September 12, 2023

Jennifer Abernathy
NEPA Planner, Ochoco National Forest
3160 NE 3rd Street
Prineville, OR 97754

Re: Comments on the Mill Creek Dry Forest Restoration Project, Draft Environmental Assessment (EA), https://www.fs.usda.gov/project/?project=58081

Dear Ms. Abernathy and Staff at the Ochoco National Forest,

Please accept the following comments from the Great Old Broads for Wilderness (Broads), Central Oregon Bitterbrush Broadband Chapter (COBB) regarding the Mill Creek Dry Forest Vegetation Management Project Draft EA on the Ochoco National Forest (ONF). The Great Old Broads for Wilderness has over 10,000 members across the nation. We are a national grassroots organization, led by women, that engages and inspires activism to preserve and protect wilderness and wild lands. Part of our mission is to conduct stewardship projects on public lands and advocate for those lands. We also believe that conservation and restoration of Oregon's wildlands, fish and wildlife and their habitats, and water resources are a lasting heritage that requires responsible stewardship.

Our local Bitterbrush Broads and Bros chapter has over 400 friends and members in central and eastern Oregon. The Bitterbrush Broads and Bros have been doing educational hikes, stewardship projects, and camping trips in a variety of our central and eastern Oregon national forests since our chapter was formed almost 10 years ago. Our chapter has assisted the Deschutes, Ochoco and Malheur national forests on many partnership projects including noxious weed pulling, closed and decommissioned road surveys, monitoring beaver populations, planting native milkweed for restoration of monarch butterfly populations, surveying livestock exclosures on the Crooked River National Grassland and Ochoco Forest and engaging in discussions of ways to mitigate user-created impacts in Central Oregon wilderness areas. Many of our members and supporters live in central and eastern Oregon and recreate in the proposed project area. They hunt, fish, backpack, camp, photograph, view wildlife, hike, drive, and engage in other recreational activities.

General Comments

We appreciate the amount of work that the ONF staff has done to prepare the Mill Creek Draft EA. The Mill Creek Project proposes to meet a wide variety of purposes including reducing wildfire risk, increasing forest health and vigor for timber and non-timber values, and improving fish and wildlife habitat. The project encompasses 36,430-acres in the Mill Creek watershed of the Lookout Mountain Ranger District of which approximately one third of the project area is the Mill Creek Wilderness. The project proposes a mix of commercial harvest, thinning, prescribed burning, road reconstruction, temporary roads, some road closures and decommissioning, and other activities. Timber harvest, thinning and prescribed burning are proposed on virtually every acre, not in the wilderness area.

The Broads support some level of forest "restoration", particularly in the wildland urban interface (WUI) using a blend of commercial harvest, thinning and prescribed burning but respectfully request the ONF not apply mechanical treatments in any portion of Riparian Habitat Conservation Areas (RHCAs). These are important areas for aquatic species such as redband trout and Columbia spotted frog and their essential habitats as well as a variety of wildlife species including large and small mammals, birds, and amphibians and reptiles. We also encourage the Forest Service to balance "restoration" goals using silvicultural treatments with competing resource needs to reduce road densities, and not increase new miles of temporary and permanent roads. We support the goals of improving fish and wildlife habitat but also emphasize the need to restore very degraded streams, wetlands, and riparian areas via large wood placement and floodplain restoration, but not through commercial harvest and thinning activities.

Any commercial harvest or thinning in RHCAs will cause the ONF to be in violation of INFISH (1995)[1] standards. These standards clearly lay out that no activity can be done that has the potential to compromise fish habitat including impacts to shade, water temperature and sediment. All of the action alternatives that include treatments in any portion of a designated RHCA will cause impacts to aquatic species and their habitats. We find some of the discussions in the Draft EA and Aquatics Report that support timber harvest and thinning in RHCAs not scientifically well founded and predisposed toward extractive timber harvest rather than restoration. Most of the largely degraded streams and riparian areas are a result of past timber harvest, past and ongoing livestock grazing, and high road densities (including open, closed, decommissioned and temporary roads that are still actively driven).

The Broads and Bros request that the Mill Creek Wilderness be excluded from analysis of the project area since it is a designated Wilderness area. It is a misuse of data and analysis. It should be omitted from consideration of activities in the project area. The (mis)use of the Wilderness as part of the project essentially dilutes the impacts of the roaded and non-wilderness area and therefore underestimates impacts by high road densities to riparian, stream, and wildlife resources in the 23,225-acre area that is not wilderness.

We strive to be good partners with the Forest Service because protecting and restoring our public lands is critically important for the enjoyment of current users as well as future generations. Good management of our public lands that belong to all Americans is essential for our twin crises of climate change and loss of biodiversity. Overall, we support an alternative that minimizes timber harvest, livestock grazing, and road density impacts to streams and riparian areas, and aquatic habitats, and no harvest of large trees over 21 inches dbh.

We make several recommendations to retain and restore viable habitat for fish and wildlife species. We also recommend that the final recommended alternative exclude any activity in RHCAs that will affect shade, stream temperature, and sedimentation and not allow any construction of temporary roads. We recommend no harvest of mature and large trees over 21 inches including grand fir and Doug fir. We also support all permanent and seasonal road closures that should be physically blocked, not just administratively closed or with existing useless berms that fail to block the public members that violate closed roads. The following sections, not in any particular order, state our concerns and recommendations for each issue.

Purpose and Need

The proposed project is intended to restore characteristic forest vegetative conditions, thereby increasing resilience to insects, disease, fire, and drought, reduce the risk of high severity fires, and enhance and restore hardwood

[1] USDA, Forest Service. 1995. Pacific Anadromous Fisheries Habitat (PACFISH), U.S. Forest Service and U.S. Bureau of Land Management. 1994. Environmental assessment for the implementation of interim strategies for managing anadromous fish-producing watersheds in eastern Oregon, Washington, Idaho, and portions of California. Washington, DC: U.S. Department of Agriculture, Forest Service. 68 p.

communities. Despite the severe degradation of streams, wetlands and springs and other important fish and wildlife habitats, their restoration is limited to 21 miles of adding wood and 2 miles of floodplain restoration. The project is largely about harvesting timber to meet "resilience" while other natural resources have limited attention.

The analysis uses the "historic range of variability" (HRV) as the theme for restoring vegetation on the forest (Hessburg et al. 1994[2], 1999[3]). In evaluating HRV on the Malheur National Forest, Churchill et al. (2017[4]) used the year 1890 and sampled sites to examine how tree composition, density, openings, clumps, and age have changed in the past 100 plus years. Not surprisingly, many dry side forests have changed given past management practices of large diameter timber (high grading) harvest, extensive roading, and intense livestock grazing. The late 1800s, the base years used for comparison to existing conditions, also did not have high road densities on the landscape that are known to occur on the ONF, which have caused continued degradation of streams and wildlife habitats. The point is that while using HRV as a target to increase forest resiliency in the face of climate change and hotter, drier weather cycles, the ONF needs to balance the needs and obligations for restoring and maintaining fish and wildlife habitats and productivity with this effort to restore forest resiliency.

Recommendation: The Purpose and Need is largely to cut timber and fails to restore other natural resource values for fish, wildlife, and riparian areas, streams, and wetlands.

Environmental Impact Statement vs Environmental Assessment

The Mill Creek project is essentially a very similar project to Black Mountain, which was conducted with an Environmental Impact Statement (EIS). An EIS is conducted when a project is expected to have significant environmental impacts and generally has more analyses than an EA. The Black Mountain Project authorized management activities on 15,810 acres of national forestland, including logging, roadwork, prescribed burning, and restoration. The Black Mountain DEIS and FEIS described that "*The Ochoco National Forest has prepared this Draft/Final Environmental Impact Statement (DEIS/FEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This DEIS discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives*."

The Black Mountain project has a smaller project area than the Mill Creek project area (15,801 acres vs 36,430 acres) and less timber volume harvested (17.8 mmbf vs Alt 2, 17.4 mmbf, Alt 3, 56.1 mmbf, and Alt 4, 45.1 mmbf). The projects proposed are strikingly similar in purpose and need, alternatives, and proposed management strategies. We question why the ONF has decided to issue an EA which generally has less analyses and by virtue of an EA concludes ahead of the process that there are no significant impacts. We assert that these similar projects with similar impacts indicates that an EIS is required for the Mill Creek project.

Recommendation: Conduct an EIS.

Historic Range of Variability (HRV)

The ONF continues to use HRV as a management goal and has failed to adapt to current science that shows how unacceptable this tool is for managing vegetation. The HRV in the ONF 1994 draft report Viable Ecosystems Management Guide fails to incorporate changing climate conditions for forest vegetation and management into the

[2] Hessburg et al.1994
[3] Hessburg et al. 1999
[4] Churchill et al. 2017.

future. As Millar (2014)[5] reports, "*As a means of developing reference prescriptions and management targets, HRV is generally inappropriate, although if historic periods are used for reconstruction that have coarse resemblance to present or projected future climates, such as the Medieval Climate Anomaly or middle Holocene rather than the presettlement centuries, these might be defensible…historically informed approaches are likely more effective than an HRV approach under future changing climate regimes for managing and restoring ecosystem function and for assisting transitions to new ecosystem states*".

The proposed project is an alleged effort to move forest stands toward a condition more resilient to wildfire, insects and disease in the short term that has taken 100+ years of past (mis)management to unbalance. The Draft EA (p. 2) states that "*Forested stands in the project area are at high risk to experience impacts from multiple types of disturbances including from insects, disease, fire, and drought. The current species composition, stand structures, and density of forested stands are different than they once were historically on this landscape."* It further states (p. 34) "*Currently, 23,021 acres (63% of the project area) are considered at high risk (Table 11). That is almost 10,000 acres more than the historical condition that ranged from ranged from 16 to 37 percent of the area Currently, all PAGs except moist grand fir are above HRV for high insect and disease risk*."

HRV has been mischaracterized as forest stand treatments which emphasize commercial treatments and thinning when in reality HRV is more complex. Our experience with observing HRV treatments on the ground, particularly on the ONF, such as in the Gap and Wolf project areas, is that they look like even-aged management, shelterwood, or seed tree cuts where just a few trees are left standing in each acre treated with a few postage-sized "leave areas".

Churchill et al. (2017)[6] and other authors used 1890 or a range of time periods in the late 1800s as their reference point for HRV forest stand conditions. In 1890, there were almost no roads and the few that might have been present were of such a small amount that the forest road density was virtually zero. In addition, Churchill et al. (2017)[7] and others evaluating HRV did not have any HRV plots in riparian areas. Sampling occurred on upland sites.

The Project proposes using the dated HRV paradigm to re-create the historic range of tree species, tree density, and forest structure, but generally, fails to restore other forest resource conditions like biodiversity, water quality, reduced road densities for winter range and general forest, and reduced grazing. The Draft EA proclaims that disease, insects, and wildfire need to be "managed" but these in fact are a normal condition of forests and a necessary part of succession, biodiversity, and forest ecosystem processes critical for forest resilience. Under the Forest Service paradigm, any natural evolutionary agent that kills a tree, such as drought, wildfire, insects, or disease, except for a chainsaw, is considered a threat. Natural morality agents are the same factors that shape and maintain healthy forest ecosystems. Using the goals of HRV, the Draft EA is forcing a shift toward a monoculture of open Ponderosa pine stands. Timber harvest, both removal and trampling by machinery, kills the mycorrhizal network that is essential for tree health and surviving current and future drought cycles.

One example that the Draft EA states repeatedly and is used to justify cutting large grand fir and Doug fir in the project area is under the guise of saving large old ponderosa pine. For example, Alt 3 (DEA, p. 24-25) proposes "*Within Alternative 3, some grand fir and Douglas-fir 21-30" DBH are proposed for removal (shown in Figure 16). In addition, commercial thinning of units with average slope(s) greater than 35% are proposed using both skyline and helicopter harvesting systems. More proposed treatment acres with a higher intensity of commercial thinning in specific stands results in a higher percentage of stands with early seral dominance (51% of the project area) and*

[5] Millar, C. 2014. Journal of Sustainable Forestry, 33: S28–S42. DOI: 10.1080/10549811.2014.887474.
[6] Churchill et al. 2017. Ibid.
[7] Churchill et al. 2017. Ibid.

meets the objective of moving within HRV following treatment (Table 8). Early seral species dominance is maintained within HRV in the mid and long-term to the greatest extents of all alternatives."

Yet, the literature shows that grand fir are important for carbon storage, biodiversity, and wildfire resistance. Mildrexler et al. (2023)[8] reports that "*Oregon stands out with the most forested area in the western USA, yet the lowest proportion of its forests protected (Law et al., 2021) … a trait-based approach to assess fire resistance found that the grand fir forest type had the second highest fire resistance score, and one of the lowest fire severity values among forest types of the Inland Northwest USA (Moris et al., 2022)… Across the entirety of all six national forests large grand fir represent 2% of the total species population, a proportion slightly lower, but roughly on par with other dominant species (Figure 3, Mildrexler et al., 2020). It is not uncommon for grand fir to reach 250 to 300 years of age (Howard & Aleksoff, 2000). Thus, large grand fir ≥53 cm DBH and <150 years of age can continue growing and play an important role in storing and accumulating carbon from the atmosphere to help abate the climate crisis… grand fir are resilient to prescribed fire because they have attained the thick bark that provides resistance to low- and moderate-severity fire (Howard & Aleksoff, 2000; Pellegrini et al., 2017… These carbon-rich forests have a large cooling effect on maximum temperatures, provide thermal refugia for biodiversity including sensitive species, and are a high priority for protection. Large grand fir form the best hollow trees for wildlife (Rose et al., 2001).*" In essence, grand fir (and Doug fir) are very important for a variety of attributes including resistance to wildfire, a natural based solution for carbon storage to combat climate change, microclimates for cooling effects, and supporting biodiversity.

Recommendation: Stop using HRV as recommended by many scientists. Use recommendations from climate scientists that have far more experience that the FS in understanding the complexities and impacts of timber harvest on temperate forests and climate change and future impacts. Retain all mature and old growth trees over 21 inches for all tree species. Keep commercial timber harvest and machinery out of sensitive areas such as RHCAs, springs, seep, and wetlands. Given the dated and arbitrary use of HRV, there should be must less treatment and "management".

<u>Alternatives</u>

The ONF proposes four alternatives for analysis, including the (No Action) Alternative 1, and three action alternatives that propose a range of commercial harvest, non-commercial thinning, and prescribed burning throughout the non-wilderness project area to move timber stands toward HRV. All, action alternatives treat nearly the entire project area outside the wilderness. Alts 2 and 3 treat 98.96% of the non-wilderness project area while Alt 4 treats 76% of the non-wilderness area. We recommend Alternative 1 because it has the least impact on other natural resources.

However, recognizing the ONF is likely to implement a project, we secondarily recommend an alternative that has the least impact to RHCAs, streams, and mature and old growth stands. We recommend, rather than treating virtually every acre outside the wilderness, use lighter treatments of proposed commercial harvest, and thinning, no cutting in the undeveloped land between Mill Creek Wilderness and Wildcat Campground, and many more road closures. We recommend a new "Great Old Broads for Wilderness, Bitterbrush Broads and Bros Alternative" with reduced harvest activities, no new temporary roads throughout the project area and no commercial harvest in RHCAs, and other recommendations.

