August 29, 2022

Mr. Jamie Barbour, Assistant Director
Ecosystem Management Coordination
USDA Forest Service
Washington, D.C. 20250

RE: Request for Information (RFI) on Federal Old-growth and Mature Forests, 87 Fed. Reg. 42,493 (July 15, 2022); Docket Number: 2022-15185

Dear Mr. Barbour:

Thank you for the opportunity to respond to the Request for Information (RFI) captioned above. The American Forest Resource Council (AFRC) is a trade association representing mills, wood product manufacturers, loggers, and purchasers of public timber in the Western United States. Put another way, AFRC represents the customers and partners of the U.S. Forest Service and Bureau of Land Management (BLM). We have member companies in Montana, Idaho, Washington, Oregon, and California. Their expertise, employees, and equipment – and the vast, complex product supply chain of the forest infrastructure they help create, maintain, and support – are essential to achieving the forest management goals and missions of the Forest Service and BLM.

Background and Context

AFRC, its employees, and our members care deeply about the health and resiliency of our public lands and national forests. The very existence of our members' businesses – many of which are family-owned and operated, and have been for multiple generations – are intertwined with the trajectory of our federal forests. Our members not only derive a livelihood and significant personal meaning from our federal forests, but they are also often the caretakers and stewards of these awesome natural resources and the innumerable benefits they provide to our society.

American Forest Resource Council
700 N.E. Multnomah, Suite 320 • Portland, Oregon 97232
Tel. 503.222.9505 • Fax 503.222.3255

We strongly support the Biden Administration's ambitious goals of dramatically increasing the pace and scale of science-based, active forest management to reduce the risk of catastrophic wildfires, to protect at-risk communities and vulnerable populations, and improve the health and resiliency of our federal forests. Although we appreciate the Biden Administration's sensitivity to and focus on old-growth and mature forests, the greatest threat to our federal forests and public safety are catastrophic wildfires and toxic smoke. More than 80 million acres of federal forests are at-risk and need action-based solutions. This emergency threatens the air we breathe, the water we drink, wildlife populations, recreational opportunities for tens of millions of Americans, and likely trillions of dollars in critical infrastructure, homes, businesses of all sizes and types, and overall public health and well-being.

We appreciate the Biden Administration's articulation of the scale and scope of the wildfire challenge by releasing "Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America's Forests" (January 2022). We also appreciate the leadership of Forest Service Chief Randy Moore in calling for a "paradigm shift" in how we think about and manage our overstocked federal forests and for the need to increase fuel and forest health treatments by "up to four times current treatment levels in the West." We also recognize and appreciate the bipartisan support for increasing forest management activities across the country, as codified by the Bipartisan Infrastructure Law (Public Law 117-58) that provides historic, multi-billion-dollar investments in our land management agencies with the specific mandate of addressing our wildfire crisis.

As such, we implore the Administration to tackle this emergency as an *emergency*: to take an all-hands-on-deck, *urgent* approach; deploy all available federal resources, technology, and management tools; and to deliver a message – from D.C. down to the forest level – that elevates, prioritizes, and focuses agency personnel on addressing the unhealthy conditions of our federal forests.

As a transparent and direct partner, we voice our concern about diverting limited agency staff time and resources away from this emergency to a complex, controversial, and lengthy administrative process that does not meaningfully address the imminent and real threat at hand: catastrophic wildfires. Wildfires on federal lands are contributing to climate change at an alarming rate and destroying hundreds of thousands of acres of old-growth and mature forests *that this Administration seeks to protect*. As President Biden made clear in his Earth Day 2022 Executive Order (EO) 14072 on "Strengthening the Nation's Forests, Communities, and Local Economies," indeed, the greatest threat to old-growth and mature forests is climate change and wildfire – *not* forest management or timber harvesting, or the lack of a universal definition or inventory of our old-growth and mature forests. Through this lens, we provide the following recommendations and comments.

I. Recommendations

1) Keep it local, flexible, and transparent.

The agencies should avoid the impossible and unscientific task to come up with a top-down, single, "universal" definition of old-growth that would apply to many diverse forests and forest types across the United States.

Instead, the agencies should continue to rely on local and regional planning processes that require every national forest management plan to "provide for key characteristics associated with terrestrial and aquatic ecosystem types," *including* old-growth. This would ensure any old-growth definition is tailored to the specific geographic location and region, ecosystem, and forest type; derived from local knowledge and expertise; developed through existing, legally-valid, and known public processes; adapted if and when necessary in response to disturbances and unforeseen circumstances; and would provide flexibility and adaptation to meet dynamic forest management goals. This approach also ensures any definition or policy change affecting our national forests will be analyzed and publicly disclosed through the National Environmental Policy Act.

