

An Open Review of the:
Proposed Action and Alternatives in the US Forest Service Pacific Northwest
Region's Forest Plans Amendment:

Management Direction for Large Diameter Trees in Eastern Oregon
Environmental Assessment (preliminary, August 2020)

By Jerry F. Franklin, S Trent Seager, and K. Norman Johnson

24 September 2020

Introduction

This letter is an open review of the Pacific Northwest Regional Office's proposed Forest Plans Amendment on the Management Direction for Large Diameter Trees in Eastern Oregon. Having been approached by multiple parties working on and with many of the six National Forests, we wanted to share our thoughts openly for Tribes, Collaboratives, stakeholders, and others to consider in their comments and engagement with the Forest Service.

We recognize the changes proposed in the final Environmental Assessment (EA) are intended to assist in conservation and growth of late and old structural (LOS) stages in the dry forests east of the Cascade Range in Oregon. This includes the Ochoco, Malheur, Umatilla, and Wallowa-Whitman National Forests and all areas of the Deschutes and Fremont-Winema National Forests that are outside of the Northwest Forest Plan.

The action alternatives in the draft EA only amend the 21" rule component of the Wildlife Screen, and this rule only applies outside of LOS stands. Like the other sections of the Screens, all timber sale activities must be planned so that they maintain and/or enhance LOS components. More broadly, the EA is intended to respond to planning rule direction for management to restore and maintain the integrity of these forest ecosystems.

Overall, we support the effort to decrease the barriers to restoration of dry forests (e.g., dry pine and mixed conifer forest types that were dominated by frequent fire) in eastern Oregon. Old trees are the backbone of these ecosystems, and young large trees that have grown over 21" dbh since fire suppression now put the old trees at risk. Efforts are underway across eastern Oregon to restore dry forest systems and prepare them for continued climate disruptions such as extreme or prolonged drought and fire events.

The EA offers a range of alternatives, and we recognize that diverse groups will have varying social and cultural values that they will want met within their preferred

alternative. Here, we offer a review of the EA to share our thoughts and insights on the content of the document and its analysis relative to the ecology of eastside dry forests. We have significant concerns about the science and analysis in the EA relevant to achieving the stated goals. This is especially important since some alternatives within the EA propose significant reductions in existing old tree populations. While the EA is limited by being framed within the ecosystem standards and retaining the dated definition of LOS, we believe the EA needs to:

- 1) Explicitly recognize the unique ecological nature and roles of old trees in the dry forests and differentiate them from young large trees;
- 2) Provide clear and adequate requirements for sustaining old tree populations in both their live and dead forms in the dry (e.g., frequent fire) forests;
- 3) Correctly analyze the ecological outcomes of the alternative as they offer varying limitations on harvest of either old or large trees; and
- 4) Clarify that age should have always been understood as a characteristic of LOS (late and old structure) which includes additional morphological characteristics besides dbh.

We address each of these issues below in more detail, and offer specific examples from the EA, putting those into context of our understanding eastside dry forest ecosystems.

1. Explicitly recognize the unique ecological nature and roles of old trees in the dry forests and differentiate them from young large trees

The Nature of Old Trees in Dry Forests

Old trees are the structural backbone of the dry forests in their live, standing dead, and down forms. As such, they provide habitat for wildlife and have high levels of fire and drought resistance. They are also the social and cultural icons in these ecosystems for both indigenous and western cultures. Old trees are currently at very low levels in many of these National Forest landscapes relative to their historical levels, and many of the old trees that remain are at great risk of premature death as the result of competition and fuel loadings created by the dense stands of younger trees that have arisen because of past management (primarily overstory removal and fire suppression). The very nature of being an old tree is evidence of their persistence over centuries, and their ability to survive periods of drought with additional fire, insect, and disease disturbances. The longevity of old trees comes from their interaction with local conditions and the disturbances that removed competition. Thus, these trees are growing where they are best suited and have been best served for centuries.

Water and Hydrology

Old trees have deep root systems, which is one reason why they have a high level of drought resistance when free of intense competition from dense or close young trees. Furthermore, because of their long residence time, complex belowground networks involving both mycorrhizal connections and actual root grafting is typical among old trees. After several centuries of co-existence, including the development of these belowground networks, clusters of old trees should be viewed as collaborations producing net positive outcomes for the participants rather than primarily as potential competitors. The deep rooting of old trees is also the key to the process of hydrologic redistribution in dry forests. Hydrologic redistribution is the process by which deeply rooted trees absorb water deep in the soil profile and bring it to the surface where they release some of it to the surface soil, with positive impacts on understory vegetation and other biota.

