

Fire on the Landscape: The Case for Beneficial Fire

Catastrophic wildfires are burning through forests—and budgets. Yet one of the best tools to prevent them, prescribed and managed fire, is still underused. While suppression costs climb, the federal government continues to shortchange proven, low-cost strategies that reduce risk and restore forest health. Prescribed fire can cost as little as **\$11 an acre**—compared to **\$2,000 or more** for mechanical thinning. It's not just cheaper; it's often more effective. But outdated policies, poor incentives, and regulatory barriers keep this tool on the sidelines. Until federal agencies treat fire as a necessary ecological process—not just a threat—taxpayers will keep footing the bill for avoidable disasters.

Beneficial Fire is Necessary

Beneficial fire—including prescribed burning, cultural burning, and managed naturally-ignited wildland fire (sometimes known as resource objective fire, prescribed natural fire, or managed fire)—is necessary to restore fire-adapted ecosystems and reduce the risk of high-severity wildfires that pose a significant threat to communities.

The use of prescribed fire has increased in recent decades; fire agencies completed and reported an average of 1 million hectares of prescribed fire over the period 1998 to 2018, with annual totals increasing by an average of 5% per year.¹ The U.S. Forest Service (USFS), the largest federal land management agency, conducts about 4,500 prescribed fires each year covering an average of 1.3 million acres.² However, the federal government still falls behind state and private partners in the use of beneficial fire; 84% of prescribed fire occurred on state and private lands in 2020.³ The use of prescribed fire is also highly regional; collectively, federal land management agencies reported that 72% of prescribed fire activity was in the Southeast and only 24% in the West.⁴ Many experts

¹ Crystal Kolden, “We’re not doing enough prescribed fire in the Western United States to mitigate wildfire risk,” *Fire*, May 29, 2019. <https://doi.org/10.3390/fire2020030>.

² U.S. Forest Service, “National Prescribed Fire Program Review,” September 2022. <https://lessonslearned-prod-media-bucket.s3.us-gov-west-1.amazonaws.com/s3fs-public/2023-02/National%20Prescribed%20Fire%20Program%20Review-2022.pdf>

³ During 2020, the Bureau of Indian Affairs, Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service collectively treated 1,471,855 acres with prescribed fire while 7,912,493 acres were treated on state and private lands. Source: Mark Melvin, “2021 National Prescribed Fire Use Survey Report,” Coalition of Prescribed Fire Councils and the National Association of State Foresters. https://www.stateforesters.org/wp-content/uploads/2023/01/2021-National-Rx-Fire-Use-Report_FINAL.pdf

⁴ Ibid.

agree that more fire on the landscape is needed to improve forest health and protect communities from the risks of catastrophic wildfires.

Addressing the Fire Deficit

Early opposition to prescribed fires and a strict policy for suppressing naturally occurring wildfires in the 20th century has resulted in a fire-deficient landscape more prone to catastrophic wildfires. In 1935, the U.S. Forest Service introduced the “10 a.m. policy,” which called for “thorough suppression of all fires in all locations” by 10 a.m. the day after detection—a policy that continued for more than 4 decades. During this time, prescribed burns were also either prohibited or strongly discouraged. The USFS even withheld fire funding from states that allowed prescribed burning until the 1940s and 1950s.⁵

In the late 1960s and early 1970s, federal land management agencies permitted some use of prescribed fires—Sequoia-Kings Canyon became the first National Park with institutional prescribed fires in 1968—and managed some wildfires for ecological objectives, but fire suppression remained the prevailing policy until recently.

These policies contributed to a growing fire deficit on our landscapes, particularly in wilderness areas where periodic burns once cleared out underbrush and maintained forest health.

Ecological & Wildfire Mitigation Benefits

Hazardous fuels reduction treatments are proven to reduce the severity of wildfires. While much emphasis has been placed on mechanical treatment—which offers its own benefits and limitations—there is a strong fiscal and ecological case for the reintroduction of beneficial fire.

In general, more frequent burning is associated with less intense or severe wildfires.⁶ Research indicates that beneficial fire can be effective for restoration of frequent-fire forests, particularly on landscapes with long histories of fire use and in areas of moderate burn severity.⁷ The use of intentional fire reduces wildfire risk by clearing dried brush and reducing the buildup of hazardous fuels that increase the size and severity of a wildfire.⁸ Beneficial fire, as opposed to other forms of hazardous fuels reduction like mechanical thinning, can also provide important ecological benefits, such as species diversity and landscape resiliency, as many ecosystems depend on fire

⁵ Randal O'Toole, “The Perfect Firestorm: Bringing Forest Service Wildfire Costs under Control.” The Cato Institute, April 30, 2007. <https://www.cato.org/sites/cato.org/files/pubs/pdf/pa591.pdf>

⁶ “The National Strategy: The Final Phase of the Development of the National Cohesive Wildland Fire Management Strategy,” April 2014. <https://www.forestsandangelands.gov/documents/strategy/strategy/CSPhaseIIINationalStrategyApr2014.pdf>