Given the recent decision by Judge Hallman regarding Eastside Screens, Alternative 2 appears to be the only viable action alternative remaining, which is hardly a choice. It is arbitrary for the agency to consider in detail the two action alternatives that the agency lacks authority to implement, at the expense of other, viable alternatives.

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[8] Mildrexler, D.J., L.T. Berner, B.E. Law, R.A. Birdsey and W.R. Moomaw. 2023. Protect large trees for climate mitigation, biodiversity, and forest resilience. Conservation Science and Practice. 2023;5: e12944. wileyonlinelibrary.com/journal/csp2. https://doi.org/10.1111/csp2.12944.

Recommendation: Develop a new alternative that we call a Great Old Broads for Wilderness, Bitterbrush Broads and Bros Alternative with the following provisions that reduces impacts to other forest natural resources. It should include the following requirements:

**Protect all mature and old growth trees of all species greater than 21 inches dbh.*
**Set aside additional areas for recruitment of new late old seral structure.*
**No steep slope logging.*
**Manage the forest lightly for climate change and biodiversity for forest resilience and restoration.*
**No logging or commercial harvest in RHCAs and for all class 1, 2, 3 and 4 streams.*
**Do not implement any actions that fail to meet INFISH RMOs (e.g., no loss of shade).*
**No harvest or new roads in the 1,160-acre undeveloped area that meets the criteria for undeveloped lands in the Mill Creek project area. The polygon is directly adjacent to Wildcat Campground and the Mill Creek Wilderness (Draft EA p. 228-230).*
**No harvest around the perimeter of the wilderness area.*
**Dramatically limit the scope and scale of treatments in areas outside the wilderness and emphasize treatments in areas largely near the WUI boundary.*
**Physically close and maintain all roads to meet LRMP standards for road densities in winter range and general forest.*
**No new roads and no temporary roads.*
**Where stream restoration activities are planned, ensure their success by constructing and maintaining riparian livestock exclosures.*
**Conduct and disclose thorough analyses of carbon costs of this project.*
**Surveys and required and no treatments in potential elk reproductive habitats particularly in areas proximal to wetlands, riparian areas, streams, seeps, and springs.*

<u>No Steep Slope Logging</u>

Timber harvest on steep slopes significantly increases the risk of landslides and floods and has been avoided for decades to protect soils from disturbance and compaction. Trees and shrubs create a network of roots and stems that both bind soil particles together and slow water rushing down slopes. In addition, opening up the tree canopy by harvest increases wind effects, drying, and the potential for wildfire spread and intensity. Wooded slopes are also good wildlife security areas adding to the diversity of flora and fauna in the forest.

Recommendation: No steep slope logging should be done in this project area.

<u>Undeveloped Land</u>

The 1,160-acre undeveloped area between the Mill Creek Wilderness and Wildcat Campground (Draft EA p. 228-230) should receive no harvest treatment, development, or roads. This area is important for winter range, as noted in the Draft EA. It is also important elk security habitat and a buffer between the more heavily managed areas and the Wildcat and White Rock campgrounds. This area, as part of this project, must be administratively added as an Inventoried Roadless Area (IRA) since it meets the criteria. Further, these undeveloped areas are important for providing natural habitats, biodiversity, moderating climate impacts, drinking water, and restoring aquifers.

Undeveloped lands and IRAs are critically important and comprise a very low percentage of FS lands. Law et al. (2021)[9] reports that these areas have "*crucial biodiversity and carbon benefits*", "*currently provide clean drinking water for millions of people, support salmon populations and wildlife, and reduce isolation between protected areas*". They also recommend that undeveloped lands provide the "*potential to meet preservation targets by protecting uninventoried roadless areas (e.g., ~2 Mha in Oregon), many of which are candidates for protection and contiguous with IRAs or existing protected areas*". In this case, the undeveloped area's proximity provides great potential multiplier benefits by its proximity to the Mill Creek Wilderness.

Loucks et al. (2003)[10] also reported that over three quarters of the IRAs "*have the potential to conserve threatened, endangered, or imperiled species. IRAs would increase the conservation reserve network containing these species by 156%".* The authors conclude that IRAs belonging to the FS are one of the most important biotic areas in the nation, and that their status as roadless areas could have lasting and far-reaching effects for biodiversity conservation. Any roadless and untreated area left on the ONF should and must be left intact.

DellaSala et al. (2011)[11] also reported how critically important roadless are for "*affordable drinking water for municipal and rural communities; water for agricultural and industrial uses; flood control; instream aquatic recreation; aquifer recharge; flood protection; reliable water supply; diverse and productive fisheries; healthy aquatic ecosystems; resident and migratory waterfowl habitat; recovery of endangered species; and, increasingly, the vitality and sustainability of local economies" and that these "benefits accrue nationally and at the local and regional levels*". DellaSala et al. (2011)[12] also states that "*the roaded, intensively managed landscapes of the other national forest lands have been closely correlated with heavily sediment-laden streams and dramatic changes in flow regimes (Espinosa et al. 1997; Trombulak and Frissell 2000; Center for Biological Diversity et al. 2001; Coffin 2007; Frissell and Carnefix 2007). The small roadless areas that have been left "unmanaged", with a dearth of logging and roads, play a critical role in maintaining high-quality water and protecting aquatic ecosystems. The clean water from remnant roadless areas is important to maintain healthy coldwater salmonid fisheries, sustain viable aquatic ecosystems, and help protect threatened species and ecosystems (Abell et al. 2000; Trout Unlimited 2004). Roadless area are an important refugia for many salmon and trout populations, as well as for a diversity of endangered freshwater species (Henjum et al. 1994; Huntington 1998; Trombulak and Frissell 2000; CBD et al. 2001; Strittholt and DellaSala 2001; Oechsli and Frissell 2002; Strittholt et al. 2004; Petersen 2005)." DellaSala et al. (2011) state that "restoration of salmon and trout fisheries in places with high road densities will likely fail without the pivotal role provided by roadless areas as fishery strongholds." Further, they state that "For many major drainages (entire watersheds of major rivers, such as the Columbia River Basin), roadless areas and other wilderness areas represent the last few percentages (typically 1% to 5%) of the landscape with a minimally disturbed, or near natural, hydrology*."

Frissell and Carnefix (2009)[13] report that "*Roadless areas can be small and fragmented but can accrue to a large fraction of critical landscape. In the Upper Missouri Basin in Montana, within the 37% of the landscape with watersheds classified as highest value for freshwater conservation, almost one-half occurs within unprotected federal*

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[9] Law, B. E., Berner, L. T., Buotte, P. C., Mildrexler, D. J., & Ripple, W. J. 2021. Strategic forest reserves can protect biodiversity in the western United States and mitigate climate change. Communications Earth & Environment. 2:254. https://doi.org/10.1038/s43247-021-00326-0, www.nature.com/commsenv.

[10] Loucks, C., N. Brown, A. Loucks, and K. Cesareo. 2003. USDA Forest Service roadless areas: potential biodiversity conservation reserves. Conservation Ecology 7(2): 5. [online] URL: http://www.consecol.org/vol7/iss2/art5/

[11] DellaSala, D.; J. Karr, and D. Olson. 2011. Roadless areas and clean water. Journal of Soil and Water Conservation, 66(3): 78A-84A. Accessed at: http://.jswconline.org/content/66/3/78A.full.pdf.

[12] DellaSala et al. 2011. Ibid.

[13] Frissell, C. and Carnefix, G.; 2007. The Geography of freshwater conservation: roadless areas and critical watersheds for native trout. Wild Trout IX symposium. Accessed at: http://www.blm.gov/or/plans/wopr/pub_comments/paper_documents/Paper_1989- 2023/WOPR_PAPER_01989.120001.pdf.

roadless areas; just 7% is inside wilderness and parks. In western Montana, bull trout Salvelinus confluentus abundance increases with watershed roadless proportion. Roadless lands tend to occupy middle to lower elevations compared to protected Wilderness, where they more directly interface with high-value fish habitat; a Montana statewide "fine-filter" assessment revealed remarkably high occurrence of native trout populations associated with roadless areas, even within watersheds that are otherwise compromised. Most roadless areas contain steep lands with expanses of erosion-prone soils. We conclude that the value of roadless areas for native trout and biodiversity conservation continues to receive insufficient evaluation and disclosure in roadless policy debates and decisions."

Undeveloped areas are always under pressure from extractive industries for development. We assert, rather than more management and more treatment, that this area be left alone. There is no need for the ONF to add new roads to harvest this area, and such disturbances increase all the harmful activities caused by logging and roads such as soil compaction, erosion, displacement of wildlife, fragmentation of habitat, the spread of noxious and invasive weeds, the increased risk of wildfires from human ignitions (90% of wildfires are caused by human activity), loss of carbon storage, and loss of biodiversity. The ONF must leave this area untouched, as such areas are increasingly rare and more valuable every year.

From these reported scientific observations from diverse authors, we conclude that commercial logging or thinning treatments, and additional roads in the undeveloped area will cause considerable harm to other natural resources including fish and wildlife habitats and water quantity and quality.

Recommendation: The ONF must not implement any logging, roads, or treatments in the undeveloped lands. Rather than "treating" this area, this portion of the project area should be left alone and administratively added to the Inventoried Roadless Area since the ONF has very few.

No Harvest of Mature and Old Growth Trees and Forests Over 21 Inches DBH

We request that the ONF please verify that the Mill Creek project will not authorize cutting of any trees over 21 inches, consistent with the original 1994 Eastside Screens. Judge Hallman of the District of Oregon ruled on August 31, 2023 (Greater Hells Canyon Council v. Wilkes, Case No. 2:22-cv-00859-HL, ECF 97) that the Forest Service's 2021 Amendment to the Eastside Screens which eliminated the 21-inch rule was unlawful under NFMA, NEPA and the ESA and the Screens Amendment should be vacated. That means that Vacatur of the Screens Amendment results in the reinstatement of the 21-inch rule as the controlling Forest Plan standard with which this project must be consistent.

The 1995 Eastside Screens were implemented to preserve the few remaining large and old trees, and the ecosystem values they provide for soil, water quality, wildlife, and fish habitats. Those protections were removed by the highly controversial decision made by the Undersecretary of the Department of Agriculture in January 2020 and the Forest Service never completed the required formal NEPA and objection process. The ONF made a political choice to implement the demands of industry and Congressionals to support extractive industries rather than support conservation of natural resources.

Historically, large old trees dominated as much as 75% of the eastern Oregon forests (DellaSala and Baker 2020)[14]. The Eastside Screens were in place for 25 years and not long enough to restore the historic amount of large and old trees. The previous century of logging from the 1920s to the 1990s removed the largest and oldest trees across many of the forests in eastern Oregon and impacted biodiversity, soils, water quantity and quality, and many fish and wildlife species that used large old trees for part or all of their life history needs.

[14] DellaSala, D.A. and W.L. Baker 2020. Large trees: Oregon's bio-cultural legacy essential to wildlife, clean water, and carbon storage.

Large trees are important as either live or dead, standing or fallen onto the forest floor or into the stream and are critical to forest, wildlife habitat, and watershed function. In streams, fallen logs are large woody debris (LWD). LWD is important for structure, function, and biodiversity of forests in upland and aquatic ecosystems. Habitat for a diversity of wildlife species is found in the dead branches, cavities, seeds, cones, snags, and the buildup of the forest floor with littler. Large old trees have thick bark that withstand forest fires and survive, and provide shade, wind breaks, soil moisture and a cooling effect in the multilayered canopy.

Large trees in RHCAs are a "biocultural heritage" that sequester and store carbon and provide ecosystem services such as clean water, nutrient cycling, and below-ground processes (DellaSala and Baker 2020)[15]. With climate change, it is critical to retain as much atmospheric carbon tied up in the forest and soils, which also benefits biodiversity and water quality (Brandt et al. 2014[16], DellaSala and Baker 2000[17]). Large trees in riparian areas provide stream-side shading and instream hiding cover for aquatic species. Large mature trees accrue soil depth, cycle nutrients, mitigate pollution, purify water, release oxygen, and provide habitat for wildlife at levels far superior to logged forests (Brandt et al. 2014)[18].

Clearing old growth and mature forests in primary forests has major impacts on water and energy cycles at local, global, and continental scales DellaSala et al. (2011)[19]. Old growth and mature forests provide the highest water quality and generate water vapor through evapotranspiration, affecting precipitation at continental scales, provide cooling at local and global scales, and infiltration and groundwater recharge. Roadless areas (which have generally not been harvested) provide the best examples of clean water and biodiversity that are most closely linked to undisturbed natural ecosystems. Numerous authors have reported that when undisturbed watersheds in roadless and protected areas such as national parks, wilderness areas, and national monuments are fragmented by roads, logging, and intensive recreation, both water quality and biodiversity decline as hydrological integrity is lost (USFS 1972[20], 1979[21]; Alexander and Gorte 2008[22]; Anderson 2008[23]).

Over 95% of our national wood supply comes from non-federal lands of which most is small-diameter logs. While logging on Forest Service (FS) lands has declined since the early 1990s, meeting the "annual sale quantity" (ASQ) target is arbitrary and continues to drive agency management, culture, and practice. The FS alleges timber harvest receipts are needed to support forest restoration and mitigation. This illogical and wasteful use of taxpayer dollars is justified by the need to restore other parts of the forest previously harmed by past timber harvest and high road densities, which is done by implementing more timber harvest along with new and temporary roads for each project. Also, proposed "mitigation" of timber harvest impacts has a long history of not happening such as road closures. In

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[15] DellaSala, D.A. and W.L. Baker 2020. Large trees: Oregon's bio-cultural legacy essential to wildlife, clean water, and carbon storage.

[16] Brandt et al. 2014. Brandt, P., D. J. Abson, D. A. DellaSala, R. Feller, and H. von Wehrden. 2014. Multifunctionality and biodiversity: ecosystem services in temperate rainforests of the Pacific Northwest, USA. Biological Conservation 169:362–371.

[17] DellaSala and Baker 2020. Ibid.

[18] Brandt et al. 2014. Ibid.

[19] DellaSala et al. 2011. Ibid.

[20] USDA, Forest Service. 1972. RARE I: Final Environmental Statement: Roadless area review and evaluation. Washington, DC: USDA Forest Service.

[21] USDA, Forest Service. 1979. RARE II: Final Environmental Statement: Roadless area review and evaluation. Washington, DC: USDA Forest Service.

[22] Alexander, K., and W. Gorte. 2008. National Forest System Roadless Area initiatives. CRS Report to Congress, Order Code RL30647.

