Two Birds, One Stone: How Preventing Wildfires Could Also Help to Mitigate Climate Change

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On October 15, Texas Governor Greg Abbot declared a state of disaster in Bastrop County, as wildfire ripped through the area. The fire, which ignited on October 13 in Smithville, has burned over 4,500 acres of forestland. 141 structures, including 64 homes, have been destroyed. Thankfully, the fire did not claim any lives. It did, however, create health problems for residents of central Texas. Smoke from the fire quickly spread across the region, leading to a decline in air quality, with a spike in particulate levels. When ingested by humans, particulates can contribute to various respiratory problems, including coughing, shortness of breath, and chest pain. Recognizing this, officials warned that young children, the elderly, and others with existing health problems should remain indoors until the smoke clears.

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The smoke also contains other pollutants, which may have longer lasting impacts, particularly on the environment. One such pollutant is carbon dioxide, which may be released in significant quantities, as a result of the burning of trees and other plants. Through the process of terrestrial carbon sequestration, carbon dioxide is absorbed from the atmosphere by plants during photosynthesis and stored in stems, branches, leaves, and roots. When the plants are burnt, the stored carbon dioxide is released back into the atmosphere, where it acts as a greenhouse gas.

The volume of carbon dioxide released during a particular wildfire depends on its severity and, in particular, the amount of plant material burned. While fire severity is influenced by a range of factors, including the local climate and geography, arguably most important is the amount of flammable material available to fuel the flames. Where flammable material builds-up over time, a fire will typically burn hotter and longer, increasing emissions of carbon dioxide. With recent improvements in fire fighting, many natural fires that would ordinarily prevent the build-up of plant matter are now extinguished quickly, thus causing flammable material to accumulate in large volumes. This increases the severity of fires that do occur.

So, what can be done to prevent these catastrophic wildfires? One possible solution, frequently discussed by policy makers, is to conduct prescribed or controlled burns to reduce fuel loads. By conducting a number of small burns across a larger area, land managers may produce a patchwork of burned and unburned land, minimizing the risk of catastrophic wildfires and thereby reducing the amount of carbon dioxide emitted. Still though, some trees are burnt and some carbon dioxide released. It would, therefore, be preferable to reduce fuel loads without resorting to fire.

Another option for preventing catastrophic wildfire is forest thinning whereby trees and other plants are removed from the forest. Currently, where thinning is used, the removed material is often burnt. This releases carbon dioxide and is therefore little better than prescribed burning. But what if, instead of simply burning the removed materials, they were put to use? Wood could, for example, be harvested and used in place of steel, aluminum, concrete, and similar materials in the construction industry. Other

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materials not suitable for use in construction, such as course roots, small branches, and leaves, could be used to generate electricity in a biomass generator.

By preventing the build-up of flammable materials, harvesting wood for reuse should minimize the risk of catastrophic wildfires, thereby reducing carbon dioxide emissions. Additionally, it could also have other benefits. Increased use of wood in construction may, for example, help to curb greenhouse gas emissions since the production of lumber uses substantially less fossil fuels than other building materials. Similarly, substituting wood for fossil fuels in electricity generation may also lessen emissions. Focusing solely on "smokestack" emissions, woody biomass offers a "closed carbon cycle," meaning that the carbon dioxide released when it is burned may be recaptured by new biomass growing in its place. Moreover, the release consists of carbon dioxide that was recently present in the atmosphere and therefore does not cause a net increase in carbon dioxide levels. In contrast, fossil fuel generation releases carbon dioxide that has not been present in the atmosphere for millions of years.

In view of these benefits, a number of policy makers have called for an increase in timber harvests, particularly in national forests. The harvesting of timber from national forests is overseen by the Forest Service under the National Forest Management Act of 1976 (16 U.S.C. § 1600 et seq.). The National Forest Management Act provides for the selling of trees through a competitive bidding process. The highest bidder, whose bid is equal to or exceeds the appraised value of the trees, is awarded a contract authorizing the harvesting thereof over one or more years.

The Forest Services' sale of trees to the logging industry has been heavily criticized, particularly by environmental groups, which argue that forestland provides vital wildlife habitat. While this is certainly true, it may be possible to protect wildlife habitat, while also allowing timber harvesting. According to a report published last year, current harvesting rates in some national forests are below the long-term sustainable yield, meaning that additional trees could be harvested without degrading forestland. Where this is the case, increased harvesting is unlikely to significantly affect wildlife habitat. It could, however, deliver important climate benefits

by minimizing the risk of catastrophic wildfires and thereby reducing carbon dioxide emissions. That would surely be a win-win.

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