September 20, 2019

David Halemeier, District Ranger
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HC 73 Box 320
Mill City, Oregon 97360

Re: Dry Beard Project EA

Dear Dave,

The following are my comments on the above referenced EA, to be entered into the public record. I would like to first of all congratulate you on your recent promotion to District Ranger from District Hydrologist, a post you held for about five years. The promotion is appropriate and of great benefit to the public, given the importance of the District watersheds and water resources to downstream public water supplies and recreational uses. The EA is excellent, and the project itself timely in terms of stand health and economic recovery from the logged timber.

1. Contents. The page numbers correspond with the text, except (a) Affected Environment starts on p. 33; (b) Hydrology starts on p. 91. Figure 21 should read "underburning". The second Figure 32 should read Figure 33.

2. Chapter 1 - Purpose and Need. The cover photograph of a dense, dark forest with many spindly trees illustrates the need for thinning quite well. The need for the project is also supported by the history of the area and stand description (stem exclusion stage). Most of the overly stocked stands have not been treated for 40 years, so thinning would be beneficial and simply accelerate a natural process. The proposed units are in Matrix and Riparian Reserve land use allocations, so what is needed is allowed. Land ownership percentages are also important to describe. Since most (81%) of the project area is federally owned, this 1,339 acre project will have a relatively small impact on the watersheds involved. The location and vicinity maps are nice.

The Proposed Action is well summarized on p. 8; the figures are consistent with the text elsewhere. I liked the description of watershed analyses, which are so important in this EA and incorporated by reference, along with management plans and other federal documents.

Table 1 (Management Allocations) is quite informative and the numbers all add up and are consistent with the text elsewhere (no mean feat). Are LSRs 16a or 16b? It is always important to note

that Riparian Reserves overlay other management allocations. Most of the thinning treatments will occur in scenic allocations not managed to maintain a high level of scenic quality. Figure 2 illustrates this quite well, and the explanatory text on p. 11 is also helpful.

Table 2 examines non-key issues as defined by NEPA regulations. These issues were raised during the scoping period by myself and two environmental organizations, as well AFRC (pro-logging group). I appreciated the specific consideration given to my comments as well as those of others, and their inclusion in the EA. Oregon Wild's comments are excellent, and the Proposed Action contains many of their recommendations. The treatments in Riparian Reserves (Appendix G) are more nuanced and responsive to onsite conditions than those desired by Oregon Wild, and they do not violate the Aquatic Conservation Strategy (Appendix E). I like citing the studies from similar projects on p. 13, bottom.

The EA's responses to comments made by AFRC are excellent, especially on what constitutes a "skip" in terms of its purpose to increase diversity at the stand level. AFRC recomments no-cut riparian buffers of no more than 40'; again, the Forest Service's proposed treatments are more nuanced and site specific, as well as in accordance with federal regulations and management plans.

The Proposed Action and EA are responsive to my concerns, summarized on p. 15. Although the Project Area encompasses over 10,000 acres, only 1339 acres will be treated in the form of thinning or gaps. An EA is the appropriate level of analysis because the effects, mitigated by PDEs and federal law requirements, will be insignificant.

WildEarth Guardians was concerned about minimizing the road system and improving riparian areas beyond the stated purposes of the project. I liked the specificity of the response to the roads issue, which I also mentioned in my scoping comment. This area is over roaded and the roads are costly for the agency to maintain. Those not needed should be decommissioned or stored, which is a positive aspect of this project.

3. Chapter 2 - Alternatives, Including the Proposed Action. Since The Proposed Action is thinning treatments, there really is no need to consider a third alternative, as there might be if regeneration harvest were involved. It is clear that the No Action alternative does not meet any of the needs of this project, which consist of timber production, road maintenance and bridge repair, and improving the stand health and diversity in these dense plantations.

The Proposed Action is summarized on pp. 17 and 18 and in Table 3. The numbers all add up and the table and text are consistent with each other and information presented elsewhere, sometimes in a different form (such as logging methods). I like the third column in Table 3 that correlates the activity with a specific purpose.

This is a very well designed thinning project, as summarized here and detailed in Chapter 3 and the appendices. I like (a) the relatively small project size (10% of the area); (b) skips on 20% of the treatment acres, based on good criteria; (c) gaps and DTR release; (d) sugar pine restoration; (e) carefully selected Riparian Reserve thinning; and (f) replanting of diverse species on cleared acreage. I am less enthused about the fuels treatments, especially underburning as it can be difficult to control. The road work is all good, and replacement of the bridge is necessary. It should not have to be tied to a timber project.

Figure 3 is a nicely color coded map of the proposed treatment units which also shows land ownership in the Project Area. Figure 4 shows roads to be stored or decommissioned as well as all of the existing roads of various categories. This figure should also have shown the Idanha bridge and labeled Blowout road, where it is located. I could not find this information elsewhere in the EA or even on Google maps.

Table 4 contains the Project Design Elements specific to this project which will reduce negative environmental effects and ensure compliance with standards and guidelines, goals and strategies. Some apply to all units, and some apply to specific units. They are all important, along with those I will mention specifically below.

It is critical to protect legacy trees as such, by unit layout as well as skips or other methods. PDE #2 is necessary to protect Riparian Reserves during fuels treatments. PDE#9-12 are important in preventing temporary roads, landings, and skidding corridors from becoming dispersed recreation sites. I like PDE's 16 and 17, which are sensitive to maintaining or restoring the visual qualities of this highly valued recreational area. All of the Wildlife PDE's (#18-26) are of particular importance to me--seasonal restrictions, canopy/snag/downed wood requirements, and no-cut buffers to protect certain species or habitats, most of which apply to all units. I like the Botany PDEs that protect special habitats in designated units (#27-32).

The Roads PDEs are standard; I like the seasonal or weather related restrictions on roadwork, hauling, and culvert replacements. Replacing undersized culverts (#45) is always a positive feature of timber projects. Under "Soils and Aquatics", #50 (location of landings) is of importance to me. Landings should be located outside of Riparian Reserves and totally restored after use. Surface rock can degrade aquatic habitats, so the prescription in #51 is good. PDE #54 prescribes a 50' no equipment buffer for all streams, and PDE#55 describes the no-cut buffers for various stream classifications. I like the fact that the no-cut buffers are measured from the tree closest to the stream, not the edge of the stream itself. PDE #59 deals with restrictions on temporary roads in Riparian Reserves, including their required removal after use and rehabilitation. I would prefer that no roads be built in Riparian Reserves, but since they are allowed this PDE is necessary.

Monitoring (p. 32) is extremely important, expecially to ensure that contractors are in compliance with their logging contract. Post project implementation is also critical for such features as invasive species removal, snag abundance, and road decommissioning.

Table 5 (Comparison of Alternatives) is consistent with Table 3 and figures presented elsewhere in the text.

4. Chapter 3 - Affected Environment and Environmental Consequences
The introduction to this chapter is quite good, defining direct, indirect and cumulative effects in succinct terms. It is important to note that the spatial and temporal analysis boundaries may vary by resource. The EA and proposed treatments clearly reflect an IDT approach, and make good use of both the IDT reports and relevant scientific studies. The discussion of what is required for a cumulative effects analysis ("current aggregate effects") is important; specific actions are relegated to Appendix D, rather than interrupting the flow of the EA.