Wildlife Habitat

The unique structural features of old trees are a consequence of their persistence over centuries, and their unique ecological roles in these forests relate directly to these features. Old tree canopies are typically highly individualistic (non-model conforming) and, in the case of ponderosa and larch, live branches and canopy generally begin well above ground fuels. Crowns of old trees are characterized by very large and complex branch systems and often have decadent features (e.g., brooms and other complex reiterations), dead and/or rotten tops, and cavities – all of which are important as habitat niches for wildlife and other biodiversity. Relative to their size, old trees have thick bark which contributes to their fire resistance and is an important factor in providing habitat for some wildlife (e.g., bats), particularly on snags.

The ecological adaptations that allow old trees to persist also allow them to continue to provide habitat for wildlife even after drought, fire, and other disturbance events. Young large trees are less resistant to disturbances and therefore less likely to persist. Thus, while some wildlife species will use young large trees (of the appropriate conifer species), those trees cannot provide that habitat if they are lost to disturbance. Additionally, snags and logs from these young trees do not persist, decay, or offer the same structure as old tree snags and logs. In essence, habitat provided by young large trees is ephemeral, and cannot be relied upon to provide consistent wildlife value.

Old trees have more defects providing habitat such as structure for nest platforms (branching structure and defects) and areas of rot or decay within a live tree (for cavity nesting or insect foraging). The latter allows some old trees to facilitate cavity nesting within a live tree, greatly increasing the duration of the cavity on the landscape. While

most snags have species-dependent fall rates, and thus there is a need for recruitment across time, a live tree with some decay can persist across a much longer time period. This negates the need for continued snag recruitment and offers snag-dependent wildlife species habitat within late-open stands of old ponderosa that experience low mortality rates from their resistant to fire and drought.

Old trees have a high proportion of heartwood, which causes snags and logs derived from them to undergo decay processes very different from those derived from large young trees, which have little or no heartwood. The large proportion of heartwood in old trees is very consequential in slowing their rate of decay, and therefore providing snag and log habitat conditions different from young large trees. Old trees are critically important in dry forests following their death because of the importance of snag and log structures that are required habitat for wildlife and other biota.

As the EA outlines, there are many wildlife species that depend upon live and dead trees to provide structure and other habitat requirements. This includes wildlife species of regional significance (e.g., those found on the Regional Foster's Special Status list: white-headed woodpecker, Lewis' woodpecker, little brown myotis, among others) and the MIS found in each National Forest plan being amended. Each of these species have their own unique requirements for habitat. While the species may be generally categorized into using late-open and late-closed habitat types, it is important to recognize that conifer species composition, tree and snag sizes, and tree and snag spatial placement is not inherently defined or guaranteed by those two habitat categories.

2. Provide clear and adequate requirements for sustaining old tree populations in both their live and dead forms in the dry (e.g., frequent fire) forests

Density

There is no scientific evidence of the presence of "excessive densities" of old trees in dry forests. The nature of disturbance regimes (especially drought and fire) across centuries has selected for the carrying capacity and current densities of old trees present. The threat is from encroachment of younger trees or conifer species that would have been removed by fire and drought. This encroachment decreases moisture capture, increases moisture use and competition, and creates ladder fuels for fire to reach the crowns of the old trees.

The old trees have had centuries to interact with each other and sort out their relationships. They have undergone episodes of drought and insect outbreaks and of wildfire. The old tree component may be a relatively small number of large trees (e.g., 15 to 20/acre) or a larger number of small old trees. Silviculturists often look at such

densities and conclude, based on the basal areas, that there are excessive numbers of trees. However, total basal area is not a useful measure in stands dominated by old trees; a more useful measure (but probably inadequate as well) would be the sapwood cross-sectional area that is present in these stands.

In no case should the stand density indices developed for managed stands be used to judge conditions in old tree dominated stands. The stand density indices used in managed stands composed largely of younger trees are not appropriate to judge competitive conditions in stands of old trees, in which the basal areas are largely composed of heartwood rather than sapwood. It is particularly important to be conservative in judging conditions in clusters of old trees, which have been growing together for 200 or more years. As noted above, it is much more likely that these trees are collaborating with each other through a dense belowground network than competing with each other.

