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RE: South Five Mile Insect and Disease Project

Dear Kameron,

As you are aware, Bark's mission is to bring about a transformation of public lands on and around Mt. Hood into a place where natural processes prevail, where wildlife thrives and where local communities have a social, cultural, and economic investment in its restoration and preservation. Bark has over 31,000 supporters[1] who use and depend on the public land forests surrounding Mt. Hood, including the areas within the South Five Mile project area, for a wide range of uses including, but not limited to: hiking, nature study, non-timber forest product collection, spiritual renewal, and recreation. We submit these comments on behalf of our supporters.

For a project to be considered under Section 603, commonly known as an "Insect and Disease categorical exclusion (CE)", it considers the best available scientific information to maintain or restore ecological integrity, including maintaining or restoring the structure, function, composition, and connectivity. Bark is

[1] Supporters in this case is defined as significant donors and petition-signees which Bark has identified as being active users of Mount Hood National Forest.

generally supportive of the idea to actively reintroduce fire back to the landscape in fire-prone forest ecosystems like those present at South Five Mile. That said, we request that you actively engage with the substance of these comments and use the information herein to create a better project for the Barlow Ranger District.

CE IS LIKELY TO ADVERSLY AFFECT NORTHERN SPOTTED OWLS AND CONTRIBUTE TO CUMULATIVE IMPACTS

A CE is a class of actions that a federal agency has determined, after review by CEQ, do not individually or cumulatively have a significant effect on the human environment and for which, therefore, neither an environmental assessment nor an environmental impact statement is normally required. Depending on the scope of the action, the agency should have metrics that would allow them to determine the trigger point at which a full environmental analysis would be required. One example of this type of trigger would be a finding of impacts to federally listed species, such as the northern spotted owl (NSO). In the case of the South Five Mile project, **the scale and intensity of proposed treatments have been predicted to cause a meaningful and measurable impact on the species**, as detailed below. This is despite the agency's assertion that they will be operating within the sideboards provided to them through a recent programmatic NEPA effort with USFWS. The whole assumption that a CE will not add to existing and future cumulative impacts is turned on its head, given this determination.

For the South Five Mile project to satisfy the requirements for a CE, there must be metrics and thresholds for which the project is compared to in order to have determined its consistency or trigger an EA process.

1. As it relates to NSO, what are these metrics and what is this "trigger point". If it isn't a Likely to Adversely Affect (LAA) determination, then what is another example and how is this addressed in South Five Mile?
2. How does the LAA determination add to cumulative impacts in the area, how is this determined, and how will this be documented?

The South Five Mile project area contains dispersal and suitable habitat for federally listed NSO, and NSO designated critical habitat. Because proposed activities would downgrade some nesting, foraging and/or roosting habitat (less than 600 acres, according to the Scoping letter). Within the project area, canopy cover within suitable northern spotted owl habitat would be downgraded or

retained at 40-60% based on guidelines from the Northern Spotted Owl Recovery Plan. The anticipated effects determination is LAA NSO and NSO critical habitat. However, the details regarding the spatial distribution of effects to NSO and their critical habitat have not been included in planning documents. **The agency should specify what types of habitat are being downgraded and approximately where these effects are expected in the project area.** In addition, planning documents should describe the NSO habitat limiting factors that could be addressed through the proposed treatments and the expected temporal scale of those habitat improvements.

Section 7(a)(2)of the Endangered Species Act requires the Forest Service, in consultation with and with the assistance of the Secretaries of the Interior and Commerce, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. (16 U.S.C. 1536(a)(2)). The U.S. Fish & Wildlife Service updated the definition of destruction or adverse modification of critical habitat to mean: a direct or indirect alteration that *appreciably diminishes the value of critical habitat for the conservation of a listed species*.

The 2011 Recovery Plan for the Northern Spotted Owl, the blueprint for management of this species on federal lands in the region, contains the provision that long-term benefits to spotted owls of forest thinning treatments must clearly outweigh adverse impacts from commercial logging for fuels reduction. The following Recovery Actions are relevant here:

Recovery Action 10: Conserve spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl populations.

Recovery Action 32: Because spotted owl recovery requires well distributed, older, and more structurally complex multi-layered conifer forests on Federal and non-federal lands across its range, land managers should work with the Service to maintain and restore such habitat while allowing for other threats, such as fire and insects, to be addressed by restoration management actions. These high-quality spotted owl habitat stands are characterized as having large diameter trees, high amounts of canopy cover, and decadence components such as broken-topped live trees, mistletoe, cavities, large snags, and fallen trees.

In addition to the ESA's prohibition on destruction or adverse modification of Critical Habitat, the rule that designated this section of the forest as Critical Habitat determined that *all* of the unoccupied and likely occupied areas in this subunit are essential for the conservation of the species to meet the recovery criterion that calls for the continued maintenance and recruitment of northern spotted owl habitat. The increase and enhancement of northern spotted owl habitat is necessary to provide for viable populations of northern spotted owls over the long term by providing for population growth, successful dispersal, and buffering from competition with the barred owl.

In its Designation of Revised Critical Habitat for the Northern Spotted Owl, the USFWS provided the following suggestions regarding active forest management for consideration by land managers within critical habitat as consistent with the recommendations of the Revised Recovery Plan for the Northern Spotted Owl:

Focus active management in younger forest, lower quality owl habitat, or where ecological conditions are most departed from the natural or desired range of variability.

> Avoid or minimize activities in active northern spotted owl territories (or the high-quality habitat within these territories).
>
> Ensure transparency of process so the public can see what is being done, where it is done, what the goal of the action is, and how well the action leads to the desired goal.
>
> Practice active adaptive forest management by incorporating new information and learning into future actions to make them more effective, focusing on how these actions affect northern spotted owls and their prey.
>
> > *-USFWS, Designation of Revised Critical Habitat for the Northern Spotted Owl, 2012, at 32.*

Bark suggests that the FS could better align their Proposed Action with Recovery Actions 10 and 32, and more recent recommendations by the USFWS by **analyzing an alternative that does not downgrade suitable habitat within the South Five Mile project area, and that does not trigger a LAA determination, which puts the project at odds with its CE classification.** This alternative should be pursued if it allows the agency to address both the

Purpose and Need for this project and align its activities with the long-term habitat needs of northern spotted owls within this habitat unit.

