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VIA ONLINE PORTAL at: https://cara.ecosystem-management.org/Public//CommentInput?Project=53966

RE: Flat Country Draft EIS Comments

Background

Please consider the following comments, submitted on behalf of Cascadia Wildlands and Oregon Wild, regarding the Draft EIS for the Flat Country Project. Cascadia Wildlands is a public interest nonprofit organization with 10,000 members and supporters throughout the Cascadia bioregion. Our mission is to defend and restore Cascadia's wild ecosystems in the forests, in the courts, and in the streets. We envision vast old-growth forests, rivers full of wild salmon, wolves howling in the backcountry, and vibrant communities sustained by the unique landscapes of the Cascadia bioregion.

The Willamette National Forest including this project area has long been a special focus of ours. We remember the Robinson-Scott timber sale years ago in this area. Our volunteers, staff and supporters have been visiting and enjoying this project area for over a year, and we care deeply that these incredible places be protected and safeguarded. We appreciate the good work done by USFS staff to improve on past exploitative practices, and in that spirit urge that further changes could improve the project.

Our primary interest in this project is conservation of wildlands, especial wildlife habitat, pristine waterways, and Wilderness values. Secondarily, we are interested in the outstanding recreational opportunities in this area, including both economic activities like fly fish guiding, and the soul-enriching primitive and dispersed recreation opportunities that abound in this area.

The proposed action includes several different purposes and a variety of proposed actions, some of which we emphatically support, and others of which are cause for concern.

We are most supportive of the purposes and aspect that relate to riparian health and sustainable road management.

We are most concerned with the driving purpose to produce timber volume for industrial timber sales, and the proposed extensive regeneration harvest and heavy thinning in older stands, many of which are valuable old-growth targeted for something very like clearcutting. This is unseemly in 2020.

Falling between and along a continuum are the proposals to actively manage stands to benefit "vegetation, wildlife, and overall health of the forest."[1] Site-specific comments are given below, but generally-speaking we do support those parts that address previously-logged plantation stands, typically younger than 80 years old, with thinning rather than regeneration harvest. Even some native stands along roads could be usefully thinned, with caution.

In our opinion Alternative 3, which roughly follows this distinction, best achieves the balance of benefits from active management while avoiding significant harm to the environment. These amazing places, given to us through no labor of our own, are worth the twelve million dollars in foregone profit to protect.

Purpose & Need

Timber Volume

The proposed action would produce an estimated 104 million board feet, a huge amount of commercial timber in the context of recent decades. The PSQ for the entire forest is 111 mmbf. We do not agree that a timber sale this large is warranted. It is sad that, in 2020, the Forest Service is literally going to be logging old-growth trees, some even with something very much like a clearcut, from this invaluable recreation and wildland area.

Please explain how the Forest Service is planning its timber volume production. Where are the requirements coming from? What are they based on? What does it mean to go above or below them?

Active Management to improve stand conditions

We are concerned that this project is not using the latest and best science as regards forest stand conditions, relying instead on a mechanistic, misleading and outdated notion of "forest health."

The DEIS is vague and misleading in characterizing stands as "overstocked." The implication—incorrect and unsupported by science— is that there is an established "ideal" density of trees against which stands should be measured and brought into line. That is not right, at least not on diverse natural stands.[2]

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[1] DEIS, p.1.

[2] We do agree it is a rational method on tree farms, but there are or should be none of those here.

The DEIS hinges everything off of SDI, which is a useful figure, but which doesn't come close to telling the whole story about stand conditions. Tree species, for example, matter. This assumption does not match at all with our own observation of site-specific factors, with stands of varying density showing varying values at different elevations, aspects, and soil conditions. Young, high-elevation lodgepole pine are being judged by the same metric as old, low-elevation western hemlock.

This picture also entirely omits the many and various ways that trees *benefit* one another. How can it be that so many of the big trees growing in the forest are grouped up in clusters, if trees are in competition? The image at right from unit 1300 is illustrative. We measured another cluster of 4 trees within a 22' diameter cluster, only one of which was under 40," the others over fifty and sixty. The notion that thinning out clusters like that is just like weeding carrots is wrong.

The Purpose & Need section says that "all stands" are "overstocked," and asserts that this is a condition resulting from planting densities after clearcuts, and fire suppression. It is troubling that there is no scientific support provided for these assumptions. These assumptions are dangerous because they imply that these forests aren't really natural, and so by exploiting and manipulating them nothing of value is being lost. Based on our review of the area and science, we disagree. We consistently observed natural openings forming, especially in the older stands, even those that were very dense and dark. Everything is working exactly the way it is supposed to be working, even under the classic Franklin et al. (1981) succession pattern, towards old-growth.

This purpose makes more sense on old clearcuts than in old-growth. The proposed action would log over 2,000 acres that are older than 80, essentially all of which are never-before-logged native forests. Worse, 1,602 of those acres are listed at over 121 years-old.[3]

In our view, the most important thing as to forest health is careful, on-the-ground review at the stand level by resource experts in the IDT setting. Much as health of human beings is judged at an individual level, the health of forest stands needs to be evaluated at the site-specific level.

It is hard to tell because the actual unit designs aren't disclosed in the EIS (even with eye-crossing cross-checking it is impossible to check many unit plans against what we found in the field), but it actually does seem as if the USFS team applied a good deal of site-specific

[3] DEIS, p.30.

knowledge to designing units. How else could the acreage figures have been calculated, but by drawing a shape? It is a major omission that the DEIS never tells us how those designs are actually arrived at.

Habitat complexity and hardwoods along streams

We commend the Forest Service for its work in refining, evaluating and pin-pointing locations where riparian restoration could be usefully done. This site-specific work contradicts the statement in the Purpose & Need section that says "[p]ast logging practices and fire exclusion have resulted in dense, uniform species stands with few hardwood trees or understory shrubs throughout Riparian Reserves."[4] That is not at all true, at least not relatively. Lots of the riparian reserves are in pretty good shape, and very few of them are being targeted by this project for logging.

As with the "forest health" issue, we put a premium on site-specific consideration by resource experts, and object to simplistic, mechanistic portrayals of this dynamic landscape.

Sustainable Road Management

We strongly agree with this purpose and need, and wish it had been given a bit more close attention. Many more miles of road were recommended for decommissioning by the latest systematic risk analysis, yet only one option is given for roads.

Forest Plan & Management Direction

The management direction laid out is a very confusing hodge-podge of forest plans, amendments to them, and individual EISs. Making matters worse, these plans all date to decades ago. Some of these, like the LRMP and Northwest Forest Plan, are of obvious relevance, but some of the others are a bit confusing.

Please clarify what about the Robinson-Scott FEIS and ROD is applicable to the proposed action, and to what purpose that 1997 FEIS and ROD is tiered to this proposed action.

Similarly what in the invasive plants FEIS and ROD is being tiered to here.

The Forest Plan here is old, and has not been updated in several decades during which a large amount of new science has been discovered. There was recently a major scientific synthesis for the NWFP, among lots of other new developments in various specialties, especially regarding climate and fire. Please explain how new science is being addressed here in the context of the old Forest Plan. NEPA can serve as kind of a bridge to the old plan, filling in the best science even for issues that weren't known in the past.

[4] DEIS, p.18.

Alternatives

Environmentally preferred Alternative

The actual environmentally preferred Alternative is likely to be some mix of action and no-action.

Is the fuel reduction considered to be on balance environmentally beneficial, or not? We hope it can be a light touch, aimed at facilitating fire on the landscape, rather than only increasing fire suppression. Please do not make fire safety-related projects like that controversial by overdoing it or being careless with them.

Alternative 3

Thank you for considering Alternative 3, which stays clear of stands older than 80 and doesn't include regeneration harvest.

It is disappointing that the meadow enhancement is not a part of Alternative 3, on the rationale that because that Alternative generates less timber revenue the funds would not be available.[5] Please explain this rationale more. Is the agency depending on this sale being subject to stewardship contracting? If so, then we are disappointed to see that commendable tool being misused here to leverage greater resource extraction, which is at cross-purposes with any reasonable notion of stewardship. Worth-while restoration must not depend tit-for-tat on specific resource exploitation projects for funding. [6]

What amount of revenue would be needed to accomplish that project? What are the revenue sources and projections? It might be that the environmentally preferred Alternative would be some version of Alternative 3, but including actions like the meadow enhancement, fall & leave in riparian areas, and maximum road decomissioning. We hope that ideal Alternative should be considered and disclosed under Alternative 3 at least to the extent that it is reasonably foreseeable. The ROD and later contracting can (and surely will) adjust which actions are and are not taken according to available funding, so nothing is lost.

That said, thank you for disclosing this practical factor (funding availability) in a specific way. It does help clarify government decision-making for the public.

Silviculture Alternatives

The EIS does not contain maps or other information illustrating prescriptions for units. All logging is equal, to look at the map, and it is only with cross-checking appendixes that Shelterwood regeneration units can be distinguished from light riparian thinning. Please provide a map that reasonably illustrates the spatial distribution of various logging prescriptions—in particular regeneration harvest.

There are very real and important Alternatives available from a silvicultural perspective. Light thinning is a very, very different thing than heavy shelterwood harvest! The 97 remaining trees

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[5] DEIS p.34.

[6] The comparison is over-dramatic, but in structure it is like a hostage situation.

per acre in the 38-year-old unit 1690, is very unlike the 176 acres of shelterwood harvest in the 136 year-old unit 1110. The project area encompasses different forest plant associations and tree species.

On the one hand, we compliment the Forest Service and appreciate the relatively high degree of site-specific planning that has gone into unit design here. Units are not treated uniformly, and even within individual units the treatments often vary between intensive clearings and lighter thinning.

On the other hand, it is concerning that the EIS never actually illustrates those site-specific unit designs. This general problem emerges in a few ways. First, spatially, commercial timber sale units are all portrayed identically on Alternative maps. From the tables in the Appendix we can tell that, for example, unit 1980 has 16 acres of riparian reserve, 62 acres to be thinned, 15 acres of gaps, 3 acres of dominant tree retention, 102 acres of shelterwood cutting, 24 acres of no-cut skips (16 acres of which are the riparian reserve). But nowhere is it explained where those different things are prescribed in that unit. Or why.

Second, the EIS doesn't portray information in a way that allows comparison of alternative treatment methods. For instance, while the App. C helpfully says that all of Unit 1980's various treatments together will produce 4627 mbf of timber, at 35 mbf per harvest-acre, that total and the average don't reveal differences there would be between Alternative treatments. The shelterwood harvest could potentially be thinned instead, correct? How much volume-efficiency is there in gaps, as opposed to shelterwood?

Third, even within the single method of commercial thinning, the various thinning intensities are nowhere specifically indicated, even though apparently they have been determined to a high degree of precision. Appendix C provides a post-harvest t.p.a. >7" for each unit. That is very helpful and informative for units designated for a relatively uniform thin. However for units like 1980 where treatments vary, that overall average is a misleading rather than a helpful figure. Stating an average between no-cut and clearcut areas masks the intensity of logging, and quickly becomes arbitrary where it hinges on where unit boundaries happen to be drawn.

Appendix B Comments

Thinning

The term "health and vigor" is central to the analysis. *See e.g.* DEIS App.B p.234. What does that mean? Is "health and vigor" uniformly associated with low tree densities? What can that mean on a landscape where variability is itself essential to health?

The effects of thinning are not uniform. Please ensure that the EIS effects analysis is accurately considering and disclosing the differences in effects between heavy and lighter thins, and of thinning in different stands and sorts of forest.

Thinning benefits are most certain and most impactful when done earlier in stand development.[7] That is one major reason we favor Alternative 3, which focuses thinning effort

[7] DEIS App.B, p.235.

on younger stands. **Across issues, please be careful to consider and disclose the different predicted effects between thinning in previously-logged, younger plantations, as opposed to in older, native groves.** For instance, the positive effects to Northern Spotted Owl habitat are much greater, and the negative impacts much less, when thinning occurs in old clearcuts.

There are also important differences between lighter and heavier thinning. Generally, we favor lighter thinning than is proposed, as that can leave more natural features and processes intact.

This project emphasizes much heavier thinning. The DEIS says that heavier thinning would "promote rapid growth of trees with characteristics normally associated with old trees in old-growth stands."[8] A great deal is made of studies finding that old-growth forests developed with little tree-to-tree competition. Does that necessarily equate to lower tree densities? Is there not controversy and uncertainty about relying on past conditions to predict future effects in this way? The EIS relies heavily on Franklin et al. 1981, and especially Teppeiner et al. 1997, to support heavier thinning, but these and other studies do not support the EIS's sweeping confidence.

