputs will then be reviewed by analysts to determine their validity. Overall, these automations will enable MTBS to map more fires.

127: Sarah McCaffrey

Conventional Wisdom vs. Reality: Public Views and Actions In Relation to Fire Management

Abstract: As populations living in natural areas increase, the active involvement of the public will increasingly be central to efforts to minimize fire risk and improve forest health. One barrier to effectively engaging the public may be that many of the standard descriptions related to the public and wildfire are based primarily on conventional wisdoms that may or may not hold. Developing an understanding of public views of fire and forest management that is based on empirical rather than anecdotal data will be important in designing policy and outreach that effectively engages the public and ensures that limited resources are most effectively targeted at the issues that are of actual rather than perceived public concern. This presentation will present findings from multiple studies on social issues of fire management with particular emphasis on the accuracy of various accepted truths about the public and fire management, and which variables are associated with more pro-active actions and views in relation to different fire management practices.

Tuesday Concurrent Session 3: Pocahontas Room B

131: Susan C. Loeb, Joy M O'Keefe

Fire and Bats in the Appalachians: Emerging Threats, Emerging Challenges

Abstract: Bats in the eastern U.S. are facing a myriad of threats including habitat loss and fragmentation, mortality from wind turbine collisions, climate change, and most notably, White-nose Syndrome (WNS), an emerging infectious disease that has killed over 5.5 million bats since 2006. Three species that inhabit the Appalachians (Indiana bats, gray bats, and Virginia big-eared bats) are currently listed as federally endangered. Due to high mortality rates from WNS, three additional species (northern long-eared bats, little brown bats, and eastern small-footed bats) are being considered for federal endangered species status. We review the potential impacts and benefits of prescribed fire on Indiana bats and northern long-eared bats, two forest dependent at-risk species. Prescribed fire may have many benefits for forest bats such as increased suitability of forests for foraging (e.g., reduced clutter), increased insect abundance, creation of roosting structures and habitat, and reduced risk of wildfire during the pup rearing season. However, prescribed fire may also have some direct impacts including disturbance when bats are at roost, production of dangerous smoke, and destruction of roosts. Policies regarding prescribed fire in areas where endangered species exist are often conservative to avoid potential take, but concerns about short term impacts may delay management actions necessary to sustain optimal habitat for forest bats over the long term. We will consider how the impacts and benefits of prescribed fire may interact with other stressors, particularly WNS. This information can be used to guide the development of management plans that allow managers and policy makers to balance the short-term impacts on at-risk species with the long-term benefits of prescribed fire for forest bats.

132: Daniel M. Downey, Jens-Peter Haraldstadt

Water Chemistry of North Branch Simpson Creek and the Rich Hole Wilderness Fire

Abstract: In April 2012, an estimated 95% of the understory of the Rich Hole Wilderness Area in the George Washington National Forest of Virginia was burned in a major forest fire event known as the Easter Complex Fires of 2012. The watershed of North Branch of Simpson Creek (NBSC), which drains the southern slope of the Wilderness, was completely within the burned zone. A large database of common water chemistry parameters was available for NBSC from acid rain research conducted during the period 1987-present. Since in other locations forest fires have produced changes in soil composition, surface run-off and water chemistry Forest Service staff saw a unique opportunity for the study of effects of forest fires on streams in the Appalachian Mountains and request James Madison University to conduct a short-term study. As the most dramatic effects of forest fires on streams have been the result of episodic discharge, sampling was conducted May – September 2012 for precipitation runoff events. In addition, synoptic samples were taken in 2012 and 2013 throughout the stream reach. Chemical parameters including pH, acid neutralizing capacity (ANC), Na^+, K^+, Mg^{2+}, Ca^{2+}, Cl^-, NO_3^-, SO_4^{2-} and Al were measured for comparison to previous data sets. Of particular interest was the possible introduction of carbonate from ash and the effect, if any, on ANC. Other parameters, such as turbidity and conductivity, were also evaluated. A second stream, Bob Downy Branch near the burned area, was not affected by the forest fire and served as a "control" with samples collected coincidentally with those from NBSC. The paper will present the unique combination of forest timber stands, historic and present day land use, acid deposition, geology and the fire in the observed water chemistry of NBSC.

133: Sally P. Horn, Christopher A. Underwood, Alisa L. Hass, Mathew S. Boehm, Matthew J. Valente, Henri Grissino-Mayer, David S. Leigh, Zheng-Hua Li, Charles W. Lafon

Appalachian Fire History from Charcoal in Soils and Sediments

Abstract: Charcoal particles in soils and sediments of the Appalachian region provide evidence of long-term fire history relevant to resource management and to studies of paleoclimate, vegetation history, and the effects of prehistoric and historic humans on the environment. Fire histories reconstructed from charcoal studies are coarse in comparison to fire histories from dendrochronological records, but charcoal records extend beyond the reach of tree-rings, at some sites back to the Late Pleistocene over 14,000 years ago. We focus here on fire history interpreted from charcoal particles of different sizes preserved in soils and in lake and wetland sediments of the southern Appalachian Mountains of Tennessee and North Carolina. Particles of microscopic (<125 μm) charcoal on slides prepared for pollen analysis are often interpreted to reflect regional fires, whereas larger, macroscopic charcoal particles in sediments or soils are interpreted as evidence of local burning. This generalization follows from expectations of charcoal transport during and after fires, and is probably more true for macroscopic than microscopic charcoal. That is, larger charcoal particles, especially large (>2 mm) charcoal particles in soils, provide strong evidence of fires onsite, whereas smaller particles could derive from either local or distant fires. Soil charcoal >2 mm may be of sufficient mass to enable AMS radiocarbon dating of individual particles. When such particles also can be taxonomically identified, they provide information on prior vegetation composition as well as the timing of past fires. Soil mixing due to physical and biological factors creates soil profiles in the southern Appalachians in which charcoal age is not predictable from charcoal depth. Unlike lake sediment sequences, in which ages of charcoal or other components can be estimated from radiocarbon dates that bracket the materials, soil charcoal records from the southern Appalachians require the dating of large numbers of individual charcoal particles.

134: Joanne Rebbeck, Todd Hutchinson, Louis Iverson, Michael Bowden, Aaron Kloss

Ailanthus and Prescribed Fire: Is it a Volatile Combination?

Abstract: Throughout much of the Central Hardwoods region, the use of prescribed fire on public lands has increased rapidly in the last decade to improve oak regeneration. While prescribed fire can favor oak regeneration, its use may also increase risk of invasion and expansion of non-native plant species (NNIS). Although fire has often been shown to facilitate the expansion of NNIS in the western US, much less in known about the effects of fire on invasives in the eastern US. In 2008, a team of Ohio scientists and land managers initiated a JFSP project to gain a better understanding of how the distribution and abundance of Ailanthus is related to recent prescribed fires, harvesting activity, seed sources, and other landscape and stand characteristics. Our experimental approach was to efficiently locate Ailanthus seed-sources across a highly dissected forested landscape by employing digital aerial sketch mapping technology to geo-reference adult female trees (seed-producers) during the dormant season from helicopters. Combined with field data of Ailanthus demography, and other stand attributes such as fire, harvesting, and stand structure, we found that recent harvest activity (<25 years) was the best predictor of Ailanthus presence; and that prescribed fire was not. We also quantified the direct effects of prescribed fire on the demography of Ailanthus populations, with and without a pre-burn application of stem-injected herbicide, and found that after one prescribed fire, Ailanthus germinants and sprouts from top-killed saplings and trees were poor competitors with faster-growing post-fire woody regeneration as forest floor shading increased over time. This study demonstrates that prescribed fire alone does not appear to facilitate the spread of Ailanthus. These findings also suggest that further empirical studies are needed to address the combined impacts of fire and timber harvesting on Ailanthus invasions in eastern US forests.

135: Patrick H. Brose

Making Sense out of Confusion: A Review of the Fire-Oak Literature

Abstract: An obstacle to using prescribed fire to manage mixed oak forests is the varied of results of previous fire studies. It has been reported that fires enhanced, hindered, or had no effect on the competitive position of oak in the regeneration pool. I review a portion of the published literature and identify key factors that led to the relative competitiveness of oak reproduction benefiting from or being harmed by prescribed fires. These key factors are synthesized into general guidelines to help practitioners understand how fire can be a positive force in the oak regeneration process. I also point out some situations where fire hinders the competitive position of the oak regeneration, and provide suggestions for researchers studying fire in mixed oak forests.

136: Joseph M. Marschall, Richard P. Guyette, Michael C. Stambaugh

Red Oak Timber Product Value Loss Due to Fire Damage

Abstract: Prescribed fire is used for a variety of land management tasks in sites containing merchantable sized red oak trees with sparse information on how it affects lumber product values. We analyzed how fire related injuries affect lumber volume and value in 88 red oak (Quercus velutina, Q. rubra, and Q. coccinea) lowest logs harvested from three sites in southern Missouri. Trees with varying degrees of external fire damage, time since fire, and diameter were harvested and milled into dimensional lumber. Lumber grade changes and volume losses due to fire related injuries were tracked on individual boards (n=1298, 18.3 cubic meters (7754 board feet)) and analyzed using the individual log as the unit of study. Observed volume and grade per board were compared to expected volume and grade (ignoring fire damage). Threshold values were identified regarding scar height and percent basal circumference injured, beyond which significant value losses occur. Annual percent value loss for different fire scar sizes was determined for the first fourteen years after fire damage occurred. Overall, value and volume losses due to fire damage were surprising low. If fire damage is less than 50 cm tall and/or 20 percent basal circumference injured, little value loss is expected. If these thresholds are exceeded, value loss is likely. Value loss is very low if trees are harvested within five after fire damage, regardless of scar size. These findings are applicable under these constraints: time between fire damage and tree harvest is not greater than fourteen years, and trees are at least 20 cm diameter at breast height at time of fire damage.

