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Linda Walker
Director, Ecosystem Management Coordination
United States Forest Service
201 14th Street SW
Mailstop 1108
Washington, DC 20250-1124
Linda.Walker@usda.gov

Re: Comments on Notice of Intent for Land Management Plan Direction for Old-Growth Forest Conditions Across the National Forest System

On behalf of the undersigned organizations, thank you for the opportunity to comment on the Notice of Intent for Land Management Plan Direction for Old-Growth Forest Conditions Across the National Forest System (NOI).[1] This process is an important step that, done right, could realize significant protections for our Nation's climate-critical forests and help meet the promise of Executive Order 14072 to "conserve America's mature and old-growth forests on Federal lands."[2] And we welcome the agency's stated commitment to "maintaining and developing old-growth forest conditions while improving and expanding their abundance and distribution."[3]

As explained in our comments below, the final policy must improve on the Preliminary Proposed Action to meet the NOI's stated aims. We provide specific policy recommendations that would help ensure that this process results in a policy outcome achieving those aims. Above all, the agency should do everything possible to ensure old-growth trees stay in the forest, most critically by ending their commercial exchange. And it should ensure that only the Secretary of Agriculture can change the amendment after finalization. The agency should also eliminate the provision that allows the Tongass National Forest to be exempted from the amendment's protections. It should adopt a more inclusive, straightforward, and administrable definition of old growth. And it should go further and protect mature trees, consistent with the NOI's purpose of enhancing old-growth conditions over time and for their unique climate values, as enshrined in E.O. 14072. We urge that these policies be considered in an alternative in the environmental impact statement (EIS).

Additionally, we welcome the U.S. Forest Service's (USFS or Forest Service) acknowledgement of the importance of Tribal engagement and the incorporation of co-stewardship goals, Tribal sovereignty, and Indigenous Knowledge into the interpretation and implementation of the proposal.[4] We recognize the profound importance of old-growth forests and trees to Tribal Nations, including for traditional and customary uses. Consistent with the purpose of the NOI, we call on the agency to respect Tribal uses, meet trust responsibilities and the obligations contained in treaties with Tribal Nations, and work with Tribal Nations to expand co-management and co-stewardship opportunities. And, as the agency moves forward, it must maintain and expand these commitments to engagement—USFS must make the time and provide the resources to fully consult at all government and agency levels with Tribal Nations during and after the pendency of the amendment process.

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[1] U.S. Forest Service, Department of Agriculture, Land Management Plan Direction for Old-Growth Forest Conditions Across the National Forest System, 88 Fed. Reg. 88,042 (notice of intent published Dec. 20, 2023) ("NOI").
[2] Exec. Order No. 14072, Strengthening the Nation's Forests, Communities, and Local Economies, 87 Fed. Reg. 24,851, 24,851 (Apr. 27, 2022) ("E.O. 14072").
[3] NOI, 88 Fed. Reg. at 88,044.
[4] NOI, 88 Fed. Reg. at 88,047.

I. PURPOSE & NEED

A. Purpose

1. The purpose section must more clearly convey the benefits that protecting old growth will generate.

The Forest Service must more clearly link the purpose of the amendment to the benefits of old-growth forests. Old-growth forests provide vital benefits, including climate mitigation, habitat creation, enhanced wildfire forest resilience, watershed integrity, scenic enjoyment, and reducing nature-deprivation for communities. We describe these benefits in more detail in section II.B.1 of these comments. By expressly incorporating the need to safeguard and increase these benefits into the purpose, the agency will fully explain the rationale for promulgating the amendment.

In the NOI, the purpose is characterized as "maintaining and developing old-growth forest conditions while improving and expanding their abundance and distribution," as well as protecting them from threats posed by potential stressors.[5] While this framing appropriately recognizes the inherent value of old growth, it does not convey that the amendment will generate benefits at the regional, national, and global levels. Reframing the purpose around the benefits of old growth will demonstrate the tangible value of the amendment, in addition to the inherent value of old growth.

The agency must ensure that the EIS places "improving and expanding" old-growth abundance on equal footing with "maintaining and developing old-growth forest conditions"—a feature of the amendment that is potentially ambiguous as currently worded in the NOI.

2. The purpose should include recovering from and preventing ecologically inappropriate vegetation management.

We also recommend that the purpose acknowledge the need to recover from a deficit of old growth caused by past management. The purpose statement should include ongoing "ecologically inappropriate vegetation management" among the threats that this amendment seeks to help prevent. The agency has acknowledged this threat in the Advance Notice of Proposed Rulemaking as well as in its Mature and Old-Growth Forest Threat Analysis Update.[6] We believe that inappropriate logging is a bigger current threat than the agency has recognized, and, notwithstanding the relative magnitude of various threats, inappropriate logging should be addressed because it is wholly within the agency's control. We have identified several ongoing examples in two reports, *Worth More Standing* and *America's Vanishing Climate Forests*.[7]

[5] NOI, 88 Fed. Reg. at 88,044.

[6] U.S. Forest Service, Department of Agriculture, Organization, Functions, and Procedures; Functions and Procedures; Forest Service Functions, 88 Fed. Reg. 24,497, 24,503 (advance notice of proposed rulemaking published Apr. 21, 2023); U.S. Forest Service, Department of Agriculture. "Analysis of Threats to Mature and Old-Growth Forests on Lands Managed by the Forest Service and Bureau of Land Management: Introductory Report" (Jan. 2023) 4. https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/MOG-Threats-Intro.pdf.

[7] Climate Forests Campaign. "Worth More Standing: 10 Climate-Saving Forests Threatened by Federal Logging" (2022). https://www.climate-forests.org/_files/ugd/73639b_03bdeb627485485392ac3aaf6569f609.pdf; Climate Forests Campaign. "America's Vanishing Climate Forests: How the U.S. Is Risking Global Credibility on Forest Conservation" (2022). https://www.climate-forests.org/_files/ugd/ae2fdb_b5a2315e3e8b42498b4c269730c3955a.pdf.

3. The agency should prioritize natural succession processes over active management whenever possible.

We applaud the NOI's recognition that "natural succession processes can support achievement of desired conditions"[8] and urge a clearer articulation that such processes should be prioritized over active management whenever possible. This prioritization is always possible in infrequent-disturbance forest types. Old-growth conditions in such forests are long-lived and need no active management to maintain them. To attain more old-growth forest across the landscape and over time, it is simply necessary to allow mature and other forests to age into old growth. The same principle applies after a stand-replacing event. Natural succession processes can take an area through the critical pre-forest and early seral stages and lay the foundation for complex natural old-growth conditions. In frequent-fire forest types (those that are not infrequent-disturbance forest types[9]), sometimes active management is desirable to conserve or restore ecological process and function to old-growth forests.

4. The purpose section must clarify that the need for old growth protection and recruitment is immediate.

The purpose section must clarify the near-term urgency for on-the-ground progress toward the protection and recruitment goals of the amendment. The climate and biodiversity crises have reached an acute phase. Absent broad and immediate changes, these crises will only grow markedly worse. The climate importance of old-growth forests and trees is extensively documented.[10] Bringing these forests and trees to bear in the climate fight immediately is an essential part of success.

As drafted, the NOI's purpose and need is ambiguous on timing. The text does not articulate clear goals for implementing protections for current old growth or recruiting additional old growth in the near term. While the text of the "Objective" does call for improvements over a decade, each unit is only obligated to improve a single landscape.[11] And "Plan Monitoring" calls for biennial monitoring reports but requires no measurable progress.[12]

To advance the stated goal of recruiting additional old growth, the agency should include several clarifications in its Purpose and Need. It should make clear that protections for old-growth forests and trees need to be immediately implemented across the entire System. It should direct that efforts to bolster old growth recruitment nationwide begin immediately. It should establish that the biennial reports included in "Plan Monitoring" are intended to reflect measurable progress on both goals. And it should direct that old growth protections and recruitment yield widespread on-the-ground improvements over the next decade.