RIPARIAN RESERVE TREATMENTS

The South Five Mile Project includes 195 acres of potential treatments in Riparian Reserves (RR). According to the Scoping letter, there would be proposed treatments in designated RRs to maintain or improve the forest health of the stand. Treatments could range from 30% canopy cover within pine oak habitats to 40-50% canopy cover within dry mix conifer stands. However, there is no elaboration about these treatments and the conditions in which they would be implemented in the Project Design Criteria. Riparian Reserve treatments, to attain Aquatic Conservation Strategy objectives (ACSO), require at least 50% canopy cover to remain in treated areas.

There are several units where Bark has questions about the rationale of including them in proposed treatments. **Unit 6** is estimated to have a canopy cover of just 45% (Appendix B). The Forest Service should apply extra consideration to this unit and further explain their rationale for treatment in order to meet ACSOs. Much of the same could be said about RR **Unit 2** (30% canopy cover), and **Unit 8** (50% canopy cover currently).

These considerations are important, as the proposed project area is a critical source of high-quality water and refugia for spawning and rearing steelhead. The Miles Creek Watershed Analysis identified water temperatures, peak flows, baseflows, fine sediment, and large woody debris levels outside the range of desired conditions. *WA at 105.* As you know, timber harvest in RRs is prohibited, except when **needed** to "acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives." *Northwest Forest Plan, C-31,2.* Thus, the Forest Service has the responsibility to identify which ACSOs are not currently met in the RRs and explain how the proposed commercial logging is necessary to acquire the vegetation characteristics needed to meet the ACSOs .

Given sensitive and protected species dependent on healthy functioning condition of riparian areas within the South Five Mile project area, the FS should apply extra consideration to the impacts of logging and roadbuilding on these habitats. As you know, any action taken in RRs must comply with the ACS of the NWFP. The ACS includes nine specific objectives for restoring watersheds. *NWFP at B-9.* Complying with the ACSOs means that the FS must manage riparian-dependent resources to maintain the existing condition or implement actions to restore the conditions. Commercial logging in Riparian Reserves is

generally prohibited and is allowed *only when necessary* to "acquire the desired vegetation characteristics needed to attain ACS objectives." *NWFP at C-33*. While some aquatic degradation, standing alone, does not constitute ACS noncompliance, the FS must avoid degradation that leads to the non-attainment of ACS objectives at both the short-term, localized scale and the long-term, watershed scale.[2] To make a finding that the logging "meets" or "does not prevent attainment" of the ACSOs, the NWFP requires the FS to describe the existing conditions of the watersheds within the project area, assess the natural variability of important physical and biological components, and explain *how* the proposed logging would maintain or restore the conditions of the watershed.[3]

Research suggests that ACSOs could be better met through a "no action" alternative. For example, many RRs are currently below the Forest Plan standards for woody debris in streams (which correlates to ACSO #3 and #8). Pollock and Beechie[4] reviewed the sizes of deadwood and live trees used by different vertebrate species to understand which species are likely to benefit from different thinning treatments. In Pollock and Beechie's study, passive management created dense forests that produced large volumes of large diameter deadwood over extended time periods as overstory tree densities slowly declined. To better meet the ACSOs, and enhance wildlife habitat, Bark recommends no commercial timber harvest in RRs.

Even if the FS can adequately demonstrate how commercial logging in riparian reserves is *necessary*, the action still must comply with the ACSOs, on both short- and long-term timeframes. Complying with the ACSOs means that the FS must manage riparian-dependent resources to maintain the existing condition or implement actions to restore the conditions. While some aquatic degradation, standing alone, does not constitute ACS noncompliance, the FS must avoid degradation that leads to the non-attainment of ACS objectives at both the short-term, localized scale and the long-term, watershed scale.[5] To make a finding that the logging "meets" or "does not prevent attainment" of the ACSOs, the NWFP requires the FS to describe the existing conditions of the watersheds within the project area, the natural variability of important physical and biological components, and explain *how* the proposed logging would maintain or restore

[2] Pac. Coast Fed'n of Fishermen's Ass'ns v. NMFS, 265 F.3d 1028, 1037 (9th Cir. 2001).

[3] Klamath Siskiyou Wildlands v. Forest Service, 373 F. Supp. 2d.

[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. DOI: 10.1111/jawr.12206

the conditions of the watershed.[6] ACS Objective #8 recognizes that logging in the Riparian Reserves will thwart compliance, not improve it.

While Bark has not been able to visit all RR units in this project, a case in point is **Unit 19**. This unit's main feature is the stream, however there are also many areas of cedar which are not directly adjacent to the stream course, as well as indicator plants and wet areas within the unit indicating the presence of seeps. Unit 19 contains a diversity of tree species and age classes, including a 40" DBH western red cedar and a 38" Doug fir. It is also worth noting that there are signs of wildlife use and many snags and down wood.

In the Decision, the FS should provide a summary of current stand conditions in Riparian Reserves, rationale for active management, and predicted short and long-term results of this treatment. This should be done after the agency drops areas within Riparian Reserves that already contain complex forest structure where treatments are not needed for achieving ACSOs. If rationale and short and long term predictions cannot be provided, the units should be dropped.

Also, please analyze compliance with the ACSOs in the context of a changing climate. As weather events are becoming more unpredictable, riparian areas can act as a refuge for organisms as a heat buffer and heat sink. Thus, restoring vegetation to provide shade over riparian zones will be crucial to the success of riparian inhabitants, as well as provide the latent effects of water purification and filtration.[7]

B6 Special Emphasis Watershed

2,703 acres of the South Five Mile project are withing B6 Special Emphasis Watershed land allocation. The primary goal of the B6 land use allocation is to "maintain or improve watershed, riparian, and aquatic habitat conditions and water quality for municipal uses and/or long-term fish production." In the project decision, please include project rationale related to this land allocation's primary goal as stated, and how this compliments or conflicts with the insect and disease treatments.

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[7] Seavy NE, Gardali T, Golet GH, Griggs T, Howell CA, Kelsey R, Small SL, Viers JH, Weigand JF. 2009. Ecological Restoration, 27:3; 330-338.

