

January 31, 2024

RE: Region 5 and Region 6; California, Oregon, and Washington; Forest Plan Amendment for Planning and Management of Northwest Forests Within the Range of the Northern Spotted Owl

Introduction:

We would start by asking the agency to be honest about the data and the success of the Northwest Forest Plan (NWFP). We would also ask that the agency acknowledge that this success was largely associated with limitations within the plan placed on agency discretion and restrictions on logging. Yet the justification for this amendment is clearly operating from a false, disingenuous, misleading narrative that is not backed by the agency's own science. Although according to the agency's own analysis, the Northwest Forest Plan (NWFP) is working as intended, (Davis et al. 2015, Davis et al. 2022, Dunham et al 2023) the agency is painting the opposite picture.

It appears that this amendment is intended to eliminate the necessary limits on agency discretion and loosen restrictions on commercial logging (particularly in reserve networks), with the supposed goal of creating forests more resilient to climate change and wildfire effects. Yet, as we will demonstrate in this comment the agency is having the opposite effect with its timber sale program, and already has the ability to manage fuels, although with proper limitations that require ecologically appropriate treatments. Unfortunately for the agency the science simply does not support their position and if changes are needed, they are needed to increase conservation and habitat protection on federal lands.

Our concern is that the Forest Service has long wished to circumvent the NWFP, avoid its restrictions on mature and old forest logging, and increase its "flexibility" to heavily log the very forests the NWFP intends to protect. In fact, the agency has been successfully and repeatedly sued for their attempts to avoid the restrictions of the plan. It is our position, that instead of weakening the NWFP, the current climate crisis is best addressed through additional conservation measures, additional limits on agency discretion, and the protection of all mature and old growth forest remaining on Forest Service lands.

Likewise, the NWFP was intended to be a 100-year plan and has not yet been implemented for 30 years. The agency is intending in this amendment to water down the NWFP, making it ineffective at meeting the plans long-term goals of maintaining and recruiting mature and old growth forest. To eliminate the discretion and restrictions on mature and old-growth logging that allowed the NWFP to be a success is counterproductive, unacceptable and inconsistent with the intent of the plan.

Given the post NWFP developments surrounding the 2012 Northern Spotted Owl Recovery Plan, the 2011 Critical Habitat Ruling, Executive Order #14072, Executive Order #14008, the recently

proposed National Old-Growth Amendment, the existential threat of climate change and the impending biodiversity crisis, a more robust conservation focus is needed and any amendment to the NWFP should be additive, rather than reductive.

To achieve the goals of these plans and Executive Orders and to address the issues of our time, we ask the agency to create a conservation alternative that addresses the issues raised in our comments and implements our recommendations for increased habitat protection, the protection of all mature and old-growth forest, and the expansion of the existing reserve network by both building off existing reserve areas and creating new ones.

We believe a conservation alternative must be considered that;

- i) Protects all mature and old-growth forest over 80 years of age and all trees over 21” diameter in younger stands.
- ii) Prioritizes fuel reduction and fire risk reduction treatments near homes and communities and in heavily altered and highly flammable tree plantations.
- iii) Incorporates the use of managed wildfire into the planning process as well as prescribed fire and cultural burning.
- iv) Designates and expands existing conservation-based land use allocations such as Late Successional Reserve (LSR) forests, Adaptive Management Areas, Botanical Areas, Special Interest Areas, Designated Backcountry Areas, and Riparian Reserves.
- v) Transfers all dry forests to the LSR network, managing them for late successional habitat, which in turn will increase fire and climate resilience.
- vi) Creates new land use allocations and designates them at scale including; National Carbon Reserves in all forests over 80 years of age, Connectivity Corridors in important connectivity habitats and linkages, and Designated Climate Refugia.
- vii) Reduces or eliminates the Probable Sale Quantity (PSQ).
- viii) Protects complex early seral habitat following wildfires and other natural disturbance events
- ix) Maintains and increases Survey and Manage Requirements and the number of sensitive species monitored for.
- x) Expands the restorative benefits of the Aquatic Conservation Strategy by dramatically increasing road closures and obliteration, restricting logging in Riparian Reserves, reintroducing beavers to federal lands, reducing logging on watershed scales, retiring or more heavily regulating federal grazing allotments, prohibiting new road construction (either temporary or permanent), and significantly increasing Riparian Reserve widths to at least three tree heights.

Below are detail comments and recommendations for the upcoming EIS and NWFP revision process:

1) The NWFP is working and proposed amendments will undermine that success

According to agency science, *“Twenty years after implementation of the NWFP in 1994, net changes in the amount of older forests on federal lands managed under the Plan’s guidance have been small (a 2.8 to 2.9 percent decrease). This occurred despite losses from wildfire (4.2 to 5.4 percent), timber harvest (1.2 to 1.3 percent), and insects or other causes (0.7 to 0.9 percent), suggesting that processes of forest succession have compensated for some of these losses.”* They also found that *“Losses from wildfire were about what was expected when the Plan was designed.”*(Davis et al 2015)

Additional research reviewing the results of the NWFP after 25 years of implementation came to similar findings, but mature forest had slightly increased on the scale of the NWFP during the 25-year period. Despite mature and old-growth forest losses from wildfires, natural disturbances and commercial logging, forest succession on the landscape scale had begun recruiting additional old-growth habitat and the plan was working. (Davis. 2022)

This same research found that *“Given that we are only one quarter into a 100-year plan, nothing in these findings suggests that desired outcomes are unattainable over the next 75 years.”* Thus, one must wonder, why is the agency intending to put these gains at risk with less restrictive timber policy. The same paper also found that results *“were consistent with expectations for OGS I 80 abundance, diversity, and connectivity outcomes for this period of time. For OGS I 200, these outcomes were slightly degraded.”* (Davis. 2022).

Scientists also conducted a 25-year review of the NWFP and its impact on watershed conditions, and found *“widespread and incremental improvements.”* The conclusion to this study found that *“Overall, these findings indicate that a quarter century of broad-scale forest recovery combined with targeted forest, road, and stream management under the NWFP have led to actions and observable outcomes that improve watershed condition.”* (Dunham et al . 2023). The same research also found that canopy cover had recovered slightly, large tree density near streams had increased, and forest structure in 80-year-old stands now contained more old-growth characteristics than when the plan was initiated. (Dunham et al. 2023).

The findings of these reviews are well known to the agency, yet in the NOI they claim, *“large, uncharacteristic wildfires have resulted in losses of mature and old growth forests eliminating gains achieved in the first 25 years of implementation of the NWFP.”* The agency’s own research demonstrates that this statement is untrue and shows that losses associated with fire and other natural disturbances are within the range identified in the original NWFP and the succession of mature forests is beginning to compensate for those losses on a landscape scale, just as the plan intended. (Davis. 2022).

Small declines in mature and old-growth habitat were anticipated in the first few decades of the NWFP, but the analysis also expected the restrictions on mature and old forest logging in reserve areas to compensate for those losses over time. Ultimately, if implemented as intended old-growth forests would increase over the 100-year period envisioned in the plan, growing our nations carbon stocks and old-growth forests. Given the changing climate, the continued decline of the northern spotted owl, barred owl invasion, the continued decline of fisheries, and other

impacts not considered in the original NWFP, we believe additional restrictions on logging, as well as additional habitat protections will be needed to meet the NWFP's long-term goals.

We are particularly concerned that the proposed NWFP amendments will undermine these positive developments and alter the trajectory of this currently successful land management plan.

2) Any amendments to the NWFP must comply with and incorporate the goals of President Bidens Executive Orders (EO) #14072 and #14008, as well as the subsequent National Old-Growth Amendment.

It appears that the proposed NWFP amendments and the approach to management proposed is inconsistent with the protection of mature and old-growth forest outlined in EO #14072 and the National Old-Growth Amendment. This policy direction requires the agency to protect and expand mature and old-growth forest habitat for the benefit of climate mitigation, as well as other ecosystem services. Yet, it appears that the NWFP amendment is working in the opposite direction, by proposing to increase timber production, reduce limitations on logging in mature and old-growth stands and dramatically reduce or render meaningless the current NWFP reserve system including LSR forest. We cannot support these proposals and find them altogether inconsistent with President Biden's EO 14072 and the National Old-Growth Amendment.

We are also concerned that reducing habitat protections as proposed is inconsistent with President Biden's EO #14008 supporting the 30X30 initiative. The administration has stated a goal of protecting 30% of the countries land and waters by 2030, and we are concerned that the Forest Service is headed in the opposite direction. The agency aggressively opposes nearly any level of habitat protection that reduces their "flexibility" and discretion. Yet, these protections have been put in place specifically because the agency has historically been unable to behave responsibly and maintain important biological values on the landscape, while also managing for timber and other extractive resources. The problem addressed by protection is the lack of discretion practiced by the agency and its inability to self-impose meaningful restrictions that maintain our environment.

The reality is that without the NWFP the agency would have liquidated or severely damaged all mature and old-growth forests outside Wilderness Areas, National Monuments, Research Natural Areas and Inventoried Roadless Area long ago. Increased discretion to log mature and old-growth forest (particularly in reserve networks) is not consistent with EO #14072, EO #14008, or the National Old-Growth Amendment.

The plan amendments must increase habitat protection on the landscape scale and specifically increase protections for mature and old-growth forest. Any proposal to do otherwise is inconsistent with agency and administration policy and must be corrected. We propose the continued and more stringent protection of all stands over 80 years of age, protecting them

from commercial logging in both dry and wet forest habitats. We also proposed the retention of all trees over 21" diameter, on all land use allocations and in all stand ages.

The goals and objectives of EO 14008 and 14072 promote a climate, forest and public land policy focused on utilizing natural climate solutions, preserving natural habitats, protecting important carbon sinks, and restoring habitat that has been heavily degraded by past and current management practices. We wholeheartedly support these goals, but believe more concrete, durable protections for mature and old-growth forests and/or intact habitats must be enacted through this EIS process.

As demonstrated later in this comment (Appendix A & B) mature and old-growth forests on federal lands are not adequately protected and are regularly targeted for large tree logging, heavy canopy reduction, and habitat degradation. Additionally, protecting these forests is one of the most effective climate mitigation strategies available, with significant societal and conservation benefits (DellaSala et al., 2022., Birdsey et al., 2023., Law et al., 2018).

3) The distinction between moist or dry forest is arbitrary, capricious, simplistic and inconsistent with the existing environmental conditions on the ground.

The agency has distinguished arbitrary definitions of moist and dry forest that are simplistic and inconsistent with the existing conditions on the ground, yet significantly influence management actions. In reality, many forests are not quite wet and not quite dry, depending on slope position, exposure, hydrology, geologic conditions, microclimate conditions, and localized weather patterns. Forests make transitions, and West side forests, especially at the southern end of the NWFP planning area can include a diverse and fine grained mosaic of moist and dry plant communities jumbled together and growing adjacent to each other.

Converting naturally moist forest habitats to "dry" forest standards, even if spatially small or jumbled up with other forest associations is not restoration, does not represent responsible forestry and will not reduce fire risks. Additionally, it will badly damage northern spotted owl habitat because these moist forest associations within the dryer forests to the south are the most likely to persist, most likely to develop the layered canopy necessary for northern spotted owl nesting, roosting and foraging habitat, and are most likely to store large quantities of carbon on this landscape.

To degrade these conditions and treat these areas as if they were dry forests would reduce or eliminate the older, more resilient moist forest characteristic, reduce climate refugia and reduce connectivity on the landscape scale. By removing canopy cover, reducing structural complexity, reducing future snag and downed wood recruitment, eliminating layering, and converting these moist stands to open "dry" forest treatment standards much will be lost, including some of the best northern spotted owl habitat in the region and some of the most diverse conifer forests in the world.

In the Klamath-Siskiyou Mountain we routinely see moist or transitional forests identified as “dry” despite receiving over 50” of rain per year or more, and being dominated by Douglas fir, incense cedar, and at times, even Port Orford cedar plant associations. Stands with western azalea, western rhododendron, salal, vine maple and other cool, moist or coastal understory species are often defined as “dry forest”, making the distinction meaningless.

Additionally, many transitional habitats can be found where these plant associations merge with sugar pine, ponderosa pine and mixed hardwood habitats include madrone, chinquapin, live oak, and deciduous oak species. These transitional habitat are neither moist or dry, but share characteristics of both. They are something in between, but will be forced into a box under the proposed NWFP amendment and if deemed “dry” heavily logged.

In southwestern Oregon and northwestern California forests are far too diverse to correctly map and describe at the scale proposed. The region’s mosaic of moist, dry and/or transitional forests, especially at the coarse scale of the NWFP is just not well captured and therefore will not be managed for. Future amendments and NEPA planning must reflect this diversity and the transitional nature of many forest habitats. Many of the federal forests in southwestern Oregon and northwestern California simply don’t fit in either category. To state the obvious, there are more than two kinds of forests in western Oregon, western Washington and northwestern California.

Forcing our forests into essentially two structural conditions and simplifying the compositional make up of these stands will have lasting and currently unanalyzed impacts on watersheds, fire risks, climate refugia, connectivity, biodiversity, forest resilience, spotted owl habitat, and scenic values. We suggest that such black and white characterizations of Pacific Northwest forests is simplistic and unhelpful. Yes, both dry and moist forests existing in the area, but so do dozens of important habitats and plant communities including a myriad of variations among them. The moist and dry distinction, on the scale being analyzed is being given far too much weight in this process and will so heavily influence management that inaccurate designations will lead to extensive long-lasting impacts and heavy commercial logging in “dry” forest stands.

We believe it is more important to mandate the protection of carbon rich trees and forests, manage for older age classes, forest complexity, and late successional characteristics. These conditions are more beneficial for watersheds, wildlife, fire resilience, carbon storage, climate refugia, connectivity and climate mitigation. By coupling these protections with a program that encourages managed wildfire, cultural and prescribed fire, fire risks would be reduced over time. Biodiversity would increase, carbon would be stored on the landscape, and the areas northern spotted owl habitat could be maintained. The EIS must analyze these issues and identify a conservation alternative that protects old trees and forests wherever they might occur.

- 4) Probable sale quantity must be reduced or eliminated to be sustainably managed with other multiple use objectives including biological values, wildlife values, fisheries, recreational values, cultural values, etc.**

While the original Probable Sale Quantity (PSQ) for the NWFP was set at an unsustainable 1.2 billion board feet that level of harvest was quickly re-evaluated and never fully implemented. This is largely because the agency cannot sustain this level of harvest while also sustaining other important multiple use values including biological values, wildlife values, fisheries, recreational values, cultural values and other uses. For decades the old-growth was liquidated at the expense of these values and a balanced multiple use management agenda must now be implemented that sustains and in fact prioritizes the need to maintain other ecosystem values.

The level of harvest originally proposed was also never implemented because it was not and still is not socially acceptable. Many of the communities around the West transitioned away from an unsustainable timber economy and are instead now focusing on ecosystem services, quality of life, recreation, tourism, agriculture, etc. These communities have culturally and economically moved on and are now investing in the attributes of their region that bring visitors, businesses and jobs to the region. In many cases, these attributes are impacted, not enhanced by a more robust public land logging sector. Especially after all the automation in the timber industry, these economic drivers provide more jobs, a more sustainable future for these communities, a higher quality of life, a healthier environment, and a far stronger conservation and stewardship ethic with far fewer biological and climate related impacts.

In many communities weakening the NWFP and its conservation-based protections will also weaken our economy and undermine the investments these communities have made to build a sustainable future. Fishing guides, bed and breakfasts, Air B'n'B's, farm stays, farms, vineyards, wineries, backcountry guide services, hunting guides services, rafting services, outdoor recreational businesses, amenities based businesses, hospitality, food services, brew pubs, etc would all be impacted if public land logging was increased and the protections in the NWFP were minimized. After decades of adjusting culturally and economically, a transition back to heavy industrial logging on public lands would do much more harm than good to many rural communities, as well as the urban communities that are gateways to them.

At the same time, climate conditions are changing and the importance of intact forests as carbon sinks and climate refugia is much better understood than in 1994 when the Forest Plan was developed. From this perspective it is undeniable that we have and will benefit greatly from the fact that the PSQ was never fully implemented. Additionally, for these very reasons, the PSQ should be reduced or eliminated. Allowing land managers to implement commercial treatments if and when biologically necessary and scientifically justified, rather than to meet arbitrary and unsustainable timber targets.

5) Proposed Plan Amendments will bring back the timber wars and destabilize our communities.

Our organizations and the communities we represent in southwestern Oregon and northwestern California have long been at the frontlines in the struggle to protect old-growth forests on federal lands. As rural organizations operating in southwestern Oregon and northern

California many of our staff and supporters lived through the “timber wars” of the 1990s and our communities are only now starting to fully heal. In the 1990s, the loss of ecosystem services associated with old forest logging and the cultural conflict it triggered shattered our communities, which have been mended by the approval and implementation of the NWFP.