(a) Forest Vegetation. All of these subtopics contain a summary of the effects analysis, which overall are well written and manage to be comprehensive. They are a good idea for the casual reader who does not have the time or inclination to read the entire 200 page EA. Here, the summary is superb. "Was" should be "as", second line, page 35.

Figure 5 is a very nice project area map which identifies the rivers, 5th field watersheds, reservoir and District boundaries. Figure 6 shows the stand age in the project area, a reflection of the area's disturbance history, which is described in the text above it and broken down by percentage in Table 6. The earlier the disturbance period (by fire, prior to 1900), the greater the possibility of finding older stands. Both the table and figure show that there are older stands on public land in the vicinity of the younger stands to be thinned in this project.

The "Stands Conditions" section is superb; the photographs in particular serve to illustrate the current conditions and "sell" the project. I like the fact that the photos are of specific units, stands of different ages, and of mixed conifer stands as well as Douglas Fir plantations. The text gives good detail and explains terms which the average reader may not understand, such as "stem exclusion stage".

The "Effects" analysis for Alternative 1 (No Action) is excellent. The descriptive text mentions the die-out of sugar pine, a shade intolerant species, and decreased habitat for bird species and pollinators which need early seral habitat. Foraging habitat for big game species would also continue to decline. Forest health would decline due to competition for limited sunlight and other resources. It is Figure 13, however, that is compelling: A Douglas Fir plantation from 1921 that was never thinned. This is what unit stands will resemble if they are not thinned. The forest resembles something out of a northern European fairy tale, or in my experience the trail up to Stahlman Point. There is no understory or mid-canopy trees, due to the lack of sunlight. The trees are sickly looking, overcrowded, and lack dominant trees with full crowns.

Figure 14, under Alternative 2 (thinning), provides stark contrast to Figure 13 by showing a recently thinned 40-50 year old plantation. The photograph shows a lot of blue sky, and well spaced "dominant" trees resulting from a "thin from below".

The Action Alternative, a commercial thin, does "provide timber products to the local economy", meeting one of the needs of the project. However, I like the fact that the effects analysis focuses on how the project will improve forest health and introduce more diversity into these young stands. It's also a good strategy for making the project acceptable to environmentalists.

I really like the "Designation by Description" (D x D) thinning prescriptions, which are well explained on pp. 40-41, coupled with tpa densities which allow for the residual trees to grow but also provide sufficient canopy cover for the Northern Spotted Owl and protect minor species and legacy trees. Apart from improving the health and diversity of these stands, the text is honest in admitting the negative impacts of logging on understory vegetation and below ground fungi. This negative impact will be minimized by using a relatively small percentage of ground based yarding, with designated skid trails, and full log suspension in skyline and helicopter yarding systems.

Figure 15 is another compelling photograph which illustrates the long term (30 years) benefits of thinning, i.e., development of a mid-story cohort of trees (hemlock) of varying species.

The use of skips, gaps and Dominant Tree Release introduces additional nuance and creativity into the management of these stands. Skips (no treatment) are proposed on 260 acres within the thinned units for the excellent reasons given on p. 42. Gaps one to three acres in size will be created in nine units, for a total of 25 acres, leaving three to eight trees per acre for future snag and down wood recruitment and to provide density diversity. Dominant Tree Release gaps are created by clearing out 1/4 or 1/2 acre around dominant trees or a tree, leaving seedlings/saplings of appropriate species or planting them if not present. I like the nuance of creating the larger gaps on southerly slopes where sun loving species such as sugar pine would be likely to succeed. The project includes 51 DTRs on 20.5 acres.

Figure 16 is a nice before and after representation of the use of skips and DTR gaps to introduce diversity into a thinned stand. Figure 17 is a great Google Earth image of recently created DTR gaps in a thinned stand and helps to explain and "sell" this portion of the project. The scientific citations (p. 44) are also helpful in supporting the proposition that thinning these stands will promote diversity.

I am a big fan of sugar pine, so any attempt to re-introduce this species on the landscape has my enthusiastic support. Here, the need and rationale (i.e., previous presence) are well presented. The trees will be planted in an area "suitable to its prolonged existence", and the site prepared by a more radical thinning prescription

(20-30 tpa) and underburning. The rust-resistant stock will be planted on 3 acres in Unit 54, DTR gaps, and in other gaps throughout the project. The long term effect should be to create a new cohort of sugar pine, incense cedar, and western white pine, as well as the "increased presence" of sugar pine on the landscape for decades to come.

The Cumulative Effects analysis is good, encompassing two similar small projects on Forest Service land and the anticipated logging (clear cuts) of 200-300 acres of private forest land over the next five years.

(b) Fire and Fuels. The summary is good. It is probably appropriate to re-introduce fire as an "ecological function" since "naturally occurring lightning fires" were a primary agent of disturbance prior to Euro-American settlement. The main purpose of fuels management is to reduce the increased fuel loading caused by thinning operations, but an added goal is to recreate the mosaic of forest types and age classifications caused by natural fires.

Fire Regime and intensity are defined and discussed on pp. 46-47. Of relevance is that recent studies have shown that lower severity fires, as well as stand replacing fires, can act as disturbance agents in the Western Cascades. Thus, planned burns can also play a role in forest succession. It is convenient that a study of the effects of fire on stand structure was done on an area only 20 miles south of the planning area (p. 46).

As stated in the text, fire suppression has been the predominant forest management strategy in the project area, resulting in only 87.3 acres burned as a result of 33 small fires since 1970. Figure 18 shows that much of the area is at risk for high severity fires. The units to be thinned are currently in Fuel Model 8, characterized primarily by slow burning ground fires. Post harvest, elevated fuel loadings create the potential for increased fire intensity (Fuel Models 11, 12), hence the need for fuels treatments. Both fuel models are nicely displayed in the photographs in Figure 19.

Under Alternative 1 (No Action), these stands would self-thin due to overcrowding, leaving dead snags and down wood. The fire danger would thereby increase from the higher fuel loading. This fact gives another rationale for the thinning project. Although the post-harvest fuel model would be 11 or 12, fuel reduction treatments within two years of harvest would bring the stands back to Fuel Model 8.

I don't like underburning because of the acceptable mortality range in overstory trees of up to 10%, and because the burns can get out of control. However, I realize that this is the method for creating a mosaic of burned and unburned areas, i.e., "a controlled replication of the natural fire disturbance process", as well as reducing fuel loads related to logging. I'm glad that each underburn will have a Fire Plan, and that additional restrictions will protect wildlife and riparian areas. The photographs (Figures 20-23) were also persuasive and reassuring, especially those post-burn.

Pile burning is to occur on 503 acres, and underburning on 419 acres. What were the criteria for determining which method of fuels

reduction to use on a particular unit? With respect to Cumulative Effects, the thinning project around Stahlman Summer Home tract is obviously a compatible project.

Infrastructure is not generally discussed in this EA section, but I'm glad it is here. A very strong reason for replacing the Idanha bridge is that without it, response times to fires on both public and private lands would be considerably longer. On the other hand, road storage and decommissioning would apply to short spur roads, so fire fighting access would not be reduced.

