[redacted]
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Portland Eugene Bend Enterprise

23 June 2025

TO: Shaun McKinney, Wallowa-Whitman Forest Supervisor
ATTN: Objections
VIA: objections-pnw-wallowa-whitman@usda.gov

Subject: Objection to the Morgan Nesbit Forest Resiliency Project

Dear Supervisor McKinney:

In accordance with 36 CFR 218, Oregon Wild, Eastern Oregon Legacy Lands, and WildEarth Guardians hereby object to the project described below.

LEAD OBJECTOR: Oregon Wild represents 20,000 members and supporters who share our mission to protect and restore Oregon's wildlands, wildlife, and water as an enduring legacy. Our goal is to protect areas that remain intact while striving to restore areas that have been degraded. This can be accomplished by moving over-represented ecosystem elements (such as logged and roaded areas) toward characteristics that are currently under-represented (such as roadless areas and complex old forest). Oregon Wild's contact for this project is Doug Heiken, Conservation and Restoration Coordinator | [redacted] | dh@oregonwild.org.

OTHER OBJECTORS:

WildEarth Guardians is a non-profit organization dedicated to protecting and restoring the wildlife, wild places, wild rivers, and health of the American West. WildEarth Guardians has 7,900 members and more than 187,000 supporters across the western states and maintains offices in Portland, Oregon, and Seattle, Washington. WildEarth Guardians' contact for this project is Chris Krupp, Public Lands Attorney, [redacted] ckrupp@wildearthguardians.org.

Eastern Oregon Legacy Lands is dedicated to expanding public awareness of greater Eastern Oregon's natural and cultural history, and accelerating the pace of land conservation throughout the Blue Mountains ecoregion. We embrace the key role of scientific research and public education in helping rural communities better understand and manage the landscapes they call home. Contact for this project is James Monteith, [redacted] info@eorlegacylands.org.

DOCUMENT TITLE: Morgan Nesbit Forest Resiliency Project, Draft Decision Notice, Draft Environmental Assessment and Finding of No Significant Impact

PROJECT DESCRIPTION:

Table 1 Proposed Actions

Commercial Thinning	Slopes <30% (acres)	Slopes >30% (acres)	Total Acres
Commercial	10,254	1,359	11,613
Commercial w/patch cuts	1,305	217	1,522
Irregular Shelterwood	431	14	445
RHCA Category 1	15	0	15
RHCA Category 2	43	0	43
RHCA Category 4	179	0	179
Total Commercial Thinning Treatments			13,893
Noncommercial Thinning	**Mechanical Thinning (acres)**	**Hand Thinning (acres)**	**Total Acres**
Noncommercial	1,599	1,094	2,693
Noncommercial in RHCAs	19	364	383
Shaded Fuel Breaks	2317	1732	4049
Shaded Fuel Breaks in RHCAs	76	523	599
Total Noncommercial Thinning Treatments			7,669
Other Treatments			**Total Acres**
Aspen Enhancement			264
Meadow Enhancement			129
Prescribed Fire			74,840
Transportation			**Total Miles**
Temporary Road Construction			18
Road Maintenance			367
Road Decommissioning			17.4
Road Storage			3.4
Culverts			**Total Culverts**
Culvert Replacement			16
Culvert Removal			18

PROJECT LINK: https://www.fs.usda.gov/r06/wallowa-whitman/projects/58961

PROJECT LOCATION (Forest/District): Wallowa Valley Ranger District & Hells Canyon National Recreation Area, Wallowa-Whitman National Forest, Wallowa County, Oregon

NAME AND TITLE OF RESPONSIBLE OFFICIAL: Brian Anderson District/Area Ranger: Eagle Cap & Wallowa Valley Ranger District and Hells Canyon National Recreation Area, Wallowa-Whitman National Forest

REQUEST FOR MEETING TO DISCUSS RESOLUTION: Objectors hereby request a meeting to discuss potential resolution of the issues raised in this objection.

NARRATIVE DESCRIPTION OF THOSE ASPECTS OF THE PROPOSED DECISION ADDRESSED BY THE OBJECTION:

- Excessive logging in moist forests that are not a high priority for treatment.
- Excessive logging that will increase vapor pressure deficit and increase stress from climate change, which will make forests less resilient and conflict with the purpose and need.

- Excessive logging that will increase fire hazard, which will make forests less resilient and conflict with the purpose and need.
- Excessive road building in a landscape that already exceeds road density standards, which will make watersheds less resilient and conflict with the purpose and need.
- Excessive logging that will move stands away from LOS conditions in violation of the Eastside Screens.
- Excessive logging that will emit greenhouse gases and make climate change worse, which will make forests less resilient and conflict with the purpose and need.
- Logging in unroaded areas which will push the landscape away from the natural range of variability for large blocks of unfragmented habitat.
- Killing large (>21" dbh) and old trees (>100 years old) in aspen stands.
- Failure to take a hard look at the issues above.
- Failure to prepare an EIS to address significant effects.

SUGGESTED REMEDIES THAT WOULD RESOLVE THE OBJECTION:

Oregon Wild and WildEarth Guardians respectfully request that the Forest Service withdraw the recommended project and —

- Issue a clear decision that avoids logging and road building in roadless and unroaded areas, and protects mature and old-growth trees and stands, protects riparian forests from commercial logging, and retains more trees in logged areas to mitigate adverse effects on future recruitment of large trees and snags, carbon storage, microclimate refugia, and fire hazard. Other suggestions for avoiding adverse impacts and improving this project are explained in our prior comments and this objection; or
- Create separate decisions and do supplemental analysis for the portion of the project in the Hells Canyon National Recreation Area. Since it was created in 1975 by an act of Congress to differentiate it from the rest of the adjacent National Forest, it has not been subject to commercial logging. In addition to not adequately addressing the incredible complexity of the ecological landscape, the EA and FONSI largely ignored that these areas have different management plans and goals. At a minimum, the Forest Service should separate out the HCNRA portions of the project into a different decision and complete supplemental analysis to ensure the proposed actions in the HCNRA are appropriate and consistent with the very different landscapes, legal requirements, and social values of the HCNRA's very distinct, diverse, and complex landscapes.
- Prepare a new EIS to address the significant impacts and unresolved conflicts and fully complies with the requirements of NEPA and addresses the specific concerns expressed below.

In addition to our general concerns, Oregon Wild and WildEarth Guardians have some specific requests for project modifications that would partially address our concerns, including:

Drop Unit 372: This is a small unit (about 10 acres?). It's the headwaters of a riparian area in the HCNRA and likely provides habitat for Rocky Mountain Tailed and Spotted Frogs - along with other values. Based on field review, this unit includes very nice LOS and moist mixed

forest. If it's dense, it's supposed to be that way. As with another unit or two below, our concern here is also that this unit is adjacent to lots of aggressive RHCA and upland logging. Leaving these 10 or so acres for the values mentioned would be helpful for the species reliant on them and provide diversity in an appropriate place. If necessary, perhaps some non-commercial hand thinning could be ok here, but there certainly shouldn't be equipment or fire in this unit, and this unit would be degraded by commercial work. In particular - and as noted in the NEPA docs - here and elsewhere, even moderate intensity thinning is going to lead to decreased shade, drying the area out which will be bad for many values - especially here, riparian wildlife and values. Even temp streams play an important role downstream. And, we fear that this year is a preview of what's to come in our climate-changed future. While we don't think we can afford to do all this thinning across the landscape which will dry it out sooner, we especially think it's important to protect spots like this as microclimate refugia for species dealing with climate stress.

Drop Unit 354B: This is place where thinning is clearly not restoration. It's near an RHCA and great habitat for numerous species that need protection. It's moist forest, presumably LOS, and just really really good habitat and scenic values.

Drop Unit 330: This unit is also very small (less than 15-acres). It is the only unit to the west of the paved 39-road (and therefore between that road and the Wilderness) that requires a temp-road (TR-76). The analysis says it's only 0.35-mile temp road, but it appears that to get there, the agency has to re-open a closed road that goes through the middle of a wildlife corridor. The problems with this unit are magnified by the fact that without a Travel Management Plan (and based on our past experience), we expect that the agency will not have the time and resources to stop that road from being used. Presumably the cost to re-open that road, build the temp-road, decommission the temp road, and re-close the closed road, offsets most - if not all - of the alleged benefits from the timber extraction. Also, with the 39-road there and all the other aggressive treatments including fuel breaks, those acres aren't necessary to "catch a fire" less than half a mile away.

Drop Non-Commercial Thinning Unit NCT-027: This is another spot where this might be ok if it stood alone. However, this unit is in an area with lots of other RCHA treatments, and it's just too much. Non-commercial thinning often becomes an extension of the aggressive adjacent commercial logging. Thinning in this context requires a really compelling justification which we do not see, while dropping it adds appropriate diversity while protecting some unique values. In particular, this is a tributary to Grouse Creek which is an incredibly important steelhead stronghold - one that we know is especially important to the Nez Perce (and everyone who cares about fish). We understand that some maps call the place Shadow Canyon.

Drop RHCA Unit 354B: Another spot that is moist LOS RHCA. With tons of RHCA CAT IV thinning/logging happening, this spot stands out as one with unique values that should be dropped.

Drop non-commercial RHCA units that are adjacent to large areas of adjacent commercial units and/or unforested acres for reasons explained above. These units might be ok if this was the entirety of the project, but in this context, leaving these acres makes a lot of sense to protect a number of important values and provide diversity and refugia on what will be a very disturbed landscape.

Modify the aspen restoration prescription to retain all of the trees >100 years old, and fall and leave some of the large/young conifers.

DESCRIBE HOW THE OBJECTIONS RELATE TO PRIOR COMMENTS:
Oregon Wild submitted detailed comments on the Environmental Assessment (dated 12-19-2024) and during scoping (dated 4-6-2023). These comments raised a variety of concerns including but not limited to each of the issues raised again in this objection.

SPECIFIC ISSUES RELATED TO THE PROPOSED ACTION:

Contents

Failure to follow NEPA

Several of our objections are based on the failure to follow the requirements of the National Environmental Policy Act. While NEPA law may be in flux due to a few radical court decisions and Trump era executive orders, there is still a lot of valid NEPA law that must be followed, including but not limited to:

1. NEPA is a statute, codified at 42 USC §§ 4321-4347, as amended by the Clean Air Act (42 U.S.C. 7609), and the 2023 Fiscal Responsibility Act (FRA),
2. Extensive NEPA case law interpreting the statute, much of which occurred before the 1978 CEQ regulations were approved, but continuing after the CEQ regulations, for instance, when courts rendered decisions founded on statutory language and interpretation, legislative history, other court decisions, etc.
3. NEPA rules properly promulgated by agencies other than CEQ, e.g., 36 CFR 220, including the CEQ regulations where those agency-specific regulations tier to the CEQ regs, e.g., 36 CFR § 220.4.
4. Internal agency guidance that is based on the NEPA statute, NEPA caselaw, and rules properly adopted by agencies with rulemaking authority, e.g., USFS (FSM 1950, FSH 1909.15).
5. CEQ's Feb 19, 2025 memo on implementation of NEPA says " ... agencies should apply their current NEPA implementing procedures with any adjustments needed to be

consistent with the NEPA statute as revised by the FRA. Moreover, although CEQ is rescinding its NEPA implementing regulations at 40 C.F.R. parts 1500–1508, agencies should consider voluntarily relying on those regulations in completing ongoing NEPA reviews …" We will continue to cite the CEQ regs because it still represents the best available guidance on implementing the NEPA statute.

Some of the core requirements of the National Environmental Policy Act itself include …
NEPA Section 101:

> … [I]t is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

42 U.S.C. § 4331

NEPA Section 102:

> The Congress authorizes and directs that, to *the fullest extent possible*: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act, and (2) *all agencies of the Federal Government shall—*
>
> (A) utilize a *systematic, interdisciplinary approach* which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;
>
> (B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by title II of this Act, which will *ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations*;
>
> (C) consistent with the provisions of this Act and except where compliance would be inconsistent with other statutory requirements, include in every recommendation or report on *proposals for legislation* and other *major Federal actions significantly affecting the quality of the human environment, a detailed statement* by the responsible official on—
>
> (i) reasonably *foreseeable environmental effects* of the proposed agency action;
> (ii) any reasonably *foreseeable adverse environmental effects which cannot be avoided* should the proposal be implemented; '
> (iii) a *reasonable range of alternatives* to the proposed agency action, including an analysis of any negative environmental impacts of not implementing the proposed agency action in the case of a no action alternative, that are *technically and economically feasible, and meet the purpose and need* of the proposal;
> (iv) the *relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity*; and
> (v) any *irreversible and irretrievable commitments* of Federal resources which would be involved in the proposed agency action should it be implemented.
>
> Prior to making any detailed statement, the head of the lead agency shall *consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise* with respect to any environmental impact involved. *Copies of such statement and the comments* and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be

made available to the President, the Council on Environmental Quality and to *the public* as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes;

(D) *ensure the professional integrity, including scientific integrity*, of the discussion and analysis in an environmental document;

(E) make use of *reliable data and resources* in carrying out this Act;

(F) consistent with the provisions of this Act, study, develop, and *describe technically and economically feasible alternatives*;

(G) ...

(H) study, develop, and *describe appropriate alternatives* to recommended courses of action in any proposal which *involves unresolved conflicts concerning alternative uses of available resources*;

(I) consistent with the provisions of this Act, *recognize the worldwide and long-range character of environmental problems* and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(J) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment;

(K) initiate and *utilize ecological information in the planning and development of resource-oriented projects*; and

(L) assist the Council on Environmental Quality established by title II of this Act.