5. The purpose section should incorporate measures to ensure that frontline communities and nature-deprived communities directly benefit.

The stated intention to incorporate Indigenous knowledge and Tribal leadership in the amendment, and to enable co-stewardship, are consistent with this recommendation, but there are additional measures that should be incorporated. The amendment should include the purpose of eliminating "the nature gap" for nature-deprived communities, and elevating the importance of delivering the stated benefits of this amendment in communities that are underserved and over-burdened by pollution.

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[8] NOI, 88 Fed. Reg. at 88,045.
[9] Franklin, J. F. et al. "Ecological Forest Management." *Waveland Press* (2018) (see especially chapter 3, part 3).
[10] *See, e.g.,* Lutz, J. A. et al. "Global importance of large-diameter trees." *Global Ecology and Biogeography* (2018) 27(7): 849-864. https://doi.org/10.1111/geb.12747.
[11] NOI, 88 Fed. Reg. at 88,047.
[12] NOI, 88 Fed. Reg. at 88,048.

The updated Fireshed Risk Map integrated in the *Climate Risk Viewer* could serve as a model to achieve this purpose. The *United States Forest Service Climate Risk Viewer* specifically demonstrates where firesheds intersect with one or more disadvantaged community tracts.[13] In a similar fashion, by developing an "equity layer" to the *Climate Risk Viewer's* mature and old-growth forest estimates mapping, a spatial analysis can demonstrate the amendment's benefits to underserved communities.

6. The purpose of the National Old-Growth Monitoring Network must include tracking potential *future* old growth.

When addressing the National Old-Growth Monitoring Network in the purpose section, the agency needs to clarify that a purpose of the network is to track the potential for recruiting future old growth, in addition to tracking trends in existing old-growth conditions. As the NOI states, comments on the ANPR revealed widespread agreement that "[c]onsistent and effective monitoring of current and future old-growth forest conditions over time would better inform adaptive management."[14] However, the NOI does not reference future old-growth conditions when presenting the purpose of the monitoring network.

To meet the agreed-upon aim of monitoring future old-growth conditions—and to support the NOI's stated purpose of expanding the abundance and distribution of old-growth conditions—the monitoring network must track mature forest conditions as well as old growth. Mature forests have a high potential to become old growth, and understanding the status of mature forests is integral to tracking and forecasting future old-growth conditions. It is essential that the purpose of the monitoring network incorporate tracking mature forests to anticipate future old growth abundance.

7. Only the Secretary should be authorized to change the amendment.

The agency should clearly state that authority to revise, amend, modify, or otherwise change the operative provisions of this policy—including the Standards for Management Actions Within Old-Growth Forest Conditions—resides exclusively with the Secretary of Agriculture.[15] The agency should also clarify that, because the amendment sets a floor for protection,[16] more restrictive constraints on actions that may affect existing or potential old-growth forest conditions do not revise, amend, modify, or otherwise change the operative provisions of this policy. This recommendation supports the NOI's goals of "consistent plan direction" and "maintaining and developing old-growth forest conditions."[17]

B. Need

1. Our comments on the purpose section also apply to the need section, as applicable.

The NOI's need section largely mirrors the purpose section. To the extent that the EIS takes the same approach, our comments above about the purpose apply equally to the need. In addition, we offer the following recommendations for clarifying the need, as distinct from the purpose.

[13] U.S. Forest Service, Department of Agriculture, "United States Forest Service – Climate Risk Viewer (Beta 0.2.4) – Fireshed Map," https://experience.arcgis.com/experience/2ea6b7fab491474aaeea9d5979b5f21c.
[14] NOI, 88 Fed. Reg. at 88,044.
[15] 36 C.F.R. § 219.2(b)(3).
[16] NOI, 88 Fed. Reg. at 88,045 ("If existing plan direction provides more restrictive constraints on actions that may affect existing or potential old-growth forest conditions, those more restrictive constraints would govern.").
[17] NOI, 88 Fed. Reg. at 88,044.

2. The need section must explain why a new policy is required to achieve the purpose.

The need section of the NOI appropriately highlights consistency across forest plans and monitoring strategies, as well as "recogniz[ing] and incorporat[ing] Indigenous knowledge and tribal rights and interests."[18] In addition, the agency must further clarify why the amendment is necessary to achieve the policy's stated purposes.

In particular, the need section must acknowledge that current policies do not provide sufficient assurance that the benefits of old growth—including climate mitigation, habitat creation, enhanced wildfire resilience, and watershed integrity—will be preserved and increased. The "need" for the amendment is to enshrine a policy that appropriately values those benefits, both within a forest's immediate region and beyond. As we explain in section II.B.1, agency officials are strongly encouraged by—among other things—local political pressure, internal performance metrics, and agency history to provide timber volume for sale. These incentives heavily influence agency decision-making. The amendment must incentivize officials to value old-growth forests not for timber, but rather for their many other benefits that cutting them would forfeit.

3. The need should include advancing E.O. 14072.

The need should specifically incorporate establishing policies to advance the aspects of section 2 of E.O. 14072 pertaining to the conservation of older forests, including, but not limited to, old-growth forests, specifically to "institutionalize climate-smart management and conservation strategies that address threats to mature and old-growth forests on Federal lands."[19]

4. The need should include advancing the Justice40 Initiative.

We applaud USFS's commitment to the Urban and Community Forestry program and other restoration projects as part of the Justice40 initiative.[20] However, Justice40 programs mark the baseline, not the ceiling, for what the agency can do to benefit disadvantaged communities. Justice40 is more than an economic goal for covered programs at USFS.[21] It is a commitment to protecting quality, healthy ecosystems for vulnerable underserved communities in our journey towards forest climate resilience. The need section should iterate the imperative for at least 40 percent of climate-related investments to directly benefit "disadvantaged communities that are marginalized, underserved, and overburdened by pollution."[22]

II. ALTERNATIVES

The NOI rightly sets out a goal of "maintaining and developing old-growth forest conditions while improving and expanding [the] abundance [of old growth]."[23] Below we identify gaps and ambiguities contained in the Preliminary Proposed Action that would prevent achieving these goals by allowing for significant logging and sale of old-growth trees and forests. Following that, we recommend policies to consider in an alternative that would more robustly ensure the protection of extant old growth and ensure that the final policy can get closer to meeting the NOI's goal of maintaining and developing old growth.

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[18] NOI, 88 Fed. Reg. at 88,044.
[19] E.O. 14072 § 2(c)(iii).
[20] U.S. Forest Service, Department of Agriculture, "Urban and Community Forestry Program," https://www.fs.usda.gov/managing-land/urban-forests/ucf.
[21] U.S. Forest Service, Department of Agriculture, Justice40 covered programs list for USDA, https://www.usda.gov/sites/default/files/documents/usda-justice-40-programs.pdf.
[22] The White House, "Justice40: A Whole-of-Government Initiative," https://www.whitehouse.gov/environmentaljustice/justice40/.
[23] NOI, 88 Fed. Reg. at 88,044.