An additional important structural attribute of a dry forest dominated by old trees is that it is that it is spatially heterogeneous or patchy, with clusters of old trees and intervening areas that are open and largely free of trees. This is an important structural and landscape pattern feature that facilitates several aspects of old forest function, including its superior ability to capture and retain snow, resist fire, and provide suitable habitat for a variety of wildlife and other biota. This is why traditional silvicultural concepts and measures designed for wood production forests – uniformly distributed young trees of particular densities or basal areas – has no place in restoration of the old-tree-dominated dry forests that are optimal for producing the full array of ecosystem benefits, including resistance to wildfire.

Policy

Science provides no ecological support for cutting of old trees, in contrast with the important case that can often be made for removing large young trees of shade-tolerant species. There is no evidence that stands exist in which there is an excess of old trees, yet there is a large body of scientific information that indicates the current populations of old trees – live, dead, and down – are far below historical levels. Hence, any new policy regarding old trees in dry forests should begin with retention of existing trees. Any old trees that die or are cut for whatever reasons should, as a matter of policy, be left in the forest to fulfill their important roles as snags and down logs. Any new policy should also recognize that the clumped nature of trees is a critical structural feature in dry forests and should not be a basis for removal of old trees. Again, the policy or guidelines should direct that, if killing of old trees is deemed imperative by a silviculturist, that such trees are to be left in the forest to fulfill the dead wood functions distinctive to old, heartwood-

rich trees. This will also sustain the commitment to citizens that old trees are not being cut for economic purposes.

Given the critical role of old trees we believe that any new policy or guidelines need to go beyond simply retaining all old trees but also direct that restorative treatments be undertaken to facilitate continued survival of the old trees. Retention is insufficient: conditions that promote persistence is essential. Such treatments should include the removal of fuels and competing vegetation around the retained old trees to allow them to live out their normal life span. If older trees remain surrounded by unnatural accumulations of heavy fuels and competing younger trees, which also provide fuel ladders that carry fire into the old tree canopies and increase drought stress of the old trees, then the retention of old trees may not be enough to keep them alive on the landscape.

If the alternative is adopted that provides for retention of large as well as old trees, it should be clear that the old trees are to be viewed as the most irreplaceable. Large young trees should not be retained that provide direct threat to old trees either as competitors for moisture and other resources or as potential fire ladders. More generally, the adopted guidelines should make clear that management to provide replacement old trees should be a part of the management plan, with a view to restoring historical population levels of old trees.

Species Composition

The EA importantly captures that for snags, the spatial scale, distribution, and species composition are important when considering wildlife habitat and ecological processes (EA 3.4.1.1). To provide that, the live trees must equally be considered with an eye towards species composition in addition to size and spatial scale. As noted above, wildlife species are selecting habitat at a finer scale than late-closed and late-open. This is primarily around in-stand conifer species composition and distribution. Further, while some tree species may be categorized and grouped as fire-tolerant (e.g., ponderosa pine, larch, Douglas-fir), wildlife are selecting separately for each of the tree species within that category. It is important that tree species composition be addressed in the live tree considerations as it is with snags and downed wood. The retention of a smaller ponderosa pine would play a very different role as a replacement old growth or future snag than a young large grand or white fir. The trade-offs in the decision space need to be critically informed by the role of species composition for ecological integrity, ecosystem functions and processes, and wildlife habitat within late-closed and late-open forest types.

Snag and Green Tree Retention

The changes proposed that are common to all alternatives (EA 2.6) should help address the inadequate amount of snag retention and recruitment seen in post-treatment project areas in eastern Oregon. We would note that the important guidelines for these changes are found in a table in appendix (EA Appendix B, d. Scenario A). We suggest these guidelines be moved up into the main body of the EA text. Snag recruitment and retention within different forest vegetation types is important to many wildlife species (as shown by the MIS on each of the six National Forests).

As discussed above, old trees have adapted to persist during disturbance events. Additionally, when old trees do die, their heartwood to sapwood ratio and thick bark extend their time as both snags and downed wood. This provides different habitat than young large trees do as snags and logs. Further, old trees have persisted on the landscape for more than 150 years. These trees are more likely to die as individual stems whereas young large trees (especially those with high LAI such as grand and white fir) will more readily die in larger numbers from drought, fire, and other disturbances. The nature of old tree death allows the provision of large snags with longer hang time that are well distributed across the landscape, whereas young large trees provide a pulse of short-lived snags concentrated in areas of fire or other disturbance.

