Blue Mountains Biodiversity Project comments on the
Mill Creek Dry Forest Restoration Project Draft Environmental Assessment

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Statement on listed comment deadline:

The Forest Service Project webpage comment portal, available at https://cara.fs2c.usda.gov/Public//CommentInput?Project=58081, has the 30-day comment period for the Mill Creek Dry Forest Restoration Project Draft EA ending at 11:59PM PST on September 14, 2023. The legal notice in The Bulletin in Bend, OR was published on August 16, 2023. The usual method of counting days in legal deadlines is to consider the "trigger date," in this case the publication date in the paper of record, as Day 0, stating the 30-day count with Day 1 as the first full day following publication. This also aligns best with general Forest Service policies, as is the case with the computation of time periods under the Forest Service's project-level predecisional administrative review regulations. *See* 36 C.F.R. § 218.6(b) ("***Starting date.*** The day after publication of the legal notice … is the first day of the objection-filing period."). With this count, the 30-day comment period actually ends on Friday, September 15, 2023 at 11:59PM PST. As such, Blue Mountains Biodiversity Project reserves the right, if needed, to submit materials on September 15, 2023 and have these materials be considered, along with any comments submitted by BMBP prior to the 15th, in the Project Record as BMBP's comments on the Draft EA for consideration by the Forest Service and to reserve legal standing to participate in the predecisional administrative review process (the "objection" process).

Re: Purpose and Need for Action:

This is far too fast for a timber sale rotation, with the FEIS for the Mill Project Timber Sales having prepared a FEIS and Record of Decision in 1999, with the logging taking place there after—up to 10 years or more later. So this new Mill Creek timber sale would have a decision less than 25 years since the last comprehensive timber sale decision in the same area! Repeated timber sales on short rotations with heavy equipment use will just further degrade soil productivity, wildlife habitat, and water quality, and make future regeneration very difficult, with additional ecological processes poorly functioning.

Re: the Purpose and Need for Action being "Increase Resilience to Insects, Disease, Fire, and Drought", claiming that "Forested stands in the project area are at high risk to experience impacts from multiple types of disturbances from insects, disease, fire, and drought." This is the standard Forest Service public relations propaganda being used to justify logging, no matter what the actual forest conditions are and how recently it was logged and otherwise managed already.

The Mill Creek area is already in an existing condition of already having been extensively thinned and still being mostly wide open from recent past logging. The existing condition is

probably congruent with the "desired future condition" determined by the Forest Service at the time, with variable density and more open stands. However, there are also many obvious impacts from the recent logging, such as unregenerated skid trails, no significant re-growth except for small (< 9" dbh) and pole-sized trees, and missing mature and large, old trees evident in lots of stumps. It's far too soon to be logging again (while we are not assuming that it should ever be logged again), as the forest is still recovering from the relatively recent logging with not enough time elapsed between timber sales for trees to grow much larger or for young trees to grow into mature trees. Where greater density exists, it is in retention patches of young, small trees (probably for hiding cover) with more vigorous growth in naturally denser moist mixed conifer. See our field survey sheets and sample photos that document existing conditions in commercial sale units.

Addressing the Purpose and Need bullet points:

The absence of Ponderosa pine stands of large trees were greatly diminished by logging, which should not be repeated. Planning to log Ponderosa pine up to 21" dbh, as planned, would perpetuate the loss of large Ponderosa pine stands by preventing mature pines from growing into large and old Ponderosa pine. This would be contrary to the purpose and need re: correcting "departures" from "more sustainable historic conditions".

Since: "Many stands, which were once dominated by large trees, have been replaced by stands in which pole and/or small sized trees are most common", the sensible management action to reduce any excess tree density would be to thin only small and pole-sized trees to remedy the loss of large trees, since there aren't that many mature and large trees left from past logging. The mature and large size classes are not dense.

Shade tolerant understories are small non-commercial size trees and/or pole-sized trees, so thinning just those small tree size classes would deal with any stand densities above those that occurred historically. (This would be assuming that Historical Range of Variability (HRV) estimates theoretically based on pre-colonization base lines can be trusted at all, and that they are a proper guide under extreme climate change, both of which would be false assumptions.)

HRV estimates are highly suspect, but even if true, most density—almost all—is small, young trees, not mature and (possibly) large trees that would be targeted for commercial logging.

Re: "Climate change may exacerbate the stress to late seral and less-drought tolerant species", this is a good reason to not log mature and large trees critically needed for carbon sequestration and storage to reduce or slow extreme climate change effects.

In this case, density management can be accomplished just by non-commercial thinning up to 9" dbh and through prescribed burning in truly dry, Ponderosa pine dominant forest types.

Just implementing non-commercial thinning of small trees up to 9" dbh and prescribed burning in the dry forest types would take care of fire risk reduction.

Re: EA p. 3:

While we're all in favor of ecologically sound riparian restoration, more logging, road re-opening, "temporary" road construction, and heavy equipment use in RHCAs and on steep slopes above drainages will only exacerbate existing problems that caused currently degraded riparian conditions.

We are strongly opposed to commercial logging, closed road re-opening, heavy biomass removal, and heavy equipment use within RHCAs.

Logging and roading in RHCAs as planned would defeat the purpose of the proposed action as stated in par. 2 on EA p. 3.

Another timber sale in the Mill Creek area this soon and with such intensity as planned in alternatives 3 and 4 would not provide "the production of quality wood products in a manner consistent with other resource objectives [and] environmental constraints", as logging on such a short rotation in already open, thinned forest and logging large trees and logging on steep slopes would not protect wildlife habitat for species associated with greater forest density, large tree structure, or blocks of security habitat. Logging in RHCAs and on steep slopes would threaten Sensitive Redband trout and Columbia Spotted frog viability, as well as Sensitive plants, impair water quality, and deplete water retention. These impacts represent failure to meet resource objectives and to defer to environmental constraints as required by the Forest Plan. (See EA p. 3, 3rd par.) Logging on steep slopes in the absence of abundant mature and large trees due to past logging would not be economically efficient.

Re: EA p. 4:

Re: Management direction, we doubt that the Mill Creek timber sale would meet Forest Plan standards for snag and down wood abundance and large sizes of snags and down wood, and the detrimental soil impact standard (especially under alts 3 and 4), and existing Forest Plan goals to maintain and increase the abundance of large and old trees across the landscape, especially. under alternatives 3 and 4, , due to but also under alternative 2, due to mature trees being logged that would otherwise grow to become large and old trees.

Logging and road re-opening or construction in the Stein's Pillar Recreation Area would fail to: "Maintain a scenic, natural or natural-appearing setting" and to: "Provide roadless nonmotorized recreation, with various opportunities to enjoy nature", as required by Ochoco Forest Plan management direction.

Where is the Summit Trail in the Mill Creek project area, and is it still actually pristine? How would it be managed to protect and preserve the Trail's historic qualities? Not by logging and roading it.

We are concerned that logging sale units all along major travel routes would not: "Maintain the natural-appearing character of the Forest along major travel routes, where management activities are usually not evident or are visually subordinate to the surrounding landscape."

Logging large (and inevitably old) trees would not "provide habitat for wildlife species dependent on old growth stands", especially as this logging would occur on a landscape scale.

Only using non-commercial small tree thinning around Wildcat Campground and the associated RHCA to provide for "a relatively natural outdoor setting" as required by the Forest Plan.

We are concerned that logging and re-opening of closed roads and/or constructing "temporary" roads within RHCAs would violate INFISH established RHCA buffers intended to prevent logging impacts and prevent achievement of related Riparian Management Objectives (RMOs), as well as violating Forest Plan standards and guidelines for activities occurring in RHCAs.

Re: EA p. 7, Proposed Action and Scoping and Key Issues:

The Forest Service should not be adding controversial large tree logging, steep slope logging, and the near tripling or more than tripling the volume of timber logged, when none of these changes were discussed during scoping. Since scoping can be used as legal standing to file an objection without submitting EA or EIS comments, people who submitted scoping comments may assume that the EA describes in more detail only what was covered in scoping, and thereby think that they would not have to read the EA or write comments on the EA. The large tree logging, steep slope logging, and great escalation in timber sale lumber volumes in alt.s 3 and 4 are especially controversial, with a great deal of scientific controversy over the logging of large trees that was not disclosed in the EA. Actually, most of the science is against the logging of large trees, with the Forest Service wielding only a few studies, some of which have very questionable methods and accuracy. The ecological risks and high costs of steep slope logging are well known, with timber contractors having questioned the economic viability of logging on steep slopes in recent years.

We field surveyed nearly all the commercial sale units over 7,888 acres disclosed in scoping and on the draft sale map. We use our field survey sheets and related photographs to support our EA comments and provide evidence of existing conditions. However, we were not able to field survey and document existing conditions in the additional sale units added in alternatives 3 and 4, as we otherwise would have done since we didn't know there would be additional sale units, logging on steep slopes, or logging of large trees =/> 21"dbh. None of this was disclosed in scoping information. This deprived us of having the opportunity to survey the additional sale units for informing our comments on the EA and for gathering evidence on existing conditions regarding steep slope logging planned.

Re: Key Issue #1: Large and Old Trees Removed During Thinning:

The EA acknowledges that: "The proposed action that was scoped with the public called for commercial thinning on 7,888 acres. The proposed action also did not propose removal of trees over 21" dbh. Some commenters are concerned that there is a shortage of large trees and removing larger trees during timber harvest will negatively affect wildlife habitat…." (EA p. 7)

Since when is large tree logging required to reduce insect infection, when the vast majority of density in the stands is only small trees—young non-commercial thinning sized or pole-sized trees, as acknowledged in the EA? There is no excess density of large trees due to past logging of large trees throughout the Mill Creek project area.

Based on our field surveying across multiple Blue Mountains Forests, we have found substantial evidence that most trees =/> 21" dbh already show visual characteristics of old growth, including thicker, more fire-resistant bark at the base of trunks and higher live crowns that are also more fire-resistant, with fewer or no lower limbs—regardless of the tree species.

Necessity of re-scoping the Mill Creek Project due to inclusion of large tree logging and other issues not addressed in scoping:

Between the release of scoping materials in 2020 and the release of the Draft EA in 2023, the Forest Service made drastic changes in the proposed actions being analyzed for implementation as part of the Mill Creek Dy Forest Restoration Project. Due to these changes—including the

scientifically and legally controversial logging of large trees—the Forest Service must reinitiate NEPA scoping.

Pursuant to NEPA, "[a]gencies shall use an **early and open** process to determine the scope of issues for analysis…, including identifying the significant issues and eliminating from further study non-significant issues." 40 C.F.R. § 1501.9(a) (emphasis added). "As part of the scoping process, the lead agency shall determine the scope and the significant issues to be analyzed in depth in the environmental [analyses]." 40 C.F.R. § 1501.9(e). In general, the scoping process is intended to establish the boundaries of actions being considered for implementation in order to give both the agency and the public a fair understanding of the issues being addressed and actions being taken for any given project. The Forest Service has failed to accomplish this with the Mill Creek Scoping package.

The Forest Service frequently restricts the public comments submitted beyond issues limited to what is presented in those scoping materials. The so-called "Key Issue #1, Large and Old trees," Mill Creek Draft EA at 12, is an issue integral to BMBP's mission to protect and restore the ecosystems of eastern Oregon and southeastern Washington. This was **not** an issue identified in the Mill Creek Project scoping materials. *See generally* Mill Creek Scoping Details (making no mention of large trees being an issue that needs addressing for this Project area). As such, BMBP and many other groups interested in keeping these ecologically important trees in the ground never had a chance to comment on this issue as early as would have been possible in a truly "early and open" process. In this instance, BMBP is lucky in that it is able to submit comments now on the Draft EA. However, this opportunity does not remedy an otherwise legally insufficient process. Other groups or individual commenters may have only had the chance to submit scoping comments, not realizing that the Draft EA would differ so heavily from the issue presented in Scoping. In this instance, although these commenters would have secured the right to a predecisional administrative review (the Forest Service's "objection" process), it is doubtful that these commenters would be able to object to the logging of large trees due to the governing Forest Service regulations. *See* 36 C.F.R. Part 218.

The Service's "Project-Level Pre-Decisional Administrative Review Process," or the "objection" process, "is the sole means" by which interested groups and individuals can seek administrative review of Forest Service Projects before final approval and implementation. 36 C.F.R. § 218.1. Only "individuals and entities … who have submitted timely, specific written comments regarding a proposed project or activity that is subject to these regulations **during any designated opportunity for public comment** may file an objection." 36 C.F.R. § 218.5(a) (emphasis added). Further, "[i]ssues raised in objections must be based on previously submitted specific written comments regarding the proposed project or activity and attributed to the objector, unless the issue is based on new information that arose after the opportunity to comment." 36 C.F.R. § 218.8(c). And although that language allows for entities to object to new issues raised after the opportunity for public comment, "[t]he burden is on the objector to demonstrate compliance with this requirement for objection issues." *Id.*

Given this context, the Forest Service has effectively hamstrung anyone that may have submitted scoping comments but subsequently didn't have the time, opportunity, or notice to submit comments on the drastically different issues raised for the first time in the Draft EA. If someone that only submitted scoping comments wanted to subsequently file an objection with the Forest Service regarding the issue of logging large trees, that person would then be required

to meet the burden of demonstrating that this was new information raised after the Scoping comment period had ended. This is a lot to ask of someone to comply with given that it was the Forest Service's failure to properly scope the relevant issues to begin with. To avoid any potential issues moving forward, and in order to give everyone a fair a full opportunity to provide public comments in what is intended to be an early and open process, the Forest Service needs to re-scope the Mill Creek Dry Forest Restoration Project, this time with all supposed "Key Issues" such as the logging of large trees clearly identified in the scoping materials.

Beyond the deficiencies in the Mill Creek Project's Scoping materials, the logging of large trees itself is legally untenable in eastern Oregon and southeastern Washington. BMBP has actively and successfully brought numerous lawsuits against the Forest Service for the seemingly endless targeting of large trees for logging across the Blue Mountains and Eastern Cascades. *See generally LOWD/BMBP v. Connaughton*, 2014 WL 6977611 (D. Or. Dec. 9, 2014) (successfully challenging the Service's use of site-specific amendments to address commonplace conditions across the region, such as the presence of large fir trees); *BMBP v. Wilkes*, Case No. 1:22-cv-01500-CL (D. Or. 2023) (Magistrate Judge Clarke recommendation denying the Forest Service's Motion to Dismiss BMBP's legal challenge to the 2021 Eastside Screens amendment). Given the current legal landscape, the proposed large tree logging in Alternative 3 of the Mill Creek Project will undoubtedly violate NFMA and the Ochoco National Forest Land and Resource Management Plan.

The Eastside Screens were first adopted in the mid 1990's in order to address the loss of large trees in eastern Oregon and southeastern Washington due to over a century of heavy logging, in part by the Forest Service. In 2021, in the last days of the Trump administration, the Forest Service rushed through an amendment to the Eastside Screens, replacing the rule prohibiting logging trees greater than or equal to 21" DBH with a voluntary guideline. This 2021 amendment has been challenged in two separate successful lawsuits in Oregon, including *BMBP v. Wilkes* mentioned above. Although no final legal ruling has been made in the BMBP case or in *Greater Hells Canyon Council v. Wilkes*, Case No. 2:22-cv-00859-HL (D. Or. 2023), both cases have received rulings from District of Oregon Magistrate Judges finding that the 2021 Eastside Screens Amendment was illegally enacted. As such, the only legally valid management directive regarding large trees in eastern Oregon and southeastern Washington is the original Eastside Screens prohibiting the logging of large trees except in very rare instances where conditions are above the Historic Range of Variation. The Forest Service has not published any finding that such conditions exist within the Mill Creek Project area, and therefore, no large tree logging can take place without amending the Ochoco National Forest LRMP. Further, as determined in *LOWD/BMBP v. Connaughton*, an amendment to the Ochoco LRMP would likely violate NFMA because the presence of large fir trees is not a condition unique to any one area on the Ochoco National Forest, or any other national forest in the region.

By specifically targeting the logging of large Douglas fir trees up to 30" DBH, the Forest Service is taking the very action that environmental groups expected when the 2021 Eastside Screens guideline was illegally adopted. The 2021 Amendment raised the limit for what was consider "large" for grand fir and white fir in eastern Oregon and southeastern Washington from 21" DBH to 30" DBH. The amendment specifically considered, but did not adopt, the same increase in what is considered large for Douglas fir. However, because the amendment changed a steadfast *rule* to a voluntary *guideline*, there would have been no legal or administrative mechanism that could have stopped the Forest Service from logging trees of any size or species.

In effect, the inclusion of large tree logging in the Mill Creek Project Draft EA, particularly the targeting of Grand and Douglas fir up to 30" DBH, has proved the point of the environmental community that the Forest Service cannot be trusted with more autonomy when it comes to the management of large trees across the region. In light of recent legal decisions, the proposed large tree logging must be dropped from the Mill Creek Project in favor of abiding by the original provisions of the Eastside Screens.