Rather than destabilizing many communities, the reduction in unsustainable logging practices on federal lands allowed these communities to find other, more sustainable options. As described earlier the NWFP played a significant role in allowing our communities to transition from an unsustainable logging economy based on mature and old-growth timber, to one based on recreation, restoration, amenities, quality of life, etc. It is heart breaking to see our communities go through the social/political/economic turmoil of the “timber wars,” make the difficult, but necessary economic transition and now be thrown back into this polarizing conflict by proposed plan amendments. Many of our communities have moved on, yet the Forest Service seems stuck in the past and is focused on timber production as the main economic driver.

For many communities surrounding National Forest land public land, logging is a hinderance to the economy and emerging economic sectors. An increase in logging on public lands, in NWFP reserves, mature and old-growth forests will be welcoming the protest, the litigation, the road blockades, the social turmoil, and animosity of the timber wars, back into our communities. We have moved on and are shaping a new economy, please don’t pull us back into a polarizing past. Help us build this more sustainable future based on recreation, scenery, and in places non-commercial, process based restoration.

The proposed plan amendments will bring back the timber wars back to many rural communities, by loosening restrictions on old-growth logging, weakening reserve networks and once again opening up significant loopholes that will lead to controversial mature and old-growth logging projects. Socially and politically, it will create the same problems as the past, destabilizing our communities and economies all over again. There is no need for increased timber harvest from a biological perspective, and if the agency would more significantly invest in recreation, many communities would prosper. The EIS must consider the areas real economic drivers, the outdoor recreation economy, the economic value of spectacular public land scenery, and the quality of life this approach leads to. It must also be very careful not to reopen the wounds and the conflict of the timber wars. No one benefits from another social/political conflict at that scale.

6) Sideboards are needed to protect mature and old growth forests and trees and carbon storage.

Information provided in this comment demonstrates that mature and old forest logging on federal lands remains a significant impact to our nation’s forests and climate resilience. These forests are disproportionately important in both storing and accumulating carbon and mitigating the impact of climate change. Yet, nearly every federal land vegetation management project or timber sale our organizations have tracked in the last 20-30 years have included a significant

mature and old-growth forest component, and these activities are both degrading and diminishing mature and old-growth forest habitat on federal lands. These projects are also often implemented or proposed under the guise of fuel reduction, forest restoration or fire resiliency, yet often have the opposite effects.

Although the current status quo includes the routine targeting of relatively intact old forests and large, old trees for logging in almost every federal timber sale. The current climate and biodiversity crisis necessitates a new, more responsible approach that protects and preserves carbon storage and climate refugia on federal forest lands. This approach is outlined in Birdsey 2023 using a regionally adjusted stand age and diameter threshold. These metrics for retention are easily identified, tracked and monitored on the ground, allowing for realistic and effective implementation in a wide variety of forest types (Birdsey. 2023).

We believe, based on years of experience monitoring federal land timber sales and reviewing the best available science, that the best way to protect stored carbon, maintain climate refugia, support resilience and preserve large, old trees is to designate age and diameter limits for commercial logging on all federal lands, and to protect National Carbon Reserves where logging will not take place. Only this approach of protection, coupled with strong sideboards for all vegetation management projects will preserve and restore carbon rich forest habitats on federal lands. Although the agency goes out of its way in environmental analysis documents leading to this Notice of Intent to avoid using the term logging, it is board footage requirements under the Probable Sale Quantity (ASQ) that are driving forest management practices on Forest Service lands. This near singular focus on timber production is a significant contributing factor to our overall carbon emissions, biodiversity loss, and habitat degradation. It is also one of the most contentious social issues on public lands.

All forest management projects on Forest Service lands with a commercial logging component including those called restoration, fuel reduction or forest resiliency projects must include robust, science-based sideboards protecting mature and old-growth forests and trees with a regionally adjusted stand age and diameter threshold. This should be codified in every Forest Plan maintaining and protecting stands over 80 years of age as National Carbon Reserves, while retaining all trees over 21" DBH in younger stands as a minimum standard.

7) Carbon emissions and habitat destruction associated with commercial logging are far more significant than those from natural disturbance processes, including wildfire, insects and wind combined.

Mature and old-growth forests and the large trees within these forest habitats play an outsized role in both storing and accumulating atmospheric carbon (DellaSala., 2022, Stephenson et al., 2014, Mildrexler et al., 2020). Protecting mature and old-growth forests and trees can help to mitigate old forest loss and can facilitate the maturation of mid-size trees and mid-successional forest into large diameter classes and more mature successional stages. (Moomaw et al. 2019) 2019These values are important from a climate, habitat and watershed perspective. At the

same time logging these stands can create a significant and long lasting “carbon debt” that takes decades or centuries to restore or “repay” (Moomaw et al. 2019; Law et al., 2022).

Research demonstrates that national and regional estimates of emissions associated with commercial logging are 5-10% greater than emissions from natural disturbance processes, including wildfire, insects, and wind combined (Harris et al., 2016., Law et al., 2018). In fact, research in Oregon demonstrates that the logging and forest products industry is the single largest source of emissions in the state, constituting an incredible 39% of the states total emissions (Law et al. 2018). Protecting mature and old growth forests is extremely important because even when threatened by natural disturbances associated with climate change there is substantial evidence that old-growth forests can continue to maintain or increase carbon stocks if adequately protected (Stephenson et al., 2014, Law et al., 2018., Lesmeister et al., 2021). This is partially because significant carbon remains in standing snags even after high severity wildfires and other natural disturbance events. In most cases carbon is simply transferred from live vegetation to dead standing material where it can be stored for long periods of time (Stenzel et al., 2019., DellaSala. 2020.). It is also because mature and old forests are the most resilient habitats on the landscape with significant natural fire resistance.

The NWFP amendments must work to maximize carbon storage on federal lands as a natural climate solution. This must also include protections for all mature and old-growth forests and trees remaining on federal lands including Forest Service lands. This objective can be achieved by following the approach identified in recent research using regionally adjusted stand age and diameter thresholds.

This approach would protect between 36% and 68% of total carbon in all trees in a representative selection of 11 National Forests. Carbon accumulation of live above-ground biomass from mature stands and large trees was also 12%-60% of the total accumulation in all trees. (Birdsey et al., 2023). At the tree level, the largest trees in old-growth forests may represent just 1% of all stems yet store at least 40% of the above-ground carbon (Stephenson et al. 2014., Lutz et al., 2018., Mildrexler et al., 2020). Likewise, recent research found that the carbon stocks for large trees in mature stands accounted for between 41% and 84% of total carbon storage, while total carbon accumulation from large trees in mature stands accounted for between 53% and 71% (Birdsey et al., 2023).

Additional research on National Forest lands in dry forests of eastern Oregon demonstrated that large trees over 21” diameter made up only 3% of the trees in the forest, but stored 42% of the above ground carbon (Mildrexler et al., 2020). These studies demonstrate the importance of large trees and mature forests in both storing and accumulating carbon, and mitigating climate change.

At the stand level, old-growth forests store 35% to 70% more carbon, including in soils, when compared to logged stands (Keith et al., 2009; Mackey et al., 2014; Mayer et al. 2020). Old-growth forest stands may also act as a natural buffer against extreme climate conditions (De Frenne et al., 2013; DellaSala et al., 2015; Frey et al., 2016; Betts et al., 2017, Xu et al., 2022). At

the watershed level, old-growth forests maintain hydrological cycles (Perry and Jones., 2016; Crampe et al., 2021), while in the Pacific Northwest, old-growth forests may function as fire refugia in large wildfire complexes (Lesmeister et al., 2019).

Additionally recent research demonstrates that timber harvest is by far the largest contributor to tree mortality in the West, with timber harvest in Oregon and Washington being the single largest source in all 11 states. (Berner.2017) Other papers have shown that cumulative mortality following timber harvest and wildfire, is higher in thinned stand than in stands subject to only wildfire (Hanson 2022, Baker. 2022).

Maintaining ecological integrity and managing federal lands consistent with EO 14008 and 14072 requires the agency to protect all existing mature and old-growth forests and trees, while restoring plantations stands and young forests heavily altered by previous logging activities. This creates a true national carbon/climate strategy, using the most effective natural solution we have; mature and old-growth forests. We recommend allowing mature stands to develop through natural process into old-growth forests, maintaining existing old-growth forests by committing to not logging them, and managing young stands (less than 80 years) to more quickly develop mature and late successional characteristics. All stands over 80 should be protected from logging and all trees over 21" DBH should be retained.

8) Increase the use of conservation-based land use allocations to achieve climate and biodiversity goal, as well as 30X30 goals on public lands.

Scientist across the planet are recommending bold action to face the ecological threats of our time. To be successful, this action must include increased habitat protections through the use of conservation-based land use allocations including increased protections for expanded Inventoried Roadless Areas including recommending them to congress for Wilderness Designation, the designating of new or additional Botanical Areas, Research Natural Areas, Special Interest Areas, Backcountry Areas, Connectivity Corridors and National Carbon Reserves intended to store carbon in natural ecosystems and mitigate climate change. A significant increase in all these land use allocations is required to address the climate and biodiversity crisis and is consistent with President Biden's recent Executive Orders 14008 and 14072. These designations can also be used to protect mature and old-growth forests under the National Old-Growth Amendment. Upcoming Forest Plans should require an increase in existing conservation-based land use allocations and the designation of new allocations such as National Carbon Reserves and Connectivity Corridors on Forest Service lands. Protecting mature, old-growth, and primary forests, as well as new Wilderness Areas, Botanical Areas, Research Natural Areas should be a top priority in upcoming management plans and could be supported by a strong conservation stance in this NWFP amendment.

9) National Carbon Reserves should be designated and protected in all mature and old-growth forests.

All mature and old-growth forests identified in the recent federal inventory should be protected as National Carbon Reserves. These areas should be protected from the impact of federal land logging activities and managed to maximize carbon storage by encouraging more mature, late successional and old-growth forest habitats or characteristics. Logging including the types of commercial thinning often implemented on Forest Service land, releases far more carbon than natural disturbance processes such as drought, bark beetle mortality or wildfire effects and logging also produces far more cumulative mortality in the 11 Western states (Berner. 2017).

President Bidens recent Executive Order on forests directs the agency to protect mature and old-growth forests habitats and maximize carbon storage in natural forest environments as a climate solution. Implementing this policy direction requires protecting mature and old-growth forests from commercial logging in National Carbon Reserves.

By protecting both mature and old-growth forests, currently mature forests will be allowed to grow into complex late successional or old-growth habitats, facilitating the recruitment of additional old-growth forests overtime (Moomaw. 2019). It has also been proven that mature, late successional and old-growth forests are far more resilient to wildfire and climate effects than managed forest allowing them to be more persistent despite climate impacts (Bradley. 2016., Lesmeister. 2019., Zald. 2018., Lesmeister. 2021).

Additionally, research has shown that far more acreage and northern spotted owl habitat is degraded under the current active management strategy than is affected by wildfire effects (Odion.2014). Researchers have shown that over a 20 year period in 11 western states only 2-4.2% of fuel treatments were likely to encounter a moderate to high severity fire (Rhodes & Baker. 2008). Other researchers have also shown that less than 1% of fuel treatments coincide with wildfire each year and only 10-20% will encounter wildfire while still effective due to regrowth and the establishment of woody vegetation (Schoenaggel. 2017 & Barnett. 2016). Finally, research in the southern Cascade Mountains and in other regions has shown that commercial thinning creates higher levels of tree mortality within treated units than wildfire alone. (Hanson. 2022., Baker. 2022)

Designating National Carbon Reserves would far more effectively mitigate climate change and store carbon than actively managing these lands for timber production or “restoration” forestry. It would also have additional benefits to watersheds, water quality, habitat values, biodiversity, habitat connectivity and the maintenance of climate refugia. This may be the single most important contribution the Forest Service could make towards mitigating climate change and serving the public interest. We strongly encourage you to protect and designate all mature and old-growth forests as National Carbon Reserves in the upcoming Forest Plans and exclude these habitats from commercial timber production. Efforts should be made to protect all forests over 80 years of age on National Forest land as National Carbon Reserves.

10) Research Natural Area (RNA) designations should be increased on Forest Service lands

Research Natural Areas should be used to protect intact habitats throughout the Forest Service landbase and utilized to protect intact native environments as an environmental baseline from which climate change and its impact on native ecosystems can be researched. RNAs should also be sufficiently large to allow for natural processes and a wide diversity of habitats. Research Natural Areas should be designated in high quality representations of common native ecosystems and in unique or rare plant communities or wildlife habitats with rare or threatened species or in unroaded areas between 1,500 and 5,000 acres in size.

New Research Natural Areas could be designated as additions to existing RNA's, as stand alone RNA's or overlapping other designations such as Connectivity Corridors, National Carbon Reserves, Botanical Areas and other Special Interest Areas. Maintaining existing RNAs and designating a significant expansion to the RNA network should be a priority in the NWFP Amendment. This would protect old forests, maintain natural resilience, support biodiversity, and provide an outdoor classroom from which scientist could conduct ecological research in relatively intact habitats.

11) Botanical Area (BA) designations should be increased on Forest Service lands

The NWFP is in many ways focused on forests, but it also addresses biodiversity and implemented the Survey and Manage protocol for rare plant and non-vascular species. Building off that foundation, NWFP amendments should be designated to protect high value plant communities, unique habitats, rare plant species, and unusual plant associations. Existing Botanical Areas protect important areas but are often not adequately managed for the protection botanical resources or were designated in small areas that could benefit from significant expansion. Given the dramatic declines in biodiversity associated with climate change, industrial impacts, noxious weed spread, inappropriate motorized recreation and public land grazing, these lands are under threat despite previous Botanical Area designations.

Expansion of existing Botanical Areas and future additions to the Botanical Area network are necessary to maintain biodiversity and rare species. In many cases, like on the Rogue River-Siskiyou National Forest and Klamath National Forest, Botanical Area Management Plans were never established as proposed in the original Forest Plan and designation process. Currently, stronger protections and the establishment of the mandated Botanical Area Management Plans defining how these botanical resources will be preserved and protected are necessary on most National Forests.

In addition, funding is needed to provide the botanical research, protection and enforcement measures necessary to adequately protect botanical areas from inappropriate impacts or to better understand these diverse, unique and rare plant communities. Funding could be included for cattle exclosures, allotment closures, off-road vehicle closures, and stronger regulations to eliminate impacts associated with federal lands logging, road construction and fire suppression impacts. We believe additional emphasis, protection and enforcement is needed to achieve the stated objectives of existing Botanical Areas.

We also support the protection of additional Botanical Areas across National Forest lands to help mitigate the biodiversity crisis and more comprehensively protect intact, rare, uncommon, or unique plant communities. The designation of new Botanical Areas could start with a public nomination process during Forest Plan comment periods, but could be strengthened by requiring new Botanical Areas in the NWFP revisions.

The agency could also start by designating all previous candidate Botanical Areas for designation and eliminating any non-compatible uses. Maintaining existing Botanical Areas, expanding them, strengthening them and designating new Botanical Areas should be a priority in all upcoming Forest Plans. This management direction should be documented in the NWFP amendments.

12) Special Interest Area designations should be increased on Forest Service lands including the designation and protection of high value Connectivity Corridors & Climate Refugia

The increased designation of Special Interest Areas in need of special management should be encouraged. Special Interest Areas can be focused on botanical values, like Botanical Areas, geologic values in Geologic Areas and recreational values in other recreation based Special Interest Areas. These designations address specific needs on the landscape and could be utilized to increase designations focused on biodiversity and climate resilience.

In particular, new Special Interest Areas could emphasize the protection of climate refugia and connectivity by designated Connectivity Corridors and Climate Refugia in the NWFP amendment. These corridors and discrete refugia areas should include intact habitats and important habitat linkages providing for the migration and dispersal needs of plant and wildlife species attempting to find habitat under a changing climate. As habitats throughout the country shift and change with our climate, connectivity between habitats will become increasingly important and should, along with forest protection and National Carbon Reserves, be a more prominent portion of our national climate strategy. In addition, climate refugia is vitally important in the maintenance of connectivity, as the climate changes.

Species seeking appropriate habitat conditions may need to shift their ranges to address the new realities including dispersing West and closer to the coast, by moving further north to avoid increasingly extreme climatic events, by moving to higher elevations, and by searching out the climate refugia still remaining on the landscape.

