YAAK VALLEY FOREST COUNCIL

September 20, 2024

Chris Bachman
Conservation Director
Yaak Valley Forest Council
1426 Seventeen Mile Rd.
Troy, MT 59935
(406) 295-9736
cbachman@yaakvalley.org

VIA CARA AND ELECTRONIC MAIL

https://cara.fs2c.usda.gov/Public//CommentInput?Project=65356

September 20, 2024

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 Draft Environmental Impact Statement for Amendments to Land Management Plans to Address Old-Growth Forests Across the National Forest System

---

On behalf of the Yaak Valley Forest Council, we appreciate the opportunity to comment on the Draft Environmental Impact Statement for Amendments to Land Management Plans to Address Old-Growth Forests Across the National Forest System ("DEIS"). A clear intent of the National Old-Growth Amendment (NOGA) is to establish a consistent management approach for preserving and enhancing old-growth forests while also increasing their distribution and abundance.

The Yaak Valley Forest Council, created in 1997, is a Northwest Montana-based 501(c)3 nonprofit that implements conservation and restoration programs focused on protecting and preserving critical wildlife habitat for the sensitive, threatened, and endangered species inhabiting the wild Yaak Valley. Our Mission is to maintain and restore the ecological integrity of the wild Yaak by conserving and improving habitat for native and sensitive species–particularly the grizzly bear–and to advocate for a return to the historic range of variability of old and mature forests in the valley, given their ability to safely store vast amounts of carbon over the centuries. We also aim to safeguard the valley's biological diversity, which is under threat due to climate change.

The old-growth and mature forests of our Yaak home—centuries-old larch, cedar, hemlock, spruce, and more—are our first line of defense against the impacts of climate change, capturing and storing atmospheric carbon that would otherwise worsen the climate crisis. These big trees play a vital role in restoring our planet's health. It is crucial to the Yaak's, and the planet's, health that we act to save these old forests and trees.

Close to home the Black Ram Project in the Yaak Valley of N.W. Montana, part of the Kootenai National Forest, vacated by the United States District Court for the District of Montana, Missoula Division[1], has been appealed. Proceeding with this project violates the intent of E.O. 14072 and this Draft Amendment. The project involves logging an old-growth forest that has been a stable, resilient ecosystem type for 200 years or more.[2] We must preserve this forest for future generations due to its biodiversity, carbon sequestration, and magnificence.

We appreciate the opportunity to offer our concerns and provide recommendations for how the USFS can correct and adopt a policy that realizes significant protections for our Nation's oldest forests and helps meet the promise of Executive Order 14072 to "conserve America's mature and old-growth forests on Federal lands."

Introduction

Logging is the greatest avoidable threat to old-growth and mature trees in the United States.

The Biden/Harris Administration has repeatedly acknowledged the essential role mature and old-growth trees and forests play in protecting ecosystems and fighting climate change[3] and their importance for biodiversity. The Administration has recognized the exceptional carbon sequestration and storage capabilities of these forests, especially infrequent-fire forests, in the fight against climate change.

---

[1] *Citing Climate Impacts and Grizzly Bear Mortality, Judge Halts Yaak Logging Project.* (2023, August 18). Flathead Beacon. https://flatheadbeacon.com/2023/08/18/citing-climate-impacts-and-grizzly-bear-mortality-judge-halts-yaak-logging-project/

[2] Hammond, H. (2021). *Black Ram Project Proposed Action Project Review*. SILVA Ecosystem Consultants Ltd.

[3] 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"); U.S. Forest Serv., *Amendments to Land Management Plans to Address Old-Growth Forests Across the National Forest System: Draft Environmental Impact Statement* 7-8 (June 2024) ("DEIS"); U.S. Forest Serv., *Climate Adaptation Plan* 14 (July 2022).

The DEIS's purpose and need rightly recognize the urgency of protecting the Nation's remaining old-growth and expanding the abundance and distribution of old-growth. The preferred alternative would not meet this intent or the purpose and need. It would, instead, reinforce the status quo regarding the management of old-growth in the National Forest System.

Unfortunately, the proposed National Old-growth Amendment looks more like a logging proposal than an old-growth conservation plan. As written, the preferred alternative includes numerous opportunities for the Forest Service (USFS) to send these essential trees to the sawmill. Provisions in the proposal allow for logging and clear-cutting old-growth trees and logging within old-growth forests when these activities are proposed under the guise of wildfire management or "forest health." The draft proposal also does not provide any protection for mature forests.

The Draft Environmental Impact Statement (DEIS) highlights the crucial role that old-growth trees play. Additionally, it underscores their contributions to carbon sequestration, biodiversity, watershed integrity, and resilience. The DEIS also emphasizes the significance of old-growth trees after they die, as they evolve into snags and coarse woody debris that continue to provide essential ecological benefits.

Despite the acknowledged benefits and alarming deficit of old-growth trees and forests, commercial logging in National Forests continues unabated. The approval of numerous logging projects, including projects with old-growth components, and appealing judicially vacated projects like Black Ram, is resulting in the destruction of valued portions of the nation's natural heritage further depleting the exceptional carbon sequestration and storage capabilities of these forests

The agency must adopt policy that meaningfully maintains and develops the Nation's old-growth, as stated in the DEIS's purpose and need[4] and as directed by Executive Order 14072. Alternative 2—the agency's preferred alternative—does not meet this purpose and need.

The DEIS states that a core purpose of the proposed action is to:

> *Foster ecologically focused management across the National Forest System by maintaining and developing old-growth forests while improving and expanding their abundance and distribution and protecting them from the increasing threats posed by climate change, wildfire, insects and disease, encroachment pressures from urban development, and other potential stressors, within the context of the National Forest System's multiple-use mandate*.[5]

To bring the policy in line with the purpose and need, the agency must abandon Alternative 2 and modify Alternative 3 to:

- end the commercial sale of old-growth trees.

---

[4] DEIS at 7-8.

[5] *Id.* at 7.

- The agency must also bar logging of such trees inside and outside old-growth stands.
- And it must bar any logging of infrequent-fire old-growth stands.

Drawing this distinction between stands and trees is not currently in any proposed alternative. Drawing this distinction will advance old-growth protection while allowing for necessary, targeted management in frequent-fire forests and forests within the statutorily defined Wildland Urban Interface. Logging old-growth trees and stands is counterproductive, inefficient, ineffective, and is contrary to both best science and public opinion.

