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Title:

Comments: Dear Forest Service staff - attached are my comprehensive comments on the OGNA. Thank you

WILD HERITAGE

Comments on Amendments to Land Management Plans to Address Old-Growth Forests Across the National Forest System: Draft Environmental Impact Statement for the Old Growth National Amendment (FRN 65356) Submitted for the public record via: <https://cara.fs2c.usda.gov/Public/CommentInput?Project=65356> Wild Heritage is a science-based conservation group whose mission is to protect primary forests of all age classes and forest types globally and in North America. Given the scarcity of primary forests in the US (lower 48 states especially), we call for the protection of all remaining primary forests (old growth, complex early seral that has not been logged) in addition to allowing mature forests to restore old-growth characteristics overtime (i.e. proforestation, Moomaw et al. 2019). We appreciate the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the National Old Growth Amendment (OGNA) proposed for all 128 national forests. We recognize that this has been a monumental task for the agency as initially directed by President Joe Biden under Executive Order (EO) 14072. However, we have substantive concerns with the analysis and findings that do not provide an adequate range of alternatives, are not based on best available science, will degrade ecological integrity of mature and old-growth forests (MOG), and cause undo harm to their biodiversity values and carbon stores. Wild Heritage has published numerous peer-reviewed studies on old-growth ecology and its conservation that have national and regional significance in structuring an alternative based on best available science. We summarize find that the DEIS did not follow the best available science largely because it ignored requests from the public and scientists to fix the numerous problems in scoping and the agency's inadequate treatment analysis, and to provide protection for all of the nation's MOG from logging. Our main concerns with the DEIS are summarized in the following points. (1) The DEIS does not: (a) provide an adequate range of alternatives nor does it take a hard look at the importance of mature forest protections as well as old growth, (b) must include protection from all forms of logging (thinning or otherwise) in old-growth forests on the Tongass National Forest, and (c) lacks a proper analysis of carbon loss from management actions, and the appropriate recognition of the substantial carbon sink in MOG that will be degraded by the agency's "stewardship" activities. None of the alternatives comply with relevant administrative policies, including, the Glasgow Leaders' Forest Pledge, the Paris Climate Agreement (Article 5.1), and US global policy on reducing emissions across all sectors, particularly forestry. (2) Not a single acre of MOG is protected under the DEIS despite requests made by hundreds of scientists in scoping to use this unique opportunity to prohibit the commercial exchange of large trees in the nation's older forests. In doing so, the DEIS essentially ignores the overwhelming public and scientific support for strict protections from logging. In fact, logging levels are projected to go up, especially in the Pacific Northwest where MOG is concentrated (Threat Analysis, Figure A8.6-7). (3) The alternatives would squander a unique opportunity to end degradation of MOG and is therefore inconsistent with the Glasgow Forest Pledge - that is - logging in the DEIS would result in forest degradation as defined by multiple studies (e.g., Rogers et al. 2022, DellaSala et al. in prep - see below). (4) The DEIS is silent on the 30 x 30 aspects of EO 14008 whereby the agency was directed by the president to begin closing the gap on this target - that is - while the Forest Service barely responded to the intent of EO 14072, it completely ignored the protection direction of EO 14008. Compliance with EO 14008 therefore should have been analyzed. (5) Does not address the White House road-map on nature-based solutions¹ given nothing in the DEIS protects a single acre of carbon-dense MOG from logging that is the nation's best terrestrial carbon sinks (DellaSala et al. 2022a - mature/old growth analysis). (6) Inappropriately compares all disturbances as having equivalent degradation effects on ecosystem integrity while downplaying major differences between commercial logging and natural disturbances. The threat analysis is an apples to oranges comparison of natural disturbances vs logging because natural disturbances result in essential successional processes in MOG that

produce complex early seral forests with high levels of biodiversity, integrity, and carbon stocks (Swanson et al. 2010), while logging removes legacies, degrades integrity, and releases carbon (Law et al. 2018, Hudiburg et al. 2019, Moomaw and Law 2023). This major difference is not analyzed properly in the DEIS that groups logging together with natural disturbances as if they are equivalent in impacts to ecosystem integrity (we mentioned this repeatedly in scoping and in our comments on the threat assessment). Thus, the agency did not take a hard look at all forms of logging in MOG in relation to degradation as defined in the literature, discussed below, and in our prior comments.