137: Julia E. Kirschman

Technology Transfer: Taking Science from the Books to the Ground at Bent Creek Experimental Forest

Abstract: Technology transfer: taking science from the books to the ground at Bent Creek Experimental Forest Technology Transfer has been an important part of the research program at Bent Creek Experimental Forest since its establishment in 1925. Our mission is to develop and disseminate knowledge and strategies for restoring, managing, sustaining, and enhancing the vegetation and wildlife of upland hardwood-dominated forest ecosystems of the southern Appalachian Mountains. Over the years disseminating knowledge has taken many forms to many different user groups. Through verbal and nonverbal communications information has been shared. Verbal communications is through tours of the demonstration forest, workshops, and presentations. Nonverbal communication is through websites, publications, interpretive signs and other written and electronic material. A diversity of user groups make disseminating knowledge challenging. Groups range from professors and scientists, graduate and undergraduate students, resource managers all the way to garden clubs and boy scouts troops. Since the 1980s Bent Creek Experimental Forest has had a Technology Transfer Specialist on staff. As a Technology Transfer Specialist there are many rewards and challenges. Some of the challenges are internal, such as, budget, communications, leadership changes and internal priorities. Some challenges are external such as knowing your audience, making materials understandable for all people, forming partnerships, and exchanging information. But the rewards are great when individuals understand, support and get excited about the work being conducted by the Forest Service.

Day 2-Wednesday, October 9, 2013

Wednesday Opening Plenary Roanoke Ballroom D

Patrick H. Brose

Management–Research Partnerships from a Scientist's Perspective

Abstract: Forest Service research has had long-time partnerships of varying types and degrees with private and public forest managers throughout the United States. Sometimes these partnerships are close, cordial, productive, and beneficial to both parties and at other times they are strained, dysfunctional, and fruitless. In this talk, I will focus on what scientists need from land managers when they are collaborating on research, how to build positive partnerships, and how to identify and avoid potential conflicts. In the modern era of shrinking budgets and growing regulation, productive research-management partnerships are absolutely essential to both parties.

Dean M. Simon

Management–Research Partnerships from a Manager's Perspective

Abstract: Natural resource managers have long desired to obtain user friendly, management directed answers from research results. Through partnerships with researchers, cooperative projects, and management hosted endeavors, mutually beneficial outcomes have been accomplished that provide quantifiable data and applicable direction for both research and management professionals. Often times, projects conducted by managers are further facilitated by having

research associated elements, which provide support and justification through science based monitoring and assessment to evaluate outcomes and results. This information transfer from researchers to managers has been an evolving relationship cultured through understanding by both parties of needs, limitations, feasibility, and applicability. Flexibility and compromise by managers and researchers has been an integral part of this process as well. Numerous examples of successful ventures between managers and researchers have occurred, where research has been facilitated by the managers hosting these projects, while managers have benefited by site specific data of implemented management actions.

Susan L. Stout, Patrick Brose, Joanne Rebbeck

SILVAH: Managers and Scientists Work Together to Improve Research and Management

Abstract: Various Forest Service task forces have studied the challenge of improving science delivery by bridging cultural differences between land managers and scientists. One important precondition often identified for effective science delivery is the engagement of users and partners throughout the full research and development cycle. SILVAH, a systematic approach to inventory, analysis, and prescription preparation for sustainable management of forested stands, is a 35-year old example of this approach. While the SILVAH system includes computerized decision support software to support users of the system, its vocabulary, conceptual framework, annual training sessions, and the community of practice that these have engendered are far more important reasons for its success as a science delivery tool. It is very important to note that the community of practice embodied in the SILVAH system improves research as well as practice. This talk with highlight a partnership among the Pennsylvania Department of Conservation and Natural Resources Bureau of Forestry, FS R&D, and Pennsylvania State University, focused on oak (Quercus spp.) regeneration, as a case study of this engagement and associated successful science program delivery. We will also explore the engagement of other research and management partners, and extract key lessons learned about sustaining a management/scientist community of practice.

Elizabeth J. Bunzendahl

Research–Management Success Stories on the Daniel Boone National Forest

Abstract: The Daniel Boone National Forest recognizes the important role fire plays across the landscape and has increased the use of prescribed fire; the forest now averages over 12,000 acres burned per year. In our complex ecosystems, designing prescribed fire projects that will produce the desired outcomes is quite a challenge. In order to help sort through the complexities and to accomplish our mission, the Daniel Boone National Forest has long recognized the value of partnering with researchers to learn more about fire ecology and fire effects. Collaborative projects including federal Forest Service research stations and universities have resulted in increased communication and understanding among managers and scientists, which results in research that managers can and will use. For example, the relationship with the University of Kentucky and Dr. Mary Arthur led to the 2008 three day workshop "The Science of Prescribed Fire on the Cumberland Plateau" that focused on the synthesis of research and its application to land managers. Additionally, research conducted by the Northern Research Station and Dr. Matt Dickenson produced several options for burn bosses to mitigate risk to tree-roosting bats during prescribed fires. Over time, increased dialogue and idea exchange between researchers and practitioners has resulted in a successful burn program which focuses on burning in the right places and achieving objectives on a landscape scale.

Wednesday Concurrent Session 1: Roanoke Ballroom D

211: Daniel Stratton

Designation of the New EPA Primary Standard for PM2.5 and the Implications for Prescribed Burners in the Appalachians

Abstract: EPA's designation of the new PM 2.5 primary standard and what it means to prescribed burners in the Appalachians. Appalachian counties that may be impacted and non-attainment issues.

212: Josh Kelly

An Assessment of the Ecosystems of Nantahala-Pisgah National Forest and Surrounding Lands: A Synthesis of the eCAP Methodology and LiDAR Vegetation Analysis

Abstract: Ecological restoration has become one of the guiding principles of National Forest management. However, it can be difficult to identify a reference or desired condition as a restoration goal, and furthermore, accurately assessing ecosystem condition is dependent of the quality of the data available. LANDFIRE Biophysical Settings are computer models that combine scientific research, historical information, and expert opinion to describe the disturbance probabilities of ecosystems and simulate a Natural Range of Variation as a restoration target. Ecological zone maps are the most accurate ecosystem maps available for the Southern Blue Ridge Ecoregion and can be cross-walked to LANDFIRE Biophysical Settings. Light Detection and Ranging (LiDAR) data are recognized as one of the most comprehensive and accurate methods for measuring vegetation structure. A study area including the overlap of the 2005 Phase III North Carolina LiDAR data and the proclamation boundary of Nantahala-Pisgah National Forest was analyzed with the use of ecological zone maps, LANDFIRE Biophysical Settings, and LiDAR vegetation models. In total, over 700,000 hectares (1,760,000 acres) of forest were evaluated using LiDAR measured height and US Forest Service stand records to estimate forest age, and LiDAR measurements of canopy closure and shrub density to measure those physical characteristics. Of 11 forest ecosystems evaluated, six were found to be highly departed from reference conditions. In general, ecosystems with a more frequent historical fire return interval were more departed from reference conditions than mesic forests, and ecosystems with greater timber value were more disturbed than ecosystems with less economic value, creating a pattern of disturbance on the landscape that differs markedly from the pattern predicted by reference models. The identification of over-abundant and under-abundant structural classes in this study, relative to reference conditions, allows for prioritizing management activities between and within ecosystems.

213: Melissa A. Thomas-Van Gundy

Inferring Fire Regimes from Data You May Already Have

Abstract: Two methods used to map fire-adapted vegetation and fire regimes are presented and compared. The methods used are applicable to other landscapes and should be useful for others trying to define areas where restoring fire would be most applicable across a larger landscape. First, a rule-based mapping method for locating fire-adapted vegetation from existing vegetation, potential natural vegetation, and ecological land types is explained. This simple ranking and weighted averaging technique is easy to implement in a GIS if data sources are readily available. Secondly, a more direct method from mapped witness trees (trees listed in early land surveys) is presented. Here, each species listed as a witness tree was categorized as pyrophilic or pyrophobic and a percentage of pyrophilic species calculated for each survey corner. The calculated percentages were then interpolated to create a continuous coverage. The results of these two methods on the Monongahela National Forest are compared and their ecological applicability assessed.