The preferred alternative in the DEIS will grant the USFS significant flexibility to log and sell old-growth trees and forests justified by heightened risk of permanent loss from climate change. The agency contends that climate change increases the vulnerability of old-growth forests to severe disturbances, thereby justifying the necessity for wide-ranging discretion in their management and use. However, the DEIS itself shows that this reasoning does not justify the discretion incorporated into Alternative 2.

The DEIS makes a strong case for the irreplaceable role of old-growth trees in forest ecosystems. It emphasizes the significance of preserving old-growth forests and the resilience they provide when their key elements are maintained. Furthermore, it highlights the speculative nature of vegetation management's role in mitigating the effects of climate change on old-growth forests. Alternative 2 maintains the current flawed proactive stewardship mandate, granting excessive discretion to log, even when unnecessary and harmful according to both the DEIS's analysis and the literature.

Recommendations

To achieve the goal of protecting old-growth forests, the agency should choose an improved version of Alternative 3. This version should specifically safeguard old-growth trees and infrequent-fire old-growth forests from logging and prevent these trees from being commercially traded. By adopting a modified Alternative 3 that focuses on stopping the commercial exchange of old-growth trees, the major flaw that currently permits discretionary logging of old growth can be addressed. Based on its own analysis and findings, the USFS should prohibit the logging of old-growth trees and all trees in infrequent-fire old-growth stands. Additionally, old-growth trees should not be included in commercial timber sales resulting from vegetation management.

To be effective the adopted protections must also eliminate the large number of exceptions and allowances that are common to all alternatives. The policy outlined in the DEIS falls significantly short of the goal to "expand the abundance and distribution" of old-growth forests and to "demonstrate compliance with Executive Order 14072."

Adopt a Modified Alternative 3

Alternative 3 must be modified to ban the commercial exchange of old-growth trees in any forest type and any trees from infrequent-fire old-growth stands, including timber sales and goods-for-service contracts. This component simplifies old-growth management decisions. It ensures that any considerations about cutting and removing old-growth trees are free from commercial or personnel performance pressures. If the Forest Service continues to engage in such commercial exchange, agency personnel will continue to be subject to competing pressures, and the public will lack assurance that the trees are being cut and removed for the stated rationale, rather than for commercial purposes.

This modification to Alternative 3 would protect the ecological values of these old-growth trees and forests, and the critical role of dead (standing or fallen) old-growth trees in the ecosystem. Dead old-growth trees continue to provide a host of ecological benefits, including carbon storage, habitat creation, and water purification. These benefits accrue regardless of whether the trees persist as standing snags or coarse woody debris.

Additionally, the approved amendment should prohibit the cutting of old-growth trees in *any* forest type except in very limited circumstances. As the DEIS clearly makes the case of old-growth trees delivering critical environmental and social attributes wherever they occur, regardless of forest type or the age of the surrounding forest. They provide unique habitat, sequester and store vast quantities of carbon, and are irreplaceable on any scale relevant to addressing the climate and biodiversity crises.

The agency's DEIS states:

> [T]he presence of old trees, both within and outside of old-growth forests, represents a critical structural element that provides essential habitats for a diverse array of species and significantly contributes to carbon sequestration, biodiversity, and overall ecosystem resilience. The rarity of old trees in comparison to historical conditions, as well as their keystone ecological functions and services, highlight their conservation value.[6]

The agency also rightly acknowledges the role of old trees for "cultural heritage, traditional practices, and social values."[7]

The DEIS acknowledges the value of old-growth trees and does not provide a convincing ecological reason to cut them, even when the agency claims a need to manage activities in old-growth stands. Prohibiting the logging of old-growth trees, as conclusively supported by the DEIS, would improve the internal consistency of the agency's policy. There is no scientifically supported need to cut these trees for ecological restoration.

The final policy must also prohibit any cutting in infrequent-fire old-growth stands, to protect the carbon storage, habitat creation, water purification, recreational opportunities, and social significance of these stands.

Alternative 3 should be revised to read:

> Standard 3: Vegetation management shall not result in
>
> 1. Cutting of old-growth trees in any forest type or cutting of trees in infrequent-fire old-growth forests, except

---

[6] DEIAR at 24.

[7] Ibid. at 25.

   a. to abate a demonstrated, imminent risk to public safety within the statutorily defined Wildland Urban Interface as defined in the HEALTHY FORESTS RESTORATION ACT[8];
   b. via tree selection for Native American or Alaska Native traditional and customary uses; or
   c. as required to effectuate a statute or treaty.
2. Commercial timber harvest of old-growth trees in any forest type or in infrequent-fire old-growth forests.

Remove the authority to alter national amendment's protections

The final policy should clearly state that the authority to revise, amend, modify, or otherwise change the operative provisions of this policy resides exclusively with the Secretary.[9] As it currently stands, the proposed action allows plan-by-plan, forest-by-forest amendments that could weaken the protections provided by a nationwide National Forest amendment.[10]

The agency must ensure that the old-growth definitions themselves do not become loopholes. Currently, if an old-growth forest ceases to meet the agency's narrow definition of old-growth, any protective standards cease to apply. Disturbingly, this loss of protection can result from Forest Service management activity. The DEIS explicitly acknowledges that field personnel can eliminate old-growth—both stands and trees—while implementing the proactive stewardship mandate, a policy common to all alternatives. This framework significantly undermines the effectiveness of any old-growth policy and runs counter to the purpose and need of the DEIS and President Biden's EO 14072.

The agency must correct this. In particular, the final NOGA decision should guarantee that:

1. The policy cannot be implemented in a way that allows the agency to remove identified old-growth stands from old-growth status.
2. Protections under the policy continue even if an identified old-growth forest falls out of the definition of old-growth due to natural disturbance. Even if a stand doesn't meet the narrow definitions of old-growth after a disturbance, the old-growth trees and other legacy structure features should not be allowed to be degraded or eliminated. A fire or insect infestation might cause some old-growth trees to die, but its values continue.
3. Field personnel cannot manage an old-growth forest down to the minimum criteria for old-growth status as defined by the old-growth definitions referenced in Standard 1. Those definitions should be used purely for identification purposes, and not as guidelines or targets for management outcomes.

---

[8] *Healthy Forests Restoration Act of 2003*. (2003). GovInfo | U.S. Government Publishing Office. https://www.govinfo.gov/content/pkg/COMPS-1123/pdf/COMPS-1123.pdf
[9] 36 C.F.R. § 219.2(b)(3).
[10] DEIS at 17.

