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Via: <https://cara.fs2c.usda.gov/Public/CommentInput?Project=67995>

Subject: Cala-Wiley Environmental Assessment

Please accept the following comments from Oregon Wild and Cascadia Wildlands (“Commenters”) concerning the Cala-Wiley 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 upland stand growth, diversity, and structure; improve structural diversity and complexity of riparian vegetation to control stocking and accelerate attainment of Aquatic Conservation Strategy Objectives (“ASCOS”); and support local economies with forest products. EA at 3-4. To accomplish these purposes, the Project proposes the following treatments and activities:

Upland Thinning:	320 acres
Riparian Reserve Thinning:	273 acres
Gaps:	75 acres
Dominant Tree Release:	73 acres
Skips (No Harvest):	158 acres
Road Maintenance:	92 miles
Fuels Treatments Post-Harvest:	742 acres

A total of 899 acres of commercial thinning are proposed for the Project using a combination of thinning, dominant tree release, gap creation and skips. The Project proposes to thin only in

plantations less than 80 years old, with ages ranging from 30 to 63 years old. Harvesting will be accomplished using helicopter, skyline, and ground-based yarding. EA at 5.

Please consider the following comments regarding the Project as described in the EA.

Commercial Thinning in Upland Stands

Commenters are generally supportive of carefully planned and implemented thinning in dense, young plantations under 80 years old. We appreciate that the Project only proposes commercial thinning in stands ranging from 30 to 63 years old on approximately 320 acres. Proposed treatment in these upland thinning stands includes a combination of commercial thinning, gaps, dominant tree releases, and skips and will be accomplished through variable density thinning. EA at 5. The EA characterizes the plantation stands as overstocked and having an average of 220 trees per acre and 70% canopy cover. The area is composed mostly of Douglas-fir and western hemlock. EA at 15. Stands would be thinned to between 34 and 53 percent canopy cover and would retain 38 to 105 trees per acre. EA at 6.

Thinning in young plantations 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 wildlife species and habitat, impacts to future recruitment of snags and down wood, spread of invasive plants and weeds and impacts to fire hazard caused by modified microclimates, movement of fuels, and growth of new fuels. In all, thinning in young plantations has negative effects on the environment; however, it is generally accepted that the benefits of thinning in young plantation stands outweighs the adverse impacts, thus creating net benefits.

Two common consequences of conventional thinning practices include 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 According to the EA, the units proposed for thinning in the Project likely already exhibit a uniform forest structure and composition, given that these are previously managed stands. Commenters are particularly concerned with the impact on development of snags or down wood. 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 northern spotted owl and the small mammals that are their prey.

Several small mammals, including the northern flying squirrel, form the prey base for northern spotted owl and are among the species associated with abundant large dead standing and down wood. The fruiting bodies of hypogeous fungi are a food source for northern flying squirrels and

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.

are also associated with down logs. This suggests that there are complex, indirect paths through which dead wood support northern spotted owls.³ Commenters appreciate that the Project contains a Project Design Feature (“PDF”) to retain all snags, regardless of dbh.

Commercial thinning reduces long-term recruitment of snags and down wood because thinning reduces the pool from which these habitat features will be recruited from in the future. In the longer term, the consequences of reducing the recruitment pool include decreased availability of habitat, associated impacts on listed species including northern spotted owl, and decreased storage of carbon in the ecosystem. The Forest Service should ensure that sufficient trees remain after thinning to provide a sufficient pool for future recruitment of snags and down wood. The current thinning prescription provides for retention of 38 to 105 trees per acre post-thinning. Please provide more analysis regarding how dead wood recruitment will be impacted depending on how many trees are retained, and how that will affect dead wood dependent species. The range of tree retention varies considerably, so the effects likely do as well.