Re: Key Issue #2: Vegetation Management in Riparian Habitat Conservation Areas and Potential Impacts to Streams, EA p. 8:

We are strongly opposed to commercial logging and roading in RHCAs. We shared the concerns of other commenters: "Commenters question the need for these activities and expressed concern about potential impacts to shade and stream temperature, sedimentation, turbidity, bank stability, and future large wood recruitment. Commenters also questioned the distinction between upper and lower RHCA vegetation." (EA p. 8) We knew the differences between upper and lower RHCAs while commenting on the importance of the entire RHCA drainage being unlogged and not having biomass removed, in order to retain moisture through tree shading and down wood retention, which affect micro-climate cooling and moisture levels. Protected transitional and upland adjacent RHCA zones are still important for preserving shading, cooling, and moisture retention in the drainage, as well as for maintaining slope stability to reduce excess sedimentation in streams and recruitment of large wood for pools over time.

The science supporting the ecological degradation from logging in RHCAs is well established. This is an outrageous timber grab within vulnerable protected riparian areas over 1,210 acres of RHCAs within RHCA categories 1, 2, 3, and 4—apparently indiscriminately. Yet all that's really needed (if any management is needed in RHCAs at all) would be to thin conifer seedlings and saplings up to 9" dbh at the most, only where really needed to greatly reduce or remove any impediments to riparian hardwood establishment and felling any small trees into stream channels or in the flood plain for roughness. Standing live trees and snags are needed for future log recruitment into stream channels over time. Heavy equipment use in the RHCAs and removal of trees greater than 9" dbh is contrary to achieving riparian restoration goals and riparian management objectives. Drop all commercial logging in the RHCAs.

We did field survey along segments of Mill Creek that were proposed for commercial logging and found that there was already substantial riparian hardwood cover, with the biggest problems not being conifers shading out hardwoods (although some of that—young Ponderosa pine planted or growing into recreation sites next to Mill Creek--had already been felled into the stream channel.) Instead, the biggest problems were cattle in the riparian areas and loss of water in the channel as the summer progressed (during the hot dry summer of 2021) to the point of no flowing water in Mill Creek. There's private land with cattle along Mill Creek, so the cattle could be drinking a lot of the Mill Creek water, as well as any diversions of the creek reducing water flow and cattle limiting the riparian hardwood growth.

Re: Key Issue #3: Big Game Habitat:

Why would a timber sale which creates more access for human disturbance through re-opened roads, skid trails, and "temporary" road construction, be "in conjunction with improving security" for elk and deer? The area does not have much forage in part because of legacy over-grazing by livestock and continued use by livestock (cattle) under minimal forage conditions, yet

that is not considered in the analysis. Is there any more current science contesting the 60% forage/40% cover formula for elk and deer winter range?

Re: Issue #4: Size of project/Amount of Commercial Harvest and Temp. Roads (EA p. 9)

We shared concerns with other commenters during scoping "that the scale of the proposed treatment would not meet long-term needs for dense forests, snags, and dead wood." (EA p. 9) Now these concerns are compounded by the addition of large tree logging and steep slope logging, as well as by much higher timber volumes, which were not disclosed as potential management during scoping.

Chapter 2—Description of the Alternatives:

Alternative 3:

It doesn't make sense to remove Grand fir up to 30" dbh in the Mill Creek project area since the EA acknowledges that "late seral" conditions with old growth Grand fir and Douglas fir are already under-represented at only 2% compared to the assumed HRV baseline of 7-21% of the project area, at about 2,534 to 7,708 acres historically. (See EA p. 23) There is nowhere near that acreage of old growth Grand fir and Douglas fir now, due to past logging with plenty of old growth fir stumps as evidence, as well as residual live old growth Grand fir and Douglas fir and old growth fir snags and logs. Since the deficit would include old growth Douglas fir, logging of Douglas fir up to 29.9" dbh is also unwarranted. The Eastside Screens amendment did not include switching the size of large Douglas fir to 30" dbh from 21" dbh, so the Mill Creek sale plan to log Douglas fir up to 29.9" dbh across the board is actually a violation of even the Eastside Screens amendment.

We found very few old growth Grand fir and Douglas fir left during our field surveying of the commercial sale units. Those that remain are far too few to be "encroaching" on Ponderosa pine or Western larch, or to cause excess tree density of any significant fire risk. Grand fir, like other tree species, usually have more fire resistant characteristics as large trees, including thicker bark on the bases of the trunks, higher live crowns, and fewer low branches. Most of the Grand fir and Douglas fir between 21" dbh and 30" dbh would also be old growth, based on the visual characteristics. Further, the Van Pelt guidelines' authors clarified that visual characteristics for old growth fir species would not be reliable for determining the age of fir trees. Deschutes Forest Service staff on the Bend-Fort Rock District actually cored large Grand firs in the Ursus timber sale to see at what diameter Grand fir were statistically at least 150 years old, thus qualifying as old growth. They found that the Grand fir in the Ursus sale were statistically averaging out as 150 years or older at 22" dbh, only 1 inch greater than the 21" dbh limit being used to protect old growth trees and large structure.

The conditions under which Grand fir up to 30" dbh and Douglas fir up to 29.9" dbh would be logged are so broad as to be all inclusive of any potential situation. The rationales given don't really make sense, based on how few old growth Grand fir and Douglas fir are remaining from past logging. See EA p. 12 under Alternative 3. When Grand fir up to 30" dbh would be logged "regardless of landscape position and proximity to Ponderosa pine", it's clear that the large Grand fir removal is arbitrary and just an old growth/large tree timber grab.

The "special report" of forest health issues within the Steins Pillar Recreation area is claimed on EA p. 12, last par., to describe "insect and disease disturbances that are affecting stand

structure with findings that are applicable to the rest of the planning area." Yet there is no further detail as to what the insect and disease disturbances are, as to what insects and diseases were found, whether these were at endemic or epidemic levels, and why the findings would be "applicable to the rest of the planning area." There is no scientific citation given, no summary of the report, and no further explanations. Why should we trust such a claim when none of the details are divulged, giving us no clue as to what the report's findings might be, and with no disclosure of the scientific methodology involved, as required by NEPA.

Alternative 4, EA p. 13:

While we want aspects of alternative 4 to scale down alternative 2, the original proposed action under scoping, that is not the same as favoring alternative 4 at all. Instead, if there are to be any negotiated resolutions to our concerns, the starting point would have to be alternative 2, not an alternative (such as both alts 3 and 4) that would log large trees and log on steep slopes, both of which we strongly oppose. After eliminating large tree logging, logging on steep slopes, and increased timber volume from high intensity logging that is much higher than the scoped alternative 2, then we could negotiate on the basis of alternative 2. We strongly oppose any commercial logging in RHCAs, as in alt. 2. We strongly oppose any commercial logging in Old Forest Preserves. We strongly oppose logging and roading in undeveloped lands. If logging in RHCAs, Old Forest Preserves, and Undeveloped lands were dropped, then we could negotiate over scaling down the foot print of alternative 2 by dropping commercial logging in the already minimal amounts of moist mixed conifer forest, including all the old growth moist mixed conifer sale units. We would also ask for already open stands to be dropped from commercial logging and for the sale units with the best wildlife habitat that we found while surveying to be dropped. We would also request that all "temporary" road construction be abandoned and that closed roads that are not maintained for seasonal use not be re-opened. Overall, there also needs to be more dense forest areas left for density-associated wildlife, such as Northern goshawk, Pileated woodpecker, Rocky Mountain elk, American marten, Mule deer, and Cooper's hawk. Some of these remedies could overlap with each other.

In other words, we have found plenty of problems with alternative 2, let alone alternatives 3 and 4, which are completely unacceptable due to large tree and steep slope logging, and the much higher timber volume from large tree logging, which indicates very intensive logging with hardly any large tree and old growth structure left.

We refuse to accept alternatives 3 and 4. The planned logging of large trees on a landscape scale, logging on steep slopes, and much higher timber extraction in both alternatives 3 and 4 were not scoped, and would decimate the Mill Creek area forest structure, biodiversity, soil productivity, moisture retention, slope stability, water quality, moisture retention, wildlife habitat, and cultural uses. Helicopter logging would be completely uneconomical and cable yarding would also likely be uneconomical.

Logging of mature and large trees is the greatest threat to large and old trees that currently exist, not fire. Climate change is the greatest threat to wildlife, biodiversity, ecosystem functioning, and organized human civilization—globally. Oregon's biggest contributor to Carbon dioxide emissions fueling extreme climate change is commercial logging. Commercial logging of mature forest cover and large and old trees has to stop or be extremely limited, as preserving forest carbon sequestration and storage is essential to reducing extreme climate change effects. The National Forests store the most forest carbon in the country, so that carbon

has to be sequestered and stored by fully protecting the National Forests as carbon sinks. The National Forests also provide wildlife habitat, and sources of fresh, clean water, as well as preserving biodiversity and ecological processes essential to a viable planet. There is no other viable planet. Resource extraction cannot be allowed to destroy the Earth and a livable climate.

Alternatives 3 and 4 represent the reckless extraction choice, not the consideration of how to change course for sustainable, ecologically sound restoration, and working toward the possibility of helping future generations survive global warming. Increasing the scoped timber volume from 17.4 mmbf to 45.1 mmbf under alternative 4 and to the even more extreme 56.1 mmbf under alternative 3, represents reckless extraction on an already highly degraded landscape by removing most of the last remaining large (and old) trees and through the long-term impacts of steep slope logging.

Alternatives and Project Design not Considered in Detail:

The suggested alternatives or project design criteria that were not considered in detail that should have been considered in detail included restrictions on logging large Grand fir, not conducting logging and biomass reduction within Riparian Habitat Conservation Areas, including more road closures and decommissioning, and avoiding management actions within certain Management Areas. We are strongly opposed to commercial logging, closed road re-opening, and "temporary" road construction within RHCAs. We are strongly opposed to logging large Grand firs and other large trees =/> 21" dbh. We are deeply concerned that most or all of the 54 miles of roads closed previously would now be re-opened and used again, with the consequent extensive negative impacts. Funding should be sought for decommissioning all existing closed roads that are not maintained for seasonal use. We are strongly opposed to any commercial logging and re-opening of closed roads or building "temporary" roads in Old Growth Management Areas, the Steins Pillar Recreation Area, RHCAs, and undeveloped lands. Our further comments on these Management Areas, logging large trees, and road construction and re-opening can be found in other sections of our comments.

Chapter 3—Environmental Impacts of the Proposed Action and Alternatives:

The Ochoco Forest Plan of 1989 is greatly outdated and lacking currently best available science to direct responsible and fully informed management actions.

Re: Late and Old Structure (LOS) stands and "potential LOS stands":

"Forested Vegetation":

Why were LOS stands limited to a minimum stand size of 5 acres, when the project area has already lost so much LOS (old growth) already? Further, old growth inventory on Blue Mountains National Forests is done on one acre plots, not based on 5 acre areas. I conducted old growth inventory to Umatilla National Forest protocols in 1992. Likewise, the minimum large tree numbers per acre for old growth status (or LOS status) should be 10 trees per acre, based on the 1992 Umatilla old growth inventory and on current requirements for LOS designation on the Malheur National Forest, rather than 10-20 live large trees per acre, depending on the PAG. There is no ecologically sound rationale for logging large trees in eastern Oregon or in the Mill Creek project area, as there is no excess density of large trees, and instead, a large deficit in large tree abundance compared to historical conditions. Large trees now only comprise about 3 % of the Blue Mountains National Forests, based on David Mildrexler's study.

It is bizarre that potential or future LOS stands were limited to stands with open structure, apparently regardless of the forest type and moisture regime. The implication of this restriction is that none of the naturally denser, more productive moist mixed conifer forest would be identified as potential or future LOS, at the expense of wildlife species dependent on denser old growth conditions with higher canopy closure, such as Pileated woodpecker and Northern goshawk. This is an extreme bias toward open forest stands that should not be allowed to corrupt the process of identifying Late and Old Structure potential for future LOS stands.

Negative impacts from past timber sales in the Mill Creek project area and "existing conditions":

The Mill Creek area has already been over-logged and over-grazed by livestock for decades—nearly to the point of no return. See EA p. 20, par. 1: "Past treatments [i.e. timber sales] have occurred within the planning area, including multiple even-aged [clearcutting] and un-even age [commercial thinning or other logging] silvicultural treatments [timber sales] authorized under the Mill FEIS and ROD (USFS 1999), various NCT and older vegetation projects [timber sales] including the Hash Rock Salvage and Reforestation FEIS (USFS 2001) and reforestation and minor inclusions of recent FEIS areas (Spears and McKay EIS areas" [timber sales that we field surveyed] , with the McKay timber sale FEIS in 2013 and the Spears timber sale FEIS in 2007. "Data on vegetation management prior to the 1980s is incomplete. Even age treatments such as clearcut or shelterwood are evident from aerial images, current stand structures, and lidar derivatives. Past treatments [logging] also include selective removal of larger individual trees, as evidenced while traversing stands with sporadic large diameter stumps, or stands with low levels of remnant, old, or greater than 21" Ponderosa pine. Selective removals of these larger individual trees occurred pre-1980 …[were] targeting trees with high risk of insect attack. <u>All past treatments [timber sales] are incorporated into the described current condition.</u>" (EA p . 20, par. 1, with underlining emphasis and bracketed clarifying text ours)

That concluding sentence is problematic, as it subsumes all the past management impacts from multiple timber sales in the Mill Creek project area into "the described current condition", often referred to as "the existing condition", in order not to analyze in depth the long-term cumulative effects of past management that overlap the currently proposed timber sale. Examples we noticed from the long-term effects of past timber sales in the Mill Creek project area and current commercial sale unit areas include the following: an obvious deficit in large trees compared to historic or never logged conditions, with many large stumps as evidence; even-age young conifer stands that were planted after clearcutting (i.e. the reforestation referenced above); unregenerated skid trails and landings from past timber sales; highly compacted soils in sale units; loss of large and old firs in particular based on huge and large old growth fir stumps; many large and mature Ponderosa pine stumps in the drier, Ponderosa pine-dominant stands; many still evident closed logging roads that were never fully decommissioned; loss of plant diversity in heavily logged and clearcut stands that may also have been affected by long-term cattle over-grazing; and greatly degraded stream conditions, often with either signs of livestock (or cattle present) and/or with old roads that crossed the streams.

All these long-term impacts of past management should not be swept under the rug, as the intent of NEPA was to fully disclose environmental effects and analyze them in depth in public documents available for comments and appeals (or now, objections). Without such detailed analysis of past management impacts, the same mistakes are repeated, and adaptive management

strategies are not planned and adopted to move toward ecologically sound restoration and better management practices.

Further logging to even lower stand densities on a landscape scale, and possible extensive logging of large trees (which was not scoped) would be unsustainable, including potential soil damage, landslides, and water quality impairment from steep slope logging under alternative 3 and 4.

Wild fires, defoliating insects, and tree diseases:

It is hard to determine if there are any grounds for claiming that fire suppression is responsible for small tree re-growth, as: "Multiple wildfires have occurred in the project area, most notably the Hash Rock Fire of 2000." (EA p. 20, par. 2) Yet no further detail, such as dates and acreages burned in past fires and their proximity or overlap with the Mill Creek project area, is disclosed in the EA, at least not on p. 20. Instead the next sentence notes that: "Additional descriptions of fire history can be found in the fuels report." Fire history in or near the Mill Creek project area should have been at least summarized in the EA with dates and acreages of the fires. Most people writing comments (including me) don't expect to have to dig through separate reports in the "project file", wherever that is. Sometimes the reports are not on the website. It's hard to access these reports, for example, due to lack of internet access, long drives to actually visit the Forest Service District office, and/or lack of knowledge as to how to navigate the internet in order to find the reports. All three of those problems apply to me. I imagine that I am not the only one facing these obstacles in rural eastern Oregon.

The presence of defoliating insects is not a crisis requiring logging, as bark beetles and mistletoe are natural disturbances and may be at only endemic levels. In fact, mistletoe can be spread by logging, based on the science. Bark beetle epidemics can spread farther when the logging perpetuates large areas of mostly just one or two tree species. Homogenous tree plantations established after clearcutting or other heavy logging allows species-specific defoliating insects and tree diseases to spread further than if the stands were mosaics of different tree species and openings, as in more natural conditions.

Use a project design criterion to prohibit removal or destruction of any Incense cedar seedlings or saplings, as this is an isolated population of Incense cedar in the upper reaches of the Dry Creek drainage.

Current "departures from the project area's historic (and desired future) conditions and disturbance regimes":

The EA admits on p. 20 that: "Today, open 'park-like' stands of large trees are relatively scarce and below their historic levels of abundance" and that: "Many stands, which were once dominated by large trees, have been replaced by stands in which pole and/or small sized trees are most common." This loss of large trees is due to past logging of large trees, which is now planned under alternatives 3 and 4 for the repetition of large tree logging, which would result in the same outcome: fewer large trees and less old growth structure, with in-growth of small-sized and pole-sized trees. Why would a different outcome be expected from repeating the same mistake?