Key Watershed

Upper Eightmile Creek is a Tier 1 Key Watershed located within the planning area, which is to be managed for improved viability of the at-risk wild, federally listed winter steelhead population, pacific lamprey and other aquatic species who depend on these watersheds. The proposed project area is a critical source of high-quality water and refugia for spawning and rearing steelhead. The Miles Creek Watershed Analysis identified water temperatures, peak flows, baseflows, fine sediment, and large woody debris levels outside the range of desired conditions. *WA at 105.* Standards and guidelines outlined in the NWFP stress the need to reduce road building activities within key watersheds. *NWFP Standards and Guidelines C-7.*

In recent years, the Miles Creek Watershed has experienced prolonged drought and extra consideration should be taken to ensure that the proposed project has minimal alterations to peak flows, baseflows, and other hydrologic regime features that could affect habitat quality.

The location of temporary roads associated with the project have not been determined but according to the agency are expected to occur in or near riparian areas. Temporary roads and skid trails may increase the duration and concentration of suspended sediment in streams, negatively impacting water quality, biological productivity, and habitat conditions. We encourage the agency to avoid temporary roads in areas that may contribute to water quality degradation, such as within RRs.

RETENTION OF LARGE TREES

For a project to be considered under Section 603, commonly known as an "Insect and Disease categorical exclusion (CE)", it must maximize the retention of old growth and large trees, as appropriate for the forest type, to the extent that the trees promote stands that are resilient to insect and disease.

Related to this, there was a recent discussion in the Wasco County Forest Collaborative about the removal of large Douglas firs within the South Five Mile project area. There was not collaborative consensus on how to treat large diameter (>21") Doug firs in areas which lack large live trees and snags, especially in pine-oak stands and in land allocations such as B5 (Pine Marten/Pileated Woodpecker), but also in NSO Critical Habitat. We shared in meetings that we would like the agency to consider retention, removal, drop and leave, girdling, and topping of large Doug firs to meet the Purpose and Need and

existing habitat requirements in these areas. Large Doug fir trees are providing important habitat and structure and would provide important future snag habitat if retained.

Seemingly in response to these concerns, the FS devised the following PDCs:

- Within pine/oak plant communities maintain at least 2 Douglas-fir greater than 24 inches DBH per acre when available.
    - Douglas-fir should be insect and disease free.
    - Do not maintain any within 50 feet of a dripline of legacy ponderosa pine or Oregon white oak.
- Within pine/oak plant communities Douglas-fir and grand fir greater than 24 inches DBH that are over topping healthy ponderosa pine greater than 18 inches DBH and Oregon white oak greater than 14 inches DBH can be topped, felled, or girdled and left on site with the approval of District Silviculturist and Fuels planners.
- All legacy trees must also be retained.

We would like to further encourage the agency to retain more than 2 large Doug firs per acre if District staff determine that they are not creating soil moisture or sunlight competition with the oaks and pines. We also request that more detail is provided within PDCs that prioritize retaining standing live, standing dead, or down dead trees (Fig. 1) wherever possible to meet the habitat requirements present within the project area. The second bullet point above implies this to be an option, however it is not clear whether or how many dead trees will be left on site versus removed, for example. For the agency to be proposing treatments within these habitat types, we believe they should approach the existing habitat components with care and put these positive efforts in writing as PDCs.

Figure 1: Large live and dead Douglas fir providing habitat in Unit 3

RATIONALE IN MITIGATING THE LOSS OF TREES FROM INSECTS AND DISEASE

As you know, Bark beetles are a native species that have been one of the major agents of forest change and succession for at least the last 12,000 years.[8] Insects are and have been an important part of nutrient cycling and forest succession. The following sources illustrate the importance of providing clear rationale in interrupting these processes.

[8] USDA Forest Service. (2005). Bark Beetle Outbreaks in Western North America: Causes and Consequences. Beetle Bark Symposium. https://www.fs.fed.us/rm/pubs_other/rmrs_2009_bentz_b001.pdf

Findings from recent studies suggest that mountain pine beetle outbreaks affect trees with genetics ill-suited to drought and therefore imply that beetle outbreaks may act as a form of natural selection to help forests adapt to changing climates.[9]

Millar and colleagues studied tree rings of whitebark pine after an outbreak of mountain pine bark beetle in subalpine zones of eastern California. They found that the trees that had died from the outbreak had faster growth during the 19th century, a colder and wetter time period, and slower growth during the 20th century, a warmer and drier time period, than trees that had survived the outbreak. They concluded that these results suggest beetle outbreaks function as natural selection for trees best suited to current climates.[10]

Knapp, Soule, and Maxwell found similar results when examining radial growth rates of co-occurring mature healthy and Mountain Pine Beetle-infected ponderosa pine trees in western Montana. They found that trees infected with mountain pine beetle started exhibiting slower growth rates than healthy ponderosas 2-3 decades before the outbreak. They wrote that this support implied that beetle outbreaks are strongly associated with long term tree vigor and promote an overall increase in vigor and drought resistance in forest populations.[11] Both studies suggest that thinning from outbreaks is functional for long-term forest health and that working to prevent outbreaks may be detrimental to the forests' adaptability to a changing climate.

Finally, Bleiker and Six studied the effect of changing conditions in lodgepole pine on the susceptibility to colonization by fungal symbionts of mountain pine beetle. During this study, they found that trees under the same conditions that exhibited higher sapwood moisture were less susceptible to mortality due to beetle infestation. Given they studied trees existing in similar conditions, this difference suggested genetic differences in water efficiency and again hints at the

[9] Studies reviewed in Six, D.L., Biber, E., & Long, E.. (2014). Management for mountain pine beetle outbreak suppression: Does relevant science support current policy? *Forests*, *5*(1), 103-133. https://doi.org/10.3390/f5010103

[10] Millar, C.I., Westfall, R.D., Delaney, D.L., Bokach, A.L., Flint, A.L., & Flint, L.E. (2012). Forest mortality in high-elevation whitebark pine (*Pinus albicaulis*) forests of Eastern California, USA; influence of environmental context, bark beetles, climatic water deficit, and warming. *Canadian Journal of Forest Research*, *42*(4), 749–765. https://doi.org/10.1139/x2012-031

[11] Knapp, P.A., Soule, P.T., & Maxwell, J.T. (2012). Mountain pine beetle selectivity in old-growth ponderosa pine forests. *Ecology and Evolution*, *3*(6), 1141–1148. https://doi.org/10.1002/ece3.522

possibility that mountain pine beetle selection may lead to forests with trees better suited to drier, warmer climates.[12]

We encourage the Forest Service to take this research into account when finalizing this project. There may be, for example, opportunities for clarification on the FS's rationale in working to prevent tree mortality due to insects and disease or an opportunity for future effectiveness monitoring to get at some of the questions raised by the studies above.

