



FIRE LINES

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IN THIS ISSUE

Feedback Relationships: Fire and Brazilian Pepper in Pine Savannas	1
Fire, Cogongrass, and Longleaf Pine Forest Restoration	1
Resources on Fire and Invasive Species	2
Conference Opportunities Close to Home	3
Fall 2015 Prescribed Fire Council Meetings	3
Video Features Latest Research on Estimating Safety Zones	3
Upcoming Events	3
Cohesive Strategy: Southeast Region Update	4
New Spot Weather App for Florida	4
Early Notice for JFSP Research Funding Topics	4
News and Reminders	4

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Feedback Relationships: Fire and Brazilian Pepper in Pine Savannas

The invasive shrub Brazilian pepper is known to invade and dominate several ecosystem types in southern and central Florida, including fire-dependent pine savannas. To better understand the interactions between Brazilian pepper and fire, a study was conducted within a pine rockland savanna in Everglades National Park from 2006 to 2007. Specifically, this research examined whether Brazilian pepper initiates a fire-suppression feedback dynamic, which then perpetuates the species' invasion of the ecosystem. The study site contained six burn units with low densities of Brazilian pepper; three units were burned during summer months and three units served as control sites. Brazilian pepper individuals were surveyed along transect lines before and five months after the burn to measure basal diameter, mortality, and resprouting. In addition, temperature sensitive paints placed on stainless steel tags at the base of Brazilian pepper individuals were used to detect fire temperature. This same process was repeated in a section of one burn unit containing high densities of Brazilian pepper. In addition to the field data collected, remote sensing, fire history information, and modeling were used to analyze and simulate landscape-level patterns of Brazilian pepper invasion and fire.



Photo: Amy Ferriter, State of Idaho, Bugwood.org

In low-density populations, fire caused 30 to 45% mortality of Brazilian pepper individuals in all size classes. These results suggest that frequent fire can be an effective management tool for Brazilian pepper populations that are recently established with low densities. In high density areas, however, fire temperatures decreased by up to 200°C, fire spread was reduced, and mortality rates were observed to be as much as 80% lower. Remote sensing analysis showed that fire was the strongest predictor of Brazilian pepper invasion in pine savannas, with those areas treated with frequent fire having less Brazilian pepper. Using model simulations, the study concluded that fire-free time periods may allow Brazilian pepper to reach a density threshold that reduces fire temperature and spread when it does occur. This begins a positive feedback cycle that can ultimately reduce fire frequency and rapidly shift the ecosystem to being dominated by Brazilian pepper. The Wildland Fire in Ecosystems report described on page 2 of this newsletter notes that similar effects have been suggested for Chinese tallow and Chinese privet in some ecosystems.

Stevens, J. T., & Beckage, B. (2009). *Fire feedbacks facilitate invasion of pine savannas by Brazilian pepper (Schinus terebinthifolius)*. *New Phytologist*, 184, 365-375.

Fire, Cogongrass, and Longleaf Pine Forest Restoration

With the region-wide focus on longleaf pine forest restoration, the effects of fire on cogongrass—an aggressive invasive grass found in pine forests in many southern states—is an important consideration. Numerous studies have been conducted on this topic, showing that frequent fire promotes cogongrass invasions and that areas dominated by cogongrass will have increased fire intensity (see the Wildland Fire in Ecosystems report, described on page 2 of this issue). The results of a study conducted in 2010 (Yager et al.) suggest that, after fire, longleaf pine-bluestem forests are more susceptible to cogongrass invasions than pine-shrub forests. Specifically, the research team measured rates of cogongrass encroachment into burned and unburned plots within both forest types in southern Mississippi. While cogongrass growth was not affected one year post fire in either forest type, growth was significantly greater two years post fire in the burned forests, with the longleaf pine-bluestem forest type

Continued on Page 2

Fire, Cogongrass, and Longleaf Pine Forest Restoration (Cont'd from page 1)

experiencing more rapid cogongrass encroachment than the pine-shrub forest. The authors recommend that managers involved in longleaf restoration efforts monitor and implement cogongrass control methods before and after prescribed fire use.

To build upon this research and provide insight regarding effective control methods, a recent study investigated prescribed fire, herbicide treatment, and seeding as integrated strategies for cogongrass management in longleaf pine forests (Enloe et al. 2013). This study was conducted in Southwest Alabama at two forest sites containing 10 year-old planted longleaf pines with understories dominated by cogongrass. Study plots were set up at both sites to apply combinations of the following treatments: winter prescribed burns (or no burn), followed by spring and fall glyphosate herbicide applications, and seeding native herbaceous species after the first spring glyphosate application. To determine treatment effects on vegetative cover, species richness and diversity, data were collected for three growing seasons. As expected, burning alone or seeding alone in burned or unburned plots provided no cogongrass control nor did those individual treatments increase species richness or diversity. However, three glyphosate applications in either burned or unburned plots reduced cogongrass cover to less than 10% two years after the initial treatment. With the cogongrass reduction after glyphosate treatments, native herbaceous vegetation cover and species diversity increased over the two years, with the largest increases in the seeded plots. In summary, the authors state that “glyphosate and integrated strategies utilizing glyphosate and seeding are very useful for cogongrass management and increasing herbaceous species richness and diversity in longleaf pine.”

