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Via: https://cara.fs2c.usda.gov/Public/CommentInput?Project=68347

**Subject: Station Butte Environmental Assessment**

Please accept the following comments from Oregon Wild and Cascadia Wildlands (collectively, Commenters) concerning the Station Butte Environmental Assessment (Project). Oregon Wild represents 20,000 members and supporters who share our mission to protect and restore Oregon's wildlands, wildlife, and water as an enduring legacy. Oregon Wild's goal is to protect areas that remain intact while striving to restore areas that have been degraded. This can be accomplished by moving overrepresented ecosystem elements (such as logged and roaded areas) toward characteristics that are currently under-represented (such as roadless areas and complex old forest).

Founded in 1998, Eugene-based Cascadia Wildlands represents approximately 18,000 members and supporters with a mission to defend and restore Cascadia's wild ecosystems in the forests, in the courts, and in the streets. Cascadia Wildlands envisions vast old-growth forests, rivers full of wild salmon, wolves howling in the backcountry, a stable climate, and vibrant communities sustained by the unique landscapes of the Cascadia bioregion.

The stated purposes of the Project are to improve stand growth, diversity, and structure and to support local economies with forest products. Improving stand growth, diversity and structure is further specified as increasing upland stand growth and improving forest structure and diversity, and improving structural diversity of riparian vegetation to control stocking and accelerate attainment of Aquatic Conservation Strategy Objectives.

The Project proposes the following treatments and activities:

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| Commercial thinning harvest – total treatment area: | 3,998 acres |
| Riparian Reserve thinning: | 1,058 acres |
| Riparian Reserve no-harvest buffers | 647 acres |
| Gaps: | 190 acres |
| Skips: | 187 acres |
| Ground-based harvest systems: | 1,476 acres |

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| Skyline harvest systems: | 2,032 acres |
| Helicopter harvest systems: | 490 acres |
| Temporary roads – new: | 3.0 miles |
| Temporary roads – existing template: | 3.8 miles |
| Haul route maintenance and reconstruction | 157 miles |
| Stream habitat restoration – total treatment area: | 130 acres |
| Aquatic organism passages: | 3 culverts |
| Restoration subsoiling within harvest units: | 50 acres |

In general, Commenters do not object to carefully planned and implemented thinning in dense, young plantations under 80 years old. We appreciate that commercial thinning harvest is only proposed in plantation stands that range between 40 and 75 years old. Commenters also commend the Forest Service for engaging in stream habitat restoration, improving aquatic organism passages, and restoration subsoiling in harvest units. Habitat restoration treatments are vital for healthy and functional ecosystems. However, Commenters are concerned about the effects of thinning on older, larger trees within some of the plantation stands, thinning in Riparian Reserves, and effects to northern spotted owls, among other resource concerns.

Please consider the following comments on the Project and EA.

Commercial Thinning in Upland Plantation Stands

The Project proposes to commercially harvest on about 3,998 acres of plantation stands that are described as 40 to 75 years old, including treatment of about 1,058 acres of the outer portions of Riparian Reserve stands. EA at 8. Commercial harvesting will be accomplished through variable density thinning that would remove individual or small clumps of conifers across all size classes. The thinning prescription would target leaving 40 trees per acre in upland stands. Both skips and gaps will be incorporated into treatment. *Id.*

Commenters are generally supportive of thinning in younger plantations, but recognize that thinning in young plantations still involves trade-offs that must be carefully evaluated and weighed in an environmental analysis. Trade-offs include, but are not limited to, carbon emissions that exacerbate global climate change, impacts from road construction and reconstruction, impacts to northern spotted owl and their habitat, long-term impacts to future recruitment of snags and deadwood, spread of invasive plants and weeds, and potential for increased fire hazard due to modified microclimates and increased growth of surface and ladder fuels. Accordingly, all thinning has negative effects that must be compensated for by beneficial effects. It is generally accepted that when thinning in very young stands, the benefits of treatment outweigh the adverse impacts, thus creating net benefits.

In particular, Commenters note the long-term adverse effects that thinning has on snags and downed wood. As stated by Paul D. Anderson in 2013, "[t]wo common consequences of conventional thinning practices have been increased uniformity of forest structure and composition, and removal or delay in the development of dead wood as snags or down wood to

meet habitat functions."[1] Intensive wood production practices may alter the cycle of structural development both by truncating succession before large structures develop and by removing most existing structures during harvest.[2] In turn, these consequences have the potential to affect the habitat needs of various species in the long-term, including spotted owls and small mammals that make up their prey:

> Several small mammals, such as the northern flying squirrel form the prey base for the Endangered Species Act (ESA) listed spotted owl and are among the species associated with abundant large dead standing and down wood. This presumably, is why spotted owls prefer to forage in stands with abundant standing and fallen dead wood (Table 2, North et al. 1999). The fruiting bodies of hypogeous fungi are a food source of northern flying squirrels and are also associated with down logs, suggesting that there are complex, indirect paths through which dead wood supports spotted owls (Amaranthus et al. 1994, Carey 2000).[3]

In thinning the upland plantations proposed for treatment in this Project, Commenters urge the Forest Service to ensure that snags and downed, dead wood are retained, and that sufficient trees are maintained to develop into future snags and downed wood. Various harvest prescription design features touch on snags and downed wood. PDF Wildlife 27 calls for retention of snags 10" DBH or greater unless they pose a safety hazard. This PDF is limited to portions of units 100, 101, 105, and 106 that are within MA-9d. EA at 75. The Forest Service should expand this PDF to all project units to ensure existing snags are retained in order to benefit wildlife that rely on snags for habitat. Doing so will also help accomplish the purpose and need of improving forest structure and diversity within the Willamette National Forest. The Forest Service should also consider a thinning prescription that targets leaving greater than 40 trees per acre to leave a bigger pool of recruitment for future snags and downed wood. Additionally, PDFs Silviculture 8 and Silviculture 9 touch on retention of existing downed wood. Silviculture 8 calls for retention of all existing large downed wood >10 inches while Silviculture 9 permits removal of class 1 and 2 down wood in upland units. *Id*. Commenters appreciate these PDFs to retain down wood within the proposed treatment units, which will benefit wildlife habitat, soil health, and carbon storage. How will the agency ensure these PDFs are followed during implementation?