We also encourage the agency to clarify in future planning documents to what extent insects and diseases are currently affecting the area or areas adjacent to it. Other than the density of trees in the area, what makes the Forest Service concerned about this area being affected by the listed insects and diseases and what, other than tree mortality, is at risk if it is affected?

THINNING AS AN EFFECTIVE STRATEGY FOR MANAGING FOR BARK BEETLE OUTBREAKS

Depending on the insect disturbance agent in question, research is inconclusive on the effectiveness of thinning in creating beneficial long-term outcomes on the stand and landscape levels. In a review of management policies for Mountain Pine Beetle outbreak suppression, Six, Biber, and Long question the efficacy of indirect controls of bark beetle by pointing to flaws in analysis and reporting of their efficacy. The following paragraphs summarize their key points. [13]

The authors assert that, when evaluating the efficacy of indirect controls to manage beetle outbreaks, there is an underreporting of failures and an overreporting of successes. Failures are often not reported because they are blamed on other factors such as poor management of neighboring plots. Successes are often reported during non-outbreak conditions and therefore do not accurately reflect the efficacy of preventing mortality during an outbreak. When success is reported during an outbreak, it is often measured by comparing the percent tree mortality due to the outbreak infestation in treated and control stands. The authors point out that using this metric limits the potential to evaluate the efficacy of these treatments.

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[12] Bleiker, K.P., & Six, D.L. (2009). Competition and coexistence in a multi-partner mutualism: Interactions between two fungal symbionts of the mountain pine beetle in beetle attacked trees. *Microbial Ecology, 57*, 191–202. https://doi.org/10.1007/s00248-008-9395-6

[13] Six, D.L., Biber, E., & Long, E.. (2014). Management for mountain pine beetle outbreak suppression: Does relevant science support current policy? *Forests, 5*(1), 103-133. https://doi.org/10.3390/f5010103

While thinning does consistently lead to a lower percentage of tree mortality due to insect outbreaks, it does not necessarily lead to an increase in living trees after outbreaks. Plots reported as successful due to their lower percentage of tree mortality may have comparable levels of large living trees as control plots. Without this type of comparison, there is insufficient information to determine whether the financial expenditure and other negative effects of implementing treatments are worth their overall benefit. Six et al. cited the following studies as examples in which untreated plots were found to have acceptable levels of living trees after an outbreak: Hansen and colleagues found similar densities of living trees after an outbreak in treated and untreated plots after conducting a retrospective study on Engelmann spruce in the Southern Rocky Mountains;[14] Klutsch et al. found that untreated plots kept desired levels of stock and productivity after an outbreak during a study on lodgepole pine stands in Colorado;[15] and Hawkins et al. observed in their evaluation of lodgepole pine forests in British Columbia that 44-98% of stands contained enough trees to be considered stocks and predicted that they would reach merchantable volumes within 3 years.[16]

Six et al. also point out that long-term outcomes between treated and untreated stands can be significantly different and that there is little to no research documenting those differences. They cite some existing research which suggests that untreated forests after beetle outbreaks lead to better long term outcomes than forests thinned by humans.[17] Beetles are likely to leave more advanced regeneration,[18] a more mosaic and heterogeneous structure,[19] and select trees

[14] Hansen, E.M., Negron, J.F., Munson, A.S., & Anhold, J.A. (2010). A retrospective assessment of partial cutting to reduce spruce beetle-caused mortality in the southern Rock Mountains. *Western Journal of Applied. Forestry*, *25*(2), 81–87. https://doi.org/10.1093/wjaf/25.2.81

[15] Klutsch, J.G., Negron, J.F., Costello, S.L., Rhoades, C.C., West, D.R., Popp, J., & Caissie, R. (2009). Stand characteristics and downed woody debris accumulations associated with a mountain pine beetle (Dendroctonus ponderosae Hopkins) outbreak in Colorado. *Forest Ecology and Management*, *258*, 641–649. https://doi.org/10.1016/j.foreco.2009.04.034

[16] Hawkins, C.D.B., Dhar, A., Balliet, N.A., & Runzer, K.D. (2012). Residual mature trees and secondary stand structure after mountain pine beetle attack in central British Columbia. Forest Ecology and Management, 277, 107-115. https://doi.org/10.1016/j.foreco.2012.04.023

[17] Six et al. (2014). Management for mountain pine beetle outbreak suppression: Does relevant science support current policy?

[18] Egan, J.M., Jacobi, W.R., Negron, J.F., Smith, S.L., & Cluck, D.R. (2010). Forest thinning and subsequent bark beetle-caused mortality in Northeastern California. Forest Ecology and Management, 260(10), 1832–1842. https://doi.org/10.1016/j.foreco.2010.08.030

[19] Collins, B.J., Rhoades, C.C., Hubbard, R.M., & Battaglia, M.A. (2011). Tree regeneration and future stand development after bark beetle infestation and harvesting in Colorado lodgepole pine stands. Forest Ecology and Management, 261(11), 2168–2175. https://doi.org/10.1016/j.foreco.2011.03.016

more adaptive for current and future climates.[20] This forest structure, as opposed to thinning prescriptions that tend to focus on leaving large trees with even spacing, ultimately lead to more biodiversity and forest resilience to fire and future outbreaks.[21]

We encourage you to use this opportunity to conduct the type of monitoring necessary to better understand the long-term consequences of using thinning to manage beetle outbreaks. Effectiveness monitoring for multiple criteria, done in partnership with the Wasco County Forest Collaborative could investigate, for example, how stands which were thinned and burned fared against future beetle outbreaks compared to nearby un-thinned stands or stands which were only thinned but not burned. Residual forest structure and regeneration could also be investigated. Bark is interested in continuing the shared learning which the collaborative group is facilitating by exploring opportunities for long-term monitoring and research in the South Five Mile project area.

MISTLETOE TREATMENTS

The South Five Mile scoping letter includes a mention that some stands within the project area contain native dwarf mistletoe. When we visited one of these stands with the FS during the fall 2021 Wasco Collaborative Group field trip, the agency shared their plan to remove brush and to plant the stands with species less susceptible mistletoe, such as larch.