[23] Anderson, M. 2008. A decade of National Forest Roadless Area Conservation: Background Paper. Seattle, WA: The Wilderness Society.

fact, the DEA (p. 15) reports that "*The current project will reinforce road closures that are breached or add new physical closures where there had not been one previously*." Please explain why road closure mitigations were never completed from the previous sales in the Mill Creek watershed, especially when they were *required by the LRMP.*

Large mature and old growth trees must be protected. A variety of species, many in decline because of the habitat loss, depend on large trees and old forests including the American marten, Pacific fisher, Black bear, Vaux's swift, Pileated woodpecker, Northern goshawk and other accipiter hawks, Great gray owl, Black-backed woodpecker, Three toed woodpecker, Pileated woodpecker, and Olive-sided flycatcher. These types of species, which rely on denser forests, and mature or old growth mixed conifer forests with multi layered canopies, are harmed by logging. They rely on large old trees for foraging, roosting and reproduction. Harvest of large mature trees will continue the decline of many species that rely on these special habitats. The Draft EA did not provide any legitimate evidence that commercial harvest of large trees over 21 inches will benefit wildlife or restore ecosystem processes.

Recommendation: Do NOT cut any trees over 21 inches.

Protect Mature and Old Growth Forests and Trees for Climate Change

The inventory of mature and old growth forests on FS and USDI Bureau of Land Management (BLM) lands was released in April 2023 to fulfill Executive Order (EO) 14072. The EO directed the USDA Forest Service and the USDI Bureau of Land Management (BLM) to "*develop policies to institutionalize climate-smart management and conservation strategies that address threats to mature and old-growth forests on Federal lands*." More specifically, the intent of the EO is to address the importance of mature and old growth forests on federal publicly owned lands for their role to support nature-based climate solutions by storing large amounts of carbon, increasing biodiversity, and water quantity and quality.

The major threat to the mature and old growth forests is timber harvest. Although wildfire, insects and disease are also increasing due to climate change, timber harvest is the greatest threat that the FS can and must address. As the Biden administration has called for protecting forests in the US and abroad, hundreds of thousands of FS acres are proposed to cut mature and old growth forests, diminishing our nature-based solution to combat climate change.

Again, the primary threat to mature and old growth trees is logging, not wildfire, insects, fungi, drought, or climate change. There are nearly 11 million acres of mature and old growth trees in federal forests in Oregon and Washington (about 19% of the lower 48 states). Only about 24% of mature and old growth forests on federal land in Oregon and Washington are fully protected from logging (GAP 1 & 2 designation), despite their huge role in carbon storage and climate mitigation (DellaSala et al. 2022)[24].

In central and eastern Oregon, what are considered the "dry side" forests, are particularly vulnerable to extensive timber harvest and loss of mature and old growth forests. We support home hardening for wildfire protections (https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Preparing-homes-for-wildfire), and limited thinning in WUI close to communities. The primary threat to homes comes from wind-driven embers. A recent California wildfire study (Chamberlain et al. 2023)[25] showed that home hardening, landscaping around homes, zoning

[24] DellaSala DA, Mackey B, Norman P, Campbell C, Comer PJ, Kormos CF, Keith H and Rogers B. 2022. Mature and old-growth forests contribute to large-scale conservation targets in the conterminous United States. Front. For. Glob. Change 5:979528. doi: 10.3389/ffgc.2022.979528.
[25] Chamberlain, M., R. Lee, T. Deacon, N. Watkins, K. David, F. Lei, and I. Meftah. 2023. Town of Paradise

reforms, and buffering could result in 75% fewer homes ignitions. Metal roofs, screened vents, and other modifications vastly improve the chances of a home surviving even a high-severity blaze. Thinning can contribute to fire risk since new studies have shown that it can promote the spread of wildfires by increased dry fuels, winds, increased growth of vegetation and fine fuels, and increased access to humans that cause 90% of ignitions.

Treatments far from communities and entering roadless and undeveloped areas that have never been harvested is counterproductive to combating wildfires. Many vegetation treatment projects proposed by the FS are 25 to 50 miles or more from communities, and often include harvesting mature and old growth trees. These trees have thick bark and already have survived wildfires and must be left alone. Many wildfires, given hot, dry, and windy conditions, burn regardless of vegetation treatments as demonstrated by the Labor Day 2020 wildfires in the Cascades.

Large mature and old trees are important for carbon sequestration and a natural (and free) component for fighting climate change. Large trees in eastern Oregon are only 3% of the remaining trees but store 42% of the carbon (Mildrexler et al. 2020)[26]. Every large and old tree in the forest is critical to retain on the landscape, especially with the twin crises of climate change and loss of biodiversity.

Mature and old growth trees are in short supply due to the legacy of past and present timber harvest. When logged, these trees release up to two thirds of their stored carbon to the atmosphere contributing to global warming. Their emitted carbon takes decades to centuries to recover, if ever. Scientists have tracked carbon emissions from forests to wood products to landfills and from wildfires (Law and Moomaw 2021)[27]. Their analysis of Oregon carbon emissions from wood harvested over the past century showed that 65% of the original carbon returned to the atmosphere as CO_2, while landfills retained 16%, and only 19% remained in wood products. The scientists also undermined the false claims that wildfires are major carbon emitters. Their research from the enormous Biscuit Fire, which burned 772 square miles in southwest Oregon in 2002, emitted less than 10% of Oregon's total emissions that year. Further, scientists compared carbon emissions into a future projection from 2020 to 2140 and discovered that even after 120 years, an unharvested forest stored 100 Mg of carbon more than a harvested forest plus its products.

Oregon's wildfires are not major sources of carbon emissions. Oregon State University scientists estimated that between 2011–2015, forest fires averaged 4% of Oregon's total carbon emissions each year, while timber harvest contributed roughly 35% (Figure 1)[28]. Forests store most of their carbon even after severe wildfires, so long as these areas are not salvage logged.

California Resilience Challenge Task 1 to Task 4: Risk Reduction, Climate Change, and Insurance Premiums. A Milliman and Corelogic Report. https://drive.zooce.com/management/builtinapps/fileoperator.aspx?child=1&a=D3B60E43-50D3-46D5-A799-2C3CECF14238&ro=1&fid=18160612176842570679_9742692961587398287.
Prepared with funding from the California Resilience Challenge Grant

[26] Mildrexler DJ, Berner LT, Law BE, Birdsey RA and Moomaw WR. 2020. Large Trees Dominate Carbon Storage in Forests East of th3 Cascade Crest in the United States Pacific Northwest. Front. For. Glob. Change 3:594274. doi: 10.3389/ffgc.2020.594274.

[27] Law, B.E., and W. Moomaw. 2021. Keeping trees in the ground where they are already growing is an effective low-tech way to slow climate change. https://theconversation.com/keeping-trees-in-the-ground-where-they-are-already-growing-is-an-effective-low-tech-way-to-slow-climate-change-154618.

[28] Law, B. E., T. W. Hudiburg, L. T. Berner, J. Kent, P. C. Buotte, and M. E. Harmon. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. Proceedings of the National Academy of Sciences USA 115:3663–3668.

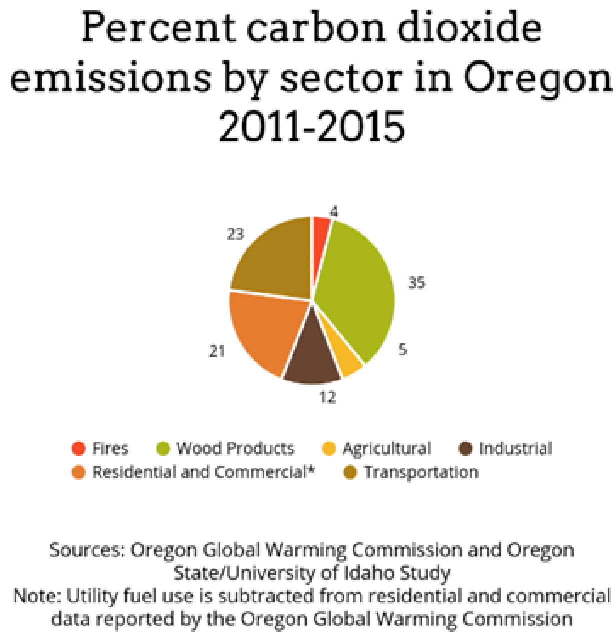

Figure 1. Annual Oregon carbon emissions, 2011-2015 (Data from Law et al. 2018)[29].

Numerous well-respected climate scientists advocate for forest reserves to protect valuable lands and resources that provide carbon storage and sequestration. Scientists at Oregon State University, around the West, and around the world, advocate that countries including the US should create numerous strategic forest reserves to fight climate change and safeguard biodiversity. They explain that climate change and biodiversity are inseparably linked, and forest reserves would counter both emergencies and protect water resources.

Recommendation: Do not cut any mature and large trees over 21 inches consistent with the Eastside Screens (1995). Support the recommendations of climate scientists and forest protection as low-cost solutions to climate mitigation. Protect all large mature and old growth trees which accumulate massive amounts of carbon in trees, vegetation and soils, homes for diverse wildlife, and serve as sources of water for drinking and other uses.

Transportation, Road System and Densities

While we recognize that Best Management Practices (BMPs) and project design criteria can ameliorate some impacts to fish, wildlife, and streams, we are skeptical of a modeling analysis that asserts little to no impact from extensive reopening of temporary roads (40-60 miles depending on the action alternative).

The ONF has road densities as high as 12 mi/mi^2, despite Forest Plan standards of 3 mi/mi^2 in general forest and 1 mi/mi^2 in big game winter range. The forest uses "motor vehicle use maps" (MVUM) to designate open roads. In independent surveys by the Oregon Department of Fish and Wildlife (ODFW) and the Great Old Broads for Wilderness, Bitterbrush Broads and Bros chapter, in the Black Mountain Project areas, over 2/3 of the "closed roads" surveyed were regularly driven by the public, and up to ½ of the "decommissioned roads" were driven as well.

[29] Law et al. 2018. Ibid.

The Bitterbrush Broads and Bros partnered with several other conservation groups and conducted closed road surveys in 2021 in the Mill Creek project area. Despite denser forest and steeper topography than the Black Mountain project area, we found a substantial amount of closed roads that were driven by the public and user created roads. In the Mill Creek project area, of the 110 closed roads surveyed, 31 (28%) were closed, 66 (60%) were open and illegally driven, and 13 (12%) were not surveyed. We also found numerous decommissioned roads and user created roads that were driven but did not enumerate those. Of the numerous closed roads that were used by the public, the following were some of the more egregious:

*The 3370-230 road is well used and goes to the top of the ridge separating the Mill and McKay creek drainages and connects with the Green Mountain OHV trail. The well used "closed" road connected to the 3300-170 road on McKay Creek.
*The 3360 and 3380 roads are supposed to be closed for big game winter range and have metal gates and boulders. Those sites were visited on January 1, 2022, and found well driven motorized use and a pickup was departing the 3360 road behind the road closure gate.
*The 3360-060 road is legally open 1 mile but the gate at the end of the open area was constantly down on multiple site visits and accessed many "closed" roads and illegal OHV trails such as in Schoolhouse Creek and across several ridge tops.
*The 3330-050 has a major OHV trail that drops down to the W Fork Mill Creek and accesses numerous "closed roads" and user created OHV trails throughout the entire W Fork Mill Creek area and even more critically between the W Fork Mill Creek and the Mill Creek Wilderness
*The Broads and Bros offer our data and summary if needed by the ONF to improve their assessment of road closures and increase the amount of physically closed roads in the project area.

The project proposes to close a mere 1.86 miles, decommission another 3.26 miles, open new 0.9 miles, and implement 24 physical closures (that were not done with the previous sale). However, the DEA (p. 86) also reports an astonishing amount of reopening temporary roads with "*Alt 3 would have the most temp road ground disturbance at 59.3mi and therefore the most effects to sensitive plant habitat, followed by Alt 4 at 49.1mi, and Alt 2 at 40.4mi.*" In essence, the ONF proposes to add another 40-60 miles of open roads that will "*In the short-long term (5-20 years) re-use of these disturbances as temporary roads would remove this vegetation, displace soils, and could contribute to soil erosion.*"

Then, the analysis of the transportation system asserts that the project meets open road densities and will contribute to soil erosion but not put any sediment into streams, which is contradictory to the statement above from the Draft EA p. 86. The Fish and aquatics report (p. 20) claims that "*As a result* [of proposed BMPs], *there would be no detrimental cumulative effects that would exceed management direction for soil and aquatic resources in the Ochoco Forest Plan within the project area from all of these actions.*" We find these assertions <u>*ludicrous*</u> in the face of abundant scientific reports that document the large amounts of sediment produced from roads including closed, decommissioned, temporary and user created roads that impacts streams and water quality.

Physical closure, compliance and enforcement of road closures are virtually nonexistent on the ONF. Therefore, every time a new planning project is created for timber harvest, thinning, prescribed fire or some other vegetation treatment, it creates higher and higher densities of roads, where wildfires can be started by the public, and fish and wildlife habitat, and streams and water quality continue to degrade.

The ONF needs physically close all closed and decommissioned roads, and not implement any new temporary roads. In addition, if there are any temporary roads, they and the well driven "closed" roads and motorized trails MUST be incorporated in the analysis for road densities. High road densities are a major pathway to altered hydrology in each basin including higher peak, lower base flows, and a major contributor to sediment in streams as well as impacts to wildlife such as fragmentation of habitats and disturbance. The analyses must include all roads driven by timber harvest vehicles and the public, not just open roads in density calculations. Open road density calculations are a bogus analysis.

Roads are well documented in the literature to cause permanent impacts to numerous terrestrial and aquatic ecosystems, and are a major threat to biological diversity, fragmentation, loss of connectivity for animal distribution and movement patterns, and have contributed to the spread of invasive and exotic weeds. The existing road system has caused changes to the natural hydrology, adverse impacts to soils, water quality and stream flow, reduced riparian habitat, altered floodplains, and added sediment that has degraded streams and destroyed fish habitat.

Elevated sediment occurs as a result of timber harvest and the increase of "temporary" roads long after treatment stops. Elliot et al. (2011)[30] reported that sediment is the greatest pollutant of forest streams with a forest road network as the main annual source of sediment in forest watersheds. A major factor that increases erosion is traffic. Roads with heavy traffic generate 4 to 5 times the sediment of roads compared to roads with light traffic (Elliot et al. 2010)[31]. Carnefix and Frissell (2009)[32] found there is not truly "safe" threshold road density for aquatic species and negative impacts begin with the first road segment in a watershed, and highly significant impacts began at road densities as low as 1 mi/mi2.

The USFS has ignored and downplayed the well-documented negative effects and ecological risks associated with logging and roads within streamside corridors. Rieman et al. (2001)[33] noted that: "…*vulnerable aquatic species could be impacted in the short term in ways from which they could not easily recover, even if long-term benefits eventually became evident in later years*."

Many authors have reported on the increased sediment load from roads connected to streams, causing increased aggradation of stream beds, filling of pools, enlarged channel widths and widening width-to-depth ratios (Jackson and Beschta 1984[34], Lisle 1982[35]). As road density increases, there is a clear decline in pool frequency and frequency of large pools, both of which are essential requirements for high-quality fish habitat. Lee et al. (1997)[36] reported that increasing road densities are correlated with declines in the four non-anadromous salmonid species including bull trout, Westslope cutthroat trout, Yellowstone cutthroat trout, and redband trout. As pools are filled in by sediment,

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[30] Elliot, W.J., P.R. Robichaud, and R.B. Foltz. 2011. Erosion processes and prediction n NW US forests. International Symposium on Erosion and Landscape Evolution. September 18-21, 2011. Anchorage, Alaska. 8 pp.

