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Comments: On Earth Day, April 22, 2022 President Joe Biden issued Executive Order (E.O.) 14072 that in part called for, "the Secretaries of Agriculture and the Interior, within one year, to define, identify, and complete an inventory of old-growth and mature forests on Federal lands, accounting for regional and ecological variations, as appropriate, and making the inventory publicly available." The Northeast Washington Forest Coalition (NEWFC) supports this insinuation and believes that it is long overdue to make publicly available an inventory of these crucial habitat features.

In NEWFC's collaborative work to balance ecological, commercial, and management aspects of the Colville National Forest (CNF) we have repeatedly asked for data on the amount of large old trees on a given timber management project and what proportion of those trees will be removed to meet management goals. The CNF staff and Supervisor have refused this request, stating that it is unfeasible. This issue has caused repeated tension between the Colville National Forest and NEWFC and recently led the forest supervisor to instruct his staff to cease the collaborative process.

We are pleased to see that this Administration recognizes, as we do, the vital role that large trees play in sustaining ecosystem health, genetic vitality and carbon sequestration. An inventory of the abundance of large trees, or lack thereof, is critical to understanding the impacts that their removal would have on the local and regional ecosystems, and climate change.

Until recently, the forests of Eastern Washington and Oregon have followed the 21-Inch or Eastern Screen rule as a proxy for maintaining the benefits of mature and old-growth trees. This rule has since been replaced with vague and general guidelines that have fostered lawsuits from several conservation organizations in Oregon and added considerably to the difficulty of collaboratives reaching consensus on vegetative treatments. NEWFC understands the limitations of the Eastern Screen, particularly in its ability to only identify individual trees and its inability to recognize many additional features that characterize old-growth habitat. NEWFC desires to use a holistic definition that both protects crucial mature and old-growth habitats and incorporates the climate mitigation capacity of these vanishing forest types.

Large and old-growth trees are not readily replaced and it is well-known that over 93% have been extirpated from American forests. We find it foolhardy to remove more of these trees, often 100's of years old, when we do not know how many remain nor fully understand their roles. For example, in January of this year, the first study confirming that old-growth trees are key in providing genetic integrity in ecosystems. On-going studies demonstrate repeatedly that large and old-growth trees are fire-resistant, massive carbon sinks.

Forest Service Chief Dale Robertson's 1989 letter to Regional Foresters, entitled "Position Statement on National Forest Old-growth Values", provided this direction:

"Regions with support from Research shall continue to develop forest type old-growth definitions, conduct old-growth inventories, develop and implement silvicultural practices to maintain or establish desired old-growth values, and explore the concept of ecosystem management on a landscape basis."

While this directive was issued over 3 decades ago there are many Forests that have not completed this inventory nor made it publicly available. For those 30 years, the public remains unaware of the amount of mature and old-growth forest that have been lost. Many current Forest Plans purposefully avoid any mapping or inventory of old-growth, and Environmental Assessments, in our collective experience, do not mention or discuss old-growth, presumably to eliminate litigation on its removal. Meanwhile, our understanding of the importance of old-growth habitats has only increased.

In the Forest Ecosystem Management Assessment Team (FEMAT) report, Chapter 3: Old-growth, Disturbance, Forest Succession, and Management in the Area of the Northwest Forest, Spies, et.al., summarized the various definitions of old-growth, from spiritual values to ecosystem services, noting the those include:

*An ecosystem "distinguished by old trees and related structural attributes. Old-growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics including tree size, accumulation of large dead woody material, number of canopy layers, species composition and ecosystem

function" (USDA FS 1989).

*An ecological state resulting from interactions among successional, disturbance, and ecosystem processes (e.g., nutrient and carbon cycles, microclimate).

*A biological condition defined in terms of life histories and demographics

*A habitat for particular fauna, flora, and fungi

Several tools already exist to inventory mature and old-growth forest in different regions, forest types, and fire regimes. In 2015, Davis et al. created an old-growth structure index (OGSI) which characterizes the degree of old-growth structure that occurs in a stand of any age or history. This tool is similar to those used by the Forest Ecosystem Management Assessment Team (FEMAT). Inventory techniques are outlined in the publication, "Status of Mature and Old-Growth Forests in the Pacific Northwest," might also provide important guidance. This paper underscored the need to regularly monitor, inventory and increase protection of mature and old-growth forests. Using the latest imaging techniques are discussed below.

