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Our Mission:
To provide fire science to resource managers, land-owners, and the public about the use, application and effects of fire within the region



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PROGRESS AS PROMISED

Every fall, as part of our internal program assessment, we review our activities from the previous fiscal year. This process allows us to assess how our fire-science outreach activities advanced our mission, and helps to illuminate our path forward. We've just completed this process for FY2018, and will be incorporating the lessons learned as we lay out our activities for 2019 and beyond.

As in previous years, our efforts this year focused on providing field-based learning opportunities, promoting interactions between fire scientists and managers, and publishing science-based materials that efficiently translate to current issues in management. We provided 7 workshops, 6 webinars, and 7 field tours. We published quarterly newsletters, research briefs, virtual demonstration sites, and video recordings of conference and workshop presentations. Our activities provided 50 continuing education credit hours approved by both the Society of American Foresters and The Wildlife Society.

Possibly our most exciting new endeavor involved outreach designed for private landowners, the general public, and K-12 teachers and students. We previously identified these groups as underserved, yet important to the fire science and management community. To this end, we developed a series of fire ecology workshops tailored to private landowners and are currently developing fire-science curricula tailored to high school students. Both of these efforts are designed to be transferable to new parts of our region, so contact us if they are of interest to you.

We recognize that maintaining partnerships and developing new ones are critical to our success. It has been a positive experience to work on sharing fire-science information throughout our region, and we are excited about working with you in the next year!



More than 60 land managers from at least 6 agencies and 4 states attended the Shortleaf Pine Restoration in Kentucky field day cohosted with the Forest Stewards Guild and Daniel Boone National Forest.

Moving fire forward...



RESEARCH HIGHLIGHT:

Slow recolonization of burned oak–juniper woodlands

by Ashe juniper (*Juniperus ashei*):

Ten years of succession after crown fire

[Charlotte M. Reemts and Laura L. Hansen](#)

[Forest Ecology and Management 255 \(2008\) 1057–1066](#)

In this study, researchers investigated plant community changes over nearly a decade following a crown fire in mature oak-Ashe juniper woodlands (*Quercus* spp.-*Juniperus ashei*) of central Texas. Of particular interest was determining the length of time needed for reestablishment of Ashe juniper trees, a required habitat component for the federally endangered golden-cheeked warbler (*Dendroica chrysoparia*), and how it varied across three locally common soil types: Evant silty clay (Evant); Eckrant-rock outcrop complex (Eckrant); and Real-rock outcrop complex (Real).

The study occurred on the Fort Hood Military Reservation, located at the intersection of the Cross Timbers – Southern Tallgrass Prairie and the Edwards Plateau ecoregions. A limestone area with steep-sided mesas and wide valleys, this area historically supported communities ranging from mixed-grass prairies to floodplain forests, including oak shrublands, oak savannas, and oak-juniper woodlands. The latter hosts one of the largest known breeding populations of the golden-cheeked warbler.

In the region's oak-juniper woodlands, Ashe juniper can co-occur with live oak (*Q. fusiformis*), post oak (*Q. stellata*), blackjack oak (*Q. marilandica*), shin oak (*Q. sinuata* var. *breviloba*) and Texas red oak (*Q. buckleyi*). Unlike oaks, Ashe juniper does not resprout after being top-killed by fire. Communities vary according to slope, moisture levels, fire frequency, and especially the soil type. Post oak dominates the deeper Evant soil type; shin oak dominates the shallow, flat Eckrant soil type; and Texas red oak dominates the sloped Real soil type.

In February 1996, following a year-long drought and during a period of high temperatures and strong winds, military exercises at Fort Hood sparked grass fires that spread into adjoining woodlands and burned for more than two weeks. Crown fires in these oak-juniper woodlands included more than 2,000 ha of golden-cheeked warbler habitat, and affected more than 4,000 ha of woodlands overall.

Within a few months after the fire, permanent vegetation monitoring transects were established in burned areas of former golden-cheeked warbler habitat, randomly located on all three soil types. Control transects were placed in unburned mature oak-juniper woodlands on the same soils. Data were collected annually from 1996 to 2002, and in 2005.



Background: unburned Ashe juniper–oak woodland. (Photo: Charlotte Reemts). Inset: golden-cheeked warbler. (Photo: Gil Eckrich)

Management Implications

- Ashe juniper, a critical component of golden-cheeked warbler habitat, is a slow-growing species that may require decades to recover following a crown fire.
- Due to the paucity of available golden-cheeked warbler habitat, crown fires in mature oak-juniper woodlands should be avoided.