Commenters also appreciate that the Project contains a PDF to retain legacy trees. Legacy trees are vital for habitat function and serve as a pool of future snags and down wood. Commenters suggest that this PDF specify that all trees greater than 20” dbh will be retained in order to protect the larger, more resilient trees in each stand. Commenters previously conducted some field checking and submitted scoping comments to the Forest Service which contained descriptions of different units proposed for treatment. Those scoping comments are incorporated by reference. Field checking in Unit 158 revealed an average dbh of around 30”, but many trees exceeding 40” dbh. Commenters do not believe that commercial logging of larger trees in Unit 158 meets the first purpose and need of the Project, and we urge the Forest Service to retain all large trees found in this unit and any other similar units proposed for treatment. Additionally, Commenters noted that Unit 170 supports high wildlife and plant diversity as evidenced by the presence of burrowing mammal holes, ferns with signs of herbivory, presence of pollinators, an understory of water-loving native plants, and the presence of the rare quinine conk. Commenters urge the Forest Service to drop Unit 170 in order to protect this rich and diverse stand.

The commercial thinning units are proposed in various land allocations under both the Willamette Forest Plan and the Northwest Forest Plan (“NWFP”). Under the NWFP, the Project proposed commercial thinning on approximately 17 acres of designated Late Successional Reserve (“LSR”). Thinning in this stand would maintain at least 40% canopy cover, 10% of the stand will be placed in skips, and there will be a diameter limit of 20” for harvest trees. EA at 6. Under the NWFP, thinning or other silvicultural treatments in stands under 80 years old within LSRs are subject to review by the Regional Ecosystem Office (“REO”) to ensure that the treatments are beneficial to the creation of late-successional forest characteristics. NWFP S&G at C-12. Treatment proposed within LSRs for the Project will be conducted pursuant to REO

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.

exemption 801. EA at 6. REO exemption 801 is an amendment to REO exemption 694, dated July 9, 1996.

While the EA states that thinning would maintain at least 40% canopy cover with 10% of the stands placed in skips and that there will be a diameter limit of 20 inches for harvest trees, the EA does not otherwise describe how all of the objectives, stand attributes and treatment standards will be met, as required for silvicultural treatment to be exempted from REO review pursuant to REO exemption 694/801. The Forest Service should augment its analysis in the EA to demonstrate exemption from REO review from the LSR stand proposed for treatment. REO exemption 694-801 is clear that **all** criteria must be met, and the current analysis does not meet this bar. Please also provide more information concerning the proposed stand conditions with the LSR stand that is proposed for logging, including which unit number this stand falls within. Is the LSR unit proposed for thinning similar to the other plantation units? Or does this stand exhibit different characteristics in terms of average tree size, presence of legacy trees, species and structural diversity, and other habitat components such as snags and downed wood?

Commercial Thinning in Riparian Reserves

The Project proposes to commercially thin approximately 274 acres within Riparian Reserves to accelerate attainment of ASCOs. EA at 5. The stands proposed for commercial thinning are characterized as young, even-aged conifer plantations. EA at 17. Commercial thinning in Riparian Reserves was proposed because the Forest Service determined that ASCO #9 could be attained quicker because thinning would increase plant species and structural diversity more quickly than natural, density-related mortality thinning. EA at 17-18. Treatments in Riparian Reserves would maintain at least 40% canopy cover and 60 trees per acre and would retain all legacy trees. PDF Aquatics X, EA at 50.

Commenters are concerned about the impacts to aquatic habitats caused by commercial thinning within Riparian Reserves. Commercial removal of trees and reduction in canopy cover may have detrimental impacts to microclimate, stream temperature, and long-term wood recruitment. Riparian vegetation is important in several ways. It shades the water surface from direct solar exposure; it shades soils and shallow groundwater before it is discharged to streams; it reduces wind penetration and air mass mixing over the water surface, insulating the stream from summer daytime warming or winter night time cooling; and it stabilizes streambanks and floodplain surfaces and provides a supply of downed wood that helps keep channels narrow while also establishing and maintaining hydrologic complexity. While the Project does contain a PDF for no harvest buffers around streams, the PDF allows for commercial harvest as close as 30 feet from streams in some instances. PDF Aquatics 1, EA at 50. Commercial logging close in to streams raises concerns about shade, sediment, and wood recruitment.