Current language in the DEIS would permit the management of old-growth forests to the minimum standard as per Green et al.

The DEIS and inventory of old-growth both rely on old-growth definitions put forth by Green et al.[11] However, the Forest Region-specific definitions of Green et al. were not developed under the planning process governed by National Forest Management Act (NFMA) regulations. These Forest Region-specific definitions were intended to clarify how the National Forests are to identify old-growth stands. They do not require Forest Service managers to adopt broader old-growth values or acknowledge old-growth landscapes and ecosystems. The definitions fine-tuned the process by employing structural criteria to identify old-growth stands.

Green et al. set the "minimum number" of trees per acre 21 inches DBH at only ten. [12] Importantly, Green et al. intended this minimum number to be used as ***screening criteria*** to select stands suitable for management as old growth.

The DEIS leaves the potential for the USFS to manage old-growth forests down to the Green et al. minimum large tree "screening criteria." This scenario could lead to the cutting down of large, old trees from old-growth forests, even if the old-growth area retains the minimum required number of large, old trees. The agency would still be able to cut down smaller and younger trees in the old-growth area without disqualifying it, as the number of such trees is not part of the minimum criteria.

The collateral damage of this potential old-growth management strategy includes the loss or reduction of old-growth habitat components, such as the number of snags, down woody material, dead tops and decay, and tree diameter variation. These old-growth-associated characteristics are not included as minimum screening criteria but represent the structural diversity defining old-growth. These old-growth characteristics are inevitably reduced during logging activities.[13]

Retaining Old-Growth Trees and Infrequent-fire Old-Growth Forests

The DEIS does not disclose a rational justification for logging old-growth trees or infrequent-fire old-growth stands, nor does the broader scientific literature. These forests provide myriad benefits when left unlogged and are in severe deficit nationwide. Logging them is an ineffective, inefficient, and counterproductive approach to managing them. Retaining discretion to log old-growth trees has no justification, and there is no justification for subjecting them to commercial exchange.

---

[11] Green, P., J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann, 1992. Old-growth forest types of the northern region. Northern Region, R-1 SES 4/92. Missoula, MT.

[12] Green, P., J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann, 1992. Old-growth forest types of the northern region. Northern Region, R-1 SES 4/92. Missoula, MT.

[13] Juel, J. (2021, October 21). MANAGEMENT OF OLD GROWTH IN THE U.S. NORTHERN ROCKY MOUNTAINS. https://www.friendsoftheclearwater.org/wp-content/uploads/2021/11/Juel_2021-Old-Growth.pdf. https://www.friendsoftheclearwater.org/wp-content/uploads/2021/11/Juel_2021-Old-Growth.pdf

Old-growth trees and stands deliver significant carbon storage and sequestration benefits.

The DEIS recognizes old-growth trees are carbon storage powerhouses, disclosing their "important role in carbon stock accumulation."[14] If left undisturbed, these forests will keep storing carbon long after they die. Logging these trees severely curtails this core climate benefit.

The DEIS does not dispute the science showing that old-growth trees continue to sequester carbon at a high rate until they die.[15] As trees age and grow, research indicates that they will continue to absorb carbon at an increasing rate, storing more carbon than younger trees.[16] As it develops, a tree's total leaf area increases, which means more light can be intercepted, which in turn, through photosynthesis, means more atmospheric carbon is absorbed.[17] Moreover, the increase in the rate of carbon accumulation continues even as a tree's overall growth rate per unit leaf area declines.[18] Older, larger trees thus hold significantly more carbon than their younger brethren in the forest.[19]

Old-growth trees can store their accumulated carbon for centuries. As a tree ages and continues to absorb carbon, the absolute amount of its stored carbon increases.[20] Older, larger trees can hold a substantial portion of a forest's total above-ground carbon even though they account for a relatively small percentage of the trees.[21] Further, research indicates that once dead, such trees

---

[14] DEIAR at 24.

[15] 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.

[16] 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.

[17] *Ibid.*; Xu, C-Y. et al. "Age-related decline of stand biomass accumulation is primarily due to mortality and not to reduction in NPP associated with individual tree physiology, tree growth or stand structure in a *Quercus*-dominated forest." *Journal of Ecology* (2012) 100(2): 428-440. https://doi.org/10.1111/j.1365-2745.2011.01933.x; Pregitzer, K.S. and E.S. Euskirchen. "Carbon cycling and storage in world forests: biome patterns related to forest age." *Global Change Biology* (2004) 10(12): 2052-2077. https://doi.org/10.1111/j.1365-2486.2004.00866.x; 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: 594272. https://doi.org/10.3389/ffgc.2020.594274.

[18] 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.

[19] 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: 594272. https://doi.org/10.3389/ffgc.2020.594274; 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; Brown, S.A. et al. "Spatial distribution of biomass in forests of the eastern USA." *Forest Ecology and Management* (1999) 123(1): 81-90. https://doi.org/10.1016/S0378-1127(99)00017-1.

[20] Xu, Cheng-Yuan, Matthew H. Turnbull, David T. Tissue, James D. Lewis, Robyn T Carson, William S. F. Schuster, David Whitehead, Adrian S. Walcroft, Jinbao Li and Kevin L. Griffin. "Age-related decline of stand biomass accumulation is primarily due to mortality and not to reduction in NPP associated with individual tree physiology, tree growth or stand structure in a Quercus-dominated forest." *Journal of Ecology* 100 (2012): 428-440. https://doi.org/10.1111/j.1365-2745.2011.01933.x; Pregitzer, Kurt S. and Eugénie S. Euskirchen. "Carbon cycling and storage in world forests: biome patterns related to forest age." *Global Change Biology* 10 (2004): 2052-2077. https://doi.org/10.1111/j.1365-2486.2004.00866.x; Mildrexler, David J., Logan T. Berner, Beverly E. Law, Richard Birdsey and William R. Moomaw. "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). https://doi.org/10.3389/ffgc.2020.594274.

[21] Mildrexler, David J., Logan T. Berner, Beverly E. Law, Richard Birdsey and William R. Moomaw. "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). https://doi.org/10.3389/ffgc.2020.594274; Lutz, James A., Tucker J. Furniss, Daniel J.

often decay more slowly than smaller, younger trees.[22] When these dead trees remain in the forest, they hold onto their stored carbon for decades—or centuries—as they slowly decay.[23] Even with decay, not all carbon is lost to the atmosphere—much is absorbed and retained in the forest soil.[24]

The DEIS does not fully disclose the harmful effects of logging on the carbon stored in old-growth trees. While it acknowledges that logging can result in carbon loss, it relies on a vague, general analysis of how management activities could potentially maintain "carbon stability."