(7) Overstates the efficacy of thinning to reduce the intensity and frequency of insect outbreaks, forest diseases, and wildfires by ignoring published reviews of the substantial co-lateral damages from Forest Service logging and fire suppression actions that are far worse than the beneficial effects of natural disturbances on ecosystem integrity and ecosystem dynamics (DellaSala et al. 2022b - Sisyphus article).

(8) The agency did not analyze an alternative that restricts all forms of commercial exchange of large trees even though large trees and their carbon values have been defined and analyzed independently (see below) and sent to the agency during scoping. For these reasons, we request that the Forest Service develop a preferred alternative that places clear restrictions on the commercial exchange of all large trees in MOG nationwide (that includes frequent and infrequent fire systems) and that you include full protections for the Tongass National Forest because it has the highest concentration of old growth in the nation, is the nation's most vital carbon sink (DellaSala et al. 2022c - Tongass article), is potential climate refugia (DellaSala et al. 2015 - NWFP article), and does not need thinning in its older forests. While Alternative 3 includes restrictions on commercial harvest, we prefer that you analyze restrictions on the commercial exchange of large trees (defined below) given that the agency can still log commercially under Alternative 3 by defining the purpose and need as something other than a commercial timber harvest. We summarily disagree with the agency's decision to not select Alternative 3 on grounds that it would limit the application of prescribed fire without commercial removal of large trees (see below). While small tree thinning under limited conditions can reduce the potential for crown damage, small trees play a vital ecosystem role in resilience strategies as they tend to be the survivors of beetle infestations (Six et al. 2014, 2016) and may have important adaptive traits in a warming climate (Baker and Williams 2015). We also disagree with the notion that the action alternatives constitute "stewardship" of old growth ecosystems. Removing carbon, degrading wildlife habitat, compacting soils from thinning, and logging large trees in no way, shape, or form is "stewardship." As an example of one of the problems in the agency's notion of stewardship, the Forest Service continues to conduct an inappropriate analysis of carbon stock reductions from its management actions by using the wrong spatial scale of analysis in comparing timber harvest emissions at the project level to the entire US GHGs in many of its EAs. The agency also routinely overstates wood substitution benefits (Harmon 2019), and downplays logging related carbon losses (DellaSala et al. 2022b). In doing so, the Forest Service has not taken a hard look at the cumulative degradation of ecosystem integrity from its proposed management (mainly timber harvest) by downplaying logging emissions and falsely comparing them alongside natural disturbance processes. For these reasons, we request that you conduct a comprehensive carbon life cycle analysis (Hudiburg et al. 2019), compare the alternatives to one another and not the entire US GHGs, and then select the alternative with the lowest emissions. We now focus our comments on the questions raised by the agency on the DEIS.

Question 1: Does the approach outlined in the DEIS appropriately consider place-based information and current land management direction about old-growth forest management? None of the alternatives meet this NEPA obligation as they provide too much local discretion, and there is not an adequate range of alternatives to place restrictions on logging in MOG. While the agency's inventory of MOG was an important contribution that recognizes the variability in MOG ecosystems nationwide, the main problem is local discretion. We request that the Forest Service take a hard look at local discretion vs national direction from historical situations that it likewise struggled with. For instance, prior to the National Roadless Conservation Rule, the agency resisted nationwide prohibitions on road building, asking for local discretion and "flexibility" that was the main reason why roadless areas were declining in the first place. A similar level of resistance to national direction from President Bill Clinton at the time also occurred in the initial rollout of the Northwest Forest Plan, as the agency resisted logging restrictions even though the public and scientists overwhelmingly rejected the local discretion/flexibility argument because the Forest Service needs national guidance in order to follow the intent of policies that place any restrictions on logging. In other words, the agency has a propensity to fit logging into most issues that it is addressing and without national direction will