The NWFP prohibits timber harvest in Riparian Reserves, except as described in three exceptions, including when applying silvicultural practices to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics *needed* to attain ASCOs. NWFP S&G at C-31-32 (emphasis added). The Forest Service therefore carries the burden to establish that the need for thinning and the biological outcomes from thinning produce a net positive

result in Riparian Reserves. Yet, the analysis performed in the EA does not clearly demonstrate that commercial thinning in Riparian Reserves is needed to attain ASCOs. As stated in the EA, the stands within Riparian Reserves would self-thin through natural, density-related mortality leading to plant species and diversity. Taking no action in Riparian Reserves would also benefit dead wood recruitment which provides inputs to duff and soil processes, provide cover for wildlife species, and provide foraging habitat for wildlife species. EA at 17. The Forest Service should drop proposed commercial treatments within Riparian Reserves and instead either conduct non-commercial treatments by hand or allow natural processes and disturbances to improve structural and species diversity over time. Despite a delay in development of late-successional characteristics through no action, no action will avoid the negative trade-offs associated with commercial thinning and use of heavy machinery.

Allowing natural processes to prevail in Riparian Reserves is supported by scientific literature. Pollock and Beechie (2014) found 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.⁴ Concerning the impacts on deadwood production, Pollock and Beechie found that thinning minimally increased the production of large diameter deadwood > 100cm, while causing substantial losses in deadwood 30-50 cm and 50-100 cm diameter, with no acceleration in the production of these class sizes. This finding suggested that thinning was not an effective approach for increasing the abundance of ecologically functional deadwood in young, planted stands of Douglas-fir forests.⁵ Accordingly, allowing natural processes to prevail will help correct any shortage of dead wood present in the Riparian Reserve stands proposed for commercial thinning.

Further, thinning can reduce the long-term abundance of large diameter live trees compared to thinned stands. In a study by Kim Kratz, thinning accelerated the development of large diameter large trees by about 20 years such that there were more live trees > 18" dbh in the two decades following thinning relative to an unthinned stand. However, three decades after thinning, there were more live trees > 18" dbh in the unthinned stand. Five decades after thinning there were twice as many live trees >18" dbh in the unthinned stand relative to the thinned stand.⁶

Frissell et al. (2014) described negative impacts from commercial log removal in Riparian Reserves. Use of heavy machinery in Riparian Reserves can also disturb vegetation and soils in close proximity to surface water, where the risk of sediment delivery and other impacts is demonstrably higher. Logging activities that disturb soil within riparian buffers can reduce the buffer's effectiveness to retain sediment and nutrients delivered from upslope sources. Further, thinning within riparian and wetland areas can cause decades of diminished summer low flows

⁴ 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.

⁵ *Id.*

⁶ Kim Kratz, Ph.D., Issue Paper for Western Oregon. NMFS, Oregon State Habitat Office. 7-23-2010. Appendix 1. page 38.

as a consequence of increased water demand by rapidly re-growing vegetation.⁷ Overall, Frissell et al. (2014) concludes that thinning and fuels reduction by means of mechanized equipment or for commercial log removal purposes should generally be prohibited in Riparian Reserves and key watersheds.⁸

Commenters urge the Forest Service to drop proposed thinning in Riparian Reserves within the Project area. At the very least, the Forest Service must conduct further analysis to weigh the adverse effects against the positive outcomes of thinning in Riparian Reserves. The Project EA contains a table of trade-offs of commercial thinning versus natural thinning, but this table does not weigh the trade-offs. Instead, the table appears to identify habitat features and lists the Project PDFs that will maintain or create those features. Accordingly, the analysis of proposed thinning in Riparian Reserves is currently deficient. In the event the Forest Service conducts thinning in Riparian Reserves, the Forest Service should implement a 12" dbh diameter limit to help preserve future recruitment of dead wood to the ecosystem.