3. Correctly analyze the ecological outcomes of the alternative as they offer varying limitations on harvest of either old or large trees

We have concerns about some of the analyses in the EA and what it offers to the potential outcomes of each alternative. Specifically, the Adaptive Management alternative appears to allow for and anticipate a significant reduction in old trees. In fact, the model results state that this alternative could result in a nearly 20% decrease of old trees per acre from the current standards and a 35% decrease from the old trees per acre than the Old Tree Standard (EA 3.1.6.3.2.1). This is concerning because as described above, (1) old trees are already far below expected densities within historical range of variability; and (2) old trees and large trees play different ecological roles in forest resilience and wildlife habitat. With that, it is unclear how the Adaptive Management alternative can be shown as having some of the better ecological outcomes (EA Table 24). This leads us to have concerns in the EA setting precedent of how the ecology and underlying science of eastside dry forests are used in NEPA and forest planning.

Old Tree and Large Tree Outcomes

It is unclear how FVS modeling to describe a range of different outcomes (EA 3.1.3.4) with vastly different constraints (21" dbh, 250 years, 150 years, and no restrictions, for each alternative respectively) could result in such similar old tree outcomes. We understand that modeling is an exercise. Our concerns are that managers on each National Forest or District can be making determination of how to implement the selected alternative. Some of the alternatives do not require the retention of old trees or fire-tolerant tree species. As such, the modeling only offers some potential outcomes. Yet, the EA uses the modeling results to compare direction of change and magnitude of difference between alternatives and suggestions of impact on old trees and large trees by species and/or fire-tolerance groups (EA 3.1.6.3).

We have concerns that the average model outcomes do not accurately reflect what could potentially happen in post-management stands and projects. Thus, we find that the model outcomes are certainly less important for analysis and comparison than the bookends that each alternative offers for constraints. We suggest that viewing the alternatives under the EAs modeling constraints (21" dbh, 250 years, 150 years, and no restrictions, for each alternative respectively) provides clearer comparison of general trends for old and large trees than what is given in EA under 3.1.6.3.

We have significant concerns that the modeling results (EA 3.1.6) speak to the landscape level when the management action would be occurring at the stand or project level (see Current Conditions below). Using the Old and Large Tree Guideline Alternative as an example, we are unsure how the EA can allow harvest of any tree species up to 250 years of age (as a model constraint, as there is no age limit standard in the alternative) and yet purports to find that large trees would continue to increase with a decrease in the number of large grand and white fir to promote more fire tolerant species composition over time (EA 3.1.6.1.3). This shift in species composition within large diameter trees is only a guideline, and it is not a requirement of the alternative. This is similar in the Adaptive Management Alternative. Specifically, managers could choose to log old ponderosa pine while retaining young large grand and white fir. This would meet the requirements of the amendment and fit within the original definition of LOS. We question the trajectory of these model outcomes, as they assume the intent of managers in two action alternatives that have no standards on the constraints, only guidance.

Following the EA's statement that "because thinning is expected to occur on a relatively small portion of the total landscape, and because fire, insect attack, and other disturbance that kills old tree at a high rate in untreated forests will continue, modeling indicates that the number of old trees will decrease across the landscape over the

analysis period” (3.1.6.3.2.1), we agree and suggest that the modeling results do not offer clear metrics or comparisons between alternatives.

In short, the constraints given in each alternative as standards (required direction), guidelines (constraints with deviation allowed), or open adaptive management (no required direction or constraints) should be the metric used to compare the range of impact on each approach to old trees and large trees.

Wildlife Habitat: Late-open and Late-closed Types and Big Game

Under Environmental Effects (EA 3.4.2) for each alternative, the EA addresses habitat under LOS for late-closed and late-open associated wildlife species. This fails to account for conifers species composition, and more importantly, the stand specifics of each conifer species (e.g., dbh, spatial placement) for wildlife habitat requirements. Since different alternatives allow the harvest of different tree species, sizes, and ages, it does not hold that post-treatment stands classified as late-open or late-closed will inherently contain the habitat needed by the northern goshawk, fisher, or white-headed woodpecker (to use examples given in the EA).

The northern goshawk requires branching structure (platforms) to hold its nest, and thus in eastern Oregon selects ponderosa pine, Douglas-fir, and western larch while avoiding grand fir and white fir. If late-closed forests do not contain the appropriate conifer species and associated canopy structure, the habitat type will not provide for goshawk nests (for example). Alternatively, late-closed forests without proper conifer species composition providing rapid decay (e.g., grand fir or white fir) will not provide appropriate pileated woodpecker habitat. For late-open habitats, some alternatives would allow timber harvest without retention of live or defective large ponderosa pine and still meet the definition of late-open habitats with LOS. Thus, this general habitat type cannot be assumed to provide for the white-headed woodpecker, which is strongly associated with open, large diameter ponderosa pine.