We whole-heartedly support the designation of a large Connectivity Corridors and propose the Siskiyou Crest (on the Rogue River-Siskiyou and Klamath National Forest), as a premier Connectivity Corridor designation in the Pacific Northwest and Northern California. The area connects the Cascade Mountain to the Coast Range and is the only east-west tending transverse range in the Pacific Northwest region. It also includes high quality connectivity habitat linking high elevation subalpine habitats to low elevation valley and foothill communities, allowing for dispersal across the landscape and throughout a wide variety of ecosystems. The protection of

the Siskiyou Crest is a key climate solution with landscape scale implications. It has also been identified as maintaining regionally significant climate refugia habitat (Olson.2012). For these reasons, the region in its entirety (at least on all federal lands) should be designated as one of the premier Connectivity Corridors and Climate Refugia Areas on the West Coast. The Siskiyou Crest and other connectivity pathways and regional climate refugia should be identified and prioritized for protection in the NWFP.

Connectivity Corridors should be used to connect mountain ranges, intact habitats, wilderness areas, and other conservation areas. They should also be sufficiently sized to accommodate natural disturbance processes and to connect broad ecosystems throughout the country. They should be utilized to exclude these areas from habitat stressors which compound climate impacts including commercial logging, road construction, off-road vehicle use, public land grazing, and other anthropogenic impacts. They should also be designed to facilitate species dispersal and migration for both plant and animal species by supporting intact wildlife habitats, plant communities, and unroaded areas.

Climate Refugia could be found within designated Connectivity Corridors or designated as a stand alone habitat. Climate refugia could include, but is not limited to high elevation areas, springs, wetlands, fens, and sphagnum bog habitats, cool moist forest associations, canyon bottoms, north facing slopes and more specific habitats such as disjunct plant populations currently found as range extensions for species more common in another, often cooler or more mesic region. These locations have proven in some cases, over millennia to support conditions that are resilient to climate change. They are also repositories of biodiversity and refugia for species adapted to these more mesic, moist, or snowy conditions. Climate Refugia should be designated, along with larger Connectivity Corridors in all upcoming Forest Plans and the mandate for their designation should be identified in NWFP amendments.

13) Recommend all Inventoried Roadless Areas for Wilderness designation

The maintenance and protection of biodiversity, carbon stocks, habitat connectivity and intact natural habitats could be dramatically increased through the permanent and adequate protection of all Inventoried Roadless Areas (IRAs) on National Forest lands. Utilizing this EIS process, the agency should recommend Wilderness designation for these areas and encourage Congress to approve new Wilderness Areas and expansions to existing Wilderness designations. Putting conservation on equal footing with other multiple use objectives means designating more lands as Wilderness and by extending the most stringent habitat protections to the most intact lands remaining on public lands.

Although these formal recommendations do not actually protect these lands as wilderness, the existing IRA protections and official Forest Service recommendations for Wilderness designation would prioritize the protection of these lands to meet the 30X30 targets embraced in Executive Order 14008. If the agency is serious about elevating conservation to meet climate, connectivity and biodiversity objectives, additional Wilderness is absolutely necessary.

It is also currently the best assurance and most effective land use allocation at excluding logging, mining, development, new road construction, damaging economic activities, and other habitat stressors that compound the already significant impacts of climate change and best designation for protecting intact, undisturbed wildlife habitats and intact plant communities, Wilderness will also help to maintain habitat connectivity and facilitate undisturbed species migration and dispersal in a changing climate.

Unmanaged lands with intact biological legacies have proven to be effective at buffering habitats from the worst effects of climate change (Lesmeister. 2019), while they have also been shown to support more natural fire regimes (Johnston. 2021), lower burn severity (Bradley et al. 2016), and significant fire refugia (Lesmeister. 2019, Lesmeister. 2021).

All Inventoried Roadless Areas should be reviewed for potential expansion and recommended for Wilderness designation. These recommendations could be formalized administratively by expanding and recommending Inventoried Roadless Areas for Wilderness designation in upcoming Forest Plans. These recommendations should also be formalized by providing stronger administrative protections including Backcountry Area designations for all unroaded lands with wilderness characteristics.

14) Backcountry Areas should be designated and protected on National Forest lands.

All areas maintaining wilderness characteristics on National Forest lands should be inventoried and protected in the upcoming Forest Plans. This should include all Inventoried Roadless Areas, unroaded areas adjacent to Inventoried Roadless Areas or Wilderness Areas, and stand alone unroaded areas that otherwise meet designation criteria. Areas both over 5,000 acres and smaller areas with distinct opportunities for solitude, intact habitats, and wilderness characteristics should also be consider for designation.

These Backcountry designations enacted through Forest Plans should also include recommendations to congress for permanent Wilderness designation. Explicit language in the NWFP could support recommendations for wilderness designation of all IRA's and other unroaded lands.

By designating these areas in a comprehensive Backcountry Non-Motorized Area network the agency would be committing to these areas protection with guidelines similar to the current Roadless Rule. Within each area wildland qualities, biodiversity, and habitat connectivity should be maintained and enhanced through rewilding efforts that include the designation of significant new Backcountry Non-Motorized Areas and the restoration of any non-compatible uses or historic/legacy impacts (e.g road closures or obliteration, structure removal, etc.).

These designations would protect the area's wildland qualities, biodiversity and connectivity habitat, and would set an example from which congress could act. They would also support EO 14008 and the 30X30 Initiative embraced by the Biden Administration. Additionally, these protections would support the goals of Executive Order 14072 and the National Old-Growth Amendment by protecting the most intact, unaltered forest habitat remaining on public lands.

Yet, currently the Inventoried Roadless Area network has failed to adequately identify, designate or acknowledge the actual unroaded acres on the National Forest landscape. Many of the original RARE inventories excluded important roadless areas, or portions of otherwise inventoried wildland habitats. In other locations, roadless or wilderness-like habitats have developed since the RARE process and a combination of road blow outs, rewilding, neglect, and/or road decommissioning has or could expand most Inventoried Roadless Area. These processes could also merge or develop areas that did not maintain these characteristics when the RARE process took place. At any rate, current roadless area inventories underestimate that actual extent of roadless National Forest lands in need of protection.

Areas should be screened using established criteria including naturally appearing, untrammelled landscapes, opportunities for solitude, and the presence of habitats influence largely by natural process. Likewise, additional areas not originally identified should now be considered for Backcountry designation and for recommendation as Wilderness. This would include, but not be limited to smaller areas that could be merged through road decommissioning or deconstruction to create larger wildlands that meet roadless area criteria, all unroaded or intact areas adjacent to currently Inventoried Roadless Areas, and all unroaded or intact areas over 5,000 acres.

Demand for Wilderness is currently extremely high, with many wilderness areas currently subject to permit systems. Due to overuse and the extreme popularity of wilderness recreation in these beautiful regions, use has now been limited to protect the areas environment and the sense of space and solitude Wilderness protects. Expanding our wilderness system and increasing designation Backcountry designations in upcoming Forest Plans will mitigate these impacts, spread recreational use across the landscape and benefit wildlife, biodiversity, and wildland values in some of the last undeveloped and non-industrialized landscapes on federal land.

All unroaded areas down to 5,000 acres should be designated as Backcountry Non-motorized Areas on federal lands. These protections would include significant unlogged, mature and old-growth forest and would contribute in a significant way to the National Old-Growth Forest Amendment. Although the Forest Service cannot designate Wilderness Areas, they can recommend them to congress for Wilderness designation, and they can be designated in the upcomin as Designated Backcountry Areas and manage them to maintain wilderness values.

15) Adaptive Management Area designations should be expanded and enhanced with stronger regulation and more consistent implementation.

The Applegate Valley has been designated an Adaptive Management Area since approval of the NWFP, but has been inconsistently implemented. The designation in the Applegate has been extremely useful in engaging the public and also in promoting more innovative, idiosyncratic forms of forest management. Without the AMA designation it is extremely unlikely that forest managers would participate with the public in a meaningful and collaborative manner. With the AMA such work is mandated and projects benefit greatly from public input.

Adaptive Management Areas should be maintained and enhanced in the upcoming NWFP amendment by removing them from matrix lands and from the PSQ requirements. They should be used to encourage ecosystem management, rather than timber management and be used to demonstrate a more conservation oriented approach, as outline in this comment.

16) The Aquatic Conservation Strategy must be strengthened and key watersheds expanded.

The Aquatic Conservation Strategy is one of the NWFPs most successful provisions, yet must be modernized to compensate for current and ongoing climate impacts. This means strengthen key watershed protections and strengthening the Aquatic Conservation Strategy. We also recommend expanding key watershed designations to additional areas including all fish bearing streams and all headwater streams.

Additionally, no amendment should reduce the scope, scale, intent, or level of protection provided by the Aquatic Conservation Strategy. If anything, provisions should be tightened to address watershed impacts that are certain to occur in a changing climate and were not fully considered in the original NWFP.

Additionally, the NWFP amendment should clearly identify policies directing National Forest managers to promptly and effectively address legacy sediment sources and fish passage concerns across National Forest lands, and particularly in fish bearing streams and key watersheds. If we are to maintain water quality, aquatic species habitat and high-quality riparian habitats, the NWFP must inductive additional habitat protections, stronger protection measures, and a smaller road network.

17) Maintain Survey and Manage

Survey and manage is the cornerstone of biodiversity management in the NWFP and requires the agency to survey and often buffer rare, usual or sensitive species. This includes animals species, plant species, fungi, byrophytes, macroinvertebrate, and other species representing the regions biodiversity. Survey and manage is absolutely necessary in addressing the biodiversity crisis and should be maintained in the NWFP amendments. Not only has the practice of survey and manage protected existing sensitive species populations, but it has also dramatically increased our scientific understanding of these species and of biodiversity in general. Survey and manage protocol should strengthen, not diminished.

Additional species should also be added to the list, which should be updated annually for each National Forest. Disjunct, rare, and endemic species should be prioritized for protection under Survey and Manage protocol and additional protective measures should be considered to address the needs of these species.

18) Protection of complex early seral habitat is necessary

In the years since approval of the NWFP acknowledgement of the value provided by complex early seral habitat has steadily grown. Since natural disturbances such as fire and beetle mortality are natural throughout virtually all Forest Service lands, patches of fire killed, beetle killed, blown down, or otherwise disturbance effected habitats are far more than “devastated” forests, they are forests reborn.

They contain exceptional biodiversity, unique plant assemblages, browse, forage, berries, and abundant food for wildlife species ranging from deer and elk, to black bear and cougar, from song birds, to raptors, to owls. Most wildlife will find forage and/or find cover in the habitat as it rejuvenates young shrubs, trees, and for the first number of years wildflowers like one has never before seen. This creates a pulse of pollen, nectar, and flowering plants for native butterflies and bees, as well as a pulse of insects, snags and cavity habitats for white headed woodpeckers, black-backed woodpeckers. Black bear will roll in the ash, make dens in big burned out trees, gorge on berries and feast on grubs for years to come. Fox, coyote, martens, fishers, and wolverines will find burrows and dens in burned out snags and root cavities.

These burned out snag forests, also provide carbon storage for long periods of time as the snags, slowly fall and decay. Large snags become downed wood which has incredible benefits to soils, mycorrhizal associations, soil carbon, moisture retention and dramatically aids natural forest and woodland regeneration. Biochar is introduced into forest soils on a large scale, replenishing nutrients and storing carbon in very stable forms. This transition from mid to late successional and back to early seral has many biological benefits and for many species of plant, wildlife, fungi, or beetle it represents life, not loss. This stage is part of the cycle and a dynamic, diverse, and beautiful ecosystem in its own right.

These habitats are also important by providing continuity between life stages and maintaining biological legacies that become the foundation for future forest complexity, productivity, and habitat quality. The snags and downed logs are not just dead trees, they are the key to the development of future forest habitats and should be maintained where they exist on the landscape.

Post-disturbance logging should be significantly restricted in all habitats to facilitate natural vegetative recovery and prohibited in LSR forest. Additionally, the massive scale “salvage” logging operations currently being proposed on federal lands under the guise of public safety and roadside hazard logging are absurd unnecessary and enormously environmentally damaging. Proposals coming out include between 200’ and 500’ on the side of roads, often far more than can be credibly described as a roadside hazard and often on the downhill slope with almost no probability of falling in a road. These proposals also include logging along hundreds and even thousands of miles of road without regard for land use allocation including LSR, Riparian Reserve, etc. This practice must stop and a more

18A) The EIS must adequately disclose and analyze both the value of complex early seral habitat and the impact of post-disturbance logging (including artificial reforestation) on forest succession/recovery/productivity

To alter forest succession through post-logging and tree planting is not only unnecessary but also potentially detrimental to the forest's development and regeneration. In a widely respected article on fire management authors recommended the following approach: First and "most critically" they recommend to "*forego those activities that either cause additional damage, or prevent the establishment of native species, ecosystem processes, or plant succession. The avoidance of degradation is far easier than trying to rehabilitate degraded lands.*" (Beschta, 2004). Instead they advocate for the restoration of fire suppression impacts to facilitate natural recovery, including the mitigation/ restoration of fire lines, helispots, road work to reduce sedimentation, replacement of culverts, spike camps, etc.

Other authors and scientists tend to agree that no scientific study to date has substantiated claims that post-fire logging and tree planting promotes a resilient natural recovery of forest associations. On the contrary, post-fire logging tends to degrade soil, vegetation, and aquatic resources and decrease biodiversity, creating simplified plantation stands, not patchy and fire adapted native ecosystems. It does not facilitate forest development or reduce fuels.

Post-fire logging hinders natural regeneration in many ways. It negatively effects nutrient replenishment by damaging, compacting, and eroding soil resources during falling and yarding operations. Post-fire logging can also cause "*onsite impacts to early successional native plant species...where species are nitrogen fixers, (salvage) can significantly affect a major pathway of nutrient replenishment.*" (Beschta, 2004)

Perhaps the most obvious impact of post-fire logging is the removal of large standing snags. These snags and the large downed wood they provide have been identified as "keystone structures" providing habitat, building soil, recycling nutrition, holding moisture, stabilizing soils, harboring regeneration, providing microclimate, and protecting against temperature and climate extremes. (Perry 1997) "*Large dead wood is one of the most obvious structural legacies of a natural disturbance, and a major reason why clearcuts are not the ecological equivalent of natural disturbance.*" (Perry 1997) Post-fire logging will degrade this natural process and the rich post-fire landscape. Post- fire logging on the other hand, is the ecological equivalent of a clearcut and creates essentially the same structural condition, through the same management activities.

In a very informative study following the 1987 Galice Fire in the Siskiyou National Forest, Michael Amaranthus found "*tremendous quantities of water stored in class II and class III logs. Even after 77 days without rain and an intense wildfire,*" the researchers literally wrung water out of downed logs which had 25 times more moisture on a weight basis than did soil samples. 157% for class II and 199% for class III logs compared to 6% stored in the soil. The researcher suggests that this moisture after a fire event "*may help pioneering plants become established where soil moisture is low*". They continue by stating that the "*wood component becomes*

critical when the dry sites are also low in nutrients.” as is much of Forest Service land in the arid West and even in the mountains of the West Coast.

This same research identified the increased presence of feeder roots, ectomycorrhizae associates essential to most woody plants, increased nitrogen availability due to ectomycorrhizae associates, and increased availability of moisture in downed logs. The “wood component provides not only essential soil moisture, and nutrients, but also the means of utilizing them.” In this context downed woody debris is essential for “*seedling growth after clearcutting and intense fire on droughty sites*” and “*a requisite for maintaining long term forest growth.*” The author explains that “*in the Klamath Mountains conifer seedling performance can depend on the ability of the soil to retain moisture and support nitrogen fixing and ectomycorrhizal organisms. Removal of large amounts of organic material may result in difficult reforestation of these thin, droughty, and infertile sites.*” (Amaranthus, 1990)

The loss of large downed wood can be especially critical in the context of a stand replacing disturbance because “*the pulse of large wood after the stand replacing disturbance is all the large wood that the recovering ecosystem is going to get for many decades or even a century...some of the deadwood legacy from the stand replacing disturbance will persist and fulfill important functional roles in the recovering forest from many decades and in the case of the largest and most decay resistant material for well over a century.*” (Franklin. 2009). Obviously, post-fire logging, through the removal of the snag patches and especially the removal of large diameter snags is detrimental to forest diversity, succession, and recovery and should be avoided, especially in LSR forest, complex old stands and landscapes adapted to mixed or high severity fire, which is essentially the entire Forest Service landscape in the West.

Likewise, areas supporting natural succession and natural fire regeneration are important and increasingly rare habitat types contributing significantly to regional biodiversity. This is especially true because “*Relatively few large areas have been allowed to recover without major intervention after fire, limiting availability of “control” areas in ecological research. This is a particularly acute need in low elevation ponderosa pine forests*” (Beschta, 2004, P.9). Much of the forest burned in the West and proposed for post-fire logging is Douglas fir, ponderosa or sugar pine habitat at relatively low elevations and should be allowed to recover naturally.