Since there were previous recent timber sales in the Mill Creek sale area, most understories and increases in stand densities are only small, young trees up to 9-10" dbh, or pole-sized trees, based on our field surveying.

The EA also acknowledges that "generally it is assumed fewer old individual trees are present on the landscape than in the past…." and that "Past management, including fire exclusion, has homogenized the forested vegetation conditions in the project." The EA also acknowledges that: "A mix of early, mid and late seral species, stand density, and structural stages are important for the longevity of wildlife habitat, water availability, forest products, recreation opportunities, and rangeland use." Yet the planned logging would still be favoring "early seral" species and eliminate mature and large late seral species (e.g. Grand fir and Douglas fir), and would again homogenize the forest by reducing stand density on a landscape scale, and remove structural stages such as late and old structure by removing large trees and many other mature trees between 15" and 21" dbh, resulting in fewer future large and old tree structure. So there is an obvious disconnection between the desired future conditions, based on this portrayal of "current departures" from the "desired future conditions," and the predictable effects of repeating past management practices and types of logging that would just exacerbate the existing departures from historic and desired conditions.

The EA also acknowledges that: "It's important to maintain and protect existing and future potential LOS [Late and Old Structure] that is at high risk of loss because it takes 150-400 years to create these stand types." (EA p. 21, 4th bullet point) Yet LOS is not maintained and protected by planned logging removal under alternatives 3 and 4 of large (and usually old) trees and logging mature trees in the next size class to become large trees (15-21" dbh), which would keep them from growing into large and old structure.

Desired Future Condition:

The EA also admits that "HRV is not a perfect metric for forest resilience through future climatic changes…." (EA p. 21) Forest Service researchers working with the Pacific Northwest Research Station published an article in the Station's newsletter advocating that the historical range of variability concept is not appropriate to use for guidance under rapidly changing extreme climate changes. Relying heavily on the HRV concept ignores the agency's own scientists.

By basing the desired future condition on HRV, the Forest Service is failing to disclose and consider the scientific critique of the Forest Service use of HRV. The current climate change regime will likely thin out the forest itself by stressing and killing tree species on marginal sites for the species and potentially eliminating much forest cover through more intense wild fires, prolonged droughts, and record-breaking high temperatures, as well as due to severe storms, seasonal temperature changes, and erratic precipitation patterns. These new conditions should be met with far more forest protection from logging, not more logging removal of forest cover on a landscape scale.

Fast rotation repeated logging, as planned, would <u>not</u> "move the landscape towards having more diverse landscape patterns and forest structure" as stated for desired future conditions on p. 21. Instead, the forest would be further homogenized by heavy removal of trees on a landscape scale that favors retention of only Ponderosa pine and Western larch and which would

systematically remove large fir trees. We are opposed to tree species conversion to only timber industry-preferred tree species.

Logging would not "maintain natural-appearing forest stands" in the Steins Pillar Recreation Area or elsewhere.

Not all forest types and Plant Association Groups (PAGs) are appropriate for using the lower management zone SDI [Stand Density Index] for Ponderosa pine, as implied on the last sentence of p. 21 into p. 22. Moister mixed conifer forest with moist PAG indicators are naturally more productive and naturally denser. Further reduction below the lower management zone SDI would result in incremental forest liquidation, as the stands would dry out, mycorrhizal fungal communities might no longer support tree stands' resiliency to stressors, and ecological functions would start breaking down. Reducing the forest density should be left to natural disturbances and climate change effects to accomplish, giving the forests the ability to compensate in natural ways, rather than being subject to even more unnatural management stress.

Species Composition—Existing Condition:

Early "seral" tree species do not naturally dominate areas where moister mixed conifer was historically present and with more areas being conducive to mixed conifer stands during recent periods of moister climate. In the Mill Creek project area the forest types range from Ponderosa pine dominant stands and Ponderosa pine/Douglas fir stands, to moist mixed conifer at higher elevations, with evidence of old growth firs historically existing, including Grand fir and Douglas fir—old growth live, snags, and logs. These changes are based on soil types, topography and slope aspect, elevation, and moisture retention levels. See our survey sheets and photos for evidence of these conditions in the original sale units proposed under alternative 2. These will be mailed separately from these comments, as part as our overall comments on the Mill Creek Project.

Endlessly managing for mostly Ponderosa pine and Western larch is unnatural and often futile for mid and high elevation forest sites—especially on north aspect slopes, in ash soils, and in moister PAGs, as well as in RHCAs, hollows, and high elevation. Western larch is an early successional species that is much more abundant right after wild fire, including stand replacement and mixed severity wild fire, with its seedling regeneration success enhanced by open mineral soil conditions after intense fire. Ponderosa pine plantations in moist mixed conifer habitat are often sickly.

The EA admits that stands in late "seral" conditions are currently under-represented and that: "Late seral stands occur on 2% of the project area but would have historically comprised 7 to 21% of the project area." The historical acreage of the moist mixed conifer forest is estimated to have ranged from 2,534 acres to 7,708 acres within the project area. There is nowhere near that acreage of moist mixed conifer dominated by late seral tree species in the project area now. This means that there is less moist mixed conifer forest than there was historically, so not all of the project area should be thinned to low basal area retention as if it was all historically open dry forest stands. See our survey sheets and photos for evidence of historic Grand Fir and Douglas fir (now old growth structure) locations in proposed sale units. These are generally recommended for dropping the sale units as there is little moist mixed conifer habitat remaining in the project area due to past logging. Wildlife species associated with moist mixed conifer old

growth habitat are intensively using the remaining old growth moist mixed conifer, including Pileated woodpeckers.

It's inaccurate use of the science to project tree species composition 50 years into the future without being able to predict and incorporate natural disturbance effects and extreme climate change effects.

Insects and Disease—Existing Condition, EA p. 33:

We find the following method for determining susceptibility of the project area to insects and disease to be inaccurate use of the science:

"The susceptibility hazard (risk) of the project area to insects and disease has been evaluated by comparing the abundance of seral/structural stages that are either at high stand densities and/or have a large proportion of grand fir and Douglas-fir associated with them and comparing them to the historic range of variability." (EA p. 33, last par.)

This is not a scientifically valid way to identify areas at high "risk" of insects and disease when actual evidence of insect outbreaks and disease are not being used to determine the insect and disease ratings. High stand densities and/or having "a large proportion of Grand fir and Douglas fir" and "comparing them to the historic range of variability" (p. 33, last par.) does not mean necessarily that the stands are at high risk of insects and disease. Denser stands may be moister and naturally more productive, and stands with Grand fir and Douglas fir are usually moister and more resilient than drier stands. I have never seen this method used to establish high risk of stands to insects and disease. Usually, instead, pathologists are brought in to sample in the field the abundance levels of defoliating insects or the spread of a particular tree disease, which is far more credible, based on both expertise and evidence from the field.

Late and Old Structure—Environmental Consequences:

Figures 16 and 17 do not disclose the total numbers of large Grand fir and Douglas fir based on the numbers of large trees removed per acre multiplied by the numbers of acres of each category.

Open stands do not guarantee the future development of Late and Old Structure (LOS). More open stands from past logging in moist mixed conifer is likely to lose significant water retention and thus be more affected and stressed by droughts or heat waves, as cooling shading and more down wood retains more moisture.

No existing LOS should be commercially logged as "LOS can take 150 to 400 years to develop" and: "It is not expected that all of these potential future LOS stands will grow into LOS during the next 100 years." (EA p. 42)

Figure 16 and the related discussions of alt. 3 and alt. 4 are very misleading, with the methodology being highly suspect and unprofessional in some of its stated implications.

LOS Cumulative Effects analysis:

The EA fails to disclose the scientific methodology used to determine so-called "potential future LOS" and "Total Potential Long-Term LOS" in Table 16—in violation of NEPA requirements. The meaning of these increased acreage numbers of "potential future LOS" and "Total Potential long-term LOS" is incredibly opaque and incomprehensible for "immediately

following treatment [logging] by alternative." How does logging removal of large trees next in line to be old growth (or likely, already old growth) lead to increased acreage of "Potential Future" and "Total Potential Future" LOS? This makes no sense. Also it is inaccurate use of the science to inflate Single Strata LOS and make it seem like after logging large trees, there is more LOS, when old growth and large structure was removed from multi-strata LOS, leaving instead less total LOS structure and degraded LOS conditions for wildlife and future LOS. After all, Late and Old Structure status is determined by the Forest Service according to a minimum number of live large trees per acre plus large snags and logs. So if the live large trees are brought down to minimum LOS numbers as Single Stratum LOS, all it takes to lose LOS status is less than 10-20 large trees per acre, according to the Plant Association Group, based on information in the EA.

This is a very biased and incomplete cumulative effects analysis (on EA p. 46), in that it fails to consider the long-term effects of extensive earlier logging that did overlap the current Mill Creek sale that was called the Mill Project, referenced in the first section of the EA. Yet this extensive heavy logging in the same area not very long ago (with the decision signed in 1999) being subsumed into "the existing condition" so as to avoid acknowledging the long-term negative impacts of timber sales over decades, including extensive soil compaction; extreme reduction of large and mature trees; unregenerated skid trails; difficult future tree regeneration; extensive loss of wildlife habitat for more diverse species; loss of any rare plant species; loss of moisture retention; highly degraded and dysfunctional riparian ecosystems from both riparian area logging and intensive livestock grazing; loss of scenic integrity; and loss of potential Wilderness Areas, etc.

Fire and Fuels:

"Fire behavior is estimated to be generally mild in Riparian Habitat Conservation Areas…." (EA p. 55) So commercial logging and density removal is not likely needed in these RHCAs. Yes, riparian areas are "fragile ecosystems", which is a major reason for not logging, roading, and using heavy equipment in RHCAs. Riparian ecosystems evolved with wild fire, but not with logging and roads. There is science showing evidence of fish surviving wild fires, as well as of fish runs diminishing to an enormous extent, primarily due to livestock, agricultural diversions, dams, and logging in RHCAs.

Botany:

We are very concerned about logging and roading impacts to Sensitive Calochortus longebarbatus var peckii (Peck's Mariposa lily), as it is a restricted local endemic threatened with extinction throughout its range in eastern Oregon. Most of the Peck's Mariposa lily is on the Ochoco National Forest. Only use non-commercial thinning by hand and prescribed burning outside of the spring reproductive season in potential Peck's Mariposa lily habitat.

Since Moonwort species (Botrychium) are extremely hard to find (I've only seen one in 32 years of field surveying) and often don't emerge at all in various years, not using heavy equipment and not logging or doing road construction or re-construction in RHCAs would help protect any Botrychium species and other Sensitive riparian plants that may occur.

We are also opposed to steep slope logging due to potential negative impacts to Sensitive plant species in riparian areas below the steep slopes, with potential sediment increases. See p. 79 of

the EA, 2nd par. We are also opposed to "temporary" road construction and logging within RHCAs due to potential impacts to as yet undiscovered Sensitive plants.

Non-Native Invasive Plants:

With extensive bare ground areas in the Mill Creek project area and already established exotic invasive plants, including in riparian areas, cattle grazing and past timber sales have created a lot of potential for out of control invasive plant populations, which are called "not systematically inventoried or controlled" on EA p. 94. Thus we are deeply concerned, based on both our field surveying and the EA, that the extensive ground disturbance and increased road access from the proposed Mill Creek timber sale should be significantly scaled down or dropped altogether. Closed road re-opening should be cancelled and ground disturbance should be kept to a minimum by thinning far less acreage with less intensive logging and biomass reduction. There should also be no "temporary" road construction, which often is never fully decommissioned, becoming de facto system roads that increase access for introduction and dispersal of exotic invasive plants. Avoid using burn piles. Do non-commercial thinning by hand. Drop much of the commercial logging proposed based on our recommendations.

Buffer and flag any existing invasive plant populations so that heavy equipment and logging or roading doesn't enter the populations.

We support the concerns regarding negative effects of the proposed actions that could introduce and spread exotic invasive plants, as expressed on p. 95, 2nd, 3rd, and 4th full paragraphs.

We are concerned by the effects of all three action alternatives that would introduce and spread exotic invasive plants, as: "Alt. 3 will be the highest risk and likely result in the most introduction and spread of noxious weeds since it has the most ground disturbing acres of vegetation and fuels activities and transportation activities of the three action Alts. Alt. 2 has more ground disturbing acreage from vegetation and fuels activities, while Alt. 4 has more transportation activities that create bare soil through new and existing temp roads." (EA p. 97, 2nd to last par.)

High severity wildfire is more likely to involve invasive plant introduction and dispersal if past management already established the invasive plants and/or post-fire logging is implemented with introduction and dispersal of invasive plants through heavy equipment use.

Wildlife:

Threatened, Endangered, Proposed, and Sensitive Species:

An update: Actually, the wolverine is being re-considered as a candidate for uplisting to Threatened status, at least the last I heard.

Wolverine use very extensive home ranges for a pair of about 150 square miles, so wolverine could use most forest areas as scavenging habitat and dispersal habitat. The Ochoco National Forest on the east side of highway 26 could have suitable wolverine denning habitat at higher elevations. The Mill Creek Wilderness Area could be used as security habitat within the analysis area. Effects to wolverine should have been considered in the EA.

Effects to Lewis' woodpecker should have been considered in the EA analysis, as they select for old burns such as the Mill Creek fire. A Lewis' woodpecker pair nested where I live in dry

Ponderosa pine and juniper forest at 3,400 to 3,700 feet elevation, using an old burn from 1996 for nesting (with successful fledglings) for about four to five years and still forage there with their young, so it is possible that Lewis' woodpeckers use the old burned areas from the Mill Creek fire in the project area. Lewis' woodpeckers also use riparian areas. Any potential impacts from logging and roading in RHCAs will not be mitigated if commercial logging or tree felling is allowed there as planned.

Gray wolf: The Mill Creek project area already has "a high amount of human disturbance" and: "All action alternatives include an increase in human use of the area." (EA p. 100, 3rd to last par.)

We advocate for less commercial thinning in the Mill Creek sale in part because Mule deer are in sharp decline in the region and deer need hiding cover to protect them from human predators and wolves. Many of the sale units proposed for commercial logging are already very open stands with variable density from previous logging. Many sale units should be dropped on this basis.

The EA analysis warns that: "Prey such as elk and Mule deer may be displaced onto nearby private lands, which in turn may encourage wolves to occupy those same habitats as they disperse through the area, increasing the potential for conflicts with private landowners." (EA p. 104, 1st par.) Given these analysis findings, potential impacts to dispersing and foraging wolves could be significant to wolf recovery, as wolves may be shot, poisoned, or trapped if they are attracted to private lands where there is livestock. They could also be killed by the Oregon Department of Fish and Wildlife (ODFW) based on livestock predation judged to be by wolves. Thus the effects to dispersing wolves, who add to genetic diversity and help expand wolf range and establish new packs are not "insignificant and discountable", as claimed on EA p. 104, 2nd par.

We had a positive daylight sighting by myself and two volunteers of a huge black wolf in the Paulina District of the Ochoco in the Black Mountain timber sale area. Seeing a wolf in the wild is a thrilling experience. We want Mill Creek project management to be more restrained so as not to drive Mule deer and wolves onto private lands by maintaining more hiding and thermal cover.

Cumulative effects analysis must take into consideration the cumulative effects over time of past management, including prior reduction of hiding and thermal cover and increased access for human disturbance. Yet this is absent from the cumulative effects analysis for Gray wolf. The analysis lacks specific outcomes from past management. There is no specification as to what kind of degradation and how much degradation to habitat conditions for wolf prey species derived from the McKay and Spears timber sales and earlier timber sales.

Wasn't the Lemon Gulch Mt. bike trail system project cancelled?

The determination of "May Effect, not Likely to Adversely Affect" doesn't seem to be justified, since their main prey, elk and deer, would be negatively affected by loss of hiding and thermal cover and by increased human disturbance, depleting the summer fat reserves in deer that are necessary for winter survival. There is also the possibility of both deer and elk being displaced onto private lands or other parts of the Forest, as the EA acknowledged. This could also cause dispersing wolves to be displaced to private lands and potentially be killed, due to any predation

of livestock. How are these not adverse effects to Gray wolves in the project area? This is inadequate and biased cumulative effects analysis.

White-headed woodpecker:

The analysis for effects to White-headed woodpeckers conveniently ignore their reliance on large trees that would be removed under alternatives 3 and 4. Logging in reproductive habitat may degrade its suitability if large trees and snags are lost to logging, as would be likely.

Logging large trees and mature trees up to 21" dbh would not result in "enhancing the development of large trees in stands where they are currently limited." (EA p. 106, last par.)

Instead, there would be logging reduction of existing large trees that White-headed woodpeckers could otherwise use for nesting or foraging. Logging reduction of mature trees, including Ponderosa pine, up to 21" dbh is the size class that would otherwise be the first "to enhance the development of large trees". Prescribed fire could potentially reduce large snags suitable for nesting.

