Great Old Broads FOR Wilderness

FACT SHEET

Importance of Mature and Old-Growth Forests of the Pacific Northwest For the Climate and Wildfire Risk Reduction

Carbon storage and sequestration, climate mitigation.
The Pacific Northwest forests have a high capacity for storing and sequestering carbon and mitigating climate change. These are among the most carbon-rich forests in the world, holding more carbon per acre than tropical rainforests (Law 2021). The largest trees, mature and old growth trees (MOG) store the most carbon (Mildrexler et al 2020).

A study by Oregon State University researchers has identified forests in the western United States that should be preserved for their potential to mitigate climate change through carbon sequestration, as well as to enhance biodiversity (Buotte et al 2019). These forests are mainly along the Pacific coast and in the Cascade Range. Not logging those forests would be the carbon dioxide equivalent of halting eight years' worth of fossil fuel burning in the western lower 48, the scientists found, noting that making land stewardship a higher societal priority is crucial for altering climate change trajectory.

The western Pacific Northwest forests are at lower risk of wildfire, and thus can provide significant carbon stores for climate mitigation. According to Beverly Law, professor of forest ecosystems and society in the OSU College of Forestry, these forests "are expected to have low vulnerability to fires, insects and drought in the future. Dr. Law and colleagues analyzed forests in the western United States to simulate potential carbon sequestration through the 21st century". The five-year study supported by the U.S. Department of Agriculture's National Institute of Food and Agriculture identified, and targeted for preservation, forests with high carbon sequestration potential, low vulnerability to drought, fire and beetles, and high biodiversity value. "Preserving temperate forests in the western United States that have medium to high potential carbon sequestration and low future climate vulnerability could account for about a third of the global mitigation potential previously identified for temperate and boreal forests".

Carbon loss in wildfires.
Even severe wildfires don't release much of the existing carbon when a forest burns. Research of two large wildfires in California's /Sierra Nevada showed the vast majority of carbon stores in trees before the blazes were still there after the fires (Harmon et al. 2022). In trees killed by the fire, the

carbon is released slowly over decades or even centuries–*if the forests are not subjected to post-fire logging (emphasis added).*

Post-fire logging.
Post-fire logging reduces carbon storage, impairs forest regeneration after wildfire, and does not reduce the risk of future fires. Donato et al.(2006) maintain that postfire logging is detrimental to long-term forest development, wildlife habitat and other ecosystem functions. Most of the carbon is preserved and natural recovery can occur without the disturbance of logging fragile soils.

Wildfire risk reduction.
Logging mature and old growth trees does not reduce wildfire risk, as these are the most fire-resistant trees. The moss-draped forests of the Cascade Mountains and Coast Range deter frequent fires. Fires that burn here can be severe, but these forests evolved with disturbances and they grow back quickly if they have adequate biological legacies left on the ground. Dr. Law (2021) states that west of the Oregon Cascades there is no scientific basis to attempt to reduce fuels as they just grow back rapidly and it is not possible to reduce their flammability.

In drought- and fire-prone forests of the Northwest (*e.g.,* ponderosa pine and dry mixed-conifer forests east of the Cascades and in southwestern Oregon), fuels management that reduces forest density can decrease crown fire potential, thus reducing mortality (Halofsky, 2018). In these forests retention of mature and old growth trees is the most effective strategy for reducing fire damage, as these are the most fire-resistant (and most carbon-dense) trees. Halofsky et al. state that fewer options exist for reducing fire severity in wetter, high-elevation and coastal forests of the Pacific Northwest, historically characterized by infrequent, stand-replacement fire regimes. In these ecosystems, thinning and hazardous fuel treatments are unlikely to significantly affect fire behavior, because fuels are abundant and fires typically occur under extreme weather conditions (i.e., during severe drought). A study of Oregon's 2020 wildfires indicate that tall canopies (i.e. mature forest) significantly reduces the probability of high burn severity in both extreme and moderate fire weather conditions (Evers, 2022).

Many researchers recommend that thinning and fuel treatment be prioritized to high-risk locations such as the wildland-urban interface to protect structures, not in mature forests. Forest management for wildfire protection is most effective in the 60-100 feet zone from structures, "defensible space": the home outward strategy (Bevington, 2021).

Many fuel reduction projects include cutting older trees, as these are more economically valuable. However, this practice reduces the fire resilience of the forest, and is thus detrimental to the goals of wildfire prevention projects. Wildfire protection funds could be directed to identifying and protecting mature and old growth stands, as these are the most resilient to wildfires.

Threats to mature and old growth forests.
The primary threat to mature and older forests is ***logging***, not wildfire or climate change. There are nearly 11 million acres of MOG in federal forests in Oregon and Washington (about 19% of the lower 48 states). Despite the important role they play in carbon storage and climate mitigation, only about 24% of MOG on federal land in our two states are fully protected from logging (GAP 1 & 2 designation). The remainder have varied levels of protection, some under the Northwest Forest

Plan, in Late Successional Reserves, or in Inventoried roadless areas (which may be subject to post-fire logging.) This analysis has recently been released in a mapping study by DellaSala et al. (2022).

Management plans and policies in the Pacific Northwest, including the Northwest Forest Plan and the BLM's Resource Management Plan of 2016, continue to allow logging in mature and old growth forests. And under the Trump administration, the USFS removed protections for large trees in eastern Oregon and Washington (the "21-inch rule"), opening up opportunities to log the 4% of largest trees in this landscape, which store 41% of the area's carbon (Mildrexler et al. 2020). These forests deserve, and require, more protection from the threat of logging.

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