We acknowledge and appreciate the agency's direction to actively promote forest structure which includes vigorous and healthy stands of trees. However, Bark also values - and must draw attention to - the variety of ecological benefits of mistletoe such as food, cover, and nesting platforms birds and other small

[20] Millar et al. (2012). Forest mortality in high-elevation whitebark pine.; Knapp et al. (2012). Mountain pine beetle selectivity in old-growth ponderosa pine forests.; Bleiker, & Six. (2009). Competition and coexistence in a multi-partner mutualism.

[21] Martin, K., Norris, A., & Drever, M. (2006). Effects of bark beetle outbreaks on avian biodiversity in the British Columbia Interior: Implications for critical habitat management. *Journal of Ecosystems and Management*, *7*(3), 10–24. https://jem-online.org/forrex/index.php/jem/article/view/354; Franklin, J.F., Spies, T.A., van Pelt, R., Carey, A.B., Thornburgh, D.A., Berg, D.R., Lindenmayer, D.B., Harmon, M.E., Keeton, W.S., Shaw, D.C., & et al. (2002). Disturbances and structural development of natural forest ecosystems with silvicultural implications using Douglas-fir forests as an example. Forest Ecology and Management, 155(1-3), 399–423. https://doi.org/10.1016/S0378-1127(01)00575-8; Larson, A.J.; Churchill, D. Tree spatial patterns in fire-frequent forests of western North America including mechanisms of pattern formation and implications for designing fuel reduction and restoration treatments. Forest Ecology and Management, 267, 74–92. https://doi.org/10.1016/j.foreco.2011.11.038; Ager, A.A., McMahan, A., Hayes, J.L., & Smith, E.L. (2007). Modeling the effects of thinning on bark beetle impacts and wildfire potential in the Blue Mountains of eastern Oregon. Landscape and Urban Planning, 80, 301–311. https://doi.org/10.1016/j.landurbplan.2006.10.010

animals. Mistletoe has been a natural component of the forest ecosystem in this area for thousands, if not millions, of years.

During this project planning, the ecological benefits of mistletoe should not be under-estimated, and prescriptions should reflect these benefits. For example, it has been suggested that mistletoe is a "keystone species" in many vegetation communities.[22] The abundance and diversity of birds is correlated with the degree of mistletoe occurrence, and avian vectors seem to prefer infected hosts.[23]

It has also been noted that mistletoe brooms provide important habitat for relatively high densities of prey for spotted owls and several carnivores.[24] This function of mistletoe brooms is quite valuable in typical stands that are deficient in large snags.

The fruit, foliage and pollen of dwarf mistletoe are a food source for numerous bird, mammalian, and insect species. Dwarf mistletoe of all types alters the growth patterns of infected trees, creating structural complexity within forests in the form of "witch's brooms" and snags, both which are used by numerous wildlife species (including some species of owls) for nesting, roosting and cover.

Research suggests that greater bird diversity is associated with increased mistletoe infestation; the key limiting resource for the birds in this situation may be snags. Management Strategies for Dwarf Mistletoe: Silviculture[25] describes mistletoe control treatments in which infected trees were killed but left standing for woodpeckers and other cavity-nesting animals. Although these snags are used, they remained standing for only a few years. Studies of broom use by wildlife include work by Hedwall[26], and Garnett[27]. These studies identify which birds and mammals use witches' brooms, how they use it (for nesting and roosting), and what kinds of brooms are preferred. This information is useful to determine if retaining certain brooms is a potential benefit for a favored species.

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[22] Watson, D.M. 2001. Mistletoe — A keystone resource in forests and woodlands worldwide. Annu Rev Ecol Syst 32: 219-249

[23] Aukema, J.E. 2003. Vectors, viscin, Viscaceae: Mistletoes as parasites, mutualists, and resources. Frontiers in Ecology I(3): 212-219.

[24] PNW Research Station. Rocky to Bullwinkle: Understanding Flying Squirrels Helps us Restore Dry Forest Ecosystems. Science Findings. Issue Eight. February 2006. http://www.fs.fed.us/pnw/sciencef/scifi80.pdf

[25] Muir, J. A.; Geils, B. W. 2002. Chapter 8. Management strategies for dwarf mistletoe: Silviculture. In: Geils, Brian W.; Cibrián Tovar, Jose; Moody, Benjamin, tech. coords. Mistletoes of North American Conifers. Gen. Tech. Rep. RMRS-GTR-98. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. p. 83-94

[26] Hedwall, S. 2000. Bird and mammal use of dwarf mistletoe witches' broom in Douglas-fir in the Southwest. MSc Thesis, Northern Arizona university, Flagstaff, AZ.

[27] Garnett, G. N.; Chambers, C. L.; Mathiasen, R. L. 2006. Use of witches' brooms by Abert squirrels in ponderosa pine forests. Wildlife Society Bulletin 34:467–472.

On the aforementioned field trip to the project area, it was shared that thinning stands containing mistletoe could inadvertently expose live plants on the trees retained to additional sunlight, promoting vigorous growth. Mistletoe brooms are apparent on live residual trees across the forest where thinning or shelterwood harvest has occurred (Fig 2). While not necessarily a bad thing for the surrounding ecosystem, the agency should be realistic about the ability of these types of treatments in their ability to rid stands of dwarf mistletoe, and about the tradeoffs inherent with this type of activity.

Figure 2: Mistletoe brooms often flourish in openings or along edges, as is the case in Unit 63 (L) and Unit 4 (R)

Figure 3: Willow timber sale (Barlow district, Dalles Watershed) – 2nd mastication of ground cover

The agency has shared that they plan to masticate the shrub understory of stands containing mistletoe in order to replant them with species less susceptible to mistletoe. In other stands Bark has seen a masticator used (Fig 3), the treatment has required follow-up treatments in subsequent years to keep native shrubs low. The goal of this treatment is to remove sufficient brush to reforest the stand with other species. Does the FS foresee multiple entries to the stands in order to successfully complete their work? What impact will this have on soil productivity and health as it relates to root pathogens in the area?