- Enloe, S. F., Loewenstein, N. J., Held, D. W., Eckhardt, L., & Lauer, D. K. (2013). [Impacts of prescribed fire, glyphosate, and seeding on cogongrass, species richness, and species diversity in longleaf pine](#). *Invasive Plant Science and Management*, 6(4), 536-544.
- Yager, L. Y., Miller, D. L., & Jones, J. (2010). [Susceptibility of longleaf pine forest associations in south Mississippi to invasion by cogongrass \[*Imperata cylindrica* \(L.\) Beauv.\]](#). *Natural Areas Journal* 30(2), 226-232.

Resources on Fire and Invasive Species

MANAGING INVASIVE SPECIES LEARNING MODULE

The U.S. Fish and Wildlife Service, Center for Invasive Management has several learning modules that provide an overview of concepts, principles, and practices related to invasive plant species management. One of the learning modules focuses on using [prescribed burning as a management method](#). The four sections of this learning module walk through several topics including fire regimes and behavior, management tactics, monitoring, and integrated management methods. The module is self-paced and can be viewed at any time.

WILDLAND FIRE IN ECOSYSTEMS: FIRE AND NONNATIVE INVASIVE PLANTS

In 2008, the US Forest Service Rocky Mountain Research Station published a review to summarize information on interactions between wildland fire and invasive plants. The report, [Wildland Fire in Ecosystems: Fire and Nonnative Invasive Plants](#), contains a section specific to the Southeast region (see page 91) that provides an overview of fire and invasive plants in the following southeastern habitats: wet grasslands, pine and pine savannas, oak-hickory woodlands, tropical hardwood forests, and cypress swamps. The role of fire and fire exclusion in promoting nonnative plant invasions, effects of plant invasions on fuel and fire regimes, and the use of fire to manage invasive plants for these habitats are discussed. Within this section, you will find research results for several species, such as melaleuca, Brazilian pepper, cogongrass, climbing fern, Japanese honeysuckle, and kudzu.

FIRE EFFECTS INFORMATION SYSTEM (FEIS)

Using the [Fire Effects Information System \(FEIS\)](#), you can look up science-based information regarding life history, general ecology, and fire ecology and effects for 182 invasive plant species. In addition, 'fire studies' in FEIS summarize fire effects on different species as measured in a variety of individual research projects. For tips on using FEIS, check out this [3-page SFE fact sheet](#).

INVASIVE PLANTS IN SOUTHERN FORESTS

The USFS has two companion guides published in 2010 that provide an excellent identification guide for major invasive species across the South and important control information, especially with herbicides.

- * [A Field Guide for the Identification of Invasive Plants in Southern Forests](#)
- * [A Management Guide for Invasive Plants in Southern Forests](#)

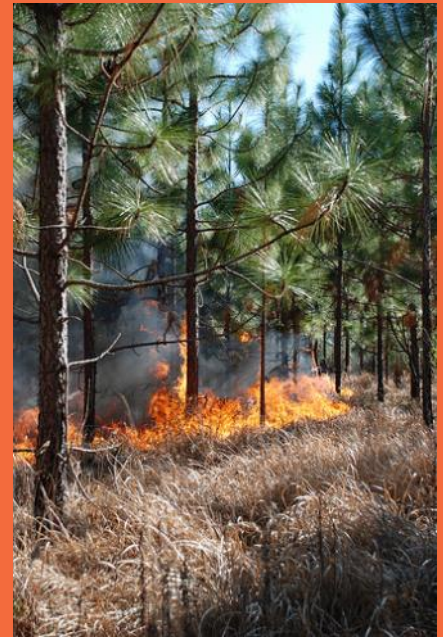


Photo: Nancy Loewenstein, Auburn University

For more information on control strategies for cogongrass, check out the Auburn Cooperative Extension Service publication [Cogongrass Management FAQ \(www.aces.edu/pubs/docs/A/ANR-2230/ANR-2230.pdf\)](#)



An entomologist observes old world climbing fern in southern Florida. Photo: Peggy Greb, USDA Agricultural Research Service, Bugwood.org



Managers discuss melaleuca treatment in the field. Photo: Stephen Ausmus, USDA Agricultural Research Service, Bugwood.org

Conference Opportunities Close to Home

This fall, three national or international conferences will be held in the Southeast, providing great opportunities for attendance by managers, students, and researchers in the region.