continue to use local discretion to push through logging projects that degrade MOG by calling them "stewardship," "restoration," "resilience," "forest health," etc. In other words, the Forest Service will always find a reason to log by calling it something else and by deflecting criticism from the public and scientists. In what is a Deja-Vu moment, the agency is now resisting prohibitions on logging in MOG as it continues to weigh alternatives based on "flexibility" and "discretion" that will cause undo harm to the public's values inherent in MOG. Because of historic logging, we are now in a situation where every acre of MOG is critically important as the nation's best climate and biodiversity refugia and the Forest Service has most of those acres (DellaSala et al. 2022a). Thus, there is a public responsibility on the part of the agency to properly steward this limited resource by first and foremost protecting it from timber harvest throughout the national forest system because this is the only disturbance you can realistically control. Notably, as stated on p. 16 of the DEIS, "None of the alternatives require all areas currently meeting the definition (and associated criteria) of old-growth forest to be retained as such. Standard 2.a (DEIS p. 29) allows vegetation management to occur in areas currently meeting the definition (and associated criteria) of old-growth forest for the purposes of proactive stewardship." We reiterate - this is not stewardship - it's a means to keep timber harvest open via discretionary language at the local level and this threat is reflected in the threat analysis that shows timber harvest actually increasing over decades in MOG (Figures A8.6-7). Simply put, timber harvest is an ongoing cumulative threat and not a stewardship objective. Thus, we request that all large trees of all species be retained in MOG management units nationwide (frequent and infrequent fire systems) as the main purpose and need. Protecting large trees from logging should be a theme carried through all alternatives that properly defines the agency's stewardship obligations. Immediately, the agency also needs to cancel all timber sales in MOG currently planned or in the pipeline.

Question 2: What would be the impacts if Standard 3 would be updated to read as: "Proactive stewardship in old-growth forests shall not result in commercial timber harvest." First, we support additional restrictions on commercial harvest within MOG. However, as noted this must include an adequate examination and alternative that is based on "no commercial exchange," which would tighten the many loopholes in the DEIS. Strengthening protections for not only old growth but for mature would benefit climate mitigation and biodiversity objectives of the agency's stewardship and ecosystem integrity responsibilities across the national forest system. There is simply no other way to do this and any form of commercial exchange in MOG is damaging to the public's climate and biodiversity values in MOG. We note that the national forests are no longer the nation's wood basket as minimal amounts of timber volume come from national forests (Oswalt et al. 2019). The agency's main multiple use obligation in this situation is to examine the multiple values that would be enhanced by restricting commercial exchange in MOG. Those values that need proper analysis include - carbon retention, wildlife habitat, imperiled species habitat, drinking water, and recreation as among the top ecosystem services uniquely provided by MOG on federal lands (DellaSala et al. 2022a). At a minimum, the agency needs to conduct a proper life cycle carbon accounting (Law et al. 2018, Hudiburg et al. 2019). The agency could still do fuel reduction through limited small tree removals and prescribed fire (see below).

Question 3: Do current standards and guidelines provide enough restrictions to protect current and future old-growth forests from future timber harvest? Neither current standards nor the DEIS provide adequate protections for MOG and the DEIS does not examine an adequate range of alternatives that restrict the commercial exchange of trees. While the DEIS is under consideration, the Forest Service continues to log in MOG and needs to cancel those sales and any other MOG sales immediately. The threat analysis projects that logging of MOG will continue nationally and in the Pacific NW, despite overwhelming public and scientific support for the opposite as reflected in our prior comments and that defy true notions of "stewardship." Importantly, in the only nationwide analysis of MOG that evaluated MOG protection levels, the Forest Service has protected just 24% of its MOG with over 50 million acres deemed vulnerable to logging (DellaSala et al. 2022a). Thus, the agency's standards and guidelines are summarily too weak to ensure millions of acres of MOG will not be degraded. The only way to ensure that MOG is protected is to terminate the commercial exchange and timber targets in MOG and that was not properly analyzed by the agency. As mentioned, the Forest Service has not provided an adequate analysis of the carbon stores impacted by ongoing logging under the alternatives. The agency did not analyze an alternative that restricts all forms of logging of large trees even though large trees and their carbon values have been defined in the literature (Birdsey et al. 2023) and that information was provided to the agency in public scoping. Tree diameter distributions are available from FIA and so are their carbon values. Despite the agency having this information from its own inventory, the carbon and biodiversity benefits of protecting large