Heavier thins have much greater impacts to wildland values, generally speaking, and warrant particular attention. Without any alternatives, it is impossible to tell what difference a lighter thin would make.

Please consider reasonable alternatives in terms of thinning and logging intensity, and explain the rational for making the prescriptions you do, where you do.

Other than acknowledging the tradeoff of down wood, the focus of analysis here appears to be entirely on inter-tree competition. Aren't there other factors that are important? Don't trees cooperate as well as compete? Productivity of stands in terms of habitat or carbon storage, for instance, doesn't increase when stands are thinned and soil disturbed. We urge the agency to apply its best knowledge to designing the best possible thinning prescription.

Can you please explain how harvest prescriptions would be marked and implemented? Will trees be marked to leave or fall? Will the agency mark units ahead of time, or leave it to purchasers?

Gaps

What does it mean that gaps might be place "to provide scenic vistas?" DEIS p.236.

Gaps are of random shape and location, ranging from ¼-acre to 3-acres in size. Without any illustrations or more information, it is hard to know what this might look like. Appendixes give us acreage of gap and skip, which is something, but some additional information about this prescription would be helpful.

Please clarify how the gaps and other prescriptions relate to the others. The DEIS says "gaps are a part of variable density thinning," which makes sense, but it appears that specific areas have been prescribed for thinning, gaps, DTR, and shelterwood. In the context of a heavily thinned

[8] *Id.*

unit, will gaps be gaps in the thinned areas? Or, will gap-and-skip zones be distinct from CT zones?

Fuel Reduction Areas

Why are there no Alternatives for fuel reduction? Where did this plan come from? Some of the logic is not obvious.

How were these areas arrived at? Might we consider enlarging or shrinking them?

Please also describe how the areas are envisioned to function in a bit more site-specific detail.

Alternatives considered but eliminated

The DEIS says an alternative that doesn't involve new road construction wasn't financially feasible. Why not? What factors made that option un-economic?

Are there not alternative yarding methods, such as skyline, that facilitate logging with less need for roads?

Misc PDF comments

PDF 77, regarding enhancement effects to special habitats, has a list of unit numbers that don't correspond to any units in the preferred Alternative.

The buffers for special habitats are important in a great many units.

We appreciate PDF 49 regarding legacy structure retention.

We would appreciate knowing, for unit-specific comments, where and how the Forest Service is applying these PDFs or other buffers to protect special identified resources. The small meadow in unit XXXX, for example—will it be buffered?

Regarding PDF 37, and riparian buffers generally on roadside fuel treatment,

Snag and Down Wood Creation

Regarding S&G C-46 regarding black-backed woodpecker, harvest is not allowed if snag-creation requirements can't be met. DEIS p.56. Can these requirements be met on all stands? Were stands dropped for inability to meet this requirement?

Monitoring (DEIS §2.8)

Rather than just list the monitoring schematic, it would be helpful for the EIS to link to monitoring effectiveness reports and related information, drawing any important lessons from them. What is the point of monitoring schemes if they aren't applied to projects? It is essential to know how reliable these monitoring methods have been, in order to know whether or they'll be effective to avoid significant effects, or avoid causing irreversible damage.

It is disappointing that no additional monitoring is involved or proposed regarding the effectiveness of proposed "treatments" on the landscape. Why on earth invest all this energy in a big meadow restoration project, then gather no data about it?

Fuel reduction areas along roads also cry out for special monitoring attention. It is insane to cut miles and miles of fuel reduction on roads, then forget about it.

We are concerned with the six sites needing ongoing NSO surveys to avoid "take." What is that about? Please do not approve anything that is not cleared as to spotted owl take. There is no reason to push any boundaries here—be conservative about owls, and only make judgements where the data is sufficiently reliable.

Chapter 3 General Comments

The boilerplate on page 62 regarding the Interdisciplinary Team is a large detail, often overlooked and undervalued, for which we want to specially commend the Forest Service. We sincerely do appreciate that the Forest Service, based out of the local Ranger District office and staffed by people who live there(abouts), has done most of the analysis itself (albiet with contractor help). We appreciate that the IDT is staffed with people who are trained in their respective disciplines, and that they were given time and resources to apply their expertise on the land. In a similar vein, we also appreciate the commitment to the "best available science." There are a huge number of small variations and improvements that have been made to the project as a result of this body of effort that have greatly improved this project due to those IDT efforts. As environmental advocates we commend and appreciate that good work.

Forest & Stand Structure (§3.1)

General Comments

While as a statement of aspiration it is commendable, the statement that "stands proposed for treatment… would positively respond to and benefit from treatment" might also betray a false sense of assurance that all commercial logging that is proposed will *improve* each stand.[9] Granting that there certainly are benefits in some respects, there are also harms in others, and the balance of benefits and harms is variable. Some of the proposed units, such as 1110 or 1970, seem to be more directed to producing efficient and economic timber volume, rather than on *improving* the forest as such.

Additionally, while the language is somewhat understandable, really there is no uniform "better" and "worse" for stands; nor is there a set picture of "health." The whole language of "treatment" and "health" can paint a misleading picture. It is important therefore that where objectives are identified, like accelerating the growth of more of the largest trees, that those are specifically identified and carried through the analysis. Then the clearly known benefits can be weighed with the foreseeable risks of harm, so as to arrive at an optimum project. But be wary of the seductive notion that everything other than some idealized farm or garden is "sick" and therefore in need of human manipulation.[10] In particular we value the mature, edge-of-old-growth stands in the 80 – 150 year range. Without fire they are generally more dense than

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[9] *See* DEIS p.63.

[10] Among other problems, what that ideal stand looks like is different from different perspectives. The traditional "ideal" of stand health for foresters equates to, basically, a tree farm. From a wildlife perspective, on the other hand, such perfect "health" would be a disaster.

probably is average, but generally they are unique, vibrant, life-filled, diverse, *healthy and vigorous* forests.

The DEIS explains that logging prescriptions are aimed at creating increased diversity of species, composition and structure in stands. What exactly does that mean? How is diversity, in that sense, measured?

The DEIS says that all the commercial treatments would shorten the duration in stem exclusion successional stage.[11] Is that true of shelterwood? And of gap creation? This is probably true of younger plantations, but not heavy logging of mature stands.

Thank you for acknowledging the tradeoff with snags, as compared with growth of remaining trees.[12] This is a very simplistic way to express a profound set of tradeoffs involved in commercial entry. We suggest that the tradeoffs involved, while site-specific, follow the general pattern that benefits are higher and harm lesser, where stands are younger, more intensively impacted in the past, and where proposed 'treatments' are less extractive. For older, native stands here, for example, there is no real case to be made that shelterwood logging is an improvement on stand health.

The DEIS claims that all logging "would reduce the risk of fire spreading through the understory by increasing the growth of understory vegetation."[13] First, this contradicts fire models and science from the IDT own fuels report showing that small-diameter woody material in the understory is the big factor enabling not only fire spread, but also high flame lengths, increased safety hazard to firefighters, and increased fire severity. It is totally illogical to cut out big wood to grow small wood. With heavy thinning moreover it increases solar radiation and wind speeds. Please correct or clarify the basis for this statement.

Second, as with stand "health" the DEIS is painting with a too-broad brush. The implications for fire risk and hazard are multifaceted, and vary widely depending on the stand itself, and the proposed treatment. On other stands we have seen it recognized that thinning to 60% canopy yields substantial benefits as to fire hazard, whereas regeneration harvest models like shelterwood and heavy thinning result in long-term increases in fire hazard.[14]

Regarding §3.1.2, the scale of analysis is just stated as being the project area, without any warrant for that. Two additional scales of analysis strike us as being important here: stand-

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[11] DEIS, p.63.

[12] DEIS, p.63.

[13] DEIS, p63.

[14] *See e.g.* BLM , November 2019, *Shively Clark Harvest Plan EA*, pp.44 – 49 (finding "significantly smaller fires and lower suppression hazard" under a lighter thinning prescription, but increased fire size and hazard after regeneration harvest methods, analogous to what is proposed here). Available online at: https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=101334

level; and watershed level. The project boundary is quite arbitrary, ecologically, encompassing different forest types. The discussion of Alt 1 in §3.1.4 shows the folly of relying on the broad, project-level analysis because it involves only the vague description of forest conditions and a misleading narrative about "overstocking." It is not true that no action results in a static condition of high competition

Regarding §3.1.3, the four-level schematic being used for stand age classification is not supported or justified by anything. The number-crunching here is fine as far as it goes, but, where is that? So what that 9% of this project area is between 0 and 30 years old? Also, these measures are different in different places. A 30, or 80, or 180 year-old stand is very different depending on whether it is low elevation western hemlock, or high elevation lodgepole pine. As the DEIS itself recognizes on the next page, "age alone does not tell much…" about a stand.

The DEIS section on "stand vigor and growth" and the SDI is perhaps more helpful in explaining stand development, but there too caution is warranted. The SDI model seems to have been developed in a tree-farming context, where conditions are more uniform. It is hard to know how SDI would apply where skips and gaps are proposed, for example.

What is the best available science with regard to metrics of stand development here? Recognizing that stand age and SDI are both very limited in their utility, better methods ought to be developed.

Previously Logged Stands ought to be managed differently from Fire Regenerated Stands.

Thank you for directly addressing the difference between previously managed and fire regenerated stands.[15] Our organizations are keen to support responsible thinning of previously-logged plantations; we remain cautious and concerned about logging on native stands.

Flat country Alternative 2 would log 1,302 acres of previously managed stands, and 2,210 acres of native, fire-regenerated stands.[16] We are disappointed by the emphasis on native stands, and relatively small amount of previously managed stands.

Please clarify the amount of existing previously logged plantation in the project area. We are unclear if there are 14,457, or 2,418 acres, of previously-logged plantation.

Legacy Structure

PDF 47 says that "legacy" trees and snags were mapped and identified by the district wildlife biologist, and would be protected, in units 10, 110, 160, 1220, 1230, 1240, 1400, 1440, 1450, 1650, 1680, 1720, 1730, 1750, 1900, and 2190. Legacy snags are retained in units 110, 140, 1220, 1250, 1400, 1710, 2110, and 2120. We are concerned that this list reflects an incomplete inventory of actual legacy tree and snag presence on the landscape.

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[15] *See e.g.* Franklin et al. 1981 (Distinguishing natural from managed stands, noting: "Contrasts are very sharp between natural and managed young growth in several ecological attributes…").

[16] DEIS, p.67.

§3.2.4 Consequences to Forests

With regard to no-action, it is not reasonably foreseeable that there will not be future disturbance in these stands. Fire, blowdown, snowdown, slides, insects and disease will all foreseeably continue to play a role on this dynamic landscape. Please include and discuss the natural range of variability and natural frequency of disturbance. We observed quite a lot of blowdown in native stands proposed for logging here, for example, contradicting the EIS narrative if stands frozen in an unhealthy "overstocked" condition.

It is notable that the benefits of canopy thinning taper off over 15-20 years.[17] Gaps only last from 10-20 years.[18] The project benefits thereby are quite temporary.

The DEIS sites studies showing benefits of thinning on "young uniform stands like those proposed for treatment."[19] But, are they, really? The studies emphasize the benefits of *early* thinning, whereas stands proposed for thinning here are as old as 150 years old. **The EIS draws no distinctions as to effectiveness of thinning based on stand development.** That is not consistent with these studies, which emphasize that thinning works better in some cases than in others; and that the benefits concentrate where it is done early in development of a uniform stand. Later, when discussing riparian thinning, the DEIS quotes Spies et al. (2013) that "greatest potential ecological benefits of thinning to accelerate the development of older forest structure (e.g. large trees, large dead trees, spatial structure and compositional heterogeneity, etc.) come in dense uniform plantations less than 80 years and especially less than 50 years old."[20]

The DEIS then addresses heavier thinning, which it says "would likely promote rapid growth of trees with characteristics normally associated with old trees in old-growth stands."[21] It is noteworthy that no scientific studies are cited here as to effectiveness of the proposed treatments on mature, native stands. Please correct us if this is wrong, but there appears to be no direct evidence that heavy thinning as proposed here is actually effective in promoting old-growth stand characteristics. That idea would be highly controversial.

We are concerned that the studies sited regarding heavy thinning do not provide scientific support for the conclusions being drawn. Tappeiner et al. 1997 for instance was a study in the coast range—of very questionable validity here in the high Cascades. Franklin et al 1981 is a classic, but it is dated and doesn't provide support for heavy thinning being a restoration action. Both studies are used to explain that old-growth sometimes resulted from slow regeneration at low densities—but that is not at all the same as the conclusion that is drawn from it, which is that creating a low density forest will result in old-growth. To its credit the DEIS

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[17] DEIS p.69; Chan (2006).