42 U.S.C. § 4332.

Note: EAs which lead to a FONSI are subject to the same requirements as an EIS. *Idaho Sporting Congress v. Alexander*, 222 F.3d 562, 565 n.2 (9th Cir. 2000); *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1152 (9th Cir. 1998), *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1247 (9th Cir. 1984); *Southern Oregon Citizens Against Toxic Sprays v. Clark*, 720 F.2d 1475, 1480 (9th Cir. 1983) (stating that "[t]he label of the [NEPA] document is unimportant. We review the sufficiency of the environmental analysis as a whole"). The "alternatives provision" of 42 U.S.C. § 4332(2)(E) applies whether an agency is preparing an EIS or an EA and requires the agency to give full and meaningful consideration to all reasonable alternatives. *Native Ecosystems Council v. U.S. Forest Service,* 428 F.3d 1233, 1245 (9th Cir. 2005); *see Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir. 1988) (The alternatives requirement is triggered where unresolved conflicts as to the proper use of resources exist, whether or not an EIS is required). *Te-Moak Tribe v. Interior, 608 F.3d 592, 601-602 (9th Cir. 2010)* ("Agencies are required to consider alternatives in both EISs and EAs and must give full and meaningful consideration to all reasonable alternatives.")

Failure to use best science

Several of our objections are based on the failure to consider and use best science to inform the public and the decision-maker.

Falsifiability is at the core of science. One must test hypotheses against the best arguments against those hypotheses to see if they hold up. Far too often forest managers tellingly ignore the best arguments against the hypothesis that logging is good for forest ecosystems. Some of the

most reputable forestry schools tend to reinforce economic forestry rather than seek to falsify hypotheses as required by rigorous scientific methods.

NEPA, NFMA, ESA all require use of the best available science and information, so the agency decision-making process overcomes the natural human tendencies to promote institutional interests or perpetuate the status quo.

During ESA Section 7 consultation, the agency "shall use the best scientific and commercial data available." 16 U.S.C. § 1536(a)(2). "[T]he Federal agency requesting formal consultation," "shall provide the Service with the best scientific and commercial data available or which can be obtained during the consultation," to serve as the basis for the Fish and Wildlife Service's subsequent BO. 50 C.F.R. 402.14(d). If the agency uses this kind of information for purposes of consultation, they must share it with the public through the NEPA process.

NEPA's primary purposes are to ensure fully-informed decision-making by federal agencies and to provide for informed public participation in environmental analyses and decision-making processes. 40 C.F.R. § 1500.1(b) & (c). NEPA requires federal agencies to rely upon "high quality information," "accurate scientific analysis" 40 C.F.R. § 1500.1(b), and "full and fair discussion of significant environmental impacts," 40 C.F.R. § 1502.1. The scientific information upon which an agency relies must be of "high quality because accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."[1]

40 CFR 1500.1(b) "The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."

42 USC 4332(2)(D) "Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental documents."

The 9th Circuit held: "To take the required 'hard look' at a proposed project's effects, an agency may not rely on incorrect assumptions or data in an EIS."[2]

Forest Service directives at FSH 1909.12 Section 07 further define the term "best available science" to "inform the planning process":

> (1) Accurate information estimates, identifies, or describes "the true condition of its subject matter" (Forest Service Handbook [FSH] 1909.12 sec 07.12, Figure 1). This can include specific measurements of conditions or estimation of trends. Accurate scientific information should be quantitatively unbiased and free of systematic error.
>
> (2) Reliable information is precise and unaffected by random error; multiple samples represent the same condition (Figure 1). Appropriate scientific methods, including study design, assumptions, analytical approach, and conclusions, should be well-referenced and described, with citations to relevant, credible literature.

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[1] *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1151 (9th Cir. 1998) (internal quotations omitted); see also Portland Audubon Society v. Espy, 998 F.2d 699, 703 (9th Cir. 1993) (overturning decision which "rests on stale scientific evidence, incomplete discussion of environmental effects... and false assumptions")

[2] *Native Ecosystems Council v. USFS.* (9th Circuit August 11, 2005) http://www.elawreview.org/summaries/environmental_quality/nepa/native_ecosystems_council_v_u.html *citing* 40 C.F.R. §§ 1500.1(b) and 1502.24.

> (3) Relevant information is that which pertains to the issues under consideration and relate to the appropriate temporal and spatial scales. Both accurate and reliable science need to be assessed for applicability to the management question. This includes the ability to transfer results to a management question from different systems, species, or geographies or via different methodologies.
>
> The directives note that sometimes a clear scientific consensus might not exist, and in such cases, conflicting information can be acknowledged without necessarily choosing one "best" source of information (FSH 1909.12 sec 07.12).[3]

High quality information and analysis is also required by the 2001 Information Quality Act which amended the Paperwork Reduction Act (44 U.S.C. chapter 35) to require agencies to use accurate, useful, objective, and complete information and analysis. Public Law 106-554, Section 515.

OMB's 2002 Guidelines implementing this law require agencies to:

> … maximize[e] the quality, objectivity, utility, and integrity of information, including statistical information, disseminated by the agency …
> …
> Establish administrative mechanisms allowing affected persons to seek and obtain correction of information maintained and disseminated by the agency …
> …
> Agencies shall treat information quality as integral to every step of an agency's development of information, including creation, collection, maintenance, and dissemination. This process shall enable the agency to substantiate the quality of the information it has disseminated through documentation or other means appropriate to the information.

2002 OMB Guidelines, Fed.Reg 2-22-2002.

The Forest Service must follow USDA guidelines which state: "USDA will strive to ensure and maximize the quality, objectivity, utility, and integrity of the information that its agencies and offices disseminate to the public." USDA also adopted "information quality criteria" that define the terms objectivity, utility, and integrity, using terms like accurate, reliable, unbiased, complete, useful, and transparent. The Morgan Nesbit EA failed to provide complete and unbiased analysis of core issues related to the proposed action (e.g., logging and roads) and their ability to achieve the purpose and need (e.g., resilience).

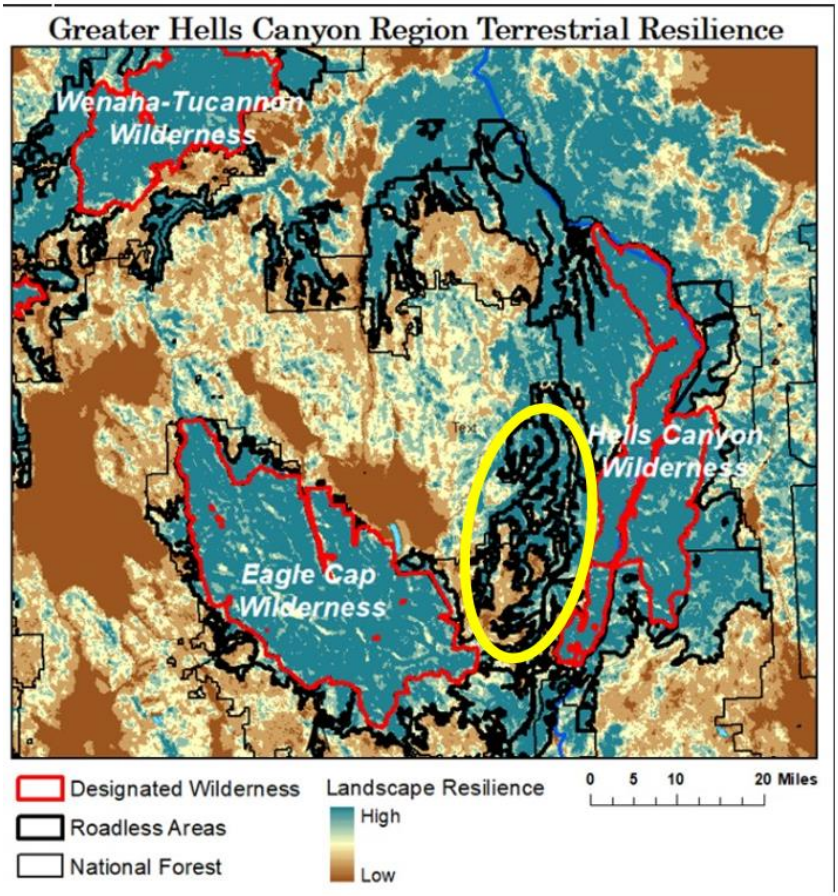
The EA fails to use best science to recognize that fuel reduction is not needed and likely counter-productive in moist mixed conifer forests.

As explained in great detail in objectors' prior comments this is a special landscape that does not need a heavy-handed logging project.

[3] Esch et al. 2018. Using Best Available Science Information: Determining Best and Available. J. For. 116(5):473–480. doi: 10.1093/jofore/fvy037. https://www.researchgate.net/publication/327738915_Using_Best_Available_Science_Information_Determining_Best_and_Available. *citing* https://www.fs.usda.gov/about-agency/regulations-policies/handbook/190912-zero-code

Almost 12,000 acres of the ~14,000 acres of proposed logging are in Douglas-fir, or fir/spruce/mountain hemlock forest types. These forest types naturally develop relatively dense vegetation and experience relatively infrequent fire, and when fires do occur, they tend to be driven by weather conditions rather than fuel conditions. Experts say fuel reduction should focus on warmer/dryer areas mainly at lower elevations, and they de-prioritize fuel reduction in cool/moist areas like this.

The Eastern Oregon Legacy Lands Project (EOLL) has conducted an analysis and produced a map (below) showing that the Morgan Nesbit Project Area is among the more resilient areas in the Pacific Northwest, which brings into question the core purpose of this project, especially the large footprint and aggressive approach to logging.[4]



Northeast Oregon Resilience Map - Morgan Nesbit Project Area circled in yellow.

[4] The supporting science and methods can be reviewed here: https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/oregon/science/Pages/Resilient-Landscapes.aspx *citing* Buttrick, S., K. Popper, M. Schindel, B. McRae, B. Unnasch, A. Jones, and J. Platt. 2015. Conserving Nature's Stage: Identifying Resilient Terrestrial Landscapes in the Pacific Northwest. The Nature Conservancy, Portland Oregon. 104 pp. https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/oregon/science/Documents/PNW%20Terrestrial%20Climate%20Resilience%20Report%20March3%202015.pdf

Another factor that makes landscape fuels treatments less necessary is the natural mosaic of forest and grasslands that cover portions of this project area. (See aerial photo below showing a portion of the Morgan Nesbit Project Area.) Where fuels are naturally fragmented and discontinuous, fire naturally tends to move along the ground, and stay along the ground when it encounters forest.

Halofsky et al (2018) explain why forests with infrequent, stand-replacing fire regimes are not good candidates for fuel reduction.

> To date, most climate adaptation guidance has focused on recommendations for frequent-fire forests, leaving few published guidelines for forests that naturally experience infrequent, stand-replacing wildfires. Because most such forests are inherently resilient to stand-replacing disturbances, and burn severity mosaics are largely indifferent to manipulations of stand structure (i.e., weather-driven, rather than fuel-driven fire regimes), we posit that pre-fire climate adaptation options are generally fewer in these regimes relative to others. Outside of areas of high human value, stand-scale fuel treatments commonly emphasized for other forest types would undermine many of the functions, ecosystem services, and other values for which these forests are known.[5]

Ho et al (2019) state:

> Fewer options exist for reducing fire severity in wetter, high-elevation and coastal forests of the Pacific Northwest, historically characterized by infrequent, stand-replacement fire regimes. In these ecosystems, thinning and hazardous fuel treatments are unlikely to significantly affect fire behavior, because fuels are abundant and fires typically occur under extreme weather conditions (i.e., during severe drought).[6]

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[5] Halofsky, J. S., D. C. Donato, J. F. Franklin, J. E. Halofsky, D. L. Peterson, and B. J. Harvey. 2018. The nature of the beast: examining climate adaptation options in forests with stand-replacing fire regimes. Ecosphere 9(3):e02140. DOI:10.1002/ecs2.2140. https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/ecs2.2140.

[6] Joanne J. Ho, Robert A. Norheim, Jessica E. Halofsky, David L. Peterson, Brian J. Harvey 2019. Changing Wildfire, Changing Forests - How climate change is affecting fire regimes and vegetation in the Pacific Northwest (storymap) https://uw.maps.arcgis.com/apps/Cascade/index.html?appid=9c0f8668f47c4773b56c9b9ae6c301e3 *based on* Jessica E. Halofsky, David L. Peterson, and Brian J. Harvey. 2018. Changing Wildfire, Changing Forests: A Synthesis on the Effects of Climate Change on Fire Regimes and Vegetation in the Pacific Northwest. Seattle: Northwest Climate

Platt et al (2008) state:

> Many of the stands where restoration of historical forest conditions is needed are open canopy and located on south facing slopes and at lower elevations. In contrast, many closed canopy stands are often located at higher elevations and on north-facing slopes where restoration of historical forest conditions is not needed.[7]

The DN is arbitrary and capricious because it is based on a flawed assumption that logging is needed in these moist mixed forests, when in reality these forests have all the building blocks and natural processes present to self-correct, self-organize and produce desired outcomes for this landscape.

The EA fails to use best science to recognize that logging will increase drought stress and make forests less resilient.

Extensive logging will conflict with the purpose and need related to resiliency and adaptation. Excessive logging and canopy removal will allow more warm dry air into the stand and exacerbate vapor pressure deficit which will increase drought stress on existing vegetation.