Professor Jerry Franklin seems to agree stating in his comment on the Biscuit Fire salvage project that “*naturally disturbed habitat that is undergoing slow natural reforestation—without salvage or planting—is the rarest of the forest habitat conditions in the Pacific Northwest. Yet it is increasingly evident from research such as at Mount St. Helens, that such large slowly reforesting disturbed areas are important as hot spots for regional biodiversity.*” (Franklin. 2004).

18B) The EA failed to adequately disclose and analyze the impact of post-fire logging and replanting on fuel loading and future fire severity.

Many studies have also shown that post-fire logging and reforestation (e.g. planting) is associated with increased fire severity and fuel loading by encouraging dense regeneration of even-aged woody fuels and by depositing a pulse of logging slash across the forest floor. The combination Numerous studies have shown that the density and configuration of regenerating vegetation has more influence on future fire severity than any other factor, including downed, fire-killed trees. Additionally, a significant body of science exists to demonstrate that plantations are highly flammable.

A recent literature review of twenty-one separate scientific papers found a link between post-fire logging and replanting treatments and increased fire and fuel risks (J.D. Mclver and L. Starr. 2000). Other researchers found, “there is no scientific evidence that supports the claims that post fire salvage and replanting of conifers reduces the intensity or severity of subsequent fires. On the contrary, post fire salvage logging has been shown to actually increase future fire risks because of the buildup of fine combustible fuels in the short term.” (Strittholt, 2004, P. 6)

A study of post fire logging in Oregon found salvage without slash treatment increased fine fuels by 3-13 tons per hectare (Duncan, 2002). This is highly significant to this project because it is unlikely that the KNF will dispose of logging slash in a timely manner, if at all, following logging operations.

In a study conducted in the Biscuit Fire area researchers found the following key findings: 1) Salvage logging does not reduce reburn potential 2) Severe re-burn is driven by the structure of young vegetation and regeneration not by residual woody material from previous fire (Donato, 2008). The researcher stated that “ *if the management objective is to reduce the risk of high severity reburn, post fire management of deadwood may need to focus on non-merchantable material, which makes up a large portion of residual deadwood and is the most available fuel.*” Yet, with fire killed, old growth logs being sold for literally pennies per thousand board feet, small material will not pay its way off the hill and particularly in older stands is often not a significant stand component.

It is clear to most all fire scientists and firefighting personnel that “heavy logging slash” Fuel Model 13, is the most problematic fuel, with the highest potential fire line intensity. Yet, treating this slash in the post-fire landscape has become increasingly difficult due to the sheer number of acres involved. It has also been shown that treating post fire logging slash can affect plant succession and thus forest regeneration. (Strittholt, 2004 P. 19) Likewise, treating logging slash in recently burned areas can increase erosion. (Strittholt, 2004 P. 26)

After a wildfire, naturally recovering forests slowly build fine fuels allowing for various levels of decomposition and a diversity of wood structures and sizes. Most trees slowly lose fine fuels, such as small diameter branches and needles before falling to the forest floor and becoming “fuel.” When post-fire logging occurs a “pulse input of surface fuels resulting from salvage logging...may increase susceptibility to severe reburns in the early stages of forest development.” (Thompson, 2007). Many studies have shown a correlation between increased fuel loads, post-fire logging and replanting (Donato 2006, Thompson 2007, Lindemayer 2008).

Similar conclusions were found in research conducted during the 1987 Silver Fire in the SNF. This study showed that—the same structure created by post-fire logging and replanting—were much more likely to burn with intensity. 65% of “managed” stands experienced high severity impacts while only 25% of unmanaged stands were similarly impacted. (Perry. 1994, 1995, USDA. 1994) At the Gap Fire After Action Review on the Klamath National Forest, Terry Silverstro for the Fruit Growers Supply Company stated that 58% of plantation stands 1- 10 years old were lost due to fire, 79% of plantations between 11-20 years old were lost, 33% of plantations between 21-30 years old and 31% of plantations over 30 years old were lost. These plantation stands were affected with high severity fire at much higher percentages than the remaining portions of the fire.

One researcher stated that once unmanaged stands were mixed with a patchwork of plantation stands “the potential exists for a self-reinforcing cycle of catastrophic fires.” (Perry, 1995 b) An unpublished study of the Biscuit Fire found that areas salvage logged after the 1987 Silver Fire burned with twice as much high severity fire than in unsalvaged stands (Harma, 2003 P.82).

In a separate review of the Silver Fire salvage, researchers found areas salvage logged burned 16%-61% higher during the Biscuit Fire than in unsalvaged areas. He concluded that “the hypotheses that salvage logging followed by planting reduces burn severity is not supported by the data.” He found this to be true even in stands that were salvage logged and broadcast burned; this is due to the vegetative diversity and small gaps found in naturally recovering forests (Thompson, 2007). A similar conclusion was found by Donato (2006) who determined that residual dead wood does not influence reburn potential as significantly as does the structure of regenerating forest. Thus, even salvage logging with slash disposal disturbs natural recovery, creating dense plantation stands where fuel connectivity and fire severities are unnaturally high.

In the KNF, research into the 1987 fires showed that “plantations were uniformly destroyed with few exceptions...the vast majority suffered complete mortality.” (USDA FS, 1994)

Examination of the spatial pattern created by the 1987 KNF fires showed that tree plantations had twice as much crown fire as unmanaged stands. (Odion 2004) To further support these findings, analysis of the 1994 Dillion Fire on the KNF found plantations burned with more severity than unlogged stands. Plantations also created conditions that encouraged adjacent unlogged stands to burn with high severity and possibly encourage fire spread into areas that may not have otherwise burned (Key, 2000). This finding was evident on the south face of Copper Butte in the Abney Fire. Other authors agree that “*reforestation goals should avoid establishing dense, uncharacteristic, “fully stocked” forests, thereby perpetuating the potential for uncharacteristic fire.*” (Franklin and , 2009 P.68) Weatherspoon and Skinner came to similar conclusions in their study of the 1987 Hayfork Fires (Weatherspoon and Skinner, 1996).

These scientific studies were conducted in ecosystems representative of National Forests throughout the west. Although just a small sample of the research showing the problems with post fire logging, they’re combined findings prove that post-fire logging generally leads to

increased fire and fuel risks, creating higher fire severity in future fire events. Post-fire logging tends to increase fine fuels through the creation of activity slash, by altering forest succession, and hindering natural recovery. Tree planting creates simplified plantation stands with excessive fuel loads and fuel connectivity. The practice encourages high severity fire effects. To claim post-fire logging will reduce future fuel risks and wildfire severity in the project area is unsubstantiated, unfounded, and contrary to the best available science.

Yet, rather than acknowledge the science and the value of complex early seral habitat following fire, beetle outbreaks and other disturbance events the agency has continued to undermine the entire LSR network with post-disturbance logging (including living or “green” tree removal) that reduces habitat complexity for decades to centuries going forward and regenerates biologically simplified plantation stands that represent the region’s most acute fire risks. The retention of complex, early seral habitat should be prioritized in the NWFP Amendments. Post-fire logging should be significantly restricted to include only valid roadside hazard logging no more than 1.5 tree lengths on the uphill slope. Decisions should be made on a tree by tree basis and retained if they do not pose a risk to the road or public use on the road. Post-fire logging simplifies early successional forest habitats reducing them to plantation-like stands which are incompatible with the management of late successional forest habitats or their development. Amendments in the updated NWFP should restrict all post-fire logging to the narrow exception above for public safety.

19) The pace and scale of northern spotted owl habitat degradation must be dramatically reduced.

As the northern spotted owl falls towards extinction in its competition for habitat with the barred owl, the Forest Service should not be removing more habitat in commercial logging operations. The limiting factor on some levels remains habitat. Before the barred owl, we needed habitat for existing species to repopulate and recover the species. This was facilitated in the NWFP through restrictions on commercial logging and through the creation of the LSR network. Yet, after the barred owl, the need for dispersal is even more acute as existing northern spotted owl populations shift to compensate.

The Forest Service has responded to declining owl populations the only way it appears to know how. With more logging as the so-called solution, with more intensive logging activities that degrade, downgrade, or remove existing suitable habitats in order to supposedly “develop” future, entirely theoretical habitat. This has led to a dramatic increase in habitat degradation throughout the Klamath-Siskiyou Mountains and likely throughout the northern spotted owls range.

Research conducted by Klamath Forest Alliance demonstrates the level at which habitat removal is occurring. For example, in the Klamath, Six Rivers, Mendocino, Shasta-Trinity, and Rogue-River Siskiyou National Forests, as well as the Medford District BLM the following habitat impacts occurred in just five years, between 2013 and 2018.

- 211 Northern spotted owl “take” permits (the 2012 Recovery Plan estimated that 2,680 northern spotted owl were present in the Klamath-Siskiyou Mountains region, 211 take permits accounts for 8% of the population in just 5 years)
- 5,684 acres of nesting, roosting and foraging habitat (NRF) removed
- 12,408 acres of NRF downgraded
- 10,277 acres of NRF degraded
- 5,104 acres of post-fire foraging 1 (previous NRF habitat) removed
- 2,511 acres of post-fire foraging 2 removed
- 10,263 acres of dispersal habitat removed
- 5,270 acres of dispersal habitat degraded
- A total of 51,517 acres of habitat negatively affected by project activities.

(for more information this research: <https://siskiyoucrest.com/2019/04/15/kfa-report-klamath-siskiyou-northern/>)

This level of impact is unacceptable, is contributing significantly to northern spotted owl declines and habitat deficits, and must be corrected with additional protective measures including the expansion of the LSR network, the protection of all stands over 80 years of age and the retention of all trees over 21” DBH. It must also be addressed with a moratorium on northern spotted owl downgrades and “take permits.

20) The threat of mature and old-growth logging to the health and resilience of Forest Service lands Oregon and the need for additional protections.

We believe the agency must identify meaningful protections for mature and old-growth forests and trees in the NWFP and ensure that policy direction is sufficiently robust to ensure these protections are codified in Forest Plans. The agency must also acknowledge the unsustainable and environmentally damaging nature of their current timber program and the regularity under which mature and old-growth forest is currently logged. Currently, this process has failed to address these scientific and environmental realities and is instead ignoring the contribution of Forest Service timber sales have to old-growth forest loss, climate/carbon cycles, biodiversity loss, and other impacts.

For decades our organizations have monitored federal land timber sales in southwestern Oregon and northwestern California and essentially every commercial logging project on either BLM or Forest Service lands has included a mature and/or old-growth logging component. These logging units have a profoundly negative effect on the health and resilience of Forest Service lands and surrounding areas, they release significant and disproportional levels of carbon into the atmosphere, degrade wildlife habitat, damage native plant communities, often increase fire risks, and have been shown to reduce a stands resilience to climate change, wildfire, beetle outbreaks and noxious weed spread by altering microclimate conditions, encouraging young, dense, even aged growth, by disturbing soils, spreading noxious weeds, and degrading watershed values.

Please see Appendix A at the end of this comment for a list of timber sales either proposed, approved or implemented on Rogue River-Siskiyou and Klamath National Forest lands since 2010. Every one of these timber sales contained or contains a significant mature and old-growth forest logging component, all would or did dramatically reduce canopy cover, significantly increase logging related carbon emissions, damage wildlife habitat, and increase fire risks.

We provide this information to demonstrate that the threat of mature and old forest logging on Forest Service lands is a real, prominent, and avoidable threat. Mature and old forest logging is still the rule on Forest Service lands, not the exception. Where mature and old forests still exist, they are being logged or proposed for logging. The targeting of mature and old growth trees and stands must be addressed with a rulemaking that prohibits these activities and protects our last carbon rich, climate forests.

Additionally in the Applegate River watershed there is a strong correlation between commercial logging on BLM lands (including so-called “restoration” or “forest health” timber sales) and elevated bark beetle mortality during conducive, episodic weather events. This same correlation is now appearing on Forest Service thinning and “restoration” projects including the flagship “restoration” logging project, the Ashland Forest Resiliency Project (AFR) on the Siskiyou Mountains Ranger District, Rogue River Siskiyou National Forest. Please read the following reports for more information and incorporate these reports into this comment by reference:

[Bark Beetles, Timber and the BLM in the Applegate Valley: An Overview of Bark Beetle Science and Land Management on the Medford District BLM](#)

21) Plan Amendments must strengthen and expand, not weaken the LSR network through additional habitat protections

As noted earlier the NWFP is working and largely due to the restriction place on logging and the development of the reserve network. Unfortunately, the threat of extinction for the northern spotted owl is more real than ever and climate change is altering habitat on the landscape scale. Now more than ever LSR forest is needed for all of the northern spotted owls life cycles. Designated specifically for the northern spotted owl, these areas are also intended to protect habitat for a wide variety of species needing late successional habitats. They are also intended to provide connectivity and to help protect watersheds. All are especially important under a changing climate and also provide important climate refugia habitats and stepping stones for species dispersal.

The LSR network should be managed in the NWFP amendments to include all dry forest. All dry forests are best managed for late successional characteristics, which also translates into fire and climate resilience. Provisions to protect stands over 80 years of age are consistent with LSR management and should remain that way. Additionally, retention stands should require retaining all trees over 21” diameter.

22) Federal timber management activities in mature and old-growth forest habitats routinely implement prescriptions that increase fuel loading and reduce stand resilience.

Forests throughout the National Forest system were heavily logged between 1950 and the late 1990s damaging, degrading or eliminating mature and old-growth forest habitats nation-wide. Yet, in most locations, especially in dry forest associations natural stands, not subjected to previous industrial logging are routinely prioritized for logging “treatments.” This is largely because little commercial value remains in previously logged plantation stands and very few could be commercially logged with economic viability. Thus, land managers are increasingly turning to unlogged mature and old-growth stands for timber production and to meet their PSQ.

In these areas, where less intensive commercial logging has occurred fuel loading and fire hazards are significantly less problematic than in the adjacent clearcuts and shelterwood units. Yet, these plantations and logging induced thickets are routinely ignored to focus on timber production from intact habitats and unlogged stands. The logging treatments generally proposed often reduce large trees and old forest canopy that is important in maintaining fire and climate resilience. In fact, the level of dense, young, even-aged, woody vegetation is often directly related to the level of overstory canopy retained in logging treatments. Overstory canopy suppresses understory growth and the heavy fire hazards found in many adjacent over logged stands. When the overstory is removed or significantly reduced (as is proposed in all Forest Service timber sales) fire hazards and woody regeneration proliferates.

The clearcuts and shelterwood units on National Forest lands demonstrate the most altered forest conditions on the landscape, with the least fire resistance or resilience. These conditions are outside the range of variability, while other more natural stands may be somewhat impacted by climate effects or fire suppression impacts, they are often within the range of variability. In many cases natural stands are still developing the large old trees, old snags and large downed wood necessary to meet old-growth criteria, but these characteristics will be more readily developed through passive restoration, purely non-commercial fuel or prescribed fire treatments, and the management of young, plantation stands to better set them on a trajectory towards old-growth or late successional conditions.

Yet, it is in these natural stands, with commercially valuable timber that agency often focuses its “treatments,” not in the more altered and more flammable plantation stands. Despite their highly flammable conditions, the clearcuts and shelterwood units are often not treated in Forest Service thinning projects due to the lack of timber value, while mature and old-growth stands are targeted for commercial thinning that produces substantial timber volume. This demonstrates that these projects are not really about fire hazard reduction, but instead about timber production.

It is also important to note that the Forest Service has tens thousands and thousands of acres of non-commercial fuel reduction and prescribed fire units authorized, but not implemented. The

backlog means that many so-called Vegetation Management Projects end up implementing the timber sale portion of the project with negative implications for fuel and fire management, as well as northern spotted owl habitats and forest resilience, but never fully implement the non-commercial fuel component or prescribed fire component. This is common on Forest Service land across the country.

We demand that Forest Service disclose the number of acres of non-commercial fuel reduction and prescribed fire approved in the past 15 years, but not fully implemented, nation-wide. A number in acres must be provided as part of a valid NEPA analysis and the agency must disclose and consider the previous lack of follow through surrounding non-commercial implementation. Without this analysis and this public disclosure all Forest Service decisions considering the full implementation of non-commercial treatments are faulty, unsupported by recent evidence and invalid.

In reality, many projects are being designed and implemented as a commercial timber sales that will increase fire hazards. They are often designed in this way to meet arbitrary and biologically unjustified PSQ targets and have virtually no other purpose. Although often identified in the Purpose and Need as a secondary priority, it appears loopholes for this sort of logging are being promoted in the NOI, as long as logging for economic purposes is not the “primary purpose.” Our National Forests have a staggering backload of approved, but not implemented fuel reduction and prescribed fire treatments, demonstrating that many approved fuel treatments will likely never occur, but commercial treatments are almost always fully implemented.