trees in MOG were not adequately examined. Thus, there is little mention of the carbon stores and natural climate solution values of large trees in the DEIS. We cross reference to comments by Dr. Birdsey (submitted separately and the citations are in his comments) - "Mature and old-growth forests with large trees have characteristics that are beneficial for climate change mitigation and other ecosystem values such as biodiversity (Lutz et al. 2018), and represent a significant portion of the CO₂ that needs to be removed from the atmosphere by the land (Lawrence et al. 2022). MOG forests store far more carbon than younger managed forests, and in most cases can continue to accumulate carbon for centuries if not logged or severely disturbed (Birdsey et al. 2023b; Law et al. 2018; Leverett et al. 2020). For example, large trees in MOG forests on federal lands store between 41 and 84 percent of the total biomass carbon stock (Birdsey et al. 2023b; Mildrexler et al. 2020). Furthermore, the largest trees in MOG forests accumulate C faster than smaller trees (Mildrexler et al. 2020; Mildrexler et al. 2023; Stephenson et al. 2014). And older undisturbed MOG forests also continue to pack away carbon annually in their woody debris and soils, which are largely protected from effects of severe disturbance." Additionally, we strongly disagree with the DEIS assertion of the importance of harvest wood pools (HWP), as the DEIS overstates HWP carbon stores and fails to conduct a proper carbon life cycle analysis. Published literature shows the value of HWP is overstated (Harmon 2019) and that most carbon leaves the forest when logged (Law et al. 2018, Hudiburg et al. 2019, Moomaw and Law 2023). Thus, the agency did not conduct a proper life cycle analysis in overstating HWP carbon stores while understating logging emissions that are up to 10x greater than natural disturbances combined (Harris et al. 2016). Importantly, the agency's own research has repeatedly demonstrated that older forests with larger trees are more resistant to wildfires (Lesmeister et al. 2019, 2021) than logged areas. Other studies have shown protected forests burn in lower fire intensities (Bradley et al. 2016) and logged areas combine with extreme fire weather that contribute to large wildfires (Zald and Dunn 2018). This information was not properly evaluated in the DEIS.

Other Issues/Problems with Alternative 3 assumptions - the Forest Service rejected Alternative 3 on grounds that it would restrict the use of prescribed burning. We disagree with this assertion and ask that the agency evaluate these studies that all show how prescribed fire can be used safely even in dense forests without mechanical removal of large trees. Many of these are the agency's own publications: Knapp EE, Keeley JE, Ballenger EA, Brennan TJ. 2005. Fuel reduction and coarse woody debris dynamics with early season and late season prescribed fire in a Sierra Nevada mixed conifer forest. *Forest Ecology and Management* 208: 383-397. Available on the USFS website - https://www.fs.usda.gov/psw/publications/knapp/psw_2005_knapp001.pdf

Knapp, E.E., and Keeley, J.E. 2006. Heterogeneity in fire severity within early season and late season prescribed burns in a mixed-conifer forest. *Int. J. Wildland Fire* 15: 37-45. Available on the USFS website - <https://research.fs.usda.gov/treearch/41752>

Knapp, E.E., Schwilk, D.W., Kane, J.M., Keeley, J.E., 2007. Role of burning on initial understory vegetation response to prescribed fire in a mixed conifer forest. *Canadian Journal of Forest Research* 37: 11-22. Available on the USFS website - <https://research.fs.usda.gov/treearch/34451>

van Mantgem, P.J., A.C. Caprio, N.L. Stephenson, and A.J. Das. 2016. Does prescribed fire promote resistance to drought in low elevation forests of the Sierra Nevada, California, USA? *Fire Ecology* 12: 13-25. Available on the USGS website - <https://pubs.usgs.gov/publication/70170396>

van Mantgem, P.J., N.L. Stephenson, J.J. Battles, E.K. Knapp, and J.E. Keeley. 2011. Long term effects of prescribed fire on mixed conifer forest structure in the Sierra Nevada, California. *Forest Ecology and Management* 261: 989-994. USFS website - <https://research.fs.usda.gov/treearch/38347>