The Morgan Nesbit draft DN (p 2) says "The modified proposed action meets the purpose and need by Modifying forest composition and structure to reduce stand density, promote desirable drought and fire tolerant species, and promoting late old structure forest stands." This is based on questionable assumptions, such as:

- The incorrect assumption that drought stress is best addressed by reducing stand density to reduce competition for soil water, but new science shows that trees are more stressed by vapor pressure deficit, which will be made worse by logging that allows more warm dry air into the forest.
- The project intends to shift species composition toward more drought and fire tolerant species. Implicit in this is the incorrect assumption that Douglas-fir and Grand fir are not fire tolerant, when science shows these tree species are relatively fire resistant and resilient.
- The incorrect assumption that logging to create less dense stands promote LOS structure, when evidence shows that logging will reduce and degrade important features of LOS forests including dead wood habitat, complex canopy structure, microclimate moderation, etc.
- The incorrect assumption that logging to create less dense forests will reduce fire hazard, when the evidence is that opening the forest canopy tends to increase fire and fuel hazards, with warm dry conditions, slash is moved from the canopy to the ground where

Adaptation Science Center. https://nwcasc.uw.edu/science/project/changing-fires-changing-forests-the-effects-of-climate-change-on-wildfire-patterns-and-forests-in-the-pacific-northwest/

[7] R. V. Platt, T. T. Veblen, and R. L. Sherriff. 2008. Spatial Model of Forest Management Strategies and Outcomes in the Wildland–Urban Interface Natural Hazards Review, Vol. 9, No. 4, November 1, 2008. DOI:10.1061/(ASCE)1527-6988(2008)9:4(199) http://public.gettysburg.edu/~rplatt/Platt%20et%20al._NatHazReview08.pdf.

it is more available for surface fires, and more site resources are made available to stimulate the growth of surface and ladder fuels.

- The implicit assumption that trees are the problem and logging is the solution, and that other factors such as livestock grazing are not contributing factors that reduces the resilience of this landscape through soil compaction, erosion, aquatic degradation, weeds, shifting species composition, encouraging conifer ingrowth, and increased fuel hazard.

The DN is arbitrary and capricious because it is based on a flawed assumption that logging will enhance resilience, without considering all the ways that logging can reduce resilience.

New evidence shows a weak relationship between stand density and resilience. The NEPA analysis failed to consider evidence that thinning may make the stand less resilient instead of more resilient to drought. Thinning will increase penetration of warm dry air into the stand and expose trees to greater vapor pressure deficit. There is new evidence that drought stress and mortality risk experienced by Douglas-fir trees is less a function of soil water availability, but is rather strongly related to atmospheric water availability, specifically vapor pressure deficit. Tree density and thinning may have some minor effect on soil water, but will have no beneficial effect on atmospheric water availability, so thinning is much less likely to provide beneficial effects on tree stress than previously believed. In fact, thinning likely increases drought stress on trees by increasing penetration of warm dry air within thinned forest stands. Lighter thinning would partially mitigate the effect compared to heavy thinning. The agency should consider and disclose these effects and consider a mitigating alternative with light non-commercial thinning of the understory. Watts et al. (2024) found:

> Atmospheric water demand, not soil moisture availability, appears to be the primary cause of tree water stress in the late summer. Temperature-driven increases in vapor pressure deficit from climate change are likely to reduce forest productivity regardless of soil moisture availability.
> Atmospheric water demand, not soil moisture availability, appears to be the primary cause of tree water stress in the late summer. Temperature-driven increases in vapor pressure deficit from climate change are likely to reduce forest productivity regardless of soil moisture availability.
> …
> "How in the world can the trees be water stressed if they haven't used all the water available in the soil?" Wondzell recalls pondering. "We spent a lot of time at the whiteboard asking ourselves, 'Is this data actually correct?'" recalls Bladon.
> …
> In 2018, Jarecke read up on other studies that researched why trees might experience drought stress. What she learned was that the drought stress could be coming from aboveground. "New studies were emphasizing the impact of increasing vapor pressure deficit on tree water stress," she explains. "And there's a misconception in forest management on how we've been thinking about water stress being all about the belowground drought stress."
> Jarecke describes vapor pressure deficit (VPD) as the "drying power of the atmosphere" or phrased another way, how much water vapor or humidity is needed to saturate the air at a given temperature. Hot air can hold more moisture than cold air, which means as temperatures increase without a corresponding increase in humidity, VPD increases. So, how does VPD affect trees? "You can think of a tree as a cluster of tiny straws," explains

> Wondzell. "As the soil dries out, the tree finds it harder and harder to pull soil water into the bottom of these straws. Conversely, aboveground it is the dryness of the air that does the pulling. And as the air gets drier, it pulls harder and harder on the water at the top of the straws."
> ...
> Latewood carbon isotope composition was most strongly correlated to mean daytime VPD between May and September and total rainfall between May and August. The researchers noticed that increased VPD during June, when there was still plenty of soil moisture, decreased the latewood growth, which lent weight to the hypothesis that VPD limits growth even when soil moisture is plentiful.
> ... Karla's research strongly suggests that at her study site, these trees are highly sensitive to vapor pressure deficit," Wondzell says. "Of course, they're also sensitive to rainfall, but it's actually vapor pressure deficit that is by far and away the bigger driver."
> ...
> If vapor pressure deficit is a primary cause of water stress and a primary limitation to tree growth during the long, dry summers typical of western Oregon, thinning could prove ineffective, or even counterproductive, for increasing drought resilience. Thinning a stand could allow penetration of hot, dry air deeper into the canopy, potentially increasing tree water stress.[8]

The airmass warming and drying effect caused by logging likely adds cumulatively to the already significant increase in AED (atmospheric evaporative demand) caused by global warming. Gebrechorkos et al. (2025) state: "... by developing an ensemble of high-resolution global drought datasets for 1901–2022, we find an increasing trend in drought severity worldwide. Our findings suggest that AED has increased drought severity by an average of 40% globally. Not only are typically dry regions becoming drier but also wet areas are experiencing drying trends."[9]

These findings are corroborated by Sohn et al (2016) who showed that heavy thinning was less effective on more arid sites. Thinning in water-limited sites that exposes individual large trees to more sunlight may actually increase certain stress factors, causing "greater vulnerability to hydraulic stress and to higher radiation and evaporative demand of the more exposed crowns" when compared to smaller trees in crowded stands.[10]

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[8] Watts, Andrea; Wondzell, Steve; Jarecke, Karla; Bladon, Kevin. 2024. Hot air or dry dirt: Investigating the greater drought risk to forests in the Pacific Northwest. Science Findings 268. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 6 p. https://www.fs.usda.gov/pnw/sciencef/scifi268.pdf. See also, Karla M. Jarecke, Linnia R. Hawkins, Kevin D. Bladon, Steven M. Wondzell 2023. Carbon uptake by Douglas-fir is more sensitive to increased temperature and vapor pressure deficit than reduced rainfall in the western Cascade Mountains, Oregon, USA. Agricultural and Forest Meteorology, Volume 329, 15 February 2023, 109267. https://www.sciencedirect.com/science/article/abs/pii/S0168192322004543.

[9] Gebrechorkos, S. H., Sheffield, J., M., S., Funk, C., Miralles, D. G., Peng, J., Dyer, E., Talib, J., Beck, H. E., Singer, M. B., & Dadson, S. J. (2025). Warming accelerates global drought severity. *Nature*, 1-8. https://doi.org/10.1038/s41586-025-09047-2, pdf.

[10] Sohn, J. A., S. Saha, and J. Bauhus. 2016. Potential of forest thinning to mitigate drought stress: a meta-analysis. Forest Ecology and Management 380:261–273. https://www.researchgate.net/profile/Somidh_Saha/publication/308097759_Potential_of_forest_thinning_to_mitigate_drought_stress_A_meta-analysis/links/59cc0becaca272bb050c64ea/Potential-of-forest-thinning-to-mitigate-drought-stress-A-meta-analysis.pdf?origin=publication_detail.

High air temperatures caused by thinning can even cause plants to lose water through their cuticle, even when their stomata are closed. Garen et al. (2025):

> We found that the pathway of water loss varied with temperature, such that the cuticular pathway increasingly dominated at higher temperatures. … We further found that as temperature increased, the proportion of water escaping the leaf via the cuticle typically increased … Such high-temperature increases in gcw may be due to phase transitions in the cuticular wax, or thermal expansion of the cuticular matrix resulting in the opening of additional pathways for diffusion in the cuticle surface, … .[11]

Similarly, thinning often also transitions stands from being sun limited to water limited. It may be counter-intuitive, but even in a dry landscape, a stand that is "overstocked" may not be limited by moisture. The competition for sunlight slows growth before it's limited by water, but solar limits are not lethal. Silviculturists often suggest "opening up the stand" to reduce competition for resources including water. However, they might "release" the trees from the solar limitation to the point that they bump into the water limitation, which is in fact lethal, and also likely exacerbated by increased solar radiation and wind heating and drying soils faster.

Thinning is also no a great way to reduce mortality from wildfire. High quality habitat is often relatively dense, but science shows that such forests are also relatively fire resistant and resilient.[12]

The relationship between stand density and mortality may be intuitively appealing but is not well-supported by the evidence. Comments from the Center for Biological Diversity to the California Department of Forestry explained --

> A study in the Douglas fir forests of northeastern Washington found that competition [i.e., higher density] did not affect tree responses to extreme drought. Importantly, trees with more competition from neighbors appeared to have higher drought resistance (i.e., a significantly higher proportion of sapwood area in latewood, which is a trait associated with drought resistance). The authors suggested that "a tree's ability to cope with environmental variability is driven not just by the proximate effects of neighbours on resource availability, but also by phenotypic plasticity and long-term adaptations to competitive stress."
>
> A study that directly investigated the lack of fire on the physiological status of oldgrowth ponderosa pine trees in unlogged forests in Idaho found that, contrary to predictions, oldgrowth trees in stands that were unburned for at least 70 years showed no significant differences in multiple stress indicators compared to non-fire-suppressed stands, indicating that these trees may be "more resilient to increased stand density associated with the lack of fire than previously thought."[13]

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[11] Garen, J. C., & Michaletz, S. T. (2025). Temperature governs the relative contributions of cuticle and stomata to leaf minimum conductance. *New Phytologist*, *245*(5), 1911-1923. https://doi.org/10.1111/nph.20346; https://nph.onlinelibrary.wiley.com/doi/epdf/10.1111/nph.20346.

[12] See for instance, Lesmeister, D. B., S. G. Sovern, R. J. Davis, D. M. Bell, M. J. Gregory, and J. C. Vogeler. 2019. Mixed-severity wildfire and habitat of an old-forest obligate. Ecosphere 10(4):e02696. 10.1002/ecs2.2696. https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/ecs2.2696. And Lesmeister, D.B., Davis, R.J., Sovern, S.G. et al. Northern spotted owl nesting forests as fire refugia: a 30-year synthesis of large wildfires. fire ecol 17, 32 (2021). https://doi.org/10.1186/s42408-021-00118-z; https://fireecology.springeropen.com/counter/pdf/10.1186/s42408-021-00118-z.pdf.

[13] Center for Biological Diversity et al., March 17, 2017 comments on the California Forest Carbon Plan (January 20, 2017 Draft). http://www.biologicaldiversity.org/campaigns/debunking_the_biomass_myth/pdfs/Forest_Carbon_Plan_Commen

The EA also failed to consider the cumulative adverse effects of both logging and continued livestock grazing on the resilience of this landscape.

The EA fails to use best science to recognize that logging has complex effects on fuel conditions and fire hazard.

The EA failed to take a hard look at the complex effects of logging and fuels and fire hazard. Logging that significantly reduces forest canopy can exacerbate fire hazard:

- by making logged stands hotter, drier, and windier,
- by moving hazardous fine fuels from the canopy to the ground where they are more vulnerable to surface fires,
- by more rapidly drying understory fuels,
- by allowing more sunlight and other resources available to stimulate the growth of surface and ladder fuels,
- by extending flame lengths and the rate of fire spread,
- by making future fuel maintenance treatments more frequent, more expensive, and more uncertain.

The DN is arbitrary and capricious because it is based on a flawed analysis in the EA that fails to account for the fact that heavy thinning to open the forest canopy will exacerbate fire hazard, and the analysis fails to account for the fire and resilience benefits of retaining more forest canopy.

When the agency intent is to reduce canopy fuels and canopy fire, the NEPA analysis must consider the return interval of running crown fire (relatively rare), not the return interval of surface fires (relatively more common).

An implicit assumption of many logging proponents is that less fuels means less fire. This is not supported by the evidence. Less fuel does NOT mean less fire. Some fuel can actually help reduce fire, such as deciduous hardwoods that act as heat sinks (under some conditions), and dense canopy fuels that keep the forest cool and moist and help suppress the growth of surface and ladder fuels, and those canopy fuels are connected to large tree boles with thick bark that do not readily burn.

Fitzgerald and Bennett (2013) state:

> Opening up the stand significantly will dry surface fuels due to increased light levels, surface winds and temperatures. This may increase surface fire intensity and rate of spread unless total surface fuel loading is reduced. In addition, thinning that allows

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ts.pdf *citing* Carnwath, G.C. and C.R. Nelson. 2016. The effect of competition on response to drought and interannual climate variability of a dominant conifer tree of western North America. Journal of Ecology 104: 1421-1431, and Keeling, E.G. et al. 2011. Lack of fire has limited physiological impact on old-growth ponderosa pine in dry montane forests of north-central Idaho. Ecological Applications 21: 3227-3237. https://besjournals.onlinelibrary.wiley.com/doi/pdfdirect/10.1111/1365-2745.12604.

> significant light to reach the forest floor may result in the regrowth of small trees and shrubs, which over time become new ladder fuels.[14]

Hakkenberg et al. (2024) showed that ladder fuels were the main driver of wildfire severity, whereas dense, high canopy fuels tend to reduce fire severity, even during extreme fire conditions.