[31] Elliot, W. J., I. S. Miller, and L. Audin (eds.). 2010. Cumulative watershed effects of fuel management in the western United States. Gen. Tech. Rep. RMRS-GTR-231. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 299 p.

[32] Carnefix, G., and C. Frissell. 2009. Aquatic and other environmental impacts of roads: the case for road density as indicator or human disturbance and road-density reduction as restoration target; a concise review. Pacific Rivers Council Science Publication 09-001. 9 pp.

[33] Rieman, B., J.T. Peterson, J. Clayton, P. Howell, R. Thurow, W. Thompson, and D. Lee. 2001. Evaluation of potential effects of federal land management alternatives on trends of salmonids and their habitats in the interior Columbia River basin. Forest Ecology and Management 153:43-62.

[34] Jackson, W.L. and R. L. Beschta. 1984. Influences of sand delivery on the morphology of sand and gravel channels. Water Resources Bulletin 20(4): 527-533.

[35] Lisle, T.E. 1982. Effects of aggradation and degradation on riffle-pool morphology in natural gravel channels, northwestern California. Water Resources Research. 18:1643-1651.

[36] Lee, D.C., J.R. Sedell, B.E. Rieman, R.F. Thurow, J.E. Williams, D. Burns, J.L. Clayton, L. Decker, R. Gresswell, R. House, P. Howell, K.M. Lee, K. Macdonald, J. McIntyre, S. McKinney, T. Noel, J.E. O'Connor, C.K. Overton, D. Perkinson, K. Tu. and P. Van Eimeren. 1997. Broadscale Assessment of Aquatic Species and Habitats. In: An Assessment of Ecosystem Components in the Interior Columbia Basin and Portions of the Klamath and Great Basins, T. M. Quigley, and S. J. Arbelbide (Editors). USDA Forest Service Gen. Tech. Rep. PNW-GTR-405, Vol. III, Portland, Oregon, pp. 1057-1713.

they support fewer fish, fish suffer higher mortality, reduce salmonid embryo survival (Bjornn and Reiser 1991[37]; Jensen et al. 2009[38]) and cause decreased fry emergence and juvenile densities, loss of winter carrying capacity, and increased predation (Chapman 1988[39]; Everest et al. 1987[40]; Scrivener and Brownlee 1989[41]; Magee et al. 1996[42]; Weaver and Fraley 1993[43]; Young et al. 1991[44]). High fine sediment load reduces intragravel dissolved oxygen, increases metabolic waste concentrations, decreases intergravel space for aquatic life, and restricts movements of alevins (young fry) (Bjornn and Reiser 1991[45]; Chapman 1988[46]; Everest et al. 1987[47]; Baird et al. 2012[48]).

The Broads recognize that the ONF has implemented a Travel Management Plan (TMP) using Motor Vehicle Use Maps (MVUMs). MVUM maps identify for the forest user the open roads identified in the TMP, but these maps, based on road surveys in the Black Mountain and Mill Creek project areas, fail to show the real roads present on the landscape that are driven. Maps do not prevent or enforce users from traveling on closed, decommissioned, temporary and user-created roads and trails. We observed that over 60% of the "closed" roads in both the Mill Creek and Black Mountain project areas are driven by the public. ODFW conducted surveys in the Black Mountain area and generally found a similar number of road violations.

The Draft EA also does not clarify an adequate plan for physically closing roads including funding, monitoring and effectiveness. The ONF has a long history of failing to follow through implementation of road closures and meet Forest Plan standards for road densities. While the HEI analysis used planned road closures (roads that were supposed be closed from the 1997 Mill Creek project but never completed) to demonstrate an increase in security habitat, the ONF needs to effectively show that they can close roads and maintain closures over the coming decades.

Recommendation: Analyze ALL roads in the project that are driven including closed, decommissioned, user created and temporary roads for a true estimate of road density. All designated closed roads should be clearly signed and physically blocked, and all decommissioned, user- created and temporary roads be physically blocked for entry by any motorized vehicles. Signage fails to stop the segment of users that don't believe any road should be closed. All

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37 Bjornn, T.C. and D.W. Reiser. 1991. Habitat requirements of salmonids in streams. In Meehan, W. (Ed). Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19.
38 Jensen, D.W., E. A. Steel, A.H. Fullerton, and G.R. Pess. 2009. Impact of fine sediment on egg-to-fry survival of Pacific salmon: A meta-analysis of published studies. Reviews in Fisheries Science, 17(3):348–359.
39 Chapman, D.W. 1988. Critical review of variables used to define effects of fines in redds of large salmonids. Transactions of the American Fisheries Society 117(1): 1-21.
40 Everest, F.H., R.L. Beschta, J.S. Scrivener, K.V. Koski, J.R. Sedell and C.J. Cedarholm. 1987. Fine sediment and salmonid production: a paradox. Pp. 98-142, In: J. Colt and R.J. White, eds. Streamside management: forestry and fishery interactions. Contrib. No. 57. Seattle, WA. Institute of For. Res., Univ. WA.
41 Scrivener, J.C., and M.J. Brownlee. 1989. Effects of forest harvesting on spawning and incubation survival of chum and Coho salmon in Carnation Creek, British Columbia. Canadian Journal of Fisheries and Aquatic Sciences. 46:681-696.
42 Magee, J.P., T.E. McMahon, and R.F. Thurow. 1996. Variation in spawning habitat of cutthroat trout in a sediment-rich stream basin. Transactions of the American Fisheries Society 125 :768-779.
43 Weaver, T.M. and J.J. Fraley. 1993. A method to measure emergence success of Westslope cutthroat trout fry from varying substrate compositions in a natural stream channel. North American Journal of Fisheries 13:817-822.
44 Young, M.K., W.A. Hubert and T.A. Wesche. 1991. Selection of measures of substrate composition to estimate survival to emergence of salmonids and to detect changes in stream substrates. North American Journal of Fisheries Management. 11:339-346.
45 Bjornn and Reiser. 1991.
46 Chapman. 1988. Ibid.
47 Everest et al. 1987. Ibid.
48 Baird, E.J., W. Floyd, I. Van Meerveld and A.E. Anderson. 2012. Road surface erosion. Part 1: Summary of Effects, Processes, and Assessment Procedures. Streamline Watershed Management Bulletin 15. 9 pp.

closures must be done commensurate with the timber sale and not wait for up to 10 years following implementation to occur. Road density standards are not simply "mitigation measures" but LRMP requirements.

Hydrology, Streams, Riparian Areas, Wetlands, Seeps, and Springs

False Statements: The Draft EA and Aquatics Report must not continually refer to INFISH as a document that was written for bull trout which do not occur in the project area. There are numerous references about bull trout that are incorrect or falsehoods. The Draft EA (p. 172) states that "*The temperatures in the INFISH Interim Riparian Management Objectives are based on Bull Trout presence or potential." Another example is (p. 184) "Since the streams in the analysis area support Redband Trout populations, not Bull Trout populations, which are more sensitive to habitat disturbances, a more desired condition may be those based on channel type as defined by Rosgen (1994)."*

These statements stating that INFISH was written for bull trout are simply **NOT TRUE**. INFISH was written for all interior native fish species not just bull trout. Many of our Broads and Bros members and partners are professional retired fish biologists, including the ONF and ODFW, and participated in INFISH when it was implemented in the mid-1990s. We assure you it was called the **Inland Native Fish Strategy** not the bull trout strategy and was developed for the conservation of all inland natives not just bull trout. Retired fish biologists from the ONF assert that the Standards and Guidelines are applied to all Forest streams not just the tributaries to Lake Billy Chinook where bull trout reside. The Final environmental document must be corrected and not refer to INFISH as though it was written for bull trout.

A History of Degraded Streams: From the 1940s to the early 1990s on western forests there were no safeguards to balance the risks posed by increasing timber harvest and a lengthening road system (Hicks et al. 1991[49]; Dose and Roper 1994[50]). This led to simplified stream channels with less instream LWD, increased fine sediments in streambeds, and destabilized streambanks (Meehan 1991)[51]. Like many other western forests, much of the Ochoco Forest experienced management actions such as the construction of valley bottom roads and intensive timber harvest and livestock grazing.

The bulk of the National Forest System roads were built in the last 50-60 years with most constructed to access timber harvest, particularly along streams and in riparian areas. With the depletion of large trees over the past century from high grading timber harvest practices, the remaining large trees in riparian areas are all the more important to retain. Large trees provide a far greater benefit than smaller trees and are critical for forming and retaining high quality pools, last longer than smaller trees, and are more effective at providing instream habitat and reducing bank erosion.

Timber harvest and thinning near streams and in riparian areas can harm water quality and fish habitat, especially the negative effects associated with the removal of large, commercial-sized trees. While some habitat loss from thinning and burning may be short term for a few years, the loss of large-diameter trees, snags and down wood takes decades or centuries to recover. Harvest also reduces recruitment for future snags and downed wood.

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[49] Hicks, B.J., J.D. Hall, P.A. Bisson, and J.R. Sedell. 1991. Responses of salmonids to habitat changes. Pp. 483-518, In: W.R. Meehan, ed. Influences of forest and rangeland management on salmonid fishes and their habitat. American Fisheries Society Sp. Publ. 19. Bethesda, MD.

[50] Dose, J. J., and B. B. Roper, 1994. Long-Term Changes in Low-Flow Channel Widths Within the South Umpqua Watershed, Oregon. Water Resources Bulletin 30:99-1000.

[51] Meehan, ed. 1991. Influences of forest and rangeland management on salmonid fishes and their habitat. American Fisheries Society Sp. Publ. 19. Bethesda, MD.

Beschta et al. (1995)[52] reported that "*Land management practices in the interior Columbia… have profoundly impacted forest, grassland, and aquatic ecosystems. Watersheds and forests have been degraded (e.g., ecosystems fragmented, habitats simplified or lost, disturbance regimes altered). At every level of biological organization -- within populations, within assemblages, within species, and across the landscape -- the integrity of biological systems has been severely degraded. This is best seen in the marked reduction in the biological diversity in the region."* The authors further stated that "*By narrowly concentrating on forest health (often a euphemism for tree health, recently referring to carbon cycling), federal land managers have embarked on an ambitious attempt to address forest management in ways that risk neglecting watershed health and the ecology of aquatic ecosystems*."

<u>INFISH and Impacts of Forest Management Activities.</u> One of the primary goals of amending planning documents (e.g., INFISH, Eastside Screens) in the 1990s was to implement new management practices that would support viable native salmonids (Ratner et al. 1997[53]; McHugh et al. 2017[54]). The primary method to improve riparian and stream conditions was to limit activities such as timber harvest, road construction, livestock grazing, and other activities near streams that had caused the degradation (Boisjolie et al. 2017[55]; Roper et al. 2018[56]). The new policies were implemented to minimize sediment runoff from roads, conduct watershed analyses, identify priority watersheds where aquatic species would have greater protection, and implement stream restoration projects. Concurrent with changes in management policies that were expected to improve streams and riparian areas was a 70% reduction in the quantity of timber harvested from public lands in the Pacific Northwest region (Adams et al. 2006)[57].

Effects on fish habitat from loss of streamside vegetation [from timber harvest, roads, and livestock grazing] include increased stream temperature, loss of cover, increased erosion, widening and shallowing of the stream channel, and reduction or loss of perennial flow. Degraded habitat is characterized by increased sediment and water temperatures, declines in pool depth, quality, and frequency, reduced LWD, increased cutbanks and bank instability, and high width/depth ratios. Water quantity and quality problems, primarily flow reduction or loss, temperature, sedimentation, and turbidity, limit fish distribution and production (Bottom et al. 1985)[58].

Studies have shown that logging, even selective logging, has increased instream fine sediments (Kreutzweiser et al. 2005[59], Miserendino and Masi 2010[60]) and increased instream water temperatures (Guenther et al. 2012)[61] and these

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[52] Beschta, R.L., C.A. Frissell, R. Gresswell, R. Hauer, J.R. Karr, G. W. D.A. Perry, and J.J. Rhodes. 1995. Wildfire and salvage logging: Recommendations for ecologically sound post-fire salvage management and other post-fire treatments on federal lands in the west. 14 pp.

[53] Ratner, S., R. Lande, and B. B. Roper. 1997. Population viability analysis of spring chinook salmon in the South Umpqua River, Oregon. Conserv. Biol. 11: 879-889.

[54] McHugh et al. 2017. Linking models across scales to assess the viability and restoration potential of a threatened population of steelhead (Oncorhynchus mykiss) in the Middle Fork John Day River, Oregon, USA. Ecological Modelling. 355:24-38.

[55] Boisjolie, B.A., M.V. Santelmann, R.L. Flitcroft, and S.L. Duncan. 2017. Legal ecotones: A comparative analysis of riparian policy protection in the Oregon Coast Range, USA. Journal of Environmental Management 197 (2017) 206-220.

[56] Roper, B.B., J.M. Capurso, Y. Peroz, and M.K. Young. 2018. Aquatic biodiversity conservation in the context of multiple use management of National Forest System lands. Fisheries, 43, 396–405.

[57] Adams, D.M., R.W. Hayes, and A.J. Daigneault. 2006. Estimated Timber Harvest by U.S. Region and Ownership, 1950-2002.

[58] Bottom, D.L., P.J. Howell, and J.D. Rodgers. 1985. The effects of stream alterations on salmon and trout habitat in Oregon. Oregon Department of Fish and Wildlife, Portland. 70 pp.

[59] Kreutzweiser, D.P., S.S. Capell, and K.P. Good.2005. Effects of fine sediment inputs from a logging road on stream insect communities: A large-scale experimental approach in a Canadian headwater stream. Aquatic Ecology 39(1):55-66. DOI:10.1007/s10452-004-5066-y.

[60] Miserendino, L. and Masi, C. 2010. The effects of land use on environmental features and functional organization of macroinvertebrate communities in Patagonian low order streams. Ecological Indicators, 10(2): 311-319.

[61] Guenther, S., T. Gomi, and R. Moore, R. 2012. Stream and bed temperature variability in a coastal headwater catchment: influences of surface-subsurface interactions and partial-retention forest harvesting. Hydrological Processes, 28: 1238–1249.

changes in habitats are found decades after harvest. Most streams on National Forest lands in Eastern Oregon, like the ONF, have high stream temperatures and violate state water quality standards for temperature. These high temperatures are a serious long-term threat to water quality and continue to be a problem due to both past and current land management practices of timber harvest, high road densities and livestock grazing. High stream temperatures, especially in violation of state and Forest Plan stream temperature standards, create chronic and acute lethal conditions for native fish and limit their productivity and survival in areas where they are already stressed by high loads of fine sediments. Even local increases of water temperatures and sediment at the subwatershed or reach scale can cause local extinctions which cannot be recovered (Frissell 2017)[62].

Logging in riparian areas can increase nutrient loads, stream temperature, and sediment and reduce LWD to streams, compromising fish habitat and water quality. Any active management in stream corridors and riparian areas risks harm to stream ecosystems (Frissell 2017)[63] via the release of nutrients and increases in sediment and stream temperatures.