Old-growth trees provide myriad carbon storage and sequestration benefits. Logging them eliminates their ability to sequester carbon and results in short-term emission of much of their carbon. This release occurs through the transportation, manufacturing process, and end use (and particularly if the biomass is burned for energy).[25] Substantial quantities of logging debris will decompose or be burned, a carbon loss frequently under-reported.[26] The milling of logs into products quickly releases substantial stored carbon from the harvested tree boles.[27]

To ensure that these trees can continue to provide critical ecosystem services, the agency should adopt a standard that maintains them in the forest.

Johnson, Stuart J. Davies, David Allen, Alfonso Alonso, Kristina J. Anderson-Teixeira, et al. "Global importance of large-diameter trees." *Global Ecology and Biogeography* 27 (2018): 849-864. https://doi.org/10.1111/geb.12747; Brown, Sandra A., Paul E. Schroeder and Jeffrey S. Kern. "Spatial distribution of biomass in forests of the eastern USA." *Forest Ecology and Management* 123 (1999): 81-90. https://doi.org/10.1016/S0378-1127(99)00017-1.

[22] Harmon, Mark E., Jerry F. Franklin, Frederick J. Swanson, Phillip Sollins, Stanley V. Gregory, John D. Lattin, Norman Herbert Anderson, et al. "Ecology of Coarse Woody Debris in Temperate Ecosystems." *Advances in Ecological Research* 15 (1986): 133-302. https://doi.org/10.1016/S0065-2504(03)34002-4; Herrmann, Steffen, Tiemo Kahl and Jürgen Bauhus. "Decomposition dynamics of coarse woody debris of three important central European tree species." *Forest Ecosystems* 2 (2015): 1-14. https://doi.org/10.1186/s40663-015-0052-5.

[23] Lutz, James A., Soren Struckman, Sara J. Germain and Tucker J. Furniss. "The importance of large-diameter trees to the creation of snag and deadwood biomass." *Ecological Processes* 10 (2021): 1-14. https://doi.org/10.1186/s13717-021-00299-0; Stenzel, Jeffrey E., Kristina J. Bartowitz, Melannie D. Hartman, James A. Lutz, Crystal A. Kolden, Alistair M. S. Smith, Beverly E. Law, et al. "Fixing a snag in carbon emissions estimates from wildfires." *Global change biology* (2019): n. pag. https://doi.org/10.1111/gcb.14716.

[24] Magnússon, Rúna Í., Albert Tietema, Johannes H. C. Cornelissen, Mariet M. Hefting and Karsten Kalbitz. "Tamm Review: Sequestration of carbon from coarse woody debris in forest soils." *Forest Ecology and Management* 377 (2016): 1-15. https://doi.org/10.1016/j.foreco.2016.06.033.

[25] 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.

[26] 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/10.1748-9326/ab28bb.

[27]Harmon, M.E. et al. "Modeling carbon stores in Oregon and Washington forest products: 1900-1992." *Climatic Change* (1996) 33: 521-550. https://doi.org/10.1007/BF00141703; Law, B.E. et al. "Land use strategies to mitigate climate change in carbon dense temperate forests." *Proceedings of the National Academy of Sciences* (2018) 115(14): 3663–3668. https://doi.org/10.1073/pnas.1720064115; 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.

Natural Disturbances

The DEIS suggests that fire, insects, and drought are increasing threats to old-growth and that proactive stewardship–including logging–is the way to address those threats. However, neither the DEIS nor current research provides support for logging old-growth trees or infrequent-fire old-growth stands to manage natural disturbances.

Fire

Old-growth trees and forests are generally more fire-resistant and are not the primary contributors to wildfires. The DEIS acknowledges that older trees are more fire-resistant than younger trees.[28] Old trees are often well-suited to withstand the impacts of climate change, including wildfires, due to multiple adaptations including increasing bark thickness, self-pruning of lower branches, increasing crown height, and development of more open crowns.[29] These adaptations make it difficult for fire to ignite tree boles or climb into flammable canopies in larger/older trees, particularly in western fire-adapted forest types.[30]

Old-growth stands–primarily characterized by the presence of old-growth trees–can act as refugia for imperiled species during wildfire events.[31] One study demonstrated that old-growth forests have cooler microclimates that can better provide refugia for temperature-sensitive species when compared to single species, even-aged plantation sites.[32] Other studies also show old-growth stands typically have larger moisture content, resulting in less proportionate biomass that is available to burn. This moisture, combined with larger basal area, also results in stands having increased shade and humidity, as well as lower temperatures and wind speeds, improving overall fire resistance.[33]

---

[28] DEIAR at 24

[29] 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. doi.org/10.3959/1536-1098-75.1.34.

[30] 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; 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.

[31] Lesmeister, D.B. et al. "Mixed-severity wildfire and habitat of an old-forest obligate." Ecosphere (2019) 10(4): e02696. https://doi.org/10.1002/ecs2.2696. *See also* DEIAR at 24.

[32] Sarah J. K. Frey et al. ,Spatial models reveal the microclimatic buffering capacity of old-growth forests.Sci. Adv.2,e1501392(2016).DOI:10.1126/sciadv.1501392.

[33] Countryman, C.M. "Old-growth conversion also converts the fire climate." USDA Forest Service Fire Control Notes (1956) 17(4): 15–19. https://www.fs.usda.gov/sites/default/files/fire-management-today/FSPubs-FMT-79%283%29.pdf (last accessed July 24, 2024); ; Kitzberger, T. et al. "Decreases in Fire Spread Probability with Forest Age Promotes Alternative Community States, Reduced Resilience to Climate Variability and Large Fire Regime Shifts." Ecosystems (2012) 15: 97–112. https://doi.org/10.1007/s10021-011-9494-y; Frey, S.J.K. et al. "Spatial models reveal the microclimatic buffering capacity of old-growth forests." Science Advances (2016) 2(4): e1501392. https://doi.org/10.1126/sciadv/1501392; Agee, J.K. "Fire Ecology of Pacific Northwest Forests." Island Press (1993)

Fire is a natural and necessary part of many forest ecosystems.