We also identify policies that will meet the NOI's goal of improving and expanding the abundance of old growth, and the goals of E.O. 14072. The E.O. establishes an immediately effective, ongoing policy to "conserve America's mature and old-growth Forests on federal lands" and to "manage forests on Federal lands, which include many mature and old-growth forests," for purposes including "retain[ing] and enhanc[ing] carbon storage" and "conserv[ing] biodiversity."[24] The goal of the directive to define, inventory, and develop strategies for mature and old-growth forests is expressly "[t]o further conserve mature and old-growth forests."[25] We urge the agency to include, in an alternative, a policy that would set a firm old growth recruitment goal. And, to create an opportunity for action that would meet the E.O.'s urgent prioritization of carbon storage and biodiversity conservation, we urge the Forest Service to include an alternative in its EIS that would provide immediate protections for mature forests.

A. The NOI as drafted would allow substantial old growth logging to continue, holding up progress toward its goals.

As drafted, the proposed amendment needs to be changed to ensure that the final policy achieves the NOI's stated goal of protections for old-growth forests and trees. The language in several of the provisions found in the Standards for Management Actions Within Old-Growth Forest Conditions is substantially broad. This language would not halt the sale of old-growth trees nationwide, set a low bar for engaging in vegetation management activities in old-growth forests, and undermine application of this amendment to the Tongass National Forest.

In particular,

- Section 3 of the Standards for Management Actions Within Old-Growth Forest Conditions would not be a significant barrier to logging old growth for economic reasons.[26] While the NOI would seem to preclude old growth logging primarily for the production of timber products, in practice, the Forest Service no longer promotes logging/thinning projects where the ***primary*** purpose is for economic reasons. The primary purpose of Forest Service projects is most often characterized by a range of "stewardship" activities including resilience, restoration, hazardous fuel reduction, density reduction, insects and disease, etc. Where it is present, timber production is nearly always included as a secondary purpose. Taken together with internal agency policy and performance incentives, the language in this provision could undermine the purpose of the amendment. While these activities are constrained by standards 1 and 2, our collective engagement in nearly every Forest Service region over decades raises significant concern with the language of Section 3. Projects including Black Ram in the Kootenai National Forest and Southside in the Nantahala-Pisgah are examples of projects that were advanced under a restoration/resilience rationale, but still let old growth go to the mill.[27] In many ways, the proposed amendment is not different from the status quo. As long as the Forest Service continues to utilize number of board feet produced (the larger the tree, the more the board feet produced) as a performance metric and rewards line officers for meeting these targets, this language creates the potential for significant misapplication. And NEPA processes offer increasingly limited recourse to meaningfully change projects, due to the reliance on categorical exclusions and

[24] Exec. Order No. 14,072, 87 Fed. Reg. 24,851 (April 22, 2022). https://www.federalregister.gov/documents/2022/04/27/2022-09138/strengthening-the-nations-forests-communities-and-local-economies.
[25] *Id.* (emphasis added).
[26] NOI, 88 Fed. Reg. at 88,047.
[27] Climate Forests Campaign. "Worth More Standing: 10 Climate-Saving Forests Threatened by Federal Logging" (2022). https://www.climate-forests.org/_files/ugd/73639b_03bdeb627485485392ac3aaf6569f609.pdf; Climate Forests Campaign. "America's Vanishing Climate Forests: How the U.S. Is Risking Global Credibility on Forest Conservation" (2022). https://www.climate-forests.org/_files/ugd/ae2fdb_b5a2315e3e8b42498b4c269730c3955a.pdf.

other NEPA shortcuts. Economic reasons should never be a purpose for vegetation management in old-growth forest conditions.

- The exception for the Tongass raises similar concerns. The NOI would single out the Tongass for exclusion from its protections by creating an exception for old-growth logging under the Southeast Alaska Sustainability Strategy (SASS).[28] Importantly, the SASS is an unenforceable policy that has not been adopted as a regulation or otherwise made durable and can be changed without any public process, exposing the Tongass to a risk of increased logging. Moreover, while permitting limited old-growth logging had transitional value for ramping down old-growth logging in the Tongass when the transition first began under Secretary Vilsack's 2013 directive,[29] that transition should now be complete. There is a ready and ample supply of second growth in lower conservation value areas with open road networks that can support existing local mills. At the very least, there is no justification for enshrining a policy that could allow increased logging of the Tongass's old growth in a new plan amendment. In addition, allowing such logging in the Nation's greatest remaining concentration of old-growth forest would send the wrong message to other nations that the United States is urging to reduce deforestation in their home countries.

- Additionally, the provisions of standard 2(a) and 2(b) are often vague. Sections 2(a)(i)-(xi) do not require a finding or public review before they can be utilized to justify management activities.[30] And section 2(a)(xi)—allowing for vegetation management to promote "other key characteristics of ecological integrity"—is vague and could be interpreted to alone justify a range of deleterious activity.[31] Similarly, several of the exceptions are worryingly open-ended. For example, the Wildlands Urban Interface definition can be very broadly interpreted beyond the Healthy Forests Restoration Act statutory definition of 1.5 miles from a community.[32] Protecting communities and critical infrastructure is essential. Utilizing broad definitions like this, however, can readily lead to abusive logging unrelated to any health or safety goal. And section 2(b)(v)—allowing an exception to the protective standard "in cases where it is determined that the direction in this amendment is not relevant or beneficial to a particular forest ecosystem type" could be read as giving license to local managers to disregard the amendment.[33] The agency must draft the rationales and exceptions narrowly to fulfill the NOI's goal of protecting and expanding old growth; any management in old-growth conditions that relies on a rationale or exception in section 2(a)-(b) must be subject to public comment and a high standard, as described below.

B. Stronger old growth protections must be considered in one or more alternatives.

To address the gaps and ambiguities outlined above, the agency must consider in at least one alternative — whether by modifying the proposed amendment or drafting new alternatives—provisions that would move the amendment toward meeting its stated goal of protecting existing old-growth forests and trees. The agency must consider eliminating the commercial exchange of old-growth trees. The agency must consider ending, with very limited exceptions, logging of old-growth trees everywhere and all logging in old-growth stands where fire is infrequent. The agency must consider eliminating the Tongass exception. And the agency must consider using an inclusive and more consistent definition of old growth.

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[28] NOI, 88 Fed. Reg. at 88,047.
[29] United States Department of Agriculture Office of the Secretary, Secretary's Memorandum No. 1044-009, "Addressing Sustainable Forestry in Southeast Alaska," (July 2, 2013). https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5445760.pdf.
[30] NOI, 88 Fed. Reg. at 88,047.
[31] NOI, 88 Fed. Reg. at 88,047.
[32] NOI, 88 Fed. Reg. at 88,047, and Healthy Forests Restoration Act of 2003, 16 U.S.C. § 6511.
[33] NOI, 88 Fed. Reg. at 88,047.

1. Prohibition on commercial exchange of old growth

The agency must consider prohibiting the commercial exchange of old-growth trees. There is no ecological justification to send old-growth trees to a mill. Old-growth trees provide significant ecological benefits while alive,[34] including carbon storage and sequestration,[35] wildfire resilience,[36] habitat creation,[37] and watershed integrity values.[38] And even when dead—whether as a snag or as coarse woody debris—old-growth trees provide a host of critical ecological benefits, including carbon storage, habitat creation, and watershed protection.[39] Against this, transporting and processing these trees emits much of their carbon into the atmosphere in the near term, eliminates other ecological co-benefits, often results in wood products with short lifespans (1-10 years), and ends any future sequestration potential.[40]

Additionally, allowing for commercial exchange of these trees distorts agency decision making. Agency officials are strongly encouraged by—among other things—local political pressure, internal performance metrics, and agency history to provide timber volume for sale.[41] Leaving old growth available for commercial exchange in the face of such pressures strongly incentivizes the removal of these trees, even if the primary purposes are articulated as resilience, restoration, etc.

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[34] *See* DellaSala et al., "Mature and old-growth forests contribute to large-scale conservation targets in the conterminous United States." *Frontiers in Forests and Global Change* (2022) 5:979528. https://doi.org/10.3389/ffgc.2022.979528 (citing sources).