A. Nutrients. Riparian areas filter and retain harvest activities up slope. Any vegetation disturbance from wildfires, but especially logging, frees phosphorus and nitrogen in soils and causes a spike in streams. Excess nitrogen increases growth of aquatic plants and algae, consumes dissolved oxygen, and blocks light to deeper waters. Too much nitrogen and phosphorus in the water causes algae that can harm water quality, aquatic habitats and decreases oxygen needed by fish and other aquatic life. Oxygen depletion from algal blooms leads to toxicity and even death of large numbers of fish. Sweeney and Newbold (2014)[64] reported that "*The most familiar aspect of streamside forest buffers is their role in creating sufficient space to intercept pollutants created by upland activity before they enter the stream. It is intuitive that wider buffers with more vegetation have greater potential for intercepting, sequestering, degrading, and processing pollutants*." The authors concluded that "*when applied to a site with average water flux, predicts removal efficiency of 48% for a 30-m buffer, increasing to 90% for a 100-m buffer*." Wetlands, like riparian areas, also improve water quality by filtering sediments, nutrients, and contaminants (Environmental Protection Agency 2002)[65]. Wetlands are also essential habitats for a wide variety of plants and animals, including many federally threatened and endangered species.

B. Stream temperature. Timber harvest, particularly in streamside zones, increases water temperature that can become chronic or acutely lethal to native fish species especially cold-water salmonids water.

Timber harvest in the Mill Creek project area includes 661, 1,253, and 593 acres of commercial timber harvest for Alternatives 2, 3 and 4 respectively. The Draft EA (p. 174-175) acknowledges that "*The proposed thinning activities would slightly decrease riparian shade in the short-term in areas dominated by conifers where historically the shade component was provided primarily by hardwoods*" ... "*These treatments would not result in a reduction in shade along the entire proposed acres of vegetation treatments within RHCAs but only along sections identified for treatment due to forest stand conditions/fuels reduction and/or for source wood for stream restoration projects*." These streams already have degraded water quality (Oregon Department of Environmental Quality), failing to meet standards for shade and temperature, and any management activity is likely to impair both parameters.

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[62] Frissell, C. 2017. Panel on logging in streamside corridors. John Day, Oregon. https://bluemountainsbiodiversityproject.org/panel-on-logging-in-streamside-corridors-john-day-oregon-2017/.
[63] Frissell, C. 2017. Ibid.
[64] Sweeney, B.W. and J.D. Newbold. 2014. Streamside forest buffer width needed to protect stream water quality, habitat, and organism: A literature review. Journal of the American Water Resources Association (JAWRA) 50(3): 560-584. DOI: 10.1111/jawr.12203.
[65] Environmental Protection Agency. 2002. Functions and values of wetlands. Office of Water EPA 843-F-01-002c Environmental Protection Office of Wetlands, March 2002; Agency Oceans and Watersheds (4502T). 2 pp.

Yonce et al. (2021)[66] observed that "*The effects of timber harvest on the thermal regime of streams have been observed globally*" … "*Reduction in baseflow, which can occur due to soil compaction during harvest, may also reduce the capacity to absorb increased thermal inputs. Preventing these adverse effects was a motivating factor in the development of. riparian buffer management practices for forestry. Riparian buffers influence water temperature through shading that reduces direct insolation to streams, and secondary effects on microclimate (air temperature and wind) within the buffer are also important. Additional benefits of buffers include reducing peak storm runoff, maintaining stable baseflow, and potentially filtering out sediment, nutrients, and other pollutant loads from the surrounding area*."

Stream temperatures also increase from the interruption of hillslope drainage patterns. The increase in peak flows and lower base stream discharges are caused by the interception of surface and subsurface flow and increases of channels on the landscape (Furniss et al. 1991)[67]. Loss of riparian cover from timber harvest is well known while a third mechanism is the conversion of groundwater to surface water (Williams 1999)[68]. As streams degrade, subsurface water changes to surface flow and increases solar insolation (Fissekis and Hersh-Burdick 2007[69]; Wonzell et al. 2009[70]). The hyporheic zone is the area under or beside a stream channel or floodplain that contributes water to the stream and supports cold water refugia for salmonid fish populations and is degraded by timber harvest.

Roads also degrade stream temperature. Roads along valley bottoms, next to streams cause loss of riparian vegetation and canopy cover which increases stream temperature. Higher stream temperature impacts aquatic life by raising stream temperatures above tolerable range for spawning and rearing, leading to disease, reduced metabolic efficiency, and shifts or losses in fish species assemblages (Beschta et al. 1987[71]; Hicks et al. 1991[72]).

C. Sediment. It is well documented in the literature that elevated sediment occurs from timber harvest and the increase of "temporary" roads long after treatment stops. INFISH explains the degradation of streams caused by timber harvest and roads and consequent listing of native inland fish species. Many scientific studies support 200-to-300-foot riparian buffers along streams that are needed to protect aquatic habitats. A review of numerous authors in INFISH reported that "*non-channelized sediment flow rarely travels more than 300 feet and that 200-to-300-foot riparian 'filter strips' are generally effective at protecting streams from sediment from non-channelized flow*." Beschta et al. (1995)[73] reported that "*Analysis of sediment impacts, for example, that accept existing conditions as the baseline are highly inappropriate because these have been increased over natural background levels for 50-100 years in many cases. There is considerable evidence that current conditions are insufficient to maintain viable populations of many native species, including sensitive and declining trout, salmon, and other fishes.*"

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[66] Yonce, H.N., S. Saumya, J.B. Butcher, T.E. Johnson, S.H. Julius, and S.D. LeDuc. 2021. Forest riparian buffers reduce timber harvesting effects on stream temperature, but additional climate adaptation strategies are likely needed under future conditions. Journal of Water and Climate Change 12 (5): 1404–1419.https://doi.org/10.2166/wcc.2020.031

[67] Furniss, M.J., T.D. Roelofs, and C.S. Yee. 1991. Road construction and maintenance in Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication 19:297-323.

[68] Williams, C.D. 1999. Summary of Scientific Findings on Roads and Aquatic Ecosystems. Primary Research and Analysis. Environmental Consultants, Medford, Or. 17 pp.

[69] Fissekis, A. and R. Hersh-Burdick. 2007. The physical characteristics of hyporheic Flow. Center for Watershed Sciences. University of California, Davis.

[70] Wonzell, S., R. Haggerty, and M.N. Gooseff. 2009. Hyporheic Zones and Mountain Streams. Key Findings. USDA Forest Service. Aquatic Ecology and Management. Corvallis, OR. 5 pp.

[71] Beschta, R.L., R.E. Bilby, G.W. Brown, L.B. Holtby and T.D. Hofstra. 1987. Stream temperature and aquatic habitat: fisheries and forestry interactions. Pp. 191-232, In: Salo and Cundy, eds.

[72] Hicks et al. 1991. Ibid.

[73] Beschta et al. 1995. Ibid.

The biological impacts of sediment caused by timber harvest, roads and grazing are well documented. Fine sediments reduce percolation of water through salmonid redds (fish nests) and reduce egg and early life survival (Bowerman et al. 2014)[74]. May and Lee (2004)[75] state that "*increases in coarse sediment supply can be associated with sharp reductions in salmonid habitat and productivity*" and reported that streams with discontinuous flow caused by sediment increases reduced survival by crowding fish into smaller areas with reduced food availability. Fine sediments from harvest and roads fills in stream channels, losing pool depth, channel complexity, and changing channel profiles to a shallow, wide profile (Chin et al 2004[76]; May and Lee 2004[77]).

Many streams throughout eastern Oregon forests have documented sediment embeddedness of greater that 20% and in some cases has high as 45% (USDA Summit Off Highway Vehicle Trail (USDA, Ochoco National Forest SFEIS 2016)). While we appreciate that the ONF provided the stream data that has been gathered for streams in the Mill Creek area, we note that many of the Riparian Management Objectives (RMOs) are not met. One example is the level of fines in streams, which as noted above, causes great harm to aquatic species. Table 3a of the Mill Creek projects reports sediment embeddedness from fines in streams in the project area ranging from as low as 0.89% to as high as 66.7%. The table showed that of 24 reported measurements of percent fines, 16 (67 %) were over the threshold of 20% fines (which greatly impacts fish), while over 1/3 of the values were substantially greater than the threshold. When streams show that level of embeddedness, causative factors that add sediment to streams are road densities, past timber harvest and livestock grazing, all of which occur in the project area and on the vast majority of the ONF.

D. Large Woody Debris. LWD is an important measure of habitat complexity for sediment retention, pool formation and bank stability on the ONF (Cordova 1995[78]; Stuart et al. 2007[79]). It is also an important feature in the physical and biological structure of a forested stream (McDade et al. 1990)[80]. Higher native salmonid densities are found in streams with more LWD. LWD adds stream complexity and stability and provides habitat for a variety of species and age classes in aquatic communities (Lisle 2002)[81]. Most RHCAs on the managed portions of ONF lands are deficient in LWD from past and present timber harvest. Roper et al. (2019)[82], compared managed versus unmanaged stream reaches on national forests in eastern Oregon and Washington, and Idaho and Montana, and found that wood frequency and volume, and pool frequencies all increased as the forested percent of the riparian zone increased.

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[74] Bowerman, T., B.T. Neilson, and P. Budy. 2014. Effects of fine sediment, hyporheic flow, and spawning site characteristics on survival and development of bull trout embryos. Can. J. Fish. Aquatic Sci. 71: 1059–1071.
[75] May, C.L. and D.C. Lee. 2004. The Relationships among In-Channel Sediment Storage, Pool Depth, and Summer Survival of Juvenile Salmonids in Oregon Coast Range Streams. North American Journal of Fisheries Management 24:761–774.
[76] Chin, A., D.M. Rohrer, D.A. Marion, and J.A. Clingenpeel. 2004. Effects of all-terrain vehicles on stream dynamics: In: J.M. Guldin (ed.). Ovachita and Ozark Mountains Symposium: Ecosystem Management Research. USDA For. Serv. Gen. Tech. Rep. SRS-74. Pp. 292-296.
[77] May and Lee. 2004. Ibid.
[78] Cordova, J. 1995. Streamside forests, channel constraint, large woody debris characteristics, and pool morphology in low order streams, Blue Mountains, Oregon. M.S. Thesis. Oregon State University. Corvallis, OR.
[79] Stuart, A.S., D. Grover, T.K. Nelson, and S.L. Thiesfeld. 2007. Redband trout investigations in the Crooked River Basin. In Redband trout: resilience and challenge in a changing landscape. Oregon Chapter, American Fisheries Society, Corvallis. pp. 77-90.
[80] McDade, M.H., Swanson, F.J., McKee, W.A., Franklin, J.F., and Van Sickle, J. 1990. Source distances for coarse woody debris entering small streams in western Oregon and Washington. Can. J. For. Res. 20: 326–330.
[81] Lisle, T.E. 1982. Ibid.
[82] Roper, B.B., W.C. Saunders and J.V. Ojala. 2019. Did changes in western federal land management policies improve salmonid habitat in streams on public lands within the Interior Columbia River Basin? Environ Monit. Assess (2019) 191:574.

Riparian Management Objectives (RMO) parameters on the ONF. RMOs such as temperature, bank stability, pool depth and frequency and % fines of sediment are largely degraded on all streams in the project area. While the data were not comprehensive for all streams in the project area, many RMO parameters for shade, temperature, LWD, stream bank stability, cutbanks, and pool frequency for streams were not assessed or failed to meet INFISH standards. The Draft EA Aquatics Report (p. 6) states that "*continued non-attainment of some of these standards such as pool frequency and large wood targets in the project area for the foreseeable future leaves the watershed at risk for decreased resiliency to the effects of climate change in the region*". Particularly with a warming and drying climate, restoration of riparian areas and degraded streams by past management practices has become more urgent. We note that over the past 30+ years, streams that were once perennial have become intermittent in drought years and some local redband trout populations have been extirpated (e.g., some streams on the south side of the Maury Mountains). Without restoration of streams by limiting and cessation of harmful management practices, local extirpations of native redband trout will continue with a warming climate, leading to extirpation and extinction.

Stream and riparian habitats are extremely fragile communities that support ESA-listed species and Regional Forester Sensitive species. INFISH (1995) set riparian goals that include: maintain or restore water quality, stream channel integrity and channel processes, and instream flows to support healthy riparian and aquatic habitats. Interim riparian management objectives include bank stability greater than 80%, and interim pool frequency objectives. INFISH also stated that "*Actions that reduce habitat quality, whether existing conditions are better or worse than objective values, would be inconsistent with the purpose of this interim direction.*"

Recommendation: Correct statements that falsely claim that bull trout are the basis for INFISH and RMO standards. Comply with federal law and provide detailed descriptions and analyses of RHCAs. Because portions of the Mill Creek watershed are impaired and stream reaches are degraded and fail to meet RMO standards, the ONF must exclude commercial harvest and limit thinning and prescribed burning in designated RHCAs. Permanently close all roads possible in RHCAs and reduce road densities to <3mi/mi2 in general forest and <1mi/mi2 in winter range areas. Any treatments in RHCAs should be carefully limited to aspen stands and meadows, and all trees should be dropped by hand with no temporary roads, mechanical treatments, heavy equipment, or removal of wood. Any wood thinned should be left on the ground and near streams to deter livestock grazing. Any thinning should be implemented with a commensurate amount of increased miles of road closures with effective physical barriers.

Environmental Baseline

The Draft EA Aquatics Report states that "*There is very little measured sediment data for the project area so certain assumptions must be made in order to assess both the existing condition of sediment delivery*" (p.2) and "*All of the most recent survey data was compiled and analyzed and was comprised of a mixture of BLS and Level II data from 1991-2020. It is recognized that not all data are reflective of current management (last 3-5 years). For some of the stream systems there is data from the early 1990s and 2000s which has been compared to recently collected data (2009-2020). Using this, assessments of current conditions and trends in habitat are assumed to be reflective of management action effectiveness. Evaluation of streams with only recent data was compared to RMOs to determine habitat condition as long-term trends could not be determined. Extrapolations will be made from currently collected data across the entire project, since data was not collected on every stream*" (p. 4).

In addition to the general lack of historical and current data, and trends, we could not find in the Draft EA, Aquatics Report, or Wildlife Report any maps, descriptions, locations, or detailed analysis of the RHCAs and Class I-IV streams and how the proposed treatments will move streams toward attainment of the RMOs in each of the 4 classes of RHCAs. The public cannot fully review and assess the ONF's proposed management activities and impacts to RHCAs, steams and aquatic species without full disclosure of important project information that should be available in the Draft EA and specialist reports.

To comply with NEPA's "hard look", the FS must maintain inventories or otherwise collect and disclose information about the resources it manages so that an adequate baseline exists to evaluate the environmental impacts of a proposed action. Without establishing the baseline conditions in the Project area before the action begins there is no way to determine what effect the project will have on the environment and no way to comply with NEPA.

Recommendations: Conduct an EIS and provide maps, data, analyses to identify the baseline environmental conditions, and the impacts of the proposed project to meet NEPA requirements for a hard look.