Stem density and basal area were calculated for four categories of woody plants: seedlings, including resprouts (<0.3 m tall), shrubs (>0.3 but <1.8 m tall), saplings (>1.8 m tall but < 5.0 cm dbh) and trees (>5.0 cm dbh). In the study's final year, stem density and basal area were calculated by species for Ashe juniper, post oak, shin oak, and Texas red oak.

Researchers observed low relative abundance of woody species and basal areas in the burned areas. Densities of Ashe juniper in burned areas were very low throughout the study period. Oak dominance in burned areas, measured as a

...Cont'd on Page 3

Moving fire forward...

Research Highlight, continued:

percentage of basal area, was significantly lower than in unburned areas across all soil types. However, by study's end in 2005, burned areas became more similar to unburned ones, except for a lack of Ashe juniper. High numbers of oak stump sprouts suggest that burned areas will develop into oak woodlands in the future.

Seedling density in burned areas increased rapidly between 1999 and 2005, at which time it was about the same between burned and unburned areas. In 1996, **shrub density** was similar between burned and unburned areas. In burned areas it increased during the first few years, but then remained constant until declining during the study's last year. **Sapling density** in burned areas was low at the start (<800 stems/ha), but increased greatly within a year (1,800 - 5,000 stems/ha). By 2005, sapling density was higher in burned than unburned areas. **Tree density** on burned areas was low until 2005, but tree regrowth on burned areas varied by soil type and species.

Ashe juniper seedling density was considerably lower compared to unburned sites for the entire period and across all soil types (in 2005, 76 ± 267 /seedlings/ha, burned, vs. $6,192 \pm 389$ seedlings/ha, unburned). Similarly, density of shrub-size stems for this species was also lower than on unburned areas, except on Evant soils. No stems had reached the tree size class by the end of the study.

Post oak seedling density was significantly lower in burned than in unburned areas throughout the study period. Early in the study, post oak shrub density was high in burned areas, but declined by 2005 as resprouted stems moved into the sapling class. Density of tree-sized stems was very low (51 ± 67 trees/ha) at that time.

Shin oak seedling density rebounded to levels found in unburned areas during the first growing season for Evant and Real soils, but not for Eckrant soils, where the species is dominant. Shrubs and saplings of this species, by 2005, were of similar densities in both burned and unburned areas. However, at that time none of the regrowth had reached the tree-size class.

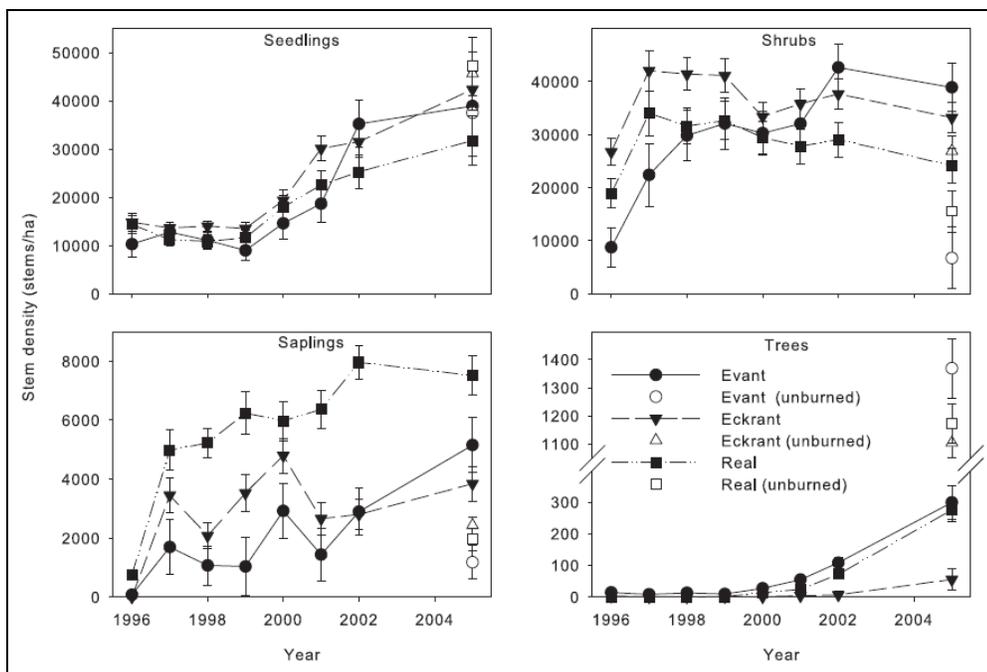
Texas red oak recovered faster than post oak and shin oak. Seedling density remained lower on Real soils (where it is a dominant) throughout the