The DEIS does not sufficiently acknowledge the ecological benefits of wildfire, a natural process that most native plant and wildlife species are adapted to, and that there is still a deficit of natural fire processes across many forested landscapes.[34] Wildfires help moderate fuel loads,[35] create a mosaic of habitat types that many species rely on for various essential behaviors,[36] and regulate nutrient cycling.[37]

Cutting old-growth trees is not necessary and often counterproductive in addressing wildfire

The DEIS acknowledges cutting old-growth trees is an ineffective, inefficient, and counterproductive approach to managing the risks associated with fire. The broader scientific literature reinforces this conclusion. The rate of forest fire spread is typically dictated by the quantity of highly flammable foliage and branches in smaller (drier) trees and shrubs–not the presence of old trees.[38] Research shows that climate change is the main driver of increasing fire size, fire severity, and driving larger patches of high-severity fire.[39]

Further, research demonstrates that large tree removal is an ineffective approach to reducing wildfire risks[40] and in some cases can increase fire risk. When logging occurs in old-growth

---

121-124; Agee, J.K. and C.N. Skinner. "Basic principles of forest fuel reduction treatments." Forest Ecology and Management (2005) 211: 83–96. https://doi.org/10.1016/j.foreco.2005.01.034.

[34] Marlon, J. R. "Long-term perspective on wildfires in the western USA." PNAS (2012) 109 (9): E535-E543. https://doi.org/10.1073/pnas.1112839109; Parisien, M. A. et al. "Fire deficit increases wildfire risk for many communities in the Canadian boreal forest." Nat Commun (2020) 11, 2121. https://doi.org/10.1038/s41467-020-15961-y.

[35] Miller, C. "Wildland Fire Use: A Wilderness Perspective on Fuel Management." USDA Forest Service Proceedings, RMRS-P-29 (2003). http://winapps.umt.edu/winapps/media2/leopold/pubs/480.pdf.

[36] See, e.g., Clark, D.A. "Demography and Habitat Selection of Northern Spotted Owls in Post-Fire Landscapes of Southwestern Oregon." Oregon State University M.S. Thesis (2007). Robert Anthony, Advisor. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/5m60qt980.

[37] McLauchlan, K.K. et al. "Fire as a fundamental ecological process: Research advances and frontiers." Journal of Ecology (2020) 108(5): 2047–2069. https://doi.org/10.1111/1365-2745.13403.

[38] Rothermel, R.C. "How to predict the spread and intensity of forest and range fires." USDA Forest Service Gen. Tech. Rep. INT-GTR-143. Intermountain Forest and Range Experiment Station, Ogden, UT.

[39] Wasserman, T. N., & Mueller, S. E. (2023). Climate influences on future fire severity: A synthesis of climate-fire interactions and impacts on fire regimes, high-severity fire, and forests in the western United States. *Fire Ecology*, *19*(1). https://doi.org/10.1186/s42408-023-00200-8

[40] Dellasala, D., et al. 2022. Have western USA fire suppression and megafire active management approaches become a contemporary Sisyphus?. Biological Conservation. 268. 109499. 10.1016/j.biocon.2022.109499; Lydersen, J., North, M., Collins, B. 2014. Severity of an uncharacteristically large wildfire, the Rim Fire, in forests with relatively restored frequent fire regimes. Forest Ecology and Management 328 (2014) 326–334 (explaining that reducing fuels does not consistently prevent large forest fires, and seldom significantly reduces the outcome of large fires); See also Calkin, David E.; Cohen, Jack D.; Finney, Mark A.; Thompson, Matthew P. 2014. How risk management can prevent future wildfire disasters in the wildland-urban interface. PNAS. 111(2): 746-751 (explaining, "[p]aradoxically, using wildfire suppression to eliminate large and damaging wildfires ensures the inevitable occurrence of these fires").

forest stand understories or reduces crown densities, it can lead to higher air temperatures, increased surface winds, and drier surface fuels, which raises the risk of wildfires.[41]

Old-growth trees confer drought resilience to entire stands

Old-growth trees are less susceptible to drought-related mortality. Old-growth trees may experience the stressing effects of drought however, they have generally developed time-adapted mechanisms that allow them to cope with drought and confer resilience benefits to the entire forest.

Old-growth trees also support the health and resilience of the rest of the forest in the face of drought conditions. Canopy-dominant trees create cooler, shady microclimates which help retain moisture in the soils and understory.[42] Deep networks of old-growth tree roots also help increase the water storage capacity of the forest by allowing trees to access groundwater, supporting porous soil structures, and allowing for greater water infiltration from the surface to deeper groundwater stores.[43] This infiltration reduces stormwater runoff, increases the water storage capacity of the system, and helps buffer against flooding and drought.[44] Even if they experience slightly reduced growth rates, these trees provide numerous supportive benefits both above and below ground to the other forest system components during drought.

Old-growth trees and moist forests are more resilient to insect-related disturbances

Native insects play a crucial role in maintaining healthy soil, recycling nutrients, pollinating flowers, controlling the population growth of other insects, and serving as vital food sources for numerous species. Old-growth trees, as a specific age class, are more resilient to insect-related disturbances.[45] Old-growth trees and forests have attributes that provide resilience to insect activity, including offering a habitat for various insect-eating predator species.[46]

Insects such as mountain pine beetles target older trees due to the rich nutrients in the phloem, which support brood production. This susceptibility is not related to the age of the trees.[47] The

---

[41] Pimont, F. et al. "Validation of FIRETEC wind-flows over a canopy and a fuel-break." International Journal of Wildland Fire (2009) 18(7): 775–790. https://doi.org/10.1071/WF07130; Parsons, R.A. et al. "Modeling thinning effects on fire behavior with STANDFIRE." Annals of Forest Science (2018), 75:7. https://doi.org/10.1007/s13595-017-0686-2.

[42] Frey, S.J. et al. "Spatial models reveal the microclimatic buffering capacity of old-growth forests." *Science Advances* (2016). 2(4). https://www.science.org/doi/10.1126/sciadv.1501392.

[43] Humann, M. et al. "Identification of runoff processes - The impact of different forest types and soil properties on runoff formation and floods." *Journal of Hydrology* (2011). 409(3-4), 637-649. https://doi.org/10.1016/j.jhydrol.2011.08.067.

[44] *Ibid.*

[45] Schowalter T. "Arthropod Diversity and Functional Importance in Old-Growth Forests of North America." Forests (2017) 8(4):97. https://doi.org/10.3390/f8040097.