(c) Wildlife. The summary is excellent and I liked the honesty with respect to the short-term delay in the development of snags and down wood under the action alternative. Under "Methods", I liked the use of existing data to the degree possible, and explanatory definitions. It is also efficient to use the effects analysis here as the Biological Evaluation for Sensitive species.

Table 7 displays listed terrestrial wildlife species, showing whether or not they or their critical/suitable habitat are likely to occur in the Project Area. I like the format, which lists vertically the species and its status, or critical habitat, then (to the right) its likely presence, presence of habitat, and then either "yes" or rationale for not analyzing the species further. Species to be considered further ("yes") are highlighted in a nice pale purple. For those deleted from further consideration, the reason is generally because of a lack of suitable habitat. Hence, the project will have no impact on these species.

I liked the general discussion of habitat associations of various wildlife categories (on p. 56) with different forest succession stages, and definition of "close associates", which serves to introduce the consideration of individual species that follows. The references to scientific studies and EIS allow brevity here but substantiate the generalities.

For the Northern Spotted Owl, tiering to the USFWS recent documents allows brevity here but gives veracity to what is stated. The summary of the habitat requirements for NSO for different life functions (nesting, roosting, foraging and dispersal) is excellent. It is particularly important to define "suitable habitat", so as not to include owl dispersal habitat which is limited to that function only. I liked the detailed description of the occurrence of owl nest sites and habitat in the Project Area. It is commendable that the numbers all add up and correspond correctly with the percentages.

The Effects analysis is excellent. The preceding Figure 13 photograph of an unthinned, 110 year old forest underscores the "No Action" statement that the development of late-successional characteristics, needed by this species and other LSR "close associates", would be delayed for decades.

The Action Alternative (thinning) is ingenious in placing gaps and DTR's such that they do not downgrade any NSO habitat to a lower

category at the stand level. Thinning prescriptions are also designed to maintain a 60% canopy closure in suitable habitat and a 40% canopy closure in dispersal habitat. No treatments are proposed in nesting or roosting habitat. The skips are artfully placed to achieve both of these goals at the stand level. I do appreciate the numbers adding up and their consistency with the text.

Flying squirrels are apparently the main prey species for NSO in this area. This species favors LSR features and thinning may delay the development of snags, etc. by a decade. The text makes the nice point that skips and design elements will mitigate adverse effects for this very mobile species.

Table 8 is a nice summary of the effects determination for both NSO habitat modifications and species disruption/disturbance (NLAA determination). Table 9, under "Cumulative Effects", summarizes the acreage of NSO habitat (dispersal and foraging) that the Forest Service is allowed to "treat", so long as the habitat category is maintained over a five year period. This project is well within the five year limit for all three categories, and I don't believe the other two Forest Service small projects occur in NSO habitat.

It is unfortunate that so little is required of private landowners to protect this species (70 acre core areas around active nests). My one remaining question for this section is, were any nesting owls actually observed in the recent surveys mentioned, or any owls at all, within the 10,000+ acre Project Area?

The rest of the wildlife species of concern in the area are "Sensitive", i.e., not ESA listed but so designated by the Forest Service for reasons of viability. Table 10 lists the seven Sensitive species of possible occurrence in the Project Area with an "effects" determination and supporting rationale. Again, the format is very nice and I like mention of specific PDEs which will mitigate any adverse effects.

Discussions of the individual species is also quite good and specific to project impacts. For bald eagles, no nest sites are located in the Project Area but will be protected if any are found during project activities. There are two active peregrine falcon nests in the area; the primary zone (1/4-3/4 mile around the nest site) is protected from thinning, and all zones (up to 3 miles from nest site) are protected from helicopter yarding during the nesting season as these birds are sensitive to disturbance.

For harlequin ducks, thinning activities are restricted seasonally within 1000' of their observed occurrence. The two bat species may be temporarily displaced but will ultimately benefit from improved habitat. For Johnson's Hairstreak, the habitat summary is nice, and I like the fact that it is identified as a butterfly. Although not observed in the Project Area, I like the study that indicates thinning may stimulate the growth of dwarf mistletoe, a key habitat element for this species. Effects on the Crater Lake tight coil are not discussed; the 35' buffer will protect this riparian/wetland species where it may occur.

The Cumulative Effects section mentions the poor quality of habitat on private lands due to a short rotation schedule; however, these species are highly mobile and can move to adjacent mature stands. The project may actually benefit peregrine falcons by improving their access to prey in more open canopies.

The text next considers "Management Indicator Species", whose presence can be used "to predict the likely response of other species with similar habitat requirements to land management activities". Outside of species already discussed under other categories, these consist of cavity excavators/pileated woodpecker; deer and elk; and the American marten, not found at this elevation.

Cavity excavator populations are used as an indicator of dead and dying trees, which they create nests in and thereby also provide habitat for secondary cavity nesters. All of these species in Oregon are holding their own or even increasing in numbers, including my favorite, the pileated woodpecker. This species was singled out for protection in the NWFP, with 25 management areas consisting of 300 acres each of mature and older forest to provide breeding habitat. During a recent survey, 92% of these areas were occupied, including the one found within this project area. I'm pleased that no activities are planned on that management site.

Habitat capability for these species is measured by the abundance of large snags, which should be at a level to support 40% of the potential populations. Current levels are above 50% for this forest type in the Willamette National Forest and relevant watersheds. However, within the harvest units, snags over 10" diameter are at the 30% "tolerance level" and large snags over 20" are generally lacking due to the age of the stands.

The Proposed Action will both destroy existing snags (felling of hazard trees, etc.) and create new ones (underburning, logging) estimated at 2-3%. The No Action alternative would create snags due to trees dying from competition for limited sunlight and other resources. Since these stands are in the "stem exclusion" stage, numerous snags will be created in the immediate future.

Figures 24 and 25 graphically depict the trajectory of snag abundance over the next 100 years for both alternatives. For all snags over 10", the No Action alternative exceeds 50% tolerance level in 10 years and stays above 80% due to the high mortality rate in these unhealthy stands. The Action Alternative (thinning) stays at 30% because the potential snags have been removed to become logged timber. For large snags, neither alternative reaches the desired 30% tolerance level for 80 to 100 years, reflecting the young age of these stands to begin with. It is these larger snags that are most useful to cavity nesters (pileated woodpeckers require them).

The actual effects analysis for the Action Alternative is more nuanced and I like that. The gaps would create forest edges, benefitting the Northern Flicker, and the skips would create snags

in the short term due to crowding, i.e., on the same tragetory as the No Action Alternative. The lack of "deadwood" should be balanced against the eventual creation of larger trees and a multi-storied canopy, more suitable habitat for the pileated woodpecker in particular. (I would note, however, that these units are still in Matrix and could be logged before such habitat develops). Again, these species are highly mobile and can find suitable nesting habitat in adjacent areas. Fortunately, these species populations are healthy, unlike the NSO, so no special provisions are needed to protect them in this project.

Deer and elk are considered Management Indicator Species because of their importance as big game hunting species. These species have declined in number, along with hunter success, since 1990. This project, with units in two "Big Game Emphasis Areas", presents the opportunity to improve the quantity and quality of forage by lowering the canopy closure and clearing out small areas as "gaps", which will create early successional habitat of value to these species as forage. As shown in Table 13 and discussed in the text, canopy reduction would elevate "poor" habitat to "low marginal" for 5-15 years. Thus, no large increase in elk/deer populations is expected as a result of this project, but there are no negative effects. Clearcutting of up to 300 acres of land on the 19.3% of the Project Area in private ownership should create foraging habitat, although of a somewhat inferior quality.

