

Science You Can Use **in 5 minutes**

Restoring natural conditions through the return of human-ignited fire

The 1964 Wilderness Act famously defines wilderness as an area “untrammeled by man.” But what does it mean to “trammel” the wilderness? Many have interpreted trammeling as any intentional human action or manipulation that affects wilderness ecosystems, which means that any management intervention, even one aimed at helping a wilderness area’s natural conditions, must be considered a trammeling action.

A new paper looks to clarify the far-reaching and long-term impacts of fire exclusion in the context of wilderness character and wilderness fire management. While fire suppression is considered a trammeling action, most fires are still suppressed in wilderness.

“After excluding fire for more than a century, certain wilderness landscapes are really at risk of extremely

severe fires and essentially permanent ecological change,” says Clare Boerigter, wilderness fire research fellow for the Aldo Leopold Wilderness Research Institute (ALWRI) and lead author of this paper. “Considering that many wildernesses were designated because of their historical ecological characteristics, this threat of change could be seen as quite troubling.”

Boerigter and her co-authors developed a framework that demonstrates that fire suppression is not a neutral act: rather, suppression activities, along with other forms of fire exclusion such as the cessation of Indigenous cultural burning, have resulted in significant and detrimental changes to wilderness over time. This framework

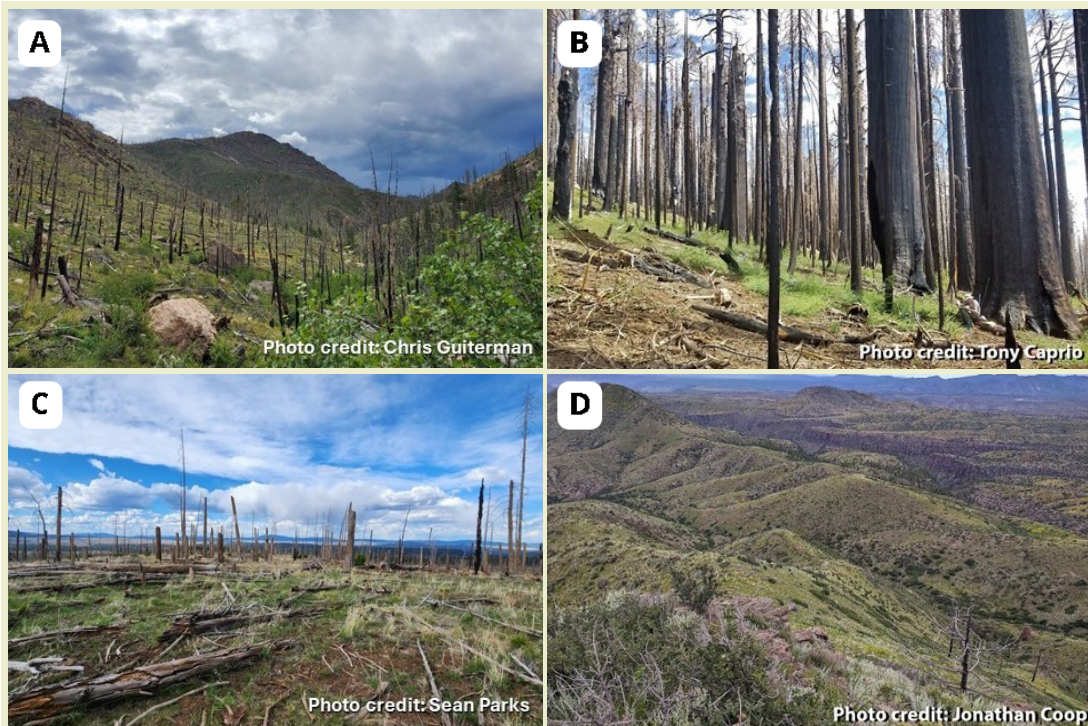


Figure 1—Photos show historically forested landscapes following uncharacteristically severe fires. A: A heavily impacted dry mixed-conifer forest in the Cache La Poudre Wilderness in Colorado following the 2012 High Park Fire. B: Fire-killed giant sequoias in Sequoia and Kings Canyon National Park in California following the 2021 KNP Complex Fire. C: Massive mortality in a Douglas-fir forest in the Gila Wilderness in New Mexico following the 2006 Bear Fire and the 2012 Whitewater-Baldy Complex Fire. D: Repeated high-severity fires have changed a forested site into a shrub field in the Dome Wilderness in New Mexico.

demonstrates the absence of historical rates of fire can put certain wilderness landscapes at risk of substantial ecological changes, decreased resilience to climate change, increased likelihood of high-severity fires, and fire-driven conversion from forest to non-forest. Additionally, uncharacteristically severe wildfires have prompted post-fire restoration activities in wilderness: these degradations of wilderness character and trammeling actions may not have been necessary had fires not been excluded for more than a century.

“Through our framework, we’re able to demonstrate that fire suppression and exclusion are actions with far-reaching repercussions that, by altering the historical ecological process of fire, have significantly degraded wilderness character,” said Sean Parks, research ecologist at AWLRI and paper co-author.

Prescribed burning is also considered a trammeling action within wilderness, and as such, it is infrequently implemented. Yet, studies indicate that intentional burning may be a critical tool in restoring the health and resilience of fire-adapted wilderness ecosystems. Areas treated with prescribed fire show a reduction in fuels and tree density and burn less severely than untreated areas during wildfires. Because of this trait, intentional human-ignited fire could be seen as capable of undoing the harm caused by fire exclusion in wilderness.

Furthermore, intentional burning by Indigenous peoples regularly occurred on many landscapes now

Management Implications

- A new framework demonstrates the substantial, long-term, and negative effects of more than a century of fire exclusion on certain federal wilderness areas
- Prescribed fire may be a critical tool to restoring these ecosystems, although its implementation in wilderness faces specific and unique barriers
- Indigenous cultural burning shaped and maintained certain fire-adapted landscapes for thousands of years, including some landscapes today designated as wilderness

designated as wilderness for thousands of years, predating the concept of trammeling. However, cessation of Indigenous burning coincided with, and often resulted from, Euro-American colonization. Accordingly, intentional burning in some wilderness areas may be warranted both for its value in redressing the effects of fire exclusion and in restoring the recognized role of Indigenous burning.

“Intentionally restoring fire to wilderness areas recognizes how many such places were historically shaped by Indigenous stewardship, begins to unwind the effects of fire exclusion, and can support tribal nations in strengthening long-standing relationships to those lands,” said Jonathan Long, a strategic planner with the Pacific Southwest Region and paper co-author.

Scientist Bios

[Clare Boerigter](#) is the wilderness fire research fellow for the Aldo Leopold Wilderness Research Institute, Rocky Mountain Research Station

[Sean Parks](#) is a research ecologist for the Aldo Leopold Wilderness Research Institute, Rocky Mountain Research Station

[Jonathan Long](#) is a strategic planner with the Pacific Southwest Region and was previously a research ecologist with the Pacific Southwest Research Station.

[Jay Thomas](#) is the author of this Science You Can Use.



Further Reading

[Untrammeling the wilderness: Restoring natural conditions through the return of human-ignited fire](#) | US Forest Service Research and Development (usda.gov)

[Untrammeling the Wilderness: A Companion StoryMap](#) (arcgis.com)

[Prescribed fire and U.S. wilderness areas: Barriers and opportunities for wilderness and fire management in a time of change](#) | US Forest Service Research and Development (usda.gov)

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