study, likely because most stems were in taller size classes. As with post oak, Texas red oak shrub density was high in early years, but declined as shrub-sized stems entered the sapling class. By 2005, sapling density was higher in burned areas than unburned. At that time, tree-size stem density had also reached levels found in unburned areas, but with low basal area.

Because fire-sensitive Ashe juniper commonly invades open land when fire is suppressed, authors were surprised that its abundance was low even 10 years after the fire, and the few junipers present were small and short. However, a lack of juniper regeneration after a crown fire had been previously observed in this region. Slow colonization was attributed to: the large extent of the crown fire; timing of the fire (February), which killed newly-sprouted seedlings; juniper seeds' sensitivity to fire; lack of relict juniper trees nearby to provide seeds in subsequent years; lack of trees of suitable size to provide roosts for birds that deposit seeds; and competition from resprouting species, particularly oaks.

Abundance of golden-cheeked warblers greatly diminished in the burned areas following the 1996 fire. However, locally, golden-cheeked warbler overall population did not decrease, presumably because the birds relocated to suitable habitat in nearby unburned areas.

Authors predict repopulating warblers in the burned area will take several decades due to the slow growth of Ashe juniper, and they recommend avoiding crown fires in mature oak-juniper woodlands where golden-cheeked warblers currently reside, due to the fragmented and overall reduced levels of available habitat for these birds.



Stem densities in four vegetation strata on three soils. Seedlings were <0.3 m in height, shrubs were between 0.3 and 1.8 m in height, saplings were > 1.8 m tall but <5.0 cm dbh and trees were > 5.0 cm dbh. Evant soils are dominated by post oak (*Quercus stellata*), Eckrant soils are dominated by the shrubby shin oak (*Q. sinuata* var. *breviloba*) and Real soils are dominated by Texas red oak (*Q. buckleyi*). For unburned areas (open symbols), only data from 2005 are shown.

Chart is reprinted by permission of ...

[Forest Ecology and Management](#)
255 (2008) 1057-1066

Download a printable version of this research brief [HERE](#)

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HEADS UP!

2018 Fall Fire Science Webinar Series



Dr. Lee Frelich, University of Minnesota
“Fire as a mediator of competition among oaks, grasslands and mesic forests”
September 11, 2018 – [CLICK HERE](#) to watch recording



Dr. Greg Nowacki, U.S. Forest Service
“Current efforts to reignite prescribed burning across central hardwood forests”
November 20, 2018, 1 p.m. CST



Dr. Marcus Lashley, Mississippi State University
Topic: Fire and herbivory. Title TBA
December 4, 2018, 1 p.m. CST



Dr. Shelly Wiggam, Kansas State University
“If you want something to die, make it be still: Pyric herbivory promotes pollinator diversity”
December 11, 2018, 1 p.m. CST



In case you missed it ...

GREAT PLAINS PRESCRIBED FIRE SUMMIT

October 1-3, 2018, Ardmore, OK
... now you can watch it on video

[CLICK HERE TO VIEW](#)



Three workshop presentation videos are now available from

FIRE & FOREST MANAGEMENT AT BERNHEIM FOREST

October 10, 2018

- “Forest and fire management effects on regional forest communities”
Heather Alexander, Mississippi State University
- “Restoration: Natural fire and fire-dependent communities of birds, plants, and animals in the Bernheim Forest region”
Cecil Frost, University of North Carolina
- “Prescribing fire amid 21st century challenges”
Kurt Dreisilker, Morton Arboretum



TO WATCH THESE VIDEOS [CLICK HERE](#)

Moving fire forward...



SPOTLIGHT

In an effort to introduce you to new people and information from the region, we interview fire practitioners and researchers about timely topics. In this issue, we asked these questions of Jeff Sparks, wildlife biologist with the Texas Parks and Wildlife Department.

What are some of the greatest fire research needs for central Texas oak woodlands?

JS: Long-term research covering multiple burn rotations is needed, and research on how to control invasive shrub species such as American beauty berry and yaupon that explode after reducing mid-story and overstory canopies.