Although the BGEAs in the Project Area meet the desired open road density (Table 14), the road closures in this project are still of benefit to these species, who avoid roads but are often killed by vehicles on them.

The Forest Service is charged by law with protecting and conserving migratory birds, especially those species of conservation concern listed in Table 15. Overall, there is also a concern with declining "high quality" early successional habitat, which includes snags, down wood and legacy trees from the previous stand cohorts. Gap creation here would benefit purple finches and rufous hummingbirds, and accelerated stand development would benefit the northern goshawk (breeding habitat) in the long term. Clearcutting on 300 acres of adjacent private lands, creating early successional habitat of lower quality, would benefit this group of species to a lesser degree.

This project is exempt from species protection for Survey and Manage species as the stands to be thinned are all under 80 years of age, and other work consists of culvert replacement, road closures, and riparian habitat improvements (Pechman ruling, 2016). Another species of concern is the Great Grey Owl, which was not found in the Project Area but gap creation may make the area more attractive for foraging by this species. Finally, the text mentions the Red Tree Vole, as it is sometimes found in younger forests and is of importance as a NSO prey species. Oregon Megomphix has no known sites within the project area. I appreciated identification of this species as a snail, and mention of these last three species at all.

(d) Botanical Resources. The summary is nice, but there is an incomplete or extraneous sentence fragment at the top of P. 75. Many of the regional "Sensitive" species (98) were originally Survey and Manage species, and thus are protected in spite of the Pechman exception. I am so pleased that potential habitat as well as known sites of the rare endemic Thompson's mist maiden will be protected by an upslope buffer as well as exclusion of sites and possible habitat from harvest. The habitat requirements described on p. 76 justify the management considerations. Figure 26, the location map for this species, is nice.

The effects analysis for Alternative 1, the No Action option, is good. It is true that leaving these stands untreated will increase the risk of fire due to higher fuel loads. A hot, uncontrolled fire could extirpate fungi by incinerating organic material in the soil layer (I like having a citation here) as well as the rare, endemic plant species (which occurs in a forb/grass habitat). Lichen stands are unlikely to persist in a completely closed canopy, which these stands are approaching.

The effects analysis for the Action Alternative is honest and site specific. It is true that sensitive non-vascular plant species are more likely to occur in stands with greater species and structural diversity (the citation gives veracity to this generalization), which will occur in these stands eventually. The one known sensitive plant species will be well protected. On the other hand, 13 of the 17 sensitive fungi species (not surveyed for as impractical) are mycorrhizal (in the soil). Thus, individual sites could be destroyed by host tree removal, soil compaction, physical disturbance or disruption of mycelial networks. Post harvest conditions such as underburning, pile burns, loss of soil moisture (due to drying, less water retention) could also reduce fungal populations in the short term. However, since this is only a thinning operation, fungal populations will quickly recolonize remaining trees; patchy burns favor fungi and reduce the risk of a catastrophic fire.

The "Invasive Plants" section is good and fairly standard for an EA. The Regulatory Framework is important as it describes priorities and management direction. Prevention is key; new invaders are to be given highest priority (includes potential invaders); and established populations are to be kept in check.

Within the Project Area, the new invaders are shiny geranium, herb Robert, and false brome, given priority for treatment. I prefer the non-chemical treatments, realizing their limitations (pp. 79-80). Table 17 lists these along with less aggressive newcomers and common, well established weeds. They all tend to occur on roadsides and in campgrounds, meaning that the "vectors" are vehicles and people. My least favorite species is Scotch Broom, which is highly visible when it flowers, serves no ecological purpose, and causes a severe allergic reaction in some people (including me).

Hopefully the Forest Service will find the funds to treat the 112 acres proposed for eradication and shown in Figure 27. I agree that emphasis should be placed on high value areas such as meadows and

and wilderness. However, many occur in treatment units so perhaps can occur in conjunction with or after timber/road work, for purposes of economy. Infestations along roads also appear targeted, which should be quite accessible. It is unfortunate that most of this apparently cannot be done without a timber project (No Action analysis).

The effects analysis for the Action Alternative describes the acreage potentially affected by invasive weeds due to project activities (Table 18). These effects will be minimized by Project Design Elements such as pre-cleaning of equipment, using clean fill, planting with clean seed, treating existing new invader sites prior to entry, and post-harvest monitoring and treatment (very important). I like the specificity on p. 83 with respect to the sites to be pre-treated. Will the wet meadows in units 52 and 62 be treated to remove the Canada thistle and St. John's wort?

Given the mixed land ownership in the Project Area, it is even more difficult to control the spread of new and established invasive species. It is hoped that private landowners and the Oregon Dept. of Agriculture will "pitch in" and help stem the spread of these species. I have noticed that some species, such as Scotch Broom, are eventually crowded out by developing stands.

Special habitats are really important to me, not only because they serve to diversify habitats but also because they provide visual contrast and make hikes more interesting. Here, they include a rock garden, rock outcrops, meadows, skunk cabbage swamps and a waterfall at the confluence of drainages. I'm glad that surveys were done to discover them. Table 19 lists these special habitats and the measures that will be taken to protect them. The prescriptions are all good and appear to be adequate. Figure 28 shows the location of these habitats. It would have been nice to label the units where they occur, so the reader could determine which habitats are in each unit by consulting Table 19.

(e) Soils. The summary is good. Table 20 is a very nice schematic of the "Management Indicators" for the major detrimental effects on soil from logging and related work--displacement, compaction, nutrient loss and instability. Seven units approached or exceeded the 20% limit on compaction even without this project.

The "Affected Environment" is well described, in somewhat technical terms, but summarized in the last paragraph by stating that soils are stable, productive, and well drained, well suited to growing forests. The field work done was commendable and necessary, since some of these units have already been heavily impacted by previous logging. The cumulative detrimental impact is not to exceed 20% of the total acreage in the activity area, including roads and landings, and in some units that percentage has already been exceeded.

Under the No Action alternative, soil conditions will continue to deteriorate as roads are not maintained and culverts not replaced. The existing compacted soil would not be subsoiled, impeding tree and vegetation growth in those units where it is heaviest. Apparently the

Idanha bridge would be allowed to fail, causing soil disturbance and the introduction of toxic materials into the river below. The bridge repair or replacement should occur regardless of this timber project. The No Action effects analysis for soils always comes up short because of the tie-in to needed infrastructure projects. Obviously, there is less detriment with the No Action than with the Proposed Action, which by its very nature will compact soil, remove nutrients, displace soil and cause disturbance, in spite of efforts to minimize or avoid them. These are considered separately for the Action Alternative.

(1) Displacement. Soil displacement will be minimized by using existing skid roads for ground-based logging, and appropriate suspension, especially over streams. Helicopter logging will minimize adding to the transportation system. Replacing the Idanha bridge is obviously worth the temporary risk of soil displacement.

