Hands-On Fire Science Workshop

Blending fire implementation and fire science for early career professionals

A Complex Challenge

In the tallgrass prairie and oak savanna region, current fire ecology research often lacks specific details needed to inform prescribed fire management.

Quantitative fire ecology methods are needed to improve the value of fire research to fire management decisions.

Key variables include:

- **fuels** (fuel moisture and fuel load),
- **environmental conditions** (fire weather), and
- **fire behavior** and **intensity** (for example, rate of spread and temperature).

Quantitative methods are important for building on the general patterns revealed by treating fire as a categorical variable (burned vs unburned comparisons, fire frequency, dormant season vs growing season comparisons).

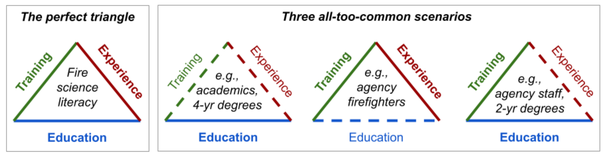
A review of fire research in rangeland ecology concluded that generic approaches to fire ecology "make it difficult to inform prescribed burning practices at a regional or national level (Limb et al., 2016).

We see two main factors perpetuating the research-management gap:

1) few university programs have invested in developing the experienced personnel, policies, and infrastructure needed to facilitate training and mentoring new researchers — graduate students and post-docs — in these methods; and

2) few examples of researcher-manager collaborations integrating prescribed fire operations and quantitative fire ecology methods.

General Principles



Researchers have identified three common syndromes of lopsided professional development (Kobziar et al., 2009).

The main issues are disparities between **education** (receiving knowledge on the fire environment, fire effects, and how and why one might conduct a prescribed fire), **training** (being taught how to use and apply various fire management resources), and **experience** (a background of having performed fire management tasks). (Text from McGranahan et al., 2022; figure adapted from Kobziar et al., 2009)

Part of the Solution

Train the next generation of grassland fire ecologists!

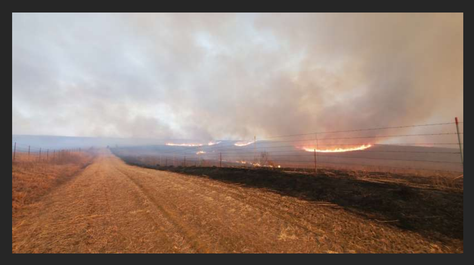
This partnership brought together fire ecologists and prescribed fire practitioners to design and launch the Hands-On Fire Science Workshop. The workshop is based on the Prescribed Fire Training Exchange (TREX) model.

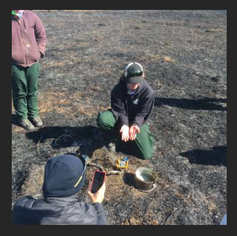
The workshop is hosted by The Nature Conservancy at Dunn Ranch Prairie in northwest Missouri, and has been run in spring 2022 and 2023. Participants are trained in standard methods to quantify weather, fuels, fire temperature, and fire effects, and serve as volunteer crew members on typical prescribed burn operations at the preserve.

So far, participants have included graduate students, post-docs, and early career professionals. All participants must hold the entry-level certification in the National Wildland Fire Coordinating Group (NWCG) system. Past experience with fire has ranged from current students lacking experience and training to participants with additional NWCG training (including Firefighter Type I) and several years of prescribed fire experience.

A review of the workshop's principles and outcomes is available as an open-access article in the peer-review journal *Fire*: "The Dunn Ranch Academy: Developing Wildland Fire Literacy through Hands-on Experience with Prescribed Fire Science and Management."

Curriculum: Pre-Burn, Fire Operations, Post-Burn





The workshop engages students from pre-burn sampling and preparation to fire operations and post-burn review.

Elements include: comparing methods for sampling fuel load; training in ignition and holding tools (not shown); preparing for operations by exploring scenarios in sandbox exercises; pre-burn briefing; spinning weather (not shown); ignitions and holding at various scales; post-burn discussion/after-action review; and retrieving scientific equipment (a thermocouple array and datalogger are shown here).

2023 Workshop Cadre and Key Partner Organizations

Ryan Gauger (Operations Lead)

Fire and Stewardship Manager, The Nature Conservancy: Missouri Chapter

Carissa Wonkka (Science)

Research Ecologist, USDA-Agricultural Research Service, Northern Plains Ag. Laboratory

Scott Moats (Operations)

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Craig Maier (Communications)

Coordinator, Tallgrass Prairie & Oak Savanna Fire Science Consortium

Devan A. McGranahan (Science)

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Chris Woodson (Operations)

Biologist, US Fish and Wildlife Service, Big Muddy National Fish & Wildlife Refuge

Jonathan Spiess

Agriculture & Rangeland Management Assistant Professor, Chadron State College

2024 Workshop: April 8-12

Applications Open

For more information, scan the QR code

or use the URL

bit.ly/fire-sci-methods

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TALLGRASS PRAIRIE & OAK SAVANNA FIRE SCIENCE CONSORTIUM

The Nature Conservancy
Protecting nature. Preserving life.

USDA Agricultural Research Service

U.S. FISH & WILDLIFE SERVICE

Works Cited

Kobziar, L.N., M.E, Rocca, M.E., Dicus, C.A., Hoffman, C., Sugihara, N., Thode, A.E., Varner, J.M., and Morgan, P. 2009. Challenges to educating the next generation of wildland fire professionals in the United States. *Journal of Forestry*.

Limb, R.F., Fuhlendorf, S.D., Engle, D.M. and Miller, R.F., 2016. Synthesis paper: assessment of research on rangeland fire as a management practice. *Rangeland Ecology & Management*.

McGranahan, D.A., Maier, C., Gauger, R., Woodson, C. and Wonkka, C.L., 2022. The Dunn Ranch Academy: Developing wildland fire literacy through hands-on experience with prescribed fire science and management. *Fire*.