Primary Cavity Excavators:

There's no guarantee that the estimated 7 large trees per acre would provide green tree replacements for future snag recruitment in the Ponderosa pine/Douglas fir forest type since Douglas fir up to 30" dbh would be logged under alts 3 and 4 with a broad spectrum of rationales, and with no evident restraint.

We are concerned that in the Eastside Mixed Conifer habitat type that: "The analysis area is below reference conditions for the 2-4, 4-6, 6-10, and 10-18 snags/acre categories, meaning there are fewer acres of high densities of large snags then would have been present historically." (EA p. 112, 2nd to last par.)

Proposed logging, including the logging of Grand fir and Douglas fir up to 30" dbh would significantly reduce future large snags, as they are in the large size class. Logging in general reduces higher densities of snags needed by Primary Cavity Excavating (PCE) woodpeckers, due to hazard snag removal and great reduction of available future snags through heavy mature tree logging. See the EA admission of this effect of past large tree logging on p. 112, 1st par., last three sentences. There is no reason to expect a different result from currently planned large tree logging under alternatives 3 and 4. Large tree logging would also cause depletion of future large down wood for foraging.

Primary cavity excavating woodpeckers that would be most likely to be harmed by large tree logging include Pileated woodpecker and Williamson's sapsucker. See the citation of research by Bull et al. (2007) and Ohmann and Waddell (2002) re: the need for these two species to have high densities of snags in the Eastside Mixed Conifer habitat where Grand fir and Douglas fir would be removed up to 30" dbh under alternatives 3 and 4. This would threaten the viability of these two MIS primary cavity excavator species, as well as other woodpecker PCEs dependent on large trees. Sensitive Lewis' woodpecker and Northern Flickers are both Management Indicator species as PCEs, and both are in decline, along with the Sensitive-listed White-headed woodpecker. Large tree logging on a landscape scale, as planned by the Forest Service under the already legally challenged Eastside Screens amendment to the 21" dbh limit would very likely result in increased declines in these Management Indicator primary cavity excavators and

upward listing trends under the ESA and violating NFMA requirements for maintaining the viability of Management Indicator species.

As with the drier Ponderosa pine/Douglas fir habitat type, logging large trees under alternatives 3 and 4 would result in likely loss of the 8 trees per acre since Grand fir and Douglas fir >20" dbh that could be logged based on almost any situation, up to 30" dbh.

Notably Pileated woodpeckers select preferentially for large Grand fir, and Williamson's sapsuckers rely heavily on large live Douglas firs for foraging.

Such projections for estimated green tree replacements > 20" dbh for future snag recruitment up to 30 years in Table 33 ignore unpredictable natural disturbances and the effects of planned logging diminishing future snags. (See EA p. 113)

Cumulative Effects analysis for Primary Cavity Excavators:

The cumulative effects analysis for Primary Cavity Excavators fails to quantify the amount of existing snag levels and future snag recruitment from the action alternatives. Instead, the analysis minimizes the potential combined loss of existing snags and the loss of future snag recruitment due to logging of mature and large trees by calling it "the potential for a slight negative trend" in future snag recruitment. The analysis does not disclose what level of snag recruitment loss would be considered "slight" and how much future snag recruitment loss there could be and with what effects to the viability of Primary Cavity Excavators.

No scientific methodology is disclosed for the conclusion that there is only potential for a "slight" negative trend in future snag recruitment.

The cumulative effects analysis for primary cavity excavating woodpeckers is inadequate due to reiteration of project design criteria that have consistently failed to avoid consequent declines in snag abundance for wildlife in timber sale after timber sale. This could also result from the Mill Creek sale, which also targets large trees in alternatives 3 and 4, reducing future large tree snag recruitment. Large snags are usually below historical levels and never logged forest snag abundance. Large snags are critical habitat elements for multiple PCEs.

Pileated Woodpecker:

Existing Condition:

Pileated woodpecker habitat is no longer increasing across the Blue Mountains Forests since Wisdom et al.'s finding in 2000, due to increasing logging of moist mixed conifer old growth habitat.

The EA recognizes that "densities of large-diameter snags (>20" DBH) have declined from historical to current levels due to the transition of stands to early seral forests that lack the historical structure, which included large snags and large emergent trees that survived crown fires (Wisdom et al. 2000; Korol et al. 2002)." (EA p. 115, 1st par. under "Existing Condition") The EA also acknowledges that the drier Ponderosa pine "habitat type does not produce large-diameter snags (>20" DBH) in densities used by Pileated woodpeckers."

The Forest Plan science is outdated. The 300 acre size Old Growth Management Areas are not large enough to ensure Pileated woodpecker viability compared to studies by Bull et al. showing that Pileated need at least 900-1,000 acres per pair of ideal habitat with lots of old growth snags

and logs. Supplemental Pileated woodpecker feeding areas and Replacement Old Growth has often been logged and is not all old growth. Meanwhile, timber sales have been logging suitable and active Pileated habitat.

The EA discloses that in the Mill Creek timber sale area: "Densities of large-diameter snags (>20 inches DBH) in the snag density classes that provide Pileated woodpeckers are below reference conditions in the Eastside Mixed Conifer Wildlife Habitat Type." This pertains to their best foraging habitat.

DECAID analysis on EA p. 116 shows low tolerance levels for Pileated woodpecker viability, with most habitat being only at the 30% tolerance level for Pileated use and only 1% of the large snag habitat at the 80% tolerance level and only 3% of the area with small snags at the 80% tolerance level.

Environmental Consequences—Pileated woodpecker:

All three action alternatives would greatly diminish suitable Pileated woodpecker habitat with logging of 2,582 acres of potential Pileated habitat to 3,336 acres logged under alternative 3. (See Table 36, p. 117) Additional prescribed burning would likely reduce the availability of soft snags and logs for foraging. These losses of suitable habitat are cumulatively increasing the existing great loss to logging of moist mixed conifer old growth (EMC) in the same area.

See numerous EA analysis disclosures of negative impacts to Pileated woodpecker viability on pages 117 and 118. For instance, "prescribed burning may have varying effects on habitat suitability by reducing down wood that provides a foraging substrate (Bull et al. 2005). Commercial treatment would reduce suitability of these stands for nesting and foraging immediately after treatment due to reduced stand densities and complexity." (EA p. 117, last par.)

Under "Alternative 3" on p. 118: "In addition, the species composition of the large tree component would be skewed toward fire-tolerant, longer-lived Ponderosa pine trees which are less likely to be utilized for foraging or nesting by Pileated woodpeckers than fir trees (Bull and Holthausen 1993)." (EA p. 118, last par.)

Conclusion:

The EA conclusion that loss of Pileated habitat "would be insignificant at the scale of the Forest" fails to recognize all the Pileated habitat loss to other timber sales across the National Forest cumulatively. Switching to the Forest scale for species viability analysis is inaccurate use of the science, in that it fails to account for loss and degradation of wildlife habitat from many other timber sales and other management impacts across the entire Forest to the same species. This switching to Forest scale to promise viability of species also reflects inadequate cumulative effects analysis.

Rocky Mountain Elk and Mule deer:

Another reason not to commercially log and construct or re-construct roads in RHCAs is their importance as the most likely elk calving and deer fawning sites. Logging would remove suitable hiding cover and closed road re-opening or "temporary" road-building and skid trails would increase human disturbance. This would likely result in no further use of otherwise suitable fawning and calving sites in the RHCAs.

The methodology for determining the Habitat Effectiveness Index should have been included in the EA. Otherwise, the numbers seem meaningless.

We disagree with the EA claim that all activities—including commercial logging—in RHCAs would "protect and enhance the character of riparian areas where calving and fawning are likely to occur." (EA p. 126). Commercial logging would be highly detrimental to the security and character of potential elk calving and fawning habitat.

Displacement of Mule deer and elk to adjacent private lands or other parts of the Forest would be deeply unpopular with private landowners in the area, elk and deer hunters, and other recreationists. Displacement would also further threaten Mule deer viability in the region.

Provision of forage must be balanced with the need for sufficient hiding cover, thermal cover, and lack of human disturbance for elk and deer.

The l ack of quantification of cumulative effects allows for emphasis on "a positive trend for many habitat variables for elk and deer" while marginalizing "some adverse impacts" that "would be expected to occur as well." Displacement of elk and deer could take place during timber sale implementation over years—with long-term negative effects.

Consistency with a very outdated Forest Plan does not ensure "continued viability of Rocky Mountain elk and Mule deer…on the Ochoco National Forest." (EA p. 129, 1st par.)

Re: Northern goshawk and Cooper's hawk:

Based on Table 43 "Last Year of Documented Activity" for known Northern goshawk nest sites, Northern goshawk nests seem to have been abandoned in the time span of 2003 to 2017, which could have overlapped with logging of timber sales in the Mill Creek area or increased human disturbance. The earlier nests of 1997 and the early 2000's could have been disrupted by the logging of the 1999 Mill Project timber sales.

Based on Table 44, each action alternative would diminish acres of reproductive habitat for goshawk, from the current estimate of 23, 612 acres to as low as 14,561 acres under alt. 3. Each action alternative would remove thousands of acres of suitable goshawk habitat, with alt. 2 removing 3,884 acres of goshawk habitat.

Cumulative effects to goshawk include effects to suitable habitat outside the Post Fledging Areas that could be degraded significantly.

Wildlife Connectivity Corridors:

The stand densities retained in wildlife corridors still have to be between 66% and 100% of "full stocking", regardless of Powell (1999). This still allows for lighter logging, while retaining the top third of site potential. Further, the Interim Wildlife Standard has the described condition of "Stands in which medium diameter and larger trees are common, and canopy closures are within the top one-third of site potential." (EA p. 137, last par.)

Logging wildlife corridors must retain 66% to 100% of "full stocking", not 50 to 75% of "full stocking" by defining the "upper limit of the management zone" as the upper threshold for canopy retention. This is a clear violation of the Forest Plan regarding retention requirements for wildlife corridors. Logging down to only 50% of full stocking and a corresponding canopy

closure from 50 to 70% of site potential violates the Forest Plan and would not meet the "desired condition" quoted above, which is embedded in the Forest Plan.

Understory trees are not usually interpreted as part of canopy closure, which is comprised of mature (midstory) and large (overstory) canopy. See EA, p. 138, par. 2. This retention of additional understory planned does not "retain canopy closure in the top third of site potential and meet the direction contained in the Wildlife standard" as claimed.

As the EA analysis notes, "Generally, connectivity corridors are maintained or managed at higher tree densities and canopy cover than adjacent areas to provide more security for dispersal or movement." (EA p. 138, 3rd par.)

Maintaining greater stand density and higher canopy closure in wildlife corridors is needed more than ever to provide for extreme climate change effects causing need for wildlife species to migrate to higher elevations or north to escape overwhelming heat and drought at lower elevations and southern regions. Drop all commercial logging in the identified wildlife corridors, especially since most of the surrounding area would have very low canopy closure and density under the action alternatives.

Commercial thinning is not maintaining or enhancing the development of large tree structure when large trees would be removed by logging, as in alternatives 3 and 4. (See EA p. 139, 2nd par.) There is even a significant loophole for not leaving portions of sale units in un-thinned patches "where desired conditions are in direct conflict." This is a highly subjective and biased exception.

Detrimental Soil Conditions:

This is a terribly high mileage of closed road re-opening, from 44.89 miles under alt. 2 to 49.66 miles would be an irretrievable commitment to detrimental soil impacts and would cause much more human disturbance through increased access. (See EA p. 218, last par.)

Table 77 on p. 220 reveals how excessive "temporary" road construction would be at 64.51 miles of ground disturbance under alt. 2, 71.14 miles of disturbance under alt. 4, and an even more extreme 86.23 miles of ground disturbance from "temporary" road construction under alt. 3. This is the most excessive mileage of "temporary" roads that I've seen for a single timber sale over the past 32 years of forest monitoring.

Why don't the total mileage figures from Tables 77 and 78 match each other for the total existing and new ground disturbance planned for "temporary" road construction?

Undeveloped Areas:

The undeveloped lands analysis should not be based solely on areas of 1,000 acres or more. The Malheur NF analysis identifies undeveloped lands of 100 acres or more, providing an opportunity to save smaller areas of last relatively pristine habitat for wildlife, last undisturbed or non-degraded areas for recreational nature study and solace and for reference conditions for different habitat types that are near areas where management has taken place, to guide restoration efforts based on more natural conditions.

An undeveloped area of 1,160 acres is far more valuable for preservation next to the Mill Creek Wilderness and the Wildcat Campground than for logging.

We are strongly opposed to any commercial logging, roading, and biomass removal in undeveloped lands. Drop all commercial logging, biomass reduction and "temporary" road construction within the identified undeveloped lands. See Adam and Drea's survey sheets and photos of likely undeveloped lands in commercial sale units, with no signs of past logging. Natural forest areas with no past logging or road construction are now very rare and critical to preserve in an undeveloped condition for wildlife habitat, primitive recreation, carbon sequestration and storage, and local reference conditions by which to compare the effects of logging and road construction. See Table 85 on EA p. 229 for planned acreages of commercial logging, biomass reduction, non-commercial thinning, and prescribed burning planned for the undeveloped area.

Climate Change:

As usual, the Forest Service's analysis of carbon and climate change is so biased that it could have been written by a timber lobbyist. The carbon and climate change section of the EA fails to disclose significant controversy that would refute and correct many of these statements and assumptions, such as failing to recognize the cumulative contributions to Greenhouse gas emissions producing the climate change disasters; the assertion that the Mill Creek timber sale does not fall into the main contributor of Greenhouse gases as "Forestry"' that there is higher release of CO2 emissions by wildfire, drought, and insects/disease than by logging, when logging is Oregon's biggest contributor to CO2 emissions; by failing to disclose the contributions of timber sale Greenhouse gas emissions and its reduction of forest carbon sequestration and storage; and that the proposed actions "are positive factors in carbon sequestration."

Highlighted below are a few of the issues with logging on public lands, including proposed logging in the Mill Creek sale:

- There is a statistically small probability that a "treated" (logged) area will encounter a wildfire within the window of time that the "treatment" is considered effective (e.g., "fuels treatments" are only effective within a ~20-year timeframe, before shrubs and saplings grows back-- often in more dense and brushy forests than before logging occurred).
- Logged forests may burn more severely due to increased solar radiation and wind, drying out of the more-open logged forests, and changes to complex structure and microclimates that occur as a result of logging.
- Protected forests do not burn at greater severity compared to managed forests.
- Native mature and old forests with complex structures are the most resilient to fire. Forests that have been degraded by decades of clearcutting are more prone to severe fires.
- Closed canopy forests with large trees tend to burn at lower severities compared to more open forests.
- Large intense wildfires are climate-driven. Wind, drought, and heat are the primary drivers of fire severity and behavior in climate-driven fires—not previous "fuels reduction".
- Most fire ignitions in the US are human-caused, particularly in areas of increased access and high road densities. Thus, it would be far more effective to close and decommission roads than to log in the backcountry.

- Fires that destroyed the most human structures in cross-boundary ignitions originated from private lands, not public National Forest lands. Fire activity peaked with dense road networks and moderate human populating densities.
- Logging in the backcountry does not keep communities safe. The most effective way to keep homes and people safe is to focus on work directly adjacent to homes.

Please review the bibliography and the copies scientific studies we have submitted as evidence for the above statements, as well as for additional concerns with logging-related effects and issues.

Logging also creates well-documented and widespread ecological damage. Wildlife and their habitats, clean cold water, sensitive and imperiled species, and the climate are harmed by logging.

- There is a huge discrepancy between the logging that is actually occurring on the landscape, vs. how the agencies and timber industry portray logging to the public.
- Logging harms key wildlife habitats and numerous imperiled species, as well as water quality, hydrology, and streams and riparian habitats.
- Logging does not increase water yield or storage on the landscape, but rather results a long-term reductions.
- Logging exacerbates climate change and many of the climate-related negative impacts increasingly experienced by forests and species.
- Logging requires a huge, costly, and ecologically damaging road network.

Highlighted excerpts from Scientific Studies (emphases below are added): In a study of fire severity and forest conditions in the Klamath-Siskiyou region of northwestern California and southwestern Oregon, *Odion et al. 2004* concluded:

> "[T]*hat multi-aged, closed forests, the predominant vegetation, burned with much lower severity than did open forest* **and shrubby nonforest vegetation; (4) that** *considerably less high-severity fire occurred where fire had previously been absent since 1920 in closed forests to where the forests had burned since 1920 (7% vs. 16%)***; (5) that nonforest vegetation burned with greater severity where there was a history of fire since 1920 and in roaded areas; and (6) that** *tree plantations experienced twice as much severe fire as multi-aged forests. We concluded that fuel buildup in the absence of fire did not cause increased fire severity as hypothesized. Instead, fuel that is receptive to combustion may decrease in the long absence of fire in the closed forests of our study area, which will favor the fire regime that has maintained these forests."*

In the study *Mixed-severity wildfire and Habitat of an Old-Forest Obligate, Lesmeister et al. 2019* discusses that older forests burn at lower severities compared to logged private lands. They also found that old-forest conditions associated with Northern spotted owls (dense, complex, and closed canopy forests) burned at lower severities that other forest types, despite their higher "fuel" loading. While the Lesmeister study focuses on spotted owls, which are not present in the Mill Creek area, it is important to note that the study area encompasses on fire-prone forests in the Klamath-Siskiyou ecoregion. The study also includes discussion and research from central

Oregon. The dynamics of these fire-dependent forests are also relevant to forests in central Oregon.