214: Sam G. Lindblom

Building a Landscape-Scale Fire Management Collaborative Partnership: The Warm Springs Mountain Restoration Project and Allegheny Highlands Fire Learning Network as a Case Study

Abstract: Sam Lindblom directs the Land and Fire Management programs for The Nature Conservancy in Virginia. Sam has been a co-leader in a collaborative (Allegheny Highlands Fire Learning Network) that started from applying fire on a 9,000 ac Conservancy preserve to planning and implementing fire and fire science across a multi-partner landscape of almost 400,000 acres in the Allegheny Highlands of Virginia. Along the way, he and his state and federal partners created tools and relationships to allow them to put fire on the ground together, sharing resources and expertise to accomplish more than any one individual organization could. Sam will talk about his experience developing partnerships in a political, planning, and operational setting. Additionally, he will describe the barriers that had to be overcome, and what it takes to break through resistance to conducting fire across, not only administrative boundaries, but also across different operational styles, rules and traditions.

215: Thomas Ledbetter

Growing Season Burning in the Appalachians

Abstract: Lightning caused fires, a majority of which occur during the growing season are a force in shaping the vegetation of the Appalachian Mountains. While using prescribed fire during the growing season is an accepted practice in both the coastal plain and the piedmont, natural resource managers in the Appalachians do most of their burning in

the dormant season. While some growing season burning has been done in the mountains, we have very little monitoring data to show the effects. A current research project underway on the Bent Creek Experimental Forest in North Carolina should provide answers to many questions concerning burning during the growing season. The few growing season burns that we have completed have shown a significant impact on small trees and shrubs, but have also raised concerns including availability of resources, safety of personnel from high heat and humidity, prescription parameters and air quality during the summer months. With the limited number of burn days in the spring and the vast acreage that needs prescribed fire, growing season burning may make us more effective in our goal to restore the oak-pine ecosystem in the Appalachians.

216: Margit A. Bucher, Beth Buchanan, Wendy Fulks, Josh Kelly, Peter Bates, Gary Kauffman, Steve Simon, Helen Mohr
The Southern Blue Ridge Fire Learning Network: A Collaborative Partnership to Restore Fire-Adapted Ecosystems and Build Resilient Forests and Communities

Abstract: The Southern Blue Ridge Fire Learning Network (SBRFLN) is part of a cooperative program of the Forest Service, Department of the Interior agencies and The Nature Conservancy to restore forests and grasslands and to make (human) communities safer from fire. Since 2007, the SBRFLN has engaged federal, state and private partners to integrate science and local knowledge. Eight landscape teams focus on restoring pine and pine oak forests, primarily through prescribed burning. Common vegetation maps/models are used to identify areas most in need of restoration, and to develop a common vision of restoration needs across the region. A network of monitoring plots tracks the effectiveness of restoration treatments. A burn prioritization tool (ecomath) has been developed in a collaborative effort based on these maps in most landscapes. The modeling has enhanced partner understanding, focused planning, and built support for burning. A partnership with the Consortium for Appalachian Fire Managers and Scientist (CAFMS) has accelerated transfer of knowledge through workshops, field trips and webinars. The network is currently expanding and integrating some of its activities with Firewise communities and the Fire Adapted Communities Learning Network.

Wednesday Concurrent Session 2: Shenandoah Room B

221: Missy M. Forder
Hemlock Wooly Adelgid and Large Fuel Pulses at Shenandoah National Park

Abstract: Throughout the Appalachians eastern hemlock (Tsuga canadensis) stands have experienced widespread decline due to the hemlock wooly adelgid (Adelges tsugae). Hemlock woolly adelgid are small aphid-like insects that attach to the underside of eastern hemlock (Tsuga canadensis) branchlets and feed on the starch of hemlock trees. The exotic insect pest hemlock woolly adelgid was first discovered in Shenandoah National Park in 1988. Mortality of nearly 100% in some stands has resulted in canopy gaps and a carpet of Birch spp. (Betula) and striped maple (Acer pennsylvanicum). Heavy fuel loading has increased as dead hemlock boles litter the forest floor. Areas with large concentrations of hemlocks have been historically viewed as a fire breaks due to the lack of fine fuels, rocky slopes, moist conditions, slope position and high degree of shading. Significant mortality in these stands raises questions regarding increased large fuel pulses resulting in enhanced fire intensity, frequency and duration. Shenandoah National Park's recent fire history (1998-2013) was examined to determine if this widespread decline has altered the fire frequency or fire intensity in these areas. While large fuels have increased no detectable escalation of fire activity or intensity has been observed. Recent fires including a large fall fire in 2000 hastened hemlock demise, while a summer fire in 2013 extinguished within and adjacent to a hemlock stand. Hemlock stands in Shenandoah National Park are mainly restricted to sheltered north facing coves and mesic slopes and flats along streams at higher elevations which may account for the lack of flammability despite almost complete hemlock mortality and increase in large fuels.

222: James L. Smith
LANDFIRE in the Appalachians: Current and Future

Abstract: The LANDFIRE Program has provided spatial data, vegetation models and tools in a continuing cycle of updating and improvement. Thus far, 4 versions have been delivered, with another update planned in 2015 and ultimately a remapping of the entire nation soon thereafter. This presentation will update participants on the status of the program, but also describe current plans for future production. We have an opportunity to listen to the LANDFIRE user community before plans are finalized and hear what has worked, what has not worked, what needs to added, and what needs to be eliminated.

223: McRee Anderson, Clarence Coffey, Mike Black, Elizabeth Holcomb, Alex Wyss, George Hernandez
The Shortleaf Pine Initiative: Developing an Institutionalized Framework to Restore an Imperiled Ecosystem
Abstract: Shortleaf pine forests and associated habitats once covered a vast area of the North America stretching from eastern Texas and Oklahoma to the eastern seaboard from New Jersey down to Florida. Early descriptions of these areas portray these pine- and mixed pine-oak forests as having open overstories that allowed sunlight to reach the ground allowing diverse native plants and wildlife to flourish. Over the last 30 years, this extensive shortleaf pine ecosystem has lost over 50% of its former acreage with most of the significant decline taking place east of the Mississippi River. Massive pine beetle outbreaks in poorly managed stands, changes in timber management practices, altered fire regimes, disease, and land use changes have contributed to this rapid decline. These forested landscapes across twenty-two states represent an extraordinary diversity of cultural, ecological and economic values centered on wildlife and recreation, water quality, and a high-value wood products industry. In 2013, to address the multiple threats facing this imperiled ecosystem, the Shortleaf Pine Initiative (SPI) was formed. The SPI represents a broad range of public and private organizations, as well as key state and federal agencies currently working in the shortleaf pine ecosystem. To rapidly gather information from a broad range of stakeholders currently working in the shortleaf pine ecosystem and associated habitats, a series of focused regional workshops are currently being implemented. The workshops will be facilitated to foster a science-based, learning collaborative for the sharing and gathering of specific information related to shortleaf pine. Information gathered from experts within each region will be the foundation for a Range-wide Shortleaf Pine Conservation Plan.

224: Nathan A. Klaus, Scott Rush, Tim Keyes, John Petrick, Bob Cooper
Effects of Fire Severity on Breeding Bird Communities in the Southern Appalachians
Abstract: Historically, fire played a part in structuring many ecosystems of the southeast. Today, on both public and private lands fire is frequently applied as a management tool, with millions of dollars spent annually on prescribed fire in Georgia alone. In spite of the history and current application of fire there exists little data for how fire may structure bird communities of some ecosystems, specifically hardwood forests. In 2004 we conducted transects of point counts in twelve large scale burns (median size about 650 acres) and four unburned controls in the Chattahoochee National Forest. Burns were categorized by intensity (low, medium, or high) and time since fire (1-2 or 3-6 years). Frequency of early succession species (Eastern Towhee, Indigo Bunting, Chestnut-sided Warbler) increased with fire severity while ground (Ovenbird) and shrub nesting species (Hooded Warbler) appear to decrease with fire severity, at least temporarily. Total bird richness and abundance were significantly higher in medium and high severity. Of 83 species detected inside 100 meters, 39 (46%) were primarily found at medium and high severity sites, including most species of high conservation priority for the Southern Blue Ridge. Furthermore, two species of high conservation concern, the Golden-winged Warbler and Cerulean warbler, were only found at medium or high severity sites. Our results suggest medium and high severity fires may improve habitat for many bird species and may be critical for some high conservation priorities.

225: Jeffrey A. Warwick
Fire in Bogs: The State of our Understanding Based on Case Examples
Abstract: Mountain Bogs are among the rarest natural communities in the world, formed in high-elevation depressions or on moderate slopes of valley floors in the Southern Appalachian Mountains. Although individual bogs vary considerably in terms of geomorphic setting, hydrology, chemistry, and unique combinations of processes that shape them, most bogs are characterized by a generally open vegetative structure predominated by diverse herbaceous flora. While historically some bogs may have gradually succeeded into forested wetlands, evidence suggests that natural disturbances such as flooding, fire, grazing, and beaver activity arrested some in early in succession. Today, anthropogenic intervention has precluded many such disturbances leading to the subsequent decline of the flora and fauna that have adapted to such unique conditions. To maintain bogs' open character and conserve these species, some land managers have turned to mimicking natural disturbance using livestock grazing, manual and chemical vegetation treatments, and prescribed fire. We discuss our experience with prescribed fire in mountain bogs, as well as the use of fire in mountain bog management throughout the southeast. Were bogs historically influenced by fire and which types of bogs were influenced by fire? In which types bogs should fire be used as a management tool and which actually require fire? We will convey experiences in bog burning to help establish dialogue on the topic and hopefully begin to answer such questions. We will present experiences from various federal, state, and non-profit organizations from Georgia north to Virginia and report on the number of land managers using fire in mountain bog systems, their experiences employing fire, types of mountain bogs that require fire, considerations, results of their burns including successes, failures, benefits and drawbacks from using fire as a management tool in these systems.

