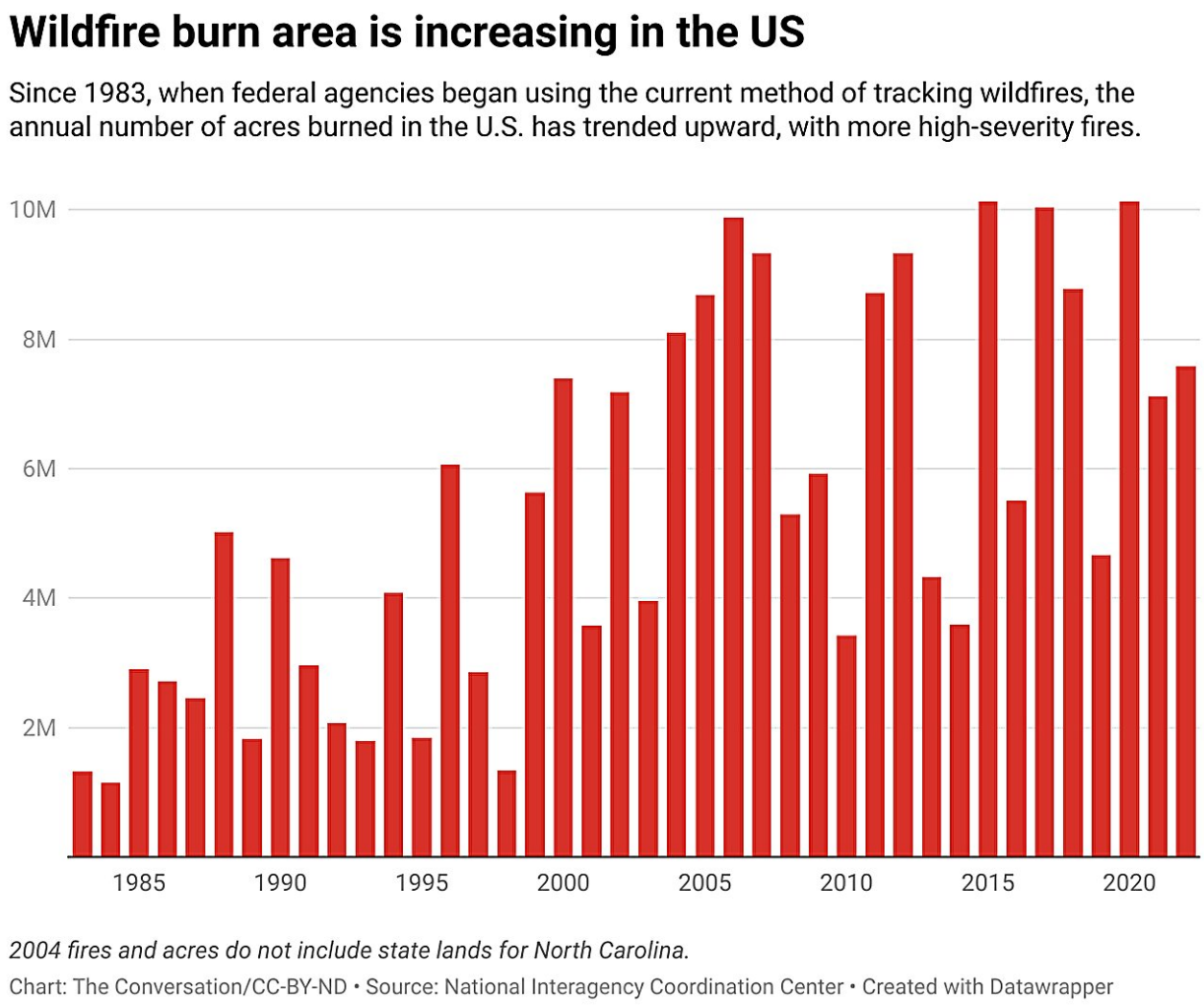
Mapped: Forest fire hot spots where treatment offers the biggest payoff for people and climate

September 9 2023, by Jamie Peeler



Credit: The Conversation

The U.S. government is investing over US$7 billion in the coming years to try to manage the nation's escalating wildfire crisis. That includes a commitment to treat at least 60 million acres in the next 10 years by expanding forest-thinning efforts and controlled burns.