[18] DEIS, p.70.

[19] DEIS p.69.

[20] *See* DEIS p.96 (citing Spies et al. 2013)

[21] DEIS p.69.

goes on to site studies explaining that old-growth also results from even-aged development and long-term suppression mortality.[22] That severely undercuts the logic of heavy thinning being necessary.

Thank you for including the Figures visualizing the treatments.[23] Those are very helpful and practical illustrations.

It is notable that there is no science cited supporting the EIS predictions for consequences of regeneration harvest. That is a very notable omission. We are most concerned with that proposed regeneration logging. Scientific uncertainty and controversy regarding those effects are good reasons to favor Alternative 3.

Please clarify the assumptions and factors regarding future treatment of regeneration units. The EIS indicates planting, pre-commercial thinning in 15 years, and commercial harvest to follow in 25 – 40 years.[24] Are those future treatments connected actions? How assured is it that these things will occur? We note that pre-commercial and commercial thinning after regeneration logging is inconsistent with purported ecological benefits of regeneration logging, or the assumptions made as to recovery of habitat for fisheries and wildlife (including NSO).

We support the proposal to map retention areas.

Please take a closer look at microclimate changes flowing from proposed action. The DEIS says:

> [DTR and thinning] result in changes in the microclimate (increased air and soil temperatures, relative humidity's, and air movement), under the main canopy for a short term (10-20 years) until the canopy closes back in (Chan, 2006). These changes in microclimate stimulate an increase in favorable growing conditions for most plant species.[25]

This is a very simplistic image of forest understory, which varies depending on many factors. Some of the rarer understory features are associated with wet places and slow growth, so would be harmed and not helped by opening the canopy. With regard to fire hazard those microclimate changes could be decisive.

The DEIS sites Andrews et al. 2005 for support of the proposition that succession stages can be shortened. This notably does not support heavy logging of the older, diverse stands, but rather supports a prioritized focus on younger, managed stands.

The DEIS says:

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[22] DEIS p.69, Winter et al. 2002a, 2002b.

[23] DEIS p.70 - ; Figs 12, 13, 14, 15.

[24] DEIS p.72.

[25] DEIS p.73.

> Commercial harvest may cause some stages of forest succession to be shortened due to accelerated growth and enhancement activities (Andrews, et al., 2005). The stands in both alternatives would more quickly move from stand initiation to understory re-initiation and on to old-growth.[26]

This is simplistic and misleading. First, it is not true of regeneration logging that that will accelerate the stand's arriving at old growth. Not only is that not true in terms of the silviculture, but only a few sentences earlier it was explained that the gaps, DTR and regen units would provide for 80-100 year "long term" timber production.[27]

For what purpose is tree planting needed? Are there no alternatives? Planting in regen units works directly contrary to ecological benefits of early-seral habitat. We encourage a focus on ecological value, rather than timber production, in making decisions where and when and what to plant.

The DEIS is simply wrong in claiming that, because of decommissioning, temporary roads will have no negative effects on forest stands and structure. Compaction from temporary roads certainly works against stand productivity, even with decommissioning. Many temporary roads would be re-used, especially in regen stands where future thinning would be needed.

Soil

The PDFs (*see DEIS p.44)* leave a lot of impact from ground-based yarding. Please ensure ground yarding is not used where it could cause irreversible effects on resources.

We are concerned for impacts to soil. The DEIS recognizes short term harm in terms of displacement, compaction, nutrient loss, and instability. It concludes that, thanks for design features, "no adverse effects to soil resources are expected."[28] That conclusion is misleadingly optimistic and not supported by the evidence.

It is alarming that there are 25 units approaching or exceeding the Forest Plan S&G of 20% detrimental soil compaction.[29]

Where are these units? Why are they not dropped?

Logging these units would seem to violate the FW-081 Standard, which holds that "the total area of cumulative detrimental soil conditions should not exceed 20% of the total acreage within the activity area…"

We are also concerned for compliance with FW-079, which requires that "[l]and management activities shall be planned and conducted to maintain or enhance soil productivity and stability." This project plainly is detrimental to soils in several ways. We are especially concerned for adverse effects to fungal networks in the soil, as well as compaction.

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[26] DEIS p.73.

[27] DEIS p.73.

[28] DEIS p.78.

[29] DEIS p.77.

The DEIS relies to a huge extent on various mitigation measures to safeguard soil. How reliable are those measures, as informed by past experience and monitoring? Our own observations of recently thinned units in the project area were of seriously impaired ground cover, even with evident efforts to mitigate impact.

We do appreciate the ground surveys and work that went into investigating soil conditions in units. That site-specific information is very valuable and it clearly resulted in a better project. Thank you.

Table 14 lists quite a number of wetlands and wet zones in the project area units. Thank you for sharing this detail. The recommendations are pretty vague, amounting in most cases to just following soil scientist recommendations. But what are those? It is hard to imagine any reason why wetlands would need to be destroyed for this sale. There is no purpose or need that could not still be met while avoiding all wetlands.

The DEIS analysis of nutrients is slight. Please address FW-085, requiring that with relation to nutrient cycling "site specific needs shall be considered in environmental analysis."

Hydrology (§3.3)

This project area encompasses a lot of the McKenzie River headwaters. Because the McKenzie is a beloved and valuable system in itself, and is also the water source for Eugene, and especially in an era of climate change, we are interested in ensuring clean water and healthy aquatic systems in the project area.

The DEIS says that:

> There is a lack of vegetation species diversity and structural complexity at the landscape and project scales. In general, habitat elements that contribute to fish and wildlife habitat quality of productivity are in an impaired condition primarily due to the alteration of riparian vegetation due to past logging activities. These conditions need to improve in order to meet Aquatic Conservation Strategy (ACS) objectives and support healthy, native fish and wildlife populations in the watershed.[30]

It goes on to say that "most of the land" has been impacted by management and recreation, many clearcut and planted with Douglas-fir, so set on an over-dense trajectory.[31] Appendix G, on the other hand, seems to show that there is <u>not</u> a need for riparian treatment on a broader scale, at least in almost all instances.

Please clarify the picture at the landscape (ie watershed) scale—are riparian stands an unhealthy monocrop or not? How is the agency making judgements and prioritization about watershed health? How was it determined where action was *needed* to achieve ACS objectives? It is easier to see how actions can be consistent with ACS objectives, or even helpful to some of the objectives, than that action is necessary. Clearly some prioritization process must have been used.

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[30] DEIS p.85.

[31] DEIS p.87.

As to this project, please focus analysis and decision-making on specific stream reaches and stands. We support riparian thinning where it happens in a priority area, after field review by experts, and is directed to fulfill specific ecosystem functions that are presently lacking.

In general we are pleased that riparian thinning is not being aggressively pursued on a wide scale, with only 164 acres of riparian thinning proposed. It is wise to limit it to stands under 80, and only where actually needed after surveys.[32]

How reliable does the agency suppose the watershed analysis information is for this area? Between the McKenzie WA (1995), GIS and Satellite analysis (NAIP 2016), and the IDT analysis, are the McKenzie headwaters well-mapped and understood (hydrologically as well as in regard to aquatic life)?

We appreciate that all potential treatment units were surveyed by fisheries and hydrology specialists.[33] This on-ground work is very important. Please clarify what this review by the IDT experts consisted of, especially in regards fieldwork. It is a bit confusing on page 88 where the EIS says stream surveys "most recently in 1999" are being used to assess habitat conditions. That is great to use surveys that are done, and we agree that the watershed condition framework rankings and factors are relevant here, but this ought to be supplemented with additional information.

The EIS says field surveys in units only estimated pool forming wood and a range of abundance.[34] Is that adequate? What did these surveys tell us about the reliability of earlier survey work? We observed some small streams in units with, to look at it, particularly good down wood supplies.

Please consider how climate change is expected of impact on hydrology in this area, to determine whether that changes any of the assumptions as to indirect or cumulative impacts of the project.

Please take a very careful look at the understanding of the role of fire and fire suppression on altering the hydrologic regime in the project area, which is a major premise of the "restoration" logic here. The DEIS says that early-seral riparian vegetation is under-represented, as compared with the natural range of variability.[35] We appreciate the citations to relevant scientific studies in the EIS, and agree that this supports a conclusion that riparian hardwoods are under-represented here. All of the strong conclusions here are very limited, so a cautious approach to management interventions seems warranted.

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[32] DEIS p.93.

[33] DEIS p.86.

[34] DEIS p.88.

[35] DEIS p.89.

Additionally, it remains unclear to us how fire ecology normally functions in this area, specifically particularly as it relates to riparian function.[36] Please be sure the agency has considered the best available science regarding local fire history, historic fire regimes, and fire-adapted plant or animal communities. Fire ecology is complex and we are concerned that simplistic generalizations could lead us down a wrong path. The notion that denser stands are more prone to high-severity fire, for instance, is misleading if applied to stands with high canopy cover and little or no ground fuels, in a moist valley-bottom on a north-facing slope. Depending on the local fire regime, fuel types that are prone to high-severity fire may be natural, inevitable and beneficial.

We support introduction of low severity fire into patches of riparian reserve, with appropriate precautions of course, if that is appropriate in light of local fire ecology and conditions. Getting fire back onto the landscape is generally a pressing need ecologically, and those sorts of opportunities should be pursued.

The proposed fall & leave treatments seem to be relatively well-supported and worthwhile. We support these actions with some reservation, but can get behind them here because of (1) the site-specific scientific work in the EIS, and (2) a conservative, limited scope of proposed work, with strong monitoring provisions. So, while commendable, please remember that effects especially of the in-stream actions can be very variable and unpredictable, so should always proceed with caution. And, please ensure that all in-stream actions have specific effectiveness monitoring over a reasonable period of time.

§3.3.6 Stream Shade & Temperature

Cold water from the headwaters is a famous and valuable feature of the McKenzie River to protect. The McKenzie is on the 303(d) list of impaired waters for temperature, and in the era of climate change this issue will only grow in importance.

Thank you for the survey work with regard to stream temperature and shade.

Low flow

The EIS seems not to have taken note of the emerging studies clearly demonstrating a low-flow effect in response to regeneration harvest, as compared with old and mature forests. The issue of stream flow, in fact, isn't addressed as a factor in relation to stream temperature. *See* Perry & Jones, "Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA", *Ecohydrology* 2016: 1-13. This is a compelling argument against regeneration harvest.

Supplemental analysis of this issue should consider, at minimum,

- Current and historic low conditions of area streams (i.e. are low flow problems implicated in watershed condition assessments or watershed analyses, 303(d) lists etc.)

[36] *See* DEIS p.93.

- Proportions of watersheds in age classes, in particular plantation forests older than 15 years.
- Cumulative impact of the proposed action on these factors.

The Perry & Jones study evaluated streamflow data from eight paired-basin experiments, and concluded that **conversion of older forests to plantations had major effects to low summer streamflows**, averaging 50% lower than reference basins. Basically, young doug-firs evapotranspirate water a lot faster than older trees, especially during dry summers.

The core issue involved in Perry & Jones is the "widespread evidence that intensive forestry reduces water yield," and that in the PNW forest plantations "have reduced summer streamflow relative to mature and old-growth forests." Perry & Jones (2016), p.1. As indicated in that paper, this phenomenon is well-known and it widespread, even as the "magnitude, duration, causes, and consequences" are not well understood. *Id.* at 2. In that context, the Perry & Jones study is hugely significant, because it provides high quality, objective data that is directly applicable to forest management in this region. Those results are dramatic and alarming. Compared with reference basins, managed forests resulted in a pronounced, 50% reduction in summer streamflow. This condition began after about 15 years of plantation establishment, and has persisted and intensified in 50-year old stands, regardless of thinning. As the authors indicate, "this finding has profound implications for understanding the effects of land cover change, climate change, and forest management on water yield and timing in forest landscapes." *Id.* p.8. The studies "indicate that even-aged plantations in 8 ha or larger clearcuts are likely to develop summer streamflow deficits, and these deficits are unlikely to be substantially mitigated by dispersed thinning or small gap creation." *Id.* at 10. As the authors indicate, their results "challenge[] the widespread assumption of rapid "hydrologic recovery" following forest disturbance." Of course, reduced summer flows is a very big deal, with potentially significant impacts to salmon, steelhead and trout, among other aquatic critters, and exacerbating trade-offs in water use downstream. *Id.* at 10. This is particularly true in the subject watersheds and subwatersheds where there are long-standing concerns about high stream temperatures harming salmon, steelhead and trout habitat. Climate change is further compounding the problem.