226: Mark A. Melvin

Prescribed Fire Councils: A Model for Success

Abstract: Twenty-first century prescribed fire managers face increasingly complex challenges that limit or potentially threaten the use of fire. Never before in history have land managers found these challenges broader in scope. Modern day prescribed fire managers must consider a complex web of policy, legal statutes, and liability, as well as public safety, health, and acceptance. Perhaps the greatest challenge to develop in recent history is the land manager's need to plan and execute prescribed fire in a socially acceptable manner. Collectively, these challenges are greater than any one land owner, group, agency, or state can address alone. Across the country, state Prescribed Fire Councils (PFC) have been developed over the last decade to better address these common issues. PFCs effectively partner federal, state, and private interests by serving as a focal point for sharing ideas and information and creating opportunities for prescribed fire collaboration internally, as well as externally. In 2009, PFC leaders collaborated to create a national 'parent' organization called the Coalition of Prescribed Fire Councils (Coalition). The Coalition leverages state PFC's efforts to ensure the ecological values and public health benefits of prescribed fire are represented on regional and national platforms. These groups are identifying barriers to fire implementation and developing pathways for success. Most importantly, they are restoring and/or preserving the modern day land manager's ability to use prescribed fire for resource benefit.

Wednesday Concurrent Session 3: Pocahontas Room B

231: Scott L. Goodrick

Smoke Prediction in Complex Terrain

Abstract: Predicting downwind smoke concentrations is difficult under the best of circumstances; however in areas of complex terrain this prediction task is even more difficult. Many of the basic concepts taught in smoke management courses such as mixing height and transport wind are very simple and straight forward over flat terrain. For complex terrain, these basic concepts become much more complex and less well understood. This talk will focus on how complex terrain influences mixing height and transport winds and what these influences mean for smoke prediction tools such as VSmoke and other dispersion models.

232: Beth Buchanan

Multi-Party Monitoring is a Valuable Tool in a Manager's Toolbox

Abstract: The use of prescribed fire has increased dramatically over the last 15 years in the Appalachian Mountains, and managers are interested in tracking the effects of their fire programs. Since the early 1990s, Region 8 National Forests have been required to collect data on fuels and vegetation in permanent plots. However, lack of personnel dedicated to this effort has limited the number of plots that each forest is capable of maintaining. Thus, forests are encouraged to work across boundaries and share information with neighboring districts, forests and agencies that have similar burn prescriptions and monitoring types, to increase the size of datasets. We discuss the results of this endeavor, including recommendations for improving this approach. In general, data collected in such a manner can be used at least to document trends, which can be used to supplement the more-rigorous research projects which now are becoming more commonplace. Fire effects monitoring completed internally by firefighters and other employees offer multiple benefits to the local units.

233: Michael Rauscher, Stacy A. Drury

Using the Interagency Fuels Treatment Decision Support System to Support Fuels Treatment Planning

Abstract: After nearly 13 years of effort by members of the Joint Fire Science Program and give years of effort by members of the Interagency Wildland Fire Information and Technology project, there can no longer be any question of the existence and importance of the "software chaos" problem in the fire and fuels management business mission of the US federal land management agencies. The Interagency Fuels Treatment Decision Support System (IFTDSS) was designed and implemented by the JFSP, working with a large number of stakeholders, to mitigate the "software chaos" problem. In 2012, the JFSP engaged the Software Engineering Institute (SEI), a Federally Funded Research and Development Center operated by Carnegie Mellon University to perform an independent evaluation of how well IFTDSS accomplished its mission. The objectives of this presentation are (1) to describe how to use IFTDSS to support fuels treatment planning and (2) to summarize the results of the just concluded independent evaluation of the IFTDSS project. All IFTDSS project reports published between 2007 -2013 may be found at www.frames.gov/iftdss including a comprehensive and detailed Final Report.

234: Nikole Swaney, John R. Moncure, Marek K. Smith, Beth Buchanan, Daniel Buckler

Fire Severity Assessment in the Allegheny Highlands of Virginia

Abstract: During the spring of 2012, wildfires burned approximately 40,000 acres within the Allegheny Highlands of western Virginia. Known as the Easter Complex, these wildfires were an unprecedented event or a region that has not experienced wildfires at this scale in recent history. The fires affected a variety of ecological systems and national forest management areas, including previously treated prescribed burned areas and designated wilderness. The fires resulted from a variety of ignition sources and were managed through a combination of natural progression and different firing techniques and patterns. Taking advantage of the opportunity to learn about the effects of fire on a landscape-scale, Central Appalachian Fire Learning Network partners embarked upon a fire severity assessment in summer 2012, utilizing Rapid Assessment of Vegetation Condition after Wildfire (RAVG) satellite imagery and the Composite Burn Index (CBI) protocol. The goals of the study include: mapping fire severity in conjunction with firing patterns and techniques, illustrating variances in fire severity throughout wildfire and prescribed fire areas. The assessment will continue through the 2014 growing season to evaluate long-term fire effects with the aid of Monitoring Trends in Burn Severity satellite imagery.

235: Joyce Bender

Restoring Kentucky Barrens with Prescribed Fire

Abstract: The Kentucky State Nature Preserves Commission is charged with the responsibility to inventory the state for rare species and unique ecological communities and to protect them in perpetuity in a system of nature preserves. There are sixty-one state nature preserves and thirteen of them protect barrens communities of varying quality. Barrens can be described as sparsely wooded ecological communities with thin rocky soils underlain by sandstone or limestone. Barrens are characterized by tree cover ranging from 10 to 60 percent and a ground cover dominated by perennial grasses and prairie forbs, some of which are listed as rare species in Kentucky. A number of rare, grassland remnant-dependent insects have been documented from these barrens. Protecting these preserves in perpetuity requires active management to maintain open habitat which sustains the grasses and forbs, yet does not extirpate the insects. Years of fire suppression have resulted in canopy closure and the disappearance of some species. Efforts in Kentucky are focused on restoration of overgrown barrens. Prescribed fire is one tool to reduce canopy and midstory cover. Fire also removes litter that can inhibit seedling establishment and limit plant growth. Examples of barrens communities in Kentucky will be presented along with agency goals for restoration and management.

236: Nathan A. Klaus, Mike Haisten

Interagency Collaboration: A Key for Success

Abstract: Tallulah Gorge, at the far southwest edge of the Southern Blue Ridge Escarpment landscape, is a transitional zone between the southern Appalachian piedmont to the south and the Southern Blue Ridge Mountains to the north. Many upland ridges and south-facing woodland slopes are embedded in a larger mesic forest matrix. The ecological system to which these upland habitats most closely conform is the Southern Appalachian low-elevation pine forest (NatureServe). This system occurs in a variety of topographic and landscape settings and is dominated by either shortleaf pine (Pinus echinata) or Virginia pine (P. virginiana) and also contains numerous dry-site oak species, such as southern red oak (Quercus falcata), chestnut oak (Q. prinus) and scarlet oak (Q. coccinea). In addition, numerous pitch pine and Table Mountain pine specimens can also be found scattered throughout the landscape, particularly in the most rugged terrain near bluffs and cliffs. Within this landscape, a diverse group of partners are collaborating via the SBR FLN to use prescribed fire and mechanical treatments to restore the natural structure and function of the ecosystems and to maintain a rich array of rare plants and animals. Historically, frequent low-intensity fires occurring every 3-5 years were responsible for maintaining a bi-layered forest structure, with widely spaced pines and oaks in the overstory and a rich and diverse grass, forb and shrub layer in the understory (oak/pine heath). A variety of partners work together across jurisdictional boundaries to effectively and efficiently restore pine-oak woodland habitats, developing methods that are applicable to the larger Southern Blue Ridge Escarpment landscape. Partners have treated approximately 9,500 acres with prescribed fire since 2012, including the first multi-jurisdictional prescribed burn in the area in the winter of 2010. The burn included lands managed by State Parks and USFS, and was implemented with assisting agencies, including the Atlanta Botanical Gardens, Georgia FS, Georgia Power and USF&W. In addition, partners have mechanically treated about 300 acres to restore ecosystem health and function and more are currently being planned. Ecological and a prescribed burn prioritization models are now being developed for the landscape, and will be used in future ecosystem restoration planning. Research plots to monitor rare species, such as persistent trillium, have been installed in burn units and a multi-year monitoring and research projects have been initiated.

Plenary Speaker Bios

Tom Waldrop
Tom Waldrop is a Supervisory Research Forester and Team Leader with the U.S. Forest Service, Southern Research Station at Clemson, SC. He earned bachelor's and master's degrees in Forest Management at Clemson University and a Ph.D. in Forest Ecology at the University of Tennessee. Tom is the founder and principal investigator for the Consortium of Appalachian Fire Managers and Scientists. In his career, he has emphasized research on fire ecology and fire technology in the southern Appalachian Mountains. Tom was recognized as the Forest Service's Distinguished Scientist in 2012.