> "Intensive management (especially on timber industry lands) that results in reduced fuel loading does not always equate to less frequent or severe fire. ***Results by Charnley et al. (2017) in southcentral Oregon showed that private industry lands had more than three times the percentage area of open-canopy forest compared to U.S. Forest Service-managed lands that included thinning trees <53.3 cm diameter, prescribed fire, and no active management. Federal land management practices resulted in forests with more resilience to high-severity wildfire as opposed to management on private lands (Charnley et al. 2017). Furthermore, Zald and Dunn (2018) found that ownership patterns were the best predictor for high-severity fire in the Douglas Complex Fires, where federal lands, with primarily older forests in late-successional reserves, burned at lower severity than non-federal forests that were primarily private timber industry lands."***
>
> ***"We found that the old-forest conditions associated with northern spotted owl habitat burned at lower severity despite having higher fuel loading than other forest types on the landscape. The microclimate and forest structure likely played a key role in lower fire severity*** in nesting/roosting habitat compared to other forest types. ***As succession progresses and canopy cover of shade-tolerant tree species increases, forests eventually gain old-growth characteristics and become less likely to burn because of higher relative humidity in soil and air, less heating of the forest floor due to shade, lower temperatures, lower wind speeds, and more compact litter layers (Countryman 1955, Chen et al. 1996, Kitzberger et al. 2012, Frey et al. 2016, Spies et al. 2018). In addition, as the herbaceous and shrub layer is reduced by shading from lower to mid-layer canopy trees, the connection between surface fuels and the canopy declines, despite possible increases in canopy layering (Halofsky et al. 2011, Odion et al. 2014).*** Alexander et al. (**2006**) found that in the Klamath-Siskiyou ecoregion, southern aspects tended to burn with greater severity, but exogenous factors also played an important role because areas with large trees burned less and had less fire damage than areas dominated by smaller trees. On the 2002 Biscuit Fire that burned near our study area, Thompson and Spies (**2009**) concluded that weather and pre-fire vegetation conditions were the primary determinants of crown damage. ***They found that forests with small-stature vegetation and areas of open tree canopies and dense shrubs experienced the highest levels of tree crown damage, while older, closed-canopy forests with high levels of large conifer cover were associated with the lowest levels of tree crown damage. The moisture content of air and soil in a forest affects the amount of fuel moisture, and thus the probability of ignition and burning temperature (Heyerdahl et al. 2001).*** In addition to the potential to mitigate negative effects of climate warming at local scales by creating refugia and enhancing biodiversity (Frey et al. **2016**), we suggest that northern spotted owl nesting/roosting habitat also has the potential to function as fire refugia (i.e., areas with higher probability of escaping high-severity fire compared to other areas on landscape) in areas with mixed-severity fire regimes under most weather conditions. Thus, in these landscapes, ***management strategies to conserve old-growth characteristics may also reduce risk of high-severity wildfire (Bradley et al. 2016) and serve as buffer to negative effects of climate change (Betts et al. 2018)."***

> ***"The time for recovery of belowground systems is a key driver of ecosystem processes and depends on burning intensity and on previous land-use practices. Soils are greatly altered and degraded in young intensively managed forest and post-salvage logged sites, which are more susceptible to repeat and short-interval high-severity wildfire, and these forests that experience multiple rapid successions of natural and human-derived disturbances may cross thresholds and be changed catastrophically (Lindenmayer and Noss 2006)."***

In the study Northern spotted owl nesting forests as fire refugia: a 30-year synthesis of large wildfires, *Lesmeister et al. 2021* discusses how interior forest microclimates function as fire refugia, and may be able to play a crucial role in fire resiliency at a landscape scale, and in dampening the effects of climate change on increased wildfires. While this Lesmeister study also focuses on spotted owls, which are not present in the Mill Creek area, it is important to note that the dynamics of the fire-dependent forests in the study are also relevant to forests in central Oregon.

> ***"Averaged over all fires, the interior nesting forest burned at lower severity than edge or non-nesting forest. These relationships were consistent within the low severity, very frequent, and mixed severity, frequent fire regime areas.*** All forest types burned at similar severity within the high severity, infrequent fire regime. During two of the most active wildfire years that also had the largest wildfires occurring in rare and extreme weather conditions, we found a bimodal distribution of fire severity in all forest types. In those years, a higher amount—and proportion—of all forest types burned at high severity. ***Over the 30-year study, we found a strong positive trend in the proportion of wildfires that burned at high severity in the non-nesting forests, but not in the suitable nesting forest types."***
>
> "Conclusions: ***Under most wildfire conditions, the microclimate of interior patches of suitable nesting forests likely mitigated fire severity and thus functioned as fire refugia (i.e., burning at lower severity than the surrounding landscape). With changing climate, the future of interior forest as fire refugia is unknown, but trends suggest older forests can dampen the effect of increased wildfire activity and be an important component of landscapes with fire resiliency."***

> "Converting older, closed-canopy forests that function as fire refugia to more open, managed forests does not assure a dampening effect on wildfire severity, due in part to the complex changes in the microclimate of forest stands after thinning. Recently disturbed forests have higher and more variable shortwave radiation, temperature, and windspeed (Chen et al. 1999), all of which can increase fire severity (Estes et al. 2017)."

From *Fire Probability, Fuel Treatment Effectiveness and Ecological Tradeoffs in Western U.S. Public Forests* (Rhodes and Baker 2008):

> "Abstract: Fuel treatment effectiveness and non-treatment risks can be estimated from the probability of fire occurrence. Using extensive fire records for western US Forest Service lands, ***we estimate fuel treatments have a mean probability of 2.0-7.9% of encountering moderate- or high-severity fire during an assumed 20-year period of reduced fuels."***

From Cohen (1999):

> Abstract: Understanding how ignitions occur is critical for effectively mitigating home fire losses during wildland fires. The threat of life and property losses during wildland fires is a significant issue for Federal, State, and local agencies that have responsibilities involving homes within and adjacent to wildlands. Agencies have shifted attention to communities adjacent to wildlands through pre-suppression and suppression activities. ***Research for the Structure Ignition Assessment Model (SIAM) that includes modeling, experiments, and case studies indicates that effective residential fire loss mitigation must focus on the home and its immediate surroundings.*** This has significant implications far agency policy and specific activities such as hazard mapping and fuel management.

From Dr. Dominick DellaSala's comments on federal policy making for Mature and Old Growth Forests (https://wild-heritage.org/wp-content/uploads/2023/06/MOGcommentsplusExhibits.pdf):

> "Relatively fire resistant properties accrue in large trees over time compared to smaller/younger trees that lack those properties and burn more readily (Leismester et al. 2019, 2021). (3) If fire occurs, MOG often burns in lower severities and bounces back quickly compared to logged areas (Bradley et al. 2016, Leismester et al. 2019, 2021). (4) MOG provides cooler temperatures than surrounding logged areas, thereby acting as climate refugia (Frey et al. 2016, Betts et al. 2017, Lombaerde et al. 2021, Wolf et al. 2021, De Frenne et al. 2021, Kim et al. 2022)."

> "….[W]hile the agency is deeply wedded to terms like "restoration," "fuels reduction," "restoration logging," "resilience," "active management," these all have substantial and cumulative co-lateral damages (DellaSala et al. 2022c). The letters from scientists (Exhibits E-H) and supporting best available published science (Moomaw et al. 2019, Mildrexler et al. 2020, 2022, Law et al. 2022, DellaSala et al. 2022abc, DellaSala et al. 2023) clearly demonstrate the importance of excluding large trees and MOG from logging because of their unique fire/climate resistance, resilience, biodiversity, clean water, and carbon stock properties. There is plenty to do that does not involve logging, including culvert improvements; closing and obliterating roads for connectivity and to reduce human-caused fire ignitions; stream improvements; beaver, imperiled species, and large carnivore recovery; and reducing the threat of fire spilling over from heavily logged private lands into urban areas by preparing towns directly (Downing et al. 2022). Importantly, the fire problem impacting communities is mostly coming from extreme fire weather triggered by GHGs (Westerling et al. 2006, 2016, Bartowitz et al. 2022, Dahl et al. 2023) acting in concert with heavily logged landscapes (Bradley et al. 2016, Zald and Dunn 2018, Downing et al. 2022). This association needs to be acknowledged in the ANPRM as protected forests and MOG burn in lower severities (Bradley et al. 2016).

The lack of home hardening/defensible space and ex-urban sprawl contribute to losses and working from the home out should be the principal focus of fire risk reduction for communities, not backcountry thinning."

"Forests protected from logging tend to burn in lower fire severities (Bradley et al. 2016, Leismeister et al. 2019, 2022) and should not be the focus of active management (Bartowitz et al. 2022). Additionally, most fires spill over from private lands that then impact communities (Downing et al. 2022). There is a much bigger problem in logged landscapes in terms of fire susceptibility compared to MOG and the same can be said for beetlekilled forests as noted– they are not a fire problem – nor do they need any tree planting after natural disturbances especially since such planting is nearly always coupled to logging and pile burning that damages complex early seral forests (Lindenmayer et al. 2008, Swanson et al. 2010, DellaSala et al. 2017)."

"Older forests are quite resistant to fire (Leismester et al. 2019, 2021) and if they burn they do so in lower severities compared to logged areas (Bradley et al. 2014, Leismeister 2019, 2021). High severity fire rotations are also within historic bounds at the landscape level allowing for sufficient recruitment of old forests over time (Odion et al. 2014ab, Baker 2015)."

"The Forest Service needs to track high severity fire based on landscape-scale fire rotations instead of fire return intervals that are mostly based on limited point sampling (see Baker 2009, Williams and Baker 2014, Baker 2017 for errors in high severity estimates using fire return intervals and way to correct for sampling problems so they do not overestimate high severity fire occurrence). Fire rotations are currently not a problem in most regions especially when compared to the much bigger threat of logging/thinning as recommended for instance in the recovery plan of the northern spotted owl. Simulation studies (Odion et al. 2014b), including one involving government scientists (Raphael et al. 2014), concluded that thinning in MOG under the spotted owl recovery plan would result in far greater losses to owl habitat than high severity fire over a four-decade period including with climate change increases in fire (also see Bond et al 2022). Additionally, the very low probability of fire even encountering a treated area makes the assertion that active management can somehow "save" those forests from severe burns completely unattainable (Schoenaggel et al. 2017). Scaling up to improve the extremely low odds of fire encountering a treated site will only result in even more co-lateral damages, including greater emissions from logging than the fires themselves (Law and Waring 2015, Harris et al. 2016, Law et al. 2018, DellaSala et al. 2022a, Harmon et al 2022, Bartowitz et al. 2022)."

"Recognizing the increasing role of extreme fire weather (Abatzoglou and Williams 2016) in governing fire behavior and low odds of fire encountering properly thinned sites, many scientists are recommending treatments should focus on cost-effective home-hardening and defensible space (Moritz et al. 2016, Schoenaggel et al. 2017). That is – working from the home outward, instead of the wildlands inward (http://bit.ly/Home-Outward-Report-2021). Doing so, means fire-hardened homes would have >90% chance of making it through a fire event (Cohen 2000, Syphard et al. 2012, 2014)."

From *Human ignitions on private lands drive USFS cross-boundary wildfire transmission and community impacts in the western US* (Downing et al. 2022):

> "Here, we use lands administered by the US Forest Service as a study system to assess the causes, ignition locations, structure loss, and social and biophysical factors associated with cross-boundary fire activity over the past three decades. Results show that cross-boundary fires were primarily caused by humans on private lands. Cross-boundary ignitions, area burned, and structure losses were concentrated in California. ***Public lands managed by the US Forest Service were not the primary source of fires that destroyed the most structures. Cross-boundary fire activity peaked in moderately populated landscapes with dense road and jurisdictional boundary networks.*** Fire transmission is increasing, and evidence suggests it will continue to do so in the future. Effective cross-boundary fire risk management will require cross-scale risk co-governance. Focusing on minimizing damages to high-value assets may be more effective than excluding fire from multijurisdictional landscapes."

From the OSU Newsroom (2022) on the Downing et al. 2022 study:

> "OSU research suggests Forest Service lands not the main source of wildfires affecting communities
>
> CORVALLIS, Ore. – Research led by Oregon State University shows that ***fires are more likely to burn their way into national forests than out of them.***
>
> ***The findings contradict the common narrative of a destructive wildfire igniting on remote public land before spreading to threaten communities,*** said Chris Dunn of the OSU College of Forestry.
>
> The study, which looked at more than 22,000 fires, found that those crossing jurisdictional boundaries are primarily caused by people on private property.
>
> It also showed ***that ignitions on Forest Service lands accounted for fewer than 25% of the most destructive wildfires – ones that resulted in the loss of more than 50 structures.***
>
> ***"In the old framing, public agencies bear the primary responsibility for managing and mitigating cross-boundary fire risk and protecting our communities, with their efforts focused on prevention, fuel reduction and suppression," Dunn said. "This has been the dominant management approach of years past, which is failing us."***
>
> The findings, published today in Nature Scientific Reports, follow by a few weeks the Forest Service's release of a new 10-year fire strategy, Confronting the Wildfire Crisis. The strategy aims for a change in paradigm within the agency, Dunn said.
>
> ***"We are long overdue for policies and actions that support a paradigm shift," he said.***
>
> Scientists including Dunn and OSU's Will Downing investigated 27 years of fires that crossed jurisdictional boundaries. The collaboration also included scientists from Colorado State University and the Forest Service's Rocky Mountain Research Station.
>
> ***"The Forest Service's new strategy for the wildfire crisis leads with a focus on thinning public lands to prevent wildfire intrusion into communities, which is not fully***

supported by our work, or the work of many other scientists, as the best way to mitigate community risk," Dunn said.""

In the Balch et al. (2017) study *Human-started wildfires expand the fire niche across the United States*, the authors found that:

> "During the 21-y time period, the human-caused fire season was three times longer than the lightning-caused fire season and added an average of 40,000 wildfires per year across the United States. Human-started wildfires disproportionally occurred where fuel moisture was higher than lightning-started fires, thereby helping expand the geographic and seasonal niche of wildfire. Human-started wildfires were dominant (>80% of ignitions) in over 5.1 million km2 , the vast majority of the United States, whereas lightning-started fires were dominant in only 0.7 million km2 , primarily in sparsely populated areas of the mountainous western United States. Ignitions caused by human activities are a substantial driver of overall fire risk to ecosystems and economies."

Also of note:

> "Wildfire Causes and Evaluations
>
> https://www.nps.gov/articles/wildfire-causes-and-evaluation.htm
>
> Humans and Wildfire
> Nearly 85 percent* of wildland fires in the United States are caused by humans. Human-caused fires result from campfires left unattended, the burning of debris, equipment use and malfunctions, negligently discarded cigarettes, and intentional acts of arson.
>
> *Source: *2000-2017 data based on Wildland Fire Management Information (WFMI) and* **U.S. Forest Service Research Data Archive**
>
> Congressional Research Service
>
> Wildfire Statistics
>
> https://sgp.fas.org/crs/misc/IF10244.pdf
>
> Most wildfires are human-caused (89% of the average number of wildfires from 2018 to 2022)."

Overview of Aquatics-related Concerns:

We are deeply concerned about the ecologically destructive logging and road building as proposed in the Mill Creek EA. There should be no commercial logging within Riparian Habitat Conservation Areas (RHCAs) and the Forest Service should drop or vastly scale back any noncommercial logging within RHCAs. We are very concerned that logging, including logging within RHCAs and in the uplands and associated activities such as road building and reopening, will result in negative impacts such as:

- Violations of the Clean Water Act (CWA) and State standards for water quality
- Violations of Forest Plan standards for RMOs
- Degradation of water quality, such as increases in stream temperature and excess fine sediments
- Retarding attainment of RMOs
- Alteration of watershed hydrology including increase in peak flows, erosion, sediment movement,
- Changes to stream channels such as ongoing erosion and instream sediment production
- Degradation of habitat and water quality in headwater and intermittent streams
- Loss of connectivity for aquatic and terrestrial species
- Destruction or degradation of wildlife habitat in riparian forests
- Loss of viability and downward trends for special status, at-risk, or imperiled aquatic species such as Redband trout
- Exacerbation of the negative effects of climate change on streams and aquatic species

CWA, State and Forest Plan Water Quality Standards:

The Forest Service does not seem to have made the Aquatics report available for public review on the Mill Creek project webpage. It also does not appear that the FS has made available any stream temperature summaries or 7-day-max average temperatures for streams in the project area. The stream temperature data we were able to find is on the NorWeST Database at: https://www.fs.usda.gov/rm/boise/AWAE/projects/NorWeST/StreamTemperatureDataSummaries.shtml#MidColumbia

Water temperatures in streams within the project area exceed state and Forest Plan water quality standards. The NorWeST stream temperature data showed stream temperatures in the project area well above the 18 degree Celsius state temperature standard in many stream reaches, with some temperatures-- for example in Mill Creek-- reaching well above 20 degrees Celsius with temperatures such as 25 degrees Celsius. There are likely many more impaired streams and stream reaches that exceed temperature and other water quality standards within the project area.