> Here we employed GEDI space-borne lidar to consistently assess how pre-fire forest fuel structure affected wildfire severity across 42 California wildfires between 2019–2021. Using a spatial-hierarchical modeling framework, we found a positive concave-down relationship between GEDI-derived fuel structure and wildfire severity, marked by increasing severity with greater fuel loads until a decline in severity in the tallest and most voluminous forest canopies. Critically, indicators of canopy fuel volumes (like biomass and height) became decoupled from severity patterns in extreme topographic and weather conditions (slopes >20°; winds > 9.3 m/s). On the other hand, vertical continuity metrics like layering and ladder fuels more consistently predicted severity in extreme conditions – especially ladder fuels, where sparse understories were uniformly associated with lower severity levels.
>
> ...
>
> Vertical fuel continuity is especially important for lower stratum ladder fuels, where greater continuity may enable flames to transition from ground and surface fires to higher canopy strata, thereby increasing contagion ... [W]e observed that steep slopes, dry conditions and high winds overwhelmed most fuel structural conditions to constrain landscape severity patterns. Importantly, the sole exception to this pattern occurred with ladder fuels ...
>
> ... This finding suggests that high-intensity fuel treatments (which target entire forest canopies rather than focusing on lower stratum ladder fuels only) may have a limited effect on wildfire severity in extreme conditions. Conversely, sparse understories (<10 m) – even those that concurrently possess robust mid- strata (>10 m) – were associated with reduced wildfire severity. This result has important management implications, especially for treatment interventions that focus on vertical fuel continuity such as understory thinning or cultural burns, which have been found to be effective in reducing high-severity burns2. Understory treatments have also been found to lessen externalities associated with more intensive thinning operations71 and simultaneously promote culturally- and ecologically-beneficial wildfire outcomes across a wide variety of topographic, weather and climate contexts1,72.[15]

Choi et al. (2023) state: "Defoliation of upper canopies will likely increase understorey light availability on the forest floor, and subsequently promote the rapid growth of subcanopy

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[14] Stephen Fitzgerald and Max Bennett. 2013. A Land Manager's Guide for Creating Fire-Resistant Forests. EM 9087. OSU Extension. http://www.nwfirescience.org/sites/default/files/publications/A%20Land%20Managers%20Guide%20for%20Creating%20Fire-resistant%20Forests%20.pdf.

[15] Hakkenberg, C. R., Clark, M. L., Bailey, T., Burns, P., & Goetz, S. J. (2024). Ladder fuels rather than canopy volumes consistently predict wildfire severity even in extreme topographic-weather conditions. *Communications Earth & Environment*, *5*(1), 1-11. https://doi.org/10.1038/s43247-024-01893-8; pdf.

species."[16] The proliferation of understories after logging has significant implications for fuel hazard and fire control.

Keeley et al. (2009) state: "Thinning is most effective when it removes understory trees, because larger overstory trees are more resistant to heat injury (Agee and Skinner 2005). In addition, shade and competition from larger trees slows the recruitment of younger trees in the understory."[17]

Johnson et al (2009) simulated thinning in a densely stocked stand of Ponderosa pine with an understory of Douglas-fir and grand fir.

> The predicted fire type after treatment is surface fire for all thinning options, but the more open stands are characterized predominantly by fuel model 2, so flame lengths increase and potential BA mortality remains above 20 percent regardless of surface fuel treatment. The 200 and 300 TPA… treatments have a more closed canopy and fire behavior is influenced less by grass fuels, so flame lengths and potential BA mortality are lower than the more open stands.
>
> …
>
> The 200 TPA treatment has the greatest long-term effect on crown fire potential, with a predicted surface fire type for 50 years with pile-and burn or no surface fuel treatment and 40 years with prescribed fire treatment. The 50 TPA (124 TPH) treatment had the most short-lived effect on crown fire potential, with regeneration causing a drop in canopy base height in 30 years regardless of surface fuel treatment.[18]

Models show that maintaining canopy cover is a useful way to reduce fire hazard, while removing canopy increases fire hazard. Platt et al. (2006):

> Compared with the original conditions, a closed canopy would result in a 10 percent reduction in the area of high or extreme fireline intensity. In contrast, an open canopy has the opposite effect, increasing the area exposed to high or extreme fireline intensity by 36 percent. Though it may appear counterintuitive, when all else is equal open canopies lead to reduced fuel moisture and increased midflame windspeed, which increase potential fireline intensity.[19]

The NEPA analysis needs to account for the fact that canopy fire risk is greatly reduced by treating surface and ladder fuels because of the increased spatial gap in the vertical continuity of

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[16] Choi, D. H., LaRue, E. A., Atkins, J. W., Foster, J. R., Matthes, J. H., Fahey, R. T., Thapa, B., Fei, S., & Hardiman, B. S. (2023). Short-term effects of moderate severity disturbances on forest canopy structure. *Journal of Ecology*, *111*(9), 1866-1881. https://doi.org/10.1111/1365-2745.14145.

[17] Keeley, J.E.; Aplet, G.H.; Christensen, N.L.; Conard, S.C.; Johnson, E.A.; Omi, P.N.; Peterson, D.L.; Swetnam, T.W. 2009. Ecological foundations for fire management in North American forest and shrubland ecosystems. Gen. Tech. Rep. PNW-GTR-779. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 92 p. https://www.fs.usda.gov/pnw/pubs/pnw_gtr779.pdf.

[18] Morris Johnson, David L. Peterson, and Crystal Raymond 2009. Fuel treatment guidebook: illustrating treatment effects on Fire hazard. Fire Management Today 69(2) https://web.archive.org/web/20170517083443/https://www.fs.fed.us/fire/fmt/fmt_pdfs/FMT69-2.pdf p 32-33.

[19] Rutherford V. Platt, Thomas T. Veblen, and Rosemary L. Sherriff. 2006. Are Wildfire Mitigation and Restoration of Historic Forest Structure Compatible? A Spatial Modeling Assessment. Annals of the Association of American Geographers, 96(3), 2006, pp. 455–470. http://www.colorado.edu/geography/class_homepages/geog_4430_f10/Platt%20et%20al_Wildfire%20Mitigatnion_AnAAG_2006.PDF.

fuels as well as the reduced preheating of canopy fuels by burning fuels below the canopy. There is no compelling need to reduce the density of canopy fuels, and many lines of evidence indicate that heavy thinning to reduce canopy density will increase rather than decrease fire hazard.

The EA fails to use best science to consider the effects of roads and alternatives that reduce the need for so many roads.

Our comments and objection repeatedly refer to significant effects from the combination of thousands of acres of commercial logging and 18 miles of road construction (plus road use). In spite of their name, "temporary roads" still cause serious adverse impacts to soil, water, wildlife, fire ignition risk, carbon, and spread weeds. Decommissioning such roads is not entirely successful and the soil compaction effects can last for decades. The agency should consider avoiding building spurs by treating more areas non-commercially (e.g. thin lightly, create lots of snags, and leave the material on site).

Carnefix and Frissell (2009) tells us that

> … no truly "safe" threshold road density exists, but rather negative impacts begin to accrue and be expressed with incursion of the very first road segment; and 2) highly significant impacts (e.g., threat of extirpation of sensitive species) are already apparent at road densities on the order of 0.6 km/km2 (1.0 mi/mi²) or less.[20]

Conservation biologist Reed Noss explains:

> Nothing is worse for sensitive wildlife than a road. Over the last few decades, studies in a variety of terrestrial and aquatic ecosystems have demonstrated that many of the most pervasive threats to biological diversity - habitat destruction and fragmentation, edge effects, exotic species invasions, pollution, and overhunting - are aggravated by roads. Roads have been implicated as mortality sinks for animals ranging from snakes to wolves; as displacement factors affecting animal distribution and movement patterns; as population fragmenting factors; as sources of sediments that clog streams and destroy fisheries; as sources of deleterious edge effects; and as access corridors that encourage development, logging and poaching of rare plants and animals. Road-building in National Forests and other public lands threatens the existence of de facto wilderness and the species that depend on wilderness.[21]

Especially in light of climate change and its interactions with the transportation system, the NEPA analysis should review and consider the information and recommendations made in the scientific literature.

> The following literature review summarizes the most recent thinking related to the environmental impacts of forest roads and motorized routes and ways to address them. The literature review is divided into three sections that address the environmental effects

[20] Carnefix, G. and C.A. Frissell. "Aquatic and Other Environmental Impacts of Roads: The Case for Road Density as Indicator of Human Disturbance and Road-Density Reduction as Restoration Target; A Concise Review." Pacific Rivers Council Science Publication (2009) 09-001. Pacific Rivers Council, Portland, OR and Polson, MT. https://web.archive.org/web/20120313104907/http://pacificrivers.org/science-research/resources-publications/road-density-as-indicator.

[21] Noss, Reed; The Ecological Effects of Roads; http://www.wildlandscpr.org/ecological-effects-roads; http://www.eco-action.org/dt/roads.html.

of transportation infrastructure on forests, climate change and infrastructure, and creating sustainable forest transportation systems.

I. Impacts of Transportation Infrastructure and Access to the Ecological Integrity of Terrestrial and Aquatic Ecosystems and Watersheds
II. Climate Change and Transportation Infrastructure Including the Value of Roadless Areas for Climate Change Adaptation
III. Sustainable Transportation Management in National Forests as Part of Ecological Restoration

...

As climate change impacts grow more profound, forest managers must consider the impacts on the transportation system as well as from the transportation system. In terms of the former, changes in precipitation and hydrologic patterns will strain infrastructure at times to the breaking point resulting in damage to streams, fish habitat, and water quality as well as threats to public safety. In terms of the latter, the fragmenting effect of roads on habitat will impede the movement of species which is a fundamental element of adaptation.

...

Transportation infrastructure and carbon sequestration

The topic of the relationship of road restoration and carbon has only recently been explored. There is the potential for large amounts of carbon (C) to be sequestered by reclaiming roads. When roads are decompacted during reclamation, vegetation and soils can develop more rapidly and sequester large amounts of carbon. A recent study estimated total soil C storage increased 6 fold to 6.5 x 107g C/km (to 25 cm depth) in the northwestern US compared to untreated abandoned roads (Lloyd et al. 2013). Another recent study concluded that reclaiming 425 km of logging roads over the last 30 years in Redwood National Park in Northern California resulted in net carbon savings of 49,000 Mg carbon to date (Madej et al. 2013, Table 5).[22]

Road networks are also associated with reduced carbon storage in adjacent and nearby forests.[23]

Science indicates that the erosion from roads is far worse than that from severe fire.[24] This should be part of the NEPA analysis weighing the relative risks from fire vs the effects of logging and roads.

The ICBEMP analysis found that roads have a disproportionate impacts on aquatic and terrestrial systems.

A good example of combined departures [from historic range of variability] is roads on BLM- and FS-administered lands. Road surface area in itself only accounts for 2 percent of the BLM- and FS-administered lands. However, because of the linear pattern across

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[22] The Wilderness Society. 2014. Transportation Infrastructure and Access on National Forests and Grasslands - A Literature Review. May 2014. https://www.fs.usda.gov/nfs/11558/www/nepa/96158_FSPLT3_3989888.pdf, https://www.sierraforestlegacy.org/Resources/Conservation/ProjectsPlans/ForestPlanRevisions/SFL%20et%20al.%20FPR%20comments%20part%205%20of%205.pdf.

[23] Hu, X., Zhang, L., Ye, L., Lin, Y. & Qiu, R. Locating spatial variation in the association between road network and forest biomass carbon accumulation. Ecol. Indic. 73, 214–223 (2017). https://www.sciencedirect.com/science/article/abs/pii/S1470160X16305738.

[24] Colombaroli, D. and D.G. Gavin. 2010. Highly episodic fire and erosion regime over the past 2000 years in the Siskiyou Mountains, Oregon. Proceedings of the National Academy of Sciences of the United States of America 107: 18909-18914. http://www.pnas.org/content/early/2010/10/13/1007692107.full.pdf.

the contour and connected effects on aquatic and terrestrial systems the affected area is approximately 65 percent. … Road density was found to be indirectly correlated with: (1) the distribution and spread of exotic plants, (2) many forest composition and structural changes, (3) efficacy of fire suppression activities, and (4) the probability of fire occurrence due to human caused ignitions. In forest systems, roads were associated with timber-management practices and thus correlated with the transition of shade-intolerant to shade-tolerant species, the loss of late-seral structures, reduced densities of large trees and snags, and increased fuel loadings. In rangeland systems, roads appear to function as vectors for dispersing exotic species. Regardless of the biophysical setting, roads appear to increase the efficacy of fire-suppression activities. … Subbasins having the highest forest integrity values were largely unroaded … Conversely, subbasins … that had been intensively roaded, typically had the lowest forest integrity …

…

Major decreases in pool habitat have been caused by two factors: the loss of riparian vegetation, and road and highway construction accompanying human activities (such as timber harvest, grazing, and farming). Most notably, pool frequency (large pools and all pools) is inversely correlated with road density and management intensity. … The amount of fine sediment (sediment less than 6 mm) on channel beds is another important aspect of habitat quality that apparently is influenced by management. The results of our analysis indicate road density significantly affects surface fines and corroborates the link between forest management practices and channel sediment characteristics. … [T]he proportion [of strong salmonid populations] declines with road density. …

Roads and Associated Activity

Roads contribute to the disruption of hydrologic function and increase sediment delivery to streams. Roads also provide access, and the activities that accompany access magnify their negative effects on aquatic habitats. Activities associated with roads include fishing, recreation, timber harvest, livestock grazing, and agriculture. Roads also provide avenues for stocking non-native fishes. Unfortunately, we do not have adequate broad-scale information on many of these attendant effects to accurately identify their component contributions. Thus we are forced to use roads as a catch-all indicator of human disturbance.

The discussion of the relationship of roads to fishes often centers around three themes: 1) the belief that road-building practices have improved enough in the last decade that we should not worry about their effects on aquatic systems; 2) the legacy of past road building is so vast and road maintenance budgets so low that the problems will be with us for a long time; and 3) the belief that there is not a strong correlation between road density and fish habitat and population.

From an intensive review of the literature, we conclude that increases in sedimentation are unavoidable even using the most cautious reading methods. Roads combined with wildfires accentuate the risk from sedimentation. The amount of sediment or hydrologic alteration from roads that streams can tolerate before there is a negative response is not well known. It is not fully known which causes greater risk to aquatic systems: building roads to reduce fire risk or realizing the potential risk of fire. More research is needed in this area.