⁷ David Huffman et al, “Restoration applications of resource objective wildfires in western US forests: a status of knowledge review,” *Fire Ecology*, July 23, 2020. <https://fireecology.springeropen.com/articles/10.1186/s42408-020-00077-x>

⁸ Kimberley Davis et al, “Tamm review: A meta-analysis of thinning, prescribed fire, and wildfire effects on subsequent wildfire severity in conifer dominated forests of the Western US,” *Forest Ecology and Management*, April 5, 2024. https://www.fs.usda.gov/rm/pubs_journals/2024/rmrs_2024_davis_k001.pdf

to maintain functionality. It is difficult, if not impossible, to mimic the beneficial ecological effects of fire, such as fuel consumption, plant mortality, and soil heating, without actual fire.⁹

Cost-Effective Strategy

Federal and nonfederal stakeholders have routinely recognized beneficial fire as one of the most cost-effective hazardous fuels reduction strategies.¹⁰ The costs of implementing prescribed fires can be far below other mitigation measures. While mechanical treatments can generate some revenue through timber sales, they are often expensive, particularly in regions where effective treatment requires removal of small, low-value trees or in large and remote areas without the necessary infrastructure.

According to the Congressional Budget Office (CBO), prescribed fires cost from \$125 to \$489 per acre, whereas mechanical

Prescribed burns can cost as little as \$11 per acre. Mechanical thinning? Up to \$2,000 per acre. That's a 180-fold difference.

treatments cost from \$700 to more

than \$2,000 per acre.¹¹ Other estimates put the cost of prescribed fires even lower, with one study determining the average cost for a prescribed burn on the Great Plains is just \$11.37 per acre.¹² The low cost of implementation, combined with the added ecological and wildfire mitigation benefits, make prescribed fire a critical tool for forest managers.

Managing naturally-ignited wildfires can also save taxpayer dollars while mitigating future suppression and recovery costs. Although many wildfires are unplanned ignitions, once burning, they can also present an opportunity. The federal government should not try to extinguish every fire at any cost. Rather, the federal government should minimize the amount of suppression activities necessary to protect communities by using wildland fire as a component of its wildfire management strategy. Federal fire policy often restricts managing wildfire for resource objectives and ecological purposes to remote areas, such as wilderness areas and national parks, and under specific conditions – ensuring to people and property are not at risk.¹³

⁹ Elizabeth D. Reinhardt et al, “Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States,” *Forest Ecology and Management*, September 4, 2008. https://www.fs.usda.gov/rm/pubs_other/rmrs_2008_reinhardt_e001.pdf

¹⁰ The U.S. National Cohesive Wildland Fire Management Strategy specifically identified prescribed fire as “one of the more effective and cost-efficient means of managing vegetation for multiple purposes.”

¹¹ Congressional Budget Office, “Wildfires,” CBO 57970, June 2022. <https://www.cbo.gov/publication/57970>

¹² Maddie Watts et al, “Analysis of the Cost and Cost Components of Conducting Prescribed Fires in the Great Plains,” *Rangeland Ecology & Management*, December 6, 2023. <https://www.sciencedirect.com/science/article/abs/pii/S1550742423001240>

¹³ “The National Strategy: The Final Phase of the Development of the National Cohesive Wildland Fire Management Strategy,” April 2014. <https://www.forestsandrangelands.gov/documents/strategy/strategy/CSPhasellINationalStrategyApr2014.pdf>

Obstacles to the Use of Beneficial Fire

Despite wide agreement on its value, beneficial fire remains boxed in by outdated federal incentives, underfunding, legal concerns, and rigid air quality regulations. Land managers often default to expensive mechanical treatments simply because they're easier to measure and fund—even if they do less for forest health.

- **Lack of Funding and Capacity**
 - Increased federal funding for mitigation activities, including the use of beneficial, is essential to protecting communities and lowering the future costs of wildfire suppression and recovery. In interviews with federal and non-federal land managers, a majority reported a lack of adequate funding and capacity as the primary obstructions to conducting more prescribed fire.¹⁴ A September 2022 review of the USFS prescribed fire program also noted barriers to using non-Forest Service firefighting resources for prescribed fires.¹⁵ These obstacles can be addressed by ensuring a dedicated funding stream for mitigation work, facilitating improved knowledge sharing, and implement procedures to more easily mobilize resources from other partners for prescribed fire activities, similar to how USFS is able to use such resources to assist with wildfire suppression.
- **Perverse Incentives in Current Federal Metrics**
 - Current performance measures do not provide sufficient incentives or accountability for increasing the use of beneficial fire. The taxpayer benefits of beneficial fire, such as fire risk reduction and biodiversity conservation, are challenging to measure. Purely relying on targets such as acres treated or timber volume may encourage land managers to rely on mechanical treatments, which produces outcomes that are easier to predict and measure.¹⁶ Outcome-based metrics—such as those that consider the effectiveness of fuel treatments in changing fire behavior, the ecological health of forests, and the protection of values at risk—would better encourage land managers to utilize a variety of wildfire mitigation tools, including beneficial fire.
- **Unfavorable Public Perception**
 - Education and community outreach are an important part of incentivizing smart, wildfire mitigation practices. USFS interviewees cited concerns with a lack of public support or political conflict when highly visible wildfires are burning as a barrier to