(2) Compaction. A very positive feature of this project is subsoiling the existing skid roads in units where compaction is at or greater than 20% of the unit area, and enhanced subsoiling for these and other units where ground-based logging is proposed. A footnote definition of "subsoiling" would have been helpful. Skyline operations usually impact less than 1% of the unit area, and landings are planned at already impacted areas such as road turnouts and junctions, as well as existing landings (good planning). Compaction will also be reduced by using existing spur roads, and removing temporary roads after use.

(3) Nutrient Loss. This parameter is measured by the amount of duff thickness remaining after management activities are completed. Creating the burn piles does not disturb the soil because the machine works while sitting on slash. Pile burning does disturb the underlying soil, but only .6% of the project area. Heat effects are reduced by burning the piles in the fall, when the soil is wet. Underburning will cause nutrient loss, but in a mosaic pattern and on only .4% of the project area.

Nutrient availability is also represented by the amount and size of downed wood. Fine woody material is already plentiful, but "coarse" or larger material is lacking. Several PDE's ensure that this parameter will not be reduced, such as requiring felled logs to remain on site in particular situations (riparian reserves, hazard trees, etc.)

(4) Instability. Again, good field reconnaissance work and knowledge of area geology and history led to deleting unstable portions of units and buffering other areas, described in detail in appendices. It is true that while thinning stands may cause short-term instability in some areas, long term effects are positive. Larger trees create more roots, which increases soil stability and creates greater evapotranspiration activity. Since high risk areas have been left out, the overall effect of this project on soil instability is a positive one.

Cumulative effects are not anticipated from this and other small Forest Service projects in the area because of Best Management Practicies and specific protection measures. One could argue that, given the road work and subsoiling, the effects overall are positive.

(f) Hydrology. The Summary is excellent, including specificity where needed such as number of stream crossings, culvert upgrades/ removals and cubic yards of sediment replacement, and acres of Riparian Reserves to be thinned. The field work is again commendable, especially assessments of Riparian Reserves to determine treatment and buffer needs to meet ACSO's. I also liked the analysis process for determining which roads should be closed or decommissioned, based not only on their usefulness but risk to aquatic resources. Finally, I liked use of a variety of sources, including professional expertise, to evaluate and compare effects at the local site, 6th field subwatershed and 5th field watershed scales.

With respect to the "Affected Environment", Figure 29 is a really fine map which shows both the old and new names for the subwatersheds, as well as the streams and their classifications. Although the new names are color coded, it would have been helpful to superimpose the names on the map as well as having them appear in the legend.

Aggregate Recovery Percentage (ARP) is explained quite well on p. 94. Within the Project Area, the threshhold of concern is 70-75%, and the current condition is 92-98%, so there is already a reduced risk of peak flow augmentation from rain on snow events. Because of the relatively young age of Project Area plantations, it can be assumed that increased evapotranspiration would reduce summer streamflows below reference conditions. Seasonal fluctuations, which are quite large, are shown on Figure 30 as 20 year averages for each month. Sometimes graphs are more effective than text in making a point, although here the text augments the graph by citing extremes. (It is unfortunate that the guage was not in place during the 1995-96 storms).

Stream morphology is well described. I like the fact that the text also describes the consequence of various gradients, etc. on such ecological habitat components as large wood and sediment delivery. What is "headwall" protection?

The effects analysis for "peak flows" is good. There are no consequences for the No Action alternative because nothing would occur which affects peak flows or summer stream flow. The Action alternative, thinning, would affect hydrology short term by (1) increasing snow accumulation in thinned areas, roads and landings, leading to higher peak flows when that snow melts, and (2) increasing summer stream flows due to reduced evapotranspiration from fewer trees. However, both of these effects will be minimal due in part to how healthy these watersheds are to begin with (Table 22). The ARP is reduced by 14% in the Log Tom subdrainage (the highest decrease), but that is acceptable because, at 82%, it is well above the 70% threshhold of concern.

As the text points out, soil instability, displacement, compaction and nutrient loss can greatly affect hydrology by altering the movement of water through subsurface and surface zones. A number of design features, described on pp. 97-98, were put in place to minimize adverse effects on soil and thereby local hydrology. These include no-harvest buffers, in-water work windows, and a minimum number (4) of stream crossings on intermittent streams only. Full suspension is required over

all stream channels, and ignition of underburns would take place outside of Riparian Reserves.

On the Cumulative Effects level of analysis, it is nice that there is limited overlap in these watersheds between private and Forest Service timber activities during the next five years (p. 98). I am convinced that this project will not have negative effects on area hydrology and that any changes will remain within normal variations.

Water quality in the Project Area is extremely important due to the presence of valued and ESA listed fish species, downstream use as a municipal water supply (including Salem), and water contact recreational uses. The three parameters examined in this EA, all of which can have harmful effects on these uses, are temperature, sediment, and algal blooms.

With respect to temperature, the goal is a maximum of 64.4^{o} F, based on the life history requirements of salmon and trout. There are several water quality limited streams in this area, attributed to logging practices that do not leave riparian vegetation that provides shade to streams. Blowout Creek had a 70^{o} moving average maximum temperature as recently as 2015 (a low water year). Generally speaking, however, these maximums have gradually decreased over time (Figure 31). Treatments near riparian areas in this project are designed to comply with the NWFP Implementation Strategy (2012) for water quality limited streams.

Natural instability and mass wasting are the primary sources of sediment delivery in the project area, with hydrated clays the main source of fine sediment and turbidity in the North Santiam River. Nonetheless, roads contribute considerable sediment in the form of erosion, surface runoff, stream crossings, poor design, and blocked culverts.

Since 1990, road maintenance has worked to reduce the factors that cause roads to increase sediment in streams. After the historic 1996 flood that caused road failures and impaired Salem's water supply, several miles of road were decommissioned or closed. Table 23 shows the existing road density in the Project Area and its subwatersheds. The total road density is 3.8 miles per square mile for the Project Area, but only 2.68 miles per square mile of open road. Road densities are higher within the project area than outside of it in the same subwatersheds, two of which are functioning "at risk" or "poor". Clearly, more can be done to improve or close roads in this area.

I became familiar with the harmful algal blooms "up close and personal" last year when bottled water was distributed at a nearby park during the most recent bloom in the summer of 2018. These blooms are primarily associated with, and perhaps caused by, Detroit Reservoir rather than any activities in the Project Area, which is upstream. Nonetheless, water quality attributes of rivers entering the reservoir may be contributing to the blooms.

The effects analysis for water quality parameters is excellent. With respect to temperature, the text on p. 102 was quite convincing

that thinning in the Riparian Reserves would not elevate stream temperatures. Of particular importance to me was (a) no thinning in the primary shade zone (60-100' depending on tree heighth, slope and aspect; (b) no gaps in the reserves; (c) a resulting density of 43-75% canopy cover; and (d) age of the plantations and their present density, coupled with a thin from below strategy. If one tree is removed, a larger tree in the vicinity will be able to provide shade and the appropriate microclimate.

The shade removing effect of temporary road stream crossings and seven yarding corridors over streams is indeed minimal but would occur on a local site scale (I liked the honesty and specificity here). What does "hyporheic" mean?

With respect to Cumulative Effects, it is unfortunate that private timberland stream buffers are not more generous, especially given the elevated temperatures in many of these streams and their "impaired" rating with respect to salmonids.