North, M.P., S.L. Stephens, B.M. Collins, J.K. Agee, G. Aplet, J.F. Franklin, and P.Z. Fule. 2015. Reform forest fire management. *Science* 349: 1280-1281. Not an open access journal - <https://courses.seas.harvard.edu/climate/eli/Courses/global-changedebates/Sources/Forest-fires/more/North-et-al-2015-short-perspective.pdf>

"[hellip] fire is usually more efficient, cost-effective, and ecologically beneficial than mechanical treatments." And here is the abstract from Stephens et al. 2021 on the use of managed wildfire to proactively reduce fuels over large areas with minimally costs: "Reducing the risk of large, severe wildfires while also increasing the security of mountain water supplies and enhancing biodiversity are urgent priorities in western US forests. After a century of fire suppression, Yosemite and Sequoia-Kings Canyon National Parks located in California's Sierra Nevada initiated programs to manage wildfires and these areas present a rare opportunity to study the effects of restored fire regimes. Forest cover decreased during the managed wildfire period and meadow and shrubland cover increased, especially in Yosemite's Illilouette Creek basin that experienced a 20% reduction in forest area. These areas now support greater pyrodiversity

and consequently greater landscape and species diversity. Soil moisture increased and drought-induced tree mortality decreased, especially in Illilouette where wildfires have been allowed to burn more freely resulting in a 30% increase in summer soil moisture. Modeling suggests that the ecohydrological co-benefits of restoring fire regimes are robust to the projected climatic warming. Support will be needed from the highest levels of government and the public to maintain existing programs and expand them to other forested areas. "Despite efforts by the Forest Service to reduce fire intensity to MOG and elsewhere, mechanical efforts will fail for at least these reasons: (1) Thinning will become increasingly ineffective in a changing climate as top-down fire weather drives large fires that then combine with logged areas to affect vast landscapes (Zald and Dunn 2018) and that cause damage to nearby towns when they escape mainly from fires spilling over from privately logged lands (Downing et al. 2023). (2) Thinning costs way more than prescribed fire and managed wildfire use (see below) and can be as effective if not more so than thinning that has carbon and ecosystem damage/costs (DellaSala et al. 2022b). (3) The odds of a thinned site encountering a fire are really small (<1% Schoenagel et al. 2017) during the period of low fuels, and expanding the scale, intensity, and frequency of thinning to improve the odds come at substantial ecological and carbon costs (DellaSala et al. 2022b). (4) The agency's treatments are at distances so far removed from towns (more than 1-km from structures in many cases) to be ineffective at wildfire risk reduction to communities (Schoenagel et al. 2017, DellaSala et al. 2024). Thus, there is no benefit to communities leaving in proximity to national forests when treatments are so far removed from structures. We believe that the DEIS fails to provide an adequate range of alternatives by overstating mechanical treatments as a pre-requisite for prescribed fire, by not providing sufficient cost comparisons in relation to treatment types (prescribed fire, thinning, wildfire use), nor does it take a hard look at the literature supporting prescribed fire without mechanical treatments. We submit this cost comparison for the Plumas National Forest as an example of how costly mechanical treatments are compared to prescribed burning only. [Tables from Environmental Assessment - Community Protection - Central and west slope Project for Plumas National Forest showing the cost of treatments per acre and by alternative] Ecological Integrity vs "Stewardship" The Forest Service is obligated under the NFMA Rule of 2012 to maintain ecosystem integrity on the national forest system and yet its logging activities are taking the nation in the opposite direction as they are a form of forest degradation. We provide excerpts from DellaSala et al. in peer review that pertains to the difference between degradation and integrity and integrity should be the agency's touchstone in evaluating whether it is actually stewarding MOG. Abstract: Forests harbor almost two-thirds of Earth's terrestrial biodiversity and play a crucial role in sequestering and storing carbon that is linked to their ecological integrity and biological diversity functions. Forest degradation [mdash] the loss of forest-ecosystem integrity measured by changes to native-species composition, functional processes, and keystone structures [mdash] is a major source of emissions and serious cause of biodiversity decline. Addressing this loss is critically important for fulfilling the Paris Climate Agreement and the post 2020 Kunming-Montreal Global Biodiversity Framework. Additionally, most forested countries have signed pledges to end degradation along with deforestation by 2030. However, many countries, particularly in the Global North, fail to fully acknowledge degradation as a problem within their own borders, and no country is on track to meet the Kunming-Montreal pledge. We propose a framework that would enable monitoring degradation of large, old trees to intact landscapes along a continuum of forest-integrity loss relative to reference conditions derived from primary, mature, historic, or semi-natural conditions. Examples of degradation include multiple forms of commercial logging and road building that alter native species composition, structure, and functionality. Case studies from temperate, boreal, and tropical biomes illustrate how expansive the degradation footprint is globally. We highlight an urgent call for countries to better detect and assess the cumulative damages of forest-degradation and to end it as promised. Ending forest degradation has been an emerging multilateral policy issue since the formation of the United Nations Forum on Forests in 2000. It was noted as a priority in the United Nations Forest Instrument, and again in the United Nations Strategic Plan for Forests. At the United Nations Climate Change Conference, 145 nations signed the Glasgow Leaders' Declaration on Forests and Land Use ("Glasgow Leaders' Declaration"), which seeks to "facilitate the alignment of financial flows with international goals to reverse forest loss and degradation" by 2030 and commit signatories to halting and reversing deforestation and land degradation by 2030. The Kunming-Montreal Global Biodiversity Framework proposed 23 action-oriented global targets, including ensuring that at least 30 percent of lands and waters are protected and degraded areas are under effective restoration by 2030. In addition, Goal A of this framework emphasized the need to