Starting in the 1990s and in response to the northern spotted owl injunction and ESA listing, the agency began aggressively thinning conifer forests throughout the West, supposedly to increase forest health and decrease fuel and fire risks. In the past 25 years, commercial thinning has occurred throughout the West and the associated canopy loss has triggered an aggressive understory response, dramatically increasing fuel loads and woody regeneration. Increased solar radiation and exposure to drying winds has also raised ambient air temperatures, reduced relative humidity and reduced fuel moisture content in many previously treated stands during the summer months. This makes these stands more flammable and more likely to sustain high levels of fire induced mortality during wildfire events. In fact, research conducted during the Biscuit Fire demonstrates that commercially thinned stands were almost twice as likely to experience high severity fire effects, than adjacent untreated areas (Raymond. 2005).

Each fire season these stands are drier, hotter, more exposed and sustain higher fuel loading due to historic commercial thinning operations. According to Raymond 2005, this increase in fuel loading can often be attributed to an increase in fine woody material created during commercial thinning operations (Raymond. 2005). Additionally, recent research in northern California shows that thinning operations followed by a large wildfire created more canopy loss and more cumulative mortality than in stands that experience fire alone (Hanson. 2022. & Baker. 2022). The agency fails to consider this cumulative mortality and the relative importance of that mortality when the impact of logging is combined with the effects of regional wildfires or climate change.

Canopy conditions must recover in treated stands before fuel loading and structural conditions will again be within the range of variability. This will take time to recover, and either passive restoration, non-commercial thinning, or prescribed, cultural or managed fire treatments designed specifically to recover historic large tree components and suppress understory growth would be most appropriate. These objectives would be met to a high degree if commercial logging was prohibited in stands over 80 years of age and large tree removal was curtailed with a 21" diameter limit in the arid West and in dry forest associations.

Although the agency often claims "benefits" from commercial logging to forest fuels, fire resilience, and fire risks, these claims are based on faulty analysis, overly optimistic assumptions, and misapplied fire regimes. There is also a lack of monitoring data identifying the long-term results from commercial thinning operations on Forest Service lands, thus these claims cannot be verified. Lacking long-term monitoring data and refusing to see the clearly negative consequences of previous commercial thinning operations, the agency plows ahead, impacting forest health and dramatically reducing fire resilience with each additional timber sale. Yet, as more land within the landscape is commercially "treated" the problem continues to grow.

Researchers have questioned the efficacy of commercial thinning and manual thinning treatments in reducing fire severity (Faison. 2023, Della Sala. 2022). While recent scientific analysis has shown that "most inference about intervention options has been drawn from theory rather than empiricism." (Prober. 2019). In fact, this massive literature review of 473 studies found that the vast majority relied on ecological reasoning, untested theory, and modeling, while only 16% relied on empirical data. (Prober. 2019). The most recent ICCP report also shows that there is almost no evaluation of the success of active management adaptation approaches in the scientific literature (Parmesan. 2022). This demonstrates that the myth of thinning has taken on a religious fervor focused more on faith than empirical evidence. Faith does not satisfy NEPA requirements, does not constitute a valid scientific approach, and does not negate the realities on the ground or the lack of effectiveness for active management strategies. The agency cannot continue relying on dogma, antidotal evidence, and wishful thinking to promote their mature and old-growth logging agenda, especially when these activities are having the opposite of the intended results.

Shrub response:

The drastic canopy reductions proposed in most Forest Service timber sales (to 40% canopy cover or lower) will increase understory and ladder fuel loading by regenerating dense shrubby understory vegetation and young conifers in the years following "treatment." The phenomenon is known as "shrub response" or "understory response" and is associated with canopy thinning, especially in mixed conifer systems with significant shrub and hardwood associates, like those specifically found in southwestern Oregon (Franklin/Johnson. 2009).

Interior forests in West support dry mixed conifer ecosystems with a high potential for shrub response. In both arid and relatively mesic forest conditions, canopy reduction will inevitably induce a significant shrub response. In fact, in their paper titled “Restoration of Federal Forests in the Pacific Northwest: Strategies and Management Implications” Jerry Franklin and Norm Johnson state that *“potential shrub responses to reduction in stand density must be considered. Some dry mixed-conifer plant associations have the potential to develop dense shrubby understories when light and moisture are made available by tree thinning; this is particularly the case in dry forests that exhibit more even-aged and dense structures.”*

Many forests targeted for “treatment” by the agency support more even-aged, dense structure and dry conditions in mature and old-growth stands. The arid site conditions and abundant chaparral and hardwood communities will also contribute to shrub response, which is vigorous after commercial logging operations. The authors continue *“ the potential for developing undesirable levels of understory fuels need to be assessed on a stand-by-stand basis and prescriptions adjusted so as to reduce the risk of undesirable understory responses. Indeed, in some cases it may be desirable to maintain essentially full overstory cover, treating only ladder fuels, and leaving all dominant and co-dominant canopy trees in place rather than risk enhancing ground fuels.”* These recommendations apply to forests across the West, yet were not been adequately addressed. Action alternatives reflecting these recommendations from Johnson/Franklin 2009 to retain canopy and all dominant and co-dominant trees should be incorporated into the proposed action.

There is a direct relationship between canopy reduction and understory shrub response, for example in the Bear Grub EA 2023, published by the Medford District BLM, the agency admits that *“Alternative 2 would create the most open conditions and may result in more rapid regeneration of surface fuels, which may necessitate earlier and more frequent maintenance treatments.”* (DOI. 2020. P. 59).

Understory response is evident and common throughout the West, but maintenance of those fuels is infrequent and inadequate. In fact, nearly every treatment area identified in recent NEPA analysis would create a compromised canopy (previously logged to below 50% canopy cover) and nearly all implemented units are currently undergoing a significant understory response. Dense, young, woody vegetation has developed in every canopy gap, while stands with higher levels of canopy cover and more large trees per acre tend to moderate understory shrub response and maintain lower surface fuel loading, which often contributes to significant fire severity. (Raymond. 2005).

The process is rather simple, increased sunlight and growing space triggers understory shrub and conifer regeneration. Likewise, soil disturbance associated with yarding activity often pierces through the soil surface triggering germination of woody species that in turn, create dense ladder and understory fuel as they mature.

This phenomenon has been noted by numerous recent studies examining fire effects and vegetation patterns in the Siskiyou Mountains. Two recent research articles studying in the

2013 Big Windy Fire and 2013 Douglas Fire in the Siskiyou Mountains, found that more open conditions and more intensive forest management led to accelerated levels of fire severity (Lesmeister. 2019, Zald. 2018). Lesmeister 2019 also cited other region research supporting these important findings, *“On the 2002 Biscuit Fire that burned near our study area, Thompson and Spies (2009) concluded that weather and pre-fire vegetation conditions were the primary determinants of crown damage. They found that forests with small- stature vegetation and areas of open tree canopies and dense shrubs experienced the highest levels of tree crown damage, while older, closed-canopy forests with high levels of large conifer cover were associated with the lowest levels of tree crown damage. The moisture content of air and soil in a forest affects the amount of fuel moisture, and thus the probability of ignition and burning temperature (Heyerdahl et al. 2001).”* (Lesmeister. 2019).

Shrub response tends to significantly increase fuels in the understory beginning roughly 5-10 years after commercial entry. The development of dense understory fuel continues until canopy conditions have recovered and can again suppress understory growth. The result is a significant increase in fuels and fire risk following logging treatments. According to BLM fire/fuel analysis in both the Griffin Halfmoon and Clean Slate Timber Sale heavy canopy reduction can dramatically increase fire risks for 20 years or more. Yet, we find this prediction to be very conservative. Because fire resistance in conifer stands throughout the planning area will take between 80 and 120 years to re-establish at current levels once logging occurs. This is because canopy cover recovers slowly, especially when considering the effects of climate change, it is also because the large, old trees between 80 and 150 years old, take that long or longer to regenerate and start contributing to late successional characteristics, overstory canopy, and the moderation of understory fuel loading.

The Bear Grub EA 2023, also documents that surface fuel loading has a direct and significant relationship with fire severity and intensity. By removing overstory canopy and increasing surface fuel loading through logging treatments, the BLM is encouraging higher rates of spread, bigger flame lengths, hotter fires, and more fire induced mortality when wildfires do burn. According to the EA, *“Surface fire behavior has a direct effect on fire severity, mortality, suppression tactics, and the initiation of crown fire. Rates of spread and flame lengths are key components affecting fire size and resistance to control. Surface fire behavior has a direct effect on fire severity, mortality, suppression tactics, and the initiation of crown fire, lower surface fuel loading produces lower flame lengths”* (DOI. 2020. P. A-94). Thus, the commercial thinning has the potential to produce more significant fire events near residential communities and the treatments proposed as exceptions in the NOI will do the same.

The relatively arid climate throughout much of the West means that stands last thinned over 20 years ago still have not recovered closed canopy conditions and many stands are further deteriorating from accelerated levels of overstory mortality. Stand shock, desiccation, bark beetle infestations and windthrow can all further reduce the overstory canopy in the years following “treatment.” The lack of canopy, also generates an understory response with extreme levels of fuel loading and fuel laddering. Fuel loading will increase until canopy conditions fill in

and reduce the growth of understory vegetation and in the interior West it may take many decades to regrow large trees that suppress understory growth.

Citizen monitoring has documented an aggressive understory response over a broad geographic area and in nearly every timber sale in the Applegate Valley over the last 25 years. Yet, the agency has essentially refused to adequately analyze “understory response”, its influence on understory fuel loading and therefore fire severity in NEPA analysis throughout the valley. The Nedsbar EA claims on page 3- 35 that the live fuel moisture content of understory vegetation offsets the impact of increased density and abundance of understory fuel. They cite an article written by James Agee (1996) that comments on live fuel moisture as a very important potential influence on future fire severity. Yet, the same article also states *“The effect of herb and shrub fuels on fireline intensity is not simply predicted. First of all, more herb and shrub fuels usually imply more open conditions which are associated with lower relative humidity and higher wind speeds. Dead fuels may be drier and the rate of spread may be higher because of the altered microclimate from more closed canopy forest with less understory. Secondly shrub fuels vary significantly in heat content. Waxy or oily shrubs like snowbrush (Ceanothus velutinus) or bearclover (Chamaehotia foliolosa) burn quite hot; others have lower heat contents.”*

In the arid West, less canopy general means dryer microclimates, increased exposure to winds and increased shrubby understory fuels. Many of the shrubby species that regenerate after heavy canopy reduction (below 50%) are extremely flammable and laden with waxes and volatile oils. These species are often highly flammable and would include young incense cedar, doug fir, live oak, manzanita and buckbrush to name a few. This means that if typical species regenerate in the understory following commercial treatments, the impact of live fuel moisture will be overwhelmed by the flammability of the conifer saplings, shrub communities and activity slash.

The following scientific studies have shown a correlation between thinning and understory shrub development:

Wilson et al. 2007, "Density Management and biodiversity in young Douglas-fir forests" Challenges of managing across scales."

Summary: This study found an increase in shrub density at 16 and 30 years following treatment.

Campbell 2008, “Carbon Dynamics of a ponderosa pine plantation following thinning treatment in the northern Sierra Nevada.”

Summary: This study found an increase in shrub cover following thinning treatments. Shrub cover increased from 9% to 32% 3 years after treatment and maintained 22% shrub cover, 16 years after treatment.

Agee 1996, The influence of Forest Structure on Fire Behavior

Summary: Altered microclimates and increased growing space can encourage the development of flammable understory fuel loads, increase wind speeds, dry soils and fuels, while increasing temperatures, all of which can increase fire severity and fire behavior during wildfire events.

Weatherspoon and Skinner 1995, An Assessment of factors associated with damage to tree crowns from the 1987 wildfires in Northern California

Summary: This study found higher levels of fire severity on open sites when compared to closed, canopy forest.

Odion et al. 2004, Patterns of Fire Severity and Forest Conditions in the Western Klamath Mountains

Summary: This paper established a connection between time since fire and fire intensity. The paper found that high levels of canopy cover can suppress understory fuel loading and reduce fire severity.

The agency has failed to adequately analyze the issue of “understory response” and its association with canopy reduction to 50% or lower. On-the-ground monitoring demonstrates that understory response can dramatically affect fuel dynamics. The agency is refusing to thoroughly analyze the impact of canopy reduction and large tree removal on fire severity and fuel loading and by doing so it push false narratives, false solutions, and ineffective management activities. The EIS must consider the influence of understory response in Forest Service logging units and maintain both large trees and canopy cover through regulations that effectively avoid these impacts and promote highly resilient old forest habitats. The current approach is doing the opposite.

For additional information, incorporate the following report by reference in this comment: [Medford District BLM Fire/Fuel Analysis for Timber Sales Authorized Under the 2016 Resource Management Plan for Southwestern Oregon.](#)

Stand drying:

The BLM admits on page 3-35 of the Nedsbar Forest Management Project EA that “*A drier microclimate generally contributes to more severe fire behavior.*” At the same time, the extent of overstory canopy cover is directly proportional to the level and seasonality of stand drying. More open sites are exposed to drying winds, high levels of solar radiation, and high ambient air temperatures, the combined affect is to dry forest stands, reducing fuel moisture, increasing the rate of spread during wildfire events, the potential for spotting, resistance to control and fireline intensity.

Citizen monitoring efforts have documented the increased fire risks associated with overstory canopy reductions, throughout the Applegate Valley. We have document this impact in nearly every watershed and timber sale treated by BLM and Forest Service in the last 25 plus years.

Again, the Nedsbar Forest Management Project EA admits on page 3-35 *“Management of forest stands can result in altered micro climates (Agee 1996). Increasing spacing between the canopies of trees can contribute to increased wind speeds, increased temperatures, drying of topsoil and vegetation, and increased shrub and forb growth (Agee 1996). A more open stand allows more wind and solar radiation resulting in a drier microclimate compared to a closed stand. A drier microclimate generally contributes to more severe fire behavior.”* The BLM and Forest Service often claims project design features will mitigate this concern, but project design will not reduce stand drying if canopies are reduced to 50% canopy cover or below, as so many commercial thinning projects do.

The Bear Grub EA agrees stating, *“Thinning and group selection openings may indirectly increase surface wind gusts. Bigelow and North (2012) found evidence of this, observing moderate increases in average wind gusts in thinned stands (up to 1.5mph) and greater increases in openings (up to 5.6 mph in openings of 2 acres). Openings greater than 2 acres could increase wind speeds to a greater extent, which could result in problematic surface fire behavior.”* (DOI. 2020. P. 57).

Regional research conducted in SW Oregon confirms that stand drying and significant microclimate alteration can increase fire hazards in various ways. Researchers found that *“Thinned forests have more open conditions, which are associated with higher temperatures, lower relative humidity, higher wind speeds, and increasing fire intensity. Furthermore, live and dead fuels in young forest or thinned stands with dense saplings or shrub understory will be drier, making ignition and high heat more likely, and the rate of spread higher because of the relative lack of wind breaks provided by closed canopies with large trees.”* (Lesmeister. 2019).

The issue of stand drying and increased wind speeds combine to make fire weather more volatile and to increase fire behavior. These effects are related directly to canopy cover reductions, which are proposed to include reductions well below 50%. Any stand thinned to below 50% canopy cover will be subjected to a significant increase in fuel loading and fire hazard and these impacts are not being adequately considered in analysis.

Extended Fire Seasons:

Many commercial logging operations and commercial thinning operations have not only increased fuel loading and fire risks, but they are also contributing to an extension of fire seasons duration each year by increasing solar exposure and drying out forest fuels.

Active fire season has been extended through a combination of climate change, logging treatments and canopy reduction. The physical alteration of forest canopies and forest structure has extended fire season by drying of forest stands and forest fuels. The increased exposure

associated with more open forest serves to dry stands and fuels earlier in the season, making them flammable weeks before they would be otherwise. The increased exposure also serves to increase evaporation, limiting the positive effects of rain or overnight RH recovery during the summer fire season. The effect is directly proportional to the level of canopy reduction, with lower levels of canopy creating the most drastic effect.

Early in the fire season, non-forest plant communities and forest with minimal canopy have dried out sufficiently to carry fire, yet closed conifer stands can act as fire breaks due to higher fuel moisture contents. The reason is largely due to shading from forest canopy and the microclimate conditions that canopy cover creates. It can also have to do with the spread of noxious or non-native species, especially exotic annual grasses like medusahead and cheatgrass which often spread in fuel reduction and commercial logging units. These grasses cure out and become flammable long before native vegetation and closed stands with canopy shade and less flashy fine fuels.