With respect to sedimentation, the No Action alternative fails, as usual, because it allows the status quo to remain, with inadequate culverts, unmaintained roads, and roads that should be closed. Even though the Action Alternative generates considerable sediment to streams, in spite of PDE's and BMP's, through road construction, hauling, skidding, and reduced stability, this is compensated for by ameliorative projects that reduce sedimentation long term. These include, under the Proposed Action, (a) closing 1.8 miles of road and decommissioning 2.6 miles of road; (b) upgrading 40 miles of road to allow haul; and (c) upgrading thirteen stream crossing culverts to 100-year flood flows (which this area has experienced). Although these activities produce sediment to streams in the short term, this is more than compensated for by sedimentation which is avoided due to the improvements. This is shown quite nicely in Table 24, and I do like the numerical specificity.

Probably the greatest long-term new source of sedimentation in the Project Area could come from new roads, which total 4.7 miles. However, only .4 miles are in Riparian Reserves, where they will be "stabilized with erosion control measures" to avoid run-off during the wet season and "effectively removed" after the project is complete.

Table 25 and the text on p. 105 present an excellent effects analysis of the project sediment-producing activities balanced with the long-term positive decrease in sedimentation due to the improvement projects, and compared with the No Action alternative. I liked the detail here, honesty, and consideration for each subwatershed, as well as description of the sources of increased sedimentation. As table 25 shows, total sediment delivery to streams is three times what it would be with no action during the seven years that the project is implemented. However, post-project sedimentation is reduced by about 25% in these subwatersheds combined, due to the improvements. This is a nice side effect, but does not justify the timber project or reduce the imperative of mitigating sediment sources from timber activities.

Description of the Idanha bridge replacement, vis-a-vis stream inputs of sedimentation and efforts to mitigate that as well as turbidity, is good.

bidity, is good.

With respect to Cumulative Effects, again it is unfortunate that private landowners are not held to the same standards as federal agencies. I'm pleased that the Forest Service is continuing to make road improvements and replace culverts in connection with other timber sales.

The section on harmful algal blooms is excellent. The direct and continuing cause of such blooms is Detroit Reservoir, where conditions favor algal blooms (standing water, higher temperatures, etc.) Upstream indirect influences consist of nutrient input and elevated temperatures (citing a study). The Proposed Action does not include forest fertilization, and sedimentation input/elevated temperatures will be minimized as discussed here. Therefore, there will be no effect on the occurrence of harmful algal blooms.

The effects analysis for "Riparian Conditions" is quite nice and makes a good case for the thinning project. The existing condition points out that almost all of these units are young plantations, "artificially dense, conifer dominated stands" that are now in the stem exclusion stage. Stand densities in the Riparian Reserves here (135-327 tpa) are contrasted with stand densities of 40-60 tpa in naturally occurring stands, as well as the lack of other species attributed to naturally occurring events. The text makes good use of watershed analyses to compare the existing stand structure percentages with reference conditions. Table 26 shows the lack of deciduous vegetation in the Riparian Reserves as well as the Project Area overall. One would expect more water-loving deciduous species in Riparian Reserves, but the "mixed" category is only 5% (compared with 3% overall), and deciduous species are dominant overall in 1% of the area for both categories. As would be expected from a plantation origin, most of the trees fall into one canopy height class (61'-100'), with very few older trees and a much smaller percentage of young trees. (Figure 32, mislabeled Figure 4 in the text).

The "Large Wood" section was informative and adequate, but needed some editing.

The effects analysis for this category is good, and corresponds with the appendices (which provide greater specificity). For the No Action alternative, snags will continue to develop and contribute to wood recruitment to streams. However, large wood would, long term, be lacking as large trees are kept from developing due to overcrowding. These stands would also fail to develop a multi-storied canopy structure, which leads to species diversity. Perhaps most importantly, the lack of deciduous species and herbaceous undergrowth would greatly reduce the ecosystem productivity of these Riparian Reserves.

I do believe that this project will be of benefit to Riparian Reserves. The 430 acres to be thinned have been carefully selected based on need, as determined by site specific surveys. Those not needing thinning have been excluded or buffered out to a distance of one site potential tree (172') along with unstable areas and wetlands.

The paragraph on underburning (p. 110) was convincing as to promoting diversity in Riparian Reserves. The precautions are good and only 12-60 acres will be affected. With respect to large wood recruitment (p. 111), I thought the no treatment buffers maxed out at 100', but if some are 120' depending on conditions that's great. If the strategy is to correlate buffer width with riparian tree size, as well as stream classification, the project should protect 90% of the trees that could fall into adjacent streams. I would assume that the "thin from below" strategy will protect those trees in the 100+-140' size category that are found in the reserves outside of the no-treatment buffer.

Figure 33 is a convincing map of the predominance of conifers in one of the Project Area subwatersheds. I like the planting and thinning prescriptions that will increase the occurrence of deciduous vegetation. The Cumulative Effects section states that 19% of land-ownership here is private; even with narrower no-cut buffers, wood recruitment would be adequate due to forest practices on federal lands. This is probably true; I am more concerned about elevated stream temperatures adjacent to these lands that can affect salmonids.

(g) Fish and Aquatics. The summary is good. The scale of analysis, which focuses on direct effects to the nearest stream channels, accumulated effects to the nearest MIS fish bearing streams (or their habitat), and then broadens out to consider subwatershed and watershed impacts, is appropriate. What does "HUC" stand for?

The Affected Environment and its history are well-described. Unfortunately, Detroit Dam inundated the most productive salmon spawning habitat in the North Santiam watershed, and the dam did not provide for upstream passage of chinook salmon. I hope efforts to utilize upstream areas for salmon spawning are successful as former habitat is improved. It is commendable that the Forest Service now considers this "Essential Fish Habitat". In Table 27 (Fish Species of the North Santiam Watershed), what do the asterisks stand for?

The Existing Condition for fish is described in terms of habitat complexity, water quality, and biological parameters. The general descriptive categories are "properly functioning", "functioning at risk", and "not properly functioning", defined for each parameter in Table 28. Habitat complexity, assessed in terms of large wood, pools, substrate, and flow, varies considerably but is not "properly functioning" at any location. Water quality, assessed in terms of temperature and sediment, is also in the "not functioning properly" category due primarily to the lack of sediment storage capacity attributed in turn to the lack of large wood, although temperatures in Blowout Creek are also too high in the summer months for salmonids. The assessments for "biological parameters" vary, with the salmon population at risk due to the necessity of trapping and hauling them around Detroit Dam.

I liked the discussion on caddisflies; three species are on the Sensitive species list and have been found on the Willamette National Forest. I think it's pro-active to treat habitat that these species could potentially use as occupied.

The effects analysis is good, considering separately each of the parameters in Table 28. The No Action alternative does not increase the abundance of LWD in streams from adjacent riparian stands, and increased sedimentation from culvert failures and lack of road maintenance could place fish populations at greater risk. The Proposed Action also places populations at some locations at risk during timber operations, but benefits them long term.

Under "Habitat Complexity", the text describes riparian treatments in terms of how they will contribute to large wood recruitment and species diversity, while at the same time protecting buffered areas and particular resources. Protective measures include the retention of the larger trees in riparian units, no removal of trees felled in protection buffers, appropriate harvest methods, and understory burning only under low risk conditions. This section describes creating small 1/2-3 acre gaps and replanting them with diverse species. Is this outside of the reserves? (See p. 102, no gaps to be created inside the Reserves).