Backyards & Beyond: Wildland Fire Education Conference

October 22-24, 2015 | Myrtle Beach, SC

Early bird registration: September 18

This conference brings together diverse audiences who are directly involved in wildland fire safety issues. More than 50 sessions will be offered, including a featured presentation by Darryl Jones, Forest Protection Chief with the South Carolina Forestry Commission. Participants can also register to attend preconference trainings on assessing hazards in the home ignition zone or using GIS for wildfire risk planning and response.



**BACKYARDS
& BEYOND™**
WILDLAND FIRE EDUCATION
CONFERENCE

Society of American Foresters 2015 National Convention

November 3-7, 2015 | Baton Rouge, LA

Early bird registration: September 4

Poster abstract submission deadline: September 30

Join SAF in Baton Rouge for a great line up of plenary sessions, workshops, field tours, and concurrent sessions. Many scientific and technical sessions will have a fire focus this year, including topics such as frequent-fire forest ecosystems; wildfire hazards following fuel management; post-fire regeneration responses and silvicultural treatments in the WUI; regional smoke emission regulations; and fire modeling, management, and ecological restoration.

Look for the SFE presentation on the program, Friday November 6 at 3pm: *The JFSP Fire Science Exchange Network: Successfully Linking Science and Natural Resource Management.*



Sixth International Fire Ecology and Management Congress

November 16-20, 2015 | San Antonio, TX

Oral presentation abstract deadline: August 14

Poster and Fire Trek abstract deadline: September 1

The 2015 Congress will bring together scientists, managers, and students from around the world to learn from each other about the event theme “Advancing Ecology in Fire Management.” In addition to plenary and concurrent sessions, participants can register for workshops and trainings—including Rx310, IFTDSS, ArcFuels10, and LANDFIRE—and field trips to local sites, such as Bastrop State Park, Chaparral Wildlife Management Area, and Balcones Canyonlands National Wildlife Refuge.



Look for the SFE and other Fire Science Exchange Networks at the exhibitor's areas and during a special session on regional fire science outreach programs.

Fall 2015 Prescribed Fire Council Meetings

Dates and agendas have been set for several Prescribed Fire Council meetings in the Southeast this fall. Mark your calendar for the meeting in your state, or even consider visiting a neighboring state's meeting this year. Meeting agendas are packed with presentations, partner updates (including SFE!), and field tours. Continuing education credits are available for attendance. Meeting dates, locations, and links to registration information are listed in the Upcoming Events column (see right).

Video Features Latest Research on Estimating Safety Zones

In a short video from the National Wildfire Coordinating Group, Bret Butler of the Missoula Fire Lab explains research findings on estimating safety zones with consideration of slope and wind. This calculation results in a larger safety zone than would be calculated using the information in the Incident Response Pocket Guide (IRPG), which is based on radiant heat only. While the research is still ongoing, watching this video can help you and your teams reassess how you are calculating safety zones now:

<https://www.youtube.com/watch?v=NW8AMbmifOA>.

UPCOMING EVENTS

Visit the [SFE Calendar](#) and the [JFSP Calendar](#) to learn more about upcoming events. To add an event to our calendar, send the event information to contactus@southernfireexchange.org.

Webinars

Virtual Workshop: Firewise's Wildland-Urban Legends
August 6, 2015, 1pm ET

Compositional and Structural Changes over Time with Different Fire Regimes in Linville Gorge, NC
Southern Blue Ridge Fire Learning Network
August 18, 2015, 3pm ET

PFC Meetings

North Carolina Prescribed Fire Council
August 11-12, 2015 | New London, NC

Alabama Prescribed Fire Council
September 3, 2015 | Mountain Brook, AL

South Carolina Prescribed Fire Council
September 23-24, 2015 | Beaufort/Waterboro, SC

Louisiana Prescribed Fire Council
September 24, 2015 | Alexandria, LA

Central Florida Prescribed Fire Council
September 25, 2015 | Kissimmee, FL

Georgia Prescribed Fire Council
September 29, 2015 | Tifton, GA

Kentucky Prescribed Fire Council
October 5-6, 2015 | Land between the Lakes, KY

North Florida Prescribed Fire Council
October 20, 2015 | Tallahassee, FL

Mississippi Prescribed Fire Council
November 12, 2015 | Hattiesburg, MS

Workshops and Trainings

Alabama Burn Manager Trainings
Sessions in August and September
Various Locations, AL

Prescribed Burn Manager Certification
September 16-17, 2015
Statesboro, GA

Prescribed Burning Short Course
October 6-8, 2015
Hattiesburg, MS

Conferences

3rd Biennial Shortleaf Pine Conference
September 22-24, 2015
Knoxville, TN

Backyards & Beyond: Wildland Fire Education Conference
October 22-24, 2015
Myrtle Beach, SC

Society of American Foresters 2015 National Convention
November 3-7, 2015
Baton Rouge, LA

6th International Association for Fire Ecology Congress
November 16-20, 2015
San Antonio, TX

GENDER SURVEY

You are invited to [provide your feedback](#) in a short Association for Fire Ecology survey aimed at identifying and solving issues of gender discrimination and sexual harassment in the wildland fire community.