The EA rightfully acknowledges that while thinning can promote development of larger trees in the long-term, thinning will reduce future deadwood abundance compared to if the stand was not thinned. EA at 29. However, the EA does not address the long-term impacts of reduced future deadwood abundance that would be caused by the proposed thinning. The NEPA analysis

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[1] Paul D. Anderson 2013. Two Decades of Learning about Thinning in the Ecosystem Management Era. https://www.fs.usda.gov/pnw/pubs/pnw_gtr880/pnw_gtr880_001.pdf *in* Density Management in the 21st Century: West Side Story PNW-GTR-880.

[2] Hansen, A. J.; Spies, T. A.; Swanson, F. J.; Ohmann, T. L. 1991. Conserving biodiversity in managed forests - Lessons from natural forests. BioScience 41(6):382- 392.

[3] Thomas Spies, Michael Pollock, Gordon Reeves, and Tim Beechie 2013. Effects of Riparian Thinning on Wood Recruitment: A Scientific Synthesis - Science Review Team Wood Recruitment Subgroup. Jan 28, 2013, p 36.

should further analyze these impacts to help ensure informed decision-making and an informed public.

Additionally, the Forest Service should aim to preserve all legacy trees greater than or equal to 24" DBH in all units. Currently, PDF Silviculture 2 calls for retention of legacy trees through marking guidelines and strategic use of skips, but does not specify a diameter limit for retention. PDF Wildlife 27 also calls for retention of legacy trees, but limits such retention to trees greater than or equal to 30" DBH and only in portions of units 100, 101, 105, and 106 that are within MA-9d. Commenters visited the Project area and noted that unit 77 contains numerous legacy trees that the Forest Service should retain [please see photos and descriptions below].

Field Checking Photos and Observations

Please consider the following observations from a field visit to the northern portion of the project area in early February.

The majority of the units proposed for logging are densely replanted plantations. Units pictured below are densely replanted plantation stands with small- to moderate-diameter Douglas firs and low diversity in species composition, canopy layering, or spacing that is reflective of much of the project area.

^Unit 78

^Unit 87

^Unit 93

Unit 77 stands out as an exception to this because it contains numerous big, old legacy Douglas firs. How will the Forest Service ensure those trees are retained? PDFs to protect legacies should apply to this unit as well. We suggest dropping the eastern edge of this unit. There are at least 10 large legacy trees in this area that abut a creek.

^Unit 77

^Unit 77

^Unit 79 also contains relatively larger legacy trees that should be retained.

^Large slash pile in Unit 51.

Please provide the burn severity map for fire-impacted project units. Some units proposed for logging appeared to have burned at higher intensities and are self-thinning (e.g., unit 6, which is

relatively steep and located above a creek). Others burned at lower intensities (e.g., unit 46) and, while a few trees have fallen, mostly green trees remain. We ask that the agency consider dropping these fire-impacted units from the project, as the risks of logging in sensitive post-fire landscapes do not outweigh the benefits. Burned areas are best left to their own natural recovery processes.