[35] *See, e.g.,* Stephenson, N. L. et al. "Rate of tree carbon accumulation increases continuously with tree size." *Nature* 507 (2014): 90-93. https://doi.org/10.1038/nature12914; He, L. J. et al. "Relationships between net primary productivity and forest stand age in U.S. forests." *Global Biogeochemical Cycles* 26 (2012): 1-16. https://doi.org/10.1029/2010GB003942; Law, B. E. et al. "Changes in carbon storage and fluxes in a chronosequence of ponderosa pine." *Global Change Biology* 9 (2003): 510-524. https://doi.org/10.1046/j.1365-2486.2003.00624.x; Keeton, W. S. et al. "Late-Successional Biomass Development in Northern Hardwood-Conifer Forests of the Northeastern United States." *Forest Science* 57 (2011): 489-505. https://doi.org/10.1093/forestscience/57.6.489; Gough, C. M. et al. "Disturbance, complexity, and succession of net ecosystem production in North America's temperate deciduous forests." *Ecosphere* 7 (2016): n. pag. https://doi.org/10.1002/ecs2.1375.

[36] *See, e.g.,* Agee, J. "Fire Ecology of Pacific Northwest Forests." *Island Press* (1993). 121-24; Thompson, J.R. and T.A. Spies. "Vegetation and weather explain variation in crown damage within a large mixed-severity wildfire." *For. Ecol. Management* (2009) 258: 1684-1694. https://doi.org/10.1016/j.foreco.2009.07.031.

[37] *See, e.g.,* Johnson, D. L. et al. "Ecological Forest Management," *Waveland Press* (2018); Perry, D. A. "Forest ecosystems." *JHU Press* (1994); Grier, C. G. and S. W. Running. "Leaf Area of Mature Northwestern Coniferous Forests: Relation to Site Water Balance." *Ecology* (1977) 58(4). https://doi.org/10.2307/1936225; Nagy, R.C. et al. "Water resources and land use and cover in a humid region: the southeastern United States." *J. Environmental Quality.* (2011) 40(3): 867-878. https://doi.org/10.2134/jeq2010.0365.

[38] *See, e.g.*, Crampe, E. A. et al. "Fifty years of runoff response to conversion of old-growth forest to planted forest in the H. J. Andrews Forest, Oregon, USA." *Hydrological Processes* (2021) 35(5). https://doi.org/10.1002/hyp.14168; Pypker, T. G. et al. "The role of epiphytes in rainfall interception by forests in the Pacific Northwest. I. Laboratory measurements of water storage." *Canadian Journal of Forest Research* (2006) 36(4). https://doi.org/10.1139/x05-298.

[39] *See, e.g.*, Lutz, J. A. et al. "The importance of large-diameter trees to the creation of snag and deadwood biomass." *Ecological Processes* (2021) 10: 1-14. https://doi.org/10.1186/s13717-021-00299-0; Stenzel, J. E. et al. "Fixing a snag in carbon emissions estimates from wildfires." *Global Change Biology* (2019): n. pag. https://doi.org/10.1111/gcb.14716. Harmon, M. E. et al. "Ecology of Coarse Woody Debris in Temperate Ecosystems." *Advances in Ecological Research* (1986) 15: 133-302. https://doi.org/10.1016/S0065-2504(03)34002-4.

[40] Law, B. E. et al. "Land use strategies to mitigate climate change in carbon dense temperate forests." *Proceedings of the National Academy of Sciences of the United States of America* (2018) 115: 3663-3668. https://doi.org/10.1073/pnas.1720064115; Hudiburg, T.W. et al. "Meeting GHG reduction targets requires accounting for all forest sector emissions." *Environmental Research Letters* (2019): n. pag. https://doi.org/10.1088/1748-9326/ab28bb.

[41] *See, e.g.*, U.S. Department of Agriculture. "FY 2024 Annual Performance Plan, FY 2022 Annual Performance Report." (2023) 22. https://www.usda.gov/sites/default/files/documents/fy-2024-annual-performance-plan-fy-2022-annual-performance-report.pdf.

2. Prohibitions on old growth cutting

Beyond a bar on commercial exchange, the agency must consider barring the cutting of old-growth trees nationwide and all cutting in old-growth stands in infrequent-disturbance forest types,[42] save for a very limited set of circumstances. There are no ecological justifications for cutting old-growth trees or cutting in infrequent-disturbance old-growth stands. As noted in section II.B.1 of these comments, these stands and trees provide essential ecological benefits. Cutting undermines these benefits. More broadly, the United States is at a significant deficit of old growth. And many areas that experience fire infrequently—such as New England, the Central and Southern Appalachians, and the Upper Midwest—are particularly deficient in old growth.[43] Old-growth trees—and old-growth stands in infrequent-disturbance forests—should be cut only in a very limited set of circumstances: imminent threats to public safety; when required to effectuate a statute, a treaty, or trust obligations; and individual tree selection by Alaska Native and Native American Tribes for traditional and customary uses.

3. Eliminating the Tongass exception

The agency should eliminate or—at a minimum—analyze an alternative that eliminates the NOI's fourth standard, which would deprive the Tongass National Forest of the benefits of this amendment. The Tongass has more carbon stored in old growth than any other national forest.[44] This old growth is of irreplaceable value for communities, the climate, and biodiversity and stands for what an old growth policy should aim to protect.

4. Inclusive and more consistent definition of old growth

We urge USFS to consider an alternative using an inclusive and more consistent definition of old growth. The agency has proposed to use narrow definitions that would leave out a substantial amount of old growth and hinder the agency from fulfilling the purposes of this plan amendment. The proposed, region-specific definitions are based primarily on structural components of the regions' forests, which has resulted in inconsistent and in many cases overly complex definitions that would be difficult if not impossible to accurately implement in the field.

For example, the old growth definition for Region 6 uses six criteria to define old growth, including "cover of downed wood" and "diameter diversity index."[45] Region 3, however, uses none of the criteria used by Region 6 but instead uses only two criteria, "stand density index" and "quadratic mean diameter."[46] While we recognize the diversity of physiographic regions and forest types across the country, such an inconsistent and complex approach to defining old growth will hamper implementation of the Preliminary Proposed Action and, most importantly, leave out a lot of old-growth stands and trees.

Given USFS's policy goal of achieving well-distributed, abundant, and expanded old-growth conditions, the definitions must be less complex; easy to apply, administer and monitor; and capture the whole range of possible old-growth conditions, including remnant old-growth trees in areas where most of the old growth has been logged.

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[42] *See* Franklin, J. F. et al. "Ecological Forest Management." *Waveland Press* (2018) (see especially chapter 3, part 3).
[43] *See* Johnson, C. and D Govatski. "Forests for the People: The Story of America's Eastern National Forests." *Island Press* (2013).
[44] Law, B.E. et al., "Southern Alaska's Forest Landscape Integrity, Habitat, and Carbon Are Critical for Meeting Climate and Conservation Goals," *AGU Advances* (2023) 4(6):e2023AV000965. https://doi.org/10.1029/2023AV000965; *see also*, DellaSala, D. A. et al., "The Tongass National Forest, Southeast Alaska, USA: A Natural Climate Solution of Global Significance," *Land* (2022) 11(5): 717. https://doi.org/10.3390/land11050717.
[45] U.S. Forest Service, Department of Agriculture, Mature and Old-Growth Forests-Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management: Appendix 1, FS-1215a (April 2023).
[46] *Id.*

a) Current old-growth definitions are limiting and exclude a significant amount of old growth.