Helen Mohr
Helen Mohr is a Forester with the USFS Southern Research Station and the Director of the Consortium of Appalachian Fire Managers and Scientists. She has worked in fire ecology research in the Southern Appalachians until taking over the Consortium 3 years ago.

Andi Thode
Andrea Thode completed her B.S. (1996) and later her Ph.D. (2005) in fire ecology through the Ecology Graduate Group at the University of California, Davis. She has worked for the U.S. Forest Service in California and is currently an Associate Professor of fire ecology in the School of Forestry at Northern Arizona University. Her research focuses on fire effects at the local and landscape scale. Andi has been heavily involved in the Association for Fire Ecology (AFE) since its inception as a founding board member, education committee chair and member, and through development and planning of several regional and national level conferences. Andi has been the principal investigator for the Southwest Fire Science Consortium since its inception in 2009.

David Van Lear
Dr. David H. Van Lear is Professor Emeritus at Clemson University. His areas of specialization include Silviculture and Forest Soils. In addition to a B.S. and M.S. in Forestry, Dr. Van Lear also has a Ph.D. in Forest Sciences from the University of Idaho and a post doctorate in Forest Fertilization from the University of Florida. Some of the awards that he has received over the past five years include: Hardwood Research award, Advisor of outstanding student chapter in the Nation, Clemson University Board of Trustees award for faculty excellence and The Godley-Snell Research Award. He served as the associate editor of New Forests and a board member of the South Carolina Forestry Association. David is an SAF Fellow and is best known for his pioneering research in using prescribed fire in the Southern Appalachian Mountains.

Patrick Brose
Since 2000, Patrick has been a Research Forester with the USDA Forest Service, Northern Research Station where he studies the oak regeneration process, the role of prescribed fire in that process, strategies for controlling mountain laurel, and the fire history of Pennsylvania. Prior to that, he worked with Dale Wade and Tom Waldrop of the Southern Research Station where he studied the fire ecology of coastal flatwood and montane pine ecosystems. He earned a Ph.D. in 1997 in forest resources from Clemson University where he studied the effects of seasonal prescribed fires on oak shelterwood stands with Professor David Van Lear.

Dean Simon
Dean M. Simon has worked for the North Carolina Wildlife Resources Commission for the last 29 years as a Regional Wildlife Biologist and Forester in the mountains of Western North Carolina. He received a bachelor's degree in Forestry from Louisiana State University and a master's degree from the University of Georgia, studying fire ecology and wildlife. He is a Certified Wildlife Biologist, Registered Forester, and a Certified Prescribed Burner. He was recognized as Wildlife Biologist of the Year by the North Carolina Wildlife Resources Commission in 2007, and he received the Management Excellence Award by the Southeastern Section of the Wildlife Society in 2008 for his work with prescribed burning, fire management, and fire ecology research in the Southern Appalachian Mountains.

Susan Stout
Since 1981, Dr. Susan L. Stout has worked as a research forester with United States Forest Service Research in Warren, PA. In 1991, she was named Project Leader, and now supervises researchers in Pennsylvania, Ohio, Vermont and New Hampshire. Her personal research interests include measuring crowding and diversity in forests, deer impact on forests, silvicultural systems, and translating results from ecosystem research into practical management guidelines. Her proudest accomplishment is contributing to dramatic improvements in deer management in Pennsylvania. Susan was educated at Radcliffe College of Harvard University, the State University of New York, and Yale University.

Elizabeth Bunzendahl
Elizabeth Jane (E.J.) Bunzendahl is the Assistant Fire Management Officer on the Daniel Boone National Forest. She has a Bachelor of Science Degree in Natural Resources Management with a minor in Agronomy from the University of Kentucky. While working in the field of natural resources she has worked for the Girl Scouts of the USA, the Kentucky State Nature Preserves Commission, the Kentucky Division of Forestry, the Wasatch-Cache National Forest Logan Hotshots, and the Daniel Boone National Forest. E.J. is an Incident Commander Type 3, Taskforce Leader, Prescribed Fire Burn Boss Type 2, Field Observer, Engine Boss, Crew Boss, Helicopter Crew Member, and Emergency Medical Technician.

Alphabetical Listing of Poster Presenters

Aldrich	Serena	10	Changing Fire Regimes and Vegetation Dynamics of Xeric Pine and Oak Stands in the Central Appalachian Mountains of Virginia
Curtin	Lindsay	4	Developing a Monitoring Program Focused on Adaptive Management
DeWeese	Georgina	7	Fire Regimes and Stand Dynamics of Xeric Oak-Yellow Pine Stands in the Central Appalachian Mountains, Virginia
Dye	Alex	8	Stand Dynamics and Fire History of a Southern Appalachian Pine-Hardwood Forest at Rainy Mountain, Chattahoochee National Forest, Georgia
Flatley	William	9	Forest Vegetation Response Along a Topographic Moisture Gradient Following Fire Suppression in Great Smoky Mountains National Park
Fox	David	11	Monitoring Avian Community Response for a Landscape-Scale Controlled Burning Project in the Allegheny Highlands of Virginia
Greenberg	Katie	13	Researching Effects of Prescribed Fire in Hardwood Forests
Grissino-Mayer	Henri	3	Climate Drivers and Possible Human Influences on Wildfire Activity (1700–1900) in the Southern Appalachian Mountains
Hockaday	William	5	Toward a Chemical Method for Post-Fire Reconstruction of Fire Intensity
Ingalsbee	Timothy	15	Torchbearers for a New Fire Management Paradigm: Firefighters United for Safety, Ethics, and Ecology (FUSEE)
LaForest	Lisa	2	Post-17th-Century Wildfire Occurrence in the Great Smoky Mountains: A Dendroecological Reconstruction
Long	Alan	17	Facilitating Knowledge Exchange About Wildland Fire Science
Marschall	Joseph	1	Comparing Four Centuries of Fire Frequencies in the Central and Southern Appalachian Mountains
Melvin	Mark	14	2012 National Prescribed Fire Use Survey
Norman	Steve	16	Assessing Wildland Fire Trade-offs in the Southern Appalachians Using a Cohesive Framework
Smith	Marek	6	Five Years of Monitoring Forest Structure and Composition for a Landscape-Scale Controlled Burning Project in the Allegheny Highlands of Virginia
Stober	Jonathan	12	Development of an ArcGIS Fire Frequency, Fuel Accumulation, Seasonality and Prioritization Tool to Facilitate Prescribed Fire Decision Making on the Talladega National Forest, Alabama

Poster Abstracts Listed by Number

1: Joseph M. Marschall, Richard P. Guyette, Michael C. Stambaugh, Patrick H. Brose, Adam M. Bale
Comparing Four Centuries of Fire Frequencies in the Central and Southern Appalachian Mountains
Abstract: Land managers in the eastern United States frequently incorporate ecological restoration goals in resource management activities. Restoration efforts can be enhanced through greater understanding of the ecosystem processes under which modern forests developed. Relict pine (*Pinus*) stumps or tree boles offer an opportunity to decipher past fire regimes in the eastern United States. We contrast two long-term (~400 years) fire regimes documented by fire scarred remnant and live pine trees in the central and southern Appalachians. Cross-sections from sixty five fire scarred red and pitch (*P. resinosa* and *rigida*) pine tree trees at two sites in northern Pennsylvania document 37 years with fire spanning 1530 - 2010. Fifty fire scarred longleaf (*P. palustris*) pine trees recorded 174 years with fire between 1550 and 2005. Composite mean fire intervals for the sites at northern Pennsylvania and northern Alabama were 10.69 and 2.61 years respectively, for the entire time period reported. In this study we explore cultural, climatic, and topographical data for these regions toward explaining these differences.

2: Lisa B. LaForest, Henri D. Grissino-Mayer, Charles W. Lafon, William T. Flatley
Post-17th-Century Wildfire Occurrence in the Great Smoky Mountains: A Dendroecological Reconstruction
Abstract: Changes in fire regimes have been associated with compositional shifts in southern Appalachian forests; however, little is known about fire history prior to and during European settlement in the region. Using dendroecological methods, we examined the historical fire regime of lower-elevation (400–600 m ASL) mixed yellow pine-hardwood stands in the western side of Great Smoky Mountains National Park, an area that escaped intensive logging and provided evidence of past fires and older trees. At three sites, we developed yellow pine chronologies against which fire-scarred cross-sections were dated, generating a 300-year record for the study area. Stand structure, age structure, stand composition, and duff depths were determined at three vegetation plots for each site. On average, wildfires occurred every two years, with more widespread fires occurring approximately every four to seven years. Prior to suppression policies, fires burned primarily in the dormant or early growing season, with frequency peaking during the 1800s and corresponding with an increase in European settlement. Wildfire frequency averaged seven years after enactment of suppression policies in the 1930s, and occurred later in the growing season. Tree establishment in the 1700s and 1800s was generally infrequent and was composed primarily of oaks and yellow pines. Mixed hardwood numbers notably increased at all sites after 1910, but tapered off after 1970. Eastern white pine and red maple were common in the canopy class, and dominated the seedling/sapling classes. Yellow pine establishment (primarily Virginia pine) peaked in the 1930s, and seedlings/saplings were uncommon. Duff depths averaged 6 cm across the sites. Results indicate that yellow pines, and longer-lived oak species, are unlikely to maintain a dominant presence in the stands under the current fire regime.