In other words, definitions, mapping and inventory exercises should take place at the regional and local forest levels with broad public input during Forest Plan and land planning processes, and any agency action or decision should be analyzed and made available to the public.

2) Improve Forest Inventory and Analysis Data and Forest Inventory.

The Forest Service and BLM should take this opportunity to bolster, improve, and modernize its Forest Inventory and Analysis (FIA) Program to ensure the agencies have up-to-date, accurate, specific, and detailed information about the enormous real estate and dynamic resources they manage. According to the Forest Service's FIA website, "FIA reports on status and trends in forest area and location; in the species, size, and health of trees; in total tree growth, mortality, and removals by harvest; in wood production and utilization rates by various products, and in forest land ownership." We strongly support efforts to continue to improve forest data acquisition and analysis to inform science-based management.

Instead of focusing exclusively on attempts to "define and inventory" old-growth and mature forests, we recommend a more holistic and analytical approach to assist our agencies and public in better understanding the risks and opportunities on the landscape created by a rapidly changing climate. We recommend that the agencies utilize FIA data to disclose trends to land managers, policymakers, and the general public to inform future decision-making, such as:

- What are the net carbon sequestration and emission rates, by National Forest and by National Forest Region or BLM district?
- How have those rates changed over the last 20 years?
- What are the expected trends over the next 20 years?
- What cause(s), activities, and/or disturbances are driving these observed trends?
- What actions can be taken to maximize carbon sequestration and carbon storage in both live trees and wood products?

3) Avoid arbitrary limits that tie the hands of forestry professionals.

Time and again, "top down" approaches to forest management have failed to deliver promised conservation benefits and intended management goals on National Forests in the Western United States. The Northwest Forest Plan and the Eastside Screens are just two examples of prescriptive and inflexible federal forest policies that have made timely, science-based forest management more difficult and expensive; exacerbated public conflict over forest management; increased unhealthy forest conditions that put communities and resources at risk; undermined credibility and trust of federal land managers, while decimating the physical and human forest infrastructure critical to the agencies' missions; and failed to meaningfully reverse the trajectory of the Northern Spotted Owl population, despite creating habitat reserves consuming millions of acres of national forests dedicated to the recovery of a single species.

The Northwest Forest Plan "zoned" national forests, including the creation of Late Successional Reserves. The Eastside Screens established a limit of 21-inch diameter-at-breast-height for harvesting trees, regardless of tree species, location, or management goals. We recommend that the agencies learn from these experiences by avoiding the imposition of additional, arbitrary limits such as tree size, age, or diameter that restrict or disregard the professional expertise, judgement, and experience of forestry scientists and professionals.

Again, we agree with Chief Randy Moore's call for a "paradigm shift" in forest management. Pursuing the same tactics and approaches as the last quarter century will result in the same outcomes: catastrophic wildfires, toxic smoke and carbon emissions, and the destruction of our national forest resources and forested communities – and the continued loss of mature and old growth forests. We recommend that the Forest Service find more ways to empower its dynamic workforce and leverage its extraordinary forestry expertise, rather than further handcuff its dedicated employees with more bureaucracy and red tape.

4) Unlock the climate mitigation potential of our forests and wood products.

The proposed exclusive focus on defining and inventorying old growth ignores the extraordinary and full potential of our national forests to be "climate change mitigation powerhouses."

Old-growth and mature forests undeniably store carbon, but wood products also store carbon. And, as our letter will articulate further, the importance of carbon storage is only meaningful indirectly as it relates to avoiding emissions. Climate change is directly mitigated by *increasing sequestration*. Science has shown (see citation 1, p. 7) that young forest stands can sequester and store more carbon on an area basis than can old-growth or mature forest stands. Any action to define and inventory old-growth and mature forests must also contextualize and clarify that, in order to *maximize* the full climate mitigation and carbon benefits of our national forests, we must also harvest mature trees to manufacture climate-friendly wood products and then regenerate with young, vigorous trees to ensure our forests remain forested while simultaneously working to improve the health and resiliency of all forest types. Unlocking the full climate mitigation potential of our forests and wood products will *not* be accomplished by locking up and walking away from old-growth and mature forests while requiring greater use of concrete and steel or increased imports of wood products from other countries.

5) Recognize and comply with existing legal frameworks and mandates.

We recommend that the agencies be cautious when defining and inventorying old-growth and mature forests in such a way that could erode, contradict, or undermine existing legal frameworks and statutory mandates. The Forest Service and BLM have willing partners to help achieve social, economic, and environmental management goals on federal land. These partnerships are often codified or exercised through legal authorizations, such as Good Neighbor Authority agreements, the Tribal Forest Protection Act, Master Stewardship Agreements, the National Forest Management Act, and the Federal Land Policy Management Act, which establish land planning coordination responsibilities with county and tribal governments.