ensure that "integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050." Target 1 of this framework also seeks "to bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030." Additionally, ecosystem condition (the relative level of ecosystem integrity) can be based on the state, processes, and changes in the ecosystem, including (1) carbon and nutrient stocks, (2) abiotic physical and chemical states such as water quantity and quality; (3) biotic composition, structure, and function; and (4) landscape diversity and connectivity (Rogers et al. 2022). In this approach, a forest with native species composition, keystone structures (e.g., biological legacies: large, old trees, snags, down wood, native understories), and functional processes (e.g., natural disturbances, food web complexities, pollinators, below ground processes, soil integrity) has high integrity compared to one where anthropogenic disturbance have destabilized these key elements in various degrees. Conversely, we refer to degradation as anthropogenic disturbances that trigger the immediate and long-term deterioration of integrity (Rogers et al. 2022, Mackey et al. 2024b). What the agency is proposing in the DEIS is more akin to degradation as defined above than "stewardship" and will compromise ecosystem integrity by the removal of important legacy large trees, compacting soils, drying out understories, releasing carbon, and impacting wildlife habitat (DellaSala et al. 2022b). In sum, that is a form of degradation and not stewardship or integrity. As stated in DellaSala et al. in review, MOG needs to function as the reference condition in assessing integrity vs. degradation. Given that the agency wants to continue logging in MOG, the DEIS is impacting reference conditions needed to determine the efficacy of its forest management practices, is downplaying cumulative impacts of logging in MOG that are glossed over, nor can it claim that what it is doing is stewardship, restoration, or resilience. To fix the numerous problems in the DEIS, we request that you: Develop a new alternative or substantially revise Alternative 3 by prohibiting any removal of commercial materials from all mature and old-growth forests as identified in the agency's mapping of MOG and related published accounts (DellaSala et al. 2022a). This includes the use of prescribed fire in fire-adapted forests without mechanical removal of any large trees and judicious understory removals that while focused on lowering fuel levels must also retain representative small tree densities, native vegetation, soil integrity, soil and understory microclimates, mycorrhizal networks, and biological legacies. That is - see the forest for more than just the trees. A revised alternative 3 or new alternative would also restrict post-disturbance "salvage" logging as this form of logging is most degrading to complex early seral forests, successional processes, wildlife habitat, and carbon stocks (Thorn et al. 2018). Include in a new alternative or revised alternative 3 the concept of "proforestation" (Moomaw et al. 2019) by allowing mature forests to fully develop old-growth characteristics overtime to begin recovering the greatly depleted old-growth ecosystem and further build carbon stocks. Provide an adequate evaluation of the impacts of logging relative to natural disturbances that clearly distinguishes the two using published definitions of degradation and integrity and not some unclear notion of "stewardship," "resilience," "restoration," and "forest health." We define ecological integrity as a measure of the composition, structure, and function of an ecosystem in relation to the system's natural range of variation. This integrity concept integrates different characteristics of an ecosystem that collectively describe its ability to achieve and maintain its optimum operating state in the face of the prevailing environmental drivers and anthropogenic stressors, while continuing to maintain its self-organization and regeneration capacity (Mackey et al. 2024b). We adopted the approach of Rogers et al. (2022) in identifying foundational elements for ecosystem integrity that include representative structures, processes, native species, and resilience. Provide an adequate range of alternatives that is based on the comments provided herein, the omission of data and studies provided in our scoping comments, and that fully restricts all forms of logging within MOG with the exception of some small tree removals in specialized cases. Analyze the importance of large trees to carbon stocks, fire resistance, and wildlife habitat and use published sources (e.g., Birdsey et al. 2023) to determine national forest specific diameter limits in large-tree definitions and logging thresholds. Analyze how the agency's "stewardship" objectives can best comply with the Paris Climate Agreement (Article 5.1 on natural climate solutions), Glasgow Leaders' Forest Pledge (end degradation as defined herein), and the 2020 Kunming-Montreal Global Biodiversity Framework. Importantly, this should include a comprehensive GAP analysis to identify levels of protection using recognized GAP status codes for each of the MOG types and how best to meet the 30 x 30 directive of EO 14008. None of the alternatives analyzed this and therefore there is not an adequate alternative that truly "conserves" older forests and complies with EO 14072. Adopt and analyze a

