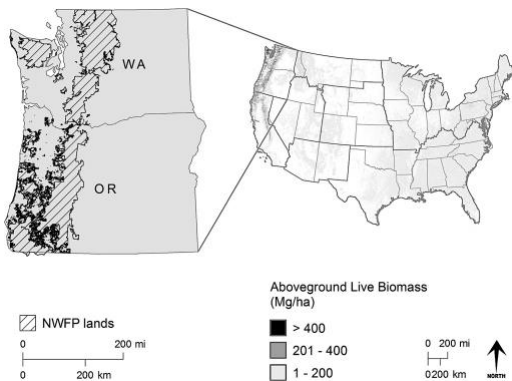


**A Primer on Forests as Natural Climate Solutions, Thinning, and Community Fire Safety**  
Dr. Dominick A. DellaSala, Chief Scientist, Wild Heritage; [dominick@wild-heritage.org](mailto:dominick@wild-heritage.org)



**Forests as Natural Climate Solutions** - [intact forests](#) (unlogged) are the best terrestrial carbon sinks on the planet. Mature and old-growth forests (“older”) in the Pacific Northwest (PNW) store more carbon per hectare than even the world’s tropical rainforests. Most of the PNW forest carbon is in large trees and soils. A single [large tree](#) of ~20 inches in diameter sequesters and stores in one year the entire carbon in a medium size tree. As the forest [matures](#) (~80 years), it stores massive amounts of carbon that remains stable for centuries, acting as an irreplaceable “carbon sink” and climate-fire [refugia](#). Importantly, large trees have thick, insulated bark and [older forests](#) tend to burn in lower severities compared to logged ones that burn [hot](#) and fast, [especially in severe fire weather](#). This is because logged forests accumulate flammable slash and are densely packed with small trees that blow up in fires, while [protected forests](#) burn in more natural fire severity patterns.

Older forests in the PNW are mainly on federal lands containing [extraordinary levels of carbon](#) (>400 Mg/ha; [Figure 1, Oregon only](#)). When these forests are cut down, they [emit >80% of their carbon](#) overtime with only small amounts temporarily stored in [wood products](#) that at best last



a few decades compared to an ancient tree. The carbon emitted from logging is not made up for by [planting seedlings](#) that will take decades-centuries to amass what was in the unlogged forest. For three decades, reduced logging levels under the historic Northwest Forest Plan (NWFP) shifted logged forests from an emissions source to a [carbon sink](#). However, there is still some logging of older forests that can reverse gains. The Biden administration has signaled interest in a national conservation rule for older

forests, yet, thus far has [not enacted](#) national forest rulemaking. The NWFP is also up for renewal. In both cases, older forests and large trees need strict protections to continue serving as a carbon sink. The region cannot meet emissions reduction targets without protecting older forests and ending climate, clean water, and biodiversity damaging, clearcut logging.

**Thinning Does Not Protect Homes or Solve the Fire Problem** - thinning is often presented as some sort of benign activity that slows or even stops fire in its tracks. Billions of federal dollars are being spent on thinning/burning that is [going to fail](#) in a rapidly changing climate while accumulating co-lateral ecosystem damages and carbon emissions from logging. To be clear, thinning small trees - and not the overstory canopy of large fire-resistant trees - and following that up with prescribed burning of fine fuels can reduce fire intensity but only under low-moderate fire weather. This is seldom the case for two reasons. (1) Thinning (Figure 2A blue marking; and salvage logging, Figure 2B) almost always takes large fire-resistant trees to pencil out timber sales and removes far too much forest biomass that then predisposes the forest to excessive drying, rapid vegetation grow-back, and high wind speeds. (2) The odds that a thinned site happens to catch a lightning bolt when fuels are lowest are slim ([<1%](#)).



Scaling up to influence fire behavior is impractical given access problems and fuel removal limitations. And it flat out will not work in extreme fire weather (hot, dry, windy), which is becoming a major factor driving large fires, triggered by [anthropogenic climate change](#) (ACC). No amount of thinning/burning will stop large fires under extreme conditions. And thinning over large areas will [release more emissions](#) than if a fire occurred over the same area, thereby contributing to the dangerous feedback between [fire and climate change](#). Notably, [researchers](#) found that most fires that spill over into urban areas come out of private lands, not public lands, yet public lands are often incorrectly targeted for logging “treatments.”



**Home [Hardening and Defensible Space](#) is the Only Way to Protect Communities** - Witness the recent wildland-urban fire destructions of Lahaina (HI), Talent and Phoenix (OR) (Figure 3), and Paradise Valley (CA). Each of these fires ran right through communities under hurricane/tornado force winds consistent with worsening climatic conditions. The Alameda Labor Day 2020 fire that took out half of Talent/Phoenix occurred [during hot temperatures, historic drought, and high winds](#). Home loss had nothing to do with the need for more thinning.