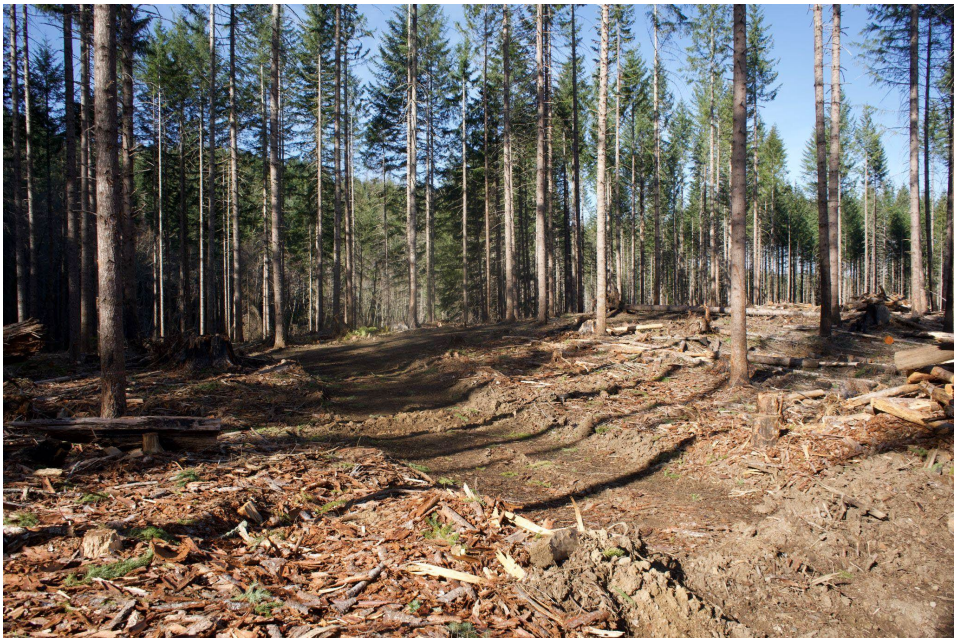
^Unit 51

^Unit 46

^Unit 46

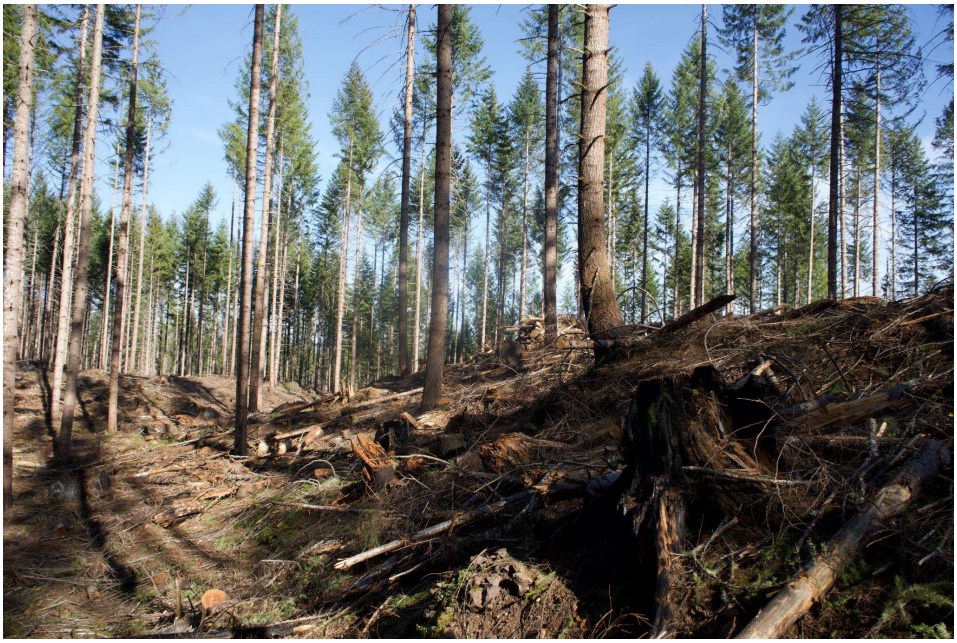
^Unit 16

Post-fire logging has already occurred next to proposed unit 18. This area was burned and has since been logged, with a temporary road punched through the middle of the unit. There is a significant amount of slash remaining on the site. There are several old-growth stumps that appear to have been cut following the fire and are located in the interior of the unit, not within striking distance of the road. Under what authority did this logging take place? What is the Forest Service doing to address the massive amount of logging debris or rehabilitate the road? Please explain. Unit 18 should be dropped from the project. It is a sensitive post-fire area right above a creek and the stand next to which has already been logged.



^Logged area next to unit 18.

^Logged area next to unit 18.



^Logged area next to Unit 18.

There is a hazard tree leaning toward the road in unit 80 (43.900431, -122.559870) that should be removed.

There were large downed trees blocking the road at 43.916338, -122.589895 on February 3rd that need to be cleared if they haven't been since then.

There are several camper vehicles along North Fork Winberry Creek/Road 1802 leading into the project area.

Commercial Thinning in Riparian Reserves

The Project proposes commercial treatment in about 1,058 acres of Riparian Reserve stands. EA at 8. The thinning prescription for these stands will target leaving 60 trees per acre. *Id*. This proposed treatment is intended to address the purpose and need of improving structural diversity and complexity of riparian vegetation to control stocking and accelerate attainment of Aquatic Conservation Strategy (ACS) objectives. The EA describes the Riparian Reserves proposed for treatment as dense, overstocked conifer-dominant vegetation with very little structural or species diversity. EA at 17.

Commenters are concerned about the impacts to aquatic habitats due to commercial thinning within the Riparian Reserves. The ACS prohibits timber harvest in Riparian Reserves except, in part, when applying silvicultural practices to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain ACS objectives. NWFP S&Gs at 31-32. Accordingly, the Forest Service bears the burden to show that proposed treatment within the Riparian Reserve units benefit aquatic and riparian resources. Ultimately, the most effective way to meet the goals of the ACS may be to allow natural processes and disturbances to prevail without active management. Doing so will allow the ecosystem to move towards greater aquatic health while avoiding the negative trade-offs associated with commercial logging.

Thinning in Riparian Reserves can have many negative effects on the ecosystem. Chris Frissell described issues related to thinning Riparian Reserves:

> Riparian thinning proponents consider stand density in riparian areas as a static factor that can be controlled and enhanced by "proper" management--often that is thinning, to benefit a narrowly defined aspect of biodiversity, or to attain a specific stand structural outcome.
>
> In my experience, natural disturbance processes are so diverse, so frequent, so unpredictable, and expressed across a broad enough range of scales in riparian forests that there is little or no justification for imposing additional human disturbance, in the form of thinning, tree tipping, or similar practices, with the expectation of producing a specific stable-state outcome. In fact, the complex and dynamic regime of natural disturbance renders any active human intervention highly unlikely to produce the anticipated or desired outcome for any significant length of time. In truth the interaction of unpredictable natural disturbance with imposed human disturbance makes it far more likely that unanticipated and undesired outcomes will occur (e.g., greatly accelerated and more widespread windthrow, with resulting floodplain and streambank instability and erosion). This is precisely why FEMAT ACS rules emphasized process-based conservation actions (in terms of both restrictions and outcomes) in riparian forests--not state-based ones.
>
> Riparian thinning proponents often point to homogeneous, low-diversity undesirable vegetation conditions, such as "stunted, overcrowded forests." that in