definition of ecosystem integrity that includes the published literature (e.g., Rogers et al. 2022) and not some nebulous notion of stewardship. In closing, Wild Heritage has presented the Forest Service during scoping and invited MOG research summits on each of these points raised. However, our information and scoping comments have been ignored in the development of alternatives and thus the DEIS did not take a hard look at the issues raised, did not use the best available science, and provided an inadequate range of alternatives. The Forest Service can and must do better to truly steward the nation's dwindling and best natural climate solution.

Dominick A. DellaSala, Ph. D. Chief Scientist* literature submitted as attached pdfs ATTACHMENT: WildHeritageOGNAcomments9-19-24.pdf - this is the same content that is coded in text box; it was originally only included as an attachment. Additional articles are included in this attachment and are called out separately below:

Baker, William L. and Mark A. Williams. 2015. Bet-hedging dry-forest resilience to climate-change threats in the western USA based on historical forest structure. *Frontiers in Ecology and Evolution*. Perspective Article. January 2015. Volume 2. Article 88. Page 1- 7. - conclusion: "Removal of most small trees to reduce wildfire risk may compromise the bet-hedging resilience, provided by small trees and diverse tree sizes and species, against a broad array of unpredictable future disturbances.

Birdsey RA, DellaSala DA, Walker WS, Gorelik SR, Rose G and Ram[acute]rez CE (2023) Assessing carbon stocks and accumulation potential of mature forests and larger trees in U.S. federal lands. *Front. For. Glob. Change* 5:1074508. doi: 10.3389/ffgc.2022.1074508 - conclusion suggest that not cutting large trees can significantly avoid increasing carbon emissions

Bradley, C. M., C. T. Hanson, and D. A. DellaSala. 2016. Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? *Ecosphere* 7(10):e01492. 10.1002/ecs2.1492 - Conclusion: "forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading. Our results suggest a need to reconsider current overly simplistic assumptions about the relationship between forest protection and fire severity in fire management and policy."