The ability of the Forest Service and Bureau of Land Management to conduct road maintenance has been sharply reduced because of declining budgets. This is resulting in progressive degradation of road drainage structures and a potential increase in erosion. Most problems are with older roads that are located in sensitive terrain and roads that have been essentially abandoned, but are not adequately configured for long-term

> drainage. Given the magnitude of the area of federal forests with moderate to high road densities, the job of road maintenance will be expensive. Most road networks have not been inventoried to determine influence on riparian or aquatic resource goals and objectives.
>
> We conducted two analyses examining the correlation of roads to habitat and fish population status. Each of these **analyses support the general conclusion that increasing road density correlates with declining aquatic habitat conditions and aquatic integrity**. Our results clearly show that increasing road densities (combined with the activities associated with roads) and their attendant effects are associated with declines in the status of four nonanadromous salmonid species. Those species are less likely to use moderate to highly roaded areas for spawning and rearing, and if found are less likely to be at strong population levels. There is a consistent and unmistakable pattern based on empirical analysis of thousands of combinations of known species status and subwatershed conditions. The analysis is limited primarily to forested lands managed by the Forest Service and Bureau of Land Management.
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> ...
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> Designated wilderness and potentially unroaded areas are important anchors for [salmonid] strongholds throughout the Basin. More than 8 million hectares (27%) of Forest Service and BLM lands in the Basin contain strongholds (40% of Forest Service and 4% of BLM). These stronghold subwatersheds contain large areas of unroaded land (about 4.7 million hectares), averaging 58 percent of the area of an individual subwatershed.[25]

Given all this evidence, it is unreasonable to think that "modern road practices" avoid these problems, because the described effects seem to be mostly inherent and unavoidable outcomes of roads.

EPA describes the impacts of roads as follows:

> Stormwater discharges from logging roads, especially improperly constructed or maintained roads, may introduce significant amounts of sediment and other pollutants into surface waters and, consequently, cause a variety of water quality impacts. ... [S]ilviculture sources contributed to impairment of 19,444 miles of rivers and streams [nationwide]. ... forest roads can degrade aquatic ecosystems by increasing levels of fine sediment input to streams and by altering natural streamflow patterns. Forest road runoff from improperly designed or maintained forest roads can detrimentally affect stream health and aquatic habitat by increasing sediment delivery and stream turbidity. This can adversely affect the survival of dozens of sensitive aquatic biota (salmon, trout, other native fishes, amphibians and macroinvertebrates) where these species are located. Increased fine sediment deposition in streams and altered streamflows and channel morphology can result in increased adult and juvenile salmonid mortality where present (e.g., in the Northwest and parts of the East), a decrease in aquatic amphibian and invertebrate abundance or diversity, and decreased habitat complexity.
>
> The physical impacts of forest roads on streams, rivers, downstream water bodies and watershed integrity have been well documented but vary depending on site-specific factors. Improperly designed or maintained forest roads can affect watershed integrity

[25] Quigley, Thomas M.; Arbelbide, Sylvia J., tech. eds. 1997. An assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins: volume 1. Gen. Tech. Rep. PNW-GTR-405. Portland, OR. https://doi.org/10.2737/PNW-GTR-405.

through three primary mechanisms: they can intercept, concentrate, and divert water (Williams, 1999).[26]

NRDC issued a report that discusses the impacts of roads:

1. Harm Wildlife
2. Spread Tree Diseases and Bark Beetles
3. Promote Insect Infestations
4. Cause Invasion by Harmful Non-native Plant and Animal Species
5. Damage Soil Resources and Tree Growth
6. Adversely Impact Aquatic Ecosystems[27]

The NEPA analysis assumes that temporary roads will have little or no effect because they are temporary. The NEPA analysis does not support this assumption. In fact, scientific research has shown exactly the opposite. Research results, published in *Restoration Ecology,* shows there is nothing temporary about temporary roads, and that ripping out a road is NOT equal to never building a road to begin with.

> The saturated hydraulic conductivity of a ripped road following three rainfall events was significantly greater than that of the road surface before ripping… most saturated hydraulic conductivities after the third rainfall event on a ripped road were in the range of 22 to 35 mm/hr for the belt series and 7 to 25 mm/hr for the granitics. These conductivities are modest compared to the saturated hydraulic conductivity of a lightly disturbed forest soil of 60 to 80 mm/hr." id. Even this poor showing of restoring pre-road hydrologic effects worsened with repeated rainfall. "Hydraulic conductivity values for the ripped treatment on the granitic soil decreased about 50% with added rainfall ($p(K1=K2)=0.0015$). This corresponded to field observations of soil settlement and large clods of soil created by the fracture of the road surface dissolving under the rainfall… The saturated hydraulic conductivity of the ripped belt series soils also dropped from its initial value. Initially, and for much of the first event, the ripped plots on the belt series soil showed no runoff. During these periods, run-off from higher areas flowed to low areas and into macropores…. Erosion of fine sediment and small gravel eventually clogged these macropores… Anecdotal observations of roads ripped in earlier years revealed that after one winter, the surfaces were nearly as solid and dense as the original road surfaces." Id. Even though ripped roads increase water infiltration over un-ripped roads, it does not restore the forest to a pre-road condition. "These increases do not represent 'hydrologic recovery' for the treated areas, however, and a risk of erosion and concentration of water into unstable areas still exists.[28]

We urge the agency to avoid road construction, including temporary road construction. The ecological costs of road construction almost always outweigh any benefits of the associated commercial logging activity. Since an optimal landscape restoration plan includes a mix of

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[26] EPA 2012. Notice of Intent To Revise Stormwater Regulations … Federal Register. May 23, 2012. http://www.gpo.gov/fdsys/pkg/FR-2012-05-23/pdf/2012-12524.pdf.

[27] NRDC 1999. "End of the Road: The Adverse Ecological Impacts of Roads and Logging: A Compilation of Independently Reviewed Research" (1999), https://web.archive.org/web/20081024112126/http://www.nrdc.org/land/forests/roads/eotrinx.asp

[28] Luce, C.H., 1997. Effectiveness of Road Ripping in Restoring Infiltration Capacity of Forest Roads, Restoration Ecology; 5(3):265-270. https://www.fs.usda.gov/t-d/programs/im/road_decomission/forms/luce_ripping_97_preprint.pdf.

treated and untreated areas, the agency can easily avoid road construction by co-locating untreated areas and areas inaccessible from existing roads.

Temporary roads have many of the same impacts as permanent roads, including complete vegetation removal, severe soil disturbance and compaction, severe modification of the flow of water and air through the soil, impairment of soil biological activity, wildlife habitat fragmentation (especially for microfauna), and wildlife cover loss. In spite of the fact that some roads may only be used by heavy equipment on a temporary basis, the biophysical effects of temporary roads can be long-lasting. The FS may even come back and use these temporary roads for future vegetation management or fire management. The temporal effects of temp roads can also be extended by legal or illegal use by off highway vehicles, woodcutters, hunters, mushroom collectors, etc.

The November 2000 National Forest Roadless Area Conservation FEIS p 3-30 says that temporary roads are not designed and constructed to the same standard as classified roads and therefore result in a "higher risk of environmental impacts." The NEPA analysis must account for this increased risk of temporary roads compared to permanent roads.

The Roadless FEIS also says:

> Temporary roads present most of the same risks posed by permanent roads, although some may be of shorter duration. Many of these roads are designed to lower standards than permanent roads, are typically not maintained to the same standards, and are associated with additional ground disturbance during their removal. Also, use of temporary roads in a watershed to support timber harvest or other activities often involves construction of multiple roads over time, providing a more continuous disturbance to the watershed than a single, well-designed, maintained, and use-regulated road. While temporary roads may be used temporarily, for periods ranging up to 10 years before decommissioning, their short- and long-term effects on aquatic species and habitats can be extensive. [The FEIS has similar disclosures citing extensive impacts to terrestrial species and habitats, and rare plant populations.][29]

Failure to prepare an EIS to address likely significant effects.

The FONSI is arbitrary and capricious. Implementing this project will cause significant effects which require consideration in an EIS. As described throughout our prior comments and this objection, significant effects are expected from:

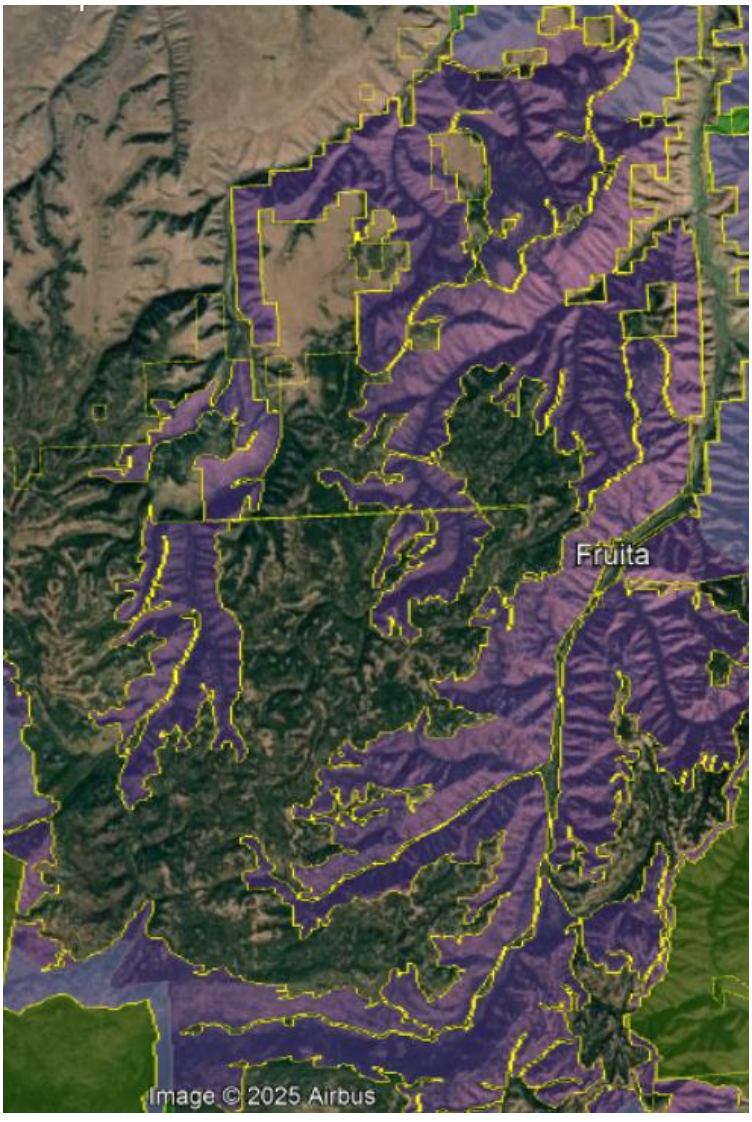
- Excessive logging in moist forests that are not a high priority for treatment. This is a large scale project with almost 14,000 acres of commercial logging with adverse impacts on habitat, microclimate, carbon emissions, dead wood recruitment, fire hazard, vapor pressure deficit and drought stress, loss and degradation of climate refugia, recreation, scenery,
- Excessive logging that will increase vapor pressure deficit and increase stress from climate change, which will make forests less resilient and conflict with the purpose and need.

[29] Roadless Area Conservation FEIS — Specialist Report for Terrestrial and Aquatic Habitats and Species prepared by Seona Brown and Ron Archuleta, EIS Team Biologists http://web.archive.org/web/20040515020554/http://roadless.fs.fed.us/documents/feis/specrep/xbio_spec_rpt.pdf.

- Excessive logging that will increase fire hazard, which will make forests less resilient and conflict with the purpose and need.
- Excessive road building in a landscape that already exceeds road density standards, which will make watersheds less resilient and conflict with the purpose and need. Es explained below, temporary roads are temporary in name only. Temporary roads have long lasting impacts on soil, water, vegetation/weeds, habitat, and carbon.
- Excessive logging that will move stands away from LOS conditions in violation of the Eastside Screens.
- Excessive logging that will emit greenhouse gases and make climate change worse, which will make forests less resilient and conflict with the purpose and need.
- Unnecessarily killing large (>21" dbh) and old trees (>100 years old) in aspen stands. Aspen and large conifers often co-exist.
- Logging in unroaded areas which will push the landscape away from the natural range of variability for large blocks of unfragmented habitat.
- This landscape already exceeds forest plan objectives for road density, but this project will build 18 miles of roads, and mitigation will not fully off-set the long-term adverse effects of roads on soil, water, weeds, big game security, habitat fragmentation, natural hillslope processes, fire ignition risk, stimulation of roadside ladder fuels, etc.,
- Logging and road construction will have complex effects and cause many adverse trade-offs, and the proposed actions actually conflict with the purpose and need, (see page 11 of our comments on the EA) but the NEPA analysis brushes aside the trade-offs and oversimplifies the complexities, and provides a misleading analysis to the public and the decision-maker,
- Logging in the Congressionally designated HCNRA, which is controversial,
- Logging will have adverse impacts on unroaded areas that are rare on the landscape and an important part of the natural range of variability,
- Logging steep slopes with risks and uncertainties for soil, water, and slope stability,
- Logging in RHCAs with adverse impacts to microclimate and wood recruitment,
- Emissions of greenhouse gases from logging and roads,
- Loss and degradation of cool-moist forests needed as climate refugia,
- Logging and roads will have significant adverse impacts to ESA-listed species,
- Logging will significantly reduce the pool of green trees and cause a long-term reduction in recruitment of snag habitat that is already in short supply,
- Uncertainty whether extensive logging and roads will meet the purpose and need,
- Potential violations of substantive requirements: (see separate section below)
- NEPA violations:
    - failure to take a hard look at significant effects related to fire hazard, GHG emissions, road construction, connectivity,
    - failure to consider a reasonable range of alternatives, such as retaining far more trees and building far fewer roads which would help mitigate adverse effects of logging and roads on fire hazard, snag recruitment, GHG emissions/carbon storage, microclimate refugia, slope stability, connectivity, habitat for special status wildlife

- failure to prepare and EIS to consider likely significant effects.

