

Open Letter to The Forest Service on the Importance of Large, Old Trees and Forests

As scientists with expertise in ecology, natural resource management, climate change, and other disciplines we write concerning the protection of primary (unlogged) forests and large (>21 inches diameter-at-breast height, >53 cm dbh), old trees in forest planning decisions. The Forest Service is amending its forest plans on >9 million acres (3.6 million ha) in eastern Oregonⁱ to lift protections for large trees that have been in place for over two decades. The planned amendment threatens to set back forest recovery that has only recently followed a century of clear-felling and high-grade logging. Protections were put into place in 1994 targeting forests that needed time to recover depleted large-tree populations particularly for wildlife species that are highly dependent on that now scarce element in these Eastside forest. Although removing protections for large trees is highly controversial from a scientific perspective, the Forest Service is rushing forward without adequately analyzing the impacts of the proposal on wildlife habitat, aquatic ecosystems, hydrological cycles and carbon values. We urge the Forest Service to reconsider this proposal, given the ongoing deficit of large trees and the fact that older forests have not yet recovered.

Primary forests and large, old trees, both living and dead, provide irreplaceable benefits to society that are essential to forestalling the loss of biodiversity and climate change related environmental emergencies. Those forests and trees have elevated conservation status, needing to reach maturation in order to achieve their ecological potential in supporting associated biodiversity, contributing to carbon storage and myriad ecosystem servicesⁱⁱ. Trees greater than 18 inches dbh (>45 cm) have been declining in forests at all latitudesⁱⁱⁱ. With that decline occurring, the following values of large trees are of utmost importance in preserving:

- Large, old trees are among the most massive terrestrial organisms on Earth. They are bio-cultural elements of a natural inheritance that is declining globally^{iv}.
- The size of a tree increases over time accumulating keystone features that provide large internal cavities and canopy structures for wildlife not present in younger trees.
- Large, old trees, including snags and downed wood, are needed for nesting, roosting, foraging, denning, and other habitat elements that support numerous lichens, epiphytes, up to 30% of all vertebrates in some forests^v, and invertebrates, many of which are rare, endemic, or endangered^v.
- Large, old trees anchor soils through their massive root systems, stabilize slopes, and provide shading and habitat (logs) for aquatic species^{vi}.
- Large, old trees provide nutrients and soil carbon, are associated with high levels of plant varieties, play critical roles in hydrological cycles, and are “blueprints” for restoration^{vii}.
- Large, old trees store a disproportionate amount of carbon with greater leaf surface area for CO₂ absorption, and massive carbon-storing tree trunks and roots^{viii}. For instance, a recent global study found half of carbon in living above ground biomass is stored in the largest 1% diameter trees^{ix}.
- Large, old trees provide stable microclimates and mitigate soil desiccation^x.
- Mycorrhiza fungal networks are more connected and carbon rich as forests age with large trees serving as central nodes in the networks^{xi}.
- Large, old trees are especially valuable when killed individually or in large patches by natural disturbance processes such as insects, forest pathogens, wind storms, and wildfire^{xii} that generate “complex early seral forests^{xiii}.”

Conserving large trees and the forests within which they occur provides a vital nature-based solution to the climate crisis. Through their protection and overall improvements to the forests that store much carbon^{xiv}, nature-based solutions can provide at least one-third of the cost-effective climate mitigation needed to stabilize global overheating to below 2° C by 2030^{xv}. That is why it is imperative to develop climate policies that protect the large tree component of forests, by allowing forests to recover diminished large tree populations and carbon stocks^{xvi}.

In sum, there is no substitute for large, old trees, living and dead, and the forest in which they can thrive. Their losses from anthropogenic stressors have impacted biodiversity, compromised water quality, and added damaging emissions to the atmosphere at a time when governments are being asked to do everything possible to sequester and store more atmospheric carbon in ecosystems to avoid imminent catastrophic climate impacts to nature and society.

We ask the Forest Service to keep large tree and forest protections in place and avoid making misguided attempts to lift those protections at a time when the nation is looking for leadership on the global biodiversity and climate crises.

Sincerely (*affiliations for identification purpose only)

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