DellaSala, D.A., et al. 2015. Building on two decades of ecosystem management and biodiversity conservation under the Northwest Forest Plan, USA. *Forests* 6:3326-3352. - Review of NWFP concluding that rather than reducing conservation measures in favor of increasing timber harvest, agencies should build on the NWFP to ensure continuing success and urge managers to, "

(1) protect all remaining late-successional/old-growth forests; (2) identify climate refugia for at-risk species; (3) maintain or increase stream buffers and landscape connectivity; (4) decommission and repair failing roads to improve water quality; (5) reduce fire risk in fire-prone tree plantations; and (6) prevent logging after fires in areas of high conservation value."

DellaSala, D.A., B.C., Baker, C.T. Hanson, L. Ruediger, and W. Baker. 2022. Have Western USA fire suppression and active management tactics become a contemporary version of Sisyphus? *Biological Conservation: Special Feature on Ending Human Domination of Nature*. <https://doi.org/10.1016/j.biocon.2022.109499> - Paper concludes that aggressive management of timber stands to reduce fire impacts is ineffective and "urge land managers and decision makers to address the root cause of recent fire increases by reducing greenhouse gas emissions across all sectors, reforming industrial forestry and fire suppression practices, protecting carbon stores in large trees and recently burned forests, working with wildfire for ecosystem benefits using minimum suppression tactics when fire is not threatening towns, and surgical application of thinning and prescribed fire nearest homes."

DellaSala DA, Mackey B, Norman P, Campbell C, Comer PJ, Kormos CF, Keith H and Rogers B (2022) Mature and old-growth forests contribute to large-scale conservation targets in the conterminous United States. *Front. For. Glob. Change* 5:979528. doi: 10.3389/ffgc.2022.979528 - Authors assessed Mature and old growth forests and determined federal lands had the greatest concentration and conservation values but many of the best carbon storage areas were vulnerable to logging and should be protected to sequester carbon and meet Paris Climate Agreement and Presidential Executive Orders

DellaSala, D.A.; Africanis, K.; Baker, B.C.; Koopman, M. An Ecoregional Conservation Assessment for the Southern Rocky Mountains Ecoregion and Santa Fe Subregion, Wyoming to New Mexico, USA. *Land* 2024, 13, 1432. <https://doi.org/10.3390/land13091432> - examined conservation targets for four species in connection with wildfire risk reduction efforts and concluded that, "

Strategically targeting the built environment for fuel treatments would improve wildfire risk reduction and may allow for expansion of protected areas held up in controversy. Stepped-up protection for roadless areas, adoption

of wilderness proposals, and greater protection for MOG and riparian forests are critical for meeting representation targets" DellaSala, D.A.; Gorelik, S.R.; Walker, W.S. The Tongass National Forest, Southeast Alaska, USA: A Natural Climate Solution of Global Significance. *Land* 2022, 11, 717.

<https://doi.org/10.3390/land11050717> - Quantified biomass and reviewed where carbon stock was located, concluding that young growth accounted for just 5% of total carbon stock and Inventoried Roadless areas accounted for over 50%, concluded that young stands should be allowed to recover carbon stock and old growth, IRAs and priority watersheds should have increased protection as natural climate solutions Downing, W.M., Dunn, C.J., Thompson, M.P. et al. Human ignitions on private lands drive USFS cross-boundary wildfire transmission and community impacts in the western US. *Sci Rep* 12, 2624 (2022). <https://doi.org/10.1038/s41598-022-06002-3> - Examined USFS-private land cross-boundary fires and concluded that they were primarily caused by humans on private lands. Concluded that, " Effective crossboundary fire risk management will require cross-scale risk co-governance. Focusing on minimizing damages to high-value assets may be more effective than excluding fire from multijurisdictional landscapes." - commenter highlighted multiple passages in this article in the pdf.

North, MP, et al. 2015. Reform forest fire management. Agency incentives undermine policy effectiveness. *Science*. 18 Sep 2015. Vol 349, Issue 6254. pp. 1280-1281. DOI: 10.1126/science.aab2356. - examined reasons for agencies not using prescribed fire and how to use it effectively. concluding that wildfire cannot be eliminated but can gain support for proactive use of managed fires which can help restore millions of hectares of forest ecosystems

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