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RESEARCH BRIEF SERIES

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This research brief is part of a call designed to help advance knowledge regarding how diverse community members perceive wildfire risk, prepare for wildfire threats, understand fire weather observations and forecasts, receive fire weather alerts and warnings, make evacuation decisions, and respond to and recover from the impacts of a wildfire.

INFORMATIONAL NEEDS AND DECISION-MAKING OF PRESCRIBED BURN PRACTITIONERS IN THE UNITED STATES

OVERVIEW

Prescribed burns have major potential to maintain forest ecosystem health, reduce fuel loads, and ultimately reduce wildfire risk across the United States. Recent policy guidance from the U. S. Forest Service has called for prescribed fires as a tool to address the nation's growing wildfire hazards, but the successful implementation of prescribed burns depends on complex decision-making processes.

Prescribed fire practices are generally not well documented. This prevents the systematic evaluation and improvement of burn protocols, hindering knowledge transfer between regions and limiting the opportunities to develop evidence-based practices for fire management. Addressing this gap is particularly relevant for understanding how practitioners navigate weather forecast uncertainty, regulatory requirements, and resource constraints when conducting burns.

This study investigated prescribed fire practices across multiple U.S. Forest Service regions, focused on California, Colorado, Georgia, and South Carolina. We examined practitioners' decision-making processes, product use, and weather and climate-related forecasting needs for prescribed burn operations. Using a qualitative approach, we conducted 21 hybrid (in-person and virtual) interviews with 24 prescribed fire decision makers.

Our findings highlight a pressing need to address scientific, technological, and policy barriers to expand prescribed fire use as a critical tool in wildfire risk mitigation.

Sign along a rural road warns motorists of a prescribed burn area ahead. Source: Heidi Bensen / Shutterstock.com

KEY FINDINGS

- Federal land managers typically plan burns several years in advance, while burns on private lands can be planned in less than a year. Despite these differing timelines, the actual procedures followed in the 10 days leading to a burn are quite similar across all land types. Common actions include managing resources and personnel and gaining a sense of forecasted weather, such as wind speeds and direction, moisture levels, and upper air dispersion rates.

- There are critical information gaps on smoke impacts and dispersal, with limited smoke modeling capabilities. Practitioners often lack high resolution air quality data from to scientifically verify prescribed burn smoke impacts.

- Practitioners leverage data from several sources, frequently their local Weather Forecast Offices webpage, but also for-profit weather products like The Weather Channel. Practitioners across regions consistently expressed a desire for resources and tools designed specifically for prescribed fire usage, rather than wildland fire. They also expressed a desire for more direct interaction with meteorologists.

- Prescribed burn practitioners are concerned that forthcoming Environmental Protection Agency (EPA) regulations for small Particulate Matter (PM2.5) may limit prescribed burn operations or increase bureaucratic barriers.

- Significant regional differences were observed. Practitioners in region 8, the Southern U.S. states, described a broad social acceptance of prescribed burns from residents. In contrast, those in the Intermountain West and Pacific Coast, regions 2 and 5, described communities as fearful because of devastating recent wildfires, which have created an aversion to all fire, regardless of source.

RESEARCH IMPLICATIONS

- Practitioners need information products specifically tailored to the needs of prescribed fire, rather than being asked to adapt wildfire tools. These resources should address the critical decision timeframes, particularly the critical 10-14-day planning window, and the day before/morning of period when detailed weather forecast information is essential for confirming necessary conditions to meet the burn objectives.

A forestry officer uses a drip torch to ignite a prescribed fire.
Source: Robert Wilder Jr. / Shutterstock.com

- More data is needed to understand the impacts of prescribed burn smoke and its cumulative effects on human health. While wildfire has a significant negative impact on communities' emotional, mental, and physical health, the literature on prescribed fire smoke needs improvement.

- Leveraging existing and well-known platforms like the Fire Weather Dashboard and Geographic Area Coordination Centers to integrate new prescribed fire products could help practitioners could provide consolidated, user-friendly information.

- There's a critical need for more supportive policies that recognize the stark differences between federal and private land management timelines and the significant hurdles federal fire practitioners must overcome to plan a burn. As climate change impacts reduce the number of favorable burn days, any policy reform should focus on streamlining and clarifying regulatory processes—particularly those related to air quality considerations—while maintaining necessary environmental protections for residents.

- To address cultural and regional differences in attitudes around prescribed burns, more targeted public messaging campaigns may be necessary to highlight the benefits of prescribed burning and the highly experienced and strategic practitioners who carry out prescribed burns.

AUDIENCE

This research is relevant for policymakers, land management authorities, and weather forecasters or researchers looking to support safe and effective prescribed fire use for wildfire risk mitigation.

Full report: Davis, S. J. S. & Triplett, A. (2026). Informational Needs and Decision-Making of Prescribed Burn Practitioners in the United States. (Natural Hazards Center Weather Ready Research Report Series, Report 22). Natural Hazards Center, University of Colorado Boulder. **hazards.colorado.edu/weather-ready-research/informational-needs-and-decision-making-of-prescribed-burn-practitioners-in-the-united-states**

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