Ecologically, if plantations are causing lower low flows, then, as the study says, "this finding has profound implications for understanding the effects of land cover change, climate change, and forest management on water yield and timing in forest landscapes." A host of well-established ecologically processes related to low summer flows are a huge issue for fish and other aquatic species. High stream temperatures for example are very commonly a critical limiting factor for fish populations, and this problem is obviously worsening with global climate change. The period of low flow in streams corresponds with the highest temperatures (as well as return timing for salmon) in late summer, and less water in streams has profound effect on stream temperature. Lower low flows also relates to sheer amounts of aquatic habitat that are available, both to fish and other aquatic species. Lower flows reduce pools and pool depth, limit migration, and otherwise restrict quality habitat.

The Perry & Jones findings challenge the assumption that there is "hydrologic recovery" only a couple decades after logging, an assumption which underpins current approaches to forest

management here.[37] It is significant to note that past watershed analyses and the forest plan did not assume or conclude that plantation development plays any important role at all in the low flow issue. To the contrary, agencies have applied a hydrologic recovery metric that presumes hydrologic recovery. That is flatly incompatible with the Perry & Jones findings.[38]

Low Flow is significant information that requires hard look NEPA analysis by the Inter-disciplinary team. Please ensure regeneration harvest does not cause or contribute to any reduced summer low flow in any area basins.

Stream Flow (§3.3.8 & .9)

The transportation network is another problem for stream flow, with specific problems and overall high densities. We are concerned for specific locations, which don't appear to be identified in the EIS, where flow is interrupted, concentrated, and enlarged. Please ensure site-specific, flow-related problems with roads are addressed.

§3.3.10 Sedimentation

We agree that the transportation system and unstable roadbeds are clearly the major sedimentation concern in the area.[39] We are interested and support the agency addressing both (1) specific roadbeds that are unstable, intercept streams, have inadequate culverts etc., and (2) a generally too-high road density.

Boulder Creek, at 3.22 mi/mi^2, and poor with impaired function, looks to be a high priority for reducing road density.

It is odd that in discussing the existing environment road densities are addressed by watershed (with big variation between them), but then for environmental consequences impacts are only displayed at project scale.[40] It would be useful to see what the project is proposing for Boulder Creek subwatershed, for example. Perhaps Table 26 could be re-visited in the next section, to compare effects with the existing condition.

We are wary of overconfidence in best-management practices and mitigation measures to completely erase sedimentation effects. The death of a thousand cuts is real.

The EIS does acknowledge an estimated increase of annual sediment yield of from 16 – 24% cumulatively, under either alternative, from use of the road system during the project, followed by a decrease by 3 – 14% after completion of all project activities.[41] Please remember that the

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[37] DEIS p.104 (explaining hydrologic "recovery" assumptions)

[38] *See* Perry & Jones at 11 ("This result challenge the widespread assumption of rapid 'hydrologic recovery' following forest disturbance.").

[39] DEIS p.105.

[40] DEIS pp.106 – 109.

[41] DEIS p.107.

first part of that equation is more assured than the second, and takes place over a much longer timeframe.

We are concerned with the mile of road construction in riparian reserve proposed under Alternative 2, for sediment and other impacts. [DEIS p.108] Alternative 3 is significantly better in this regard.

Please consider the site-specific factors related to this road construction. Are these fish streams? Is construction related with other sensitive resources (ie. caddisflies, meadows)?

We strongly support and commend the Forest Service for pursuing culvert replacements as part of this project. While praiseworthy, it ought to be recognized that this work does come at some cost to aquatic health, in particular in terms of sediment delivery to streams, even with applying BMPs. We agree that the benefit is worth the cost, but all of the in-stream and stream-adjacent ground-disturbing work causes sedimentation. Therefore, because those impacts unavoidable, road decommissioning, rather than renovation & storage, should be pursued wherever feasible.

Are there additional opportunities for remediation work on the transportation system to reduce sediment effects, that could be considered as part of this project?

As to harvest-related sediment, the DEIS claims that with BMPs and a 33' buffer, "essentially all of the harvest related sediment is eliminated."[42] This is not consistent with observed or predicted impacts to soil, which includes many units well over recognized thresholds for adverse soil disturbance.

Again, we dispute the characterization of *well-minimized* effects as zeroes. That "low equals zero" notion, repeated through this EIS as regards watershed impacts, is exactly the faulty logic that can lead to the death of a thousand cuts, and that is supposed to be addressed as cumulative effects under NEPA. Roads, skid trails, road construction & de-construction, yarding (especially ground yarding), and adverse soil disturbance all combine into a cumulative effect that is more than the sum of its parts.

In particular, please take a closer look at cumulative impacts to priority subwatersheds, such as Boulder Creek, where stream surveys have shown adversely-impacted streams.

Fish & Aquatic Species

General Aquatic Habitat Comments

We agree that this project includes both praiseworthy restoration that we support, as well as extraction-oriented destruction that is cause for concern.

Riparian thinning, like at unit 360, would have mixed effects to fish. Please carefully evaluate the site-specific factors of harvest units, including 360, to ensure that the balance of benefits and harms actually is positive.

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[42] DEIS p.109. Citing Roshin 2006, Lakel 2010.

What effect the predicted changes in forest stand structure have on fish habitat is also important. We are concerned that increases in sediment production both during harvest activities, and as an indirect consequence of less-dense forest and reduced down wood, are being under-appreciated.

We agree that the road decommissioning work is worth the tradeoff in short-long term impacts to aquatic resources, and appreciate the efforts made to identify and make use of site-specific factors, such as at Norwegian Creek, when weighing value of road decommissioning.

It is confusing that the fall and leave in stream channels is predicted to have no direct or indirect effect on fish. Wouldn't work be better focused where it can benefit fish? The lack of any maps of fall and leave or riparian treatments makes evaluating this issue difficult.

Fish - Upper Willamette River Chinook Salmon & Bull Trout

This project implicates important and valuable fish and aquatic resources. ESA-listed Upper Willamette River spring Chinook salmon and Bull Trout are present and critical to this project area. Less-protected but also valuable, from a recreational as well as environmental perspective, are numerous other species including Coastal cutthroat trout, Rainbow trout, and Mountain whitefish.

What is the general state of these imperiled species, and what is the plan to facilitate their recovery?

With regard to ESA fish species the DEIS says the proposed action may affect, and is likely to adversely affect Upper Willamette River Spring Chinook, Bull Trout, and their respective Critical Habitat, but would not jeopardize their continued existence or adversely modify their critical habitat.[43] EFH for spring Chinook is "adversely affect."[44] As to MIS, it says the project may impact individuals but would not contribute to a negative trend in viability for populations.[45] Scott Creek and Lost Creek are both Critical Habitat for spring Chinook.[46]

For spring Chinook, the DEIS seems to say that with spawning during baseflow, access is a limiting factor.[47] That makes it especially important to take a hard look at the potential for 'low flow' resulting from regeneration harvest as a contributing factor.

Unit 360 and 1960 are both adjacent to Chinook critical habitat. We have some concerns with unit 360, a lot of which is very very steep, much of which is running water when it is wet, and all of which is directly above designated spring Chinook Critical Habitat. The west of the unit is a

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[43] DEIS p.110.

[44] *Id.*

[45] *Id.*

[46] DEIS p.121.

[47] DEIS p.121.

cliff, and the east part of the unit is largely riparian. It is hard to see how the lower part of the unit could be yarded without adverse effect to the stream.

We request and recommend road decommissioning of roads 4200210 and 4200222, on Lost Creek. Great!

Bull trout critical habitat is found in Sweetwater, Anderson, Olallie, and Lost Creeks. The Table on page 34 suggests that numbers of Redds might be increasing, but not in Anderson Creek? Any idea why not?

Units 1260, 1300, 1310, and 1320 could all *directly* adversely impact Bull Trout and their habitat. None of these units would actually benefit from logging. At most impacts are being mitigated, but it begs the question of why assume this risks in the first place. Impacts, while hard to measure, would be real to these streams.

We appreciate the closer-look provided of some streamside units in the EIS, such as of **unit 1300.**[48] We visited that unit multiple ties, once immediately before this comment period with five crews of volunteer fieldcheckers, and the closer view map allowed for much more meaningful engagement.

We appreciate and strongly agree with the statement in the EIS that, "despite difficulty in measuring the effects, they would not be insignificant."[49] Is that statement meant to refer to all of the Bull Trout Critical Habitat-adjacent units, or just 1960?

We have concerns, based on that closer review, as further indicated in the unit-specific comments, of the cumulative effects to fish habitat from units like these that are adjacent to valuable habitat. What is the cumulative effect on the fish and fish habitat of units like these on those stream reaches? Please ensure that, after all the factors have been taken together, the combined effect on fish habitat is correctly understood.

We are also concerned with over-reliance on PDFs for wet weather haul to avoid impacts, including to Bull Trout (and caddisflies). The EIS does acknowledge that especially the road 2657830 will result in more fine sediment to Anderson Creek.[50] These small effects add up. The DEIS simply lists them all, without ever putting the pieces back together.

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[48] DEIS Fig. 26, 27.

[49] DEIS p.126.

[50] DEIS p.126.

Sensitive Species - Caddisflies (*Rhyacophilia chandleri & Rhyacophila leechi*)

Thank you for the information regarding sensitive aquatic insects. That information and efforts for investigation are well worth the effort. One of our young WildCATs tied this illustration of *Rhyacophila leechi*, and is looking forward to future exploration to observe live bugs. It is useful to know that the lower reaches of Sweetwater, Anderson Olallie and Lost Creeks could provide habitat for the species, and we curiously await results on USFS field surveys. *Rhyacophila chandleri* is another caddisfly potentially found at higher elevations, like in North Fork Boulder Creek (unit 1590).

What importance do these species have to fish downstream? It is generally true that the smaller headwater streams provide a lot of the biological matter that serves as food for fish throughout the system. Protecting caddisflies in smaller headwater streams could be important to fish, even potentially far downstream. What does the best available science say about the important of these sensitive species to fish downstream?

Other Fish Species

We appreciate that USFS evaluated potential for effects to all the native fish species potentially found in the project area. However, the EIS analysis is an underwhelming two paragraphs. These are merely conclusory sentences without reference. Are there any unique effects of this project on other fish species, beyond what is discussed for bull trout and chinook salmon?

How is it true that the road network has not had a substantial impact on trout or salmon? There are many problem culverts, streamside roads, road stream crossings. An essential part of identifying the minimum road system is identifying and remedying locations causing harm to fish. We value that work and urge the agency to ensure it has done as much as it can here to keep the roads from harming fish.

Botany & Invasive Plants

rare plants

We appreciate PDF 79, placing 150-foot buffers around sensitive and survey & manage botanical species. It is striking to see that a huge number of units contain such species and corresponding buffers. Clearly, doing that work was worth-while and important. This shows the value of doing a full EIS and taking the time for specialists to do surveys.

including a fungi, *Mythicomyces corneipes,* a vascular plant, *Gentiana newberryi*, ESA-candidate *Pinus albicaulis*, white bark pine, in addition to 21 survey & manage botanical species already

documented. The DEIS investigations found numerous sensitive botanticals, including a lichen *Stereocaulon spathuliferum*, that is a R6 Sensitive Species. *Plagiothecium piliferum,* a moss, was also found. It is exciting that "Field surveys also revealed a new species of fungus that has not been previously documented in the state of Oregon, *Gymnomyces ellipsosporus* and 39 additional sites of survey and manage species."[51] We hugely appreciate this valuable work!

As Table 50 illustrates, there are many sites of sensitive survey & manage botanical species in units. We are of course concerned that especially with heavy thinning, microclimate changes and disturbance/destruction of the canopy and ground surface will harm these sensitive mosses, fungus and lichens. We love them in their diversity for their own sake, and for brightening our immersion in the bright green world of Cascadia's ancient forests, and for the role they play in the big whole system of the forest, and also for who-knows-what valuable medicine or wisdom in our future.

Does emerging information about climate change have any relevance to any of these survey & manage botanicals, or for possible impacts of the project on them? Logically, problems from warming and drying changes to microclimates would be compounded as climate in general warms, with longer and hotter summers. Is 150' still adequate? Are the old Forest Plan rules and assumptions reliable in light of emerging consensus on climate warming?

rare fungi

The DEIS quantifies 3,136 acres of forest over 80 years of age that would be treated to the extent of negatively-impacted fungal species (equated to thinning to less than 40 TPA).[52] It is also correctly related that in recent past harvest, similar shelterwood and thinning treated with fire, "it is very likely these past actions have had a negative effect on special status fungi."