> their view demand thinning. I have observed that any syndrome of homogeneity or supposedly static vegetation state is rather limited to a few locales, with the vast majority of sites showing every sign of natural processes of vegetation succession and natural disturbance generating sufficient diversity of sites, species and growth rates to assure that future forest outcomes, left unaltered, would be just fine and beneficial for water quality and biological diversity outcomes. I note that Pollock and Beechie's (NMFS Northwest Science Center) stand modeling work, based on field-verified processes and rates of tree species recruitment, growth and mortality in the forest types of concern, shows this same outcome (and their simulations don't even include external stand disturbances like wildfire, floods, landslides, or major wind events).[4]

Further, Frissell et al. (2014) states that commercial log removal in Riparian Reserves should generally be prohibited:

> Thinning and fuels reduction by means of mechanized equipment or for commercial log removal purposes should be generally prohibited in Riparian Reserves and Key Watersheds. Any thinning or fuels treatment that does occur as a restorative treatment in Riparian Reserves (e.g., to remove non-native tree species from a site) should retain all downed wood debris on the ground. Thinning projects that involve road and landing (including those deemed "temporary") construction and/or reconstruction of road segments that have undergone significant recovery through non-use should also be prohibited, due to their long term impacts on critical watershed elements and processes.[5]

Commenters suggest that the Forest Service consider an alternative that allows natural processes and disturbances to prevail in the Riparian Reserve units within the Project since passive management may be the best approach to meet ACS objectives. This type of alternative is supported by Pollock and Beechie (2014) which states that "allowing riparian forests to naturally develop may result in the most rapid and sustained development of structural features important to most terrestrial and aquatic vertebrates."[6] Allowing natural processes to prevail will avoid the negative effects associated with commercial treatment, including impacts associated with sedimentation of stream habitats that may affect ESA-listed and other Forest Service sensitive species.

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[4] Chris Frissell, personal communication, January 15, 2019

[5] Frissell, CA, Baker RJ, DellaSala DA, Hughes RM, Karr JR, McCullough DA, Nawa RK, Rhodes J, Scurlock MC, and Wissmar RC. 2014. CONSERVATION OF AQUATIC AND FISHERY RESOURCES IN THE PACIFIC NORTHWEST: Implications of New Science for the Aquatic Conservation Strategy of the Northwest Forest Plan, FINAL REPORT, July 30, 2014.

[6] Pollock, Michael M. and Timothy J. Beechie, 2014. Does Riparian Forest Restoration Thinning Enhance Biodiversity? The Ecological Importance of Large Wood. Journal of the American Water Resources Association (JAWRA)
50(3): 543-559.

In discussing effects of the proposed action, the EA states that over the long-term (several decades), riparian thinning as proposed in this Project could accelerate the development of mature stand conditions and large wood inputs to streams, compared to the no action alternative. EA at 33. However, thinning may actually negatively affect the development of larger trees and thus the recruitment of large dead wood to streams over the long-term. As stated by Kim Kratz in a position paper to the Interagency Coordinating Subgroup,

> Thinning accelerated the development of large diameter trees by about 20 years such that there were more live trees > 18" dbh in the two decades following thinning, relative to the unthinned stand, but this advantage was short-lived. Three decades after thinning, there were more live trees > 18" dbh in the unthinned stand and five decades after thinning there were twice as many live trees >18" dbh in the unthinned stand relative to the thinned stand. A similar trajectory was observed for the live trees > 24" dbh.[7]

As shown in this study, over the long-term, unthinned stands may prove to better meet the ACS objectives by ultimately containing more large-diameter trees which serve as habitat and as a pool for recruitment of dead wood. The EA acknowledges this effect in stating that riparian thinning within the first STPH would lead to the production of fewer dead trees across a range of small to large sizes over the several decades following thinning, and a corresponding reduction in the amount of large wood delivered to streams. EA at 33. The Forest Service's focus on large wood input to streams also misses the fact that small wood can perform important hydrological and ecological functions. Thinning as proposed will capture mortality and remove smaller dead wood from the ecosystem, thus potentially delaying attainment of ACS objectives. The Forest Service needs to evaluate the impact that thinning will have on dead wood recruitment of all sizes and weigh whether management for large wood input will prove to be more beneficial in the long-term than passive management that allows for dead wood input of various sizes.

In any event, the Forest Service should implement diameter limits of 12" dbh for any thinning in Riparian Reserves in order to retain options for recruitment of large wood to aquatic ecosystems. The Forest Service should also define what "long-term" means in the context of the Project's effects on Riparian Reserves, and consider whether the Forest Service needs to think even further out in evaluating impacts from the proposed action. After all, the ACS approach is based on natural disturbance processes, so it may take decades, and possibly more than a century, to accomplish its objectives. NWFP S&Gs at B-9.

Overall, thinning in Riparian Reserves is likely to have significant impacts to the environment, so the Forest Service should prepare an EIS to further analyze and balance the tradeoffs associated with Riparian Reserve thinning. In the EIS, the Forest Service should also consider alternatives that allow natural processes to prevail in Riparian Reserves across the entire project area and at a level appropriate to serve as a middle-ground between all passive management and active management as currently proposed.

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[7] Kim Kratz, Ph.D., Issue Paper for Western Oregon. NMFS, Oregon State Habitat Office. 7-23-2010. Appendix 1. page 38.

Effects of Roads

The Project would maintain and reconstruct 157 miles of existing Forest System roads in the project area. EA at 39. An additional 7 miles of temporary roads would be constructed to facilitate heavy equipment access. *Id*. The Forest Service must take a hard look at the environmental impacts associated with road maintenance, reconstruction, and construction in the Project area. Some negative impacts of roads include:

- Soil disturbance, erosion, compaction, and loss of forest productivity.
- Pollution of streams through sedimentation and thermal loading.
- Hydrological modification through flow interception, accelerated run-off, and modification of peak flows.
- Impaired floodplain function.
- Barriers to movement of dead wood and spawning gravel downslope to aquatic habitat.
- Reduced recruitment of snags and down wood in terrestrial habitat.
- Habitat fragmentation and effects to wildlife dispersal.
- Vectors for weeds, human-caused fire ignitions, and litter.