The EA inappropriately downplays stream temperature violations within the project area by that "[o]n average, stream temperatures are right at the 18 degree C threshold set forth in the Oregon State water quality standards (Aquatics Report, Appendix A, Figure A-5) for trout and salmon rearing and migration but higher than the desired threshold of 13.0ºC for spawning." This is clearly not the case, at least not as shown by the stream temperature data which are publically available.

Streams within the Mill Creek project area are subject to state *and* Forest Plan water quality standards. The INFISH RMO is 13 degrees—a standard which the FS is violating. Unless the standard is changed, the FS has a clear responsibility to abide by it, rather than attempt to dismiss and ignore the existing standard. The Mill Creek EA notes that the RMO is based on "Bull trout presence or potential". Do streams in the project area have the potential to support Bull trout, thereby aiding in their recovery? Did Bull trout once exist within the project area? Does the project area provide clean cold water that is important Bull trout further downstream, and so INFISH standards recognized the importance of a colder standard for the area?

From the Mill Creek EA:

> *"The temperatures in the INFISH Interim Riparian Management Objectives are based on Bull Trout presence or potential. Redband Trout are the only salmonid currently present in the watershed. The Ochoco National Forest has incorporated into the LRMP to not measurably increase the 7-day moving average daily maximum water temperature on any adult holding habitat or spawning or rearing habitats in the planning area based on these interim RMOs. The state water quality standards more accurately reflect attainable conditions and target species (Redband Trout) found in the project area. The state standards (340-041-0028, approved by EPA Mar 2004) identify the seven-day-average maximum temperature of streams listed as having salmon and trout rearing and migration should not exceed 18.0ºC (64.4ºF). The state standards identify the seven-day-average maximum temperature of streams listed as having salmon and trout spawning should not exceed 13.0ºC (55.4ºF)."*

Temperature exceedances within some of these creeks are often substantial and frequent. Please see BMBP's addendum materials for our downloaded data from ODEQ's database. The spreadsheet is an accompaniment to NorWeST monitoring locations; you can visit the USDA's NorWeST site for monitoring location ID numbers.

Streams in violation of state and Forest Plan standards are proposed for logging within their RHCAs. While there is a clear and pressing need to prioritize the protection of stream water quality and habitat, the FS is instead focused on prioritizing HRV in order to conduct widespread and heavy logging. Logging and associated activities as proposed in the Mill Creek sale EA are likely to raise stream temperatures, in violation (or further violation) of state (as well as Forest Plan) standards. Even small or localized temperature increases may be in violation of standards, and can have significant, negative, and long-term effects on imperiled fish in these watersheds. Should the FS move forward with this project, such significant effects need to be fully analyzed using an Environmental Impact Statement (EIS).

We also want to note that shade within RHCA buffers, while certainly an important factor in protecting stream temperatures, is not the only important factor that influences stream temperatures. It is often a poor predictor of stream temperature. To emphasize this point, we've included excerpts below from the USFWS 2010 Final Rule (50 CFR Part 17 Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States; Final Rule). These excerpts discuss how other activities and watershed dynamics, even in uplands, can negatively affect stream temperature (bolded emphases added). While the excerpts discuss a specific HPC for Plum Creek, the watershed hydrology dynamics are general and apply to other forests as well.

- *"Adequate stream temperatures are addressed in a number of ways, including the use of buffers that provide shade,* ***road-management practices that avoid sedimentation, and maintenance of natural hydrologic regimes that contribute cool water to streams.***

  The buffers on streams and wetlands are designed to provide adequate shade and to avoid increasing sunlight exposure, which could result in stream warming. Stream buffers and road standards also ***address sediment delivery to avoid artificial filling of pools, which could lead to increased stream warming.*** *The HCP addresses bank stability*

and large wood recruitment which should help store fine sediment and provide for suitable substrates for bull trout spawning. It also includes provisions to manage forest cover in the rain-on-snow subbasins to maintain normal storm flows, and is designed to maintain floodplains and wetlands in a manner that retains the functions of the hyporheic zone and off-channel habitats. Water quality and quantity are addressed through a variety of mechanisms, including protecting the natural hydrograph and addressing sediment and temperature needs. HCP provisions that protect the natural environment should assist native fish in maintaining a competitive advantage over nonnative species."

- *"**Stream temperature is addressed through a number of avenues including buffers that provide shade, road-management practices that avoid sedimentation, riparian and grazing management, and maintenance of natural hydrologic regimes that contribute cool water to streams**. The buffers on streams and wetlands are expected to provide natural levels of shade to avoid increasing sunlight, which could result in stream warming. **Further, road and wetland prescriptions are expected to maintain the natural hydrological regime so that streams are not abnormally dry during periods of the year when this could exacerbate warming problems. Stream buffers and road standards also address sediment delivery, which will in turn avoid artificial filling of pools, which could lead to increased stream warming. The HCPs are designed to maintain floodplains and wetlands in a manner that retains the functions of the hyporheic zone and off-channel habitats. Water quality and quantity are addressed through a variety of mechanisms, including protecting the natural hydrograph and addressing sediment and temperature.** Provisions of the HCPs that protect the natural environment should assist native fish in maintaining a competitive advantage when that is possible."*

While we understand that stream shade is a very important component of RHCAs and in protecting stream temperatures, it is not the only important component. Even if stream shade is maintained to meet standards, other activities and dynamics can and do affect stream temperatures, such as upslope logging, road-related activities, and thinning within RHCAs. It's also important to note that the FS plans to log approximately 1,210 acres of within RHCAs in the Mill Creek sale. Such extensive logging will not only affect stream shade, it will also negatively impact water quality and stream habitats through a variety of mechanisms as described above in the USFWS's 2010 Final Rule for Bull trout.

The Forest Service frequently implies that if stream shade is maintained, then there will be no effects to water quality or stream habitats. This is unsupported by the agency's own data and evidence. There is a glaring lack of consistent correlation between stream temperatures and stream shade in other creeks within timber sales on eastside forests. For example, in several recent sales in the Malheur National Forest, stream shade is not a strong or reliable predictor of stream temperature. In many instances, shade standards were being met, but stream temperature standards were *not* being met. Hence, attainment of stream shade standards is not a reliable indicator for the attainment of stream temperature standards. Detailed examples are given below:

In the Camp Lick timber sale, nine out of 13 streams for which both stream shade and temperature data were reported in NEPA documents (Camp Lick Aquatics Report Table 3) showed stream shade meeting standards while stream temperature *did not* meet standards. So, using stream shade as a surrogate for temperature would fail in one or more stream reaches in

69% of creeks for which data were collected. Looked at another way (broken down by reaches rather than streams) in the 25 reaches for which both stream shade and temperature were reported in Camp Lick NEPA documents, the data show streams meeting stream shade standards but NOT meeting stream temperature standards in 13 out of 25 reaches. That's a 52% failure rate regarding the accuracy of using stream shade as a surrogate for stream temperature. Only one instance went the other direction—i.e., showed stream shade standards not being met, while the stream shade standard was met.

In the Big Mosquito timber sale, using stream shade as a surrogate for temperature failed in one or more reaches in 80% of creeks for which data were collected (Big Mosquito Aquatics Report Table 1). Stated another way, four out of five streams for which both stream shade and temperature data were reported showed stream shade meeting standards while stream temperature did *not* meet standards.

In the Ragged Ruby timber sale NEPA documents (Ragged Ruby Final Aquatics Report Table 3) shows that using stream shade as a surrogate for temperature would have failed in one or more reaches in 42% of streams for which data were reported. Five of the twelve streams showed stream shade meeting standards while stream temperature did not meet standards.

In the Magone timber sale, data for both stream shade and temperature were provided for six reaches across six streams (i.e., one reach per stream; Magone Aquatics Resources Report Table 1). In three of the six streams, stream shade was reported as meeting objectives, while stream temperature was not. This reflects a failure rate of 50% if the attainment of stream shade objectives was used as a surrogate for predicting attainment of stream temperature standards.

Clearly, shade is not an appropriate surrogate for temperature, and it is certainly not the only parameter that influences stream temperature.

There is evidence showing that headwaters and tributaries are very sensitive to temperature increases due to logging impacts and have a substantial effect on downstream temperatures. Studies such as Pollock et al. 2009, which found that stream temperature was more closely associated with degree of logging within catchments than with streamside vegetation (Pollock et al. 2012). Another example is Guenther et al. 2012, which found increases in stream temperature in relation to selective logging. The Guenther study found increases in bed temperatures and in-stream daily maximum temperatures in relation to 50% removal of basal area in both upland and riparian areas. Increases in daily maximum temperatures varied within the harvest area from 1.6 to 3 degrees Celsius.

Headwater streams and non-fish bearing streams are particularly at risk and need more, not less, protection than they currently have. In order to protect downstream fish bearing reaches, headwater streams need at least as much protection as larger downstream reaches (Rhodes et al. 1994; Erman et al. 1996; Espinosa et al. 1997). Negative impacts to upstream reaches, such as higher temperatures, increased sediment loading, down-cutting, and altered hydrographs also negatively affect downstream reaches. In the Mill Creek project area, this is particularly relevant to the headwater streams and draws present throughout the project.

Protecting groundwater storage, groundwater flows, and hyporheic flows associated with intermittent streams is crucial for protecting temperatures in larger downstream perennial

streams. Cold water inputs from intermittent streams to downstream reaches are essential providing cold water refugia for special-status and imperiled aquatic organisms, including ESA-listed fish (Caissie 2006; Ebersole et al. 2015; Grant & Swanson 1990; Groom et al. 2011 (a); Groom et al. 2011 (b); Jones & Grant 1996; Pollock et al. 2009). Patches of cold water refugia are crucial for fish. Shallow groundwater patterns can be important for influencing stream temperatures (Poole et al. 2008), and so are likely vulnerable to upslope logging (Caissie 2006). In research in eastern Oregon, Ebersole 2015 found that dry streams supplied cold water to downstream reaches at confluence sites. Such cold water refugia habitats are important for fish, which were observed at these locations.

Logging within RHCAs or forest wetlands can magnify water quality and hydrology impacts from upland logging (Hicks et al. 1991; Moore & Wondzell 2005). Studies such as Janisch et al. (2011 and 2012) and Buttle et al. (2009) found that wetlands associated with headwater and low order streams are more common and influential on stream hydrology and water quality than previously realized. Many of the wetlands associated with first order streams are small and fall below the size requirements for protection in relation to timber sales (Janisch et al. 2011; Janisch et al. 2012; Buttle et al. 2009). Janisch et al. 2012 found streams in headwater catchments with wetlands had larger and more consistent increases in temperature in relation to adjacent logging than did the catchments that did not contain wetlands (Janisch et al. 2012). The authors found that streams with wetlands present in their catchments tended to have streams with finer sediments in their substrates. BMBP is opposed to commercial logging and extensive/heavy NCT thinning within RHCAs.

Even limited logging within RHCAs may compromise the ability of the riparian buffer to protect streams or ameliorate the negative impacts from upland logging, including increased stream temperatures and the delivery of sediment and nutrients into waterways. Logging adjacent to streams will substantially worsen these ecologically damaging dynamics. Small streams are particularly vulnerable to temperature, even with limited selective logging. There is evidence to suggest that wider buffer widths may be necessary to protect stream temperatures, particularly in intermittent and headwater streams, and particularly when logging within 100’ of streams. Parameters that influence stream temperatures include, stream shade, overland flow, groundwater and hyporheic flows, and groundwater storage. Alteration of these parameters can increase stream temperatures, especially in small streams. Logging alters these parameters, and degrades the ability of these parameters to support cold water, and is likely to increase stream temperatures. (Caissie 2006; Davies & Nelson 1994; DeWalle 2010; Kiffney et al. 2003; Groom et al. 2011 (a); Groom et al. 2011 (b); Jones et al. 2006; Sweeney & Newbold 2014; Pollock et al. 2009; Wigington et al. 2006; Poole et al., 2008; Ebersole et al. 2015; Poole & Berman 2001; Newcombe & Jensen 1996).

Studies have found selective logging may be associated with increases of instream fine sediments (Kreutzweiser et al. 2005, Miserendino and Masi 2010), changes in macroinvertebrate community structure or metrics (Flaspohler et al. 2002, Kreutzweiser et al. 2005), alterations in nutrient cycling and leaf litter decomposition rates (Lecerf and Richardson 2010), and increases in stream temperatures (Guenther et al. 2012). Flaspohler et al. (2002) noted that changes to biota associated with selective logging were found decades after logging. While these studies did not take place in eastern Oregon, they strongly suggest that alterations caused by logging within riparian buffer zones may result in significant changes in water quality parameters and stream

biota in many areas; these results are likely tied to dynamics that may be common to many forested streams to varying degrees.

The FS itself has acknowledged that: "[r]esearch has shown that effective vegetated filter strips need to be at least 200 to 300 feet wide to effectively capture sediment mobilizing by overland flow from outside the riparian management area" (Draft Blue Mountains Forest Plan Revision vol. 2 pg. 52). In addition, Best Management Practices may need to be specially designed to ensure protection of Bull trout (USFWS 2010).

Does the FS intend to take mature and large firs out of RHCAs? What are the silvicultural prescriptions for RHCA logging?

We also want to note the already high soil detrimental conditions in many sale units. This potentially raises concerns regarding erosion and sediment delivery into streams, as well as ground water impairment.

We also want to highlight here the importance of protecting stream temperature in order to provide for recovery of sensitive and at-risk species such as Redband trout.

PACFISH/INFISH and Riparian Management Objectives (RMOs):

PACFISH/INFISH no-cut stream buffers should be adhered to and fully implemented. No commercial logging should occur with RHCAs, and noncommercial logging should be dropped or severely scaled back. Logging within RHCAs will retard the attainment of RMOs, including quantitative standards such as stream temperature, fine sediment, pool depth, embeddedness, LWD, and other RMOs. The FS appears to be lacking key baseline data for RMOs within the project area. If this is incorrect, the agency should include this information as part of an Environmental Impact Statement analysis for the project.

Overwhelming evidence shows that logging has negative effects on streams, water quality, and watershed hydrology. This is especially true for logging within riparian corridors, but is also true in regard to upland logging, particularly when large tree logging, logging on steep slopes and sensitive soils, and road-related activities are proposed. The Forest Service consistently fails to adequately consider the well-documented risks of logging and associated activities (such as road-related activities) on water quality, streams, and watershed hydrology.

In addition to some of the negative effects described above, logging is likely to increase surface runoff and overland flow, potentially delivering warmer water (and excess sediments) into streams more quickly and with a greater volume. This can affect peak flows, increase stream temperatures, and cause erosion as well as changes to in-stream structures and habitats. This is particularly a concern given the especially the extensive and heavy logging proposed in the Mill Creek project. Increased surface runoff and faster delivery of water into streams also means that less water becomes groundwater. This decreases groundwater storage, groundwater flows, and hyporheic flows (Coutant 1999; Croke & Hairsine 2006; Jones & Grant 2006). Logging can cause decreases in summer baseflows in the long-term. Decreased canopy cover due to logging can cause more snow to accumulate in these more open areas, which alters the timing and magnitude of runoff from snow melt. This can also cause changes to peak flows (Harr & Coffin 1992). Should the Mill Creek project move forward, it would create more open canopies across the landscape, which would then increase solar radiation inputs in watersheds, and as a result

may increase the amount of early snow melt. This, in turn, may further alter peak flows and groundwater recharge and the hyporheic cold water delivery downstream, including to perennial streams (Caissie 2006). Logging alters microclimates, creating hotter, drier, and windier conditions that stretch beyond forests directly affected and into adjacent forests, sometimes for distances of hundreds of feet. Such microclimate edge effects could extend into the entirety of riparian buffers, especially in smaller headwater streams (Chen et al. 1995; Brosofske et al. 1997; Chen et al. 1992).

Riparian forests and species that depend on them

The Mill Creek project area provides unique and important habitat for species such as Northern goshawks, Great grey owls, Flammulated owls, Black-backed woodpeckers, Three-toed woodpeckers, Williamson's sapsucker, primary cavity excavators, osprey, mountain lions, black bear, elk, deer, American marten, bats, Johnson's hairstreak butterfly, gray wolves, amphibians, sensitive plants, and numerous other species, including ESA-listed and Survey and Manage species. Many of the species within the Mill Creek project area rely on the complex canopy structure, denser forests with more closed canopies, mature and old multi-story structure provided within these forests. The mature and old mixed-conifer forests within the Mill Creek area are providing some of the best remaining habitat of this kind for species in this area, particularly within RHCAs.