In particular, the Oregon and California Railroad and Coos Bay Wagon Road Grant Lands Act of 1937 (O&C Act, 43 U.S.C. § 2601 et seq.) governs more than 2.2 million acres of BLM-managed forests in western Oregon. The O&C Act provides a unique and judicially-confirmed mandate for the BLM to manage these forests for sustained-yield timber production and to sell, or offer to sell, the declared annual sustained-yield capacity of timber from O&C Lands (i.e., BLM's "timber sale mandate"). *See Swanson Grp. Mfg. LLC v. Bernhardt*, 417 F.Supp.3d 22, 27 (D.D.C. 2019) (holding that the plain language of the O&C Act requires BLM "to sell or offer for sale an amount of timber that is not less than the declared annual sustained yield capacity of the timberland subject to the O&C Act"). Actions undertaken to fulfill EO 14072's directions should not interfere or hinder the BLM's obligations to achieve its timber sale mandate, which are already woefully under fulfilled.

Any definition and inventory work required by EO 14072 must be consistent and comply with existing federal statutes and mandates. Any lack of clarity on this point will lead to policy and legal confusion; delays or lack of action on the ground; conflicts between stakeholders, and litigation in the courtroom. The last thing we need during a wildfire crisis is for more wildfire

prevention work to be tied up in court, or for paperwork to be indefinitely delayed because of analysis paralysis.

II. Substantive and Technical Comments

This RFI comes at a critical juncture for both the Forest Service and BLM because each agency is receiving significant influxes of supplemental funding provided by the Bipartisan Infrastructure Law and now the Inflation Reduction Act to address the wildfire crisis through active forest management. With this funding comes a huge opportunity and responsibility to leverage the workforce and expertise needed to effectively execute the necessary land management treatments. Field units from both agencies in the West have emphasized the ongoing staffing challenges to deliver on even their basic programs, let alone treating an *additional* 20 million acres of at-risk National Forest land promised by the Forest Service's Wildfire Crisis Implementation Plan.

Executing the ambitious goals laid out in this Plan are important to AFRC and its members who depend on a forested landscape, resilient to wildfire and capable of supplying the timber products necessary to operate their companies and provide vital employment in their rural communities. With these capacity challenges in mind, we are hopeful that the Forest Service and BLM can meet the direction laid out in EO 14072 in an efficient manner that does not divert critical – but limited – agency staff time and resources from more pressing needs identified in the Forest Service's Wildfire Crisis Strategy.

The value of old-growth and mature forests identified in EO 14072 is largely centered around these forests' role in combating and mitigating climate change. The Secretary of Agriculture's June 23, 2022, Memorandum (SM) 1077-004, "Climate Resilience and Carbon Stewardship of America's National Forests and Grasslands," which references EO 14072, includes positions regarding our nation's forests' role in combating the climate crisis that AFRC agrees with. We agree that "our forests are climate change mitigation powerhouses" and that while they currently capture significant levels of carbon, "they have the potential to do more." SM 1077-004 appropriately acknowledges the role our nation's "working forests" play in this mitigation. Unfortunately, our federal forest lands will never reach their potential as climate change mitigation powerhouses unless policies are enacted that allow them to act as forests "working" as such.

Furthermore, the RFI indicates the final definitions for old-growth and mature forests will inform several needs identified in EO 14072, including the consideration of "climate smart stewardship of mature and old-growth forests." Therefore, we feel it is important to elaborate on our vision of "climate smart forestry" as a precursor to providing specific comments on how these two

forest types should be defined. This vision is informed by current climate science related to forest management in the West.