The old growth definitions were developed at a time when the goals of the agency were significantly different from the goals expressed in the NOI. The definitions were developed by the agency in the early 1990s, in response to then USFS Chief Dale Robertson's 1989 letter, with some definitions being refined over time according to the agency.[47] The Chief's letter was in response to nationwide public alarm about the massive liquidation of old-growth forests, generally by clearcutting them and replacing them with monoculture plantations. At the time, the agency was significantly focused on logging and generated about 12 billion board feet per year every year from the 1960s-1990s, including from numerous old-growth trees and forests. Given these cross-pressures, the definitions that were developed are often overly narrow and result in excluding old growth that should properly be classified as such (particularly given the significant dearth of such trees across the Nation).

Problematic aspects of the current Forest Service definitions include:

i. The minimum age of what constitutes a "large" tree is often too high.

For white fir trees, within the range of the northern spotted owl (the Northwest Forest Plan area), USFS requires that trees must attain the age of 303 years.[48] Outside of the range of the owl elsewhere in the Pacific Northwest, a white fir tree must only attain an age of 143 years to be considered "old growth."[49] Similarly, in Montana a limber pine in higher elevations must be at least 500 years old.[50]

ii. The minimum diameter of what qualifies as a "large" tree is often too high.

Trees generally grow larger faster on better growing sites. USFS's definitions should reflect that "large" is relative and varies by growing site quality, but in most cases the definitions do not.

iii. The minimum number of "large" trees per acre is too high and artificially limiting.

For coast redwood, the Forest Service requires 15 large (40 inches in diameter at breast height (dbh)) trees per acre.[51] Another example is Region 9's definition for northern hardwood old growth. Here old growth is defined as having more than 10 trees per acre, 16 inches or more in diameter.[52] But in some areas, northern hardwood stands have trees that greatly exceed 16" dbh, and can reach 30" or greater, reducing the number of such trees with crown that can fit into an acre. In fact, the source document for Region 9's definitions reveals a wide diversity in the number of large trees per acre and clearly includes stands with fewer than 10 large trees per acre (e.g., 2-10 trees >28" dbh, Table 26) in stands identified as old growth.[53]

While the number of large trees per acre in the definitions is often too high, we are also concerned that, where a stand has a higher number of large trees, the definitions are used to justify logging old-growth stands down to the minimum criteria while claiming that the logging does not result in the loss of "old

[47] *Id.*
[48] *Id.*
[49] *Id.*
[50] *Id.*
[51] *Id.*
[52] *Id.*
[53] Tyrrell, L.E. et al. "Information about old growth for selected forest type groups in the eastern United States." *USDA Forest Service*. Gen. Tech. Report NC-197. North Central Forest Experiment Station (1998). https://doi.org/10.2737/NC-GTR-197.

growth." For example, the Mud Creek Vegetation Project in the Bitterroot National Forest authorized logging of old-growth trees down to the minimum defined by the literature (in its record of decision, the agency refused to foreclose logging down to the minimum).[54]

iv. The minimum number and/or size of snags (standing dead trees) required to qualify the stand as old growth is too high.

Previous logging has resulted in a paucity of snags in many forests. Requiring a minimum number and/or size of snags results in many areas with significant remaining old-growth characteristics from qualifying as old growth.

To summarize, these definitions leave out trees and forests that should be classified as old growth. The Upper Cheat project in the Monongahela National Forest, for example, proposes to clearcut 3,463 acres of mature hardwood forests, including northern red oak trees estimated to be over 150—and even 200—years of age.[55] They would appear not to qualify as old growth under the current definition. Another example in Region 1 is the Black Ram project in the Kootenai National Forest. The Forest Service proposes to log over 400 acres of stands that should be classified as old growth, including centuries-old trees.[56]

b) The agency should consider a simple, age-based definition for identifying old-growth forests and trees.

We urge the agency to consider an alternate definition for identifying areas for old growth conservation that does not require complex and inconsistent regional and forest type definitions, and uses existing data collected by each forest. Our approach is based on "stand age" data that is available through both FIA and the Field Survey Vegetation (FSveg) sampling programs. With a simplified approach using data collected under both sampling programs, analysis and monitoring can be conducted at multiple spatial scales and used to guide stand-level management.

Specifically, we recommend using age-based criteria with a different old growth onset age for forests east and west of the 100th meridian. In identifying old-growth stands, we recommend basing stand age on a consistently applied methodology based on the dominant trees.

We also urge that a definition of an old-growth tree be included. Old-growth trees are often found outside of old-growth stands, thanks to the history of logging. Region 3 provides an example. Except for the Kaibab Plateau in the Coconino National Forest, most old-growth ponderosa pine has been logged in the region. What little is left is scattered throughout the landscape. The policy must include a definition for individual old-growth trees, so they can be identified and protected.

East:

- On each national forest, the areas to be defined as "old growth" should be:
    - all stands 120 years and older
    - no less than the oldest 30% of the national forest's stands, whichever is greater.

[54] Friends of the Bitterroot et al. "Objection to Mud Creek Project Draft Decision and Finding of No Significant Impact." (Aug. 23, 2021); U.S. Forest Service, Department of Agriculture, Mud Creek Vegetation Management Project Decision Notice and Finding of No Significant Impact (FONSI) (January 2023).

[55] U.S. Forest Service, Department of Agriculture, Upper Cheat River Project Environmental Assessment, Finding of No Significant Impact, and Draft Decision Notice (Aug. 2, 2022); Upper Cheat Fact Sheet, https://biologicaldiversity.org/programs/public_lands/forests/pdfs/Upper-Cheat-Logging-Map.pdf.

[56] U.S. Forest Service, Department of Agriculture, Black Ram Decision Notice and Finding of No Significant Impact (June 2022); Hammond, H. "Black Ram Project Review." *Silva Ecosystem Consultants* (2021). https://biologicaldiversity.org/programs/public_lands/forests/pdfs/Black-Ram-Field-Assessment-Silva-Consultants.pdf.

- On each national forest, old-growth trees are those 120 years and older.

West:

- On each national forest, the areas to be defined as "old growth" should be:
    - all stands 150 years and older
    - no less than the oldest 30% of the national forest's stands, whichever is greater.
- On each national forest, old-growth trees are those 150 years and older.

For forest types that, under the USFS's definitions used in its mature and old-growth forest inventory, attain the onset of old growth at an age lower than 120 years in the East and 150 years in the West, the lower age shall apply.

i. The approach outlined above would include more old growth.

This approach uses a stand-based age criterion as well as a second criterion such that, in any case, no less than the oldest 30% of each national forest's stands are included. The goal is to ensure that all old-growth stands are identified and designated for protection.

Support for age-based definitions:

- *Western forests 150 years and older*: Defining old growth at 150 years and older for western forests is an inclusive definition that would likely capture all old-growth stands and trees. There are various references for defining old growth at 150 years of age including by USFS.[57]

- *Eastern forests 120 years and older*: The median age of onset of old growth for 26 forest types in the Southern (R8) and Eastern (R9) regions is 120 years of age.[58]

Support for 30% of a forest's oldest stands:

We included a second criterion for old-growth areas because national forests east of the 100th meridian—as well as some regions in the West, such as Region 3—have little old growth left.

Specifically, we analyzed FSveg data for four national forests in the East (Monongahela, Chequamegon-Nicolet, George Washington, and Allegheny). The analysis found that, in most forests, only 10-12% of the stands are 120 years and older, though the George Washington National Forest had a higher rate of 29%. Given the dearth of old growth, a second criterion based on at least the oldest 30% of stands will ensure that a meaningful proportion of the oldest forest is protected. Existing FSveg data collected by each national forest can immediately identify those areas to be managed for conservation of old-growth conditions.