The thing is that, while commendably disclosing the impact, the agency seems to just decide not to deal with it. Out of sight, out of mind, apparently. Cascadia Wildlands and Oregon Wild strongly object to presumed unimportance of fungus. In our hikes in the woods, in this and other areas, the weird, diverse, ever-surprising native forest fungus are often highlights of the experience. Of things in the woods that make you go, "wow!" fungus are right up there.

Fungal surveys are apparently only required in "old growth" under the Forest Plan, and the DEIS claims none of this project is located in old growth.[53] We question if it is accurate to say none of the project is old-growth, at least insofar as these surveys are concerned. Certainly there are old-growth *trees* in these units. There are many places in units where you could stand under centuries-old trees, on ancient nurse logs, observing for hours the varied forms of fungus found in the complex native soil. It is recognized the "fire-regenerated" units have diverse fungal

[51] DEIS p.167.

[52] DEIS p.173.

[53] DEIS p.167.

networks. This lack of surveys leaves a major hole in the analysis, especially when taken in conjunction with the known heavy impacts to soil.[54]

The DEIS does admit that:

> There may be direct effects and indirect effects to special status fungi because surveys were not conducted for them since single year surveys were deemed impractical (USDA and USDI, 2001). The fire origin stands currently provide habitat for these species. It is likely that currently unknown sites of Sensitive and Survey and Manage fungi may be negatively affected in the short-term by host tree removal, physical disturbance, soil compaction, and disruption of mycelial networks (Kranabetter et al., 1998; Amaranthus and Perry, 1994). Twelve of the 16 sensitive fungi species and most of the survey and manage fungi are mycorrhizal. A study of hypogenous (a below-ground fungi, similar to truffles) found that thinning significantly reduced the diversity and amount of fruiting bodies (Gomez et al., 2003). Seven of the sensitive fungi are hypogenous. Reductions in the number of fruiting bodies of chanterelles, a common mycorrhizal species, were noted after initial thinning but appear to rebound after several years (Pilz et al., 2003).
>
> Regeneration or aggregate retention harvest has been shown to have an even greater negative effect on fungal mycelium than thinning. The removal of trees leads to loss of tree roots and subsequent reduction in the diversity and abundance of mycorrhizal fungi (Byrd et al., 2000). Increased solar radiation leads to reduced soil moisture particularly during the Pacific Northwest's summer drought. Green tree retention in shelterwood prescriptions with reserves can provide some legacy of fungal diversity during the development of the next stand (Luoma et al., 2006). However, sporocarp production and ectomycorrhizal species richness is significantly reduced at all harvest levels (Luoma and Eberhart, 2005).[55]

This science undercuts the reasoning behind the just-mentioned decision not to do surveys. Given that habitat is here and the project would destroy sensitive populations, oughtn't surveys be done? Do the studies say, "meh, what are you gonna do?" as the agency seems to do here? Please evaluate possible options for alternatives and for mitigation to avoid any irreversible impacts to fungal species.

We do agree though with the reasoning implicit in the statement that thinning of plantations could, in the long run, benefit rare botanical species.[56] This is the case for young, previously logged plantations, very unlike the native, "fire-regenerated" stands. In other words, adverse impacts to sensitive fungal species is a significant unique disadvantage of Alternative 2, as compared with Alternative 3. We don't see any reason to assume this impact by adopting Alternative 2.

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[54] As to soil impacts, the DEIS p.171 says: "Soil compaction resulting from harvesting equipment and the creation of temporary access roads can reduce host tree root growth and root tip availability for fungi (Amaranthus et al., 1996; Amaranthus and Perry, 1994; Williamson and Neilson, 2000). Compaction may occur with ground-based yarding, new temporary road construction, landing construction, and grapple piling of fuels."

[55] DEIS p.171.

[56] DEIS p.171.

Please explain what significance fungal species, and fungal networks, do have in regards to health and vigor of trees, and of the ecosystem. For instance Flying squirrels eat truffles, so would be adversely impacted by loss of fungal diversity, and that would have carry-on negative impacts to the spotted owls which eat the squirrels. The importance of information and resource sharing pathways has only recently entered popular consciousness, and we would value the Forest Service reference to the best available science on that topic. It seems logical that at some level of thinning there would be a real loss in terms of symbiosis among trees, and the 40% metric used here seems reasonable. But what does that *mean?* Does it matter to the forest of trees whether or not fungal species are destroyed? It would be ironic to try and help trees by decreasing competition for water, at the cost of cooperation for some other necessary nutrient or resistance to insects and disease.

Please relate the best available science as it is understood, and make this a priority for monitoring going forward.

Please also relate what special status fungal species might be found in the project units so that our WildCAT fieldchecking volunteers and others in the public can keep their eyes out. Searching out these fun, oddball sensitive species could be a fruitful ongoing dialogue and source of engagement between the agency and the public.

Invasive Plants

It is hard not to feel fatalistic reading the DEIS disclosure on this issue. It seems like the DEIS just sort of throws up its hands on this issue, disclosing impacts it with a fatalistic sort of formality. The risk of introduction and establishment is "high" across a wide variety of factors, from quarry rock to gap creation.

The main factors here related to invasive plants are light and ground disturbance. Those are important, but please also take consideration of the difference between native stands, and those that have been logged. In a similar vein please take increased consideration for avoiding invasive plants in light of nearby Wilderness areas, and roadless, primitive wildlands. An invasive plant infestation at a place frequented in association with hikes in the Wilderness, for instance, could result in spread into Wilderness. Sensitivity of some specific wild sites to infestation, in other words, is a necessary factor in considering risk. We expect that, because it treats previously-impacted forests, Alternative 3 would be a great deal better in this regard.

Hidden within this analysis is another strong reason against heavy logging, where 40% canopy cover is again used as a threshold, this time for invasive weed introduction.[57] The openings created by the heavy logging of native stands proposed here is recognized to result in high risk of invasive species spread on thousands of acres, hundreds of landings, over a hundred miles of haul road, with over 15 miles of new road.

We find that impact unacceptable.

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[57] DEIS p.179.

Special habitats

Additional protection for special habitats is warranted.

At **unit 360, the talus slope** and rocks should be protected with at least some buffer. Heavy equipment and felling adjacent to it would leave it entirely exposed. It is also hard to see how that could be accomplished for a lot of the unit.

At **unit 1300** we are especially fond of the meadow near the road in the unit, and hope we are correct in understanding it will not be impacted by harvest. We are happy to see that unit listed for 150-ft no-cut buffers around wet meadows and wetlands.[58] At this unit specifically but at many units, **please ensure that a lesser 150-ft wetland protection buffer is not used where a larger buffer linked with site-potential tree height ought to be used**. We noticed at least one seep, for example, above Anderson Creek. It is within the riparian buffer for the creek, but, it would seem, ought really to be given a buffer of its own. Such seeps and springs are an important feature on this landscape. Given the close link between wetlands and down woody debris, please (1) ensure that the seeps and small streams leading directly to fish streams are given full riparian buffers, and (2) consider applying wider buffers to wetlands to preserve interactions between falling trees and wetlands, and micro-climate effects.

Heritage

Thank you for avoiding everything identified as culturally sensitive from harvest. The consideration taken of the area's history, and especially consultation with tribes, is essential and worthwhile work.

Roads & Access

This project includes the very important minimum road system determination. **We are strongly supportive of the proposed road decommissioning work, and disappointed that much more is not being done. We object to the scale of proposed road construction, which includes more restrained alternatives than have been considered.** We view the minimum road system as more minimal than this.

Even the temporary roads are a major effect on the land, and should be further minimized. 15.5 miles is nothing to sneeze at, even over the broad area and on a relatively flat landscape. These are all new, permanent scars on the forest and the land. It seems frankly insane to us that we are still building logging roads to log native forests on public land, in the year 2020. How can that possibly be worth the tradeoff?

What would be the impact of implementing the full recommended closures of the Road Investment Strategy, a full 41.8 miles, versus the only 14.09 that were approved?

[58] DEIS p.175.

The DEIS says there is currently a backlog of road maintenance.[59] How much of a backlog?

When maintenance is short, what gets cut first?

The small roads marked for decommissioning on Lost Creek, just past Limberlost, are great priorities for decommissioning. They are both awesome spots for dispersed camping and fishing with obvious history of use. The roads and motorized trails are expanding to apparent detriment of the forest and stream. We do however request that you leave a turnout and a small parking area there, to enable access to the creek. This would naturally limit use of the sites, and be disincentive to historic users to seek ways around the road closure, and still allow additional high-quality recreation opportunities. Let them become hidden holes not marked on the maps.

Recreation & Scenery

Recreation Opportunity Spectrum – DEIS fails to take a hard look at recreation effects

The DEIS only addresses short term negative impacts in terms of disturbance on roads, and beneficial impacts from improved road maintenance.[60] That is a very disappointing, as the project area contains a huge number of very high quality recreational assets, many of which would be degraded by the proposed action.

Please consider that the old Forest Plan undervalues recreational value on the forest, while over-valuing timber. The economy and social environment have changed in the last several decades, which warrants a specially close look at impacts to recreation.

Please disclose and consider the amounts of recreational use on the project area. What recreational activities are these groves, streams and roads being used for? Where is use concentrated? What kinds of numbers are we talking about?

We strongly feel that native stands of all ages, shapes and sizes have unique recreational values that aren't captured here. Our members and staff have enjoyed many hours of exploring stands in this project area, and the difference between native and plantation stands is striking. Especially the older native stands are diverse and dynamic places to explore and learn. Native botanicals, medicinal and edible plants can be found. The back roads are great for biking and dispersed camping. The streams and river are world-class fishing.

Beyond baldly claiming that the project activities are all consistent with the ROS classes, the DEIS fails to analyze project impacts to recreation. Please explain the reasoning that allows the agency to so totally dismiss such a major use of the area. The Forest Plan is old and the ROS scheme is a minimal bar, so please ensure the best available science is being applied to recreation management here. The abbreviated DEIS analysis is a problem because those impacts are major, and the lack of analysis prevents development of alternatives that would avoid or mitigate those effects.

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[59] DEIS p.185.

[60] DEIS p.191

Recreational impacts are significant and warrant a closer look for one reason because of the world-class recreational attractions, notably the McKenzie River and Mt Washington Wilderness, scenic byways, springs, and multiple public and private campgrounds. Beyond listing *some* of the affected trails and campgrounds, the DEIS doesn't say anything about recreational use. Please include a more complete inventory and consideration of campgrounds; trails; recreational roads; special forest product use areas (e.g. mushroom hunting, berry-picking); hunting and fishing access (e.g. riparian access to fishable streams; important roads and areas for hunting).

Please evaluate the road decommissioning projects carefully with regard to recreational access and use. There are opportunities here that could benefit recreation in the long term. Many locations, such as the Lost Creek roads, would have both direct impacts to recreation, and have promise to guide recreational use in the future. There is dispersed camping at many locations, and access for fishing at others. Depending on the location, use can be either enabled (where it can take place safely) or discouraged (where it could cause resource damage, e.g. road expansions in the meadow near Lost Creek). If this information exists in more detail in the project file, we would appreciate the opportunity to review and comment on it.

What effect would this project have on sport fishing opportunities? The McKenzie is world-class, and we are interested in restoring and cultivating the quality of the fisheries both for environmental reasons, and also because of the economic benefits that brings. Site-specific direct impacts seem plausible especially on roads and along streams. Would any project components have direct or indirect impacts on prime fishing spots or fish runs? Negative (and positive) effects to fishing also follow from the riparian activities and effects to aquatic life. Sedimentation for example degrades fish runs and so logically reduces fishing success.

What effect would the project have on recreational use of the Wilderness? With many of the units close to the Wilderness, and work along trailheads and roads that access them, it will surely degrade the quality of those experiences at least to some degree.

What importance do the recreational opportunities in this area have to the economic stability of the local community? We know of a great many stakeholders along the McKenzie river who recreate both on the river and in these headwaters who build livelihoods from the native forest and waters. We know of even more whose lives in the area are enriched immeasurably by these opportunities. Please ensure the full value of this recreational heritage is accounted for, and harm avoided to the extent possible. As with so many issues, we see a common thread in that native forests are the most valuable and most impacted, while previously-logged plantations are less valuable and less harmed by intrusion.

Scenic Quality

It does not at all equate to say that, because forest plan standards are achieved, the project has "no adverse effect" on scenic resources.[61] NEPA and NFMA are different.

[61] DEIS p.194.

In our view, generally, the aggressive proposed logging of native stands is a considerable degradation of scenic quality of the forests and landscape. This is more than a short-term, technical difference of there being fewer trees and more stumps than before. It is the difference between being in a wild forest, and at an industrial site. You don't need to be a Wilderness purist to understand that when a native forest is logged for the first time, something is irreversibly lost. When land is abused, it shows.