[46] Schowalter T. "Arthropod Diversity and Functional Importance in Old-Growth Forests of North America." *Forests* (2017) 8(4):97. https://doi.org/10.3390/f8040097; Venier, L.A. and Holmes, S.B. "A review of the interaction between forest birds and eastern spruce budworm." *Environmental Reviews* (2010) 18, 191-207. https://doi.org/10.1139/A10-009.

[47] 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.

oldest trees within these forests are the proven survivors of decades and centuries of such disturbance cycles.

Warmer winter temperatures and longer growing seasons, resulting from changing climatic conditions, are allowing many insect species to thrive for more of the year and increasing breeding cycles.[48] Insects and disease are identified as the second greatest threat to old-growth forests in the USDA Threat Assessment, after wildfire. However, insect activity and outbreak events are natural components of forest ecosystems.

Logging is the greatest avoidable threat to old-growth and mature trees in the United States.

At low to moderate levels, insect activity poses little threat to old-growth forests. Heightened insect activity can aid in the development of several structural components that increase old-growth forest conditions, as stated in the NOGA threat analysis, *"[r]esults suggest no significant change in mature forest area but a significant net gain in old-growth area, likely owing to increases in dead tree components that are elements of some old-growth definitions.*"[49] As a natural thinning agent, insect-driven tree-mortality can help reduce stand density and intraspecific competition, create snags and cultivate decadence which serve as critical habitat, and open natural gaps in the forest canopy to increase heterogeneity of plants and tree age diversity.[50]

Old-growth trees and stands provide essential contributions to watershed integrity

The DEIS acknowledges the value of old-growth forests to watershed health and integrity. However, the preferred alternative would allow for the continued logging of old-growth trees with little functional limitation.

Individual old-growth trees are an integral part of the overall old-growth forest structure, playing a key role in maintaining watershed integrity. Their deep root systems help maintain soil structures and allow for infiltration and interfacing between the surface and groundwater.[51]

---

[48] Aoki, C. F. et al. "Old Pests in New Places: Effects of Stand Structure and Forest Type on Susceptibility to a Bark Beetle on the Edge of Its Native Range." Forest Ecology Management (2018) 419–420, 206–219. https://doi.org/10.1016/j.foreco.2018.03.009; Potter, K. M. et al. "Important Insect and Disease Threats to United States Tree Species and Geographic Patterns of Their Potential Impacts." Forests (2019) 10 (4), 304. https://doi.org/10.3390/f10040304.

[49] U.S. Forest Service and Bureau of Land Management. "Mature and Old-Growth Forests: Analysis of Threats on Lands Managed by the Forest Service and Bureau of Land Management, in Fulfillment of Section 2(c) of Executive Order No. 14072." (2024) FS-1215c.

[50] Swanson, M. E. et al. "The Forgotten Stage of Forest Succession: Early-Successional Ecosystems on Forest Sites." Frontiers in Ecology and the Environment (2011) 9 (2), 117–125. https://doi.org/10.1890/090157; Donato, D. C. et al. "Multiple Successional Pathways and Precocity in Forest Development: Can Some Forests Be Born Complex?" Journal of Vegetation Science (2012) 23 (3), 576–584. https://doi.org/10.1111/j.1654-1103.2011.01362.x.

[51] Humann, M. et al. "Identification of runoff processes - The impact of different forest types and soil properties on runoff formation and floods." *Journal of Hydrology* (2011). 409(3-4), 637-649. https://doi.org/10.1016/j.jhydrol.2011.08.067.

When compared to younger forests, old-growth trees significantly reduce stormwater runoff, increase water storage capacity, and help buffer against flooding and drought.[52]

Older trees directly benefit waterways by promoting bank stability and minimizing sedimentation and other pollutant inputs to the water body.[53] Old-growth canopy cover provides significant shade, keeping maximum temperatures down, and minimizing the frequency and duration of elevated in-stream temperatures.[54] "This is especially crucial for fish and amphibians that are suited to cooler water environments."[55]

The hydrological significance of intact mature and old-growth forests extends to the underground environment, supporting mycorrhizae that reduce erosion and nutrient loss,[56] increase plant water use efficiency and retention-helping to cool the landscape,[57] store carbon in the ground,[58] help plants adapt to changes in climate,[59] and resist pests and pathogens.[60]

Protecting old-growth trees and minimizing the negative impacts of proactive management on old-growth forests will be important to help protect watersheds in the age of climate change. Where anthropogenic stressors can be minimized, forests will face fewer disturbances, improving their resilience to climate-driven changes. This will allow these systems to continue

---

52 Humann, M. et al. "Identification of runoff processes - The impact of different forest types and soil properties on runoff formation and floods." *Journal of Hydrology* (2011). 409(3-4), 637-649. https://doi.org/10.1016/j.jhydrol.2011.08.067.

53 *Ibid.*

54 Roon, D.A. et al. "Shade, light, and stream temperature responses to riparian thinning in second-growth redwood forests of northern California." PLoS ONE (2021) 16(2), e0246822. https://doi.org/10.1371/journal.pone.0246822.

55 *Ibid.*

56 Burri, K. et al. "Mycorrhizal fungi protect the soil from wind erosion: a wind tunnel study." Land Degradation & Development (2011) 24(4): 385–392. https://doi.org/10.1002/ldr.1136; Mardhiah, U. et al. "Arbuscular mycorrhizal fungal hyphae reduce soil erosion by surface water flow in a greenhouse experiment." *Applied Soil Ecology* (2016) 99: 137–140. https://doi.org/10.1016/j.apsoil.2015.11.027.

57 Querejeta, J.I. et al. "Differential modulation of host plant δ13C and δ18O by native and nonnative arbuscular mycorrhizal fungi in a semiarid environment." *New Phytologist* (2005) 169(2): 379–387. https://doi.org/10.1111/j.1469-8137.2005.01599.x; Gehring, C.A. et al. "Tree genetics defines fungal partner communities that may confer drought tolerance." *Proceedings of the National Academy of Sciences* (2017) 114(42): 11169–11174. https://doi.org/10.1073/pnas.1704022114; Wu, Q.-S. and R.-X. Xia. "Arbuscular mycorrhizal fungi influence growth, osmotic adjustment and photosynthesis of citrus under well-watered and water stress conditions." *Journal of Plant Physiology* (2006) 163(4): 417–425. https://doi.org/10.1016/j.jplph.2005.04.024.