For national forests west of the 100th meridian, we propose a similar approach: all stands 150 years and older be identified as old growth, and at least the oldest 30% of stands in each forest be designated as old growth.

Further, we recommend that "place-based" old growth not be redesignated out of old growth conservation following natural disturbances. Natural disturbances will affect all national forests, and there is evidence that

[57] C.W. Woodall, et. al. "Classifying mature federal forests in the Unites States: The forest inventory growth stage System." *Forest Ecology and Management* (2023) 546: 121361. https://doi.org/10.1016/j.foreco.2023.121361; Franklin, J. F. et al. "Ecological Forest Management." *Waveland Press* (2018) 231; U.S. Forest Service, Department of Agriculture, Forest Plans Amendment, Forest Management Direction for Large Diameter Trees in Eastern Oregon and Southeastern Washington Decision Notice and Finding of No Significant Impact (Jan. 2021).

[58] U.S. Forest Service and U.S. Bureau of Land Management, Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management (Apr. 2023) Tables 15 & 17.

these disturbances may increase. It is rare that these disturbances will cause stands identified as old growth to stop providing critical benefits, especially if post-disturbance management does not degrade these areas.

5. Heightened standard of review for vegetation management

The agency must also consider requiring a heightened standard of review for engaging in any vegetation management activities related to old-growth forests and trees or their recruitment. As indicated above, such management activities may only be appropriate for sub-old-growth trees in frequent-fire (those that are not infrequent-disturbance forest types) old-growth stands. Where management activities affect mature trees, at a minimum, the agency should demonstrate that they are unavoidable for conserving and recovering the natural values of old-growth stands by restoring impaired ecosystem processes and functions. And the agency should make a written, site-specific finding supported by the best available science and informed by public comment.

A high standard is warranted. It would help to insulate decisions about old-growth stands from the aforementioned amalgam of political and economic incentives that can influence management decisions. And it would help signal a clear break from past agency practice that has prioritized timber production. Properly implemented, a high standard would better ensure that the agency fully weighs the consequences of disturbing old-growth forests before logging them.

6. 30 x 30

The agency should also consider in an alternative a policy that would attain the requisite level of conservation for old-growth areas so as to contribute to meeting the 30x30 executive order.[59] This E.O. calls for conserving 30% of the Nation's lands and waters by 2030. To qualify as a "protected area" under U.S. Geological Survey standards, an area must be "dedicated to the preservation of biological diversity."[60] At a very minimum, the agency would have to implement policies that allocate old-growth areas to protected status and include strong standards for protection and management. Fortunately, the agency has several tools it could use to achieve this, including the authorities found in the special interest area regulations[61] and the Federal Land Policy and Management Act's mineral withdrawal provisions.[62]

C. The agency should consider policies that better advance the NOI's old-growth recruitment goals.

The agency should consider an alternative that articulates a clear old growth acreage-based recruitment goal based on the upper bound of the natural range of variation (NRV) for each forest type within each national forest. A key reason the Forest Service needs a policy protecting older trees and forests is because of a severe deficit of old-growth forests. As the NOI implicitly acknowledges, it is not sufficient merely to conserve the old growth that is left, the amount of which will erode over time due to natural succession—it is also imperative to recruit new old growth. But the ambiguous commitments to recruitment in the current proposal will not kickstart the recruitment process.

NRV is an established concept in agency planning regulations[63] that can be used to generate nationwide recruitment goals while being sensitive to local ecological conditions. Critically, NRV provides useful historical context about the amount of old growth that has been lost and what the agency must recover to achieve the amendment's purpose. The agency should aim for the upper bound of old growth composition

[59] Exec. Order No. 14008, Tackling the Climate Crisis at Home and Abroad, 86 Fed. Reg. 7619 (Feb. 1, 2021).
[60] U.S. Geological Survey Gap Analysis Project. "Protected Areas Database of the United States (PAD-US) 3.0." *United States Geological Survey data release* (2022). https://doi.org/10.5066/P9Q9LQ4B.
[61] 36 C.F.R. § 294.1(a).
[62] 43 U.S.C. § 1714.
[63] U.S. Forest Service. "National Forest System Land Management Planning." 77 *Fed. Reg.* 21,162, 21,271 (Apr. 9, 2012).

so that policies result in old growth recruitment sufficient to exceed losses to climate, fire, and other stochastic events.

An NRV-based goal needs to have an appropriate timeframe to ensure it is effective. Within ten years, each national forest should be required to demonstrate that all forest types exhibit measurable improvements toward the goal because of retention, recruitment, and natural succession. Further, vegetation management on forests should be conducted such that it does not degrade or impair the composition, structure, or ecological processes in a manner that undermines the attainment of the high bound of NRV.

D. The agency should consider policies that better advance the goals of E.O. 14072.

To create an opportunity for action that would meet E.O. 14072's urgent prioritization of carbon storage and biodiversity conservation,[64] we urge USFS to include an alternative in its EIS that would provide protection for mature forests. Such an alternative would be consistent with the purpose of the action identified in the NOI to maintain and develop old-growth conditions and to improve and expand their abundance and distribution across national forests. The notice recognizes the important role mature and old-growth forests play in contributing to nature-based climate solutions by storing large amounts of carbon, increasing biodiversity, and mitigating wildfire risks—and that prior logging has contributed to loss of old-growth forest.[65] As a result, the notice highlights the importance of intentionally maintaining and developing old-growth forest conditions, and necessarily recognizes the role mature forests play in expanding old-growth forest conditions across the system.

Any such alternative should feature several key mechanisms:

- Establish substantive and immediately effective protection with a national standard;
- Ensure the protection of the robust bulk of the standing carbon across the National Forest System;
- Include simple-to-administer limits on logging;
- Provide for appropriate management of impaired ecosystems in dry forests, such as for damaging wildfire; and
- Curtail commercial exchange of mature trees.

Implementing natural climate solutions across all forest ownerships in the U.S. could mitigate up to 424 million tonnes of CO_2 equivalent per year by 2030.[66] Mature and old-growth forests and trees are carbon storage and carbon sequestration champions. As noted above, protecting the substantial bulk of standing carbon in mature forests would also deliver significant co-benefits, including for ecological function, biodiversity protection, and hydrological functions.[67] If the United States is to assert global leadership in fighting the climate crisis, it must protect the essential carbon-rich values present in older forests and trees.

Importantly, protecting mature forests from ecologically damaging logging will not impede appropriate wildfire mitigation work. Older, larger trees are not the primary contributors to fire risk—they have often developed characteristics that make them more resistant to wildfires, such as thicker bark and higher

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[64] E.O. 14072 § 2.

[65] NOI, 88 Fed. Reg. at 88,043.

[66] Griscom, B. W. et al. "Natural Climate Solutions." *Proceedings of the National Academy of Sciences* (2017) 114(44): 11645–11650. https://doi.org/10.1073/pnas.1710465114.

[67] *See, e.g.*, Aron, P.G. et al. "Stable water isotopes reveal effects of intermediate disturbance and canopy structure on forest water cycling." *Journal of Geophysical Research* (2019) 124(10): 2958-2975. https://doi.org/10.1029/2019JG005118; Perry, T.D. and J.A. Jones. "Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA." *Ecohydrology* (2017) 10(2): 1790. https://doi.org/10.1002/eco.1790; Perry, D.A. "Forest Ecosystems." *Johns Hopkins University Press* (1994); Dinerstein, E. et al. "A 'Global Safety Net' to reverse biodiversity loss and stabilize Earth's climate." *Science Advances* (2020) 6(36): eabb2824. https://doi.org/10.1126/sciadv.abb2824; Jung, M. et al. "Areas of global importance for conserving terrestrial biodiversity, carbon and water." *Nature Ecology and Evolution* (2-21) 5: 1499–1509. https://doi.org/10.1038/s41559-021-01528-7.

branches.[68] An alternative protecting mature forests could still permit the cutting and removal of smaller and younger trees, which act as the surface and ladder fuels that are significant contributors to damaging forest fires. Beyond this, an alternative protecting mature forests should also allow some entry into mature stands in dry, frequent-fire forests where necessary to achieve fire management and restoration goals.