Temporary roads also present significant risks to the health of the environment. Although "temporary" in name, temporary roads can have a lasting impact well beyond the implementation of a project, including impacts to soils, hydrology, native plant communities, water quality, and spread of weeds. The Forest Service should provide more explanation as to why an alternative that includes no temporary road construction would not meet the Project's purpose and need. As stated in the EA, an extensive road system with a density of more than 3.5 miles of road per square mile already exists within the Andy Creek-Fall Creek and Winberry Creek sub-watersheds. EA at 36. Why are 7 miles of temporary roads imperative to log the proposed units? A map illustrating what temporary roads the Forest Service deems necessary would be useful to help the public understand why a no temporary road construction alternative was eliminated from further study. The EA also states there is a backlog of deferred road maintenance within the Fall Creek watershed that has contributed to deterioration of project area roads and increased the risk of road failure. *Id*. Instead of expending resources to build and rehabilitate temporary roads, the Forest Service can choose to focus resources on existing roads that won't further add to the existing road network footprint and density within the project area.

Furthermore, the Forest Service should evaluate whether any roads in the project area are suitable for closure, decommissioning, and storage. Doing so would allow the Forest Service to both reduce the backlog of deferred road maintenance while also reducing the negative effects that roads have on the environment.

For example, the road to units 24–26 is an old road overgrown with vegetation and currently inaccessible to vehicles. Invasives including Scotch broom and blackberry are abundant along the main road that would lead into the renovated spur road. The Forest Service should keep this road closed to avoid adding to the already massive road network, avoid spreading these weeds further, and work to mitigate the invasive weeds present. Unit 16 would need temporary road access and should be dropped.

^Old road with regrown vegetation (43.917010, -122.595489).

Fire Impacts

Commenters are generally supportive of careful thinning of small trees in fire-suppressed forests to reduce fire risk, but thinning for fire-risk reduction should be accomplished without removal of larger fire-resistant trees that are valuable habitat trees.

The EA states that commercial thinning would have minimal effect on fire behavior in stands within the project area, under the weather conditions that were modeled. EA at 22. However, the EA then states that if the proposed action does not take place, wildfires could potentially burn more acres due to increases in fuel loading, homogenous stand conditions, and ladder fuels. EA at 23. How will commercial thinning have a minimal effect on fire behavior, yet without commercial thinning, wildfires could potentially burn more acres? The Forest Service needs to take a hard look at the impacts the Project will have on fire behavior and risk in the Project area to address this inconsistency.

The beneficial effect of thinning on fire risk depends on how heavy-handed the thinning prescription is. Heavy thinning will stimulate the growth of surface and ladder fuels that make fire hazard worse and will require more frequent and more expensive fuel maintenance. Disturbance of soil through the use of heavy equipment can also stimulate growth of hazardous fuels and weeds that make fire hazard worse. Oregon State University Extension Service explains that:

> Opening up the stand significantly will dry surface fuels due to increased light levels, surface winds and temperatures. This may increase surface fire intensity and rate of spread unless total surface fuel loading is reduced. In addition, thinning that allows significant light to reach the forest floor may result in the regrowth of small trees and shrubs, which over time become new ladder fuels.[8]

Indeed, the EA acknowledges that in the short term (1 to 5 years) until fuel treatments are completed, commercial harvest would contribute to higher surface fuel loading which would lead to higher fire intensity. While activity fuels treatments are planned to reduce higher fuel loading, the effectiveness of any fuels treatment declines over time, with the likely effectiveness for about 10 years. EA at 25, citing Davies et al., (2004). Fuel treatments proposed for the Project including machine piling, hand piling, yarding with tops and limbs attached to a landing and then burning the piles, and under burning. EA at 9.

Even with effective fuel treatments to remove fuels generated by commercial logging, the proliferation of understories after logging has significant implications for fuel hazard and fire control.

> [P]otential shrub responses to reduction in stand densities 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; … Such understories can provide significant ground fuels for wildfires, thereby negating some of the positive effects of thinning on fire behavior. The potential for development of shrubby understories can initially be assessed on the basis of plant association; i.e., plant associations vary significantly in potential understory responses. Current stand conditions provide another important measure. Hence, the potential for developing undesirable levels of understory fuels needs 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 (e.g., grasses or shrubs).[9]

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[8] Fitzgerald S and Bennett M. 2013. A Land Manager's Guide for Creating Fire-Resistant Forests. EM 9087. OSU Extension.

[9] Johnson KN and Franklin JF 2009. Restoration of Federal Forests in the Pacific Northwest: Strategies and Management Implications.

Accordingly, the Forest Service needs to take a hard look at the effects on fire behavior and risk posed by the proposed action. In thinning the proposed units, the Forest Service should evaluate the effects of leaving a higher canopy closure which would help alleviate the negative effects of open canopies on fuels and fire risk. The EA describes an alternative considered but eliminated from detailed study that includes thinning with a prescription that maintains more of the stands' canopy, but the brief discussion of this alternative does not mention the effect on fuels and fire. The Forest Service should conduct more analysis on this alternative. The Forest Service should also further evaluate the effects on fuels and fire risk as informed by the plant associations in each proposed unit, and how the plant association would influence the vegetative response to thinning as described by Johnson and Franklin (2009).