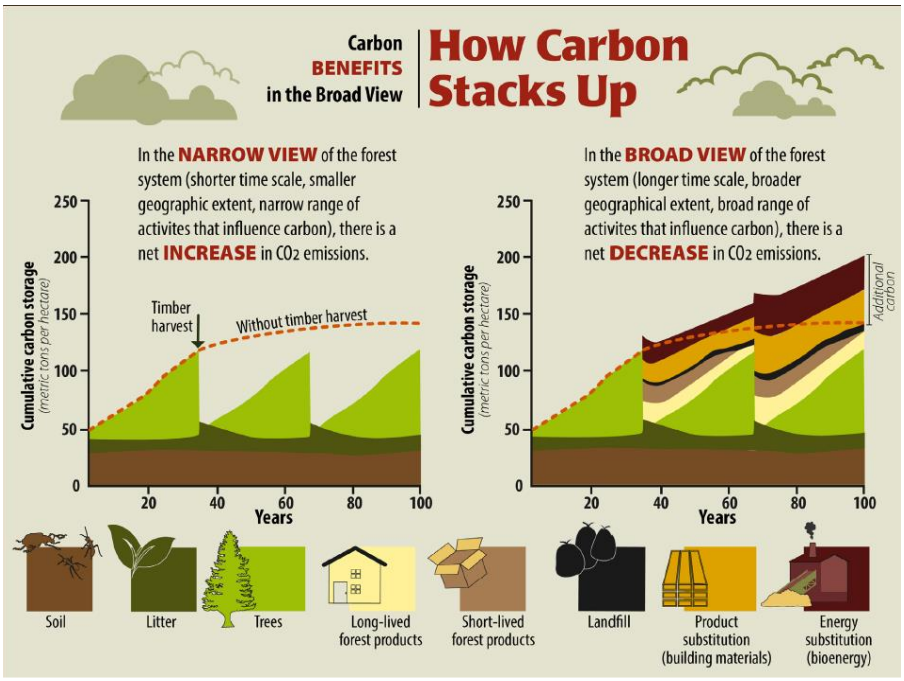
1) **AFRC's vision of climate smart forestry.**

When developing definitions in the context of climate smart forestry, the Forest Service and BLM should closely consider the role that these two forest types play in climate change mitigation. The scientific community widely accepts that effective climate change mitigation consists of two prongs: reducing emissions and increasing sequestration. SM 1077-004 cites the carbon storage capacity of old-growth and mature forests on serval occasions. However, the importance of carbon storage is only meaningful as it relates to avoiding emissions. Therefore, the goals for any "working" forest stand is to reduce the likelihood that previously stored carbon is released and to maximize that stand's carbon sequestration potential. Ensuring long-term storage can be accomplished by either mitigating the risk of stand mortality from wildfire or insects and diseases, or/and through timber harvest and storage of that carbon in long-lived wood products.

Maximizing carbon sequestration potential is less straightforward. However, recent research related to climate change mitigation through forest management asserts that, although large trees accumulate carbon at a faster rate than small trees on an individual basis, their contribution to carbon accumulation rates is smaller on an area basis, and their importance relative to small trees declines in older stands compared to younger stands. Therefore, old-growth and large trees are important carbon stocks, but they play a minor role in *additional* carbon accumulation.[1]

In other words, an acre of young, fast-growing trees can sequester more carbon than an acre of old, slower growing trees in any given timeframe. Given these scientific findings, if one prong of the solution to climate change is to maximize the carbon sequestration capacity of our nation's forests, we should pursue policies that encourage harvesting "mature" trees, storing that carbon in long-lived wood products, and then regenerating young, vigorous trees in their place. The schematic below from "Timber Harvest & Carbon from the USDA Office of Sustainability & Climate" well illustrates this important concept.[2]

[1] Gray, A. N., et al., . Carbon stocks and accumulation rates in
Pacific Northwest forests: role of stand age, plant community, and productivity, Ecosphere 7(1):e01224. 10.1002/ecs2.1224 (2016).
[2] U.S. Dept. of Agriculture, Office of Sustainability and Climate, *Timber Harvest & Carbon*, available at, https://www.fs.usda.gov/sites/default/files/TimberHarvest-Carbon-3pg-v3.pdf.



This publication also notes that timber harvest initially reduces the amount of carbon in the forest but can transfer carbon to wood products or energy use and increase productivity and health of the trees that remain. When considering the system in its entirety – forest carbon, use of forest products, and risks from environmental extremes – carbon emissions can be much lower than if the forest were left unmanaged. The Forest Service and BLM must be leaders in communicating these messages to the public and incorporating them into future polices on forest management. The public must also be informed by the agencies that when a tree is harvested, its stored carbon is not instantaneously released back into the atmosphere – carbon is instead stored in wood products – and the land where it was growing can be regenerated and put back to work sequestering carbon. A technical report with a focus on southwest Oregon further expands on the role timber harvest plays in climate change mitigation.[3] Some key points include:

- Wood harvested from forests, especially timber used for durable wood structures, can be reservoirs of long-term carbon storage.[4]
- Forests and forest products embody a closed-loop system in which carbon emissions associated with harvests and product use are eventually recovered as forests regrow.
- Although products may be retired in solid waste disposal sites, they decompose quite slowly, causing carbon to continue to be stored for many decades.

[3] U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station, *Climate change vulnerability and adaptation in southwest Oregon*, Gen. Tech. Rep. PNW-GTR-995 (2022).
[4] Bergman, R et al., *The carbon impacts of wood products*, Forest Products Journal 64: 220–231 (2014).

- Products derived from the harvest of timber from national forests reduce carbon emissions by substituting for more energy-intensive materials including concrete, steel, and plastics.