Has site-specific consideration been given for scenic resources? Views from the trails to Wilderness, and from the scenic highways, or from campgrounds, for example, should be evaluated with an eye to avoiding unnecessary scars to the landscape.

Wilderness & Roadless Areas

We are concerned with impacts to the two nearby Wilderness areas, in particular Mt. Washington Wilderness, the IRA, as well as smaller roadless areas along the edges. This is a wild country and we like it that way.

Please take a closer look at human use levels of the Wilderness and of the IRA. It seems to be the case that these high mountain Wilderness areas are increasingly "filling up," making the dispersed recreation sites around the periphery that much more important.

The DEIS correctly notes that units 10, 1130, 1140, 1450, 1480, 1720 and 1750 are all adjacent to the Wilderness.[62] The two units, 1140 and 1720, that are right next to the Wilderness boundary and wilderness trail 3508, beg the question—why? Why can't these units be dropped or modified to reduce harm to Wilderness and IRA values? Please consider doing so.

Even more units, ten of them and miles of fuel reduction treatment along roads, are adjacent to inventoried roadless areas abutting the Wilderness. While we can be willing to compromise some of the Wilderness & remoteness value for the meadow restoration treatments and fuel reduction along roads, pushing up against the edge of Wilderness and Wild places in the high Cascades for the sake of timber production is not even close to worth the tradeoffs.

We disagree with remoteness impacts of harvest are merely temporary. Especially after starting the hike through heavily thinned forest, the sense of solitude and remoteness is greatly reduced.

We are particularly concerned for invasive species impacts to Wilderness and roadless areas, so urge special attention to avoiding them. Even with best efforts, based on experience, this project will result in spread of invasive botanical weeds due to ground disturbance. That ought to be minimized by dropping or reducing the intensity of thins in units.

[62] DEIS p.198.

It is interesting that in regards to Wilderness fire is recognized as a "fundamental ecological process."[63] We basically agree with this analysis, and urge that it should be consistently applied also in regards to wildlife and forest health and vigor.

We are intrigued with the concept of the fuel reduction treatment abutting the western side of the Wilderness. If this truly can allow greater confidence, so that wildfires are allowed to burn more often rather than attacked in dangerous and destructive ways, then that would be a major benefit.

Please explain why the two spurs to the east are necessary for fuel reduction treatments. Could not those roads be stored instead, growing the IRA and benefiting Wilderness?

Fire & Fuels (§3.12)

Fire on the Land

The DEIS appears to totally fail to consider the **natural fire regime**. No distinctions or explanation is given to account for differences between high-elevation pine and low-elevation hemlock, beyond the general notion that the fire regime is "mixed." Well, yeah!

We do not expect a thesis, but the scarce paragraph on page 207 is not close to an adequate consideration of the role of fire on this landscape. Fire is so central a consideration for so many of the resources, it deserves a much more careful and up-front consideration. What is the fire regime here and how is it managed? How is Climate Change related with possible changes to fire? A huge number of the resources, including forests and wildlife, are intimately related to function of wildfire, yet the DEIS never draws those connections with its management. As the DEIS dryly notes, with suppression and logging, "wildfires have not played their natural disturbance role on the landscape."[64] OK, so what is the strategy being applied to manage fire on the landscape in light of that?

Fuel/Fire Models

The project would increase fuel loading with small-diameter fuels on 3,339 acres in Alternative 2 in the short term. DEIS p.73. With prescribed burning and attendant risks, it gets harder to justify the fire risk posed by this project as the proposed logging gets more intense.

The fuel and fire behavior models seem unreliable and to ignore essential factors, like fire regime, terrain, and microclimate. The fuel models are from the early 1980s.[65] Is that best-available science?

Please take a hard look at the reliability of models, use the best available, and give guidance as to reliability of the model results, and as to how uncertainty should be handled. Please

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[63] DEIS p.199.

[64] DEIS p.209.

[65] DEIS p.208. Anderson 1982; Maxwell et al. 1980.

especially identify any sources of controversy, as we know this is an area of science that is advancing.

A feature of the mature stands here are high levels of large down wood, and high canopy closure with relatively light mid-story. The moist, rotten large down wood in these stands can operate more as fire-break than as fuel. Please consider the role of large down wood in natural fire behavior.

Please consider that regenerating forests, such as follow the heavy thins, gaps and shelterwood logging here, are a very high risk, high hazard fuel type.[66] It is our understanding the shrubs and hardwoods tend to burn hotter and to carry fires at higher severity than conifers. The DEIS agrees that small-diameter fuel is key, and that large-diameter fuel is not.[67] That being so, this project will increase fire severity in harvest units. Yet in summarizing effects, the agency claims the opposite.

In stating effects, the DEIS is disappointingly thin and imprecise with applied science. It cites Swanson 2008, Tepley 2013, and Barrett et al. 2010, to say that underburns would "return the disturbance," but these studies do not at all endorse the regeneration logging of mature native forests and burning machine piles, as is proposed here. It asserts, without any citation, that without thinning and prescribed fire the project area "would continue to lose attributes associated with mixed severity fire regimes," and that wildfires would "potentially" burn "more acres" due to increases in fuel and homogenous stands.[68] But, what does this mean? What is this based on?

Please discuss more specifically this idea of reducing canopy continuity as reducing fire behavior.[69] That is an old idea, found in the Forest Plan, but it is not consistent with several other critical factors. Given that the most important fuels are small-diameter ground fuels, on what basis is canopy being afforded this significance? It would seem that the drying effect from microclimate changes, especially in the short term when slash fuel loads are high, and also in the mid-term when there is dense, small-diameter regeneration, more than counter-balance the reduced potential for carrying crown fires. The DEIS seems to admit as much, saying it would result in faster rates of fire spread, with more sun and wind, but then it misleadingly says that fuel treatments reduce that impact. Sure, but that is only a mitigation from the more important fact that on balance the proposed action significantly worsens fire behavior.

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[66] *See* Zald & Dunn (2018), "Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape," *Ecological Applications*, 0(0):pp.1-13.

[67] DEIS p.208.

[68] DEIS p.210.

[69] *See e.g.* DEIS p.210 ("…fire behavior would be minimized with harvest (reducing canopy continuity).

Safety

We endorse and share the interest in safety, for visitors and also for firefighters. It is appropriate to make safety a top priority.

We are also interested in how the shaded fuel-break along the major road route can be used to maximize safe use of natural wildfire. Please take a hard look at the safety implications of doing that. The fuel treatment will be a success if it allows more options for safer and less aggressive attack of wildfire; it will be a failure if it becomes an arbitrary and impossible-to-maintain line in the sand that wildland firefighters are unrealistically and unsafely expected to defend. Please consider and discuss this balance, with special attention to consulting with firefighters. Is this a line that can reasonably be "defended?"

Please discuss the safety implications of fuel models. Are human hazards more or less associated with different fuel types than others? Are the stands being created more or less dangerous for firefighters and others? We are concerned with the safety hazard of slash in the intensive cuts (which corresponds to high risk of fires starting, due to harvest operations and open roads), and with plantation-like fuel models where ground attack is impossible.

Please address any recreation-related safety hazards related to wildfire. The fire rings in the forest along Lost Creek for example, and unauthorized vehicle use on overgrown roads, can be either removed or improved to cut down on human-caused fires.

Prescribed burning

We are all in favor of pursuing prescribed burns wherever feasible, including the ideas to let fires burn into riparian areas. But burning slash piles is not at all equivalent to underburning, and should not be equated with it.[70] It would seem that the intensive logging proposed here will require burning slash piles to address the fuel hazard, which sadly precludes beneficial prescribed fires that might be pursued in more lightly-thinned stands.

Please discuss and consider the reliability of post-harvest fuel treatments, including burns. There have been instances, including for instance the old thin across the road from unit 1300, where burns seem to have gotten a bit out of hand, significantly damaging the residual trees. This of course works directly counter the ostensible purpose of logging, to benefit stand health and vigor.

It is very important that post-harvest follow-through be completed. Post-harvest underburns, where they can mimic natural fire, are critical to success of the project. Maintenance of the fuel reduction area is essential to its effectiveness over the mid-long term.

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[70] *See* DEIS p.210.

Wildlife (§5)

We appreciate the careful work that went in to this EIS preparation. It is clear that the IDT and surveys resulted in a much-improved project, and there are some components that are forward looking.

We don't disagree that early-successional forest is important to many wildlife species, but see no need for the thousand-plus acres of shelterwood and gaps proposed, and much better alternative ways to create it than this. Ideally, more of the wildfires could be safely used for early-seral habitat enhancement, rather than cutting elder forests, that were here generations before any of us.

We remain concerned primarily for effects to older forest habitat, and for the cascade of effects to native stands.[71] Even the best of intentions can cause harm. A huge portion of the life in a forest is found in snags and down wood, and this project would dramatically reduce amounts of those legacy assets. Another huge part of the life of a forest is found in the soil, which also is compacted and harmed even by thinning. Invasive and non-native species are far, far more likely to infest a forest that is disturbed by industrial logging.

The lack of a consistent approach to forest "health" of the forest carries over to wildlife.

The EIS maintains this project would maintain viable populations at the Forest level of all special status wildlife species.[72] But the range of effects is significant, with real losses for forest-dwellers.

Please explain how the viability conclusion is drawn only to species at the forest level, yet the scale of analysis for impacts are project units and the project area.[73]

What is the Forest Service's operating philosophy for restoration? The answer is important to evaluating wildlife effects. This project could be premised on an outdated model, especially as it follows a generation-old Forest Plan, that does not take into consideration climate change and the role of fire in the ecosystem.

Red Tree Vole

Thank you for conducting surveys in 13 units, which found 19 nests, 10 of which were active, resulting in 45 acres being dropped from units 1970 and 1980.[74] Especially because they turned out to be harder to find than expected, it is worth the effort to have learned that, and discovered the rare pockets in immediate need of conservation. We think that surveying for and protecting red tree voles continues to be valuable and important.

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[71] E.g. soil and hydrology and invasive species.

[72] DEIS p.133.

[73] DEIS p.136.

[74] DEIS p.139.

How reliable were the surveys that were done? Recent experience on the Umpqua National forest, where protocol surveys overlooked over a hundred vole nests in units, gives rise for caution.

Please consider drawing larger buffers than required for these sites, or otherwise re-configuring unit design to ensure maximum ability of these pockets to re-populate neighboring stands. Units 1970 and 1980 are both units with many notable valuable features, so should be given a more careful look for this as well as other reasons.

The DEIS says the proposed action would log 3,051 acres of stands over 80 (including skips), which are potential vole habitat. While helpful this simple number should not be the end of the analysis. Please address potential effects to the populations of voles that were found, and the species viability on the landscape.

Fisher

Thank you for taking a look, albiet over-brief, at fisher. This is one of those mysterious critters that we cannot afford to let become lost to legend. Hidden in the fact of the last verified record being in the 1940s is the fact that this critter does belong here, and the project area contains a whole lot of fantastic habitat for it that would be ruined by the proposed action.

Where is the nearest known population of fisher? What is the historic population range on this landscape? What is the mid-long term plan for managing fisher habitat?

How is its total absence from the landscape consistent with the viability finding?

It is a noteworthy factor that this project specifically is targeting the habitat factors favored by fisher—dense forest with lots of big dead wood. Could not the dense-growing, rarely-burned stands currently developing on the landscape not be a critical link to fisher restoration?

Fringed Myotis & Townsend's Big-eared Bat

Thank you for recognizing that snags are the critical habitat factor for these bats. Again, even though roost sites haven't been specifically identified, that is yet another reason to error on the side of leaving more large wood to die on the landscape.

Crater Lake Tightcoil

The provision buffering all perennially wet areas is important to this and likely other species. How have these areas been identified? Please ensure they are adequately identified and protected.

We are concerned that heavy thinning treatments in the lower-elevation units, like 1970, 1920 and 1910, especially if they come with dramatic microclimate changes (drying), will destroy habitat for invertebrates like this.

Sierra Nevada Red Fox

Foxes favor dense mature forests above 4,000 ft elevation, as well as talus and meadows.[75] While openings are important for foxes, it would be scientifically controversial to apply that to the heavy logging proposed here. Our observations of the landscape show that natural openings are hugely different from areas that have been logged. The number of trees may be similar, but the landscape is not the same.

The EIS admits that the proposed action would harvest 1,700 acres of fox habitat (above 4,000 ft), but doesn't explain what importance that has.[76] The rationale for determination on in Table 46 doesn't even mention that habitat loss. Why not?