Northern Spotted Owl

Commenters are concerned about the impacts of the proposed action on the northern spotted owl as continued habitat loss and barred owl competition continue to drive the species towards extinction. The Project proposes about 3,963 acres of commercial thinning in managed stands. Capable spotted owl habitat makes up 84 of these acres, dispersal habitat 3,619 acres, and suitable habitat 260 acres. Additionally, 932 acres of dispersal habitat and 158 acres of suitable habitat occur in northern spotted owl critical habitat. EA at 27-28. Overall, the Project would downgrade 67 acres of foraging to dispersal habitat within designated critical habitat, remove 114 acres of dispersal habitat, maintain 193 acres of foraging habitat (91 within critical habitat), maintain 3,505 acres of dispersal habitat (932 in critical habitat), and maintain 84 acres of capable habitat. EA at 29. There are 33 known spotted owl home ranges that overlap the project area, and 20 activity centers within the project boundary, including 16 in critical habitat. EA at 28. Eight home ranges, including 5 in critical habitat, have proposed commercial thinning within nest patches, totaling 93 gross acres. *Id.*

The Forest Service should consider an alternative that poses less impacts to spotted owl habitat, including by avoiding downgrading of 67 acres of foraging to dispersal habitat and removal of 114 acres of dispersal habitat. Consideration of such an alternative is important to help maximize the northern spotted owl's chance of survival in the face of continued habitat loss. Logging in suitable habitat, including thinning that maintains current habitat designations, disrupts the behavior of nesting birds and can harm other aspects of life needs. The BLM has acknowledged that:

> Current research has shown that spotted owls are likely to increase the size of their home ranges to utilize untreated stands in preference to newly treated stands both during and after harvest. Factors that reduce the quality of habitat within a home range or cause increased movement by owls in order to meet prey requirements may decrease the survival and reproductive fitness of owls at that site (Meiman *et al.,* 2003).[10]

[10] Roseburg BLM 2010. Third Elk Commercial Thinning EA.

Additionally, Courtney (2004) summarized spotted owl habitat use studies and found positive relationships between spotted owl habitat use and several forest attributes that are detrimentally affected by thinning, including canopy volume, canopy closure, snag basal area, or volume, and log volume.[11]

Spotted owl foraging is positively associated with snag and dead wood volume, both of which are adversely affected by commercial logging which has long-term effects on dead wood recruitment.

> Foraging activity is positively associated with tree height diversity (North et al. 1999, p. 524), canopy closure and woody debris (Irwin et al. 2000, p. 180; Courtney et al. 2004, pp. 5-15), snag volume, density of snags greater than 20 in (50 cm) dbh (North et al. 1999, p. 524; Irwin et al. 2000, pp. 179-180; Courtney et al. 2004, pp. 5- 15), density of trees greater than or equal to 31 in (80 cm) dbh (North et al. 1999, p. 524), volume of woody debris (Irwin et al. 2000, pp. 179-180), and young forests with some structural characteristics of old forests (Carey et al.1992, pp. 245-247; Irwin et al. 2000, pp. 178-179). Habitat use is influenced by prey availability. Ward (1990, p. 62) found that spotted owls foraged in areas where the occurrence of prey was more predictable within older forests and near ecotones of old forest and brush seral stages. The availability or abundance of prey can in turn influence reproductive success (Rosenburg et al. 2003, pp. 1720-1723).[12]

The EA acknowledges that thinning degrades habitat when dead, downed and dying trees are harvested because it reduces deadwood that provides habitat for spotted owl prey, and that in the longer-term thinning can reduce future deadwood abundance compared to if a stand is not thinned. EA at 28. Flying squirrels are an important prey species for northern spotted owls in all parts of the owl's range. Given the importance of flying squirrels to the diet of the spotted owl, the Forest Service must ensure that thinning does not significantly reduce the flying squirrel population. Recent evidence shows that thinning does in fact lead to a multi-decade decline in the number of flying squirrels. Manning et al (2011) found that densities of flying squirrels are particularly sensitive to thinning in young Douglas-fir forests for at least 12 years after treatment.[13] Additionally, Wilson and Forsman (2013) found that:

> [T]hinning reduces the abundance of some tree-dwelling rodents, especially Northern Flying Squirrels (Glaucomys sabrinus) and Red Tree Voles (Arborimus longicaudus), that are important prey species for Northern Spotted Owls (Strix occidentalis caurina). Recent studies suggest that reductions in Northern Flying Squirrel abundance following thinning may be driven by increased susceptibility

[11] Courtney SP, Blakesley JA, Bigely RE, Cody ML, Dumbacher JP, Fleischer RC, Franklin AB, Franklin JF, Gutierrez RJ, Marzluff JM, and Sztukowski L. 2004. Scientific evaluation of the status of the Northern Spotted Owl. Sustainable Ecosystems Institute.

[12] Fish and Wildlife Service 2024. Sand Lake Biological Opinion.

[13] Manning T, Hagar JC, and McComb BC. 2011. Thinning of young Douglas-fir forests decreases density of northern flying squirrels in the Oregon cascades. Forest Ecology and Management, Vol. 261, issue 1. 1 January 2011.

> to predation created by removal of critical above-ground cover. Predation, lack of canopy connectivity, and reduction in suitable nest substrates may all contribute to reduced Red Tree Vole abundance following thinning. The longterm benefits of some thinning treatments may be positive for both flying squirrels and Red Tree Voles, but may not be realized for several decades or more, as the development of a midstory layer of trees may be critical to the success of thinning in promoting habitat for these species.[14]

Commenters appreciate PDF Silviculture 8 that retains all existing large downed wood > 10 inches, and that PDF Wildlife 27 calls for retention of snags 10" DBH or greater unless they pose a safety hazard. However, the Forest Service should expand PDF Wildlife 27 to apply to all units in the project that contain any level of spotted owl habitat, not just portions of units that are within MA-9d. Doing so will help preserve important habitat features for spotted owl prey, and ultimately increase the chance of survival for the northern spotted owl.