Impacts to Northern Spotted Owl

Commenters are concerned about the impacts of the Project on the northern spotted owl as habitat loss and barred owl competition continue to drive the species towards extinction. The Project proposes 899 acres of commercial thinning of which 517 acres are in capable northern spotted owl habitat and 382 acres are in dispersal habitat. EA at 27. Approximately 486 acres in northern spotted owl Critical Habitat Subunit WCS3 would be harvested. *Id.* 260 acres of dispersal habitat are proposed to be moderately thinned to 40% canopy cover or greater, which would maintain the habitat. Approximately 122 acres would be thinned to no less than 35% canopy cover, which would remove dispersal habitat. EA at 28. Six known spotted owl nest sites overlap with proposed treatment, but no treatments are proposed in suitable habitat or owl nest patches. *Id.* The EA states that the Project does not include treatments that would impair northern spotted owl territories, and that treatments in critical habitat would remove a negligible amount of dispersal owl habitat within the WCS3 subunit and thus not create barriers or strong filters to spotted owl movement. EA at 27-29. Because treatments in critical habitat will remove a negligible amount, the EA states that the proposed action may affect but is not likely to adversely affect northern spotted owl critical habitat.

The Forest Service should consider an alternative that minimizes impact to northern spotted owl habitat through avoiding removal of the 122 acres of dispersal habitat in both northern spotted owl nest site core areas and home ranges. Even if units thinned to 35% canopy cover would reclose their canopies in approximately 10 to 15 years, the effects of commercial thinning may still impact the species. Meiman et al. (2003) states that northern spotted owl 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

⁷ 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.

⁸ *Id.*

range or cause increased movement by northern spotted owl in order to meet prey requirements may decrease the survival and reproductive fitness of owls at that site.⁹ 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.¹⁰

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).¹¹

By affecting long-term recruitment of snags and downed wood in the Project area through commercial thinning, the abundance of prey species for northern spotted owl are also affected. One important prey species throughout the northern spotted owl's range is the flying squirrel. Recent evidence shows that thinning leads 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.¹² 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 to predation created by removal of critical above-ground cover. Predation, lack of

⁹ Meiman, S., Anthony, R., Glenn, E., Bayless, T., Ellingson, A., Hansen, M. C., & Smith, C. (2003). Effects of Commercial Thinning on Home-Range and Habitat-Use Patterns of a Male Northern Spotted Owl: A Case Study. *Wildlife Society Bulletin (1973-2006)*, 31(4), 1254–1262.

<http://www.jstor.org/stable/3784476>

¹⁰ 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.

¹¹ Fish and Wildlife Service 2024. Sand Lake Biological Opinion.

¹² 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.

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.¹³

Additionally, northern spotted owl face serious competitive pressure from the barred owl, so maintenance of as much spotted owl habitat as possible is vital for the species' survival. However, the EA fails to analyze the impacts of barred owl on northern spotted owl for the Project. Jenkins et al. (2021) stated that:

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 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. 2019a).¹⁴

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

¹³ 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.

¹⁴ 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.

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].¹⁵

While the stands proposed for treatment in the Project are not late-successional forests or suitable northern spotted owl habitat, commercial thinning in capable and dispersal habitat will slow recruitment of future suitable habitat for the species. The Forest Service needs to further analyze the impacts of the proposed action on the survival of northern spotted owl, specifically by analyzing impacts on snag and deadwood recruitment, impacts to spotted owl prey species, and impacts from barred owl encroachment. Additional analysis in the EA is needed.

Road Maintenance and Temporary Road Construction

The Project would require about 92 miles of pre-haul road maintenance and approximately 8.9 miles of temporary non-system roads. EA at 6. The 8.9 miles of existing non-system roads have 20 stream crossings. EA at 32. Commenters appreciate the Forest Service’s recognition of the impacts of roads including on introduction of sediment to streams, side slope failures and landslides, impacts on groundwater flow and storage, and floodplain connection and storage among other impacts. See EA at 31. In addition, road maintenance, reconstruction, and construction can create barriers to movement of dead wood and spawning gravel to aquatic habitat; fragment habitat and impact wildlife dispersal; and serve as vectors for weeds, human-caused fire ignitions, and litter.

¹⁵ Eric D. Forsman, Robert G. Anthony, Katie M. Dugger, et al. 2011. Population Demography of 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>.