Great Gray Owl

Please ensure that adequate surveys have been done for Great Gray Owl. Please In light of lack of any major survey effort in many years, additional protective measures and surveys would be warranted.

The meadow restoration components of the project does seem likely to benefit Great Gray owls, however they would be harmed by many other factors of the sale, including loss of down wood and snags.

We noted quite a bit of smaller meadow habitat, which, while not meeting the old Forest Plan standard for surveys, could possibly be related to Great Gray owl nesting. The proposed road decomissioning at Lost Creek for instance has some smaller meadows that might be homes for owls (and proposed decommissioning would be beneficial to them). Also the pretty little meadow in unit 1300. Please ensure the value of smaller meadows has been fully accounted for.

The DEIS quotes Quintana-Coyer et al. 2004 for the idea that shelterwood harvest helps the small mammal populations likely to be used by owls.[77] Is food known to be a limiting factor for Great Gray owl populations, or for their habitat in this area?

Johnson's Hairstreak Butterfly

The PDF to mark all hemlock with dwarf mistletoe for retention, through all harvest units, could help.[78]

Cavity Excavators

Seven cavity-excavator MIS are known to occur in Flat Country units, none of which have any particular protections, although the Forest Plan requires habitat capability for primary cavity

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[75] DEIS p.141.

[76] DEIS pp.155 -56.

[77] DEIS p.139.

[78] DEIS p.43.

excavators to be at least 40% of potential populations, with habitat provided at the subdrainage level.[79]

The EIS decision to apply DecAID only at the 5th field McKenzie River watershed level, a huge zone of 137,567 acres, makes no sense, and does not seem to comply with the letter or intent of the Forest Plan rule. At such a wide scale, effects to snags and downed wood— a particular concern for this sale—are masked at the scale of subdrainages such as Anderson Creek or Boulder Creek. Please zoom in more and consider the potential for irreversible negative effects to snags and down wood. The proposed action has such an extreme negative effect on dead wood over the long run, it is hard to believe that FW-121 really can be met.

Tables 36 and 37 are clear, and show a general lack of snags but healthy amount of large down wood in Flat Country units. That, generally speaking, fits with our observations, and makes sense for mature stands like these, that are just now starting to transition to old-growth (Image at left, Unit 1970)

We found the description of how the DecAID model was applied, at Tables 38 and 39, confusing. Is it us or is this unclear to the uninitiated? What do the tolerance levels signify?

We aren't clear on the results, but if the DecAID model is showing a serious lack of snags, how can the Forest Plan standard be said to be met, or viability assured?

The analysis of snags is strongly influenced by how fire is considered, because fires create many of the very snag-abundant groves. Unfortunately the fire & fuels analysis did not take a hard look at the best available science as to how the "mixed" fire regimes here operate.

How significant a factor is fire in creating snags, as compared with other factors such as disease, competition mortality, wind and snow? We commonly noticed blowdown and snapped-tops in units. Natural openings are being created. On a variable landscape like this, with variable fire regimes, there could be differences. Western hemlock groves for example operate very differently than lodgepole pine. The DEIS pretends as though fire were the only factor, which is absurd.

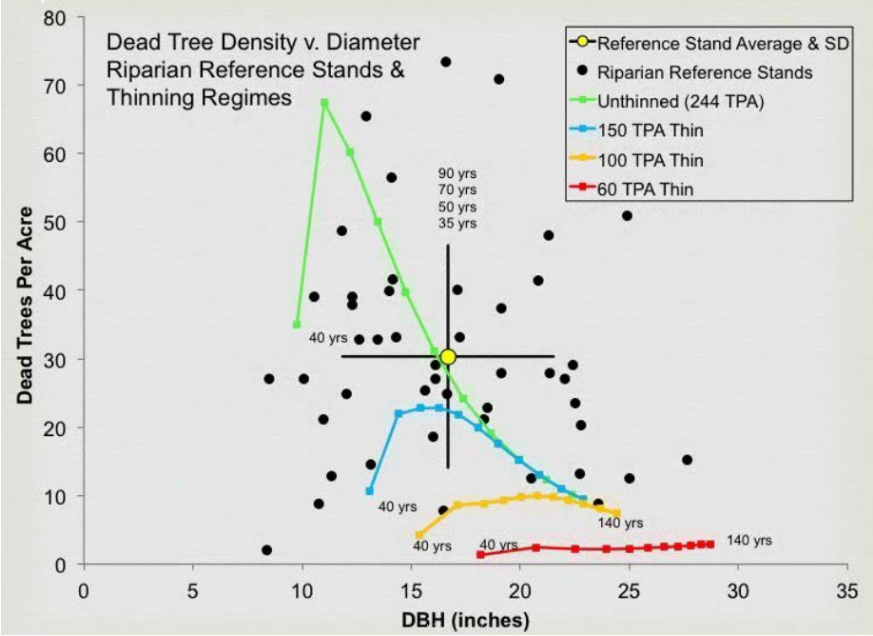
The DEIS claims population viability for cavity nesters is maintained by all alternatives, and that snag replacement and enhancement would improve post-harvest conditions. We have a few concerns.

[79] Forest Plan standard FW-121.

First, please explain the basis for that rationale, and indicate how reliable it is. The proposed action would degrade 12% of cavity excavator habitat in the entire project area, which is a lot for one project.[80] By subdrainage, even more will be impacted. At the stand level, the DEIS does not really admit it, but cavity excavator habitat will be hugely impacted over the long term. Even the greatest mitigation only work to provide snags in the short-medium term. Nothing is being left for future generations over thousands and thousands of acres of this landscape.

Second, please take a hard look at the enhancement measures in Table 9 and ensure that they are (at least) fully implemented. It isn't clear how much of that is required, versus what was recommended by the wildlife biologist, but in any case we very strongly urge that snag mitigation will be hugely important for this project. If the recommended mitigations aren't guaranteed, then the unit should not go forward.

The figure below, from Pollock et al (2012)[81], shows that tree removal through thinning can lead to stand development trajectories that miss the reference condition for dead wood. We point this out to highlight one of the trade-offs involved in thinning, and to encourage careful thinking about mitigation. Leaving the cut trees in the woods is a good short-term mitigation, but the small trees do not last long enough to fill the temporal gap between now and when the stand begins recruiting more dead wood on its own.



[80] DEIS p.162.

[81] Pollock, M. M., T. J. Beechie, and H. Imaki. 2012. Using reference conditions in ecosystem restoration: an example for riparian conifer forests in the Pacific Northwest. Ecosphere 3(11):98. http://dx.doi.org/10.1890/ES12-00175.1.

Elk & Deer

We saw deer sign in many units while fieldchecking, including in densely forested groves. It was interesting and disappointing to learn that hunter success has declined by 50% since 1990, and of a professional consensus that elk numbers are well below management objectives. What is the best science relating to the factors behind that?

Grey Wolf

Please take a look and address this area's capacity as habitat for grey wolf, which is making a big comeback in Oregon. Packs have recently established in east Lane County, and in Mt Hood National Forest, and this region logically is great wolf habitat.

While not the top reason for action here, we do feel that wolf recovery is one of the good reasons to avoid impacts to Wilderness and IRAs, and to maximize road decommissioning.

Spotted Owl

We are very concerned for this project's effects on the northern spotted owl. After spending time with some of the high quality forest groves for spotted owls in the project area, we very strongly urge the Forest Service to continue to give the Spotted Owl careful attention, and further reduce adverse impacts to that habitat.

The DEIS says the proposed action may affect, and is likely to adversely affect owls, yet is consistent with ESA recovery goals and the Biological Opinion, and is not reasonably certain to result in incidental take.[82]

The current state of the owl is a major cause for concern. While it is federally and state listed as threatened, uplisting seems likely in the near term in light of continued population decrease. This project adds to the case for uplisting. It is dismaying that protocol surveys in 2018 and 2019 resulted in no spotted owl *detections* in the project area.[83] We strongly agree that surveys should continue, especially at the three most recently occupied sites leading up to implementation.

It is more than ironic that this project would not be able to proceed as it is, if the owl population were healthier. It seems more like the death of local owls is being used as an opportunity to log out their homes, making their return and recovery less likely. With respect, that is logically and morally a bit upside-down— like kicking them while they're down.

The Draft EIS presents statistics of effects to spotted owl habitat that give rise to alarm. The proposed action would impact, adversely, an impressive 16% of the suitable spotted owl habitat in the entire project area, within the home ranges of 15 known spotted owl activity centers.[84] Even with a scandalous *no* nests surveying as occupied, especially in Critical Habitat

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[82] DEIS p.134, 147.

[83] DEIS p.147.

[84] DEIS p.134.

those nest sites ought to be protected, not exploited. The proposed action would remove or downgrade 3,068 acres of suitable spotted owl habitat; an additional 841 acres of suitable habitat, and 255 acres of dispersal habitat, would receive roadside fuel reduction treatments; and on suitable critical habitat, 399 acres would be removed and 496 acres would be downgraded, while of critical dispersal habitat 94 acres would be removed and 71 downgraded, with another 15 being treated for roadside fuels.[85]

Effects of logging to Owl Habitat should be carefully reviewed

Thinning, especially the heavier thinning and regeneration methods, would seriously impair owl habitat on older native stands. The DEIS recognizes that reducing canopy cover in stands over 80 years old "would … reduce the quantity and quality of spotted owl habitat; this effect would last for several decades."[86] … Yet it claims the landscape, even after shelterwood harvest, "would still provide suitable and dispersal spotted owl habitat post-treatment."[87] Assuming that means suitable dispersal habitat, even that low bar could be hard to clear with some of the intensive thins contemplated.

The DEIS says that 25 large trees per acre would be retained even under shelterwood prescriptions.[88] Yet unit tables directly contradict that, showing post-harvest TPA >7" in many cases that are well below that. And even some units that are thinning, like 1910, would scarcely leave more than that at 26 TPA>7".[89] Please clarify this discrepancy, erroring on the site of caution to ensure as many trees are left as intended.

Please remedy the discrepancy between the lack of RA32 habitat found in current mature stands, with the assertion that logged stands will be RA32 in 80 to 140 years after harvest. If you don't think any of the stands that old are RA32, why would the new stands fare better? Retention of legacy trees is no reason, because that happens after fire as well, and they exist in all of the fire-regenerated native stands.

The analysis on page 150 says 431 acres of dispersal habitat would be removed, but the cited Table 41 appears to show 487 acres so impacted.[90]

It is controversial to rely on a scarce 40% canopy cover to retain dispersal habitat.[91] It is also optimistic to equate a heavily thinned stand (to 30% canopy cover) after 30 years, with current

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[85] DEIS p.7, 148.

[86] DEIS p.134.

[87] *Id.*

[88] DEIS p.148.

[89] App. C.

[90] DEIS p.150, Table 41 on p.148.

[91] *Id.*

conditions.[92] We agree that would be true in plantation settings, but for not for the mature, native stands.

The DEIS recovery times are all over the map. As just indicated, heavily thinned dispersal habitat is expected to fully recover *canopy* cover in 25 years. Also found here are recovery times for critical habitat at 5, 10, 25, and 30 years.[93] First, please provide the basis for these assumptions. Studies? Professional judgement based on experience from past sales in the area? We aren't familiar with science showing such precise recovery rates, and nearby thinned units do not appear to warrant such optimism. Robinson-Scott units, thinned 10- 20 years ago to 40% canopy cover, look awfully open and bare, compared with the native stands, challenging these optimistic assumptions.

Second, please ensure that assumptions as to forest recovery are consistent across resources and IDT factors. Shelterwood units cannot recover to equivalent canopy cover (let alone *habitat*) in 25 years if they are subjected to pre-commercial thinning at 20 years, for example. Fuels treatments are supposed to last for 20-30 years, whereas hopefully they would be maintained. As to red tree voles, the DEIS claims recovery to RTV habitat in 50 – 60 years.[94]

As to owls and other wildlife the assumptions are uniformly optimistic. Please ensure that the best available science is being applied, and potential impacts and uncertainty disclosed with a precautionary principle in mind.

Table 44 shows 2,556 acres of shelterwood logging of suitable habitat under Alternative 2, which is more than double what is found in the description of Alternatives.[95]

RA32 habitat

The PDF 46 is not clear. DEIS p.49. Will RA32 habitat in those units be logged and variances sought?

We are concerned to protect RA32 habitat, and to assure that RA32 habitat is accurately identified and mapped. It is great the all RA32 habitat is identified and excluded. But field reviews only found 65 acres of RA32. That sounds low.

First, please disclose the locations of RA32 habitat, and disclose and review your methodology for delineating RA32 habitat. How was that done and how reliable are those results? Is there risk of under-counting that habitat?