Modifying RHCAs

Similar to the Black Mountain Project, it appears that the FS is once again modifying INFISH widths by distinguishing between an "outer" and "inner" vegetation zone. The 1989 LRMP stated that approximately 50% of the total stream miles on the Forest were in a degraded condition, with problems of turbidity and temperature chiefly from grazing, timber harvest and road building. The Forest Plan set standards for temperature and shade. When the 1995 INFISH amended the LRMP, it set standards for RMOs and established RHCAs along streams and around springs, seeps, wetlands, lakes, and ponds to protect the integrity of aquatic resources. Essentially, INFISH RHCA widths apply unless and until watershed analysis is completed to provide an ecological basis for increasing or decreasing widths to achieve riparian management goals and objectives and those widths may only be modified in the absence of watershed analysis only where stream reach, or site-specific data support the change.

However, the Draft EA (p. 8) fails to support protection measures in RHCAs because it claims that "*This distinction is based on the fact that within RHCAs (that were established at between 50 and 300 feet on either side of a stream channel), there are perennially wetted riparian areas (inner/lower) and areas that are outside of the perennially wetted areas (outer or upland)."* The Draft EA (p. 176) further states that "*The spatial boundary used in GIS for analyzing the effects to stream temperature in commercial thinning, noncommercial thinning, and large wood source units is 50 feet from Category I-III RHCAs and referred to as the Primary Shade Zone (PSZ). This boundary is used because the PSZ is a minimum distance from which a tree of a determined height on a determined slope is providing shade during the period when peak temperatures occur*."

INFISH does not distinguish "inner" and "outer" areas in RHCAs. By making this distinction in RHCAs, the ONF promotes greater levels of logging in the outer and upland area while still allowing some harvest in the inner and lower area by potential differences in shade from trees and how wetted the riparian zone is along streams. The Draft EA states that commercial thinning would have no adverse effects on stream temperature because logging would only occur in the primary shade zone along a limited number of stream miles. The Draft EA fails to evaluate or report the loss of shade (and associated water temperature increases) from management activities both inside and outside the primary shade zone in RHCAs. In assessing compliance with INFISH, the ONF focuses on the fact that the majority of logging activities would take place in the upper/outer vegetation zone but did not explain how commercial treatments in either the inner/lower and the upper/outer vegetation zone are needed to attain RMOs.

Timber harvest in RHCAs with roads, landings, and skid trails cause significant ground disturbance, leading to significant soil compaction, erosion, and sedimentation in streams. As a result of these activities, the Draft EA estimates substantial short-term increases in sediment. The Draft EA states that "*the GRAIP-Lite existing condition sediment model run indicates that the existing road system (Forest Service system roads and user-created roads) is delivering 951 tons/yr of sediment to the watershed (Figure 36)."* However, each of the action alternatives produces large amounts of sediment with expected amounts of sediment increasing from less than 1,000 tons/year to 11,143, 17,456, and 14,787 tons/year in the disturbed state of Alternatives 2, 3 and 4 respectively. These are not modest amounts but an astonishing increase in sediment going into largely degraded streams that already demonstrate sediment fines well beyond thresholds safe for aquatic life. Statements about no to minimal harm are inconsistent with the expected and modeled dramatic increases in sediment for each action alternative.

Recommendations: Conduct an EIS, conduct adequate baseline monitoring and public disclosure for all RMOs, and implement a reduced project with no harvest and roads in RHCAs, no additional new or temporary roads, and physically close roads to meet forest LRMP standards for road densities.

Invasive and Noxious Weeds

One of the greatest threats to public lands is the spread of exotic and noxious weeds. Invasive and noxious weeds often colonize disturbed sites where native vegetation has been disturbed, reduced, or removed. Executive Order 13112 directs federal agencies to reduce the spread of invasive plants, which is one of the four major threats to ecosystem health.

All action alternatives in the project area, including timber harvest, thinning, prescribed burning, road reconstruction, temporary roads, livestock grazing, and other activities, have a high potential for introducing and spreading exotic weeds, including species that are already present or bringing in new weed species. This can occur on upland sites and meadow, riparian, and wetland sites. While the Draft EA proposes some resource protection measures, all action alternatives in the project have a high risk of introducing and/or spreading exotic and invasive species to important habitats in violation of the Executive Order above.

While all action alternatives will increase the introduction and expansion of noxious weeds, generally the greatest number of acres equates to the greatest risk of weed expansion and alteration of habitats. With all action alternatives treating almost all of the non-wilderness area, all action alternatives have a high potential for risk. In other words, the greater amount of timber harvest, temporary roads, and disturbance, the worse the likelihood of spread of invasive noxious weed species.

The Draft Report (p. 97) states that "*The no action, Alt 1 will be the lowest risk of the Alternatives, and includes no ground disturbing vegetation and fuels activities, transportation activities, or aquatic restoration that would increase risk for introduction and spread of noxious weeds*" …" *All action Alts propose various activities that would result in more ground disturbance than Alt 1, therefore they are a higher risk. 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."*

Recommendation: Introduction and spread of nonnative noxious weeds increases substantially in all action alternatives, especially due to the proposed treatment of virtually all acres outside the Mill Creek Wilderness. Reduce the scope and scale of this project and analyze and support our Bitterbrush Broads and Bros alternative with a more reasonable project size and pursue aggressive approaches to limiting the spread of invasive noxious weed species.

Timber Harvest, Livestock Grazing, Roads, and Cumulative Effects

The premise used in the analyses of each alternative is that the Mill Creek project has dense overstocked stands of mixed conifer that are causing changes in the hydrology of the area, causing lower base flows and higher peak flows. While "legacy" fire suppression, timber harvest, and livestock grazing is acknowledged as a contributing factor for poor stream health and fish populations, the analyses largely claim that the current degradation is ongoing due to changes in forest stand composition and density. This claim is not supported in the literature. In fact, much of the stream degradation is directly attributable to high road densities, past timber harvest, and past and present livestock grazing and is clearly a cumulative effect and harmful impact not counted in the project area.

Timber harvest throughout the ONF has occurred for over 100 years with significant increases in harvest starting in the 1940s to 1960s (McCallister 2011).[83] The Draft EA (p. 112) acknowledges that "*past activities have caused current conditions on the forest with a loss of large mature old trees, reduced snags for wildlife habitat, reduced LWD and shade along streams and riparian areas*" … "*Past timber harvest targeted and removed many of the largest diameter trees reducing LOS stands. Large green replacement trees removed during this time reduced future snag potential and subsequent large snag densities throughout the project area*".

In areas of the ONF that have few or no roads and less livestock grazing, streams are in good condition and support higher populations of redband trout. Where there are high road densities and heavy livestock grazing, streams are severely degraded. Fish populations in areas with low road densities, less timber harvest, and limited grazing, such as upper reaches of Brush Creek in the Lookout Mountain roadless area and the roadless area along Rock Creek, habitat and fish populations are in reasonably good conditions. While these streams have dense streamside stands of mixed conifer stands, they also have relatively good habitat and trout densities. Where there are high road densities, more timber harvest, and heavy livestock grazing, such as Evans, Lemon and Harvey creeks and along portions of the mainstem and West Fork of Mill Creek Creeks, streams are degraded and redband trout populations are in very low abundance. While the West Fork of Mill Creek was purportedly closed to motor vehicles from the previous project, the Bitterbrush Broads and Bros documented an illegal well-used road system throughout a large portion of the area.

The ONF generally dismisses livestock grazing as a cumulative impact to streams and riparian areas. The Draft EA (p. 25) states that "*While livestock grazing also occurs within the project area, under the Mill Creek AMP (USFS 2010), there are no cumulative effects because current grazing practices do not alter species composition of forested vegetation to a meaningful degree across the project area. Effects of past grazing are part of the existing condition. Past prescribed fire activities through Mill AMP were included with the existing condition*." Then, the Draft EA (p. 186) contradicts that statement and reports that "*Cattle may have caused shifts in plant species composition and abundance through selection of more palatable forage species. This reduction of plant or shrub abundance may reduce riparian vegetative condition along stream banks along with livestock hoof shear on steam banks may affect bank stability provided by a robust riparian hardwood community. This effect in turn may result in an increase in sediment input that has been shown to result in a reduction in pool depth over time.*"

From our field observations of exclosures in the West Fork of Mill Creek, we find that livestock grazing has indeed harmed streams and riparian areas. Figure 2 shows two pictures of which the first is a picture of trees caged for protection from livestock grazing with bare areas, cutbanks and heavily grazed grasses. The second photo is a livestock exclosures that wildlife can pass through but blocks cattle access. These photos were taken in November 2021. They demonstrate the cumulative impact and degradation of livestock grazing in the Mill Creek project area. Where cattle are excluded, streams can passively recover with native riparian shrubs such as in the exclosure. That is not happening in most of the project area. Streams in the project area and any proposed restoration treatments must be fenced from livestock grazing to improve riparian and instream habitat.

[83] McCallister, R. 2011. 100 years of history for the Ochoco National Forest. Central Oregonian – News. 3 pp.

Caged riparian trees but otherwise heavily grazed by cattle.   Note ungrazed exclosure in upper half of photo.

Figure 2. West Fork of Mill Creek photos. The first photo shows wire cages to allow a few trees to grow. Note the dirt cutbanks along the stream that show degraded stream conditions and poor bank stability and lack of riparian vegetation in the first photo. The second photo is an exclosure that allows wildlife but no cattle grazing. Note the abundant riparian vegetation inside the exclosure and lack of vegetation in the foreground outside the exclosure in the second photo.

This proposed Mill Creek Project is like many of the recently implemented, ongoing and future vegetation management projects such as Black Mountain, Gap, Spears, Jackson, Howard Elliot Johnson, Deep, and Wolf. Just in the past 10 years, Gap, Spears, Jackson, Howard Elliot Johnson, and Wolf projects have "treated" over 115,000 acres, Black Mountain implementation is ongoing, while fires such as the Bailey Butte, Hash Rock, Ochoco Complex, and Bailey Butte have impacted another 30,000 acres. These are very large landscape changes that affect numerous wildlife species and their habitats, especially big game including elk and mule deer that use different habitats.

Further exacerbating the problem, rather than implementing road closures and moving toward the LRMP and Roads Analysis standards of lower road densities, there is a gradual acceptance that the current situation is normal and acceptable. The ONF has failed to meet standards and guidelines articulated in various plans including the 1989 LRMP and INFISH. With proposed timber harvest and associated roads, the ONF must not cause continued harm to aquatic and wildlife species and their habitats.

Past and present land management practices, including high road densities (that fail to meet LRMP and the 2003 Roads analysis standards), livestock grazing, fire suppression and timber harvest have contributed to current resource conditions. Cumulative effects from past and present projects have compromised streams causing high summer temperatures that fail state water quality standards, low base summer flows in streams, and downcut channels not connected with floodplains. Sediment fines in many streams exceed the 20% embeddedness threshold that many scientists cite as major harm to aquatic life. Other harms are low pool frequency, cutbanks that exceed the 20% standard, and shade that fails to meet the 80% standard for forested areas.

Cumulative effects comments in the Draft EA need to be revised where appropriate and use the appropriate spatial scale. For example, the Draft EA (p. 22) states that for the HRV analysis "*The spatial boundary for analyzing effects to resource indicators listed above is the boundary of the project area, which is essentially the Mill Creek Watershed, because this landscape is of a scale sufficient to encompass historic disturbance regimes and analysis of this scale is needed to meet the direction of the Ecosystem Standard contained in the Eastside Screens for determination of HRV.*"

Cumulative effects are supposed to consider past, present, and foreseeable future projects both inside and outside the project area, not just concurrent activities inside the project boundary. The spatial scale for HRV must include the entire forest, not just the Mill, McKay and Spears project areas and Lemon Gulch trail system (p. 25). This project generally lacks credible and complete cumulative effects analyses.

In order to adequately demonstrate and understand a cumulative effects analysis, the Broads request a detailed map of all of the vegetation management projects in the past 20 years of the ONF to show how much "vegetation treatment" management activity has occurred in these watersheds. We request that the map include areas delineating timber harvest, thinning and prescribed burning units for all vegetation management projects including Gap, Spears, Jackson, Howard Elliot Johnson, Deep, Black Mountain, Wolf, and Black Mountain, areas proposed for future management (e.g., North Fork Crooked River) and areas burned by wildfire to understand how this project fits with past, present and planned actions.

The Ninth Circuit consistently has held that to adequately consider cumulative effects, some quantified or detailed information is required. Without such information, neither the courts nor the public, in reviewing the Forest Service's decisions, can be assured that the Forest Service provided the hard look that it is required to provide.

In this case, proclaiming that streams are impaired due to conifers growing in the floodplain is like putting the cart before the horse. Streams are degraded and downcut and have lost contact with floodplain zones due to past and ongoing cumulative impacts of high road densities, timber harvest and livestock grazing. Some conifers have grown in floodplains that are left high and dry from lack of connectivity with streams due to these harmful practices. However, in other places in the forest such as roadless areas on Brush and Rock creeks, conifers are growing with riparian shrubs and trees and are part of the diverse community of species.

Without reducing road densities and improved management of cattle (e.g., significant fencing of riparian areas), reducing or cessation of livestock numbers and duration of grazing, restoration, "restoration" activities such as wood placement and floodplain reconnection will provide relatively short duration and not long-term improvements. Without making changes in management practices that cause the degradation, these will be Band-Aids that look effective for a limited period of time but will ultimately fail because causal factors have not been addressed.

Recommendation: Cumulative effects analyses must be done for the appropriate and relevant area for each resource. In many cases, the Draft EA simply uses the project area which is arbitrary and inadequate such as but not limited to HRV, livestock grazing, and road densities. Address factors (e.g., livestock grazing, road densities) causing degradation rather than Band-Aid fixes with short term effects.

Impacts to Elk

There will be significant loss to big game cover with implementation of any of the action alternatives, which will significantly degrade elk habitat and move elk to exterior boundaries of the forest, and off forest onto private lands during the spring and summer when elk are normally on the forest, calving and rearing young. The ONF is characterized by big game that, in the past, typically summer on the forest and move downslope to winter range that is primarily on private land that circles the forest at lower elevations. Most private landowners tolerate current winter elk use, but an increase in use during the spring and summer, when big game are historically on the forest, likely requires ODFW to significantly reduce the elk [and deer] populations, and in turn significantly reduce ODFW's management objectives for big game species and hunting opportunity and associated economic benefits.

The Draft EA fails to identify and analyze elk habitat, particularly for reproduction including rutting, wallowing, and calving. Elk numbers in the Grizzly Wildlife Management Unit including the project area are already below Oregon

Department of Fish and Wildlife's (ODFW) management objectives. All the action alternatives will further impact elk with loss of significant hiding and thermal cover.