Including an alternative protecting mature forests will ensure that the agency has a reasonable range of alternatives in its EIS. And it will provide a mechanism for selecting an action in 2025 that fully meets the direction provided in section 2 of Executive Order 14072.

III. IMPACTS ANALYSIS

A. The EIS must disclose impacts to carbon stocks from disturbance events, including logging.

When evaluating threats to forests, USFS needs to consider the impact of a disturbance on the carbon contained within forests and trees rather than only the total area affected. Area cannot fully capture the impact of a disturbance on the density or age distribution of trees within stands and forests. Carbon content (biomass) makes for a better proxy of impact because it is a weighted metric that corresponds to a higher value in larger, older trees. By using standard definitions for maturity and old growth (i.e., 80-year minimum age for maturity across USFS forested lands,[69] old growth minimum age of 120 years in the eastern U.S. and 150 years in the western U.S.), this lens can help illustrate the disproportionately high amount of carbon contained in these trees that is not sufficiently represented in analyses where only total area impacted is considered.

Mature and old-growth forests and trees continue to sequester carbon at a high rate late into their lifespans.[70] This is true in both the eastern and western U.S., resulting in a significant amount of carbon contained in these older forests and trees. One report in the west showed that "large trees accounted for 2.0 to 3.7% of all stems (DBH ≥ 1" or 2.54 cm) among five tree species; but held 33 to 46% of the total AGC [above-ground carbon] stored by each species."[71] In the eastern U.S., "aboveground live biomass was significantly different between mature (195 Mg/ha) and old-growth (266 Mg/ha) sites,"[72] showing the importance of looking at

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[68] *See, e.g.*, Agee, J. "Fire Ecology of Pacific Northwest Forests." Washington, D.C.: *Island Press* (1993) 121-24; Brown, P.M. et al. "Identifying old trees to inform ecological restoration in montane forests of the central Rocky Mountains, USA." *Tree Ring Research* (2019) 75(1): 34-48. https://doi.org/10.3959/1536-1098-75.1.34; Thompson, J.R. and T.A. Spies. "Vegetation and weather explain variation in crown damage within a large mixed-severity wildfire." *Forest Ecological Management* (2009) 258: 1684-1694. https://doi.org/10.1016/j.foreco.2009.07.031; Odion, D.C. et al. "Patterns of fire severity and forest conditions in the western Klamath Mountains, California." *Conservation Biology (*2004) 18: 927-936. https://doi.org/10.1111/j.1523-1739.2004.00493.x; Stevens, J.T., 2020, "Fire resistance trait data for 29 western North American conifer species." *U.S. Geological Survey data release* (2020). https://doi.org/10.5066/P97F5P7L; Habeck, R. J. "Sequoiadendron giganteum." In: Fire Effects Information System, [Online]. *U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory* (1992) https://www.fs.usda.gov/database/feis/plants/tree/seqgig/all.html; Zouhar, K. "Abies concolor." In: Fire Effects Information System, [Online]. *U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory.* (2001) https://www.fs.usda.gov/database/feis/plants/tree/abicon/all.html.

[69] Climate Forests Campaign Coordinating Group. Comments re: "Request for Information (RFI) on Federal Mature and Old-Growth Forests" (Aug. 29, 2022) 3-9.

[70] He, L. et al. "Relationships between net primary productivity and forest stand age in U.S. forests." *Global Biogeochemical Cycles* (2012) 26(3). https://doi.org/10.1029/2010GB003942; Stephenson, N.L. et al. "Rate of tree carbon accumulation increases continuously with tree size." *Nature* (2014) 507: 90–93. https://doi.org/10.1038/nature12914.

[71] Mildrexler, D. J. et al. "Large Trees Dominate Carbon Storage in Forests East of the Cascade Crest in the United States Pacific Northwest." *Frontiers in Forests and Global Change* (2020) 3:594274. https://doi.org/10.3389/ffgc.2020.594274.

[72] Keeton, W.S. et al. "Late-Successional Biomass Development in Northern Hardwood-Conifer Forests of the Northeastern United States." *Forest Science* (2011) 57:6. https://doi.org/10.1093/forestscience/57.6.489.

both carbon and area when quantifying the natural value of mature and old-growth forests and trees and the effects of disturbance. The same research notes that the difference in aboveground biomass density would be even more pronounced between young and old-growth stands.[73] Minimizing, and in many places eliminating, logging in forests preserves a large carbon sink today and into the future.[74]

We also encourage the agency to include data derived from remote sensing to augment empirical field data and to build the capacity for more accurate and inclusive monitoring. Monitoring of these forests must account for the climate benefit these forests provide by assessing the gross amount of carbon they capture and sequester. These data are essential for monitoring and evaluating the efficacy of this amendment as a natural climate solution.

B. The EIS must provide a holistic analysis of disturbance events and the effects of management.

When analyzing non-anthropogenic disturbances, the agency must disclose the beneficial role such disturbances can play in a forest ecosystem. In considering the impact of fire, for example, the agency must analyze the ecological role fire plays. Many forest types are adapted to and require some level of fire to thrive.[75] Insects and diseases can play a similar ecological role by creating natural openings and generating large, downed wood that provides essential habitat and water quality benefits.[76] In these cases, disturbance in an old-growth forest does not necessarily result in that forest no longer being old growth. While density of trees and the ratio of living to dead trees may change, it may still be an old-growth forest with most of the stored carbon remaining on site—including after a wildfire.[77] The ecosystem complexity and function are still present, though there has been a change in structure.

Another key part of this analysis is a clear-eyed examination of the impacts of logging old-growth trees as a method of managing risks from non-anthropogenic disturbances. Among other things, the agency needs to analyze potential comparative mortality of old-growth trees from logging versus other disturbance using field-verified studies, including the effects of logging older trees on the ecological values of older stands.[78] And the agency needs to analyze the deleterious ecological impacts of removing dead old growth from a forest post-disturbance, with a particular eye on the impact to a site's potential to become old growth again in the

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[73] *Id.*

[74] Birdsey, R. et al. "Middle-aged forests in the Eastern U.S. have significant climate mitigation potential." *Forest Ecology and Management* (2023) 584: 121373. https://doi.org/10.1016/j.foreco.2023.121373.

[75] Perry, D.A. "Forest Ecosystems." *Johns Hopkins University Press* (1994); Sugihara, N.G. et al. "Fire as an ecological process." In: "Fire in California's ecosystems." *University of California Press* (2018) 58-74. Edited by Van Wagtendonk, J.W., Sugihara, N.G., Stephens, S.L., Thode, A.E., Shaffer, K.E., and Fites-Kaufman, J.A.

[76] Samman, S. and J. Logan. "Assessment and Response to Bark Beetle Outbreaks in the Rocky Mountain Area." *USDA Forest Service* Gen Tech Rep RMRS-GTR-62. Rocky Mountain Research Station, Ogden UT (2000). https://doi.org/10.2737/RMRS-GTR-62.

