Fire Season Effects on Flowering Characteristics and Germination of Longleaf Pine Sandhill Grasses

Longleaf pine savannas are a fire-maintained community of the southeast United States dominated by ground-layer plants—specifically grasses. Enhanced growth and flowering is common of grasses in fire-maintained communities and is often considered an evolved adaptation to the historical lightning-season fire. Flowering, seed production, and seed germination of five grass species characteristic to longleaf pine savannas of northwest Florida were examined with respect to burn month in a fire-maintained longleaf pine community. Ground-layer sampling was used to determine the percent of plants that produced seed-bearing stems (SBS), the number of SBS per plant, and the density of SBS for each species of concern in the burn areas. Estimates of seed production were determined in the late summer (August to September) of 2006 and germination was evaluated following an 8 month period of after-ripening.

Fire season variably and sometimes significantly affected flowering characteristics and seed germination of five fall-flowering perennial grasses. For Sporobolus junceus and Schizachyrium scoparium, the percentage of plants with at least one seed-bearing stem (SBS) was greatest following late lightning-season fires (July), while percentage of the fall-flowering perennial Aristida mohrii showed a marked negative response to late lightning-season fire. SBS density was greatest in Andropogon ternarius following late lightning-season fires, but statistically similar among the other four grass species. Likewise, SBS per plant in A. mohrii showed a response (negative) to late lightning-season fires. Only Aristida purpurascens showed no change in flowering characteristics following changes to the fire-season; however, percent seed germination in A. purpurascens was significantly higher following late lightning-season fires. Similarly, percent seed germination in A. ternarius was higher following late lightning-season fires.

Continued indefinitely, we suggest that lightning-season fires might lead to reduced species diversity and greater assemblages of dominant matrix grasses. Further, our results suggest variation to fire season to capture variation in flowering of longleaf pine sandhill grasses, thus emphasizing a full complement of ground-layer richness.

For more information on this project, please contact Debbie Miller, Associate Professor of Plant/Wildlife Community Ecology at the University of Florida, at dlimi@ufl.edu, or Mack Thetford, Associate Professor of Landscape Ornamentals at the University of Florida, at thetford@ufl.edu.
Upcoming Conferences

- **Organization of Wildlife Lands and Realty Specialists (OWLS) and Association of Fish and Wildlife Agencies (AFWA) 24th Annual Conference**
  May 20-23 at the Hilton Hotel Cocoa Beach, FL
  Theme: “Sustaining Florida’s Wildlife Heritage Amid 21st Century Challenges”
  For more information visit: [http://www.ces.fau.edu/OWLS08](http://www.ces.fau.edu/OWLS08)

- **Integrated Forest Vegetation Management Workshop**
  June 11th 8:30 am-3:00 pm UF North Florida Research and Education Center, Quincy, FL
  Information on vegetation management using fire, herbicides, and machinery
  For more information visit: [http://nfrec.ifas.ufl.edu/Calendar/Forest-Jun2008.pdf](http://nfrec.ifas.ufl.edu/Calendar/Forest-Jun2008.pdf)

- **Project Learning Tree, PreK-8 Educator Workshop**
  September 13th 9:00 am-3:30 pm at the Austin Cary Memorial Forest, Gainesville, FL
  PLT Certification, Activity Guide, and Valuable Teaching Resources
  $10 at the door, lunch included. For more information visit: [http://www.sfrc.ufl.edu/plt/events_calendar/Austin_Cary_Workshop.html](http://www.sfrc.ufl.edu/plt/events_calendar/Austin_Cary_Workshop.html)

- **2008 Southern Mensurationists Conference**
  October 26-29 Holiday Inn, St. Augustine Beach, FL
  Professionals and Students welcome! Call for Papers and Abstracts!

- **Tall Timbers Research and Land Conservancy 24th Fire Ecology Conference**
  January 11-15, 2009 Ramada Conference Center, Tallahassee, FL
  Theme: “Future of Prescribed Fire: Public Awareness, Health, & Safety”
  Call for Papers and Abstracts!
  For more information visit: [http://www.talltimbers.org/FEconference/](http://www.talltimbers.org/FEconference/)

Recent Research Finding

**Fire and flood: Why are south-central Florida seasonal ponds treeless?**

While seasonal ponds in the scrub landscape of the Lake Wales Ridge in south-central Florida are favorable for establishment of small south Florida slash pines (*Pinus elliottii var. densa*), few seasonal ponds have mature trees. We hypothesize that disturbances (fire and/or flooding) periodically exclude trees from seasonal ponds. We studied the demography of slash pines in relation to water level and fire for a decade from 1992-2001 in four seasonal ponds, two with long and two with short hydroperiods. Seasonal ponds were favorable for pine growth (0.1-0.6 m increase in height annually, growth from grass-stage to one meter in about 7 y) and annual survival (survival generally over 80% in years without fires). Most recruitment (appearance of seedlings in a "grass stage") occurred in drier ponds. Flooding episodes occurred in most years and lasted 3-11 mo. Mortality increased with flooding intensity (summed flooding depth) in 3 of 9 y and was concentrated in pines <1 m tall. Growth rates were unaffected by flooding. A low-intensity prescribed fire created 72% mortality, while a large intense wildfire caused nearly 100% mortality. Although South Florida slash pine can survive short-term flooding and moderately intense fire, both flooding and fire can exclude trees from many seasonal ponds. Fire was a stronger force during our study. Seasonal ponds in south-central Florida are usually treeless not because conditions are generally unfavorable for growth and establishment of south Florida slash pines, but because episodic flooding and fire cause massive mortality of seedling and sapling pines.