3: Henri D. Grissino-Mayer, Charles W. Lafon, Lisa B. LaForest, Georgina G. DeWeese
Climate Drivers and Possible Human Influences on Wildfire Activity (1700–1900) in the Southern Appalachian Mountains
Abstract: We have created a small network of sites in the Southern Appalachians in which the history of fire was reconstructed from the fire-scar based tree-ring record. Our reconstructions are exclusively based on yellow pines and show that fire was commonplace in low to mid-elevation sites in several locations in Virginia, Tennessee, and North Carolina from ca. AD 1700 into the 20th century. A key question concerns the probable effects of climate forcing of fire activity, a strategic objective for forest management and fire personnel that has mainly been analyzed in the western U.S. We used superposed epoch analysis to evaluate several potential climate forcing mechanisms on fire, including reconstructed Palmer Drought Severity Index (PDSI) , El Niño-Southern Oscillation (ENSO), North Atlantic Oscillation (NAO), Atlantic Multidecadal Oscillation (AMO), and Northern Hemispheric Temperature across two periods, AD 1700–1800 and 1801–1900. We further broke down reconstructed fire into several classes that depict spatial extent: all fires; those years in which 10% of sampled trees were scarred; and all years in which 25% of trees were scarred. We found statistically significant relationships with PDSI two years preceding the fire event (drier than average) but stronger relationships in the year of the fire event (drier than average). We found AMO to be influential on fire activity, while the NAO was found to heavily influence winter temperature (+NAO = warmer temperatures) which could precondition forests for fire activity. ENSO, however, proved to be the most consistent climate driver, with wetter conditions (positive phase) occurring in years preceding fire events and drier conditions (negative phase) occurring during the fire event. Overall, the climate-fire relationship was much more muted than that found in the western U.S. and we suspect a strong overriding influence of fires set by Native American initially and later by European American settlers.

4: Lindsay A. Curtin

Developing a Monitoring Program Focused on Adaptive Management

The adaptive management cycle involves researching the ecosystem(s) where burning is conducted, developing measurable objectives for burn plans, planning and conducting monitoring, implementing management actions, conducting monitoring before and after burns, and analyzing the results. After results are analyzed, the cycle begins again as new information becomes available and new questions and objectives are considered. The development of a successful monitoring program requires extensive research, planning, and cooperation between Fire Management Officers and Ecologists. They must first collaborate to brainstorm the questions which can be answered through monitoring techniques. As questions are developed, they take the form of measureable objectives. Ecologists then begin to create a list of protocols that will be utilized to gather data in the field based upon current scientific methods and techniques. With these protocols comes extensive planning and development of instructions and data collection methods will adhered to by all involved in the monitoring process. Consistency in data collection is essential to viable analysis of results; therefore all methods should be agreed upon before monitoring begins. Datasheets must also be created to ensure all necessary information is collected in the field. Datasheets should be designed in correspondence with the database Feat and Firemon Integrated (FFI) to expedite data entry into the program and reduce errors and confusion during the entry process. The data, once entered into the FFI database can be statistically analyzed and those objectives identified in the burn plan may be studied. The information collected tells Ecologists and Fire Management Officers whether burns have met objectives set forth in the burn plan. Management will be altered dependent upon the results generated from data collection. Adaptive management is an ever-evolving process that will continue through monitoring and a dynamic burn program and can provide the scientific backing behind management actions on the landscape.

5: William C. Hockaday, Justin Von Bargen, Jian Yao, Joseph White

Toward a Chemical Method for Post-Fire Reconstruction of Fire Intensity

Abstract: Fire intensity, the energy output of a fire, is thought to be an important factor in post-fire ecological responses. To better understand the underlying mechanisms of above- and below-ground ecological responses, we need tools for quantifying the intensity of both recent and historic fires. Charred organic matter is a long-lasting legacy of fire which may contain information about fire intensity. We studied the degree of thermal alteration in charred organic matter as a means of estimating fire intensity (temperature and duration). We conducted laboratory charring experiments to demonstrate the feasibility of relating fire intensity to charcoal chemistry. We then analyzed charcoal samples collected immediately following prescribed fires for which we obtained thermistor-based records of temperature and duration of heating. We interrogated the chemical structure of the charred organic matter using solid-state nuclear magnetic resonance (NMR) spectroscopy. The chemical structure of the charred organic matter shows a relationship to thermistor-based intensity measurements. However, the relationship shows greater complexity than the relationship observed for lab-generated charcoals. This presentation will explore the thermodynamics and kinetics of the prescribed fire to explain the chemical legacy of fire in charred organic matter.

6: Marek K. Smith, L. Nikole Swaney, David Fox, Laurel Schablein

Five Years of Monitoring Forest Structure and Composition for a Landscape-Scale Controlled Burning Project in the Allegheny Highlands of Virginia

Abstract: In 2006, land managers and ecologists from the Allegheny Highlands region of the Central Appalachians Fire Learning Network (FLN) launched their first landscape-scale fire restoration and management demonstration project along the eastern slope of Warm Springs Mountain in Bath County, Virginia. Centered along a 20-km shared boundary between The Nature Conservancy's Warm Springs Mountain Preserve and the George Washington National Forest (GWNF), the 7,400-ha project area includes 11 contiguous burn units ranging in size from 60 to 2,200 ha. Between May 2008 and May 2013, staff from The Nature Conservancy, GWNF and other FLN partners conducted controlled burns on four burn units totaling over 2,400 ha and managed one wildfire on another 400-ha unit. To document baseline (pre-burn) conditions and assess changes in forest structure and composition from burning, 108 permanent macroplots stratified by ecological system type were sampled using a nested plot design and vegetation measurements recorded for species at all strata layers. Landscape-wide pre-burn conditions are generally characterized by: 1) a closed canopy (>90% aerial cover) oak forest (*Quercus spp*.), 2) a dense midstory (>1,500 stems/ha) and understory (>4,700 stems/ha) dominated by maple (*Acer spp*.), blackgum (*Nyssa sylvatica*), witch hazel (*Hamamelis virginiana*), and mountain laurel (*Kalmia latifolia*), 3) a sparse (<30% aerial cover) ground layer dominated by *Vaccinium spp*., and 4) negligible oak and pine regeneration. Results from 62 macroplots one year after burning indicate significant reductions in woody stem densities for <10 cm

diameter at breast height (DBH) size classes, modest reductions in canopy cover, and variable shifts in understory species composition. Although consistent with findings from studies on controlled burns elsewhere in the Appalachians, these initial results have been used to evaluate future burn frequencies and firing techniques, and track progress towards collaboratively-developed management objectives and desired conditions for the project area.

7: Georgina D. DeWeese, Henri D Grissino-Mayer, Charles W Lafon, Serena R Aldrich

Fire Regimes and Stand Dynamics of Xeric Oak-Yellow Pine Stands in the Central Appalachian Mountains, Virginia

Abstract: Xeric oak-yellow pine stands have traditionally dominated the south-southwestern slopes of the central Appalachian Mountains. However, decades of fire suppression have halted regeneration of these stands and initiated their replacement with more mesic, fire-intolerant species. Sections from fire-scarred yellow pines were collected at four sites in the Jefferson National Forest, Virginia to reconstruct the historic fire regime. Increment cores and stand composition information were collected from macroplots within each fire history site to investigate the possible influence of fires on stand structure. Results show that fire was frequent before the fire suppression era, with a Weibull median fire return interval between 2–3 years. The majority of fires occurred during the dormant season and beginning of the early growing season. Two of the four sites had a more even distribution of fire seasons, and these sites also had significant pine regeneration. Cohorts of tree establishment were visible in the fire charts of three of these sites, indicating fires that were likely moderate in severity. The canopy at three of the four sites is currently dominated by Table Mountain pine (*Pinus pungens Lamb*.), but the understory at all sites has large numbers of fire-intolerant hardwoods and shrubs. These stands will likely succeed to xeric oak and fire-intolerant hardwoods in future. Fire statistics indicate that all four sites currently exist outside their range of historical variation in fire occurrence.

8: Alex W. Dye, Henri D. Grissino-Mayer

Stand Dynamics and Fire History of a Southern Appalachian Pine-Hardwood Forest at Rainy Mountain, Chattahoochee National Forest, Georgia

Abstract: This study explored the stand dynamics of a pine-hardwood forest on Rainy Mountain in the Chattahoochee National Forest of Georgia over the last 115 years and analyzed the role fire has had as a disturbance in the forest. Increment cores were collected from trees in 30 plots, each 0.01 ha in area. The cores were used to determine date of establishment of each tree and create age structure charts for each plot and for the entire study area. Based on calculated importance values, blackgum, pitch pine, and red maple are the dominant species in the forest. However, seedling and sapling surveys showed an absence of yellow pine regeneration along with a relative abundance of red maple and blackgum, indicating that these trees will dominate the future forest. A concurrent fire history was also constructed using stumps, remnant wood, and living trees with fire scars. Small sections were collected from each and analyzed to determine how frequently fires occurred in the Rainy Mountain area. The resulting fire chronology spans from 1904 to 2012 and includes 36 individual dated fire scars from 20 trees. Fires occurred as recently as 2010, and the mean fire interval of the chronology indicates a fire event approximately once every four years. Several old stumps with fire scars were also collected, but could not be dated in many cases because of the lack of a sufficiently long master tree-ring chronology. Similar to other research conducted in the southern Appalachian Mountains, this study shows a change in forest composition from a pine-oak dominated forest to a red maple-blackgum dominated forest, a change often linked to fire suppression management policies beginning in the 1930s. However, the fire chronology at Rainy Mountain shows an increase in fire frequency after the 1930s accompanied by a concurrent change in forest composition.