When canopy cover is reduced to below 50%, the potential for ignition and spread is higher much earlier in the fire season. Fire behavior will also be increased, with the rate of spread and the potential for spotting being more pronounced in areas with lower canopy cover retention levels and drier fuels. The result of commercial thinning and heavy canopy reduction has already affected fire resilience on the landscape scale, making fires harder to contain and more likely to burn with intensity. This cumulative impact is compounded on the landscape scale as the agency works its way across that landscape logging and increasing fuel hazards. As the percentage of the landscape treated with the current commercial prescriptions increases, fire resilience on the landscape scale will be negatively impacted. Likewise, as previously treated stands are re-entered canopy conditions will be reduced further, compounding already significant impacts to the seasonality and intensity of wildfire affects in our region. Additionally, group selection logging, creates staggered openings that BLM analysis demonstrates will increase fire risks, fire intensity, rate of spread and resistance to control (Ruediger. 2020).

The issue of extending fire seasons, drying forest stands, understory shrub response, increased fuel loading and microclimate alterations that favor uncharacteristic wildfire effects and their clear association with canopy reduction have not been adequately considered or analyzed in NEPA analysis and must be considered when analyzing the National Old-Growth Amendment. Currently treatments assumed to reduce fuel loading and fire risks are having the opposite effect.

Increased fine fuel loading:

Commercial logging can increase fine fuel loading in three major ways, 1) by depositing logging slash and; 2) by regenerating dense, young, highly flammable vegetation (see shrub response above) and 3) by spreading weeds such as cheatgrass which significantly increase fire occurrence and fire spread.

Even after logging slash removal and/or pile burning, commercial logging can dramatically increase the fine fuel loading in affected stands by depositing limbs, tops, and logging slash. Disposing of this logging slash is never fully achieved and an inevitable increase in fine, woody material follows all commercial thinning operations. According to Raymond 2005, this logging slash led to a near doubling of high severity fire when compared to untreated stands (Raymond. 2005). Weatherspoon and Skinner 1995, also found a correlation between fine woody material deposited during logging operations and burn severity (Weatherspoon & Skinner. 1995).

As discussed earlier in this comment, the opening of canopies, the disturbance of soils, and the regeneration of non-native annual grasslands such as cheat grass or medusahead grass in logged areas can also increase fire spread and intensity by generating more flashy, highly flammable fuel in the understory. The dry flashy fuels represented by these non-native annual grasses can burn quickly, spread rapidly to adjacent habitats, generate significant spotting, produce substantial flame lengths, and increase tree mortality.

There is no question that large accumulations or pulses of fine fuel associated with commercial logging, post-fire logging, and canopy removal can increase fire risks. There is also no question that both the deposition of logging slash and the vegetative dynamics following logging operations can affect fire severity and increase the complexity of fire suppression efforts.

23) Prohibition on commercial logging or the logging of large/old trees do not negate appropriate forms of stand maintenance or management including non-commercial treatments, prescribed fire, cultural fire and/or managed wildfire.

All too often the agency acts as though any limitation placed on their commercial timber sale program or their ability to log large old trees will impact their ability to manage for “forest health” and “resilience.” We obviously disagree and see prohibitions on commercial logging as complimentary to fire/fuel management and the maintenance of long-term resilience. Large, old trees are the most fire-resistant portions of the landscape and create microclimate conditions that support that resilience into the future. Mature and old-growth forests often grow complex canopy structures that reduce understory shrub response, maintain cooler, more moist stand conditions, and limit within stand windspeeds during fire events. Numerous papers published using empirical data from actual southwestern Oregon wildfire events have shown that unmanaged, mature and old-growth forests burn at lower fire severity than surrounding managed stands (Zald.2018) and these same forests can create effective fire refugia (Lesmeister. 2021, Lesmeister.2019.).

At the same time, small diameter fuels are the most fire available fuel on the landscape, cure out the fastest, contribute to extreme fire spread, support a high level of spotting, and more often than not, younger stands contain far less variability, more even-aged, low statured fuels and far less resilient stand conditions. We believe it is important to note that commercial timber harvest is not necessary to address wildfire and fuel loading concerns and in many cases, makes these issues worse following so-called “restoration” logging treatments. If commercial logging is prohibited in stands over 80 years of age, these stands would still be available for

non-commercial thinning, prescribed fire, cultural fire and managed wildfire, all of which more directly affect the fuels that actively contribute to fire severity and spread.

24) Barred owl competition and spread was not adequately considered in the NWFP

Since the approval of the NWFP, the barred owl has become the single largest threat to the northern spotted owl and has spread throughout the Pacific Northwest. Competitive pressure from the barred owl now appears the newest impact driving the northern spotted owl towards extinction in large portions of its range. Spreading from north to south northern spotted owl populations have responded with strong declines.

Currently, Fish and Wildlife is proposing lethal control measures for barred owls on a massive scale, as a last-ditch effort to stave off northern spotted owl extinction. Yet, at the same time the Forest Service is actively logging northern spotted owl habitats, leading to degradation, downgrades, and habitat removal, at times to the point of “take”.

The northern spotted owl is currently spiraling towards extinction at an alarming rate. Drastic measures like barred owl removal may be necessary, but if such extreme measures as lethal removal are warranted, so too should be strict habitat protection. If competition for high quality nesting habitat is creating Northern spotted owl declines, then habitats currently supporting nesting, roosting and foraging habitats should be maintained through the protection of all stands over 80 years of age and all trees over 21” DBH. LSR habitats should be expanded and removing additional existing suitable habitat will only increase competitive pressure and northern spotted owl declines. Additionally, with habitat competition becoming more problematic, northern spotted owl will require pathways for dispersal.

Only existing habitats can support northern spotted owls for any portion of their lifecycle. Theoretical habitat, supposedly “developed” through logging treatments is highly uncertain, given a wide variety of factors. Habitat is also needed now, while spotted owl still exists. We cannot crowd it closer and closer to barred owls by continuing to reduce habitat through federal land logging activities. With the species almost extinct throughout much of its range, habitat is needed now, connectivity is needed now, and dispersal corridors are needed now.

The NWFP should implement the stringent habitat protections identified in this comment, prohibit “take” for any reason, and maintain suitable northern spotted owl habitats wherever they exist. LSR networks should also be expanded to ensure that habitat exists for dispersal when barred owl compete with northern spotted owls, and if barred owl removals are effective to provide connectivity that allows for natural dispersal back to habitats no longer occupied by barred owls. Barred owl competition makes northern spotted owl habitat protection a bigger priority than ever before, and barred owl removal does not change that dynamic.

Thank you for the opportunity to comment,

Luke Ruediger, Executive Director
Applegate Siskiyou Alliance
PO Box 114
Jacksonville, Or 97530

Luke Ruediger, Conservation Director
Klamath Forest Alliance
PO Box 1155
Jacksonville, Oregon 97530

Siskiyou Crest Coalition
13617 Highway 238
Jacksonville, Oregon 97530

Wellington Wildlands Council
PO Box 1137
Jacksonville, Oregon 97530

Williams Community Forest Project
PO Box 602
Williams, Oregon 97544

KS Connectivity
PO Box 489
Williams, Oregon 97544

Rural Residents in the Applegate Valley:

Suzie Savoie
PO Box 1155
Jacksonville, Oregon 97530

Marion Hadden
4035 Little Applegate Road
Jacksonville, Oregon 97530

Spencer Lennard
PO Box 489
Williams, Oregon 97544

Liza Crosse
PO Box 1137
Jacksonville, Oregon 97530

John MacKenzie
153 Shamrock Lane
Grants Pass, Oregon

Jane Slama
153 Shamrock Lane
Grants Pass, Oregon

Diana Coogle
9700 Thompson Creek Road
Applegate, Oregon 97530

Jeanette LeTourneux
3355 Humbug Creek Road
Applegate, Oregon 97530

Marty Paule
5198 Sterling Creek Road
Jacksonville, Oregon 97530

Rose Gerstner
5198 Sterling Creek Road
Jacksonville, Oregon 97530

References:

Amaranthus, M. P., D. S. Parrish, and D. A. Perry. 1989. Decaying logs as moisture reservoirs after drought and wildfire. (pp. 191-194) In: E. Alexander (Ed.). Stewardship of soil, air and water resources. Watershed 89. R10-MB-77. USDA Forest Service, Region 10, Juneau, Alaska.

Amaranthus, M. 1990. "Stream shading, summer stream flow and maximum water temperature following intense wildfire in headwaters streams" SNF Wildfire and Recovery Monitoring

Baker, Bryant C., and Chad T. Hanson. 2022 "Cumulative Tree Mortality from Commercial Thinning and a Large Wildfire in the Sierra Nevada, California." *Land* 11.7 (2022): 995.

Barnett K, Parks SA, Miller C, & Naughton HT (2016) Beyond fuel treatment effectiveness: Characterizing Interactions between fire and treatments in the US. *Forests* 7(237):1-12.

Berner. Logan T., Law, Beverly E., Meddens, Arjan J H., Hicke, Jeffrey A. 2017 *Environ. Res. Lett.* 12 065005 <https://doi.org/10.1088/1748-9326/aa6f94>

Bestcha, R. (etal) 2004. "Post Fire Management on Forested Public Lands of the Western United States." *Conservation Biology* Vol. 18 No. 4

Betts, M. G., Phalan, B., Rousseau, J. S., and Yang, Z. (2017). Old-growth forests buffer climate-sensitive bird populations from warming. *Divers. Distrib.* 24, 439–447. doi: 10.1111/ddi.12688

Birdsey RA, DellaSala DA, Walker WS, Gorelik SR, Rose G and Ramírez CE (2023) Assessing carbon stocks and accumulation potential of mature forests and larger trees in U.S. federal lands. *Front. For. Glob. Change* 5:1074508. doi: 10.3389/ffgc.2022.1074508

Crampe, E. A., Segura, C., and Jones, J. A. (2021). Fifty years of runoff response to conversion of old-growth forest to planted forest in the J.J. Andrews Forest, Oregon, USA. *Hydrol. Process.* doi: 10.1002/hyp.14168

Davis etal. 2015 Northwest Forest Plan—The First 20 Years (1994-2013): Status and Trends of Late-Successional and Old-Growth Forests https://www.fs.usda.gov/pnw/pubs/pnw_gtr911.pdf

Davis, Raymond J.; Bell, David M.; Gregory, Matthew J.; Yang, Zhiqiang; Gray, Andrew N.; Healey, Sean P.; Stratton, Andrew E. 2022. Northwest Forest Plan the first 25 years (1994 2018): status and trends of late-successional and old-growth forests. Gen. Tech. Rep. PNW-GTR-1004. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 82 p. <https://www.fs.usda.gov/research/treesearch/65070>

De Frenne, P., Rodríguez-Sánchez, F., Coomes, D. A., Baeten, L., and Verheyen, K. (2013). Microclimate moderates plant responses to macroclimate warming. *Proc. Natl. Acad. Sci. U.S.A.* 110, 18561–18565. doi: 10.1073/pnas.13111 90110

Dellasala, Dominick & Baker, Bryant & Hanson, Chad & Ruediger, Luke & Baker, William. (2022). Have western USA fire suppression and megafire active management approaches become a contemporary Sisyphus?. *Biological Conservation*. 268. 109499. 10.1016/j.biocon.2022.109499. <https://www.sciencedirect.com/science/article/abs/pii/S0006320722000520>

Dunham, Jason; Hirsch, Christine; Gordon, Sean; Flitcroft, Rebecca; Chelgren, Nathan; Snyder, Marcia; Hockman-Wert, David; Reeves, Gordon; Andersen, Heidi; Anderson, Scott; Battaglin, William; Black, Tom; Brown, Jason; Claeson, Shannon; Hay, Lauren; Heaston, Emily; Luce, Charles; Nelson, Nathan; Penn, Colin; Raggon, Mark. 2023. Northwest Forest Plan the first 25 years (1994-2018): watershed condition status and trends. Gen. Tech. Rep. PNW-GTR-1010. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 163 p. <https://www.fs.usda.gov/research/treesearch/66184>

Donato, D.C., Harvey, Brian J., Romme, William H., Simard, Martin, Turner, Monica. 2013, Bark Beetle Effects on Fuel Profiles Across a Range of Stand Structures in Douglas- fir Forests of Greater Yellowstone. *Ecological Applications*, 23 (1), 2013 pp. 3-20

Donato, D.C., Fontaine, J.B., Campbell, J.L., Robinson, W.D., Kauffman, J.B., Law, B.E. 2006. *Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk*. *Science* 311, 352.

Duncan, S. 2002. *Post Fire Logging: Is It Beneficial to a Forest?* Science Findings 47 (Portland, Oregon) United States Forest Service. Pacific Northwest Research Station October 2002

Franklin, Jerry. 2004. *Public Comment: Biscuit Fire Recovery Project*. Comment in response to the DEIS for the Biscuit Fire Recovery Project. January 20, 2004.

Franklin, Jerry. 2015. *Public Comment: Westside Fire Recovery Project*. Comment in response to the DEIS for the Westside Fire Recovery Project. April 6, 2015.

Franklin, J.F., and Johnson, N. 2009. *Restoration of Federal Forests in the Pacific Northwest: Strategies and Management Implications*. August 2009.

Frey, S. J. K., Hadley, A. S., Johnson, S. L., Schulze, M., Jones, J. A., and Betts, M. G. (2016). Spatial models reveal the microclimatic buffering capacity of old-growth forests. *Sci. Adv.* 2016:e1501392. doi: 10.1126/sciadv.1501392

Hanson, Chad T. 2022 "Cumulative severity of thinned and unthinned forests in a large California wildfire." *Land* 11.3 (2022): 373.

Harris, N. L., Hagen, S. C., Saatchi, S. S., Pearson, T. R. H., Woodall, C. W., Domke, G. M., et al. (2016). Attribution of net carbon change by disturbance type across forest lands of the conterminous United States. *Carbon Balance Manag.* 11:24. doi: 10.1186/s13021-016-0066-5

Hudiburg, T.W., B.E. Law, C. Wirth, and S. Luysaert. 2011. Regional carbon dioxide implications of forest bioenergy production. *Nature Climate Change* 1:419-423. <https://doi.org/10.1038/nclimate1264>

Hudiburg, T., S. Luysaert, P.E. Thornton, B.E. Law. 2013. Interactive effects of environmental change and management strategies on regional forest carbon emissions. *Environmental Science & Technology* 47(220):13132-40. Doi: [10.1021/es402903u](https://doi.org/10.1021/es402903u).

Harma, K., Morrison, P. 2003 "Analysis of Vegetation Mortality and Prior Landscape Condition, 2002 Biscuit Fire Complex." Unpublished Report. Pacific Biodiversity Institute. Winthrop, WA.

James D Johnston et al 2021 *Environ. Res. Lett.* 16 084040
<https://iopscience.iop.org/article/10.1088/1748-9326/ac13ee/meta>

Keys, J. 2000. *Effects of Clear-cuts and Site Preparation on Fire Severity, Dillion Creek Fire 1994*. Masters Thesis: Humboldt State University. Arcata, Ca.

Law, B. E., Hudiburg, T. W., Berner, L. T., Kent, J. J., Buotte, P. C., and Harmon, M. (2018). Land use strategies to mitigate climate change in carbon dense temperate forests. *Proc. Nat. Acad. Sci. U.S.A.* 115, 3663–3668. doi: 10.1073/pnas.1720064115

Law, B. E., Berner, L. T., Buotte, P. C., Mildrexler, D. J., and Ripple, W. J. (2021). Strategic forest reserves can protect biodiversity in the western United States and mitigate climate change. *Commun. Earth Environ.* 2:254. doi: 10.1038/s43247-021-00326-0

Law, B. E., Moomaw, W. R., Hudiburg, T. W., Schlesinger, W. H., Sterman, J. D., and Woodwell, G. M. (2022). Creating strategic reserves to protect forest carbon and reduce biodiversity losses in the United States. *Land* 11:721. doi: 10.3390/land11050721

Lesmeister, Damon., Sovern, Stan., Davis, Raymond., Bell, David., Gregory, Matthew., &Vogeler, Jody. 2019. Mixed Severity Wildfire and Habitat of an Old Forest Obligate. *Ecosphere* Vol. 10, Issue 4, April 2019 <https://doi.org/10.1002/ecs2.2696>

Lesmeister, D. B., Davis, R. J., Sovern, S. G., and Yang, Z. (2021). Northern spotted owl nesting forests as fire refugia: A 30-year synthesis of large wildfires. *Fire Ecol.* 17:32.
https://www.researchgate.net/publication/350014606_Older_forests_used_by_northern_spotted_owls_functioned_as_fire_refugia_during_large_wildfires_1987-2017

Lindenmeyer, D.B., Burton, P.J., Franklin, J.F. 2008 "Salvage Logging and its Ecological Consequences" Island Press. Covelo, CA.