What is your biggest concern when deciding to use fire to manage oak woodlands and forests?

JS: Smoke management is a major concern as in many of the areas we manage there is no direction to send smoke and not impact someone. Another challenge is balancing prescriptions to produce adequate fire behavior to meet management objectives on first entry burns, or sites that have not been burned for decades. Often there is a narrow window that produces adequate fire behavior to meet objectives and not burn the site with too much intensity killing desirable overstory trees.

In your opinion what is the greatest advantage to using prescribed fire when managing oak woodlands and forests?

JS: The use of prescribed fire allows us to mimic a natural process and meet numerous objectives with one tool. Historically fire was common in oak woodlands, and these habitat types are going to burn, it is just a matter of when and how. In areas that fire has been excluded for decades and fuel loads have accumulated we risk substantial long-term damage and change to forest structure and composition.

Jeff Sparks earned his bachelor's degree in wildlife management and his master's degree in environmental sciences/forestry from Oklahoma State University. He is a certified wildlife biologist through the Wildlife Society with more than 20 years experience planning and implementing prescribed fires in three states and in diverse habitat types ranging from pine-hardwood forests to coastal prairie and high desert.



Jeff has worked for Texas Parks and Wildlife Department since 1998 and currently oversees all wildland fire operations on Texas State Park managed lands. Jeff has led more than 500 burns on state lands and authored and/or co-authored more than a dozen peer-reviewed papers on fire effects, fuels, fire behavior and fire history.

Save the Date!

For more information, [CLICK HERE](#)

8th International Fire Ecology and Management Congress

November 18–22, 2019
Loews Ventana Canyon Resort
Tucson, Arizona



6th Fire in Eastern Oak Forests Conference

July 23-25, 2019

Penn Stater Hotel and Conference Center, State College, Pennsylvania

Organizers: Oak Woodlands & Forests Fire Consortium • Consortium of Appalachian Fire Managers and Scientists • Pennsylvania Prescribed Fire Council ... For more information, [CLICK HERE!](#)



Moving fire forward...

UPCOMING EVENTS



- SAVE THE DATE -

5th Biennial Shortleaf Pine Conference
October 1-3, 2019
Van Buren, Missouri

Shortleaf Pine
INITIATIVE

For more info, [CLICK HERE](#)

November 20, 2018: Webinar: Greg Nowacki, U.S. Forest Service Regional Ecologist

Current efforts to reignite prescribed burning across central hardwood forests, for more information, [CLICK HERE](#)

November 27, 2018: Webinar: Prescribed Fire Policy Barriers

Northwest Fire Science Consortium, for more information, [CLICK HERE](#)

November 29, 2018: Webinar: Jennifer Fawcett & Bobby Clontz, Southern Fire Exchange

Lessons Learned from Learn-n-Burn Events, for more information, [CLICK HERE](#)

December 4, 2018: Webinar: Marcus Lashley, Mississippi State University

Topic: Fire and herbivory, for more information, [CLICK HERE](#)

December 10-14, 2018: 15th International Wildland Fire Safety Summit

Asheville, NC, for more information, [CLICK HERE](#)

December 11, 2018: Georgia Blue Ridge Mountains FLN Fall Workshop

Dahlonega, GA, more information coming soon

December 11, 2018: Webinar: Shelly Wiggam, Kansas State University

Patch-burn grazing and native pollinators, for more information, [CLICK HERE](#)

February 11-15, 2019: Annual FLN Leaders-TREX Coaches-IPBN Workshop

Russellville, AR, more information coming soon

April 1-3, 2019: After the Flames Conference

Denver, CO, for more information, [CLICK HERE](#)

April 22-26, 2019: Fire Adapted Communities Learning Network Workshop

Location TBD, more information coming soon

April 29–May 3, 2019: 6th International Fire Behavior and Fuels Conference

Albuquerque, NM, for more information, [CLICK HERE](#)

July 23-25, 2019: 6th Fire in Eastern Oak Forests Conference

State College, PA, for more information, [CLICK HERE](#)

October 1-3, 2019: 5th Biennial Shortleaf Pine Conference

Van Buren, MO, for more information, [CLICK HERE](#)

November 18-22, 2019: 8th International Fire Ecology and Management Congress

Tucson, AZ, for more information, [CLICK HERE](#)

Please contribute your event announcements. Send information to: oakfirescience@gmail.com

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