SOIL IMPACTS EXACERBATING FOREST HEALTH ISSUES

Bark is concerned that operating heavy machinery throughout these units may also be detrimental to forest resiliency to insects and disease. Heavy machinery operating in the units will contribute to compaction of soil which can indirectly contribute to beetle outbreaks and many other problems in the forest. As the White River Watershed (nearby area containing similar forest types and landscapes) Analysis writes: "compacted soils have many effects on soil productivity, insect and disease risk, tree growth and yield, percolation rates,

peak flow, erosion, and instream sedimentation. Since compacted soils lack pore space, trees, other plants, and aquatic species have less available water, thus magnifying both seasonal and climatic drought periods. Beneficial fungi and microbes, such as mycorrhizae, do not grow as well, reducing soil organic matter and nutrient cycling. Trees are less able to fight off insect and disease attack due to the drought stress. Lack of water also slows growth rates. The soils cannot absorb as much water during rainfall and snow melt, more water runs off, and erosion rates increase." (WRWA, 3-3)

Bark recommends limiting ground-based machinery, as much as possible within the project area, to existing open system roads. If deviation from these roads is required, please clarify this in the PDCs and include additional PDCs to ensure minimal damage to soil resources and minimal creation of additional risks related to insects and disease.

HISTORIC CONDITIONS

According to the scoping letter, the landscape within the project area exhibits a different pattern of forest cover and structure types compared to what historically existed due to past management strategies, such as fire suppression, grazing, and logging. Bark notes that since fire suppression and logging created the current conditions, there is reason to believe that logging and suppression of another natural disturbance (beetles) may not necessarily *on its own* recreate the historical conditions sought after by the agency. Care should be given to avoid perpetuating a management cycle which leads to more homogeneous stands.

The scoping letter asserts that in the past, with regular fire cycles, insects and disease probably existed most commonly at endemic levels (i.e., present in the area, but causing low or moderate levels of mortality). However, population fluctuations were normal with epidemic conditions of some insects or diseases developing periodically and causing high levels of tree mortality over short periods. In future analysis, it would be helpful to (quantitatively, if possible) compare this historic condition to now, or projections into the future.

In the Decision for this project, Bark recommends providing more information on historic conditions and what methods were used to determine these conditions, how they differ from existing conditions, and how the desired conditions will be achieved through the specified management strategy.

Specifically, the Decision should include detail on how homogenizing some stands by thinning out the denser clumps and reducing cover may be mitigated by retaining some denser stands, large trees and existing structural diversity.

B5 LAND ALLOCATION

633 acres of the South Five Mile project are within the B5 Pine Marten/Pileated Woodpecker land use allocation. The goal of B5 is to "provide forestwide mature or old growth forest habitat blocks of sufficient quality, quantity, and distribution to sustain viable populations of pileated woodpecker and pine marten." Desired future conditions include mature and over-mature forest, a high density of high-quality den and nest snags and defective green trees, prevalence of dead and down woody material, and healthy, older forest with a mid-level canopy reaching maturity.[28] Bark notes that, where needed, tree mortality from insect and disease could help to create den and nesting snags and a prevalence of dead and down woody material needed for these animal habitats. The areas proposed for treatment in the South Five Mile project currently have uneven aged stands with a wide diversity in densities. Several stands we visited have definitive signs of woodpecker activity and several snags with varying cavities that seemed suitable for a range of cavity nesters. (Fig. 4) Heterogeneous stands fare better against beetle outbreaks[29] and are generally better habitats for the animals prioritized in the B5 land allocation.

[28] USDA Forest Service. (1990). Land and Resource Management Plan: Mt. Hood National Forest. Page Four-240.

[29] USDA Forest Service. (2005). Bark Beetle Outbreaks in Western North America: Causes and Consequences. Beetle Bark Symposium. https://www.fs.fed.us/rm/pubs_other/rmrs_2009_bentz_b001.pdf

Figure 4: Examples of pileated woodpecker activity in Unit 19 (L), and Unit 8 (R)

In Bark's previous comments, we referenced a recent Pacific Northwest Research Station[30] study investigating the effects of thinning on marten use of forest stands compared to untreated areas. In this study, martens were 1,200 times less likely to be detected in openings and almost 100 times less likely to be detected in areas structurally simplified by fuel-reduction treatments compared to structurally complex forest stands in the study area. Marten behavior was more erratic, with increased speeds and decreased complexity of movements, in open and simplified stands compared to forested and structurally complex stands. Martens move 3 to 4 miles daily, which is energetically demanding and increases their vulnerability to predation compared to animals that have a smaller daily range. Since martens selected home ranges with fewer openings and avoided stands with reduced structural complexity, the researchers of this study concluded that populations would benefit from increased stand connectivity within home ranges and at a landscape scale.

[30] https://www.fs.fed.us/pnw/sciencef/scifi192.pdf

All of this is to say that Bark supports the PDC that all units within B5 with 50% or greater canopy cover will be maintained at 50% post commercial treatment. However, the FS should also specify whether they are decreasing canopy cover in stands that are already under 50%. Additionally, the agency must ensure compliance with the following Standards and Guidelines: Within Pileated Woodpecker Habitat *LRMP at 4-242*.

- B5-008: At least 300 acres of mature and or old growth forest habitat shall be maintained within each 600-acre Management Area *Id*.
- B5-009: Each 300 acres of mature and or old growth habitat should be contiguous *Id*.

Within Pine Marten Habitat

- B5-010: At least 160 acres of mature and/or old growth forest habitat shall be maintained within each 320-acre Management Area.
- B5-011: Each 160 acres of mature and/or old growth habitat should be contiguous. *Id*. B5-012: Habitat improvement projects for mature and old growth species shall be encouraged. *Id*.
- B-5-020, 021: Commercial thinning may occur within the nonmature/old growth habitat component, ie stands less than 100 years of age. Crown closure within the forest canopy shall be at least 50% within commercial thinning activity areas. *Id.*
- B5-032: Open road density shall not exceed 2.0 miles per square mile. *RMP at 4-244.*
- B5-037: At least 24 snags greater than 20 inches diameter shall be maintained within the 160 acres of mature and/or old growth pine marten habitat. *Id.*

TEMPORARY ROADS

According to the scoping letter, the location of temporary roads associated with the project have not apparently been determined but are expected to be required. The locations of these roads are not included in the Proposed Action. **To fully understand the impacts of this project on the environment, the agency and interested public should be able to come to a shared understanding of where and how the effects of roadbuilding will occur within the project area.** This should happen before the decision is signed.

If the locations of temporary roads as they relate to the issues the public are concerned about are not disclosed, they will have no way of knowing to what extent their recommendations were or were not followed. For example, members of the public who advocate for the recommendation of minimizing temporary road stream crossings will read PDCs that contain language like "generally", "wherever feasible" and "wherever practical" as a response to their concerns but will not know how many stream crossings will be built, where they will be built, or if there are alternatives that exist elsewhere. In past projects it has been very useful to know the locations of proposed temporary roads and has prompted substantive feedback from the public.