58 Orwin, K.H. et al. "Organic nutrient uptake by mycorrhizal fungi enhances ecosystem carbon storage: a model-based assessment." *Ecology Letters* (2011) 14(5): 493–502. https://doi.org/10.1111/j.1461-0248.2011.01611.x; Nautiyal, P. et al. "Role of glomalin in soil carbon storage and its variation across land uses in temperate Himalayan regime." B*iocatalysis and Agricultural Biotechnology* (2019) 21: 101311. https://doi.org/10.1016/j.bcab.2019.101311.

59 Gehring, C.A. et al. "Tree genetics defines fungal partner communities that may confer drought tolerance." *Proceedings of the National Academy of Sciences* (2017) 114(42): 11169–11174. https://doi.org/10.1073/pnas.1704022114; Patterson, A. et al. "Common garden experiments disentangle plant genetic and environmental contributions to ectomycorrhizal fungal community structure." *New Phytologist* (2018) 221(1): 493–502. https://doi.org/10.1111/nph.15352.

60 Reddy, B.N. et al. "Approach for enhancing mycorrhiza-mediated disease resistance of tomato damping-off." *Indian Phytopathology* (2006) 59(3): 299–304. https://epubs.icar.org.in/index.php/IPPJ/article/view/17367; Rinaudo, V. et al. "Mycorrhizal fungi suppress aggressive agricultural weeds." *Plant and Soil* (2009) 333: 7–20. https://doi.org/10.1007/s11104-009-0202-z.

providing the societal resources we demand from our watersheds, including clean drinking water and healthy aquatic habitats.

Old-growth trees and forests provide essential habitat for a range of species.

Old-growth trees and forests provide irreplaceable habitat for wildlife. The Draft Ecological Impacts Assessment (DEIA) acknowledges this, stating *"[o]ld-growth forests support high levels of biodiversity due to complex structure, with features like large trees, diverse understory vegetation, and abundant dead wood creating a wide range of ecological niches and microhabitats.*"[61] As forests age over decades and centuries, they form complex ecosystems with vibrant old-growth trees at their foundation.

Left undisturbed, conditions such as shade from canopy closure and reduced temperatures due to evapotranspiration nurture a variety of plants and provide climate refugia to wildlife that would often struggle to survive elsewhere.[62] The DEIA also highlights that old-growth forests have the time to develop unique habitat characteristics not found in younger forests, including a higher number of tree cavities, complex lichen assemblages, and diverse fungal communities which contribute to nutrient cycling and uptake.[63] Natural disturbance events are key to fostering such diversity by creating a mosaic landscape with live and dead trees across age classes. Old-growth forests have a variety of dead trees that provide habitat in nesting and commissary trees, including standing logs, or snags, which are important habitat elements for numerous woodpeckers, owls, and rodents—and fallen large logs, or coarse woody debris, which provide food foraging for bears, habitat and cover for imperiled marten and other rodents, and essential nutrients for new vegetation and tree saplings.[64]

As a result of these and other features, old-growth forests serve as irreplaceable regional climate refugia for a wide variety of threatened, endangered, and sensitive species. In the Kootenai National Forest examples include:

- Grizzly bear (federally listed as threatened): the imperiled Yaak grizzly population relies on access to ample food sources, solitude, expansive territory, and suitable denning sites for hibernation. With a diet primarily comprised of vegetation, these omnivores rely on a mosaic landscape providing a diverse diet of plant life, insects, and small animals.

- Canada lynx (federally listed as threatened): This elusive cat species depends on complex, multistory forests for denning habitat and to find its main prey species: snowshoe hares. This type of high-quality denning habitat is limited to mature forest,

---

[61] DEIA at 11

[62] Grier, C. G. and S. W. Running. "Leaf Area of Mature Northwestern Coniferous Forests: Relation to Site Water Balance." Ecology (1977) Vol. 58, Iss. 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) Vol. 40, Iss. 3: 867-878. https://doi.org/10.2134/jeq2010.0365.

[63] DEUA at 11

[64] Johnson, D. L., J. F. Franklin, and K. N. Johnson. "Ecological Forest Management," Waveland Press (2018). Perry, D. A. "Forest ecosystems." JHU Press (1994).

which provides the coarse woody debris needed for thermal cover and protection for the lynx's young.

- Fisher (federally listed as sensitive): This is a medium-sized mustelid found in the northern Rockies, primarily Montana and Idaho. Research shows that fishers are associated with older forests throughout their range.[65] Fishers need dense overhead cover, abundant coarse woody debris, and large trees.[66] Female fishers use cavities in large-diameter live trees and snags because tree cavities regulate temperatures and protect kits from predators.[67] Forest configuration figures just as much into the type of habitat fisher need as composition, specifically the proximity of mature forest patches. Researchers found that fishers in Idaho's Clearwater Basin used landscapes with large patches of mature forest arranged in connected patterns.[68]
- Northern long-eared bat (federally listed as threatened, proposed for uplisting to endangered): The bat depends on mature and old forests for roosting and foraging.[69] Its preferred roosting habitat is large-diameter live or dead trees of multiple species, with exfoliating bark, cavities, or crevices. Its preferred foraging habitat is old forest with complex vertical structures on hillsides and ridges.[70]

Climate Change

The urgency to act on the climate crisis is reason enough to change the agency's relationship with our National Forests from resource extraction to preservation. Logging old-growth trees will not mitigate the effects of climate change on forest ecosystems.

The DEIS does not provide an economic or ecological rationale for logging old-growth forests or trees, or infrequent-fire old-growth stands.

---

[65] Aubry, K.B. et al. "Meta-Analysis of habitat selection by fishers at resting sites in the pacific coastal region." *The Journal of Wildlife Management* (2013) 77(5): 965-974. http://dx.doi.org/10.1002/jwmg.563; Olson, L.E. et al. "Modeling the effects of dispersal and patch size on predicted fisher (*Pekania* [*Martes*] *pennanti*) distribution in the U.S. Rocky Mountains." *Biological Conservation* (2014) 169: 89-98. https://doi.org/10.1016/j.biocon.2013.10.022; Sauder, J.D. and J.L. Rachlow. "Both forest composition and configuration influence landscape-scale habitat selection by fishers (*Pekania pennanti*) in mixed coniferous forests of the Northern Rocky Mountains." *Forest Ecology and Management* (2014) 314: 75-84. http://dx.doi.org/10.1016/j.foreco.2013.11.029; Weir, R.D. and F.B. Corbould. "Factors affecting landscape occupancy by Fishers in North-Central British Columbia." *Journal of Wildlife Management* (2010) 74(3): 405-410. https://doi.org/10.2193/2008-579.