Mackey, B., DellaSala, D. A., Kormos, C., Lindenmayer, D., Kumpel, N., Zimmerman, B., et al. (2014). Policy options for the world's primary forests in multilateral environmental agreements. *Conserv. Lett.* 8, 139–147. doi: 10.1111/conl.12120

Maser, C. 1989 "Forest Primevil: The Natural History of an Ancient Forest" Sierra Club Books

Mayer, P., Prescott, C. E., Abaker, W. E. A., Augusto, L., Cécillon, L., Ferreira, G. W., et al. (2020). Tamm review: Influence of forest management activities on soil organic carbon stocks: A knowledge synthesis. *For. Ecol. Manag.* 466:118127. doi: 10.1016/j.foreco.2020.118127

McIver, J.D. and Starr, L. 2000. "Environmental Effects of Post Fire Logging: Literature Review and Annotated Bibliography." US Forest Service General Technical Report PNW-GTR-486 (Portland, Oregon,: US Forest Service, Pacific Northwest Research Station, 2000.

Odion, D.C., J.R. Strittholt, H. Jiang, E. Frost, D.A. DellaSala, and M. Moritz. 2004. Fire severity patterns and forest management in the Klamath National Forest, northwest California, USA. *Conservation Biology* 18:927-936.

Olson, d., DellaSala, D., Noss, R., Strittholt, J.R., Kass, J., Koopman, M.E., Allnutt, T.F., 2012 "Climate Change Refugia for Biodiversity in the Klamath-Siskiyou Ecoregion." *Natural Areas Journal* 32 (1) 65-74

Mildrexler, D. J., Berner, L. T., Law, B. E., Birdsey, R. A., and Moomaw, W. R. (2020). Large trees dominate carbon storage in forests east of the cascade crest in the United States Pacific Northwest. *Front. For. Glob. Change* 3:594274. doi: 10.3389/ffgc.2020.594274

Moomaw, W. R., Masino, S. A., and Faison, E. K. (2019). Intact forests in the United States: Proforestation mitigates climate change and serves the greatest good. *Front. For. Glob. Change* 2:27. doi: 10.3389/ffgc.2019.00027

Perry, D.A. 1995a "Self Organizing Systems Across Scales." *Trends in Ecology and Evolution* 10: 241-244.

Perry, D.A. 1994 "Forest Ecosystems." The John Hopkins Press. Baltimore, MD

Perry, D.A. 1995a. Landscapes, humans, and other ecosystem-level considerations: a discourse on ecstasy and laundry. In R.L. Everett and D.M. Baumgartner, eds. *Symposium Proceedings: Ecosystem Management in Western Interior Forests*. May 3-5, 1994, Spokane, WA. Washington State University Cooperative Extension, Pullman, WA Pp. 177-192.

Perry, D.A. 1995b "Self Organizing Systems Across Scales." *Trends in Ecology and Evolution* 10: 241-244.

Perry, D.A. and Amaranthus, M. 1997 “Disturbance, Recovery, and Stability” Creating a Forestry for the 21st Century: The Science of Ecosystem Management. Island Press Covelo, CA

Perry, T. D., and Jones, J. A. (2016). Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA. *Ecohydrology* 10:e1790. doi: 10.1002/eco.1790

Raymond, Crystal L., Peterson, David L. 2005. Fuel treatments alter the effects of wildfire in a mixed-evergreen forest, Oregon, USA. *Canadian Journal of Forest Research*, 35, 2981–2995. <https://www.fs.usda.gov/research/treesearch/24571>

Rhodes, J.J., W.I. Baker. 2009. Fire probability, fuel treatment effectiveness and ecological tradeoffs in Western US public forests. *Open Forest Science J.* 1: 1-7. <http://www.energyjustice.net/files/biomass/library/Rhodes-Baker.pdf>

Schoennagel T, et al. (2017) Adapt to increasing wildfire in western North American forests as climate changes. . *Proceedings of the National Academy of Sciences Early Edition*:www.pnas.org/cgi/doi/10.1073/pnas.1617464114.

Stephenson, N. L., Das, A. J., Condit, R., Russo, S. E., Baker, P. J., Beckman, N. G., et al. (2014). Rate of tree carbon accumulation increases continuously with tree size. *Nature* 507, 90–93. doi: 10.1038/nature12914

Stenzel, Jeffery E., Bartowitz, Kristina J., Hartman, Melannie D., Lutz, James A., Kolden, Crystal A., Smith, Alistair M.S., Law, Beverly E., Swanson, Mark E., Larson, Andrew J., Parton, William j., Hudiburg, Tara W. 2019. Fixing a snag in carbon emission estimates from wildfires. *Global Change Biology*. Vol. 25, Issue 11, pages 3985-3994. November 2019. <https://doi.org/10.1111/gcb.14716>

Strittholt, J. and Rustigian, H. 2004. *Ecological Issues Underlying Proposals to Conduct Salvage Logging in Areas Burned in the Biscuit Fire*. Conservation Biology Institute January 2004.

Taylor, A. and Skinner, C. 2003 “Spatial Patterns and Controls on Historical Fire Regimes and Forest Structure in the Klamath Mountains” *Ecological Applications* 13 (3) PP. 204-219

Thompson, Jonathan R., Spies, Thomas A., Ganio, Lisa M., *Reburn Severity in Managed and Unmanaged Vegetation in a Large Wildfire*. *Proc Natl Acad Sci USA*. 2007 Jun 19; 104(25): 10743–10748. Published online 2007 Jun 11. doi: [10.1073/pnas.0700229104](https://doi.org/10.1073/pnas.0700229104) PMID: PMC1965583 Sustainability Science

USDA, Forest Service. 1994. Pacific Southwest Region. 1994.*Final Environmental Impact Statement for the Land and Resource Management Plan, KNF*. Siskiyou County, CA and Jackson County, OR.

XU, Xiyan., Huang, Anqi, Belle, Elise., De Frenne, Pieter De., and Jia, Gensuo. 2022. Protected areas provide thermal buffer against climate change. *Science Advances* Vol.8 No.44. November 2022. <https://www.science.org/doi/10.1126/sciadv.abo0119>

Zald, Harold S. & Dunn, Christopher J. (2018) Severe fire weather and intensive forest management increase fire severity in multi-ownership landscape. *Ecological Applications* 0(0), 2018. Pp 1-13

Zhou, D., S.Q. Zhao, S. Liu, J. Oeding. 2013. A meta-analysis on the impacts of partial cutting on forest structure and carbon storage. *Biogeosciences*, 10(6):3691-3703. <https://www.nature.com/articles/srep03547.pdf>

Appendix A: A list of recent Forest Service Timber Sales on the Rogue River-Siskiyou and Klamath National Forests with mature or old-growth logging components.

Below are examples of US Forest Service timber sales either proposed or implemented in the last 20 years that proposed a mature or old forest logging component

Shasta Agness Timber Sale

The Shasta Agness Timber Sale was approved by the Rogue River Siskiyou National Forest in LSR forest near Agness, Oregon at the confluence of the Wild and Scenic Rogue and Illinois River's. Its approval required permission from the Regional Office to exceed both age class limitations placed on federal land logging in the Northwest Forest Plan and limitations on large tree removal in LSR forest. The project authorizes the removal of larger, more mature trees up to 28" in diameter and 140 years of age in LSR forest. It also authorizes 3,770 acres of commercial logging, 5 miles of new road construction, and 4.3 miles of new motorized trails.

The area contains unique biodiversity, relatively intact old forest habitats and moist, productive growing conditions that allow these coastally influenced forests to efficiently store large volumes of atmospheric carbon.

The Shasta Agness Timber Sale proposes to convert mature and old forest habitats into oak woodland habitats in locations where few, if any oak trees are currently found. The resulting canopy loss, the loss of carbon storage and the release of carbon currently stored in living trees will be significant, as well as the loss of important old forest habitat and climate refugia. Species such as the threatened Northern spotted owl and Humboldt marten would be impacted. In fact, conservation interests located one Northern spotted owl nesting site within proposed commercial logging units. No survey's took place to confirm or disprove occupancy by these species and significant damage to their habitat will occur, when the project is fully implemented suitable habitats will be either downgraded or removed from the Northern spotted owl habitat baseline.



Unit 51 of the Shasta Agness Timber Sale has been identified as an "oak woodland restoration" treatment, but almost no oak trees are found in the unit and instead closed forest dominates the area. Prescriptions call for removing all conifers up to 28" diameter and replanting the stand with oak saplings.



Unit 53 of the Shasta Agness Timber Sale contains closed forests with a canopy of large, dominant Douglas fir trees. This unit is proposed for "oak woodland restoration," logging all conifers to 28" diameter and reducing canopy cover to below 30%. This will require removing more than half the stand, which will then be replanted with oak saplings.

Upper Briggs Restoration Project

The Upper Briggs Project has been approved by the Rogue River-Siskiyou National Forest, but not fully implemented. The timber sale proposes over 4,000 acres of commercial logging in Briggs Creek, an important tributary of the Wild and Scenic Illinois River and key watershed under the NW Forest Plan.

The project was reportedly proposed to increase fire resilience due to an assumed risk associated with potentially catastrophic fuel loading and fire risks. Yet, ironically before the project was approved, the area burned at roughly 80% low severity during the 2018 Klondike Fire, underburning most of the stands proposed for commercial logging and fuel reduction. The agency responded by claiming that the low severity fire did not kill enough trees or create the structural conditions they have arbitrarily defined as “healthy” and “fire resilient.” The agency then approved the project despite the beneficial fire effects and currently resilient stand conditions.

The project includes industrial logging prescriptions in currently intact, fire adapted, old forest habitats in the Briggs Creek watershed. Large tree removal and extensive canopy removal will impact forest values, increase fire risks, and impact natural fire regeneration following the beneficial Klondike/Taylor Fire. It will also damage scenic values in the Briggs Creek watershed, along popular hiking trails and adjacent to well used campgrounds.

The project also includes so-called “meadow restoration” which would be implemented with meadow side clearcuts at the margin of numerous meadows including the Horse Meadows Wildlife Area where timber harvest is prohibited in the Siskiyou National Forest Land & Resource Management Plan.

Carbon storage will be diminished and significant carbon will be released through large tree logging and canopy reduction. Additionally, cool, moist climate refugia and closed forest stands would be damaged through logging activities. The currently unimplemented portions of the Upper Briggs Restoration Project should be canceled to comply with President Biden’s Earth Day Executive Order on the protection of forests.



Unit 63 of the Upper Briggs Restoration Project contains mature and old-growth forest that underburned at low severity in the Klondike/Taylor Fire of 2018.



Unit 23 of the Upper Briggs Restoration Project is located along the popular Onion Way Trail and burned at low severity in the 2018 Klondike/Taylor Fire, but is none-the-less proposed for heavy industrial logging.

Slater Fire Re-entry Project

The Slater Fire Re-Entry Project was inappropriately proposed through the use of a road maintenance Categorical Exclusion. The project proposed 4,106 acres of commercial roadside logging, including the removal of trees within 300' of Forest Service roads, along 146 miles of Forest Service road. This included proposed logging treatments in LSR forest, Riparian Reserves, Special Wildlife Sites, and designated Back Country Areas. It also included provisions to remove both fire killed snags and living "green" trees that survived the fire.

In many cases, old-growth forest was logged and was even posted like a trophy on the Rogue River Siskiyou National Forest facebook page. Portions of the project were implemented under an emergency declaration for the Slater Fire with no public input or oversight. The agency logged the area under an emergency declaration long after the fire was contained. The entire Takilma-Happy Camp Road extending over the Siskiyou Crest has been clearcut to 300' on either side of the road. Many living trees that survived the fire and fire killed snags were removed.

Ultimately, the project was largely withdrawn due to an out of court settlement that resolved potential litigation and roughly 80% of the project was withdrawn. Currently the project is being repackaged as the Slater Fire Re-open Project and an Environmental Assessment is being developed to analysis potential project impacts. This project now proposes 9,650 acres of post fire logging within 200' of over 200 miles of road.

During the initial implementation stage hundreds of acres were clearcut, massive amounts of carbon stored in standing snags and surviving "green" trees was released, soils and vegetative recovery was impacted, and massive, old growth logs were hauled to the mill. The Slater Fire Reopen Project should be canceled to comply with President Bidens Earth Day Executive Order.



Massive old growth trees posted like a trophy on the Rogue River Siskiyou National Forest facebook page. These old growth trees are among hundreds of old growth trees logged during the so-called "emergency" logging operation.



A post fire clearcut at the Page Mountain Sno-Park showing the logging of large old trees and snags along with significant soil damage.

Seiad Horse Project

This post fire logging project implemented in the Johnny O’Neil Late Successional Reserve (LSR) logged approximately 1,200 acres of fire affected forest habitat, and was approved in the aftermath of the 2017 Abney Fire. Although much of the area, burned at high severity, living trees and green islands within the fire perimeter were also removed in the logging operations. The project removed large diameter trees and snags along the Pacific Crest Trail, near the Condrey Mountain Inventoried Roadless Area, and in the Kangaroo Inventoried Roadless Area.



These post-fire logging units in the Seiad Horse Project release carbon stored in standing snags, damaged forest regeneration, created extensive soil damage, surface erosion and sedimentation in important coho salmon streams in the Klamath River watershed. These units are also located at the edge of the Condrey Mountain Inventoried Roadless Area and designated Back Country Area, as well as the Cook and Green Pass Botanical Area, known as the most diverse location in the state of California.

The project area is located in an important connectivity corridor between the Red Buttes Wilderness Area and surrounding Inventoried Roadless Area. The project also impacted connectivity for the Pacific fisher, LSR habitat, and Riparian Reserves within the planning area.

The removal of large diameter trees and fire killed snags released significant carbon emissions during logging operations, dramatically reduced the carbon naturally stored on site, and damaged the natural regeneration of vegetation following the 2017 Abney Fire.

Westside Project

At the time it was proposed and approved, the Westside Project was one of the largest timber sales in Forest Service history. The project was largely implemented in LSR forest and in important salmon and steelhead streams in the Klamath River watershed. The effects on wildlife were immense including impacts to 70 Northern spotted owl activity centers, 19 Siskiyou Salamander sites, and damage to Pacific fisher habitats. The Klamath National Forest also refused to survey for numerous sensitive plant and animal species within the planning area, creating undetermined and unmonitored impacts.

The agency approved 11,700 acres of clearcut logging in fire affected forests and 20,500 acres of roadside “hazard” tree logging, including 7,560 acres of LSR logging. It also included 22 miles

new temporary roads with 14 stream crossings and 152 new log landings. The project had significant impacts to water quality, triggered large landslides, and created legacy sediment sites with lasting implications for the threatened Klamath River fisheries. The project's Water Quality Permit was predicated on the treatment or mitigation of existing legacy sediment sites, but most of these mitigations have not been implemented.

Most of the timber sales associated with the Westside Project were sold and implemented across thousands of acres in the Mid-Klamath River watershed. The clearcutting of fire affected forest led to habitat simplification, a loss of stored carbon, the sedimentation of important fish bearing streams and the disruption of natural regeneration processes on the landscape scale.



The Westside Project converted complex early successional snag forest and converted it to highly simplified slopes lacking large snags, downed wood and habitat complexity, creating deficits for hundreds of years and damaging forest regeneration.



The Westside Project was implemented as clearcut logging on very steep, unstable slopes like this one above Walker Creek, a tributary of the Klamath River.

Chetco Bar Fire Recovery Project

The Chetco Bar Fire Recovery Project was a massive post fire logging proposal that included both unit logging and roadside logging components. The project was approved by the Rogue River Siskiyou National Forest following the 2017 Chetco Bar Fire.

The project included 13,626 acres of logging, including over 9,000 acres in previously unlogged stands and hundreds of miles of roadside logging. The project included the removal of both live and dead trees in fire affected areas.

The planning area is located adjacent to the Kalmiopsis Wilderness and the surrounding Inventoried Roadless Areas. The Chetco River is also an important fishery and the river contains exceptional water quality. The extensive logging implemented on federal lands, combined with private industrial post-fire logging has badly damaged the lower Chetco River watershed.

Although much of the forest burned at high severity during a large east wind event, the coastally influenced forests supported massive, old trees. In the post-fire environment, both living “green

trees” and standing snags store vast quantities of carbon and sustain the biological legacies important for the natural regeneration of the forests in the lower Chetco River watershed.

Ultimately, large portions of the Chetco Bar Fire Recovery Project were implemented including many, many miles of roadside logging throughout the lower Chetco River watershed. The project created extreme impacts to the Chetco River watershed, to natural forest regeneration and to the climate by logging large old trees and snags in the aftermath of the 2017 Chetco Bar Fire.



Massive old fire killed trees proposed for post-fire logging in the Chetco Bar Fire Recovery Project. This unit was logged in roadside logging projects near Quail Prairie Lookout. Note the size of the individual in the photo compared to these massive carbon-rich snags.



This over 5' diameter snag was logged along near Quail Prairie Creek in the roadside logging projects following the 2017 Chetco Bar Fire. Snags like this store huge volumes of carbon on the landscape and provide important biological values.