Preserving as much spotted owl habitat as possible is also extremely important in light of competitive pressure from the barred owl. The barred owl recently invaded the range of the spotted owl, uses similar habitat, and consumes many of the same food sources. Hundreds of thousands of acres of suitable owl habitat that were assumed in the NW Forest Plan to be available for spotted owl nesting, roosting, and foraging are now occupied and defended by territorial barred owls to the exclusion of spotted owls. Accordingly, there is an urgent need to protect additional suitable spotted owl habitat while also reducing the loss of new habitat in order to increase the likelihood of spotted owl survival.

As stated by Jenkins et al. (2021),

> Barred owls not only limit the amount and distribution of available resources for spotted owls within shared foraging areas, but also exclude spotted owls from historical nesting areas via interspecific territoriality (Wiens et al. 2014). Our study indicated that this combination of exploitation and interference competition from barred owls also results in increased breeding dispersal of spotted owls, as shown by an increasing annual probability of breeding dispersal in regions with an increasing occurrence of barred owls. Previous work has documented a negative effect of barred owl presence on spotted owl territory occupancy and detection probability (Olson et al. 2005, Pearson and Livezey 2007, Yackulic et al. 2019, Duchac et al. 2020), which could represent increased mortality or emigration. Additionally, Yackulic et al. (2014) found evidence that spotted owls were less likely to colonize areas already occupied by barred owls, supporting the hypothesis that barred owls reduce territory availability and/or quality for dispersing spotted owls. Increased occupancy of study areas by barred owls was associated with

[14] Wilson TM and Forsman E. 2013. Thinning effects on spotted owl pretty and other forest-dwelling small mammals. In: Anderson PD, Ronnenberg KL, eds. Density management for the 21st Century: west side story. Gen. Tech. Rep. PNW-GTR-880. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 79–90.

> greater breeding dispersal distances for spotted owls in our study areas, suggesting that it has become more difficult for spotted owls to locate favorable habitat conditions (Jenkins et al. 2019*a*).[15]

Forsman et al.'s 2011 report "Population Demography of Northern Spotted Owls" corroborates the need to protect more than just a subset of the highest quality spotted owl habitat as contemplated in Recovery Action 32:

> We also found a negative relationship between recruitment rates and the presence of Barred Owls and a positive relationship between recruitment and the amount of suitable owl habitat in the study areas. Recruitment was higher on federal lands where the amount of suitable owl habitat was generally highest. [p 75] …
>
> While our observational results do not demonstrate cause–effect relationships, they provide support for the hypothesis that the invasion of the range of the Spotted Owl by Barred Owls is at least partly the cause for the continued decline of Spotted Owls on federal lands. Our results also suggest that Barred Owl encroachment into western forests may make it difficult to insure the continued persistence of Northern Spotted Owls (see also Olson et al. 2004). The fact that Barred Owls are increasing and becoming an escalating threat to the persistence of Spotted Owls does not diminish the importance of habitat conservation for spotted Owls and their prey. In fact, the existence of a new and potential competitor like the Barred Owl makes the protection of habitat even more important, since any loss of habitat will likely increase competitive pressure and result in further reductions in Spotted Owl populations (Horn and MacArthur 1972, Olson et al. 2004, Carrete et al. 2005). [p 76] …
>
> Our results and those of others referenced above consistently identify loss of habitat and Barred Owls as important stressors on populations of Northern Spotted Owls. In view of the continued decline of Spotted Owls in most study areas, it would be wise to preserve as much high quality habitat in late-successional forests for Spotted Owls as possible, distributed over as large an area as possible. This recommendation is comparable to one of the recovery goals in the final recovery plan for the Northern Spotted Owl (USDI Fish and Wildlife Service 2008), but we believe that a more inclusive definition of high-quality habitat is needed than the rather vague definition provided in the 2008 recovery plan. Much of the habitat occupied by Northern Spotted Owls and their prey does not fit the classical definition of "old-growth" as defined by Franklin and Spies (1991), and a narrow definition of habitat based on the Franklin and Spies criteria would exclude many areas currently occupied by Northern Spotted Owls. [p 77].[16]

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[15] Jenkins, J. M. A., D. B. Lesmeister, E. D. Forsman, K. M. Dugger, S. H. Ackers, L. S. Andrews, S. A. Gremel, B. Hollen, C. E. McCafferty, M. S. Pruett, J. A. Reid, S. G. Sovern, and J. D. Wiens. 2021. Conspecific and congeneric interactions shape increasing rates of breeding dispersal of northern spotted owls. Ecological Applications 31(7):e02398. 10.1002/eap.2398.

[16] Eric D. Forsman, Robert G. Anthony, Katie M. Dugger, et al. 2011. Population Demography of

While the stands proposed for treatment in the Project are not late-successional forests, downgrading and removing spotted owl habitat will slow recruitment of future suitable late-successional habitat for the northern spotted owl. The Forest Service should consider the effects of habitat removal on the spotted owl in light of competitive pressures from the barred owl and provide a more thorough environmental analysis in an EIS. The Project EA and associated Wildlife Biological Evaluation and Wildlife Report completely fail to discuss the effects of barred owl on the northern spotted owl, and thus likely fails to take a hard look as required under NEPA.