Our prior comments pointed out the significant extent of unroaded/undeveloped lands in this project area. See map below. These areas are a critical part of the natural range of variability which all wildlife evolved with. These large blocks of unroaded habitat that are rare on the landscape due to past logging and roading. Many of these areas have never been logged before and they provide disproportionate ecosystem services, such as soil, water quality, watershed integrity, fish & wildlife habitat, carbon storage, recreation, and quality of life. We are not opposed to careful non-commercial thinning and prescribed fire in these areas, but commercial logging and roads will cause significant effects. The EA failed to take a hard look at the disproportionate negative impacts of logging and road building in these areas. The EA did not disclose the values in these areas. Where they might be logged or roaded, nor did the EA alternatives that avoid or mitigate these impacts. The FS has an inventory of areas >5,000 acres, but they fail to recognize the current scientific view that areas 1,000-5,000 acres are also critically important and threatened by logging.



The NEPA analysis failed to reflect the growing scientific evidence (cited below) indicating the significant value of roadless areas smaller than 5,000 acres and larger than 1,000 acres, and the potential significant adverse effects from logging and roads that interfere in the natural processes that have maintained these areas for millennia. The scientific literature emphasizes the importance of unroaded areas greater than 1,000 acres as strongholds for the production of fish and other aquatic and terrestrial species, as well as sources of high quality water. Commercial logging and/or road building within large unroaded areas threatens these significant ecological values.

World Wildlife Fund and the Conservation Biology Institute summarized the important attributes of small roadless areas (1,000-5,000 acres).

> Small roadless areas share many of attributes in common with larger ones, including:
> • Essential habitat for species key to the recovery of forests following disturbance such as herbaceous plants, lichens, and mycorrhizal fungi
> • Habitat refugia for threatened species and those with restricted distributions (endemics)
> • Aquatic strongholds for salmonids
> • Undisturbed habitats for mollusks and amphibians
> • Remaining pockets of old-growth forests
> • Overwintering habitat for resident birds and ungulates
> • Dispersal "stepping stones" for wildlife movement across fragmented landscapes[30]

In a 1997 letter to President Clinton, 136 scientists said:

> There is a growing consensus among academic and agency scientists that existing roadless areas–irrespective of size–contribute substantially to maintaining biodiversity and ecological integrity on the national forests. The Eastside Forests Scientific Societies Panel, including representatives from the American Fisheries Society, American Ornithologists' Union, Ecological Society of America, Society for Conservation Biology, and The Wildlife Society, recommended a prohibition on the construction of new roads and logging within existing (1) roadless regions larger than 1,000 acres, and (2) roadless regions smaller than 1,000 acres that are biologically significant.... Other scientists have also recommended protection of all roadless areas greater than 1,000 acres, at least until landscapes degraded by past management have recovered.... As you have acknowledged, a national policy prohibiting road building and other forms of development in roadless areas represents a major step towards balancing sustainable forest management with conserving environmental values on federal lands. In our view, a scientifically based policy for roadless areas on public lands should, at a minimum, protect from development all roadless areas larger than 1,000 acres and those smaller areas that have special ecological significance because of their contributions to regional landscapes.[31]

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[30] DellaSala, Dominick and James Strittholt. 2002. Scientific Basis For Roadless Area Conservation. World Wildlife Fund. Ashland, OR; Conservation Biology Institute. (June 2002 - Updated October 2003) https://consbio.org/wp-content/uploads/2022/05/Scientific_Basis_For_Roadless_Area_Conservation.pdf.

[31] Letter to President Clinton from 136 scientists (Dec. 10, 1997).

https://drive.google.com/file/d/0B4L_-RD-MJwrRzhFcm5QcFR0MHM/view?usp=sharing&resourcekey=0-2-sbGMN3bOUBQGGMDBQM1Q

There are tremendous co-benefits from conserving large blocks of unmanaged forests, such as climate mitigation and biodiversity conservation. Roberts et al. (2020):

> Based on the species–area relationship, regarded as one of ecology's few universal laws, protection of [too] little habitat will condemn thousands of species to extinction if habitat outside them is converted, degraded or lost. It is this logic that underpins calls for 'Nature Needs Half' [26], together with an understanding that ecosystem processes and services of the scale needed to sustain the well-being of life on Earth require large wildlife populations and huge expanses of intact and restored habitat. … Climate change adds a new dimension to the question of how much protected area coverage is needed to assure conservation of wild nature. Climate change is already reducing wildlife population sizes and forcing range shifts as conditions alter [28,29]. Protected areas counter such stresses by building up populations, and connectivity of populations and habitats is emerging as a key property in securing species persistence and resilience to rapid change [5]. Hence networked protected areas, especially where embedded within well-managed land or seascapes, provide crucial stepping stones to accommodate range shifts and, where no further movements are possible, refuges of last resort [5]. Analyses suggest that adequate levels of population viability and connectivity can be achieved only with marine protected area coverages of 30% or more [27]. … [G]iven that many ecosystems are already degraded, ensuring continued provision of ecosystem services requires not only the precautionary protection of currently intact habitats, but also large-scale habitat restoration.
>
> Providing greater space for recovery of intact, vibrant nature is not altruistic conservation, but is, we argue, an indispensable act of self- preservation, producing a cascade of benefits that will help maintain the habitability of the biosphere as the climate changes, thereby securing the well-being of generations to come.[32]

Law et al (2022) make a strong case that conservation of intact forests advances the twin goals of protecting the climate and biodiversity, and that broad-scale thinning to reduce fire severity conflicts with climate and biodiversity goals.

> …
>
> "While primary forests of all extents have conservation value, areas of greater extent warrant particular attention where they persist, as they support more biodiversity, contain larger carbon stocks, provide more ecosystem services, encompass larger-scaled natural processes, and are more resilient to external stresses. The significance of large areas of primary forests has been highlighted by the global mapping of Intact Forest Landscapes (IFL) greater than 500 km2 in extent. While suitable for many purposes, other thresholds may be more suitable at regional and national levels that reflect local ecological factors." (IUCN Policy Statement on Primary Forests, https://www.iucn.org/sites/dev/files/content/documents/iucn_pf-ifl_policy_2020_approved_version.pdf, accessed on 22 April 2020).
>
> …
>
> Instead of regularly harvesting on all of the 70% of U.S. forest land designated as "timberlands" by the U.S. Forest Service, setting aside sufficient areas as Strategic Reserves would significantly increase the amount of carbon accumulated between now,

[32] Roberts CM, O'Leary BC, Hawkins JP. 2020 Climate change mitigation and nature conservation both require higher protected area targets. Phil. Trans. R. Soc. B 375: 20190121. https://royalsocietypublishing.org/doi/pdf/10.1098/rstb.2019.0121. See also, Soto-Navarro C et al. 2020 Mapping co-benefits for carbon storage and biodiversity to inform conservation policy and action. Phil. Trans. R. Soc. B 375: 20190128. http://dx.doi.org/10.1098/rstb.2019.0128 showing the congruence of high carbon value and high biodiversity value in PNW forests.

> 2050 and 2100, and reestablish greater ecosystem integrity, helping to slow climate change and restore biodiversity. The 2022 IPCC AR6 report stated that "Recent analyses, drawing on a range of lines of evidence, suggest that maintaining the resilience of biodiversity and ecosystem services at a global scale depends on effective and equitable conservation of approximately 30% to 50% of Earth's land, freshwater and ocean areas, including currently near-natural ecosystems (high confidence)." Continuing commercial timber harvest on a portion of the remaining public lands and tens of millions of hectares of private lands would continue to adequately supply a sustainable forestry sector. Preserving and protecting mature and old forests would not only increase carbon stocks and growing carbon accumulation, they would slow and potentially reverse accelerating species loss and ecosystem deterioration, and provide greater resilience to increasingly severe weather events such as intense precipitation and flooding.
>
> …
>
> Many of the existing forest management practices allegedly protect forests and homes from wildfire and are having severe adverse effects on forest ecosystem integrity and resilience, and are worsening climate change and diminishing biodiversity.
>
> …
>
> To summarize, harvest-related emissions from thinning are much higher than potential reduction in fire emissions. In west coast states, overall harvest-related emissions were about 5 times fire emissions …[33]

Law et al (2022) describe a strategic reserve approach to protect water, biodiversity, and carbon in Oregon's forests. Existing unroaded areas could make a significant contribution to such an approach.

> Our study demonstrated that Oregon has high carbon density forests that also have high biodiversity and connectivity for species movement. When these characteristics were prioritized within each ecoregion, it identified sufficient forestland to meet both the 30% protection by 2030 and 50% by 2050 targets that are important nationally and internationally. … the climate resilience rank highlights large areas within the ecoregions with larger landscape features that are important for resilience (Figure 2D), such as the topography of mountain ranges in southwest Oregon, the Coast Range, Cascades, and Blue Mountains in the northeast. … Meeting the forest preservation targets would substantially increase protection of tree carbon stocks, animal and tree species' habitat, and surface drinking water source areas. … Meeting these forest preservation targets would substantially increase forest habitat protection for threatened and endangered (T&E) species and other species of interest … Mitigation strategies need to explicitly protect existing oldgrowth forests, and allow mature secondary forests to regrow to their carbon capacity. For climate mitigation using natural climate solutions, effectiveness is based on the time that a unit of biomass carbon is resident in a forest ecosystem stock and thus kept out of the atmosphere (Körner, 2017; Mackey et al., 2020). … We also found that limiting harvest to half of current levels on public lands and doubling harvest cycles to 80 years on private lands was three times more effective as a land use strategy than replanting and reforestation after cutting within current forest boundaries in Oregon (Law et al., 2018). … There is concern that protecting areas that are vulnerable to increased drought and fire will be ineffective, however, species diversity, and threatened and endangered species still need habitat, refugia and connectivity with other protected

[33] Law, Beverly E., William R. Moomaw, Tara W. Hudiburg, William H. Schlesinger, John D. Sterman, and George M. Woodwell. 2022. Creating Strategic Reserves to Protect Forest Carbon and Reduce Biodiversity Losses in the United States. Land Vol. 11, no. 5: 721. https://doi.org/10.3390/land11050721, https://www.mdpi.com/2073-445X/11/5/721/htm.

areas. Wildfires tend to be patchy, and a majority of trees survive low to mixed-severity fires (Halofsky et al., 2011) that can be critical habitat, and burned forests still retain the vast majority of their carbon (Hudiburg et al., 2009; Law et al., 2018). … Older forests in Oregon's watersheds exhibit greater water retention and improved late summer stream flows compared to managed plantations (Segura et al., 2020). Intact forests also tend to harbor more large and old trees, bolstering carbon stores and biodiversity services that large trees provide (Lutz et al., 2018; Plumtre et al., 2021). … The most important action Oregon can take to mitigate climate change, reduce biodiversity losses, and protect watersheds for drinking water is to set aside existing forests.[34]

The EA/DN/FONSI fail to document compliance with substantive requirements as required by NEPA.

The EA (p 19) relies on a checklist to show compliance with various substantive requirements.

Legal and Regulatory Considerations

Given the nature of the project, the responsible official is requesting documentation to demonstrate compliance with the following legal and regulatory considerations in addition to NEPA:

- ☒ NFMA/Land Management Plan
- ☒ Endangered Species Act (ESA)
- ☒ Sensitive Species (FSM 2670)
- ☒ National Historic Preservation Act (NHPA)
- ☒ Tribal Consultation
- ☒ Clean Air Act (CAA)
- ☒ Clean Water Act (CWA)
- ☒ Pertinent Executive Orders

Special Management Areas:

- ☐ Wilderness N/A
- ☐ Roadless N/A
- ☒ Wild & Scenic River Corridor
- ☐ Recommended Wilderness N/A
- ☐ Research Natural Areas N/A
- ☐ National Scenic & Historic Trails N/A
- ☒ National Recreation Areas

This is inadequate. The EA needs to disclose what the requirements are and how the project meets those requirements, and considerations made to avoid or mitigate potential conflicts. The EA (p 20) admits that legal compliance is necessary to support the Finding of No Significant Impact: "consistency with relevant laws, regulations, policies, and land management plan standards ensures that the proposed action does not exceed thresholds for significance." And NEPA requires that a FONSI must be supported by a compelling statement of reasons. If the agency decides not to prepare an EIS, the agency must supply a "convincing statement of reasons" to explain why the action will not have a significant impact on the environment.[35]

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[34] Law BE, Berner LT, Mildrexler DJ, Bloemers RO and Ripple WJ (2022) Strategic reserves in Oregon's forests for biodiversity, water, and carbon to mitigate and adapt to climate change. Front. For. Glob. Change 5:1028401. doi: 10.3389/ffgc.2022.1028401. https://www.frontiersin.org/articles/10.3389/ffgc.2022.1028401/pdf.

[35] Blue Mountains, 161 F.3d at 1212; see also 40 C.F.R. § 1501.4(e); 40 C.F.R. § 1508.13. "The statement of reasons is crucial to determining whether the agency took a hard look at the potential environmental impact of a project." Blue Mountains, 161 F.3d at 1212 (internal quotations omitted). The Court is to defer to the agency's decision not to prepare an EIS only when that decision is "fully informed and well considered." Jones v. Gordon, 792 F.2d 821, 828 (9th Cir. 1986).

The EA (pp 2-3) discloses a list of LRMP management areas affected by this project, including 1) Timber Production Emphasis, (3) Wildlife and timber, (7) Wild and Scenic Rivers, (10) HCNRA Forage Production, (11) HCNRA Dispersed Recreation & Timber Management, and (15) Old Growth Preserve. We could not find a map of these management areas in the EA, nor a map of where logging and road construction overlaps with these areas. The EA does not disclose the standards & guidelines for these management areas or how this proposal for extensive logging and road construction will meet (or potentially conflict) those standards & guidelines.

For instance:

- MA11 requires maintaining habitat for snag-dependent species at 60% of optimum, but the EA does not explain how heavy thinning and regen will accomplish that given current scientific understanding of snag science and the fact that killing and removing large numbers of trees will deplete the green tree population, and reduce snag recruitment over many decades.