Crawford Timber Sale

The Crawford Timber Sale was proposed on the Klamath River between Happy Camp and Orleans, California in some of the last occupied northern spotted owl habitat in the western Klamath National Forest. The timber sale proposed commercial logging on 1,650 acres, the removal of 139 acres of foraging habitat for the Northern spotted owl in forests identified as Critical Habitat. The project would have degraded 4 northern spotted owl home ranges and included the “incidental take” of two of the areas last reproducing pairs of northern spotted owls.

The project was litigated by conservation interests and subsequently withdrawn by the Klamath National Forest.



A view across the Crawford Timber Sale and the connectivity corridor between the Siskiyou Wilderness Area and Marble Mountains Wilderness in the distance.



Old forest proposed for logging in the Crawford Timber Sale.

Bear Country Timber Sale

The Bear Country Timber Sale is located on the Wild and Scenic North and South Fork Salmon River watersheds, in some of the most remote, diverse, and mountainous country on the West Coast. The timber sale proposes 4,195 acres of commercial logging, 3,704 acres of which is proposed in natural, unlogged stands and 2,330 acres of LSR logging. This logging would remove 235 acres of nesting, roosting and foraging habitat for the northern spotted owl and an additional 701 acres of foraging habitat. This would include logging related impacts to 8 northern spotted owl home ranges and to one of the only nesting habitats documented to reproducing on the Scott/Salmon Ranger District.

The project also proposes 5.2 miles of commercial roadside “hazard” tree logging 300’ from existing roads and 2,271 acres of mastication on 24.4 miles of remote ridgeline at the heart of the Salmon River watershed. This project proposes heavy industrial logging, large tree removal, canopy reduction, and damage to mature, late successional and old-growth forest habitats. If approved and implemented this project would release abundant carbon stored in large, living trees and degrade important intact forests habitats and climate refugia.

The Bear Country Timber Sale should be canceled to comply with President Biden’s Earth Day Executive Order on the protection of forests.



Unit 80 of the Bear Country Timber Sale is located in old-growth LSR forest and proposes heavy commercial logging in high quality Northern spotted owl habitat.



Unit 126 on Butcher Gulch contains spectacular old-growth forest above the Wild and Scenic South Fork Salmon River.

South Fork Timber Sale

The South Fork Timber Sale has been proposed by the Klamath National Forest just upstream from the Bear Country Timber Sale on the South Fork Salmon River. Located in an important connectivity corridor between the Trinity Alps and Russian Wilderness Areas and a large LSR forest, the project proposes significant old forest logging in previously unlogged forest habitats. It also surrounds numerous popular trailheads, campgrounds and recreation areas around Carter Meadows at the headwaters of the Wild and Scenic South Fork Salmon River.

The South Fork Timber Sale has undergone public scoping and its current planning status is officially “on hold” due to undisclosed reasons. The South Fork Project should be canceled to comply with President Biden’s Earth Day Executive Order on the protection of forests for climate resilience.



Unit 71 of the proposed South Fork Timber Sale includes high elevation true fir forests near the headwaters of the Salmon River and adjacent to the Russian Wilderness Area.



Unit 65 of the South Fork Timber Sale includes mature and old-growth forest. Logging prescriptions call for significant canopy reduction and large tree removal.

Appendix B: Additional Information on the impact of commercial thinning on fire and climate resilience

Incorporate the following information and links by reference into this comment: The information and links provided below demonstrate how widespread and systemic mature and old forest logging is on federal lands. The level of mature and old forest logging currently being implemented and proposed creates concerns regarding the sustainability of such logging activities, the impact this logging has on fire risks, wildlife habitat, watersheds, and carbon storage, as well as the effect it will have on the scenic and recreational value of our public lands. These links demonstrate that mature and old forest logging is a significant threat to federal forests and climate resilience.

Worth More Standing Report: <https://www.climate-forests.org/worth-more-standing>

Pilot Projects: <https://siskiyoucrest.com/2013/03/05/middle-applegate-pilot-projects/>

[https://www.dropbox.com/s/a7n3ezf5dcru15e/Pilot Thompson Community Monitoring Report.pdf](https://www.dropbox.com/s/a7n3ezf5dcru15e/Pilot%20Thompson%20Community%20Monitoring%20Report.pdf)

[http://www.dropbox.com/s/j1tizckl4vbgvi0/Pilot Joe The Myth and The Reality.pdf](http://www.dropbox.com/s/j1tizckl4vbgvi0/Pilot%20Joe%20The%20Myth%20and%20The%20Reality.pdf)

Nedsbar Timber Sale: <https://siskiyoucrest.com/2015/02/01/a-hike-through-nedsbar-timber-sale-and/>

<https://siskiyoucrest.com/2015/01/25/nedsbar-timber-sale-bald-mountain-units/>

<https://siskiyoucrest.com/2015/01/21/nedsbar-public-hike-unit-28-22a-28-22b/>

<https://siskiyoucrest.com/2015/01/07/nedsbar-community-monitoring-program/>

<https://siskiyoucrest.com/2014/12/23/update-nedsbar-timber-sale-community/>

<https://siskiyoucrest.com/2014/12/13/nedsbar-timber-sale-regeneration-unit/>

Crawford Timber Sale: <https://siskiyoucrest.com/2020/08/12/keeping-klamath-wild-crawford-timber/>

Pickett West Timber Sale: <https://siskiyoucrest.com/2017/06/03/pickett-west-timber-sale-industrial-old/>

<https://siskiyoucrest.com/2017/06/15/zig-zag-creek-hellgate-canyon-and/>

<https://siskiyoucrest.com/2017/06/26/pickett-west-timber-sale-panther-gulch/>

<https://siskiyoucrest.com/2017/07/14/pickett-west-timber-sale-logging-off/>

<https://siskiyoucrest.com/2017/07/17/pickett-west-timber-sale-logging-last/>

<https://siskiyoucrest.com/2017/07/29/the-pickett-west-timber-sale-old-growth/>

Clean Slate Timber Sale: <https://siskiyoucrest.com/2018/07/02/clean-slate-timber-sale-old-growth/>

Seiad Horse Project: <https://siskiyoucrest.com/2017/12/17/klamath-national-forest-proposes/>

<https://siskiyoucrest.com/2018/04/13/klamath-national-forest-proposes-post/>

<https://siskiyoucrest.com/2018/05/11/proposed-logging-along-pct-at-cook-and/>

Chetco Bar Fire Recovery Project: <https://siskiyoucrest.com/2018/03/23/chetco-bar-fire-salvage-project-quail/>

Briggs Project: <https://siskiyoucrest.com/2018/05/30/the-upper-briggs-restoration-project-2/>

<https://siskiyoucrest.com/2019/06/18/the-upper-briggs-restoration-project/>

Bear Grub Timber Sale: <https://siskiyoucrest.com/2020/03/09/bear-grub-timber-sale-threat-to-forests/>

<https://siskiyoucrest.com/2020/05/19/wellington-wildlands-threatened-with/>

<https://siskiyoucrest.com/2020/06/01/bald-mountain-biodiversity-and-bear/>

<https://applegatesiskiyoualliance.org/the-bear-grub-timber-sale-and-the-wellington-wildlands/>

<https://applegatesiskiyoualliance.org/bear-grub-timber-sale-deming-ridge-units/>

<https://applegatesiskiyoualliance.org/bear-grub-timber-sale-save-the-east-applegate-ridge-trail-from-logging/>

<https://applegatesiskiyoualliance.org/bear-grub-timber-sale-bald-mountain-units/>

Shasta Agness Timber Sale: <https://siskiyoucrest.com/2020/08/26/shasta-agness-timber-sale-industrial-logging-dressed-up-in-restoration-language/>

Bear Country Timber Sale: <https://siskiyoucrest.com/2021/06/23/the-bear-country-timber-sale-old-forest-logging-on-the-wild-and-scenic-salmon-river/>

Rogue Gold Timber Sale: <https://siskiyoucrest.com/2021/10/18/the-rogue-gold-timber-sale-logging-the-last-old-forest-above-the-rogue-river-valley/>

Late Mungers Timber Sale: <https://applegatesiskiyoualliance.org/late-mungers-timber-sale-old-forest-logging-on-murphy-creek-deer-creek-and-tributaries-of-the-applegate-river/>

Penn Butte Timber Sale: <https://applegatesiskiyoualliance.org/the-ivm-and-late-mungers-project-intentionally-very-misleading/>

<https://applegatesiskiyoualliance.org/blm-targets-mungers-powell-creek-the-rain-forests-of-the-applegate-with-logging-in-the-penn-butte-timber-sale/>

<https://applegatesiskiyoualliance.org/penn-butte-timber-sale-old-forest-logging-in-the-williams-creek-watershed/>

The impact of so-called “forest health” or “fuel reduction” logging and commercial thinning projects on federal lands.

The logging projects listed above and discussed in the incorporated links demonstrate the continuing impact of mature and old forest logging on federal lands in a small portion of the Klamath-Siskiyou Mountains. Although we can demonstrate the problem in our region, colleagues across the West report similar problems with the federal timber sale program in the Sierra-Nevada Mountains, in the Rocky Mountains, the southwest and any forested region in the federal land system. Old forest logging is not the exception, but instead it is the current policy of federal land managers to log mature and old forest habitats in an effort to meet arbitrary and unsustainable timber quotas. It is also the policy of the agencies to use so-called “fuel reduction” or “restoration” timber sales as a guise for reaching annual timber quotas. Unfortunately, these timber sales are effective at producing timber, but counterproductive to fuel reduction and forest restoration objectives.

Historically, logging has been responsible for the majority of loss in mature and old-growth forest cover on both the continental, national, regional and global scale, and its impact cannot be ignored. Mature and old-growth forests have been almost entirely lost on private ownerships and are now found primarily on federal lands, making their protection disproportionately important for climate, for biodiversity, for watersheds, for wildlife and for the scenic and recreational values the public enjoys on federal lands. The current policies and practices of federal land managers are contributing to the loss and decline of mature and old-growth forest habitats, and should be immediately discontinued.

Every timber sale proposed or implemented on federal lands in our region has a mature and old forest logging component with impacts and effects that are contrary to President Biden’s 30X30 Initiative and Earth Day Executive Order on the protection of forests for climate resilience. This is not only because these projects are logging intact environments and releasing naturally stored carbon by logging large carbon dense trees and forests, it is also because of the impact this logging has on habitat values, and watershed values, while increasing, not decreasing fire risks and forest health concerns.

For additional information on the real-world impacts or effects of commercial thinning on public lands, please review and incorporate these links by reference into this public comment.

The O’lickety Timber Sale: Illegal BLM Logging and the Continuing Loss of Northern Spotted Owl Habitat in the Applegate Valley

<https://www.dropbox.com/home?select=BLM+Fire%3AFuel+Analysis+for+recent+sales.pdf&preview=BLM+ESA+Monitoring+Report.pdf>

BLM ESA Monitoring Report

https://www.dropbox.com/s/rui3gqhx3zczny/FINAL_2015_Medford_BLM_Post_Harvest_Monitoring_Report.3.4.16.pdf?dl=0

Bark Beetles, Timber & The BLM in the Applegate Valley: An overview of bark beetle science and land management on the Medford District BLM

https://www.dropbox.com/s/h188fxpbm2xxow3/Beetles,_Timber_%26_the_BLM_%282017%29.pdf?dl=0

The Squishy Bug Timber Sale: “Salvage” Logging, Bark Beetles and Invalid Assumptions for NEPA Analysis

<https://www.dropbox.com/home?select=BLM+Fire%3AFuel+Analysis+for+recent+sales.pdf&preview=Squishy+Bug+Timber+Sale+Report.pdf>

Medford District BLM Fire/Fuel Analysis for Timber Sales Authorized under the 2016 Resource Management Plan for Southwestern Oregon

https://www.dropbox.com/s/50u8m52bk41ih3p/BLM_Fire%3AFuel_Analysis_for_recent_sales.pdf?dl=0

New Research on Forest, Fires and Northern Spotted Owl Management in Southwestern Oregon

<https://www.dropbox.com/home?select=BLM+Fire%3AFuel+Analysis+for+recent+sales.pdf&preview=NSO+%26+Fire+Resilience+Letter.pdf>

Information and Policy Recommendations Pertaining to Forests, Fire and Smoke Management in Southwestern Oregon

<https://www.dropbox.com/home?select=BLM+Fire%3AFuel+Analysis+for+recent+sales.pdf&preview=NSO+%26+Fire+Resilience+Letter.pdf>

DellaSala, D.A., Baker, B.C., Hanson, C.T., Ruediger, L., and Baker, W. 2022. Have western USA fire suppression and megafire active management approaches become a contemporary Sisyphus? Biological Conservation

<https://doi.org/10.1016/j.biocon.2022.109499>

Commercial logging & thinning on federal lands impacts climate resilience

Mature and old-growth forests are both regularly threatened by federal land timber sales and important as carbon reserves where live trees, standing snags, downed trees and forest soils have stored immense amounts of carbon for hundreds, if not thousands of years (Law. 2022). Carbon storage accelerates dramatically with age (Stephenson et al. 2014, Mildrexler et al. 2021, Law et al. 2022), demonstrating the positive effects of protecting mature and old forests on federal lands from a carbon sequestration and storage standpoint.

Yet, mature and old forests should be protected for not only the carbon they store, but also for their important watershed values and connectivity values. As climate refugia and as habitat for species requiring overstory canopy, cool, moist habitat conditions, thermal regulation, late successional forest habitats for nesting, roosting, denning and foraging, and habitat for threatened, rare, or endangered species. The effects of mature and old forest protection have innumerable positive outcomes and few drawbacks.

According to regional research, the wood products industry is the largest single source of greenhouse gas emissions in the state of Oregon, accounting for 39% of the states total emission load (Law. 2018). Additional studies have shown that protected mature and old forest habitats are far more efficient and effective at storing carbon than actively managed forests or commercial logging supposedly implemented to reduce fire risks (Law 2022.).

In the largest study of actual wildfire effects ever conducted in the US, protected landscape were shown to burn at lower levels of fire severity than heavily managed and less protected areas (Bradley. 2016). Additionally, logging or “thinning” to reduce wildfire intensity produces far more emissions over a comparable area when compared to wildfire. In fact, emissions from logging were five times those from disturbances from wildfire, wind and insects combined. (Harris et al. 2016, Law et al. 2018).

The amount of carbon removed by thinning is much larger than the amount that might be saved from being burned in a fire, and far more area is harvested than would actually burn (Mitchell et al. 2009, Rhodes et al. 2009, Law & Harmon 2011, Campbell et al. 2011, Hudiburg et al. 2011, Hudiburg et al. 2013). Most analyses of mid- to long-term thinning impacts on forest structure and carbon storage show there is a multi-decadal biomass carbon deficit following moderate to heavy thinning (Zhou et al. 2013). Even thinning in young forests can have significant carbon impacts. For example, a study in a young ponderosa pine plantation vulnerable to drought in Idaho found that removal of 40% of the live biomass from the forest would subsequently release about 60% of that carbon over the next 30 years (Stenzel et al. 2021).

Although thinning is commonly used to reduce fire severity and associated tree mortality, a comparison of thinned with adjacent unthinned stands in the burn area of a large California wildfire showed that thinning resulted in more tree mortality than unthinned stands, showing that the fire killed more trees than thinning prevented from being killed (Hanson 2022). Additionally, the likelihood of a fire intersecting these treatments is also less than 1% and potential treatment effectiveness often lasts less than 10-20 years (Scheennagel. 2017, Campbell et al. 2011). It has

also been shown that these thinning operations create far more impacts to northern spotted owl habitat (a surrogate for mature and old forest) than wildfire alone (Odion.2014)

There are high forest carbon losses associate with thinning, and only minor differences in the combustive losses associated with high severity fire and the low-severity fire that fuel treatment is meant to encourage. (Campbell et al. 2011).

Additional habitat protections for mature and old-growth forests under both President Bidens 30X30 Initiative and his Earth Day Executive Order on the protection of forests must be immediately enacted to protect, preserve, restore and maintain adequate carbon storage in the natural environment. Fire/fuel reduction efforts should shift from focusing on logging miles from communities, in backcountry environments and in mature and old forest habitats to reducing fuels manually and with prescribed fire near homes and communities. ((Moritz et al. 2014, Schoennagel et al. 2017, Law et al. 2022). This would have extremely positive impacts on community fire safety, while protecting habitat values, reducing logging related impacts to ecosystems and carbon storage, reducing structure, home and infrastructure losses during wildfire events, work towards mitigating the home ignition problem and support management that is consistent with President Biden's applicable Executive Orders.

This shift to home and community fire protection would be win-win for society, while the reducing direct taxpayer costs to citizens and reducing impacts to ecosystems services that support our economies, communities and quality of life.