The ONF fails to execute the National Forest Management Act (NFMA) and the 1989 Land and Resource Management Plan Standards and Guidelines by not surveying for calving and wallows sites prior to implementation of the Mill Creek Project. The applicable ONF LRMP Standard and Guideline for Rocky Mountain Elk and Mule Deer (LRMP 4-246) states: "*Protect the character of elk calving sites. Minimize disturbance from human activity during calving season (approximately May 15 to June 30). Also protect wallows during rutting season (September 1 to October 15).*"

The Draft EA claims that known sites for elk reproduction including calving and wallows cannot be identified, and further claims that reproductive sites move around (p. 121). Contrary to the literature cited by the Draft EA that dismisses identification of known reproductive sites (Sadlier 1987[84] and Raedeke et. al 2002[85]), other researchers found that elk have site fidelity for calving locations. Vore and Schmidt (2001)[86] found that 4 of 5 females with > 1 years of data gave birth < 100m from where they had previously birthed. Many cows return to the same areas each year to calve (Leege 1968[87], Ralphs 1981[88] and Innes 2011[89]). Boyce (1991)[90] reported migratory elk in northwestern Wyoming travelling over 100 km from summer to winter ranges to be highly philopatric during these periods suggesting maternal females may return to calving areas in consecutive years. Other studies report migratory elk generally return to the same locations to calve in consecutive years (Roberts 1974[91], Marcum 1976[92], Seidel 1977[93]). The elk demonstrated greater fidelity during calving and post calving periods indicating these locations are important for elk survival. The importance of abundant forage and concealment cover to meet demands associated with parturition and hide calves are likely reasons for higher fidelity during the partum and post-partum periods (Allen

[84] Sadleir, R. M. F. S. 1987. Reproduction of female cervids. Pages 123–144. In: C. M. Wemmer, editor. Biology and management of the Cervidae. Smithsonian Institution Press, Washington, D.C., USA.
[85] Raedeke, K.J., J.J. Millspaugh, and P.E. Clark. 2002. Population characteristics. Pages 449–491. in Toweill, D. E. and J. W. Thomas. editors. North American elk: ecology and management. Smithsonian Institution Press. Washington, D.C., USA.
[86] Vore, J.M and Schmidt E.M. 2001. Movements of female elk during calving season in northwest Montana. Wildlife Society Bulletin (1973-2006) Vol. 29, No. 2, pp. 720-725.
[87] Leege, Thomas A. 1968. Prescribed burning for elk in northern Idaho. In: Proceedings, annual Tall Timbers fire ecology conference; 1968 March 14-15; Tallahassee, FL. No 8. Tallahassee, FL: Tall Timbers Research Station: 235-253.
[88] Ralphs, Robert M., tech. ed. 1981. Elk habitat relationships of central Idaho. [Boise, ID]: [Idaho Department of Fish and Game]. 57 p. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, Missoula, MT.
[89] Innes, Robin J. 2011. Cervus elaphus. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: www.fs.fed.us/database/feis/mammal/ceel/all.html [2019, August 21].
[90] Boyce, M. S. 1991. Migratory behavior and management of elk (Cervus elaphus). Applied Animal Behaviour Science, 29(1-4), 239-250.
[91] Roberts HB. 1974. Effects of logging on elk calving habitat. Moyer Creek, Salmon National Forest, Idaho
[92] Marcum, C. L. 1976. Habitat selection and use during summer and fall months by a western Montana elk herd. In Proceedings of the elk-logging-roads symposium. Forestry Wildlife and Range Experiment Station, University of Idaho, Moscow, Idaho. pp. 91-96.
[93] Seidel, J. W. 1977. Elk calving behavior in west central Colorado. In Western States Elk Workshop, Colorado Division of Wildlife report, Aspen Colorado, USA.

2014)[94]. Wolf et al. (2009)[95] reported a strong positive relationship with subsequent site use and revisited sites were often of higher forage quality and lower predator risk than unfamiliar locations.

Research strongly suggests that cow elk have site fidelity for previous used calving locations. As such, calf birthing is likely to occur across the project area. Survival rates for cows and calves disturbed during the neonatal period are significantly reduced and may take up to two years of no disturbance to rebound (Phillips and William 2000[96], Shively et al. 2005[97]). As elk are an ONF MIS species and the ONF has committed to help ODFW meet its current MO's, it stands to reason that the elk's reproductive cycles in the project area are important.

The Forest Plan Standard and Guideline is clear about protecting these sites during their respective spring and fall seasons. The court decision from Judge Hernandez for the past Ochoco Summit OHV Project confirms that more data regarding the location of elk calving sites and wallows must be considered. We recommend the ONF be more proactive about protecting these reproductive sites. The Project area is limited in suitable calving and wallow areas due to the extensive road system in the area. Generally, all riparian areas, aspen stands, spring, and seeps are logical calving and wallow sites and can be easily inventoried and avoided, and do not change annually. The Draft EA fails to comply with the LRMP and must take a "hard look" at LRMP standards as required by NEPA.

Further, the ONF states that the HEI model is estimated to improve habitat which we find extremely questionable. HEI is based on a combination of cover and road densities and the ONF has been generally unsuccessful at not only physically closing roads but keeping them closed. The project will treat over 23,000+ acres with harvest, thinning and burning on virtually every acre of the non-wilderness project area along with 40-60 miles of temporary roads plus the existing high density of roads (over 60% of which are "closed" but regularly driven). As stated in the Draft EA, managing healthy, stable elk populations is a cooperative effort between the FS and ODFW, with the FS responsible for the management of habitat, and with explicit direction in the Ochoco Forest Plan for the District to "manage elk and deer habitat to meet the population objectives of the ODFW to the extent practicable."

The DEA inadequately analyzes how current cattle allotments impact special elk habitats, including specific locations for calving and rutting in the Project area. Most of the Project is within the 58,857 acres of the Mill Creek Allotment Management Plan's grazing allotments, and the Wildlife Report states that "*livestock grazing may be present within portions of the project during rutting season and may impact use of the project area by elk, thus reducing the utility of some wallows*". To comply with LRMP standards, ONF must conduct a specific analysis on when and where cattle allotments interact with specific elk calving and rutting sites, as this has a direct impact on elks' ability to effectively use this habitat, and the specifics on how elk are impacted by the Project alternatives.

The Draft EA also uses an inaccurate scale for its elk security analysis. The Draft EA states that "*Much of the elk security habitat within the Mill Creek project area lies within the Mill Creek Wilderness in the northeastern corner of the watershed*." The Mill Creek Wilderness area should be excluded from the elk habitat security analysis as it is not open to treatment and dilutes this analysis.

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[94] Allen, Michael R. 2014. Calving Site Selection and Fidelity in a Restored Elk (Cervus elaphus) Herd in Bancroft Ontario, Canada. Environmental and Life Sciences MSc Graduate Program. May 2014.
[95] Wolf, M., Frair, J., Merrill, E., & Turchin, P. (2009). The attraction of the known: the importance of spatial familiarity in habitat selection in wapiti Cervus elaphus. Ecography, 32(3), 401-410.
[96] Phillips, G.E. and A.W. William. 2000. Reproductive success of elk following disturbance by humans during calving season. The Journal of Wildlife Management. 64(2): 521-530.
[97] Shively, K.J.; A.W. Alldredge, and G.E. Phillips. 2005. Elk reproductive response to removal of calving season disturbance by humans. The Journal of Wildlife Management. 69(3): 1073-1080.

Recommendation: The ONF must survey potential areas for elk calving sites and wallow areas which can be significantly narrowed by habitat types such as riparian areas, wetlands, aspens, springs, and seeps. Surveys of all potential calving and wallow sites must be completed a year ahead of the Final environmental analysis and decision. Surveys must occur during the calving and rutting periods. All project units found to contain calving and wallow sites must be removed from the project and not subject to implementation.

Wildfire

New science has emerged on the importance of a variety of wildfires from low severity at frequent intervals to mid severity and occasional high severity fires. Not all wildfires as the Draft EA implies are bad and in fact have important ecosystem functions for restoration and wildlife habitats (Hutto et al. 2016[98], DellaSala 2020[99], Harmon et al. 2022[100]). For example, Hutto et al. (2016)[101] reported that "*First, many plant and animal species use, and have sometimes evolved to depend on, severely burned forest conditions for their persistence. Second, evidence from fire history studies also suggests that a complex mosaic of severely burned conifer patches was common historically in the West. Third, to maintain ecological integrity in forests born of mixed-severity fire, land managers will have to accept some severe fire and maintain the integrity of its aftermath. Lastly, public education messages surrounding fire could be modified so that people better understand, and support management designed to maintain ecologically appropriate sizes and distributions of severe fire and the complex early seral forest conditions it creates*."

DellaSala (2020)[102] reports that "*In our region, and much of the West, wildfires burn in a mixed pattern of severity effects on plant communities. The largest wildfires are not uniform conflagrations – rather they burn in a mosaic pattern of mixed severity effects (unburned, low, moderate, high severity burn patches). At the landscape scale, this pattern has been referred to as "pyrodiversity" and it is responsible for Oregon's extraordinary levels of biodiversity present in wildfire burn mosaics. Most notably, the high severity burn patches where most trees are killed (known as "complex early seral forests," snag forests, or charcoal forests are as bio-diverse as patches of old-growth forests*."

DellaSala (2020)[103] also states that "*Active management is often proclaimed as a panacea for reducing wildfire-human conflicts, yet it is seldom even defined. Active management can mean just about anything – clearcut logging, salvage logging, high-grade logging, fuels reduction, prescribed fire, thinning, road building, etc. And while degraded forests like plantations can benefit from ecologically appropriate thinning and other restorative actions (snag creation, down logs, road obliteration, weed removals), in most cases thinning – even if done properly – will not encounter a fire during the short period (10-15 years) of when fuels are lowest.*

The Oregon landscape is so vast and efforts to spend billions of dollars on thinning are not likely to be effective nor will they make us safer. This is because we do not know exactly where wildfires will occur, and thinned forests will just grow back quickly in many cases. In fact, the largest empirical dataset ever assembled by researchers recently documented the low co-occurrence of wildfires and thinned sites. Some 99% of thousands of acres of fuels treatments on federal lands did not encounter a wildfire when fuels were lowest. Further, these same researchers found that despite the emphasis on the so-called WUI, codified in the Healthy Forest Restoration Act of 2003, most fuel

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98 Hutto, R. L., R. E. Keane, R. L. Sherriff, C. T. Rota, L. A. Eby, and V. A. Saab. 2016. Toward a more ecologically informed view of severe forest fires. Ecosphere 7(2): e01255. 10.1002/ecs2.1255.
99 DellaSala, D. 2020. Senate Interim Committee on Wildfire Prevention and Recovery. January 14, 2020, hearing and public testimony. Geos Institute. 40 pp.
100 Harmon, M.E.; Hanson, C.T.; DellaSala, D.A. Combustion of aboveground wood from live trees in megafires, CA, USA. Forests 2022, 13, 391. https://doi.org/10.3390/f13030391.
101 Hutto. 2016. Ibid.
102 DellaSala. 2020. Ibid.
103 DellaSala. 2020. Ibid.

treatments were being conducted outside this zone and in the backcountry where they will do nothing to protect homes." (DellaSala 2020)[104].

As pointed out above in the section on climate change, wildfires produce far less carbon emissions than timber industrial forests (Figure 1). The more managed lands have a generally greater risk of fire severity. Bradley et al. (2016)[105] documented that climate change and extreme weather events combines with more heavily managed industrial forests to produce more mega wildfire events (Figure 3).

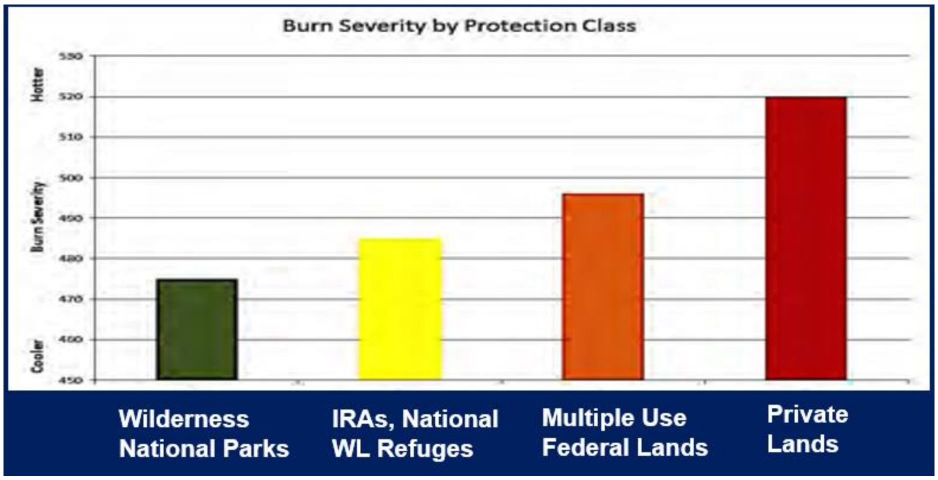

Figure 3. A comparison of burn severity across land protection class. The higher the level of protection from management, the less the burn severity (Data from Bradley et l. 2016)[106].

Data over a three-decade period, from 1984-2016, showed that 1,500 wildfires greater than 1,000 acres that covered over 23 million acres in western and great plains states had a much higher burn severity in managed versus unmanaged forests. The authors, after averaging out effects of elevation and climate, show that "*forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading*". They also state "*a need for managers and policymakers to rethink current forest and fire management direction, particularly proposals that seek to weaken forest protections or suspend environmental laws ostensibly to facilitate a more extensive and industrial forest–fire management regime*."

The authors recommend that "*allowing wildfires to burn under safe conditions is an effective restoration tool for achieving landscape heterogeneity and biodiversity conservation objectives in regions where high levels of biodiversity are associated with mixed-intensity fires. Managers concerned about fires can close and decommission roads that contribute to human-caused fire ignitions and treat* fire-prone tree *plantations where fires have been shown to burn uncharacteristically severe (Odion et al. 2004). Prioritizing fuel treatments to flammable vegetation adjacent to homes along with specific measures that reduce fire risks to home structures are precautionary steps for allowing more fires to proceed safely in the backcountry (Moritz 2014, DellaSala et al. 2015, Moritz and Knowles 2016)."*

[104] DellaSala. 2020. Ibid.
[105] Bradley, C. M., C. T. Hanson, and D. A. DellaSala. 2016. Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? Ecosphere 7(10): e01492. 10.1002/ecs2.1492.
[106] Bradley et al. 2016. Ibid.

Berner et al. 2017[107] (Figure 4) reports that the tree mortality is highest in Oregon among the 11 western states with timber harvest causing 83% of tree mortality, with bark beetles and wildfire causing substantially less mortality at 9% and 8%, respectively.

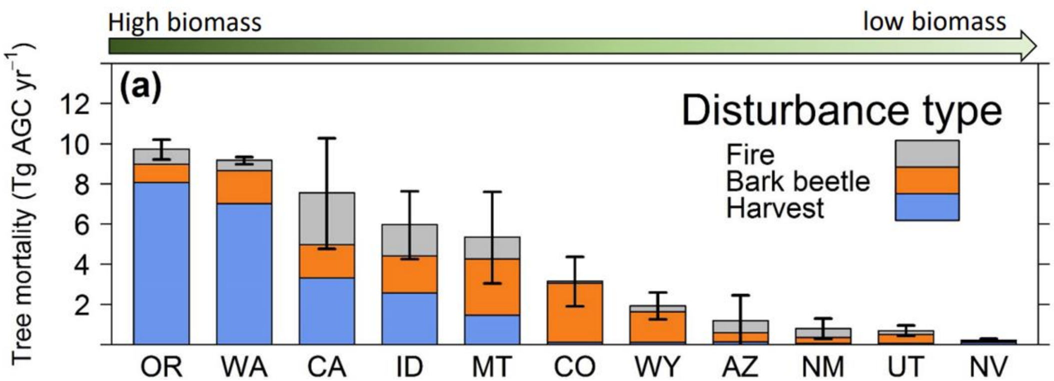

Figure 4. Mean annual tree mortality from fires, bark beetles, and timber harvest on forestland from 2003–2012 for each state in the western US. Tree mortality was quantified as the amount of aboveground carbon (AGC) stored in tree biomass killed by disturbance (Berner et al. 2017)[108].