While the agency has made it seem like putting these roads on a map is premature, in our experience the proposed locations vary little overall from their ultimate locations within units. In Bark's recent surveys of the Lava EA project area for example, we found very few additional temporary roads which were built compared to ones mapped in the initial analysis. And most of these built temporary roads corresponded almost perfectly with the previously mapped locations.

Indeed, the agency seems to be opting to use the controversial "conditions-based management approach." This means that instead of providing a map with proposed locations of temporary roads, the "[e]xact location and temporary road length would be determined on the ground during project implementation, and would be constructed while adhering to the PDC. It is anticipated that approximately eight miles of temporary roads would be constructed." *Waucoma EA at 57.*

We understand that the Forest Service is trending toward greater use of condition-based analysis and management, and we are very concerned that this is causing unnecessary conflict between the agency and the public. This approach has been the subject of recent lawsuits, including a recent case regarding the Tongass National Forest where the court just invalidated the Forest Service's EIS. See *Southeast Alaska Conservation Council (SEACC) v. U.S. Forest Service*, 2020 WL 1190453, Case No. 19-00006-SLG (D. Alaska Mar. 11, 2020).

While the Prince of Wales project in Alaska was on a larger scale than the Waucoma or South Five Mile projects, the Forest Service's approach to conditions-based analysis and its plan to rely on post-decision implementation checklists to consider details and site-specific information is similar. When assessing the Prince of Wales EIS, the court found that the conditions-based framework undermines the purpose of NEPA because the Forest Service's

approach improperly allows the agency to forgo public scrutiny of actual, site specific actions, essentially creating a blank check for a range of future activities. *SEACC* at *12 ("NEPA favors coherent and comprehensive up-front environmental analysis to ensure . . . that the agency will not act on incomplete information.").

The Forest Service has repeatedly referred to Project Design Criteria as "sideboards". Project Design Criteria often include language such as "generally" and "where practical". These are not actual sideboards because there is nothing about PDCs that says that an impact will not at some point be decided to occur. Relying only on PDCs for temporary roads will mean the public will never know which impacts occur and where, or if there was a better alternative that could have avoided an impact.

Bark provides the following brief examples of recent Mt. Hood projects where knowing the locations and types of proposed temporary roads was important to project planning and/or the discussions resulting from what later occurred on the ground:

- Polallie Cooper EA (HRRD) – Temporary roads were mapped to cross existing trails, and even use these trails as temporary roads. This led to a more robust discussion in the collaborative about impacts to recreation from this project.
- Zigzag Integrated (ZZRD) – A temporary road is currently proposed to be built straight through a known stand of remnant trees and snags. This information was available in pre-scoping and was able to be discussed by the public in a public *pre-scoping* meeting in 2019.
- Goat Mtn EA (CRRD) – Temporary roads were proposed to re-open and use previously rehabilitated illegal OHV trails (previously closed with Retained Receipts). This led to discussion and recommendations by the CSP about unauthorized access via reopening illegal OHV trails, and increased access to OHVs from timber sales in general. It also opened the discussion about the appropriateness to undo work recently completed with retained receipts.
- Jazz EA (CRRD) – A temporary road was built over a stream to access a unit, and later pit rock was left there which had to be removed after the FS got involved and directed the contractor to go back and fix it. This led to conversation between Bark and the FS about clarity and intent of contract language, and how it translates over from the intent of language within EAs and PDCs.

- Upper Clack EA (CRRD) – The CSP used temporary road maps to plan a 2017 Clackamas Stewardship Partners field trip with the FS. 100% of temporary roads that were planned were built. At least one temporary road is still not closed several years after the contract ended.
- Grove EA (CRRD) – A temporary road was proposed to be built over stream, which according to the EA was supposed to use drainage via a French drain, but did not include this during implementation. The stream has been left with a road built over it. This was discussed and visited by Bark and the FS, and highlighted in this 2015 article in Street Roots.
- No Whisky EA (CRRD) – Temporary road was not closed before contractor equipment was moved offsite, then accessed by OHV users. This led to a discussion about the timing and effectiveness of temporary road closures, and the sale administration that is available onsite.
- Hunter EA (CRRD) – Closed system roads that were repeatedly breached were proposed to be used as temporary roads, with "new" temporary roads being proposed to be built off of these breached roads. This led to public discussion about road closure timelines, effectiveness, and prevention of unauthorized access.[31]
- Quarry Timber Sale (2007 Thin EA, CRRD) – Some temporary roads were never closed after being used for the timber sale, resulting in increased access, dumping, invasive weed establishment, soil erosion. No one would have known about this issue if areas were not mapped with temporary roads.
- Airstrip EA (BLM, North Fork Clackamas) – A temporary road was proposed to be built straight through a stand of the last remnant old growth trees in the entire Airstrip sale area. This led to the eventual dropping of this road from the proposal.

Instead of doubling down on this controversial and legally shaky approach to NEPA analysis, we again ask the Forest Service to do what it has done for decades and provide project specific information. The Forest Service states that it wants to "[e]nsure we are striving to make every possible effort to meet the expectations of the public regarding temporary road location transparency, by sharing the most accurate and complete information available." *Waucoma FONSI at 14*. Please do so. We know the Forest Service has a layer of potential road locations (subject to changes as needed, of course, as it always has been shared). **In the future, please share this information with members of the public and**

provide an opportunity for public comment on the road placement before you issue your final decision.

Temporary road building impacts

It is well-documented that road construction vastly elevates erosion for many years, particularly in the first two years when the construction causes a persistent increase in erosion relative to areas in a natural condition. [32],[33],[34]. Specifically, major reconstruction of unused roads can increase erosion for several years and potentially reverse reductions in sediment yields that occurred with non-use. *Id.*

Available scientific information shows that reconstruction of closed and abandoned roads, could persistently elevate erosion and sediment delivery in several ways. Reconstructed roads cause elevated erosion and sediment for many years after decommissioning.[35] The USFS Region 5 method for estimating cumulative watershed effects indicates that even 10 years after road decommissioning, a mile of decommissioned road is equivalent to 0.2 miles of new road in terms of adverse cumulative effects.[36] After 50 years, a mile of obliterated road has still has impacts equivalent to 0.1 mile of new road. Thus, as it is apparent that decommissioning will not instantaneously eliminate the persistent impacts of roads on erosion and sediment delivery, building these roads will likely have adverse impacts to the aquatic and terrestrial environment.