TREE RINGS TELL FIRE HISTORY

A recent blog post by The Nature Conservancy, [Ancient Tree Stumps Shed New Light on Fire in Florida](#), shares information about an ongoing study using samples from old pine stumps in Central Florida to reconstruct ancient fire regimes.

NEW STUDY ON HEAT STRESS

The Wildland Fire Lessons Learned Center recently released a Rapid Lesson Sharing report that summarizes [key points from a wildland fire heat illness study](#). Take a few minutes to learn how to be safe during these hot summer months.

LONGLEAF CONE FORECAST

The US Forest Service recently released the [Longleaf Pine Cone Prospects for 2015 and 2016 Report](#), which forecasts longleaf pine cone production in the southern region.

CLIMATE LEARNING NETWORK WEBINARS

The Agriculture, Forestry, and Climate Learning Network has announced [four upcoming webinars](#) focused on building trust and collaboration, assessing risk, and adaptation practices.

THINNING, PRESCRIBED BURNS, AND SOUTHERN PINE BEETLE ATTACKS

A recent U.S. Forest Service study found that forest thinning and targeted burning efforts can protect southern pine forests from southern pine beetle outbreaks. Read the [Compass Live article](#) or the [full report](#).



The Southern Fire Exchange is funded through the Joint Fire Science Program, in agreement with the United States Forest Service, Southern Research Station. This institution is an equal opportunity provider.

Cohesive Strategy: Southeast Region Update

Contributed by Holly Campbell, Southern Regional Extension Forestry

The National Association of State Foresters is currently seeking a full-time Regional Coordinator for a one-year term to carry out the direction of the Wildland Fire Leadership Council in implementing the National Cohesive Wildland Fire Management Strategy in the Southeast Region. For the full announcement, please [click here](#).

To apply for this position, please submit a resume and cover letter to Wib Owen (Wib.Owen@southernforests.org), Executive Director, Southern Group of State Foresters by close of business on August 20, 2015. For additional information on this position, please contact Wib Owen.

In the interim, Jennifer Hinckley, District/Zone Prescribed Fire/Fuels Specialist for Alabama and North Florida National Wildlife Refuges, US Fish and Wildlife Service, will serve as the Acting Southeastern Region Cohesive Strategy Coordinator. She can be contacted at 850-251-4109.

New Spot Weather App for Florida

For managers in Florida, you can now access [spot weather forecasts](#) using a new online mobile app. Your location is the only required information to get a forecast and you can enter your location as latitude/longitude, section-township-range (STR), or zip code. Make sure to click the button for which location type you are using, in the row under the heading "Location." Hourly forecast results for temperature, humidity, wind speed and direction, cloud cover, and precipitation are shown in a table format and line graphs for temperature, relative humidity, and wind speed and direction are also provided. Questions on this new app can be directed to [Bryan Williams](#) or [Eric Dobbs](#), both with the Florida Forest Service.

Early Notice for JFSP Research Funding Topics

The Joint Fire Science Program (JFSP) recently released a Notice of Intent describing [potential topics for the JFSP FY16 funding solicitation](#). While final topics will not be released until September 2015, this early notice allows those interested in the topics to begin considering ideas with potential partners and collaborators. Topics include:

- * Implications of changing ecosystems (with selected regions tentatively identified as Pacific Northwest, Alaska, Northern Rockies, and Southeast)
- * Social, organizational, and institutional barriers to implementing prescribed fire
- * Restoration of sagebrush habitat in the Great Basin: Operational applications
- * Fire effects on tree mortality
- * Implications of managed-perimeter and burn-out wildfire response strategies
- * Post-fire landscape management
- * Regional management needs identified by three members of the Fire Science Exchange Network
 1. Southern Fire Exchange: Effects of prescribed fire and wildfire on particulate matter and ozone levels, and how this compares to modeled smoke emissions
 2. Consortium of Appalachian Fire Managers and Scientists: Prescribed fire effects in different seasons on short-term management objectives related to fuels and vegetation
 3. Oak Woodlands & Forests Fire Consortium: Prescribed fire effects on timber products
- * Fire and Smoke Model Evaluation Experiment (FASMEE)
- * New Science Initiative: Ecological and social dimensions of resilient landscapes
- * Graduate Research Innovation (GRIN) award

The SFE is available to help with outreach planning for proposals, and we'll be sending information this fall regarding options, requirements, and timelines for obtaining SFE letters of support.