[77] Campbell, J.L. et al. "Pyrogenic carbon emission from a large wildfire in Oregon, United States." *Journal of Geophysical Research: Biogeosciences* (2007) 112(G4). https://doi.org/10.1029/2007JG000451; Meigs, G.W. "Forest fire impacts on carbon uptake, storage, and emission: the role of burn severity in the Eastern Cascades, Oregon." *Ecosystems* (2009) 12: 1246-1267. https://doi.org/10.1007/s10021-009-9285-x; Stenzel, J.E. et al. "Fixing a snag in carbon emissions estimates from wildfires." *Global Change Biology* (2019) 25(11): 3985-3994. https://doi.org/10.1111/gcb.14716; Harmon, M.E. et al. "Combustion of aboveground wood from live trees in megafires, CA, USA." *Forests* (2022) 13(3): 391. https://doi.org/10.3390/f13030391.

[78] *See, e.g.*, Six, D. L. et al. "Management for Mountain Pine Beetle outbreak suppression: Does relevant science support current policy?" *Forests* (2014) 5(1): 103–133. https://doi.org/10.3390/f5010103; Fettig, C. J. et al. "The effectiveness of vegetation management practices for prevention and control of Bark Beetle infestations in coniferous forests of the Western and Southern United States." *Forest Ecology Management* (2007) 238(1): 24–53. https://doi.org/10.1016/j.foreco.2006.10.011; Mildrexler, D. J. et al. "Large trees dominate carbon storage in forests east of the cascade crest in the United States Pacific Northwest." *Frontiers in Forests and Global Change* (2020) 3(127). https://doi.org/10.3389/ffgc.2020.594274.

future.[79] In a similar vein, the agency needs to analyze the ecological benefits of post-disturbance old-growth stands that have entered a complex early seral stage.

Additionally, the agency must analyze carbon emissions from logging vs. other disturbance. Research indicates that the largest releases of carbon from U.S. forests are due to logging and milling.[80] Indeed, from 2005-2014, the U.S. Geological Survey found that carbon emissions from logging of federal forests in the conterminous United States were more than double those from fire on those lands.[81]

And the agency should take a holistic approach to analyzing risk mitigation techniques. It should analyze the efficacy of direct aid to communities, including home hardening and vegetation management in the zone of ignition. It should disclose the relative long-term efficacy of thinning from below in maintaining and restoring old-growth conditions in frequent-fire forest types, when sustained prescribed burning is present and when it is absent. And it should examine the efficacy of cutting old trees for mitigating risks from disturbances, including the likelihood that a particular treated area will encounter a disturbance.

C. The EIS must analyze and disclose the co-benefits of protecting older forests.

Finally, the EIS must analyze the potential impacts of management on the broader ecosystem values that older forests provide. Such values notably include watershed integrity and the myriad of old-growth habitat features which support broader ecological integrity.

Older forests generally develop and interact with other landscape features to enhance biodiversity and modify hydrological cycles. Intact watersheds with older forests and dense riparian vegetation are highly hydrologically functional and serve as crucial hotspots for terrestrial and aquatic biodiversity.[82] The deep roots, ample canopy cover, and self-pruning branches—all characteristics of older forests—help to regulate water temperature, provide critical inputs of woody debris, and stabilize streambanks.[83] These forested riparian zones and floodplains provide water for a range of fish and wildlife as well as cool, moist growing conditions for many vegetative species.[84]

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[79] Nemens, D.G. et al. "Environmental effects of postfire logging: An updated literature review and annotated bibliography." *USDA Forest Service* Gen. Tech. Rep. PNW-GTR-975. Pacific Northwest Research Station, Portland, OR (2019). https://doi.org/10.2737/PNW-GTR-975; Leverkus, A.B. et. al. "Tamm review: Does salvage logging mitigate subsequent forest disturbances?" *Forest Ecology and Management* (2021) 481: 118721. https://doi.org/10.1016/j.foreco.2020.118721.

[80] Law, B.E., et al. "Land use strategies to mitigate climate change in carbon dense temperate forests." *Proceedings of the National Academy of Sciences of the United States of America* (2018) 115(14): 3663-3668. https://doi.org/10.1073/pnas.1720064115; Hudiburg, T.W. et al. "Meeting GHG reduction targets requires accounting for all forest sector emissions." *Environmental Research Letters* (2019) 14(9): 095005. https://doi.org/10.1088/1748-9326/ab28bb; Sterman, J. et al. "Does wood bioenergy help or harm the climate?" *Bulletin of the Atomic Scientists* (2022) 78(3): 128-138. https://doi.org/10.1080/00963402.2022.2062933; Bartowitz, K.J. et al. "Forest carbon emission sources are not equal: Putting fire, harvest, and fossil fuel emissions in context." *Frontiers in Forests and Global Change* (2022) 5: 867112. https://doi.org/10.3389/ffgc.2022.867112.

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People and communities likewise have much to benefit from protecting forest watersheds. Hundreds of millions of Americans rely on forested lands for their clean drinking water, and the cleanest drinking water sources tend to have headwaters in intact, mature forested watersheds where logging is generally prohibited.[85] When analyzing the impact of management for old-growth characteristics, watershed conditions should be closely examined.

Old-growth forests and trees also provide a significant degree of high-quality diverse habitat for wildlife and vegetation.[86] Older trees develop unique features that support ecosystem complexity, often creating biodiversity hotspots. Logging and its related infrastructure interrupt the continuity and connectivity of these habitats, making it more difficult for plants and animals alike to migrate to more suitable locations as climatic conditions change.

Intact mature and old-growth forests and trees can thus provide irreplaceable regional climate refugia for a wide variety of threatened, endangered, and sensitive species in the U.S. (including the spotted owl,[87] marbled murrelet,[88] Kaibab squirrel,[89] Canada lynx,[90] fisher,[91] northern long-eared bat,[92] and many others). These

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older forests create cool shady microclimates due to high levels of canopy closure and evapotranspiration through larger leaves, nurturing a variety of plants and wildlife that would often struggle to survive in hotter, drier places.[93]

These benefits do not end once a tree dies. Older forests house a variety of dead trees, including standing logs (snags)—which are important habitat elements for numerous woodpeckers, owls, and rodents—and fallen large logs (coarse woody debris)—which provide food foraging for bears, habitat and cover for rodents, and essential nutrients for new vegetation and tree saplings.[94] Reconnecting fragmented old-growth forests would support ecosystem integrity and benefit native biodiversity.[95] The degree of forest connectivity and quality of habitat features present will be important metrics to consider.

IV. CONCLUSION

The Notice of Intent presents a unique opportunity to harness the natural values of federal old growth in the fight against climate change. The agency has set important goals, including the protection and expansion of old-growth forests. In these comments, we have detailed necessary changes to the proposed amendment to realize these goals. Broadly, our recommendations will help to ensure that old-growth trees stay in the forest by ending the commercial exchange of old growth and eliminating the carve-out for America's most carbon-rich national forest, the Tongass. With a more inclusive definition of old growth, the amendment can get closer to fully protecting old growth throughout our national forests. And the agency should commit to a consistent and durable framework by allowing only the Secretary to change the amendment. Finally, the agency should fulfill the purpose of the NOI and the directive of E.O. 14072 and protect mature trees and forests—our Nation's future old growth.

Once again, we welcome this process and look forward to working with the agency to secure a final policy that meets both the urgency of the moment and the laudable purpose that the NOI conveys.

Respectfully submitted,

Center for Biological Diversity
Central Oregon LandWatch
Chattooga Conservancy
Conservation Northwest
Earthjustice
Environment America
Environmental Law & Policy Center
Friends of Blackwater
GreenLatinos
The Larch Company
Massachusetts Forest Watch

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Natural Resources Defense Council
New Mexico Wild
Norbeck Society
Oregon Wild
Sierra Club
Standing Trees
WildEarth Guardians
Yaak Valley Forest Council