- Management Are 15 of the LRMP calls for old growth preservation, including multi-layered canopy, dead and down wood, and habitat for 20 species that depend on mature and old-growth forests. The EA does not explain how logging will maintain these conditions that are best achieved with little or no management. Scheduled timber harvest is not permitted, and heavy equipment use is expected to be minimal. Other logging methods are not mentioned except for salvage which is not proposed here. In MA15 areas with Douglas-fir, white fir, and spruce the LRMP calls for retention of both fire-tolerant and fire-intolerant species.

- MA 3 is supposed to provide near optimum forage and cover habitat for big game winter range, road density is supposed to be 1.5 mi/mi2 or less, snow is expected to keep roads closed during the winter to benefit big game (is this assumption still accurate given both global warming and increased use of snow machines?), both summer and winter range have specific requirements regarding size of treatments and distances to cover patches. The EA does not document compliance with these requirements.

All site-specific activities must comply with the governing forest plan. National Forest Management Act, 16 U.S.C. § 1604(i) (governing FS management of national forest lands).

NEPA requires disclosure of information necessary to determine compliance with legal requirements such as the Endangered Species Act, Clean Water Act, National Forest Management Act, and applicable Forest Plan Standards & Guidelines.[36]

See also, Judge King's October 2003 Decision in *ONRC Action v. U.S. Forest Service*:

> The underlying EAs for the timber sales at issue did not properly frame the Forest Service's survey and manage duties, they did not analyze a range of alternatives based

[36] See 40 CFR 1508.27(b)(10) and NW Indian Cemetery Protective Association v. Peterson, 795 F2d 688 (9th Circ. 1986). In this G-O Road case, the NEPA document described water quality changes resulting from a road project in terms of 7-day average changes, whereas the applicable WQ standard was defined by daily peak changes. The court found this to be a NEPA violation.

> upon these duties, they did not evaluate completed surveys, they did not demonstrate that the Forest Service had all of the proper information before it before allowing logging, and they did not provide for public influence over the decisions. For all of these reasons, the underlying EAs are legally deficient.[37]

The 9th Circuit has explicitly found that a EIS violates NEPA when it has an inaccurate or misleading description of forest plan requirements.

> The Forest Service's use of a hiding cover denominator in the EIS other than that allowed by the HNF Plan arbitrarily and capriciously skewed the EIS's elk herd hiding cover percentage. Consequently, the Elkhorn project EIS did not provide a "full and fair" discussion of the potential effects of the project on elk hiding cover and did not "inform[ ] decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts" on the Sheep Creek elk herd. *Klamath-Siskiyou Wildlands Ctr.*, 387 F.3d at 993 (quoting 40 C.F.R. § 1502.1); *see also Animal Def. Council v. Hodel*, 840 F.2d 1432, 1439 (9th Cir. 1988) ("Where the information in the initial EIS was so incomplete or misleading that the decisionmaker and the public could not make an informed comparison of the alternatives, revision of an EIS may be necessary to provide a reasonable, good faith, and objective presentation of the subjects required by NEPA.") (internal quotation marks omitted), *amended by* 867 F.2d 1244 (9th Cir. 1989).
>
> ...
>
> The Elkhorn project EIS is inadequate under NEPA because, by using a hiding cover calculation denominator that is inconsistent with that required by the HNF plan, the agency did not take a "hard look" at the project's true effect and failed to inform the public of the project's environmental impact.[38]

A 2005 case in Montana found legal error where the record cannot support a finding that legal standards were met. In this case the FS had a LRMP requirement to meet big game cover requirements based on *concealment*, but then the NEPA analysis analyzed big game cover using *canopy cover* instead of *concealment*.

> The discussion of the method used does not mention the Forest Service definition of hiding cover, which requires timber to "conceal 90% or more of a standing elk at 200 feet." AR F176 at 26. However, the method does seem to correlate with the definition used by the Montana FWP, which defines hiding cover as "[a] stand of coniferous trees having a crown closure of greater than 40%." AR F176 at 26.
>
> ...
>
> As in *Native Ecosystems Council*, the Court is not "able reasonably to ascertain from the record that the Forest Service is in compliance with the HNF Plan standard." 418 F.3d at 963. First, it seems the Forest Service has modeled hiding cover based on the Montana FWP method using canopy cover. There is no discussion either in the document describing the methodology or in the EA whether measuring canopy cover percentages, as required by the FWP definition of hiding cover, is synonymous with the Forest Service

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[37] *ONRC Action v. U.S. Forest Service,* CV. 03-613-KI (emphasis added)
http://web.archive.org/web/20041105214752/http://www.onrc.org/press/ONRCv.USFS.pdf.

And also Judge Hogan's ruling in Klamath Siskiyou Wildlands Center v. Boody (D. Or. #03-3124-CO. May 18, 2004) where he held "plaintiffs have raised a serious question as to whether BLM violated NEPA in failing to disclose sufficient information in the EA to confirm compliance with ... the RMP." (Order at page 18).
https://casetext.com/case/klamath-siskiyou-wildlands-center-v-boody-2.

[38] *Native Ecosystems Council v. USFS.* (9th Circuit August 11, 2005)
http://www.ntc.blm.gov/krc/uploads/194/2h%20-%20Native%20Ecosystems%20Council%20v%20US%20Forest%20Service%20--%20Jimtown.pdf.

> definition of hiding cover. Consequently, it is impossible for the Court to determine whether the project will, in fact, comply with the Forest Service's elk hiding cover standard.[39]

Here are few examples of substantive requirement that need to be considered in the NEPA document in and to support the FONSI:

The EA failed to explain how excessive logging will comply with the requirements of the Hells Canyon National Recreation Area Act (HCNRA Act, Public Law 94-199) which places explicit restrictions on logging and all other management activities within HCNRA boundaries. Section 7 of the HCNRA Act requires that any logging be compatible with

> "conservation of scenic, wilderness, cultural, scientific, and other values contributing to the public benefit; preservation…of all features and peculiarities believed to be biologically unique including, but not limited to, rare and endemic plant species, rare combinations of aquatic, terrestrial, and atmospheric habitats, and the rare combinations of outstanding and diverse ecosystems and parts of ecosystems associated therewith; protection and maintenance of fish and wildlife habitat…"

Mature and old-growth forests are an important biological and cultural feature of the NRA. These forests need to be protected, not heavily logged. Road building causes a variety of adverse impacts on scenic and biological features of the NRA.

The carbon in the trees to be logged are arguably part of an important "atmospheric habitat." That carbon needs to stay in the forest in order to preserve the climate.

The Act also requires all logging be "…by selective cutting." The Society of American Foresters (SAF) defines selective cutting as: "…a type of partial cutting where specific trees are removed. Regen harvest methods may not be compatible.

The EA failed to explain how excessive logging will comply with the requirement to move stands toward LOS conditions.

The Eastside Screens require that all silviculture move stands toward LOS conditions. The EA failed to explain how heavy thinning and regen harvest, including 745 acres of shelterwood and patch cuts will comply with the Eastside Screens requirement to manage toward Late Old Structure conditions high canopy cover, complex canopy, cool-moist microclimate, and abundant dead wood.

The Eastside Screens say "2) Outside of LOS, many types of timber sale activities are allowed. <u>The intent is still to maintain and/or enhance LOS components in stands subject to timber harvest</u> … Manipulate vegetative structure that does not meet late and old structural (LOS) conditions, … in a manner that <u>moves it towards these conditions</u> as appropriate to meet HRV.

[39] *Helena Hunter & Anglers v. Tom Tidwell*. Montana District Court. CV 08-162-M-DWM. July 29, 2009.

… Manipulate vegetation in a manner to encourage the development and maintenance of large diameter, open canopy structure."[40]

Looking at the old-growth definition from ICBEMP:

> old growth is typically distinguished from younger growth by several of the following attributes: 1. Large trees for species and site. 2. **Wide variation in tree sizes and spacing**. 3. **Accumulations of large-size dead standing and fallen trees** that are high relative to earlier stages. 4. Decadence in the form of broken or deformed tops or bole and root decay. 5. **Multiple canopy layers**. 6. Canopy gaps and understory patchiness.[41]

It is clear that LOS "components" such as abundant snags must be retained and recruited, and many small and medium sized trees are needed grow into large trees. Regen harvest that removes the majority of the existing stand clearly moves away from, not toward, these LOS conditions. Heavy thinning might also reduce future recruitment of LOS components, including large trees and large snags. Thinning dense understory trees might help move stands toward LOS, but any action that would remove snags or reduce recruitment of medium trees into large tree classes would not be consistent with the Eastside Screens.

The EA says that they may apply 3 different thinning intensities, but we did not see a map of where each would be applied, and what proportion of each approach would be applied across the planning area. Will there be equal application of light, moderate, and heavy thinning, or predominantly one or the other? Light thinning is probably more likely to move stands toward LOS compared to heavy thinning. With almost 14,000 acres of logging proposed, compliance with these requirements is paramount, and the EA failed to explain how so much logging is consistent with the substantive requirements of the Eastside Screens.

The Eastside Screens also state "To reduce fragmentation of LOS stands, or at least not increase it from current levels, stands that do not currently meet LOS that are located within, or surrounded by, blocks of LOS stands should not be considered for even-aged regeneration, or group selection at this time." Any action that would build roads or establish young even-aged stands would not meet the Eastside Screens. Heavy thinning for fuel reduction should also be evaluated under this connectivity standard.

The EA failed to document compliance with the connectivity requirements of the Eastside Screens.

The EA failed to carefully document all the LOS forests in the project area and failed to conserve connectivity habitat between them as required by the Eastside Screens.

Our prior comments noted the connectivity requirements in some detail.

> The explicit intent of the Eastside Screens is "to insure that blocks of habitat maintain a high degree of connectivity between them,…"[42]

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[40] 1995 Regional Forester's Forest Plan Amendment #2. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5288660.pdf (emphasis added).

[41] ICBEMP Appendix 17a. https://web.archive.org/web/20161221075704/http://www.icbemp.gov/pdfs/sdeis/Volume2/Appendix17a.pdf

[42] 1995 Eastside Screens, Scenario A, INTENT STATEMENT for connectivity (emphasis added).

> The connectivity requirements of the screens are detailed and mandatory. Connectivity corridors:
>
> - Must link all late old structure stands in at least 2 directions;
> - Must be at least 400 feet wide at their narrowest spot;
> - Must be maintained as dense as possible with medium and large trees, or in the top third of site-potential and at least 50% canopy cover;

The project website includes a wildlife connectivity map here, which shows only the connective corridors, but not the LOS stands that the corridors are supposed to provide links between. This map does not provide enough information for the public or the decision-maker to determine compliance with substantive policy.

Documenting compliance with the connectivity requirements of the screens requires delineating the location of all LOS stands, and the location of corridors that are at least 400 feet wide and connect each LOS stand to other LOS stands in at least two direction. The analysis must also disclose how logging prescriptions are adjusted within connectivity corridors to ensure conservation of high canopy cover (e.g., as dense as possible with medium and large trees, top third of site-potential, or at least 50% canopy cover).

The EA failed to document compliance with management plans for Congressionally designated National Recreation Area and Wild and Scenic River. Logging and road building violate the foundational requirements of the Hells Canyon National Recreation Area, and the Comprehensive Management Plan for Hells Canyon, and the Imnaha River Wild and Scenic River Comprehensive Management Plan.

The EA (p 47) says that this project may impact resources in the Imnaha Wild and Scenic River corridor, but concludes that it is legally compliant. The entire analysis is too brief and conclusory to be NEPA compliant:

> While vegetation and fuel treatments may create minor changes to various settings in the Imnaha Wild and Scenic River corridor, the proposed action is consistent with NFMA goals and objectives.

There are relevant requirements of the Wild and Scenic River Act that must also be met, including the requirement to protect and restore outstandingly remarkable values for which the Imnaha River was designated. The EA does not disclose compliance with this requirement. The EA does not disclose what the outstandingly remarkable values are, or describe how they are being protected and restored.

Fuel reduction in the Wild and Scenic River corridor is not consistent with conservation and restoration of the outstandingly remarkable values. Fire is a natural process and has a variety of ecological benefits that support the river vales. The alleged benefits of fuel reduction are unlikely to be realized due to the low likelihood that fuel logging will interact with wildfire during the relatively brief period before fuels regrow.

Ground-based logging likely violates LRMP soil standards. Ground-based logging with a dendritic yarding pattern may violate the LRMP 20% limit on detrimental soil conditions, especially when all the soil impacts are accounted for. The Forest Service arbitrarily excludes some soil impacts when they say are *de minimus* but they should be accounted for in the analysis of cumulative soil impacts.

As described in the Deschutes National Forest's Everly Fire Salvage EIS, a typical dendritic system of yarding corridors can cause detrimental soil conditions across 14% of an activity area. Compaction from off-trail travel adds 5% detrimental conditions. Burning fuel piles adds 2% (just the piles, not including machine use).[43] All these cumulative soil impacts add up to OVER 21% detrimental soil conditions, and this is WITHOUT considering the road system, landings (which typically add 5%), and the machines often used to pile fuels, not to mention the effects of past logging. This is simply illegal and irresponsible. Soil degradation occurs at thresholds that are not detected by the agency's definition of "detrimental soil conditions" and a NEPA analysis based on these criteria will underestimate the effects of management. NEPA requires the agency to disclose all soil impacts not just those that meet these crude, under-inclusive criteria.

The NEPA document did not disclose the methods used for determining detrimental soil conditions, but they are often described in the Soil Quality Standards as follows:

- Detrimental soil compaction in volcanic ash/pumice soils is an increase in soil bulk density of 20 percent or greater over the undisturbed level.
- Detrimental puddling occurs when the depth of ruts or imprints is six inches or greater.
- Detrimental displacement is the removal of more than 50 percent of the A horizon from an area greater than 100 square feet and at least 5 feet in width.
- Detrimental burn damage requires significant color change of the mineral soil surface to an oxidized reddish color, with the next one-half inch below blackened from organic matter charring as a result of heat conducted from the fire.
- Detrimental erosion requires visual evidence of surface loss over areas greater than 100 square feet, rills or gullies, and/or water quality degradation from sediment or nutrient enrichment.
- Agency analyses of detrimental soil condition often arbitrarily excludes real and significant soil impacts from roads, landings, and hand piles that are burned.