¹⁴ Courtney A. Schultz, Sarah M. McCaffrey, and Heidi R. Huber-Stearns, “Policy barriers and opportunities for prescribed fire application in the western United States,” *International Journal of Wildland Fire*, September 3, 2019. https://www.fs.usda.gov/rm/pubs_journals/2019/rmrs_2019_schultz_c002.pdf

¹⁵ Government Accountability Office, “Forest Service; Fully Following Leading Practices for Agency Reforms Would Strengthen Prescribed Fire Program,” June 2024. <https://www.gao.gov/assets/gao-24-106239.pdf>

¹⁶ For example, in the USFS, staff in some regions indicated they focus on mechanical treatment to meet targets for both fuel reduction and timber volume, noting that mechanical treatments are a more reliable way to meet targets than prescribed fire, which may not be possible to accomplish in any given year. Source: Courtney A. Schultz, Sarah M. McCaffrey, and Heidi R. Huber-Stearns, “Policy barriers and opportunities for prescribed fire application in the western United States,” *International Journal of Wildland Fire*, September 3, 2019. https://www.fs.usda.gov/rm/pubs_journals/2019/rmrs_2019_schultz_c002.pdf

increasing the use of beneficial fire.¹⁷ While escape rates from beneficial wildfire practices are extremely low, the use of fire always carries some risk.¹⁸ And as the extent of the wildland-urban interface (WUI) increases, so does the potential for impacts from prescribed burning and natural fires.

- **Air Quality and Smoke Regulations**

- Federal wildfire strategy must balance the need for increased use of beneficial fire with its negative community impacts. Beneficial fire creates smoke, impacting local air quality and public health. While exceptions to ambient air quality standard on the federal and nonfederal level exist for beneficial fire, local air regulators may prefer to avoid the lengthy paperwork and instead issue burn bans or deny smoke management permit requests. Because burn days are declared on a daily basis, burners also run the risk of starting a burn and then having to shut it down if air quality impacts change

- **Uncertainty Surrounding Legal Liability**

- Concerns about legal liability—and resulting impacts on an individual’s career and livelihood—are also barriers to increased use of prescribed fire, although this concern is more present at the local level¹⁹ as federal employees are broadly protected from liability under the Federal Tort Claims Act.²⁰ An analysis of prescribed burning on private land from 2008 to 2013 in the southeast—where prescribed burns are most often utilized—found that landowners in counties with gross negligence liability standards burned significantly more acres than those in counties with simple negligence standards.²¹

Conclusion

Federal agencies must establish the reasonable expectation that not all fires can be controlled or suppressed and recognize fire as an essential ecosystem process. Rather than creating conditions where fire is easier to suppress, fuel treatments should strive to create conditions where fire can occur without the need for suppression.²² Properly managed burns, consistent with the underlying

¹⁷ Ibid.

¹⁸ According to the 2022 National Prescribed Fire Program Review by the Forest Service Chief, the estimated escape rate is approximately 0.16% among the 4500 prescribed fires conducted annually across the United States by the Forest Service. Source: Shu Li et al, “Temporal and spatial pattern analysis of escaped prescribed fires in California from 1991 to 2020,” *Fire Ecology*, January 9, 2025. <https://fireecology.springeropen.com/articles/10.1186/s42408-024-00342-3>

¹⁹ Interviewees across all states also believed risk aversion was an important factor in willingness to burn. At the local level this tended to reflect concerns about personal liability in case of an escaped fire. At the higher level it tended to reflect political considerations. Source: Courtney Shultz, “Prescribed Fire Policy Barriers and Opportunities A Diversity of Challenges and Strategies Across the West,” Summer 2018. https://www.nwfirescience.org/sites/default/files/publications/WP_86.pdf

²⁰ FTCA, 28 U.S.C. §§ 2671-2680

²¹ Carissa L. Wonka, William E. Rogers, and Urs P. Kreuter, “Legal barriers to effective ecosystem management: exploring linkages between liability, regulations, and prescribed fire,” *Ecological Applications*, <https://agrilife.org/kreuter/files/2016/09/Legal-barriers-to-effective-ecosystem-management-Exploring-linkages-between-liability-regulations-and-prescribed-fire.pdf>

²² Elizabeth D. Reinhardt et al, “Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States,” *Forest Ecology and Management*, September 4, 2008. https://www.fs.usda.gov/rm/pubs_other/rmrs_2008_reinhardt_e001.pdf

land use or land management plans, can help restore natural fire cycles and reduce the risk of future, catastrophic wildfires.

Wildfire suppression alone won't fix the fire crisis. Until federal policy treats fire as a necessary tool—not just a threat—taxpayers will keep footing the bill for preventable disasters. Reforming how and where we use fire is essential to protecting both forests and federal finances.

For more on wildfire spending reform, see our [Clearing the Smoke](#) report and other tools in this [series](#).