Commenters also note that the EA indicates nearly all known spotted owl home ranges and activity centers are based on survey results from the 1990s. EA at 28. The Forest Service should disclose why it is relying on surveys from the 1990s to inform spotted owl presence in the project area today, and explain why it chose not to conduct surveys using the 2011 Protocol for Surveying Proposed Management Activities that may Impact Northern Spotted Owls endorsed by the U.S. Fish and Wildlife Service (2011 Protocol). As noted in the 2011 Protocol, research on spotted owl has provided insights that raised concerns regarding effectiveness of surveys, particularly those which do not result in spotted owl detections. Specifically, presence of barred owl was noted to have a suppression effect on spotted owl response rate, and survey results that do not account for barred owl effects on spotted owl detection rates may provide false or insufficient information about spotted owl presence in survey areas and ultimately lead to forest management activities that may impact spotted owls in conflict with the Endangered Species Act.[17] Use of the 2011 Protocol serves two primary purposes: (1) provide a methodology that results in adequate coverage and assessment of an area for the presence of spotted owls, and (2) ensure a high probability of locating resident spotted owls and identifying owl territories that may be affected by a proposed management activity, thereby minimizing the potential for unauthorized incidental take.[18] The Forest Service must provide updated information using more recent surveys to help inform its NEPA analysis before making a decision for the Project.

To more accurately detect spotted owl presence, the Forest Service should conduct surveys using ARUs. Duchac et al. (2020) stated "ARUs can effectively detect Northern Spotted Owls when they are present, even in a landscape with high Barred Owl density, thereby facilitating the use of passive, occupancy-based study designs to monitor Northern Spotted Owl populations."[19] Additionally, Appel et al. (2023) stated:

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Northern Spotted Owls. University of California Press. No. 40 in Studies In Avian Biology by the Cooper Ornithological Society. https://www.ucpress.edu/book/9780520270084/populationdemography-of-northern-spotted-owls,

[17] Protocol for Surveying Proposed Management Activities that may Impact Northern Spotted Owls, U.S. Fish and Wildlife Service, Revised January 9, 2012, p. 4.

[18] *Id*. at 4-5.

[19] Duchac LS, Lesmeister DB, Dugger KM, Ruff ZJ, and Davis RJ. 2020. Passive acoustic monitoring effectively detects Northern Spotted Owls and Barred Owls over a range of forest conditions. *The Condor*, Volume 122, Issue 3, 4 August 2020, duaa017, https://doi.org/10.1093/condor/duaa017.

> Given the sensitivity of spotted owls to land management decisions, it is critical that survey methods—especially those designed to inform protection levels by determining pair status—account for imperfect detection of pairs, which are the most important biological unit in need of protection. The probability of detecting and classifying a pair where present (0.03 at a single station and week) was quite low and suggests that a requirement for detecting both female and male owls to determine pair status with high confidence would require an extensive and onerous survey effort and may be unachievable. We suggest that single detections could be used as an alternative benchmark to ensure protection of sites used by spotted owl pairs. Stations in hexagons with potential spotted owl pairs had the highest weekly detection probability (0.169), most likely driven by males exhibiting more active calling behavior in territorial defense when paired. This pattern of higher detectability for paired owls has been observed previously (Duchac et al., 2020; Tempel & Gutiérrez, 2013). … We agree with Olson et al. (2005) that these detection probabilities are sufficient for many studies, but the consequences of missing a pair or of misidentifying a pair as a single owl are high when management actions are dependent on correctly classifying states. Using only naïve survey results and requiring both sexes to be detected as the basis of pair determinations would likely result in loss of habitat and be detrimental for spotted owl pairs. Female spotted owls call less frequently than males, especially away from the nest and using the 4-note hoot (Ganey, 1990; Reid et al., 1999; Wood, Schmidt, et al., 2019); therefore, female calling behavior is important to consider when determining pair status. Reid et al. (1999) found that male spotted owls were more than twice as detectable as females using the commonly employed 10-min nighttime callback protocol designed to detect territorial owls (Franklin et al., 1996). Using passive acoustic monitoring, we detected female 4-note calls only in hexagons where males were also detected.").[20]

Overall, the Forest Service must take into account the effects of barred owls and utilize current spotted owl surveys to inform its environmental analysis and take the hard look required under NEPA. The Forest Service should address these deficiencies in the EA, as well as evaluate an alternative that avoids degrading and removing spotted owl habitat. The Forest Service should consider preparing an EIS to fully evaluate the environmental impacts on northern spotted owls.

Cumulative Impacts

Although not expressly required under the U.S. Department of Agriculture NEPA regulations found at 7 CFR 1b, the Forest Service should consider the cumulative impacts of this Project that evaluates past, present, and reasonably foreseeable projects that overlap in time and space with the Station Butte project area. In particular, what are the cumulative impacts on northern spotted owls and its habitat in light of other projects in the vicinity?

[20] Appel C L, Lesmeister DB, Duarte A, Davis RJ, Weldy MJ, and Levi T. (2023). Using passive acoustic monitoring to estimate northern spotted owl landscape use and pair occupancy. Ecosphere, 14(2), e4421. https://doi.org/10.1002/ecs2.4421.

Conclusion

Each substantive issue addressed by Commenters should be considered by the Forest Service and used to develop NEPA alternatives that attempt to balance the tradeoffs of logging in upland stands and Riparian Reserves in different ways. Commenters urge the Forest Service to conduct an EIS for the Station Butte project because the Project is likely to have reasonably foreseeable significant impacts on the human environment, primarily through impacts to Riparian Reserves, impacts to fuels and fire risk, and impacts to northern spotted owl viability.

Thank you for considering these comments and engaging with the public for this Project.

Sincerely,

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