It is obvious from reading this that the soils of the project area could be high impacted yet still not trigger concern under these definitions. For instance, a proposed harvest unit might be compacted over a wide area, but only increase bulk density by 18% instead of the magic 20%; or an area could be 50% displaced or eroded, but in areas less than 5 feet wide and or less than 100 square feet; or an area could be burned but not quite enough to "significantly" change the mineral soil color? And what about combinations of these things? What about some burned soil, some displaced soil, some compacted soil. The cumulative and synergistic effects of sub-threshold soil effects can be significant.

NEPA requires disclosure of all effects. The bottom line is that there can be serious adverse soil effects that are not considered by the agencies arbitrary and capricious soil quality criteria.

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[43] BLM's February 2006 Planning Criteria for the Western Oregon Plan Revision says, "All (100%) of the soil directly beneath burn piles is expected to have detrimental soil damage due to deep burning." p 133.

Reliance on Ineffective BMPs may violate the Clean Water Act. The EA relies on BMPs to ensure compliance with the Clean Water Act, but the EA does not disclose the uncertainty about BMP implementation and effectiveness. Scientific assessments have repeatedly concluded that there is no reliable empirical evidence that BMPs reduce impacts of logging and roads to ecologically insignificant levels.[44]

Most agency evaluations claiming to support the effectiveness of BMPs are not scientifically credible and lack statistical rigor. Chris Frissel says that BMPs seek immunity from water quality impacts by "claiming essentially perfect prescription and implementation of BMPs, [an] ideological fiction that those of us in the trade refer to as the 'Theory of Immaculate Mitigation' and the 'Theory of Divine Implementation.'"

We have seen too often where the agency promises to mitigate impacts and then waives those very protections during contract administration. Examples of post-NEPA contract modifications include wet season log hauling, allowing landings in riparian reserves, operating off skid trials, new roads and landings, remarking large trees, expanding the boundaries of cutting areas, and on and on. This makes a mockery of the NEPA process and abusing the public's trust. One of the reasons we often favor no action, is that mitigation turns out to be a meaningless promise. Please disclose the environmental consequence of what you will really do, not what will make the project look good on paper.

As explained by EPA:

> In 2016, the Forest Service issued a report titled, *Effectiveness of Best Management Practices that Have Application to Forest Roads: A Literature Synthesis*. It summarized research and monitoring on the effectiveness of different BMP treatments for road construction, presence, and use, and stated the following:
>
> > "Many road BMP effectiveness studies do exist; however, the effectiveness of most forest road BMPs has not been investigated rigorously (including replicated and quantitative studies) under a wide variety of geologic, topographic, physiographic, and climatic conditions since their development decades ago. Much more quantification of effectiveness is needed (Anderson and Lockaby 2011a, Moore and Wondzell 2005, Stafford et al. 1996) to understand the site characteristics for which each BMP is most suitable and for proper selection of the most effective BMP techniques (Carroll et al. 1992, Weggel and Rustom 1992)."
>
> The report cites different reasons for why BMPs may not be as effective as commonly thought (p. 133). "Most watershed-scale studies are short-term and do not account for variation over time, sediment measurements taken at the mouth of a watershed do not account for in-channel sediment storage and lag times, and it is impossible to measure the impact of individual BMPs when taken at the watershed-scale." When individual BMPs are evaluated for effectiveness, the "lack of broad-scale testing in different

[44] Beschta, Rhodes, Kauffman, Gresswell, Minshall, Karr, Perry, Hauer, Frissell. 2004. Post-fire management on forested public lands of the Western USA. Cons. Bio. Vol 18 No. 4. August 2004. pp 957-967. Espinosa, F. Al, Jr., J. J. Rhodes, and D. McCullough. 1997. The Failure of Existing Plans to Protect Salmon Habitat in the Clearwater National Forest in Idaho. Journal of Environmental Management (1997) 49, pp 205-230. NPPC Independent Science Group, 1996. Return to the River: Restoration of Salmonid Fishes in the Columbia River Ecosystem. NPPC, Portland, OR. Rhodes, J. J., D. McCullough, and F. A. Espinosa, Jr., 1994. A Coarse Screening Process for Evaluation of the Effects of Land Management Activities on Salmon Spawning and Rearing Habitat in ESA Consultations. CRITFC Tech Rpt 94-4, Portland, OR. https://web.archive.org/web/20040630120242/http://www.critfc.org/tech/94-4report.pdf. Ziemer, Lisle, 1993. Evaluating sediment production by activities related to forest uses— A Northwest Perspective. Proceedings: Technical Workshop on Sediments, Feb. 1992, Corvallis, OR. Pp 71-74. http://web.archive.org/web/20041102031817/http://www.fs.fed.us/psw/rsl/projects/water/Ziemer93.PDF.

physiographies, climates, soil types, and other factors for most BMPs weakens the argument that their effectiveness is scientifically well proven." Further, the report observes, "The similarity of forest road BMPs used in many different states' forestry BMP manuals and handbooks suggests a degree of confidence validation that may not be justified," because they rely on just a single study (p. 133-32). Therefore, the report indicates that BMP effectiveness is uncertain and dependent upon site-specific conditions, and those site-specific conditions vary across a landscape-scale project.[45]

Proposed logging violates Eastside Screens' prohibition on logging that fails to move stands toward LOS. Heavy thinning and regen will remove to many trees needed for future recruitment of large trees, dead wood, and complex forest structure violate the Eastside Screens requirement to move stands toward Late Old Structure.

Thinning prescriptions are designed to avoid competitive mortality. The EA fails to retain enough basal area to meet the Eastside Screens requirement to manage for LOS conditions, which includes abundant large trees and large snags.

Heavy thinning and regen harvest will reduce stand density lower than is appropriate to meet the full suite of ecological objectives, including wildlife cover, perpetuating mortality processes that create and sustain valuable habitat features, etc. The goals should include creating a wide diversity of niches for different species, including those that thrive in dense, complex, forests with abundant snags and dead wood, instead of thinning to low basal area that tends to create one ideal niche for healthy, vigorous conifer trees.

We are concerned that the agencies' stocking guides (e.g., Powell (1999)) were created and intended to be used as a tool to avoid mortality which is clearly inconsistent with ecosystem management. ("To preclude serious tree mortality from mountain pine beetle, western dwarf mistletoe and perhaps western pine beetle, stand densities should be maintained below the upper limit of the management zone"[46]) Healthy forests require dead trees, sometimes in abundance, in order to meet the needs of diverse wildlife and provide full suite of ecosystem functions.[47]

A comprehensive restoration approach requires focusing not just on live trees, but also on the full suite of ecological processes including density dependent mortality processes that create and recruit snags and dead trees as a valuable feature of eastside forests. We urge the agency not to manage for tree vigor and minimum stocking levels because it will not provide enough green

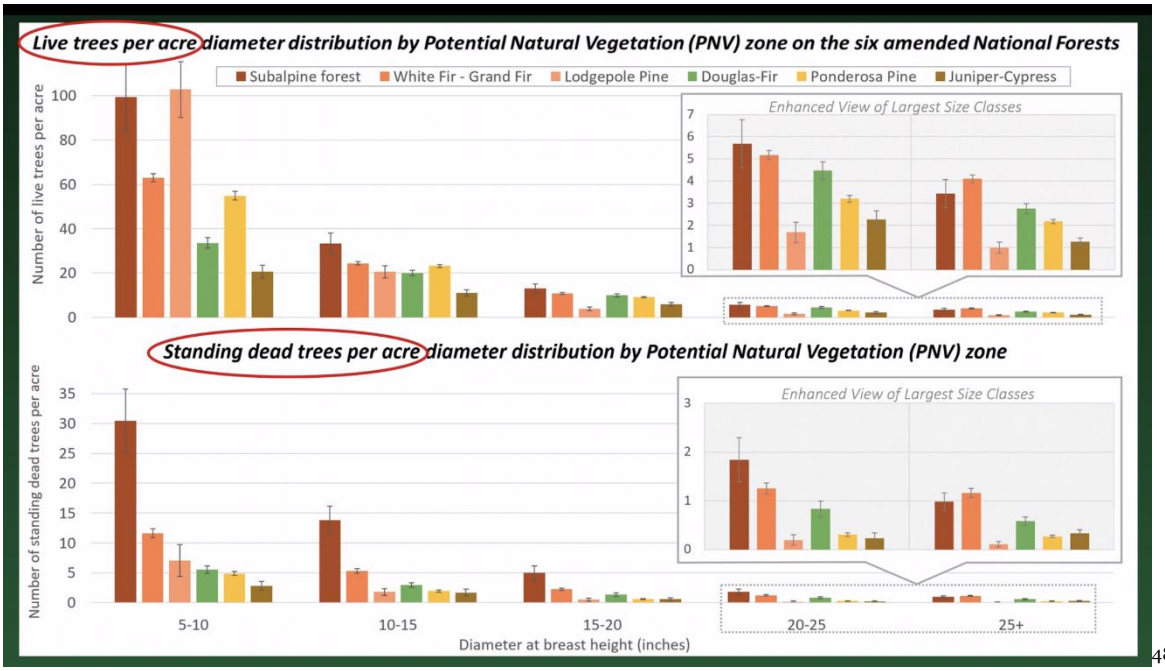
[45] McCoy, Melissa 2023. EPA Comments on the Dixie National Forest Hungry Creek EA. 8-28-2023, *citing* Edwards et al 2016. Effectiveness of Best Management Practices that Have Application to Forest Roads: A LITERATURE SYNTHESIS. General Technical Report NRS-163 October 2016. USDA Forest Service Northern Research Station. https://www.fs.usda.gov/nrs/pubs/gtr/gtr_nrs163.pdf.

[46] Powell 1999, Suggested Stocking Levels for Forest Stands in NE Oregon. Umatilla National Forest F14-SO-TP-03-99, April 1999. https://web.archive.org/web/20220121011438/https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_016034.pdf)

[47] Rose, C.L., Marcot, B.G., Mellen, T.K., Ohmann, J.L., Waddell, K.L., Lindely, D.L., and B. Schrieber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management, Chapter 24 in Wildlife-Habitat Relationships in Oregon and Washington (Johnson, D. H. and T. A. O'Neil. OSU Press. 2001) http://web.archive.org/web/20060708035905/http://www.nwhi.org/inc/data/GISdata/docs/chapter24.pdf.

trees for recruitment of snags through time. This is a critical issue given that the current standards for snag habitat are outdated and fail to provide adequate levels of snags and dead wood, and adequate levels of green trees needed to recruit those snags through time.

This graphic from the Microsoft Teams public meeting held Feb 1, 2023 to discuss the draft report of the "2nd Annual Adaptive Management Workgroup: Management Direction for Large Diameter Trees" clearly shows the close association between the abundance of large live trees and large snags. This makes perfect sense because all snags are a product of large live trees. The NEPA analysis for this project failed to provide an honest and accurate disclosure of the adverse effects of thinning to low basal area through commercial removal of medium and large trees on the future recruitment of large snags.



[48]

Commercial logging in RHCA likely violates PACFISH/INFISH. PACFISH and INFISH both prohibit actions that will retard attainment of riparian management objectives. The EA (p 15) says the objective of commercial logging in RHCAs is to "Reduce fuel loads to reduce risk of high-severity fire." This objective is not meaningfully linked to the management objectives for RHCAs. And significantly, commercial removal of canopy trees likely conflicts with RHCA goals by altering microclimate, raising water temperature, and reducing recruitment of future large trees and large wood which are essential to meeting riparian management objectives such as pool formation.

In addition, fire is a natural process in RHCAs and likely to provide many benefits associated with such disturbances (e.g., wood recruitment, vegetation diversity). It is questionable that "high severity fire" is adverse to riparian management objectives, and even if it were, the likelihood that fuel logging will interact with fuel treatments during the relatively brief period

[48] 2nd Annual Adaptive Management Workgroup: Management Direction for Large Diameter Trees https://www.fs.usda.gov/project/?project=58050

before fuels regrow is very remote. And the effects of logging on fire could be beneficial, adverse, or neutral, further limiting the alleged benefits of riparian fuel treatments. The EA did not provide a compelling discussion of the effects of logging in RHCA and whether logging in RHCA for fuel reduction is consistent with substantive requirements.

The EA failed to document how excessive logging will comply with the Endangered Species Act. This project area provides habitat (including designated critical habitat) species listed under the Endangered Species Act, including chinook salmon, steelhead, and bull trout, and whitebark pine. The FS has a duty to manage this landscape to advance the conservation and recovery of these species and avoid the taking of species and the adverse modification of critical habitat. Logging and road construction likely violate the Endangered Species Act.

The draft DN lacks specificity.

The decision is arbitrary and capricious because it lacks specificity. The draft DN says "I have decided to authorize the activities described in the Purpose and Need (EA pages 3-9) and Proposed Action (EA pages 10-18) sections of the Final Environmental Assessment." The activities described in the proposed action are reasonably clear and specific, but the activities described in the purpose and need are too general and non-specific to be part of the activities authorized by this decision.

We are not exactly sure what the Forest Service intends to accomplish with the authorization of the activities described in the purpose and need, but the DN must be limited to authorizing specific actions in specific locations, not some open-ended scope of actions to address the purpose and need in the project area. NEPA require site specific analysis and disclosure and public involvement before decisions are made and before actions are taken.

Sincerely,

Doug Heiken

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Oregon Wild

James Monteith
Eastern Oregon Legacy Lands

/s/ Chris Krupp
Chris Krupp
Public Lands Attorney
WildEarth Guardians

Attached: Cited Documents