Classifying habitats in such general terms as late-closed and late-open while allowing alternatives to manage those in differing and diverse ways so as to fail to meet habitat requirements (e.g., tree species, size, or spatial placement) does not allow for the EA to speak to the wildlife species associated with LOS. This is shown most clearly in the LOS Habitat tables for each alternative (EA Tables 18-21) where predicted trend present to +25 years are nearly identical, even as the simulations in the EA offer large variance in constraints for harvest based on tree size ($\leq 21''$, $\leq 30''$, any size) and harvest based on age (<150 years, <250 years, any age; EA 3.1.3.4).

We support that eastside forests are currently forage limited for deer and elk. Reducing canopy cover to increase moisture, light, and other resources for understory vegetation should increase forage availability. However, deer and elk have different requirements for spatial arrangement of cover and forage. Depending on the implementation of each alternative, overstory removal does not necessarily mean an increase in accessible forage (spatially or temporally) for deer and elk.

Management Options within Stands and Projects not Landscape Level Restoration

The EA does not clearly delineate that the alternatives address management direction options for restoration within project areas (i.e., increased quality) but does not provide increased funding or resources for more restoration (i.e., increased pace and scale). Many of the projected future conditions, model assumptions, and model outcomes in the EA speak to future forest conditions across the entire analysis area. This is a product of total acres restored to bring about landscape level restoration (i.e., pace and scale). While an entire eastside analysis may be required for the EA, this should be clearly distinguished from the important metrics to measure the project or stand level restoration options each alternative is offering. An example would be conifer species composition. In the EA, all alternatives are showing a continued shift toward fire intolerant species at the landscape scale even while selecting for retention of fire tolerant species at the project scale. Basal area of fire intolerant conifer species across eastern Oregon is not controlled by the alternatives. Thus, metrics for comparing alternatives should be solely within the control of the modifications offered by the EA (e.g., fire tolerant basal area at the stand or project scale).

Current Conditions

We have concerns that much of the analysis (especially modeling results) compares the alternatives to “current conditions” as of 2020 (the year of the preliminary EA). This does not fully incorporate the fact that multiple CFLR projects (Deschutes, Fremont-Winema, and Malheur NFs) and the additional extensive active management within the last 10-15 years (2005-2020) as part of collaboration to increase dry forest restoration, makes up a part of the analysis area while other large areas remain unmanaged since the late 1990s and early 2000s. This active restoration contrasting with unmanaged areas makes current conditions different from pre-1995 Interim Standards and even 10 years post-standards (1995-2005). Essentially, the dial has been shifted. We propose that areas restored within the last 10 years should be used to see the impacts of the 21” rule in its current state and for comparison to what each alternative offers.

For clear metrics of which alternative performs the best to desired future conditions, it does not work to compare them to the entire analysis area with a mix of restored areas

within large unmanaged areas. Considering the concerted effort on multiple National Forests to restore fire-prone species composition and structure, the current state does not exist in a vacuum. Figure 15 in the EA (Annual Fuels Treatment Acreage from Six National Forests) shows this with 2005-2020 being vastly different from the decade right after the Interim wildlife standards (1995-2005).

4. Clarify that age should have always been understood as a characteristic of LOS (late and old structure) which includes additional morphological characteristics besides dbh

While late and old structural (LOS) stages includes the word “old” in it, the wildlife and ecosystem standards do not define LOS by age (years), only by size (large). Specifically, “LOS, a term used in the interim wildlife standard, refers to the structural stages where large trees are common...” (page 3-4 Revised Interim Direction).

The EA clearly states that it is not proposing changes to the ecosystem standard where LOS is defined (EA 1.0). Yet the EA cites O’Hara et al. (1996) and uses “old” to define forest strata differently than the original ecosystem standards (EA 3.1.3.1). Still, the cited paper also does not define old by age (years).

We appreciate that in the EA for action alternatives which have “old trees” included, morphological characteristics are referenced along with an age of 150 years (EA 3.1.3.1). We would like the EA to clarify that age should have always been understood as a characteristic of LOS, which includes additional morphological characteristics besides dbh.