These findings should also inform climate-smart forestry when forest mortality cannot be avoided. The RIF includes a question related to how these definitions can reflect disturbances such as wildfire and insect and disease infestations. For example, consider the 1997 Charlton Butte Fire that burned on the Willamette National Forest within the Waldo Lake Wilderness Area. This wilderness area is one such congressionally designated area that SM 1077-004 asserted is "designed to protect and preserve natural values," including the value of climate change mitigation. The images below show a burned landscape devoid of trees 20 years following the fire. On the other hand, the "working forests" to the left of the burn scar (visible as lighter green polygons) are visibly greener after 20 years, reflecting a forested landscape that is actively sequestering carbon. Those working forests were likely mature forest harvested decades ago and regenerated.

1997

2016

These images certainly do not reflect "climate smart forestry." On the other hand, if the Forest Service and BLM were truly committed to being climate change powerhouses, they would adopt a policy of salvaging dead trees following disturbances, storing that material in long-lasting wood products all American consumers use, and reforesting those acres. Such a policy would minimize the release of stored carbon and accelerate the carbon sequestration potential of the impacted land.

By comparison, the two photographs below are from the same wildfire in the same watershed, but which have different ownerships. The photograph on the left is from privately managed forest land affected by the 2015 Stouts Fire in Douglas County, Oregon. The photo on the right is from the same fire on land managed by the Umpqua National Forest. The privately managed

land was partially salvage harvested and regenerated, while the land managed by the Forest Service was not salvaged and regeneration was limited. Clearly, the forest on the left is on a better path towards functioning as a climate change powerhouse while the forest on the right is not.


Regardless of how the Forest Service and BLM ultimately define mature and old-growth forests, it will be critical to accurately and transparently disclose the limited role that those forests play in climate change mitigation, particularly regarding carbon sequestration, as both agencies progress toward responding to Section 2(c) of EO 14072.

It is also important to acknowledge the role that timber harvest and active forest management play towards mitigating the risk of catastrophic wildfires, both within and adjacent to mature and old-growth forests. In the absence of active forest management and commercial thinning, many forests would thin naturally from mortality-inducing natural disturbances and other processes, resulting in dead trees that would decay over time, and emit carbon into the atmosphere. Those dead trees would also serve as fuel that could exacerbate the severity of future wildfires, resulting in higher carbon emissions.

Conversely, timber and wood fiber removed from forests would be transferred to the wood products sector for a variety of uses, each of which has a different effect on carbon storage.[5] Carbon can be stored in wood products for a variable length of time, depending on the commodity produced. It can also be burned to produce heat or electrical energy, or converted to liquid transportation fuels and chemicals that would otherwise come from fossil fuels[6].

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[5] Skog, K.E., et al., *Chapter 7: Managing Carbon. In: Climate Change and United States Forests*, Advances in Global Change Research 57 pp. 151-182 (2014).

[6] Lippke, B., et al., *Life cycle impacts of forest management and wood utilization on carbon mitigation: knowns and unknowns*, Carbon Management, 2:3, 303-333 (2011).

In addition, a substitution effect occurs when wood products are used in place of other products that emit more greenhouse gasses (GHGs) in manufacturing, such as concrete and steel.[7] In fact, removing carbon from forests for human use can result in a lower net contribution of GHGs to the atmosphere than if the forest were not managed.[8] The Intergovernmental Panel on Climate Change recognizes timber and wood fiber as a renewable resource that can provide lasting climate-related mitigation benefits that can increase over time with active management. Furthermore, by reducing stand density, the proposed action may also reduce the risk of more severe disturbances, such as insect and disease outbreak and severe wildfires, which may result in lower forest carbon stocks and greater GHG emissions.

We look forward to providing additional feedback during the formal public solicitation period for Section 2(c).

2) <u>Response to Input Requested</u>

- ***"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?"***

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

We believe that any definition of a forest attribute should be developed simply to inform a shared understanding of how to identify that attribute. It should be based on scientific and empirical evidence. Definitions should not be developed to "motivate," as prompted above, any type of management action, as this question implies. Definitions based on science could inform management actions, but they should not drive or motivate management actions. Management actions, such as the conservation of mature and old-growth forests, are described in land management plans developed in conformity with the National Forest Management Act and the Federal Land Policy and Management Act. A new definition of these terms cannot legally motivate how those terms are managed in a manner that is inconsistent with those plans. Therefore, attempting to define these terms with language designed to motivate specific management actions across millions of acres will result in a flawed definition and a confusing message to the field units tasked with implementing their respective management plans.

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[7] Gustavsson, L., et al., *The Role of Wood Material for Greenhouse Gas Mitigation,* Mitigation and Adaptation Strategies for Global Change, 11(5-6), 1097-1127 (2006).