In particular, the FS should drop all logging in areas such as unroaded areas (even small blocks); undeveloped areas; never-logged or minimally-logged areas; areas with high-quality wildlife habitat (see BMBP's survey sheets); connectivity corridors; RHCAs; steep slopes; sensitive soils; areas with evidence of historic fir dominance or co-dominance (i.e., north and east facing slopes, gulches and shaded drainages, forests with ash soils, presence of old growth fir stumps, etc.). These areas are important for a variety of values, including to support clean, cold water and the ecological integrity of streams and riparian habitats within watersheds. Moist mixed-conifer forests in the area are functionally intact, and provide crucial habitat for wildlife and, in many areas, stream ecosystems.

It's also important to note that biodiversity in headwater systems can be significant, but is not well characterized and may be underestimated (Pearl et al. 2009). We are concerned that such areas are particularly at risk in proposed logging in the Mill Creek project. We are also concerned that biodiversity is not adequately protected by current management practices. For example, amphibians such as the Columbia spotted frogs and tailed frogs, would benefit from the 300' buffers or larger protective riparian buffers. Stream-associated amphibians require clear, cold water (Corn & Bury 1989, Cushman 2005, Olson & Weaver 2007, Pearl et al. 2009, Semlisch & Bodie 2003, Welsch and Olliver 1998). In general, amphibians in headwater areas may not receive sufficient protections in relation to land management projects (Corn & Bury 1989, Janisch et al. 2011, Semlisch & Bodie 2003). Corn and Bury (1989) found that amphibian diversity decreased in lower order streams adjacent to logging. Some species, such as the tailed frog, showed increases in abundance adjacent to logged sites, provided that there were upstream areas that were uncut (Corn and Bury 1989). Semlisch and Bodie (2003) found that riparian-associated amphibians utilized and depended upon large areas of upland terrestrial habitat (approximately 300 meters for most amphibians), and so require core habitats well beyond the buffers afforded to the headwater riparian areas (Semlisch and Bodie 2003, Olson et al. 2007). Cushman (2005) suggested management strategies include headwater areas and/or patches that

are prioritized for core habitats and maintain connectivity between some watershed areas (Cushman 2005).

We are very concerned about the logging of large trees, and the associated loss of key habitat for wildlife including the widespread loss of snags and of large downed wood recruitment for logs and in streams. Large trees, downed wood, and legacy snags are important components of these mature and older complex mixed-conifer forests. For example, legacy snags and snag habitats such as the 'stove pipe' snags (large hollow snags) are preferred habitat for Great grey owls, and are also crucial for species such as bears and Vaux's swifts. Should this sale move forward, what is the agency's estimate for the number of large trees that would be logged, felled as "hazards", or cut down in relation to roads or haul or transport corridors?

Riparian corridors provide particularly important habitat that is used at disproportionately high rates by many species of wildlife. The negative ecological impacts associated with logging in mature and old mixed-conifer forests, multi-story and complex habitat, and the logging of large trees are particularly concerning in relation to riparian forests and the streams they protect. Streams and riparian forests are impacted by what occurs in the uplands as well as within riparian corridors, and can be affected by actions in neighboring creeks and waterbodies. We are concerned about the effects to streams and riparian corridors from upland logging and roading, in addition to being very concerned about such activities within RHCAs.

In addition, crucial wildlife habitat such as snags and downed wood are vitally important, particularly in RHCAs as they see disproportionally high wildlife use and serve as connectivity corridors. Unfortunately, the FS increasingly sees this key wildlife habitat as "fuels" and logs such habitat or destroys it as part of the collateral damage of logging. It's important to note that peer-reviewed evidence suggests that managed stands have fewer snags than unmanaged stands (Cline 1997) and that prescribed fire can cause lasting, long-term negative reductions in snags, logs, and dead wood habitats (Arkle and Pilliod, 2010; Pilliod et al. 2006). The August 2017 "Science Findings" from the PNW Research Station discussed the importance of snags and wildfire, and found that many more snags are needed than current regulations or standards provide for. Riparian forests are disproportionately used by wildlife and birds, and so these findings are particularly relevant to RHCAs. The 2017 Science Findings note: *"Currently, the best solution we can recommend is to provide large numbers of snags for the birds, which can be difficult without fire," According to the researchers' calculations, if one of every 20 snags (approximately 4 percent) has suitable wood, and there are five to seven species of woodpeckers nesting in a given patch, approximately 100 snags may be needed each year for nesting sites alone. This does not account for other nuances, like the fact that most species are territorial and will not tolerate close neighbors while nesting, or the fact that species like the black-backed woodpecker need more foraging options. Overall, more snags are needed than other studies have previously recommended. Based on their results, Lorenz and her colleagues see the critical role that mixed-severity fires play in providing enough snags for cavity-dependent species. Low-severity prescribed fires often do not kill trees and create snags for the birds. "I think humans find low-severity fires a more palatable idea. Unfortunately or fortunately, these birds are all attracted to high-severity burns," Lorenz says. "The devastating fires that we sometimes have in the West almost always attract these species of birds in relatively large numbers."*

The combined effects of logging and prescribed fire can also be severe for sapling recruitment. In addition, logging down to very low basal areas, followed by prescribed burning, may end up

with severely open canopies-- especially if burns run larger or hotter than intended. Apparently, it is not uncommon for prescribed burns to go ~20% over target. Opening up forest canopies to a low basal area can cause forests to be substantially drier and hotter, and cause habitat loss for species that rely on multi-layered and dense canopies. Shrubs may extensively colonize such open areas, making it difficult for forests to recover from logging. Also missing from the FS's cumulative effects analyses are the past and possibly ongoing/future effects from fire lines, backburns, and other fire suppression efforts. We are also extremely concerned about the potential severe impacts associated with logging within fire lines and ember reduction zones, and the lack of adequate analyses surrounding these activities.

Roads

There is overwhelming evidence based on peer-reviewed science, some of which is discussed in these comments, that logging, roading, and other activities proposed in the project harm water quality and imperiled aquatic species– particularly at the scale and intensity which the Mill Creek EA is proposing.

Increasing road densities in the Mill Creek project area would be harmful to aquatic habitats as well as to terrestrial and avian species that are sensitive to forest fragmentation and road-related disturbances. Note: "temporary" roads are not temporary, and the FS loses credibility and public trust every time the agency attempts to claim otherwise, despite evidence and common sense. ESA-listed fish and aquatic species continue to be jeopardized and face downward population trends as a result of high road densities across eastside forests. As a result, it is all the more important NOT to build or rebuild roads in the few areas that aren't already overburdened with a high density of roads.

The bloated road networks on National Forests lands threaten the long-term viability of imperiled fish and aquatic species. The Forest Service notes (USFS 2015) that "*[t]he most important road related environmental issue is the effects of roads on aquatic resources in general, and specifically Threatened, Endangered and Sensitive aquatic species (bull trout, mid-Columbia steelhead, and Columbia spotted frog).*" Increased road densities have been correlated with low population levels and declines of aquatic species that rely on clean, cold waters (USFWS 2010a). Of particular concern are roads that interact with stream channels. Such roads are likely to have disproportionately negative effects on water quality and sensitive fish (USFS 2018). Sedimentation from roads is known to be one of the largest contributors for degradation to water quality as well as a source of degradation to fish habitat and spawning areas. Roads in disrepair create safety issues and conflicts with protection for natural resources, especially for those such as water quality, aquatic species, and functioning wetland processes.

Carnefix and Frissell (2009) discussed impacts from roads, and show that significant negative impacts to sensitive aquatic species are present at road densities greater than one mile per square mile: *"Multiple, convergent lines of empirical evidence summarized herein support two robust conclusions: 1) no truly "safe" threshold for 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., threats of extirpation of sensitive species) are already apparent at road densities on the order of 0.6 km per square km (1 mile per square mile) or less. Therefore, restoration strategies prioritized to reduce road densities in areas of high aquatic resource value from low-to-moderately-low levels to zero-to-low densities (e.g., 1 mile per square mile, lower if*

attainable) are likely to be most efficient and effective in terms of both economic cost and ecological benefit. By strong inference from these empirical studies of systems and species sensitive to humans' environmental impact, with limited exceptions, investments that only reduce high road density to moderate road density are unlikely to produce any but small incremental improvements in abundance, and will not result in robust populations of sensitive species."

Fish stocks are stronger and better distributed in areas of little or no management and low road densities, even in fire suppressed areas, and even if severe fires occur. Numerous studies and reports show that many benefits are gained by leaving forests unroaded, and to their own ecological processes (including processes involving fire, insects, and disease). (Bader 2000; Bradley et al. 2002; DellaSala et al. 2011; Frissell and Carnefix 2007; Reiman and Clayton 1997, Reiman et al. 2000, Thurow et al. 2001; Public Lands Initiative/Trout Unlimited 2004; Western Native Trout Campaign 2001).

The Federal Registrar, Department of the Interior Fish and Wildlife Service 50 CFR part 17 (2010) Final Rule for Revised Designation of Critical Habitat for Bull Trout states (emphases added): *"Sedimentation negatively affects bull trout embryo survival and juvenile bull trout rearing densities (Shepard et al. 1984, p. 6; Pratt 1992, p. 6). "An assessment of the interior Columbia Basin ecosystem revealed that increasing road densities were associated with declines in four nonanadromous salmonid species (bull trout, Yellowstone cutthroat trout (Oncorhyncus clarkii bouvieri), westslope cutthroat trout (O. c. lewisi),* ***and redband trout (O. mykiss spp.))*** *within the Columbia River basin, likely through a variety of factors associated with roads. Bull trout were less likely to use highly roaded basins for spawning and rearing and, if present in such areas, were likely to be at lower population levels (Quigley and Arbelbide 1997, p. 1183). These activities can directly and immediately threaten the integrity of the essential physical or biological features..."* (USFWS 2010).

The NOAA 5-Year Review of Snake River Salmonids notes the synergistic negative effects of both logging and roads occurring in watersheds: *"Information from the [PACFISH Biological Opinion Monitoring Program] PIBO monitoring program indicates that unmanaged or reference reaches (streams in watersheds with little or no impact from road building grazing, timber harvest, and mining) on Federal lands in the Interior Columbia basin (including the Snake River basin) are in better condition than managed streams (Al- Chockhachy et al. 2010b). In particular, managed watersheds with high road densities or livestock grazing tend to have stream reaches with worse habitat conditions than streams in reference watersheds*."

We are also concerned that constructing "temporary" roads, conducting extensive road maintenance, and creating skid trails, cable corridors, and haul routes is likely to result in potentially massive amount of felling and logging of large trees. Such road, cable, and haul corridors often results in logging and felling of large trees. Trees adjacent, in, or near these corridors may be considered "danger" trees, or simply be in the way of road construction or cable or haul corridors. Does the Mill Creek project include any skyline logging, which can result in extensive cutting of trees, including large and old trees. What is the FS's estimate of number of large trees cut due to designation as "hazards" or felled along roads (including roads that are not major routes, closed or overgrown roads, or temporary roads)?

Felling of trees for "temporary" roads, skyline logging or cable-assisted corridors, and other similar actions may result in excessive and widespread logging of large trees. Allowing large

trees to be sold in these circumstances incentivizes cutting them, and inappropriately sidesteps environmental analyses and public transparency. We have similar concerns about logging within fuel breaks and ember reduction zones. Will fuel breaks be treated similarly to roads or haul routes, and result in the felling of large trees in and adjacent to the fuel break?

BMBP's recent post-logging field surveys in Forests in Eastern Oregon, such as the Malheur NF, suggest that the felling of large and old trees in relation to hazard trees and clearing road beds, skid trails, haul corridors, etc. can be very extensive. The pictures below are of recent felling of large and mature or old Ponderosa pine trees, most of which were felled as "hazard" trees or for road, haul, skid trails, or cable corridors in the Big Mosquito and Camp Lick timber sales. Dozens of large mature and old Ponderosa pines were felled in the Big Mosquito sale. Logging in the Camp Lick sale has only just begun, and already BMBP found legacy Ponderosa pines felled as part of either "hazard" tree felling or "temporary" road and other road-related work. The FS confirmed that many of the trees depicted in the pictures below were sold at the mill.


Photo credit: Daniel Howland 2021; all other pics from BMBP
Big Mosquito sale (Malheur NF)


09/23/2021 14:22
Camp Lick sale in 2021 (Malheur NF)

Imperiled aquatic species

We are extremely concerned that logging, roading, and associated actions proposed in the Mill Creek sale will negatively affect imperiled and at-risk species and their habitats. For example, we are concerned that species such as Redband trout, lamprey, imperiled caddisflies, mollusks, and other at-risk aquatic species may experience downward population trends, or lethal or limiting habitat conditions as a result of project implementation. We are also concerned activities such as road construction may result in lethal impacts, either directly during heavy equipment use or through increased stream temperatures and fine sediments.

Potential negative effects to special status species, including Redband trout, due to logging and roading are well documented, particularly when conducted near riparian areas and when risks from climate change are considered. For example, the USFWS 2010 Final Rule for Bull Trout states:

> *"Timber harvest and road building in or close to riparian areas can immediately reduce stream shading and cover, channel stability, and large woody debris recruitment and increase sedimentation and peak stream flows (Chamberlin et al. 1991, p. 180; Ripley et al. 2005, p. 2436). These activities can, in turn, lead to increased stream temperatures, bank erosion, and decreased long-term stream productivity. The effects of road construction and associated maintenance account for a majority of sediment loads to streams in forested areas; in addition, stream crossings also can impede fish passage (Shepard et al. 1984, p. 1; Cederholm and Reid 1987, p. 392; Furniss et al. 1991, p. 301). Sedimentation affects streams by reducing pool depth, altering substrate composition, reducing interstitial space, and causing braiding of channels (Rieman and McIntyre 1993, p. 6), which reduce carrying capacity. Sedimentation negatively affects bull trout embryo survival and juvenile bull trout rearing densities (Shepard et al. 1984, p. 6; Pratt 1992, p. 6). An assessment of the interior Columbia Basin ecosystem revealed that increasing road densities were associated with declines in four nonanadromous salmonid species (bull trout, Yellowstone cutthroat trout (Oncorhyncus clarkii bouvieri), westslope cutthroat trout (O. c. lewisi), and redband trout (O. mykiss spp.)) within the Columbia River basin, likely through a variety of factors associated with roads. Bull trout were less likely to use highly roaded basins for spawning and rearing and, if present in such areas, were likely to be at lower population levels (Quigley and Arbelbide 1997, p. 1183). These activities can directly and immediately threaten the integrity of the essential physical or biological features described in PCEs 1 through 6."*

What are the population trends of Redband trout and any other at-risk aquatic and riparian species that would be impacted by the project? Their risk levels and status? What are those trends and risks at larger scales that are relevant to the population trends and conservation of those species?

The agency has shown no evidence that logging benefits water quality, fish, wildlife, or wildlife habitat. If the FS has this evidence, please provide it. In addition, the USFS is not legally obligated to manage for HRV. The agency is, however, legally obligated to ensure the long-term viability of native species. The Mill Creek EA clearly reflects the FS's narrow focus on HRV, which they've used to justify logging, rather than considering the best courses of action (and non-action) for water quality, fish, and wildlife.

Cumulative Impacts

In addition to the likely negative due to direct and indirect impacts, cumulative impacts as a result of logging, roading, and other actions proposed as part of the Mill Creek sale are likely to negatively impact water quality, stream habitats, and riparian forests. Climate change, management including past, recent, and future logging, livestock grazing, existing and planned roads, etc. are likely to have cumulative impacts on aquatic and riparian species and habitats in combination with the Mill Creek sale.

Further, what are the cumulative impacts of livestock grazing and planned logging and roading within the Mill Creek project area? The USFWS 2010 Bull Trout Final Rule notes, for example:

> "Improper livestock grazing can promote streambank erosion and sedimentation and limit the growth of riparian vegetation important for temperature control, streambank stability, fish cover, and detrital input (Platts 1991, pp. 397–399). In addition, grazing often results in increased organic nutrient input in streams (Platts 1991, p. 423). These activities can directly and immediately threaten the integrity of the essential physical or biological features described in PCEs 1 through 8."

Risk to wildlife and fish from fire is overstated, while ignoring the benefits of mixed-severity fires including high severity fire.

The ecological risks of wildfire are overstated in the Mill Creek EA, and fail to recognize that these forests evolved with mixed severity wildfire (including high severity fire) and rely on wildfire for many ecosystem processes. For example, native trout and salmonids also evolved with wildfire and other disturbances in the PNW and-- provided their populations are not too fragmented and impacted by logging and roads-- recover fairly quickly from wildfire. The USFS proposed Forest Plan Revision (2014) vol 2. Pg. 60 noted: **"***Redband trout and bull trout have been shown to recolonize severely burned drainages within two years, provided the drainages were physically accessible (i.e., no culvert barriers, and provided that other fish in unburned areas were close enough to discover and move back into the recently burned habitat."* Logging and roads pose greater threats to forests, aquatic habitats, and imperiled fish than wildfire.