[66] *Ibid.*

[67] *Ibid.*

[68] Sauder, J.D. and J.L. Rachlow. "Both forest composition and configuration influence landscape-scale habitat selection by fishers (*Pekania pennanti*) in mixed conifer forests of the Northern Rocky Mountains." *Forest Ecology and Management* (2014) 314: 75-84. http://dx.doi.org/10.1016/j.foreco.2013.11.029.

[69] Burkhart, J. et al. "Species Status Assessment Report for the Northern long-eared bat (*Myotis septentrionalis*)." *U.S. Fish and Wildlife Service* (2022) Version 1.1. https://www.fws.gov/sites/default/files/documents/Species%20Status%20Assessment%20Report%20for%20the%20Northern%20long-eared%20bat-%20Version%201.1%20%282%29.pdf.

[70] *Ibid.*

Implementing natural climate solutions across all forest ownerships in the U.S. could mitigate up to 424 million tons of CO_2 equivalent per year by 2030.[71] Protecting the substantial bulk of standing carbon in mature forests would also deliver significant co-benefits, including ecological function, biodiversity protection, and hydrological functions.[72] 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.

Timber Targets Must Change

Instead of setting targets for timber harvest, targets should be established for carbon storage in trees and soils, increased wildlife protection, and expansion of mature and old-growth forests. Timber targets inherently incentivize the largest trees to be cut and prioritize projects that result in timber production over other forest uses. The new policy must change this flawed incentive structure.

Environmental Review of Forest Plans and Projects Must Recognize and Quantify Climate Benefits and Losses

When forest plans and projects undergo environmental review, the Forest Service must be required to quantify and disclose the impacts of active management on atmospheric carbon and carbon sequestration. Environmental review at the project level should not be circumvented by diluting project level influences over a larger forest or regional scale that obscures and dilutes the impacts of specific proposed actions. The agency should develop methods to accurately assess the effects of logging projects on forest carbon cycles and stores in ways that reflect science.

Forest Service Must Quantify Forest Carbon Impacts

Before an environmental review can be considered complete, the impacts on lost carbon-sequestration capacity and projected emissions must be quantified. This sort of analysis will require looking at multiple factors, including:

- **Quantity of mature and old-growth trees to be logged:** including documentation of the areas containing mature and old-growth forests in the project area that would be degraded or lost due to the logging.

---

[71] 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.

[72] *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.

- **Annual carbon sequestration capacity lost:** documenting destroyed carbon sequestration capacity from logging and linked increases in atmospheric carbon quantified on an annual and cumulative basis to quantify project carbon pollution in total and over time.
- **Stores of carbon removed and emitted**: most of the carbon removed from the forest will return to the atmosphere over time via burning, decomposition, or other pathways. This must also include carbon emitted from felling through end-product transportation. The analyses should quantify these carbon releases in total and over time.
- **Sequestration break-even:** documentation, at the Project level, of the projected time it will take the forest to return to pre-harvest annual sequestration and carbon storage capacity. Broader references to the greater forest are not relevant for NEPA environmental review.

Standardized analysis of projects and landscape-scale carbon cycle impacts will produce scientifically valid assessments, monitoring cumulative effects, and comparisons across time within individual National Forests. The resulting assessments will enable data aggregation and reporting across all ten USFS regions. The Forest Service should implement this approach in the environmental review for the carbon impacts of all logging projects.

Metrics for Mature and Old-Growth Forest Distribution and Abundance

The proposed policy does not ensure that total old-growth acreage is tracked or that old-growth expansion is treated as a key indicator of successful policy implementation, including a metric for expansion goals. The agency must correct this by developing metrics to assess old-growth recruitment and expansion. Such metrics include:

- Acres of old-growth by National Forest;
- The presence, abundance and distribution of old-growth dependent species as verified by population trend monitoring;
- Old-growth habitat connectivity between old-growth stands
- Progress towards amounts and distributions of old-growth within the Natural Range of Variation

The NOGA relies on structural metrics to define, identify, and inventory old-growth forests. These definitions help identify old-growth forests based on specific standards, but they may not be effective for assessing whether old growth is increasing in abundance and distribution.

Tracking old-growth acreage and stand-scale distribution is important for accountability. The USFS must focus on developing metrics that pertain to the presence, viability, and population trends of old-growth and old-growth-dependent species and the connectivity of old-growth habitats at scales that sustain old-growth species and assemblages. Without considering indicator species and connectivity in metrics, the agency risks reducing old-growth to mere structural characteristics, rather than a unique and complex ecosystem.

The Forest Service must develop metrics of progress towards attaining the high end of the Natural Range of Variation (NRV) of old-growth as a percentage target for each forest type within a given National Forest.[73] These metrics should consider the unique role of NFS lands in the broader context of public and private forestlands, as well as the amount and distribution of old-growth across all ownerships.

Protecting Mature Forests

The failure of the DEIS to protect mature forests does not align with the DEIS's purpose and need or the direction in Section 2 of Executive Order 14072. None of the proposed Alternatives contain standards that protect mature trees and forests.

To create an opportunity for action that would meet E.O. 14072 and match the intent expressed in the purpose and need,[74] the Forest Service must develop a policy with meaningful standards that protect mature forests and improve and expand their abundance and distribution across national forests. The USFS must recognize the important role mature forests play in contributing to nature-based climate solutions by storing large amounts of carbon, increasing biodiversity, and mitigating wildfire risks—as they continue to evolve into old-growth forests—and that prior logging of mature forest has contributed to the loss of recruitment of old-growth forest. The adopted policy must recognize the importance of protecting mature forests for their inherent ecological values and for old-growth forest recruitment.

The adopted policy must:

- Establish substantive and immediately effective nationwide protective standards for mature forests;
- Ensure the protection of the inventoried baseline of mature trees and forests across the National Forest System;
- Include limits on logging; and
- Curtail commercial exchange of mature trees.

Developing durable standards protecting mature forests will finish the necessary work recognized by the DEIS's purpose and need statement, provide essential guardrails on any locally developed policies aimed at mature forests, and provide a mechanism that fully meets the direction provided in section 2 of Executive Order 14072.

---

[73] Hayward et al 2016, "Applying the 2012 Planning Rule to Conserve Species: A Practitioner's Reference." Available at https://www.fs.usda.gov/naturalresources/documents/SCCPractitionersRefApplying2012PlngRuleToCnsrvSpcs.pdf.
[74] E.O. 14072 § 2.

Respectfully,

Chris Bachman
Conservation Director
Yaak Valley Forest Council