While that sounds like a lot—60 million acres is about the size of Wyoming—it's nowhere close to enough to treat every acre that needs it.

So, where can taxpayers get the biggest bang for the buck?

I'm a fire ecologist in Montana. In a new study, my colleagues and I mapped out where forest treatments can do the most to simultaneously protect communities—by preventing wildfires from turning into disasters—and also protect the forests and the climate we rely on, by keeping carbon out of the atmosphere and stored in healthy soils and trees.

Wildfires are becoming more severe

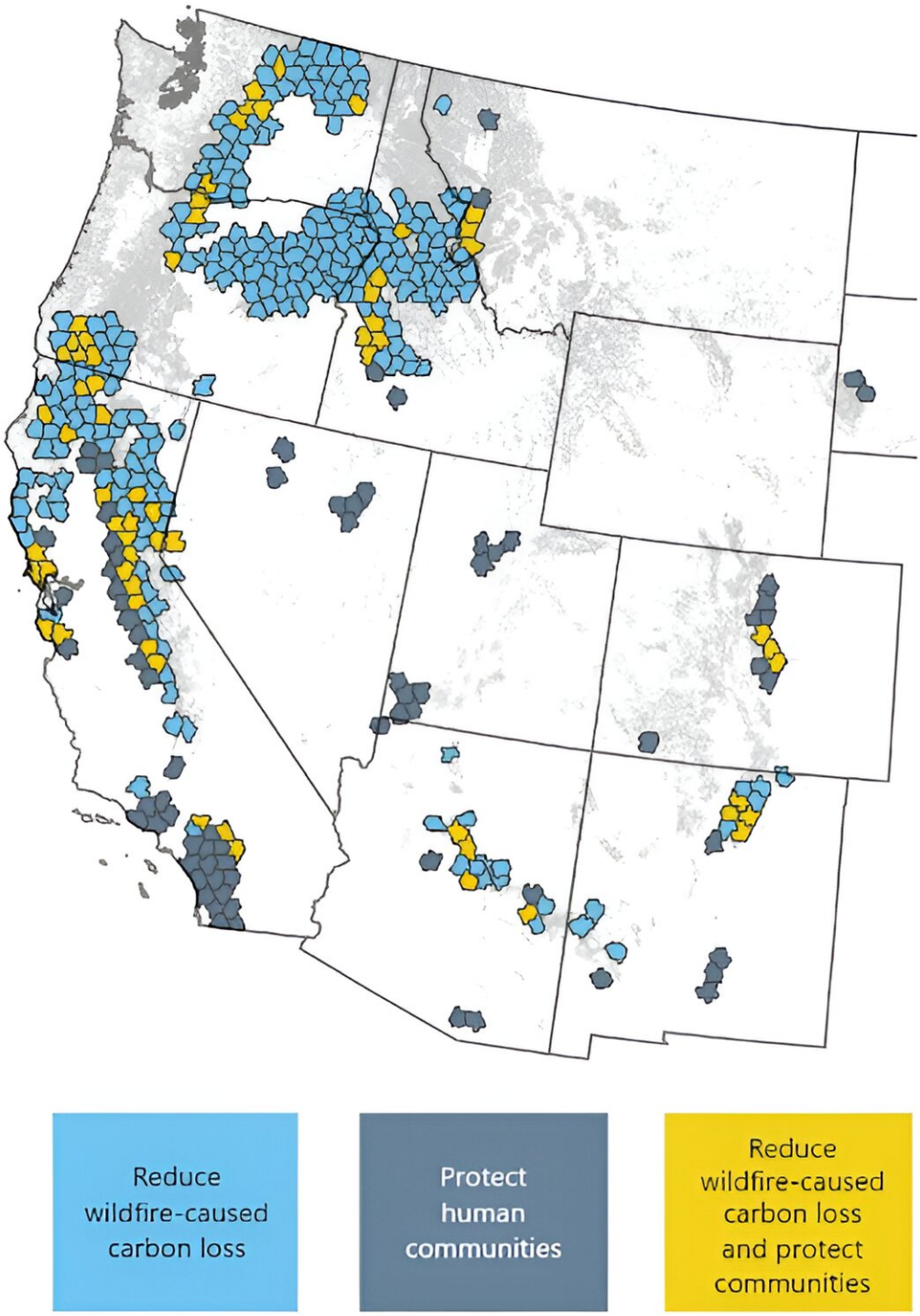
Forests and fires have always been intertwined in the West. Fires in dry conifer forests like ponderosa pine historically occurred frequently, clearing out brush and small trees in the understory. As a result, fires had less fuel and tended to stay on the ground, doing less damage to the larger, older trees.