[8] McKinley, D.C., et al., *A synthesis of current knowledge on forests and carbon storage in the United States*, Ecological Applications 21(6): 1902-1924 (2011).

Attempting to develop a "universal definition" of any kind of forest attribute when addressing complex forest ecosystems that vary widely across the multitude of eco-regions in the country is unproductive and risky. Federal forest managers in Eastern Oregon are keenly aware of these risks as demonstrated by adherence to a "universal" diameter limit that has restricted adaptable, science-based management for a quarter century. That limit, known as the Eastside Screens, has hampered their ability to meet desired end-results across a landscape that varies in soil productivity, elevation, and site class that impact tree growth and stand characteristics. This "top-down," prescriptive approach to management has decreased forest health, resiliency, and desired climate benefits of national forests in Eastern Oregon.

Developing a universal definition is difficult even when the scope is limited to a relatively smaller region. For example, attempts to define mature and old-growth in the Pacific Northwest have been well documented dating back to the 1940s. A recent assessment recognizes that old-growth characteristics differ by forest type, such that a single definition is not feasible.[9] A previous assessment determined the need for three different definitions for old-growth just within the range of the Northwest Forest Plan.[10]

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

Given the complicating factors outlined above, the criteria needed are those that are malleable and adaptive to a spectrum of forest types and conditions across the nation. Those criteria must be qualitative in nature, not quantitative. The most important forest characteristics to exclude from this definition are those that are not malleable or adaptive, such as age, tree size, or measures of stand density. For example, how could a universal tree size be used to concurrently identify an old-growth forest in the Giant Sequoia groves of California and an old-growth forest in an Appalachian hardwood forest in West Virginia? How could a universal age or stand density be used to concurrently identify an old-growth forest in the Pacific Northwest where historic fire intervals were at least 300 years, and an old-growth forest in Arizona where historic fire intervals were less than 30 years – especially in the context of a rapidly changing climate, drought, and warming environment?

The 2004 Washington State Legislature directed the Department of Natural Resources (DNR) to conduct an inventory of old-growth forest stands on state lands, as defined by a panel of scientists. In response, DNR contracted with regional scientists to create a guide that would inform local land managers as they worked to comply with this direction. Those scientists

[9] Davis, Raymond J. et al., 2015. Northwest Forest Plan–the first 20 years (1994-2013): status and trends of late-successional and old-growth forests. Gen. Tech. Rep. PNW-GTR-911. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 112 p.
[10] Moeur, Melinda et al., 2005. Northwest Forest Plan—the first 10 years (1994-2003): status and trend of late-successional and old-growth forest. Gen. Tech. Rep. PNW-GTR-646. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 142 p

concluded that "the great diversity and ages of forests found in western Washington makes the task of creating a comprehensive guide difficult" and were compelled to develop their guidance based on seven distinct vegetation zones.[11] This guide ultimately ascribed measurable attributes for identifying old-growth, but only specific to each of those seven zones. If a region as small as western Washington warranted seven distinct sets of criteria for old-growth, the entire country would warrant hundreds more.

Prominent forest ecology scientists in the Pacific Northwest have asserted that developing approaches that recognize the continuous variability in old-growth stands are recommended for the whole region. Maintaining a holistic perspective on old-growth forest ecosystems is critical in these and other current efforts to characterize old-growth by individual attributes.[12] Those same authors asserted that old-growth forest is a biological or ecological "concept." Franklin and Spies, who have published numerous documents on forest succession and identification of old-growth forests in the Pacific Northwest, concluded in a 1991 paper entitled, "Ecological Definitions of Old-Growth Douglas-fir Forests," that "further development of old-growth definitions should probably be directed toward developing more site-specific definitions, such as for specific habitat types, geographic locales, or both."[13]

The Forest Service and BLM are likely aware of these complicating factors, as indicated by the nature of the questions in the RIF. They are also likely aware that both "mature" and "old-growth" are terms that describe successional stages of forest development. Therefore, we urge you to establish a framework that aims to provide a holistic perspective based on the concept of forest successional stages. A sequence of forest successional stages for the Pacific Northwest was presented by researchers in 2002.[14] That sequence identified multiple successional stages ranging from cohort establishment, to maturation, to vertical and horizontal diversification. While Franklin and Spies do not identify old-growth in this sequence, they do note that characteristics typically associated with old-growth begin to develop during the vertical diversification stage. That stage is characterized by "canopy continuity" and "increased decadence in overstory trees and accelerated generation of coarse woody debris." The authors note that the maturation phase is marked at the point where "trees attain maximum height and

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[11] Washington State Department of Natural Resources; Van Pelt, R., *Identifying Mature and Old Forests in Western Washington*, 104 p. (2007), available at, https://www.dnr.wa.gov/publications/lm_hcp_west_oldgrowth_guide_full_lowres.pdf.

