

Forest health versus global warming: Fuel reduction likely to increase carbon emissions

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Forest thinning, such as this work done in the Umpqua National Forest in Oregon, may be of value for some purposes but will also increase carbon emissions to atmosphere, researchers say. (Photo courtesy of Oregon State University)

Forest thinning to help prevent or reduce severe wildfire will release more carbon to the atmosphere than any amount saved by successful fire prevention, a new study concludes.

There may be valid reasons to thin forests – such as restoration of [forest](#) structure or health, wildlife enhancement or public safety – but increased carbon sequestration is not one of them, scientists say.

In research just published in *Frontiers in Ecology and the Environment*, Oregon State University scientists conclude that even in fire-prone forests, it's necessary to treat about 10 locations to influence fire

behavior in one. There are high carbon losses associated with fuel treatment and only modest savings in reducing the severity of fire, they found.

"Some researchers have suggested that various levels of tree removal are consistent with efforts to sequester carbon in forest biomass, and reduce atmospheric carbon dioxide levels," said John Campbell, an OSU research associate in the Department of Forest Ecosystems and Society. "That may make common sense, but it's based on unrealistic assumptions and not supported by the science."

A century of fire suppression in many forests across the West has created a wide range of problems, including over-crowded forests, increased problems with insect and pathogen attack, greater risk of catastrophic fire and declining forest health.

Forest thinning and fuel reduction may help address some of those issues, and some believe that it would also help prevent more carbon release to the [atmosphere](#) if it successfully reduced [wildfire](#).

"There is no doubt you can change fire behavior by managing fuels and there may be other reasons to do it," said Mark Harmon, holder of the Richardson Chair in Forest Science at OSU. "But the carbon does not just disappear, even if it's used for wood products or other purposes. We have to be honest about the carbon cost and consider it along with the other reasons for this type of forest management."

Even if wood removed by thinning is used for biofuels it will not eliminate the concern. Previous studies at OSU have indicated that, in most of western Oregon, use of wood for biofuels will result in a net loss of carbon sequestration for at least 100 years, and probably much longer.

In the new analysis, researchers analyzed the effect of fuel treatments on

wildfire and carbon stocks in several scenarios, including a single forest patch or disturbance, an entire forest landscape and multiple disturbances.

One key finding was that even a low-severity fire released 70 percent as much carbon as did a high-severity fire that killed most trees. The majority of [carbon emissions](#) result from combustion of surface fuels, which occur in any type of fire.

The researchers also said that the basic principles in these evaluations would apply to a wide range of forest types and conditions, and are not specific to just a few locations.

"People want to believe that every situation is different, but in fact the basic relationships are consistent," Campbell said. "We may want to do fuel reduction across much of the West, these are real concerns. But if so we'll have to accept that it will likely increase carbon emissions."

Provided by Oregon State University

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