That changed after European colonization of North America ushered in a legacy of fire suppression that wouldn't be questioned until the 1960s. In the absence of fire, dry conifer forests accumulated excess fuel that now allows wildfires to climb into the canopy.

In addition to excess fuels, all forest types are experiencing hotter and drier wildfire seasons due to climate change. And the expanding number of people living in and near forests, and their roads and power lines,

increases the risk of wildfire ignitions. Collectively, it's not surprising that more area is burning at high severity in the West.

In response, the U.S. is facing increasing pressure to protect communities from high-severity wildfire, while also reducing the country's impact on climate change—including from carbon released by wildfires.



Areas with high potential for protecting both human communities and carbon storage. Credit: Jamie Peeler, CC BY-ND

High-risk areas that meet both goals

To find the locations with greatest potential payoff for forest treatments, we started by identifying areas where forest carbon is more likely to be lost to wildfires compared to other locations.

In each area, we considered the likelihood of wildfire and calculated how much forest carbon might be lost through smoke emissions and decomposition. Additionally, we evaluated whether the conditions in burned areas would be too stressful for trees to regenerate over time. When forests regrow, they absorb carbon dioxide from the atmosphere and lock it away in their wood, eventually making up for the carbon lost in the fire.

In particular, we found that forests in California, New Mexico and Arizona were more likely to lose a large portion of their carbon in a wildfire and also have a tough time regenerating because of stressful conditions.

When we compared those areas to previously published maps detailing high wildfire risk to communities, we found several hot spots for simultaneously reducing wildfire risk to communities and stabilizing stored carbon.

Forests surrounding Flagstaff, Arizona; Placerville, California; Colorado Springs, Colorado; Hamilton, Montana; Taos, New Mexico; Medford, Oregon, and Wenatchee, Washington, are among locations with good opportunities for likely achieving both goals.

Why treating forests is good for carbon, too

Forest thinning is like weeding a garden: It removes brush and small trees in dry conifer forests to leave behind space for the larger, older

trees to continue growing.

Repeatedly applying controlled burns maintains that openness and reduces fuels in the understory. Consequently, when a wildfire occurs in a thinned and burned area, flames are more likely to remain on the ground and out of the canopy.

Although forest thinning and controlled burning remove carbon in the short term, living trees are more likely to survive a subsequent wildfire. In the long term, that's a good outcome for carbon and climate. Living trees continue to absorb and store carbon from the atmosphere, as well as provide critical seeds and shade for seedlings to regenerate, grow and recover the carbon lost to fires.

Of course, forest thinning and controlled burning are not a silver bullet. Using the National Fire Protection Agency's Firewise program's advice and recommended materials will help people make their properties less vulnerable to wildfires. Allowing wildfires to burn under safe conditions can reduce future wildfire severity. And the world needs to rapidly transition away from fossil fuels to curb climate change impacts that increase the risk of wildfires becoming community disasters.

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