The Water Quality effects section is good, using temperature, sediment and turbidity as key indicators. Temperature levels should not be altered due to the no-treatment buffers and 50% canopy closure in the secondary shade zone. With respect to sediment input, unstable areas were deleted from harvest units. The discussion of sediment input from roads was quite detailed and referenced relevant studies, which I appreciated. Obviously, road placement and design are important; I liked the PDE's described on p.118 that apply to stream crossings and wet weather haul. Long term, road closures and decommissioning will reduce sediments to streams as well as the risk of catastrophic road failures. I also like buffering fire line construction out of Riparian Reserves to avoid sediment input to streams.

With respect to fish biological parameters, I agree that there will be no short term benefits, but that changes in Riparian structure and diversity "will likely lead to a more resilient food web at the site scale with added complexity in habitat as a result of large wood development."

Although replacement of the Idanha bridge would release some sediment into the river, fish habitat would benefit as the new bridge would be placed outside the bank-full channel, with removal of the existing center pier which is mid-channel in the North Santiam River.

The Cumulative Effects analysis is fine.

(h) Transportation. The summary is good. I liked the background information on the 2015 Travel Management Rule, which called on the Forest Service to identify the minimum road system needed for safe and efficient travel. The objectives were to reduce costs and protect resources by closing unneeded roads and better maintaining others. Road surveys resulted in a Road Investment Strategy, whereby roads were classified according to their recommended status. Table 29 shows the RIS categories for roads within the Dry Beard Project, compared

with the Proposed Action. The text on 123 does not correspond with the table for decommissioning roads. Nothing is shown in the table, as opposed to 2 miles in the text. The Proposed Action is more proactive than the RIS, decommissioning more road mileage rather than just closing it. More detail is given in Appendix C.

Alternative 2 is preferable because it provides the funding from timber logging to meet RIS objectives mentioned above. These roads are used primarily for timber haul, so without timber revenue there is seemingly no rationale for maintaining them (I would disagree). Road actions consist of closing and storing 1.8 miles of road, decommisioning 2.6 miles of road, and "abandoning" .9 miles of road on private land. In addition, pre-haul road maintenance would occur on 40 miles of road, including the installation or replacement of 57 culverts (13 stream crossing and 44 cross drain). Undersized culverts would be replaced by those able to withstand 100 year floods; culverts would be removed from roads to be decommissioned or stored, as natural drainage patterns are re-established.

The text does a good job of describing how sedimentation would be minimized during road work, and also why the new spur roads are necessary--smaller harvesting equipment has less impact on various resources, but requires better access. At any rate, the 4.7 miles of temporary roads will be built on flat, stable surfaces and almost entirely avoid Riparian Reserves. They will be removed after the project is completed so any negative impacts are short term.

The bridge replacement will provide access for 75-100 years, and is of an improved design. Repair would only add 15 to 20 years to the use of the present bridge, so replacement is by far the better option. Infrastructure needs to be replaced whenever and however funding becomes available, especially bridges.

The Action Alternative, as always, is preferable for this topic, not only because it provides funding for needed road maintenance, but also because it proactively reduces the open road system and replaces/upgrades culverts.

(1) Economics. The Proposed Action has a positive benefit/cost ratio of 1.4, covering all costs and returning about 4 million dollars extra for "restoration activities". Would this money go towards replacing the bridge? The scale of analysis (the two counties) is appropriate, given the location of sawmills and county involvement in handling timber receipts. However, economic impacts are also described specifically for the North Santiam Canyon, which is still largely dependent upon wood products for employment (41% in 2012). Table 32 compares the two alternatives with respect to revenues generated, supporting the introductory summary. In addition to restoration activities, part of the revenue would be available to the county for roads and schools, always a good thing for both children and the motoring public.

The employment analysis ties MBF production to employment at a rate of 11 jobs per MBF of timber. Since the project will harvest

24 MMBF over a five year period, it will create 259 new jobs, a small but significant increase in this small community. I would assume that the restoration activities and bridge replacement would create additional employment.

(j) Recreation. The summary is good, and mentions the importance of the bridge for access to recreational activities. For that reason, its replacement should not have to depend on timber revenues. The summary also mentions the importance of the Proposed Action in enforcing the "no camping" area along Blowout Road and elsewhere, which conflicts with designated campground use and is destructive of natural resources.

The present recreational use of this area is extensive and varied, well described on pp. 131-132. A lot of the popularity is due to the Detroit Reservoir, but proximity to large urban areas is also a huge factor. Scenic driving is one rather passive activity, making the LUA Scenic categories particularly relevant. Camping is also very popular, and I'm pleased that the "no camping" corridor has been widened and expanded. Figure 34 is a good map of the Project Area's recreation resources; there are quite a few campgrounds in the vicinity of the Project units.

In addition to "Scenic" land designations, Forest Service lands are also classified according to a Recreational Opportunity Spectrum. Lands within the Project Area are classified as Roaded Natural and Roaded Modified, and activities need to be compatible with these designations.

The "Effects" analysis is good. Any short term inconvenience to Idanha bridge users is well compensated for by the long term benefit of having a structurally sound and improved bridge. Short term adverse effects from roadwork will be mitigated by PDE's and the improvements are of ultimate benefit to the public. I'm glad that a thinning unit (1) is located near Stahlman Trail, which travels through a dark dense forest. Will the decommissioned/closed roads be available to hikers? These roads often make good hiking trails due to their accessibility and location on relatively flat terrain. They are also already graded to accommodate hikers (a good example is the road into Jawbone Flats in the Opal Creek Wilderness).

The Cumulative Effects analysis is good. The two additional Forest Service thinning projects are of obvious benefit to recreationists, especially those with homes at the Stahlman Recreational Residence tract. The Sportsman's Thin adjacent to the reservoir will reduce fire risk and improve scenic quality.

(k) Cultural. I always enjoy this part of an EA because it tells me something about the history of the area. It is unfortunate that the Molala and other tribes succumbed to European introduced diseases; artifacts in this area should be preserved. It is also unfortunate that the Detroit Dam, as necessary as it was, did not have fish ladders and was located to inundate the best chinook spawning habitat. I had no idea that cattle grazing was once considered for this area--what a waste of land ideally suited for growing forests.

(l) Climate Change. On the fourth line, p. 139, I believe .03% should read 3.5%. This is a very well-written, thoughtful and convincing section. Two important points on p. 139 are (a) 50 percent of ecosystem carbon is in the soils (so not impacted by careful logging, and (b) forestry contributes only 12% of human caused global emissions, consisting primarily of deforestation. Forest land has actually grown in the United States since 2000. Forests are extremely important for removing CO^2 from the atmosphere, above and beyond their contribution due to wildfires.

The discussion on p. 140 is excellent and I will not attempt to summarize it. Reducing stand density will reduce the possibility of a large wildfire, with considerable CO^2 emissions. Carbon can be "stored" just as readily in wood products as in dead trees, and obviates the need to use other resources to create those products. If these units are allowed to recover naturally, their carbon storage capacity will increase.

