

Foreword

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The challenge of minimizing the impacts of smoke on the public while expanding the role of fire in land management has never been greater, as air quality standards tighten and the wildland-urban interface expands with people looking to live in natural environments with clean air. Recent dramatic increases in the average number of acres burned by wildfire per year have led to increased awareness that wildfire smoke impacts are a reality that must be addressed. Prescribed fire, a vital tool to improve ecosystem health and lessen the potential impacts of wildfire, is gaining support even among unlikely allies such as clean air agencies. But this tentative support will only continue and expand if fire practitioners commit to continuously learning and applying the best science and methods for protecting air quality as well as emphasizing public communications and outreach to address concerns. In the near future, changes in climate leading to shifting ecosystems and fire regimes will provide new challenges. This edition of the *Smoke Management Guide for Prescribed fire* builds on previous versions with updated knowledge of fire and air quality science, policy, and tools. New concepts presented for the first time include chapters on smoke management communications, public perceptions of smoke from wildland fire, wildland fire and climate change, and the practical use of meteorological tools and indices for smoke management. This guidebook will serve to educate current and future generations of fire practitioners and smoke managers by building upon the good work of earlier efforts.

The challenge—and the potential—for wildland fire management in the 21st century is perhaps best described by the vision statement adopted by the Wildland Fire Leadership Council (WFLC):

“To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire.”

This vision frames the *National Cohesive Wildland Fire Management Strategy* effort (Cohesive Strategy) initiated by the Federal Land Assistance, Management and Enhancement (FLAME) Act of 2009. The Cohesive Strategy takes a holistic approach to the future of wildland fire management, and identifies three primary, national goals:

- **Restore and Maintain Landscapes**, making them resilient to fire-related disturbances.
- Create **Fire-adapted Communities**.
- Ensure safe, effective, and efficient **Wildfire Response**.

The imperative for appropriate and effective management of smoke from wildland fire is embedded in all three of these goals. The Cohesive Strategy approach is considered holistic because achievement of these goals, as well as the associated smoke management implications embedded in each, is only possible through collaborative engagement—the “all-hands/all-lands” paradigm on which implementation of the Cohesive Strategy is firmly grounded. This approach has already found considerable traction in the context of smoke management and air quality, as demonstrated by the growth and strength of recent partnerships. Adding to the legacy of contributors and partners who have worked together around smoke management (USDA, DOI, EPA, DOD, state forestry agencies and tribes) are new partners such as CDC, NOAA, NASA, NGOs, and academic institutions.

In 1976, the first comprehensive synthesis of knowledge about wildland fire emissions and management strategies to mitigate smoke effects was developed for the Southern US. The *Southern Forestry Smoke Management Guidebook* (Mobley 1976) was directed at southern forest-land managers, and begins by noting that prescribed fire is “an indispensable tool of the forest manager.” Then, as now, forest and

resource managers in the South have been leaders in the use of fire—in the mid-1970s, nearly 3 million acres were burned by prescription in the South each year. At the time, both the need for, and the science about wildland fire emissions and smoke management were largely focused in the South, and the new guide benefitted from a strong consortium of contributors, ranging from Regional Forest Service managers, to the strength of science at the Southeastern Forest Experiment Station, to contributions from both academic and industrial forestry collaborators. The authors fully recognized and acknowledged the many limitations to what they could provide so limited the scope of the guidebook to three primary subjects:

1. Broad breakdown of southern fuels
2. Single prescription fires
3. Predictions of particulate emissions only.

Despite the limitations, this regional effort set the stage for what might be possible at a national scale.

The same year as the *Southern Forestry Smoke Management Guidebook* was published, the National Wildfire Coordinating Group (NWCG) was formed and authorized through a charter signed by the Secretary of Interior and the Secretary of Agriculture. As the name suggests, NWCG was chartered as the nationally-recognized organization by which training, qualifications, standardization, and guidance for fire management could be coordinated and promulgated. One of thirteen original NWCG Working Teams was the Prescribed Fire and Fire Effects Working Team, which launched an effort to create guidelines for planning and managing smoke from prescribed fire to achieve air quality requirements through improved smoke management principals. The outcome was the first guide to focus on national smoke management principles—the *Prescribed Fire Smoke Management Guide* (NWCG 1985). That guide expanded greatly on both the scope and depth of information provided in the earlier Southern Guidebook, covering smoke management objectives and regulatory requirements, smoke production, smoke management strategies, and smoke monitoring and evaluation.

The 1985 national guide served both land and air resource managers well for many years, and was ultimately used as the course textbook for a NWCG Smoke Management Course prototyped as “RX-95” in 1988. The course was renamed “RX-450” in 1994. By the mid-1990s, the NWCG working team (renamed the Fire Use Working Team) recognized that, while fire use programs were increasing, concerns were also elevating regarding associated costs such as smoke management problems. In direct response to the escalating tension between increases in sources of smoke and the impacts on public health and safety, the NWCG team commissioned a new guide titled *Smoke Management Guide for Prescribed and Wildland Fire* (Hardy *et al.* 2001). A six-person steering committee directed the contributions of 16 authors to produce the 2001 guide, a collaboration underscored in the guide’s introduction, which states “Minimizing the adverse effects of smoke on human health and welfare while maximizing the effectiveness of wildland fire is an integrated and collaborative activity.” The 2001 guide included best practices and techniques synthesized from three regional workshops held across the US specifically for that purpose. Like the 1985 guide before it, the 2001 guide has been the national standard for both fire practitioners and air resource managers, and has stood as the reference textbook for the current smoke management training course RX-410. This new update of the Smoke Management Guidebook, sponsored by NWCG Smoke Committee, is the work of 29 authors and 8 editors/compiler. It is intended to again be used as the textbook for smoke management training courses across the country and will serve managers well for years to come.

Literature Cited

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