[12] Franklin, JF.; Spies, T.A., *Composition, function, and structure of old-growth Douglas-fir forests*. In: Ruggiero, L.F.; Aubry, K.B.; Carey, A.B.; Huff, M.H., eds. Wildlife and vegetation of unmanaged Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-285. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 71-80 (1990).

[13] Franklin, J.F.; Spies, T.A., *Ecological definitions of old-growth Douglas-fir forests*, In: Wildlife and vegetation of unmanaged Douglas-fir forests. Gen. Tech. Rep. PNW-GTR-285. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 61-69 (1991).

[14] Franklin, J.F. et al., *Disturbances and structural development of natural forest ecosystems with silvicultural implications, using Douglas fir forests as an example*., For. Ecol. Manag. 155: 399-423 (2002).

crown spread." However, they also note that these stages appear differently across different ecoregions.

Ultimately, an effective definitional framework would allow those conducting the ensuing inventory the ability to adapt the concepts of both the maturation (maximum tree height and canopy) and old-growth (canopy continuity and decadence) successional stages to specific ecoregions across the nation. *Excluding attributes such as age, tree size, or measures of stand density is critical to developing a sound framework definition.*

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

We believe a definition should be primarily based on the principles of forest succession. Disturbance is a component of forest succession and typically the primary component that transitions a forest to the stand-initiation stage, or early seral stage. Franklin and Spies describe that "[s]tand development begins with a disturbance that provides condition for establishment of a new dominant tree cohort. Disturbances vary in type, intensity, size, frequency, and homogeneity resulting in widely contrasting starting points for stand development. A new generation of trees is established during cohort establishment."[15] Other research has noted that early-successional forest ecosystems develop after stand-replacing or partial disturbances.[16] A United States Department of Agriculture white paper describes stand initiation as that successional stage following stand-replacing disturbance.[17]

Given this scientific consensus on the role of disturbance on seral stage succession, we urge you to develop a definition that acknowledges the transition to stand initiation (i.e., early seral) following those disturbances. When a windstorm destroys a stand in the stem-exclusion stage of development, that stand has been transitioned back to stand-initiation. Likewise, when an old-growth stand is burned in a high-severity wildfire, that stand has been transitioned back to stand-initiation. Inventorying such disturbances with remote sensing would be relatively simple.

It is also critical for the Forest Service and BLM to acknowledge the fact that many of the stands in most need of active management contain dominant trees that some may characterize as "old growth," with a dense understory and midstory component of younger trees, putting those stands at a high risk of destruction from catastrophic fire. Restoration treatments typically supported by most local stakeholders are those that harvest the understory and midstory component to protect the dominant component from being severely damaged by crown fire or by drought induced

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[15] *Id.*

[16] Swanson, Mark E., et al., *The forgotten stage of forest succession: early-successional ecosystems on forest sites*, Frontiers in Ecology and the Environment; doi:10.1890/090157 (2010).

[17] Powell David C, *A Stage is a stage…or is it? Successional stages, structural stages, seral stages*, White paper F14-SO-WP-Silv-10; USDA Forest Service, Pacific Northwest Region, Umatilla National Forest (2012).

mortality. Identifying these stands as "old growth" would complicate or threaten those restorative treatments. Copied below is a photograph of one such stand on the Deschutes National Forest in Oregon. The proposed treatments call for the harvest of the black-bark ponderosa pine competing with the older ponderosa pine. This stand is effectively a two-aged stand. Any definition crafted must be done to allow the ensuing inventory to categorize stands like this one as a two-aged stand with both a mid-seral component and a legacy component.

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

Forest managers and scientists have been defining and mapping forest successional stages – including old growth – for decades. In the Pacific Northwest, definitions by the Old-Growth Definition Task Group (1986) refined earlier definitions by Franklin and Spies (1984) and the Society of American Foresters (SAF) (1984), which in turn were based on a synthesis entitled "Ecological Characteristics of Old-Growth Douglas-fir Forests" by Franklin et al. (1981).[18] By 1991, definitions existed from the Old-Growth Forest Wildlife Habitat Program, The Wilderness

[18] Marcot, Bruce G. et al., *Old-growth inventories: status, definitions, and visions of the future. In: Wildlife and vegetation of unmanaged Douglas-fir forests* Gen. Tech. Rep. PNW-GTR-285; U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 47-59 (1991).

Society, the Forest Service, the BLM, the Old-Growth Definition Task Group, and SAF. Again in 1991, Franklin and Spies attempted to examine the potential for definitional and indexing approaches to identifying old-growth Douglas-fir stands.