(m) Consistency with Direction and Regulation. The applicable management plans, federal statutes, Executive Orders and regulations are summarized well and accurately. I like the specificity with which project actions are tied to Forest Plan standards and guidelines. I know that the Forest Service wants to update its management plan, but I think it serves this area well, given the added requirements of the Northwest Forest Plan. The Survey and Manage program is well described, and I'm pleased that suitable habitat for these species was surveyed, even though not required (Pechman exception). Under "Clean Water Act", "303(d)" streams needed to be defined. How does the assertion that there are no such streams in the Project Area correlate with the elevated temperatures observed at the Blowout Creek gauging station?

The summary description of the Endangered Species Act is excellent. Under "NW Forest Plan Temperature TMDL..." "303(d)" streams are indirectly defined as those not meeting State water quality standards for temperature. I would repeat my question about Blowout Creek- is it not a 303(d) stream within the Project Area? Again, I liked the specificity with which the NEPA process and National Forest Management Act are referred to. It certainly can be said that promoting "Ecological Restoration and Resilience" is a significant part of this project.

The last paragraph in this section is a nice catch-all that absolves the Forest Service if other BMPs or Standards and Guidelines apply which are not mentioned here.

(n) Irreversible and Irretrievable Commitment of Resources. The definition of these two terms is good, and the effects analysis is honest and nicely tiered to the Willamette National Forest Plan FEIS. Every effort should be made to preserve large snags and downed wood, and various means of doing so are presented in the text and appendices.

5. Chapter 4 - Consultation and Coordination. It's nice to see a few more ladies amongst the field staff. Everyone did an excellent job on this EA and the surveys and research which preceded it. Was a scoping letter sent to the City of Salem? What about Mill City, or any other entity that derives its water supply from the Project Area?

6. Appendices.

(a) Appendix A - References. The bibliography is very impressive. I recently read an EA by BLM, in which the references were subdivided into government reports, scientific studies, and staff resource field assessments. It made it easier to find a reference cited in the text. I would recommend taking a look at it (Bicounty Timber Project, April 2019).

(b) Appendix B - Proposed Treatment Descriptions. This appendix is largely repetitive of the EA text at pages 40-44 with slightly more detail. The various prescriptions--D x D thinning, skips, gaps, DTR, underburning locations and planting of diverse species--allow for a lot of creativity in determining what this forest will eventually look like and the purposes it serves.

At the top of p. 160, "than" should read "then" in the first two lines.

(c) Appendix C - Road Status and Anticipated Road Work. The description of the road maintenance levels was interesting. In the first table, the "Haul Miles" added up and were consistent with the text. The "System Miles Analyzed" appeared to be off by .22 miles- my total was 83.02 miles. Based on the notes in the last column, I totaled road segments for closure and decommissioning, and came up with .98 (vs. 1.75) miles of stored roads, and only 1.27 (vs. 3.46) miles of decommissioned roads. Please explain where the additional mileage comes from. The cost of anticipated road work is close to a million dollars ($966,665); this includes culvert replacement but not work to replace or repair the Idanha bridge. Part of the cost can be justified by the importance of maintaining the road system in an area of high recreational use, as well as watersheds that provide drinking water to downstream users. Both of these uses suffer if the road system is not kept up to high standards.

(d) Appendix D - Past, Present and Future Actions. The introductory CEQ sentence is good, citing "current aggregate effects of past actions" as adequate for a Cumulative Effects analysis. Within the Project Area, the only recent timber activity has been by a private landowner, harvesting 1.5 MMBF in 2018; another 1 MMBF of harvest on private land is expected in 2018-2020. The Forest Serve has two other small projects planned in the near future, thinning (120 acres) and hazardous fuels reduction (75 acres). The table here reminds the reader that the Forest Service is involved in projects besides timber harvest--invasive species control, restricting dispersed camping, and road work. It can safely be said that none of these activities will change the cumulative effects of the Dry Beard project from the effects of the project alone.

(e) Appendix E - Project Consistency with ACS. As a former fisheries biologist, my favorite part of the Northwest Forest Plan was the Aquatic Conservation Strategy, "developed to restore and maintain the ecological health of watersheds and aquatic ecosystems." Riparian Reserves, one of the four components of the strategy, are discussed at length here in terms of their occurrence in the Project Area and how timber harvest will be in accordance with standards and guidance, i.e., to attain the nine ACS objectives. The intent is to thin these overly dense plantations where needed to attain a more natural variability in density, while maintaining coarse wood debris levels and stream channel integrity with no-cut buffers. Only 9% (430 acres) of Riparian Reserves will be treated at all.

The Project Area does not contain any Key Watersheds, which somewhat surprised me as it is the source of Salem's drinking water, and is habitat for salmonids. The project is responsive to the needs identified in the relevant Watershed Analysis reports. The Restoration goal is to mimic "what the landscape might look like under natural disturbance regimes", while reducing the risks of "unnatural disturbances" such as road failure or catastrophic fire. "Restoration" in this project refers to vegetative patterns, late successional stand structures, and fuel loadings more typical of a natural forest. Roadwork is intended to "restore" these watersheds by reducing road density and thereby improving land stability, which this project also does by closing/decommissioning road segments.

I like the fact that the ACS objectives were analyzed at the scale of 6th field subwatersheds, for the reasons given. Each objective is analyzed for both the No Action and Action Alternative effects; overall the analyses are quite good and need not be summarized here. For ACSO #2, the resulting Riparian Reserve canopy closure will be 30-70%; for ACSO #4, it is a minimum of 40%. Which is it? Objective #9 (habitat for native species) was answered particularly well. Appendix G provides support for the assertions made here as well as additional detail.

(f) Appendix F - DecAID Analysis (Downed Logs and Snags). Fortunately, for purposes of analysis, there is only one habitat type within the Project Area (Westside Lowland Conifer--Hardwood Forest). The text on p. 179, third paragraph, corresponds with the information in the graphs, but I would have appreciated some interpretation of the data. The last partial paragraph is a mistake, repeating the end of the preceding paragraph.

(g) Appendix G - Riparian Reserve Treatment Detail. This table shows that a lot of care was taken to determine treatments, and on a unit by unit basis indicates the purpose of the treatment, compliance with the NWFP, and measures taken to protect resources or minimize risk. The no-treatment buffers correspond with the stream classification and sometimes exceed the minimum, for reasons given. Reasons include "to protect stability", "botanical species protection", "protect wetland habitats", protect "alders" or "riparian hardwoods." On the other hand, some no-treatment buffers are

narrower than would be expected in order to treat a "very dense mid-seral stand." Throughout, there are notes to "protect small patches of larger relics", or "Protect relic Western red cedar trees", which I appreciate. For some units a logging method is specified, or layout of a temporary road. In all the detail is awesome, and I wish it were a feature of every EA that involves Riparian Reserve treatments.

This concludes my comments on the Dry Beard Draft EA. It is an excellent EA and can proceed as such in final form, without need for any revisions. I would appreciate a response to the very few questions I had regarding primarily discrepances in figures. This is also an excellent project and should contribute to restoring the Project Area watersheds, along with providing economic benefits to the local community. I do hope the Idanha bridge is replaced.

Sincerely,

Karen Jeanne Sjogren

Karen Jeanne Sjogren
[redacted]