Despite the increasing amount of large, high severity fires, they have been part of history during previous warm and dry weather cycles. Keeley and Syphard (2021)[109] studied large fires in a historical context by examining records of large fire events in California back to as early as 1860. They note that drought is commonly associated with large fire events. Despite the large fires in recent years, they found that "*there have been other periods with even greater numbers of large fires, e.g., 1929 had the second greatest number of large fires. In fact, the 1920's decade stands out as one with many large fires*" …" *Earlier records show fires of similar size in the nineteenth and early twentieth century. Lengthy droughts, as measured by the Palmer Drought Severity Index (PDSI), were associated with the peaks in large fires in both the 1920s and the early twenty first century*". Another example is in 1910, Ed Pulaski became a hero when he saved numerous miners from the "Big Burn", a fire that consumed over three million acres in three different states in 36 hours. In other words, long before the FS declared that overstocked forest stands must be reduced, during hot, dry, windy conditions, large areas of forests already burned with high severity, particularly during drought cycles.

From these analyses, we conclude that the FS is using the threat of wildfire to conduct more and larger areas of timber harvest under the guise of "resiliency" and "restoration". While in some dry site ponderosa pine forests, proximate to communities and structures, thinning and harvest is warranted, the proposed thinning and harvest of large project areas away from towns is unwarranted and will likely have severe impacts on cool, moist forested areas, old growth and large multilayered stands that provide essential services for carbon storage, biodiversity, soil and nutrient cycling and water quality. These harvest strategies add to our climate change woes by adding substantially more carbon emissions.

The FS also uses the paradigm of harvesting low elevation ponderosa pine to achieve "park-like stands" and "increase wildfire resilience". It is scientifically wrong to apply the same strategy to other tree species in the forest, including

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[107] Berner, L.T., B.E. Law, A.J.H. Meddens, and J.A. Hicke. 2017. Tree mortality from fires, bark beetles, and timber harvest during a hot and dry decade in the western United States (2003–2012). Environ. Res. Lett. 12 (2017) 065005. DOI 10.1088/1748-9326/aa6f94.
[108] Berner et al. 2017. Ibid.
[109] Keeley, J.E. and A.D. Syphard. 2021. Large California wildfires: 2020 fires in historical context. Fire Ecology 17:22. https://doi.org/10.1186/s42408-021-00110-7.

larch, lodgepole pine, subalpine fir, Douglas fir, and others, which have longer fire-free intervals and were seldom open and park-like. Some species like lodgepole pine have a shorter life span and rely on wildfire to replace stands and their serotinous cones rely on wildfire to open the cones and reproduce new trees such as the Hash Rock Fire in 2000 on the project area.

Recommendation: Stop the misuse of the claims for overstocked stands to proclaim the need to do intensive forest management including timber harvest and thinning to justify "wildfire resiliency". Investigate and support climate science and research coming from a variety of universities and other learned institutions that support greater forest protections. Focus tree thinning and prescribed fire near communities.

Climate Change

The climate change and analysis in the Mill Creek project Draft EA is woefully bereft of analysis and data. In fact, no actual analysis of the Project's impacts are provided to the public and the scant discussion relies on national and global scales, rather than a site-specific scale, which of course dilutes the impacts. The Draft EA (p. 232) states that "*The release of carbon associated with this project is justified given the overall change in condition increases forest resistance to release of much greater quantities of carbon from wildfire, drought, insects/disease, or a combination of these disturbance types (Millar et al. 2007)."*

The Draft EA minimizes the impact of climate change while overstating the need to do forest management (also at the expense of streams, water quality, fish and wildlife habitats and soils) in order to protect forests from increasing wildfires from a warming and drying climate. As stated in the previous section on wildfires, future severe wildfires will be climate and wind driven events and no amount of forest management will stop mega wildfire events such as occurred in the Cascade Mountains in September 2020.

There is a huge body of science on climate change and the relationship of forests in the Pacific Northwest and their importance for carbon storage and species biodiversity. Timber harvest in Oregon is the number one emitter of carbon contributing to climate change and is also the greatest cause of tree mortality. This project as designed is flawed and increases greater impacts from climate change and species biodiversity degradation.

In addition, a recent court case in Montana decided in favor of the plaintiffs when the FS failed to consider the impacts of logging large mature trees. In this ruling, U.S. District Court Judge Donald W. Molloy found that the Forest Service failed to consider the climate harms of logging thousands of acres of forest that currently store carbon. The court rejected the Forest Service's argument that the project would have an "infinitesimal" impact on climate change because young trees would eventually replace the carbon being stored in trees the project would cut down. In his ruling, Molloy said "*logging causes immediate carbon losses, while re-sequestration happens slowly over time, time that the planet may not have*." The court stated the following:

> *"In light of the above, the USPS's consideration of the Project's climate impacts fails NEPA in two ways. First, by relying almost entirely on the cookie cutter and boilerplate Project Climate Report to analyze the carbon impact of the project, the USFS did not utilize high quality and accurate information which NEPA requires. See 40 C.F.R § 1500.1. Second, even though the USFS posited that the short-term loss of carbon from logging would be outweighed by the net increase in carbon sequestration resulting from a healthier forest, this assertion is not backed up by a scientific explanation. Rather, the USFS generally concludes that carbon as a result of the Project's activities make up "only a tiny percentage of forest carbon stocks of the Kootenai National Forest, and an infinitesimal amount of total forest carbon stocks of the United States." FS-020743. Under this logic, the USFS could always skirt "hard look" analysis when doing a carbon impacts review by*

breaking up a project into small pieces and comparing them to huge carbon stocks such as those contained within the over two million acres of land in the Kootenai National Forest.

The EA discusses how the USFS plans to ameliorate root disease from a selection of trees in the Project area, which will lead to growth of trees that can store more carbon than diseased trees. See FS-002243 (noting that a purpose and need of the Project is to "[p]romote" root disease-resistant tree species like "western larch, ponderosa pine, and western white pine"). However, like its analysis of the net carbon loss resulting from logging, the EA does not sufficiently provide scientific evidence indicating why this benefit would offset the carbon loss leading to an overall "minor" impact on the environment.

Ultimately, "[greenhouse gas] reduction must happen quickly" and removing carbon from forests in the form of logging, even if the trees are going to grow back, will take decades to centuries to re-sequester. FS-038329. Put more simply, logging causes immediate carbon losses, while re-sequestration happens slowly over time, time that the planet may not have.

While the USFS did address climate change in the EA through the Forest and Project Carbon Plans, merely discussing carbon impacts and concluding that they will be minor does not equate to a "hard look." NEPA requires more than a statement of platitudes, it requires appraisal to the public of the actual impacts of an individual project. With all in agreement that climate change as a result of carbon emissions is an increasingly serious national and global problem, see FS- 020739, the USFS has the responsibility to give the public an accurate picture of what impacts a project may have, no matter how "infinitesimal" they believe they may be. They did not do so here. Accordingly, the agency failed to take a "hard look" at the Project's carbon emissions, violating NEPA."

The ONF essentially conducts the same flawed analysis in the Mill Creek Draft EA as in the above Montana case. By minimizing the analysis to national and global scales and speaking in platitudes about the project, the ONF fails to conduct a meaningful and necessary evaluation of loss of carbon and increase of carbon emissions to the atmosphere.

Today's world has 50% more carbon dioxide in the atmosphere compared to preindustrial levels. As shown above in Figure 1, logging is Oregon's largest source of annual carbon emissions at 35%, while wildfires generally account for 4% of Oregon's total carbon emissions each year. Law and Moomaw (2021)[110] report that the Pacific Northwest contains some of the highest carbon density forests in the world that can store carbon in trees for 800 years or more, and that reducing logging on public lands by half would have huge climate benefits. The authors also found that forests retain the majority of their carbon after wildfires as snags if they are not harvested by "salvage logging."

Law et al. (2021)[111] advocate for the establishment of strategic forest reserves in the 11 western states for assisting with the twin crises of biodiversity and climate change. The researchers at Oregon State University stated that the

[110] Law, B.E., and W. Moomaw. 2021. Keeping trees in the ground where they are already growing is an effective low-tech way to slow climate change. https://theconversation.com/keeping-trees-in-the-ground-where-they-are-already-growing-is-an-effective-low-tech-way-to-slow-climate-change-154618.
[111] Law, B. E., Berner, L. T., Buotte, P. C., Mildrexler, D. J., & Ripple, W. J. 2021. Strategic forest reserves can protect biodiversity in the western United States and mitigate climate change. Communications Earth & Environment. 2:254. https://doi.org/10.1038/s43247-021-00326-0, www.nature.com/commsenv.

U.S. needs to establish new “Strategic Forest Reserves” to protect wildlife and reduce carbon emissions that contribute to climate change. Their maps showed that Western forests would store the most carbon and help the most fish and wildlife species if they were given the same level of protection from logging, grazing, and mining as designated wilderness areas receive. These maps include significant areas of the ONF which should protect more areas from timber harvest to meet President Biden’s 30X30 goal. Every National Forest, particularly in the carbon dense forests of the Pacific Northwest, should support climate change goals which should include more protected lands and less timber harvest.

While the intent of the project is to move toward “resiliency,” research shows that these same forests are critical for combating climate change by moving toward more mature and old growth forests because larger trees store and sequester far more carbon. The project as proposed currently in the Draft EA increases carbon emissions and climate change, reduces biodiversity, and makes the forest less resilient.

Climate change is expected to alter many of the native habitats of fish and wildlife species on forest lands, even for iconic species such as elk and mule deer. Streams and riparian areas will be critically impacted by warmer and drier winters, and by more extreme weather events. Climate change predictions suggest that temperature increases alone will render 2 - 7% of headwater trout habitat in the Pacific Northwest unsuitable by 2030; 5 - 20% by 2060; and 8 - 33% by 2090 (Bisson 2008[112]; Independent Scientific Advisory Board 2007[113]). Climate change, particularly in light of already poor stream conditions on the ONF of high sediment, poor bank stability, low pool frequency, and high summer temperatures may cause native aquatic species to go extinct.

Law (2021)[114] in testimony before Congress stated that “*Forests with medium and high carbon per acre also have medium and high biodiversity, promoting ecosystem resilience to climate change. We are in the midst of an emergency to address both climate change and biodiversity loss (Ripple et al. 2019)[115]. We must consider both forest carbon and biodiversity when determining management strategies in forests. Studies estimate that at least one-third of American wildlife, more than 12,000 species, are at increased risk of extinction, with extinction risk being highest in the largest and smallest vertebrates (Ripple et al. 2017)[116]. Under future climate projections, medium to high carbon density western U.S. forests with relatively low to moderate vulnerability of mortality from fire or drought also have high amounts of critical habitat and high species diversity (Buotte et al. 2020)[117]. If protected, these forests have a strong potential to support biodiversity into the future and to promote ecosystem resilience to a changing climate. These areas are primarily in the Pacific Northwest and northern Rocky Mountains in Idaho and Montana. A recent global study also strongly confirmed the spatial coincidence of areas important for carbon storage and biodiversity protection (Dinerstein et al. 2020)[118].*”

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[112] Bisson, P. 2008. Salmon and Trout in the Pacific Northwest and Climate Change. (June 16, 2008). U.S. Department of Agriculture, Forest Service, Climate Change Resource Center.

[113] Independent Scientific Advisory Board (ISAB). 2007. Climate change impacts on Columbia River Basin fish and wildlife. Northwest Power and Conservation Council. ISAB 2007-2.

[114] Law. B.E. 2021. Wildfire in a warming world: Opportunities to improve community collaboration, climate resilience, and workforce capacity. Statement of Dr. Beverly Law, Professor Emeritus Oregon State University before the U.S. House of Representatives subcommittee on national parks, forests, and public lands. 6 pp.

[115] Ripple, W.J. C. Wolf, T.M. Newsome, P. Barnard, and W.R. Moomaw, and 11,258 Scientist signatories from 153 countries. 2019. World Scientists’ Warning of a Climate Emergency. BioScience • January 2020 / Vol. 70 No. 1.

[116] Ripple WJ, C. Wolf, T.M. Newsome, M. Galetti, M. Alamgir, E. Crist, M.I. Mahmoud, and W.F. Laurance. 2017. World scientists’ warning to humanity: A second notice. BioScience 67: 1026–1028.

[117] Buotte, P. C., B. E. Law, W. J. Ripple, and L.T. Berner. 2020. Carbon sequestration and biodiversity co-benefits of preserving forests in the western United States. Ecological Applications 30(2): e02039. 10.1002/eap.2039.

[118] Dinerstein, E., A. R. Joshi, C. Vynne, A. T. L. Lee, F. Pharand-Deschênes, M. França, S. Fernando, T. Birch, K. Burkart, G. P. Asner, and D. Olson. 2020. A “Global Safety Net” to reverse biodiversity loss and stabilize Earth’s climate. Sci. Adv. 2020; 6: eabb2824.

Recommendation: *Follow the science, that is, the correct and best science and use this to minimize the project's impact on the landscape. The Broads support the science and research stated by numerous scientists that climate change is the main driver for wildfires while current forest management practices (aka timber harvest especially any large mature trees and in RHCAs) of forests is depleting not only carbon storage and sequestration but is a huge emitter and a threat to fish and wildlife species biodiversity which is in crisis right now. We believe the best option for this project is to first, eliminate the project (Alternative 1), or second reduce the scope and scale of the project, stay out of RHCAS, old growth, and other areas that should remain unmanaged, and close roads permanently.*

Conclusion

We believe the ONF has special places that need special consideration for vegetation management projects. The Mill Creek project area is best protected with Alternative 1.

We understand the Forest Service must meet a Congressional mandate for multiple-use and is also trying to reconcile implementing projects to "restore HRV" and "wildfire resiliency". We recommend that you pursue our proposed Great Old Broads for Wilderness, Bitterbrush Broads and Bros Alternative. Our alternative substantially reduces the size and scope of the project, does not reopen roads or develop any temporary roads, substantially closes, and decommissions roads more than what is stated in the Draft EA, stops steep slope logging, protects the undeveloped lands, and restricts timber harvest, thinning and prescribed burning to areas in upland dry site areas largely near WUI, and stays out of RHCAs, and mature and old growth.

Thank you for the opportunity to comment.

Sincerely,

*/Mary Fleischmann/*electronic signature

Great Old Broads for Wilderness
Central Oregon Bitterbrush Broads and Bros
Mary Fleischmann Leader
[redacted]