Attempting to create a "durable" definition is difficult and perhaps not a goal worth striving for. This will certainly not be the final effort to define mature and old-growth forests. How future definitions are developed will be based on an entirely new library of research and societal values and needs. We believe the goal for this effort is to create a definition based on the principles of forest succession and malleable enough to be adaptable to hundreds, if not thousands, of unique ecoregions across the country.

3) **Inventorying Old-growth and Mature Forests on Federal Lands.**

As described above, we have significant concerns about the impacts that the directions in EO 14072 will have on the Forest Service's and BLM's ability to effectively manage their forestland in the face of an unprecedented wildfire crisis. In fact, in EO 14072 the President identifies "climate impacts, catastrophic wildfires, insect infestation, and disease" as the greatest threat to old-growth forests – not proactive forest management and timber harvesting. The inventory designs selected by each agency will affect the workload placed on their staff at a time when both agencies lament their limited staff and challenges in filling critical positions.

Both agencies have tools to streamline this inventory effort, including the Forest Inventory and Analysis Program and remote sensing technology. However, any forestry scientist or professional will likely attest to the futility of attempting to categorize forest successional stages simply using remote sensing tools and information comprised of quantitative data. Perhaps the only effective way to accurately inventory two distinct forest seral stages across a diverse landscape is to direct foresters to visit every single stand across the 250-million-acre federal forest footprint.

Unfortunately, such an effort is infeasible and unrealistic at a time when federal forest managers have more urgent priorities in front of them; namely the need to actively manage forest land that is at risk of catastrophic wildfires and widespread mortality from drought-induced stress and disease. Therefore, we expect the Forest Service and BLM to use existing inventory data and remote sensing.

The Forest Service in the pacific northwest uses a remote sensing tool called the Old-Growth Structure Index to estimate forest successional stages. OGSI is described as a composite index that sums the values of old-growth characteristics so that the highest index values occur in the later stages of forest succession; it is the primary tool used to track forest successional stages in

the monitoring of the northwest forest plan. The 20-Year Monitoring Report[19] indicates that OGSI was calculated using one to four measurable old-growth structure elements including (1) density of large live trees, (2) diversity of live-tree size classes, (3) density of large snags, and (4) percentage cover of down woody material. It is explicitly noted that using just one of the four elements is appropriate. If OGSI, or a similar remote sensing tool, is a component of the Forest Service and BLM's inventory, its potential flaws must be considered. For example, one element of the OGSI is density of large snags. If the tool were applied using only this element, a stand recently impacted by high-severity wildfire consisting of only large, fire-killed trees would score a high OGSI and possibly be identified as old-growth. Application using only the element of percentage cover of down woody material would also result in a high OGSI on a stand that was recently impacted by a strong windthrow event.

Section 2(b) of EO 14072 simply provides direction to inventory "forests." Since both the Forest Service and BLM manage large tracts of contiguous forests, each agency must determine the appropriate spatial scale for this forest inventory process. We urge both agencies to establish that spatial scale to conform to the silvicultural concept of the forest "stand" and to adhere to a definition of that term by a credible source. The SAF defines the stand as "a contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable land management unit."[20] Forest management by both the Forest Service and BLM is currently driven by stand management based on the SAF definition above, and we urge you to adhere to this definition again as you develop your inventory strategy.

Conclusion

Thank you for this opportunity to comment on the RFI. We reiterate our commitment to working with the Forest Service and BLM to help address our nation's wildfire and forest health crisis. Our members – and your partners and customers – play an invaluable role in climate change mitigation through science-based, active forest management and manufacturing renewable, carbon-storing wood products. We strongly encourage the Administration and federal land management agencies to prioritize and focus on action-based solutions to restore forest health, reduce the risk of catastrophic wildfires, and protection communities and public health. As the Administration and action agencies consider next steps on defining and inventorying old growth and mature forests, we recommend the agencies:

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[19] Davis, Raymond J. et al., *Northwest Forest Plan–the first 20 years (1994-2013): status and trends of late-successional and old-growth forests. Gen. Tech. Rep. PNW-GTR-911*. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 112 p. (2015).

[20] *The Society of American Foresters' Dictionary of Forestry* 175 (2nd Ed. 2018).

1) **Keep it (definition and inventory work) local, flexible, and transparent.**
2) **Improve Forest Inventory and Analysis Data and Forest Inventory.**
3) **Avoid arbitrary limits that tie the hands of forestry professionals.**
4) **Unlock the climate mitigation potential of our forests and wood products.**
5) **Recognize and comply with existing legal frameworks and mandates.**

Please contact our Federal Timber Program Director, Andy Geissler, at ageissler@amforest.org for any follow up questions.

Sincerely,

Travis Joseph
President/CEO