What criteria are needed for a universal definition framework that motivates mature and old-growth forest conservation and can be used for planning and adaptive management?

Quoting from the 1989 Forest Service Chief's Position Statement on National Forest Old-growth Values, the criteria must emphasize, "...habitat for certain animal and plants, for aesthetics, for spiritual reasons, for environmental protection, for research purposes, for production of unique resources such as very large trees." The value of mature and old-growth forests in serving as fire refugia, genetic diversity, resilience in the face of significant disturbance, and carbon sequestration values could be added.

What are the overarching old-growth and mature forest characteristics that belong in a definition framework?

Characteristics that define mature and old-growth forest above as well as the following should be included:

*An ecosystem "distinguished by old trees and related structural attributes. Old-growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics including tree size, accumulation of large dead woody material, number of canopy layers, species composition and ecosystem function" (USDA FS 1989).

*An ecological state resulting from interactions among successional, disturbance, and ecosystem processes (e.g., nutrient and carbon cycles, microclimate).

*A biological condition defined in terms of life histories and demographics

*A habitat for particular fauna, flora, and fungi

*An ecosystem of old trees that contain high spiritual significance to indigenous and contemporary peoples

*An forest ecosystem not readily replaced within less than seven generations (current studies tend to agree on an average of 30 years per generation).

Understand that in order to fulfill the full suite of ecological functions inherent in mature and old-growth forests (?) - not sure where this is going..

Scientific papers have been submitted by Dr. Dominick DellaSala of Wild Heritage of Earth Island Institute in response to this RFI. These papers by Wild Heritage, Griffith University (Australia), Woodwell Climate Research Center (Massachusetts) plus scientists from the International Panel on Climate Change are currently undergoing review. The mapping methodology employed uses the latest processed LiDAR (2019) imagery on tree height, canopy cover, plus published ecosystem biomass datasets spatially derived to rank order the structural development of all conterminous U.S. forests from least developed ("young") to most developed ("mature/old-growth"). We concur with, and support the use of, these studies.

How can a definition reflect changes based on disturbance and variation in forest type/composition, climate, site productivity and geographic region?

As opposed to stand scale, landscape-scale identification of mature and old-growth forest is needed to understand the full effects of disturbance and variation by geo-region. Disturbance and variation in forests are desired to create the mosaic of habitats needed to support the full suite of ecological functions and habitats which in turn support the essential wildlife, vegetation and microorganisms that create rich biodiversity.

How can a definition be durable but also accommodate and reflect changes in climate and forest composition?

The effects of climate change on forests are inevitable and not fully understood. As stewards of our public lands the USFS and BLM must manage forests to be more resilient to a changing climate while understanding that preserving mature and old-growth forest is one of the most cost-effective and implementable climate mitigation solution. Further, the carbon sequestration values of these trees must be recognized and protected. We understand that young trees might sequester carbon faster, those young trees are also far more susceptible to disturbance (insect, disease and wildfire).

The broader effects of disturbance related to climate change suggests the inclusion of modeling (existing or purpose-driven for this study) of future forest and old-growth dependent wildlife species composition and how that composition might change over time. As adjacent treatments are implemented assisted phytomigration might serve to populate the site with species more likely to survive the rigors of maturation. Current studies suggest that it is the germination and youth phases of growth that are most challenged by a changing climate.

As proven by the simple fact that mature and old-growth forests have obviously withstood hundreds of years of disturbance, it seems these trees contain a genetic propensity for survival: all the more reason those genetics should remain in situ.

What, if any, forest characteristics should a definition exclude?

Diameter and tree height do not always correspond with old-growth characteristics. Depending on species and habitat it can, in fact, be deceptive. However, as we have seen with the implementation of the Eastside Screen, at least a diameter limit can prevent the harvest of potentially mature and old-growth trees. A diameter limit can effectively identify the need for further evaluation in implementation of forest treatments. Tree height is likewise an indicator of potential presence of mature and old-growth stands. Therefore, height and diameter might not be part of the definition but they should be included in management practice standards and modeling so mature trees are not over-looked or under-counted.