9: William T. Flatley, Charles W. Lafon, Henri D. Grissino-Mayer, Lisa B. LaForest

Forest Vegetation Response Along a Topographic Moisture Gradient Following Fire Suppression in Great Smoky Mountains National Park

Abstract: We used dendroecological methods to examine forest dynamics in an old-growth watershed that experienced at least two centuries of frequent fire; followed by a century of fire exclusion. We characterized composition, age structure and successional change along the entire south-facing slope in xeric pine, sub-xeric oak, sub-mesic white pine-hardwood, and mesic cove forest stands. Cove plots were established on both sides of the drainage, in order to assess whether stand characteristics differed in relation to this potential fire break. Samples collected from each stand were sub-divided into age classes representing establishment during three disturbance-related time periods: 1) frequent fire (1700-1910); 2) post-fire (1910-1950); and 3) mesophication (1950-2000). Distinct cohorts established during the post-fire period in all of the stand types except the protected mesic cove stands; suggesting that fire was an important driver of

vegetation composition along the entire slope gradient prior to fire cessation. Differences in composition and structure between the protected/unprotected cove stands suggest that historical fire disturbance impacts varied on either side of the stream. Cluster analysis and non-metric multidimensional scaling performed on the different age classes identified a post-fire decline in multivariate dispersion and a decrease from four to two distinct community types. Xeric pine and sub-xeric oak communities are converting to red maple-white pine communities that were formerly restricted to sub-mesic and mesic positions. Contemporary successional trajectory supports the conclusion that historical fire disturbance maintained community differentiation along the slope gradient, contributing to habitat diversity in southern Appalachian forests.

10: Aldrich, Serena R, Charles W. Lafon, Henri D. Grissino-Mayer, Georgina G. DeWeese

Changing Fire Regimes and Vegetation Dynamics of Xeric Pine and Oak Stands in the Central Appalachian Mountains of Virginia

Abstract: Fire is believed to be important in temperate ecosystems of eastern North America, particularly in xerophytic forests dominated by yellow pine and oak. During recent decades it has become evident that fire exclusion is a major contributor to changes in vegetation structure and composition in these forests. In this study we used dendroecological techniques to address two objectives: (1) develop a centuries-long fire chronology to document fire history beginning in the late presettlement era and extending through the period of modern fire exclusion; and (2) investigate vegetation dynamics in relation to fire occurrence. Fire history reconstructions were based on 231 fire-scarred trees from three sites. Fires occurred regularly – Mean Fire Intervals (MFI) ranged from 1 to 59 years – from the beginning of each chronology until the early 1900s. Little temporal variation was evident despite drastic changes in land use over the period of study. The most important change in the fire regime was the initiation of fire suppression in the early 20th century. Age structure analysis indicated that vegetation development was clearly influenced by fire. Frequent burning maintained populations of yellow pine and oak throughout the period until fire suppression allowed fire-sensitive hardwood trees and shrubs to establish. In both yellow pine and oak stands, non-oak species (mainly black gum; red maple) established following the institution of fire suppression. The understories of all study sites contained an abundance of Mountain Laurel, hardwood saplings and seedlings. It is clear from this study that continued fire suppression will likely result in fire-tolerant pines and oaks being replaced by more fire-intolerant, mesophytic trees and shrubs, such as eastern white pine, black gum, and red maple.

11: David N. Fox, Laurel Schablein, Marek Smith, L. Nikole Swaney

Monitoring Avian Community Response for a Landscape-Scale Controlled Burning Project in the Allegheny Highlands of Virginia

Abstract: Research examining the response of avian species to controlled burning in the Appalachians is growing, but few studies report results beyond the first several years after burning and we are unaware of any studies that describe the temporal and spatial response of avian communities at scales larger than individual burn units. We report on preliminary results from three years of avian monitoring conducted within the 7,400-ha Warm Springs Mountain Restoration Project (WSMRP), a collaborative initiative spanning lands owned by The Nature Conservancy (TNC) and the George Washington National Forest (GWNF). Developed by the Central Appalachians Fire Learning Network (FLN), the initiative strives to restore the historical fire regime of an oak-dominated (*Quercus spp*.) landscape through controlled burns implemented on 11 contiguous burn units ranging in size from 60 to 2,200 ha. Since 2008, FLN partners have conducted controlled burns on four burn units totaling over 2,400 ha and managed one wildfire on another 400-ha unit. From 2011 to 2013, avian point-count surveys were conducted on 107 permanent plots during peak breeding season using a time-of-detection approach. Total counts averaged 870 individual birds and 50 species, and both total species diversity and density increased across the three years. We also examined changes in relative abundance and density for seven focal species chosen for their abundance, high detection probabilities, foraging niches, and nesting habitat preferences. Relationships between vegetative changes in the landscape and avian community response will be explored in subsequent analyses.

12: Jonathan M. Stober, Geoff Holden

Development of an ArcGIS Fire Frequency, Fuel Accumulation, Seasonality and Prioritization Tool to Facilitate Prescribed Fire Decision Making on the Talladega National Forest, Alabama

Abstract: Prescribed fire is used widely to mitigate wildfires and restore ecosystems. However, there are few tools developed to evaluate fires cumulative impact, calculate frequency, examine seasonality and estimate fuel accumulation to facilitate decision making in targeting successive prescribed fire application. An ESRI shapefile of all wildfire and

prescribed fire events was assimilated from 1978-2013 for the 95,100ha (235,000ac) Talladega Division in east central Alabama. A python script-based tool was developed for ArcGIS 10 to calculate the duration of time in the dataset in years and months divided by the total number of fire events in each polygon to calculate the annualized average fire return interval, years of fuel accumulation (date last burned), and frequency of growing to dormant season fire events. The tool allows for dynamic entry of the analysis period and creates a geodatabase output in a designated work space. Development of a comprehensive fire database that can calculate generalized fuel accumulation will allow for more targeted pairing with appropriate smoke dispersion conditions and better smoke management. Calculations of fire frequency will determine if adequate fire return intervals are occurring to the landscape and focus on areas that need increased effort to meet frequency targets for restoration. The tool can also locate areas with historic wildfires which may benefit from targeted prescribed fire to reduce liability and dampen wildfire recurrence. The fire frequency tool can ultimately illustrate and facilitate better planning, prioritization and decision making in future prescribed fire events.

13: Katie Greenberg, Cathryn Greenberg, Tara Keyser, Susan C. Loeb, Henry McNab, Callie Schweitzer, Southern Research Station, Martin Spetich, David Loftis, Kathleen E. Francis, Joy O'Keefe

Researching Effects of Prescribed Fire in Hardwood Forests

Abstract: Scientists with the Upland Hardwood Ecology and Management research unit (RWU4157) administered by the US Forest Service, Southern Research Station conduct applied forestry and wildlife research with a focus on upland hardwood forest. One of our focal research areas is fire ecology, and fire effects on hardwood forests and the wildlife communities they support. Multiple current studies examine the effects of prescribed fire on upland hardwood and mixed pine forests in the southern Appalachian, Cumberland Plateau and Ozark mountains. Scientists are looking at the effects that prescribed fire, repeated burning, season of burning, and fire severity has on wildlife such as bats, amphibians, reptiles, and birds. Scientists also study how prescribed fire affects regeneration of oak and other tree species, planted oak seedlings, herbaceous plants, and American chestnut restoration. Studies are investigating historical fire frequency in upland hardwoods to help managers plan frequency of prescribed burns. Studies also address fuel loads, interaction between fire and oak decline, and oak-pine ecosystem restoration. Scientists are integrating fire return intervals into software models to predict future conditions. Understanding how fire affects upland hardwood forest communities will help land managers to develop science-based methods to meet their management and restoration goals.

14: Mark A. Melvin

2012 National Prescribed Fire Use Survey

Abstract: In the United States, annual wildfire activity has been tracked for decades. These data are necessary for securing resources, instituting fire-fighter training standards, monitoring trends, providing public safety measures, and guiding national policy needed to manage wildfire. Much less is known about prescribed fire activities, but the needs are similar. How much and where prescribed fire occurs year-to-year, and to what degree it meets resource needs is poorly understood. A national evaluation that specifically focuses on the scale at which prescribed fire occurs, what programs support prescribed fire, and identifies factors that limit prescribed fire use is nonexistent. These are all relevant questions necessary to make informed policy and programmatic decisions. To aid in gaining a better understanding of prescribed fire use, the National Association of State Foresters and the Coalition of Prescribed Fire Councils collaborated in early 2012 to conduct a national prescribed fire use survey of all state agencies responsible for prescribed fire activities.