Given the impacts of roads on the environment, the Forest Service should consider whether there are additional roads that can be decommissioned after implementation of the Project. Additionally, the Forest Service should aim to reduce the number of non-system roads that are needed for the Project and focus any commercial thinning in units that are currently accessible from the existing road system. Doing so will avoid some of the negative impacts from roads on the Project area.

In particular, Commenters note previous scoping comments regarding Unit 129. While the proposed treatment in Unit 129 itself does not pose serious concerns, Commenters are concerned about roadwork on and along forest road 430 which is comprised of high quality old growth forest habitat. This forest contained numerous large trees and snags, healthy ground cover, favorable habitat for species like northern spotted owl, and signs of large mammals. Commenters again urge the Forest Service to consider an approach to thinning in Unit 129 that does not require forest road 430 to be rebuilt. The impact of road building here could potentially disturb wildlife currently using the area for habitat that is already very limited on the landscape.

Commenters are also concerned about wet season haul. It is not in the public interest to allow wet season hauling because of the sediment and turbidity impacts it creates which in turn affects fish and their habitat and the public's water quality. The impacts are a cost created by the timber industry which is then borne by the public. Additionally, wet season haul is inconsistent with the ASCOs, especially where roads cross streams or are in riparian reserves, or where drainage may be connected to streams. Specifically, wet season haul may prevent the attainment of ASCO #5: "Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport." Mitigation and design features are partially effective at best. The Forest Service should reconsider allowing wet season haul during implementation of the Project.

Impacts of Commercial Thinning on Fire Risk

Commenters are generally supportive of careful thinning of small trees in fire-suppressed forests to reduce fire risk. To the extent there are any legacy trees in the units proposed for thinning, those trees should be retained because of their increased fire-resiliency compared to the younger cohort of trees in the plantation stands.

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 weeds that make fire hazard worse. Oregon State University Extension Service explained that opening up a stand significantly will dry surface fuels due to increased light levels, surface winds and temperatures, which may in turn 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.¹⁶

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).¹⁷

The Project proposes to thin upland stands to between 34 and 53 percent canopy cover, and Riparian Reserve stands to at least 40% canopy cover. EA at 6. Commenters are concerned that thinning as low as 34% canopy cover will open the stands too much and create the problems described above, including warm/dry/windy microclimates, movement of canopy fuels to the ground, and increased stimulation of future hazardous fuel growth. Additionally, it is not clear from the EA what the Forest Service's long-term maintenance plan is for the Project area. The EA describes treatment of activity created fuels following harvest. EA at 25. However, the Forest Service also needs to consider whether it is able to maintain surface and ladder fuels in the long-term over the coming years and decades. If not, the potential for increased fuel loading and subsequent fire risk is substantially increased which puts public safety and safety of fire crews at risk.

Overall, the EA is lacking in analysis concerning effects on fuels and fire. The EA evaluates the environmental impacts of No Action and of the Proposed Action, but it does not consider the consider or weigh the increased fire risk due to commercial logging against the benefits of thinning. The Forest Service should supplement its analysis to analyze the negative impacts on fuels and fire risk associated with commercial logging. Such analysis should include anticipated future maintenance of the stands, and whether retaining a higher canopy cover percentage will help to better manage fuels and fire in the Project area.

¹⁶ Fitzgerald S and Bennett M. 2013. A Land Manager's Guide for Creating Fire-Resistant Forests. EM 9087. OSU Extension.

¹⁷ Johnson KN and Franklin JF 2009. Restoration of Federal Forests in the Pacific Northwest: Strategies and Management Implications.

Cumulative Impacts

Although not expressly required under the U.S. Department of Agriculture NEPA regulations at 7 C.F.R. § 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 Cala-Wiley Project.

Conclusion

Each substantive issues addressed by Commenters should be considered by the Forest Service and used to develop a NEPA alternative that attempts to balance the tradeoffs of commercial logging in upland and Riparian Reserves with the negative impacts on threatened and endangered species, water quality, fish and wildlife habitat, and fuels and fire risk. Please provide Commenters with timely notice of any forthcoming comment opportunities, field visit opportunities, and any draft and final decisions on this Project.

Thank you,

A handwritten signature in black ink, appearing to read "Pablo San Emeterio".

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