Road construction is by far the greatest contributor of sediment to aquatic habitats of any management activity.[37],[38] Even <u>temporary</u> road construction can cause resource damage including erosion and sedimentation, exotic species

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[32] Potyondy, J.P., Cole, G.F., Megahan, W.F., 1991. A procedure for estimating sediment yields from forested watersheds. Proceedings: Fifth Federal Interagency Sedimentation Conf., pp. 12-46 to 12-54, Federal Energy Regulatory Comm., Washington, D.C.

[33] Rhodes, J.J., McCullough, D.A., and Espinosa Jr., F.A., 1994. A Coarse Screening Process for Evaluation of the Effects of Land Management Activities on Salmon Spawning and Rearing Habitat in ESA Consultations. CRITFC Tech. Rept. 94-4, Portland, Or.

[34] Beschta, R.L., Rhodes, J.J., Kauffman, J.B., Gresswell, R.E, Minshall, G.W., Karr, J.R, Perry, D.A., Hauer, F.R., and Frissell, C.A., 2004. Postfire Management on Forested Public Lands of the Western USA. Cons. Bio., 18: 957-967.

[35] Id.

[36] Menning, K. M., D. C. Erman, K. N. Johnson, and J. Sessions, 1996. Aquatic and riparian systems, cumulative watershed effects, and limitations to watershed disturbance. Sierra Nevada Ecosystem Project: Final Report to Congress, Addendum, pp. 33-52. Wildland Resources Center Report No. 39, Centers for Water and Wildland Resources, University of California, Davis.

[37] Meehan, W.R. (ed.). 1991. Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. Am. Fish. Soc. Special Publication 19.

[38] Robichaud, P.R., L.H. MacDonald and R.B. Foltz. 2010. Fuel management and erosion. Ch. 5 in: W.J. Elliot, I.S. Miller and L. Audin (eds.). Cumulative Watershed Effects of Fuel Management in the Western United States. USDA For. Serv. Rocky Mtn. Res. Sta. Gen. Tech. Rep. RMRS-GTR-231. Fort Collins, CO.

spread and disruption of wildlife.[39] Unpaved roads and stream crossings are the major source of erosion from forest lands contributing up to 90% of the total sediment production from forestry operations.

Bark requests that the FS should strive for no new "temporary" roadbuilding, since it is not debatable that temporary roads have a permanent impact on the forest around them and create a blueprint for future entries resulting in further impacts.

ADDITIONAL SPECIFIC UNIT COMMENTS AND QUESTIONS:

We note that there are several units with overlapping site conditions and land allocation/habitat considerations which are worth mentioning. We request that the FS include more detailed rationale for the following units, which on paper appear to contain contradictions in their rationale for inclusion in the project.

- **Unit 6** is within a RR, and also contains northern spotted owl (NSO) suitable habitat[40]. The unit is also within B5 land allocation. There are currently 2.5 snags/acre >12", 45% CC, and the stand is 112 yrs old. Listed as "commercial", actions here would bring the stand below the threshold required for ACSOs, and from its description, there is not need (as it relates to RRs and habitat) for treatments here to begin with.
- **Unit 28** contains all the same land allocation and habitat issues as above, as well as containing 6 snags/acre >12".
- **Unit 51** is within RR, contains NSO suitable habitat, NSO critical habitat, 3.3 snags/acre, with a 24.1" Mean diam (largest); and 54% canopy cover. It is also listed as commercial although all conditions indicate otherwise.
- **Unit 2** is within RR, contains NSO suitable habitat, NSO critical habitat, B5 land allocation, is 93 yrs old, and with 30% canopy cover, but is listed as "commercial". Again, bringing this stand down to a lower density would retard ACSOs.
- **Unit 8** is within RR, contains NSO suitable habitat, NSO critical habitat, B5 land allocation, at 50% canopy cover, listed as "commercial"

[39] Trombulak, S.C. and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14:18-30.

[40] Suitable habitat consists of forested stands used by spotted owls for nesting, roosting and foraging (NRF). Generally these stands are conifer-dominated, 80 years old or older and multi-storied in structure, and have sufficient snags and downed wood to provide opportunities for owl nesting, roosting and foraging. The canopy cover generally exceeds 60 percent. This habitat is described as "NRF" in the spotted owl recovery plan as revised in 2012. The appearance and structure of these forests will vary across the range of the spotted owl, particularly in the dry forest types.

CONCLUSION

Bark has provided several suggestions for improving the South Five Mile project to better meet its existing Purpose & Need. We request that the agency review these suggestions and create alternatives that meaningfully incorporate them – singly or together – to assess their ecological and community impacts and benefits:

1. Pursue an alternative that does not downgrade suitable habitat within the South Five Mile project area, and that does not trigger a LAA determination;
2. Provide a summary of current stand conditions in Riparian Reserves, rationale for active management, and predicted short and long-term results of this treatment. Based on these conditions, drop Riparian Reserve units where treatments are not needed to attain ACSOs;
3. Retain more than two large Doug firs per acre if District staff determine that they are not creating soil moisture or sunlight competition with the oaks and pines. Also request more detail within PDCs that prioritize retaining standing live, standing dead, or down dead trees wherever possible to meet the habitat requirements present within the project area;
4. Consider and respond to Bark's comments and information provided regarding forest insects and disease, mistletoe treatments, historic conditions, and soil impacts;
5. Ensure compliance with the B5 Standards and Guidelines included in these comments using PDCs. Specify whether canopy cover would be decreased in stands that are already under 50% within B5;
6. Avoid no new "temporary" roadbuilding and provide approximate locations of where roadbuilding is likely to occur. Include approximations of miles of road to be built and the type (new, existing temporary alignment, utilizing a closed system road, etc.), as well as their interaction with surrounding land allocations and habitat types (i.e. Riparian Reserve); and
7. Address concerns provided regarding specific units with site conditions, overlapping land allocations and habitat requirements which conflict with the inclusion of proposed logging treatments.

We anticipate a thorough review of these comments and look forward to the necessary changes made to both the forthcoming decision and the project itself.

Thank you,

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Forest Watch Director, Bark

/s/ Cara Christofferson
Forest Policy Advocacy Coordinator, Bark