15: Timothy Ingalsbee

Torchbearers for a New Fire Management Paradigm: Firefighters United for Safety, Ethics, and Ecology (FUSEE)

Abstract: Firefighters United for Safety, Ethics, and Ecology (FUSEE) is a national nonprofit organization promoting safe, ethical, ecological wildland fire management. FUSEE members include current, former, and retired wildland firefighters; fire managers, scientists, and educators; forest conservationists; and other interested citizens who support FUSEE's holistic fire management vision. FUSEE's primary mission is to provide public education and policy advocacy in support of a new, emerging paradigm that seeks to holistically manage wildland fire for social and ecological benefits instead of simply "fighting" it across the landscape. We seek to enable fire management workers to perform their duties with the highest professional, ethical, and environmental standards. Our long-term goal is the creation of fire-compatible communities able to live safely and sustainably within fire-permeable landscapes. Inspired by Aldo Leopold's "Land Ethic," FUSEE advocates for a new "Fire Ethic" in fire management policies and practices: *A thing is right when it contributes to the safety of firefighters and the public, ethical use of public resources, environmental protection of fire-*

affected landscapes, and ecological restoration of fire-dependent ecosystems; It is wrong when it tends otherwise. This poster will display FUSEE's philosophy, mission, research, education, and advocacy projects. Elaboration of some key FUSEE concepts will be featured, including: the FUSEE triad of safety, ethics and ecology; re-identifying firefighters as *fire rangers*; expanding community wildfire protection to become community *fire preparation*.

16: Steven P. Norman, Danny C. Lee, James Fox, Karin Rogers, Matthew Hutchins
Assessing Wildland Fire Trade-offs in the Southern Appalachians Using a Cohesive Framework
Abstract: Wildland fire affects a range of Southern Appalachian values from the resilience of fire-adapted vegetation to human health and safety. While fire use can have positive impacts across these values, wildfire and prescribed fire management decisions typically involve cross-jurisdictional tradeoffs. Because of this, broad-scale, long-term solutions require a perspective that integrates prevention, response, resilience and community protection. The recent National Cohesive Wildland Fire Management Strategy has provided national and regional guidance to address these tradeoffs, but what does this mean for land managers and the residents of the Southern Appalachian region? This poster demonstrates how the same basic risk assessment framework used at the national and regional scale can be applied more locally to inform sub-regional problems, to identify patterns of inherent differences, and to help set management priorities. We combine diverse types of data and address uncertainties related to the wildland fire issue using both probability and scenario-based perspectives.

17: Alan Long, Janean Creighton, Vita Wright
Facilitating Knowledge Exchange About Wildland Fire Science
Abstract: The Joint Fire Science Program's (JFSP) Knowledge Exchange Consortia Network is actively working to accelerate the awareness, understanding, and adoption of wildland fire science information by federal, tribal, state, local and private stakeholders within ecologically similar regions. Our network of 14 regional consortia provides timely, accurate, and regionally relevant science-based information to assist with fire management challenges. Regional activities, through which we engage fire managers, scientists, and private landowners, include online newsletters and announcements, social media, regionally-focused web-based clearinghouses of relevant science, field trips and demonstration sites, workshops and conferences, webinars and online training, and syntheses and fact sheets. This poster provides an introduction to and map of the regional consortia.

End of abstracts and conference program

AFE Wildland Fire Professional Certification

The Association for Fire Ecology Wildland Fire Professional Certification Program is designed to further ecologically-based fire science and management. To meet the increasing demands for effective analysis, decision-making, and workforce development in a changing fire landscape, AFE has developed a professional certification program for fire ecologists and researchers, managers, and technicians. The goals of the program are to formally identify fire careers as vital professions, to set standards for the preparation of future fire professionals, and to document the education, experience, and training qualifications of members of the fire ecology and management profession.

There are 6 levels of Certification:
Wildland Fire Technician and **Wildland Fire Practitioner**;
Wildland Fire Manager and **Senior Wildland Fire Manager**;
Wildland Fire Ecologist and **Senior Wildland Fire Ecologist**.
You must be an AFE member to apply for certification. For more information or to apply, see our website.


Association for Fire Ecology

WILDLAND FIRE CERTIFICATION PROGRAM

Your Name Here

has been determined by the Association for Fire Ecology to qualify for the title of

Wildland Fire Professional

Awarded this 24th day of January, 2011

AFE Wildland Fire Certificate holders must meet specific requirements pertaining to their level of education, training, and experience. All Certificate holders are expected to maintain the highest standards of professional conduct and to adhere to the AFE Code of Ethics.

AFE member since January 1, 2008

Brian Oswald

Brian Oswald, AFE President

AFE Wildland Fire Academic Program Certification

The complexity and importance of wildland fire science, management, and decision-making is at an all-time high across our Nation and worldwide. To meet current and future challenges of workforce development, analysis, and sound decision-making, AFE has developed a process for recognizing academic programs which prepare future fire professionals. Our overarching goal is to support fire ecology and ecologically-based fire management while advancing fire science and its application.

Graduating students from and AFE Certified program will qualify for an expedited application process to become an AFE Certified Wildland Fire Manager, Ecologist, or Professional. Recognized programs will also be listed on the AFE website, in our newsletter, and in other AFE promotional materials.

AFE Upcoming Conferences and Events

The Association for Fire Ecology's Regional Conferences (held yearly) and International Fire Congresses (held every three years) provide opportunities for learning, networking, collaborating, and socializing with colleagues from other agencies, universities, regions, and nations. AFE's Fire Congresses are among the largest gatherings of fire scientists in the world, bringing together some of the top fire researchers, managers, and policymakers from dozens of countries across six continents to share their discoveries, experiences, and initiatives in fire ecology. At these events, AFE also gives three different Lifetime Achievement Awards to people who have made significant contributions to fire ecology and management in the U.S., and Student Excellence Awards to students who show exceptional promise in the field of fire ecology. AFE regularly hosts our own conferences as well as collaborates with other organizations and agencies to co-host joint events.

Wildland Fire in the Appalachians: Discussions Among Managers and Scientists. Roanoke, Virginia, USA. October 8-10, 2013. www.appfireconference.org. Co-Hosted with the Consortium of Appalachian Fire Managers and Scientists.

Fostering Resilience in Southwestern Ecosystems: A Problem Solving Workshop. Tucson, Arizona. USA. February 25-27, 2014. Co-Hosted with the Southwest Fire Science Consortium.

Central Oregon Fire Science Symposium. Bend, Oregon. USA. April 7-11, 2014. In collaboration with the Oregon Prescribed Fire Council and the Northwest Fire Science Consortium.

Large Wildland Fires: Social, Political and Ecological Effects. Missoula, Montana, USA. May 19-23, 2014. www.largefireconference.org Co-Hosted with International Association of Wildland Fire.

AFE's 6th International Fire Ecology and Management Congress. San Antonio, Texas, USA. November 16-20, 2015.

Contact Us! If you have any questions or want more information about AFE, you can reach us at: office@fireecology.net or 541-852-7903. You can also Like us on Facebook at www.facebook.com/fireecology or Follow us on Twitter at www.twitter.com/fireecology.

CONSORTIUM OF APPALACHIAN FIRE MANAGERS & SCIENTISTS

Background

The Appalachian region stretches along the Blue Ridge Mountains from Pennsylvania south into Georgia and Alabama. The region's lands shelter some of the greatest biological diversity in the United States. Fire-related research is relatively new to the region; fire managers often have to rely on knowledge and techniques developed for other, less biologically diverse regions. Although two fire learning networks (FLNs) have developed in the region, a disconnect remains between managers and scientists. Outside of the FLNs, there are few ways for managers to convey to researchers the questions they have about the conditions they encounter on the ground.

Objectives

The primary objective of CAFMS is to form a widening network of fire managers and scientists to facilitate knowledge exchange and interaction among managers and scientists. This includes communicating what is known about natural fire and managing with prescribed burning in the Appalachian region, demonstrating techniques and results, and identifying remaining and emerging research questions.

CAFMS Development

Independent scoping meetings of fire managers and scientists were held throughout the Appalachian Region. At each meeting, participants were divided into breakout groups and asked how they received information about fire research and what the most effective means of science delivery are. Comments and suggestions were informative but not always predictable. Most participants noted that many fire resources existed but they were disconnected and difficult to find. One-on-one interaction is the best means of science delivery but the most costly. There is no single best method to provide science delivery because each individual receives and digests information differently.

Dozens of suggestions were given at each meeting for improving science delivery but some were common among all meetings and breakout groups. Common suggestions are listed below in order of preference. Some of these resources are already available and the others will be provided by CAFMS within the next few years.

- "One-stop shopping" web site
- Synthesis of research results for the Appalachian Region
- Face-to-face networking

Membership

CAFMS is for all land managers and researchers in the region who deal with any aspect of fire. The backbone of the consortium is a partnership between the fire managers involved in the two Appalachian region FLNs and scientists from the U.S. Forest Service Southern and Northern Research Stations and partner universities in the region. Other partners include additional federal agencies (National Park Service, US Fish and Wildlife Service), nongovernmental organizations (The Nature Conservancy, the National Wild Turkey Federation, and others), and state natural resource and other departments. Becoming a member is as simple as signing up. Visit our website at www.cafms.org or email Helen Mohr (helen@cafms.org) or Tom Waldrop (tom@cafms.org).

Notes

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