We note that a recently published study has found pattern of "Falsification of the Scientific Record" in Government-Funded Wildfire Studies Short Summary of the Newly Release Study " The study is *Countering Omitted Evidence of Variable Historical Forests and Fire Regime in Western USA Dry Forests: The Low-Severity-Fire Model Rejected*". The John Muir project summarizes the study:

> *"An unprecedented new study, Baker et al. (2023), published in the peer-reviewed journal Fire, exposed a broad pattern of scientific misrepresentations and omissions by government forest and wildfire scientists. This "falsification of the scientific record" is driving bad policies and government mismanagement of public forests, including clearcutting and commercial logging of mature and old-growth trees under deceptive euphemisms like "thinning", "restoration", and "fuel reduction". In particular, studies funded by the U.S. Forest Service, an agency that financially benefits from commercial logging on public lands, have presented a falsified narrative that historical forests had low tree densities and were heavily dominated by low-severity fires, using this narrative*

to push for increased commercial logging. While Baker et al. (2023) documents a broad pattern of scientific omissions by Forest Service studies, it focuses on Hagmann et al. (2021), a Forest Service study that has received much media attention and has been used as the justification for a series of unprofessional public attacks and character assassination efforts by Forest Service-funded scientists against independent forest/fire scientists. Centrally, Baker et al. (2023) found that, while Hagmann et al. (2021) was presented ostensibly as a review, that paper listed a series of studies by independent scientists, and then listed the Forest Service's published critiques of those studies, but never mentioned the stacks of reply studies by independent scientists that completely refuted and discredited the Forest Service critiques. Through this glaring omission of a huge body of scientific evidence, Hagmann et al. (2021) created the false appearance that the Forest Service critiques were the last word on the subject. The scientific reply studies by independent scientists note that the Forest Service critiques do not challenge the central evidence or conclusions of the initial studies, and the reply articles provide exhaustive evidence documenting why the tangential critiques in the Forest Service articles are unfounded and inaccurate–all of which was concealed by Hagmann et al. (2021). The corrected scientific record, based on all of the evidence, shows that historical forests were highly variable in tree density, and included "open" forests as well as many dense forests. Further, historical wildfire severity was mixed and naturally included a substantial component of high-severity fire, which creates essential snag forest habitat that rivals old-growth forest in terms of native biodiversity. These findings have profound implications for climate change mitigation and community safety, as current forest policies that are driven by the distorted narrative result in forest management policies that reduce forest carbon and increase carbon emissions, while diverting scarce federal resources away from proven community wildfire safety measures like home hardening, defensible space pruning, and evacuation assistance."

Logging in the backcountry

There is also a plethora of evidence to suggest that logging in the backcountry is an ineffective strategy for attempting to control fire behavior that fails to keep communities safe. Home hardening and working from communities out, not the backcountry in, is a far more effective strategy. Please see scientific studies included in our addendum materials.

Climate Change

Logging in RHCAs is likely to exacerbate some of the negative effects of climate change on riparian and stream ecosystems. Stream temperature is a primary concern. Actions that minimize increased water temperatures are important for maintaining cold water refugia. The Independent Scientific Advisory Board (2007) states:

"Adequate protection or restoration of riparian buffers along streams is the most effective method of providing summer shade. This action will be most effective in headwater tributaries where shading is crucial for maintaining cool water temperatures. Expanding efforts to protect riparian areas from grazing, logging, development, or other activities that could impact riparian vegetation will help reduce water temperature increases. It will be especially important to ensure that this type of protection is afforded to potential thermal refugia. Removing barriers to fish passage into thermal refugia also should be a high priority."

Many native aquatic species, including Redband trout, require very cold headwater streams for spawning, and so are likely to be disproportionately affected by stream temperature increases due to climate change. (ISAB 2007).

Salmon face serious threats to their continued existence due to climate change, and are predicted to suffer significant habitat loss. The Independent Scientific Advisory Board (2007) notes that according to some research predictions:

"[T]emperature increases alone will render 2% to 7% of current trout habitat in the Pacific Northwest unsuitable by 2030, 5%-20% by 2060, and 8% to 33% by 2090. Salmon habitat may be more severely affected, in part because these fishes can only occupy areas below barriers and are thus restricted to lower, hence warmer, elevations within the region. Salmon habitat loss would be most severe in Oregon and Idaho with potential losses exceeding 40% by 2090."

Commercial logging and heavy-handed NCT activities in RHCAs would likely exacerbate the issue of high stream temperatures, putting imperiled fish in additional jeopardy. Even localized temperature increases may have negative effects on struggling fish populations, especially when repeated in numerous streams across the landscape. Past and current logging, grazing, and roads have increased stream temperatures to ecologically and legally unacceptable extremes. High stream temperatures, as well as increased fine sediment in many areas, are likely the pressing risks to fish viability and stream ecosystems. The synergistic effects of climate change, high temperatures, and increased fine sediments warrant actions such as protecting shade, ecosystem integrity, and terrestrial and aquatic connectivity. Wildfire is far less of a threat to these parameters than widespread logging in RHCAs.

Hutto et al. 2016 note, in relation to climate change, that increased efforts towards fuels reduction would be an untenable emphasis:

> *"Any perceived problem with future changes in fire behavior cannot be solved by redoubling our effort to treat this particular climate change symptom by installing widespread fuel treatments that do nothing to stop the warming trend, and do little to reduce the extent or severity of weather-driven fires (Gedalof et al. 2005). Therefore, fuel management efforts to reduce undesirable effects of wildfires outside the xeric ponderosa pine forest types could be more strategically directed toward creating fire-safe communities….Fuel treatment efforts more distant from human communities may carry the negative ecological consequences we outlined earlier and do little to stop or mitigate the effects of fires that are increasingly weather driven (Rhodes and Baker 2008, Franklin et al. 2014, Moritz et al. 2014, Odion et al. 2014)."*

Logging in streamside corridors is likely to decrease connectivity, especially connectivity in mixed-conifer areas that currently serve as important corridors and are among the last remaining areas that can provide connectivity for species that are associated with mature and complex forests. Commercial logging, in order to be viable, is likely to further incentivize removal of a greater number of trees, and further exacerbate an already concerning situation.

Increasing connectivity is the most commonly recommended strategy for preserving biodiversity in the face of climate change, according to a review of 22 years of scientific recommendations (Heller and Zavaleta 2009). Increasing connectivity includes actions such as removing barriers to

species dispersal, locating reserves near each other, and reforestation. Other commonly recommended connectivity-related actions include creating “ecological reserve networks [i.e.,] large reserves, connected by small reserves, stepping stones”; “protecting the “full range of bioclimatic variation”; increasing the number and size of reserves; and creating and managing buffer zones around reserves (Heller and Zavaleta 2009). Large blocks of habitat that are well-connected to each other are important for the long-term survival for many species in the face of climate change.

It is essential that we preserve core habitats and connectivity corridors because these areas are very important for maintaining genetic diversity, facilitating movement and migration, and providing for range and habitat needs. Connectivity corridors also allow for species to colonize new areas or recolonize after disturbances, which will help species adapt to shifts in geographic range due to climate change. Many species are already facing threats to their viability due to fragmentation and a lack of connectivity; climate change threatens to severely exacerbate risks to their continued survival by further fragmenting habitats.

We are concerned about the potential negative effects of logging in RHCAs on numerous bird species, especially those likely to be vulnerable to climate change. Many birds that are threatened by climate change-driven range shifts are also threatened by logging and other practices on the Malheur NF and other NFs in eastern Oregon. Bird species that rely on denser forests and complex canopy structure are also suffering widespread habitat loss due to logging that targets mature mixed-conifer forests—these provide needed complexity and forest density. Logging in RHCAs may have disproportionately negative effects on climate- endangered and climate-threatened birds because RHCAs currently provide some of the best remaining habitat for these birds–many of which breed in eastern Oregon and rely on denser mixed-conifer forests and/or old growth mixed-conifer forests. This includes species such as: Boreal owl; Northern pygmy owl; Northern saw-whet owl; Pine grosbeak; Vaux’s swift; Hermit thrush; Three-toed woodpecker; Varied thrush; Evening grosbeak; Hammond’s flycatcher; Townsend’s warbler; Cordilleran flycatcher; Winter wren; Hairy woodpecker; Great gray owl; and Pine siskin (Csuti et al 1997; Langham et al. 2015). Multiple large timber sales across the Malheur National Forest and other National Forests in eastern Oregon are targeting denser mixed- conifer forests. This represents a significant portion of mixed-conifer forests in the region, and has resulted in widespread degradation and elimination of wildlife habitat for species that depend on these forests. Recommendations need to avoid cumulative impacts to wildlife and aquatic species and their habitats from logging and climate change.

Global climate change is a massive, unprecedented threat to humanity and forests. Climate change is caused by excess CO 2 and other greenhouse gases transferred to the atmosphere from other pools. All temperate and tropical forests, including those in this project area, are an important part of the global carbon cycle. There is significant new information reinforcing the need to conserve all existing large stores of carbon in forests, in order to keep carbon out of the atmosphere and mitigate climate change. The agency must do its part by managing forests to maintain and increase carbon storage. Logging would add to cumulative total carbon emissions so is clearly part of the problem, so it must be minimized and mitigated. Logging would not only transfer carbon from storage to the atmosphere but future regrowth is unlikely to ever make up for the effects of logging, because carbon storage in logged forests lags far behind carbon storage in unlogged forests for decades or centuries.

Forests are carbon sinks—they store carbon in both the soils and the vegetation. Carbon sinks are important for mitigating the impacts of climate change. The U.S. has many forests owned by the public and managed by the Forest Service. Harvesting wood "represents the majority of [carbon] losses from US forests...." (Harris et al., 2016). Additionally, (Achat et al., 2015) has estimated that intensive biomass harvests could constitute an important source of carbon transfer from forests to the atmosphere. Pacific Northwest forests hold live tree biomass equivalent or larger than tropical forests. (Law and Waring, 2015). "Alterations in forest management can contribute to increasing the land sink and decreasing emissions by keeping carbon in high biomass forests, extending harvest cycles, reforestation, and afforestation." (Law et al., 2018). The FS omits an honest carbon accounting of the carbon outputs of this project.

(Buotte et al., 2019) published an article prioritizing forest lands for preservation based on "carbon priority ranking with measures of biodiversity." The researchers mapped "high carbon priority forests in the western US exhibit features of older, intact forest with high structural diversity[], including carbon density and tree species richness." Here is the map from that article:

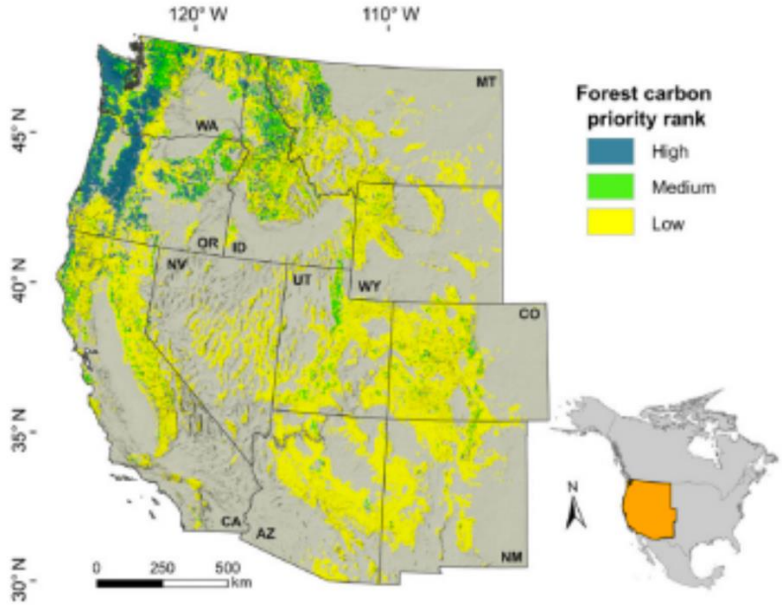

FIG. 1. Forested land in the western conterminous United States classified into priority for preservation to mitigate climate change based on the spatial co-occurrence of low vulnerability to drought and fire and low, medium, and high potential carbon sequestration. WA, Washington; ID, Idaho; MT, Montana; OR, Oregon; CA, California; NV, Nevada; UT, Utah; CO, Colorado; AZ, Arizona; NM, New Mexico.

Millar et al. 2007 state:

> *"Over the last several decades, forest managers in North America have used concepts of historical range of variability, natural range of variability, and ecological sustainability to set goals and inform management decisions. An underlying premise in these approaches is that by maintaining forest conditions within the range of pre-settlement conditions, managers are most likely to sustainably maintain forests into the future. We argue that although we have important lessons to learn from the past, we cannot rely on*

past forest conditions to provide us with adequate targets for current and future management. This reality must be considered in policy, planning, and management. Climate variability, both naturally caused and anthropogenic, as well as modern land-use practices and stressors, create novel environmental conditions never before experienced by ecosystems. Under such conditions, historical ecology suggests that we manage for species persistence within large ecoregions."

Mildrexler, et al., 2020:

> • Large-diameter trees store disproportionally massive amounts of carbon and are a major driver of carbon cycle dynamics in forests worldwide.
>
> • We examined the proportion of large-diameter trees on National Forest lands east of the Cascade Mountains crest in Oregon and Washington, their contribution to overall aboveground carbon (AGC) storage, and the potential reduction in carbon stocks resulting from widespread harvest. We analyzed forest inventory data collected on 3,335 plots and found that large trees play a major role in the accumulated carbon stock of these forests. Tree AGC (kg) increases sharply with tree diameter at breast height (DBH; cm) among five dominant tree species. Large trees accounted for 2.0 to 3.7% of all stems (DBH ≥ 1" or 2.54 cm) among five tree species; but held 33 to 46% of the total AGC stored by each species. Pooled across the five dominant species, large trees accounted for 3% of the 636,520 trees occurring on the inventory plots but stored 42% of the total AGC. A recently proposed large-scale vegetation management project that involved widespread harvest of large trees, mostly grand fir, would have removed ~44% of the AGC stored in these large-diameter trees, and released a large amount of carbon dioxide into the atmosphere.
>
> • Given the urgency of keeping additional carbon out of the atmosphere and continuing carbon accumulation from the atmosphere to protect the climate system, it would be prudent to continue protecting ecosystems with large trees for their carbon stores, and also for their co-benefits of habitat for biodiversity, resilience to drought and fire, and microclimate buffering under future climate extremes.

The FS fails to consider how climate change is already, and is expected to be even more in the future, influencing forest ecology. This has vast ramifications as to whether or not the forest in the project area will respond as the FS assumes.

Global warming and its consequences are effectively irreversible which implicates certain legal consequences under NEPA and NFMA and ESA (e.g., 40 CFR § 1502.16; 16 USC §1604(g); 36 CFR §219.12; ESA Section 7; 50 CFR §§402.9, 402.14). All net carbon emissions from logging represent "irretrievable and irreversible commitments of resources."

The Committee of Scientists, 1999 recognized the importance of forests for their contribution to global climate regulation. Also, the 2012 Planning Rule recognizes, in its definition of Ecosystem services, the "Benefits people obtain from ecosystems, including: (2) Regulating services, such as long term storage of carbon; climate regulation..."

Climate change science suggests that logging for sequestration of carbon, logging to reduce wild fire, and other manipulation of forest stands does not offer benefits to climate. Rather, increases in carbon emissions from soil disturbance and drying out of forest floors are the result. The FS can best address climate change through minimizing development of forest stands, especially stands that have not been previously logged, by allowing natural processes to function. Furthermore, any supposedly carbon sequestration from logging are usually more than offset by carbon release from ground disturbing activities and from the burning of fossil fuels to accomplish the timber sale, even when couched in the language of restoration. Reducing fossil fuel use is vital. Everything from travel planning to monitoring would have an important impact in that realm.

There is scientific certainty that climate change has reset the deck for future ecological conditions. For example, (Sallabanks, et al., 2001):

> *"(L)ong-term evolutionary potentials can be met only by accounting for potential future changes in conditions. ...Impending changes in regional climates ...have the capacity for causing great shifts in composition of ecological communities."*

Thank you for your consideration of our comments. Please keep us informed of all developments with the Mill Creek Project as soon as possible. Please mail a hard copy of the Decision Notice and the Final EA to my Fossil address or, from mid-November to mid-April, to my winter address in Portland: 5323 NE 28th Ave., Portland, OR 97211. My voice mail number is (541) 385-9167.

Sincerely,

Karen Coulter, Director
Blue Mountains Biodiversity Project

Paula Hood, Co-Director
Blue Mountains Biodiversity Project

Citations - Mill Creek Draft EA Comments from BMBP

(Copies of all articles cited here are included on the blue USB drive included with BMBP's physical submission sent via USPS Certified Mail.)

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