Second, particularly in light of an apparent lack of good owl habitat, please take extra precautions to buffer and otherwise safeguard RA32. Many of the units are adjacent to RA32, and logging those would compromise not only the RA32 groves themselves, but also reduce

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[92] *Id.*

[93] DEIS pp.151-52.

[94] DEIS p.158.

[95] DEIS p.152.

their broader habitat value of the landscape. Good owl habitat is becoming increasingly isolated, which contradicts reasonable owl recovery goals.

Nest Sites

Please explain PDF 48 and 49, related to timing restrictions for work within occupied owl nest patches. DEIS p.49. Elsewhere the document says that the project has no occupied owl nests.

The DEIS does disclose that the project will adversely modify habitat within 0.5-mile nest cores and 1.2-mile home ranges.[96] This is hugely regrettable. The two tables looking at suitable habitat in core areas and home ranges of known owl sites give rise to concern.[97] Site 2421 would go from 40 to 22% in the core area, making that site non-viable for recovery. Sites 2838 and 2408 also stand out as concerns, being in critical habitat, recently-occupied, and brought to within a whisker of falling below the 40% threshold at the core area scale. Given the (smart) decision to forego fuels treatments in their core areas, it only makes sense to also forego the commercial logging. Not only is the fuels treatment much less of an impact, but it ought to be a higher priority from every point of view except that of a timber company. That discrepancy suggests that timber was wrongly given a trump card over other interests. The wider home range figures are also discouraging. Many sites are below the 40% threshold and being brought even lower. Site 1738, and perhaps 2456, are both being heedlessly brought below the 40% threshold.

Somehow though, the DEIS simply makes the disclosure and waltzes along.

Please consider alternatives that avoid removing or downgrading owl habitat so as to protect habitat at more of these nest sites. Would an alternative be reasonable that takes greater precaution for owls?

Logging disrupts behavior of nesting birds and could harm other aspects of their life needs. BLM has acknowledged that —

> Current research has shown that spotted owls are likely to increase the size of their home ranges to utilize untreated stands in preference to newly treated stands both during and after harvest. Factors that reduce the quality of habitat within a home range or cause increased movement by owls in order to meet prey requirements may decrease the survival and reproductive fitness of owls at that site (Meiman *et al.*, 2003).[98]

The agency should recognize the long-term effects of captured mortality on the habitat needs of small mammals and spotted owls.

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[96] DEIS p.147.

[97] DEIS pp.149 – 50.

[98] Roseburg BLM 2010. Third Elk EA. http://www.blm.gov/or/districts/roseburg/plans/files/ThirdElkEA.pdf.

> Several small mammals, such as the northern flying squirrel form the prey base for the Endangered Species Act (ESA) listed spotted owl and are among the species associated with abundant large dead standing and down wood. This presumably, is why spotted owls prefer to forage in stands with abundant standing and fallen dead wood (Table 2, North et al. 1999). The fruiting bodies of hypogeous fungi are a food source of northern flying squirrels and are also associated with down logs, suggesting that there are complex, indirect paths through which dead wood supports spotted owls (Amaranthus et al. 1994, Carey 2000).[99]

Consultation

Please release the Biological Opinion and explain in the EIS any relevant provisions.

Climate (§3.14)

Thank you for including this section in the EIS. While it is not what we feel is needed, we do appreciate at the least baby steps towards managing these public forests with climate change in mind.

The Forest Plan, even the amendments, largely pre-date federal government recognition of global climate change. Reason #1 to revise the Forest Plan probably is to account for this emerging issue. In the meantime, project analysis like this one ought to make a best effort to apply science to optimize both (1) ecosystem resilience to climate change, and (2) carbon storage.

We are not satisfied with the decision to use the Regional template for carbon analysis. We are attaching detailed analysis refuting the flawed aspects of the regional template. NEPA, NFMA, ESA all require use of the best available science.

NEPA requires federal agencies to rely upon "high quality information," "accurate scientific analysis" 40 C.F.R. § 1500.1(b), and "full and fair discussion of significant environmental impacts," 40 C.F.R. § 1502.1. The scientific information upon which an agency relies must be of "high quality because accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA." Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1151 (9th Cir. 1998) (internal quotations omitted); see also Portland Audubon Society v. Espy, 998 F.2d 699, 703 (9th Cir. 1993) (overturning decision which "rests on stale scientific evidence, incomplete discussion of environmental effects... and false assumptions")

"To take the required 'hard look' at a proposed project's effects, an agency may not rely on incorrect assumptions or data in an EIS." Native Ecosystems Council v. USFS. (9th Circuit August 11, 2005)

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[99] Thomas Spies, Michael Pollock, Gordon Reeves, and Tim Beechie 2013. Effects of Riparian Thinning on Wood Recruitment: A Scientific Synthesis - Science Review Team Wood Recruitment Subgroup. Jan 28, 2013, p 36. http://www.mediate.com/DSConsulting/docs/FINAL%20wood%20recruitment%20document.pdf.

http://www.elawreview.org/summaries/environmental_quality/nepa/native_ecosystems_council_v_u.html *citing* 40 C.F.R. §§ 1500.1(b) and 1502.24.

The National Forest Management Act's (NFMA) implementing regulations require the consideration of the "best available science" for all site-specific projects. 36 C.F.R. § 219.11 (2008); 36 C.F.R. § 219.35(d)(2000). Under the 2008 NFMA regulations, this requires documenting "how the best available science was taken into account in the planning process within the context of the issues being considered;" and "that the science was appropriately interpreted and applied." 36 C.F.R. § 219.11(a).

During ESA Section 7 consultation, the agency "shall use the best scientific and commercial data available." 16 U.S.C. § 1536(a)(2). "[T]he Federal agency requesting formal consultation," "shall provide the Service with the best scientific and commercial data available or which can be obtained during the consultation," to serve as the basis for the Fish and Wildlife Service's subsequent BO. 50 C.F.R. 402.14(d).

40 CFR 1500.1(b) "The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA."

40 CFR 1502.24 "Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements."

As explained below, the Forest Service's standardized NEPA language regarding carbon and climate change fails to take a hard look that NEPA requires. The analysis makes several highly misleading statements about forest carbon and climate change. The analysis inappropriately mischaracterizes the role of individual logging projects in the cumulative problem of global GHG emissions. The analysis misstates the effects of logging related carbon emissions that are not related to "deforestation." The analysis grossly misstates the climate effects of logging intended to reduce disturbance. The analysis misleadingly implies that logging benefits the climate by increasing forest productivity.

The NEPA analysis should consider the adverse climate consequences of GHG emissions caused directly and indirectly by logging. The Forest Service should not rely on the boilerplate NEPA language from the regional office which is flawed in many ways. Instead the Forest Service:

- Must recognize the cumulative nature of the GHG emissions and climate problems. It does not matter that this project is small in the global scheme because all emissions matter when the causation is global and cumulative;
- Cannot credibly assert that this project is harmless because it's not causing deforestation. This is immaterial. All GHG emissions, regardless of the source or how it is labelled, are part of the problem and cause the same climate impacts.
- Cannot credibly assert that thinning for forest health justifies or mitigates emissions from logging. Logging does not increase the capacity for growing trees. To the contrary, logging harms soil and reduces site productivity.
- Must not compare carbon *before and after* logging. That is an improper framework for NEPA analysis. The proper NEPA framework is to compare the effects of different

alternatives (over time), so the agency must describe the carbon emissions and carbon storage in the forest over time *with* logging and *without* logging.

- Logging to reduce fire effects does not result in a net increase in forest carbon storage. The agency cannot predict the location, timing, or severity of future wildfires, so most fuel treatments will cause carbon emissions without any offsetting benefits from modified fire behavior. Studies clearly show that the total carbon emissions from logging (plus unavoidable wildfire) are greater than carbon emissions from wildfire alone.

Cannot credibly assert that carbon storage in wood products is a useful climate strategy. Logging kills trees, stops photosynthesis, and initiates decay and combustion, with the end result being a significant transfer of carbon from the forest to the atmosphere. In stark contrast, an unlogged forest continues to grow and transfer more carbon from the atmosphere to the forest. Carbon emissions caused by logging far exceed the small fraction of carbon transferred to wood products. Carbon accounting methods that attempt to account for *substitution* of wood for other high-carbon building materials are fraught with uncertainty and too often represent maximum potential substitution effects rather than lower realistic estimates.

How do stands compare, at the stand-scale, in terms of their carbon storage under different alternatives? The mature, fire-regenerated forests found here are among the *most* effective in the world at storing carbon, and that ecosystem service ought to be optimized.

It is our understanding that the best stands from a carbon storage point of view are old, mature, dense stands— exactly the kind of forest groves that are being targeted here!

The DEIS says that reducing stand density is "consistent with adaptation practices to increase resilience," to climate change, citing to very broad studies.[100] This paints with too broad a brush. Please take a hard look at the best available science regarding the plant and animal communities found here. Many of the older, mature stands will be more resilient for more values if they are left to slowly develop, rather than subjected to the shock of industrial timber harvest.

Economics

This analysis is not adequate and ought to be more carefully done.

The issue addressed in the DEIS, §3.15 is not really the economic effect of the project, but rather the more narrow public income generated. That is an important issue and we are glad you've considered it, but it misses the actual economic impacts of the project, many of which are on the private sector. Those private sector impacts include negative economic effects in terms of harm to tourism and recreation, in addition to the positive effects of timber industry jobs. If the issue is private economic effect, then the analysis needs to be balanced.

[100] DEIS p.217.

As to public economics though, Alternative 2 is said to generate $13.2 million for enhancement work in the forest, compared with Alternative 3 at $735,000. How is it known this money is for enhancement work?

Other Site-Specific Comments

Unit 1910

We enjoyed visiting this 126 year-old unit. It is surprising the stand is that old, given the relatively small size of the trees. It is indeed a very dense stand in places, though in others it is gorgeous.

The roadside fuel treatment makes some sense, though it is a very steep slope. Some light thinning in this unit seems possible, although the very heavy thin proposed here, down to 26 tpa, is at direct cross-purposes with the fuels treatment. If this road is important in the fire context, then that ought to be prioritized also in the logging treatment in the unit.

Thank you for buffering out the rock formation to the west of the unit.

The stream to the south of the unit (pictured below) is particularly beautiful, so please also be careful about buffering that. It would appear that stream could rapidly transport sediment to the river below, so sedimentation is a priority.

There was definite overstory and understory variation in the unit, with the west portion generally more naturally diverse (pictured above), and the upper eastern side more dense and uniform. It might make sense to thin this unit from the road above, just doing fuel treatment along the road on the bottom.

Unit 1880

This unit is a potential scenery concern from the highway.

While we were unable to closely investigate the unit, it appeared to possibly contain several large legacy trees with large branches. Please ensure raptor and eagle habitat is preserved, as this is right above the river and Scott Creek.

Unit 1920

It is surprising there is no RA32 in this unit, as what we saw could qualify. There are lots of beautiful big trees, big down wood, hardwoods and natural openings. Please re-evaluate those surveys. The stand is listed as 148 years old, which as an average means the unit contains lots of old-growth trees. The eastern portion that we visited seemed especially healthy in terms of coarse down wood and snags.

Please take special care of the riparian area flowing through the unit. It is hard to see how the unit could be yarded beyond the creek without causing damage to the creek.

1970

This unit is all kinds of trouble. Listed at 143 years old, really much older, the proposed action is for 60 acres of shelterwood, 10 acres of gaps, and 28 acres of thinning. It contains RA32 and RTV buffers, but even still logging this would cause a lot of damage.

This unit is only barely outside the boundary of Critical Habitat and ought to be a priority for protecting spotted owls. On the ridge above Lost Creek, these are exactly the sorts of groves where the owl could again take hold.

1980 & 460

We visited this location in spring 2020. We are alarmed at the 102 acres of shelterwood, plus 15 acres of gap, 3 of DTR, and 62 of thinning in unit 1980, all in a unit that must be buffered for RA32, RTV, and a pond. We found sign of deer, bear and rabbit when we were there. The stand is developing natural openings. What on earth!

The heavy logging in the unit works at cross-purposes with the fuel management along the road.

Unit 460, uphill side of the road, is a younger plantation. Unit 460 is younger and could be thinned, with special precaution for harm to the soil or causing sediment in the salmon stream below.

1810, 1820, 1830

This cluster of units is concerning for several reasons.

These units require lots of new road construction, which are significant negative impacts.

They are all slated for intensive logging. The post-harvest TPA for all three are very low, and for two is a scarce 17 tpa. What is going on there?

1820 contains unbuffered special habitat, while 1810 buffers a host of riparian areas and a special habitat.

As regeneration harvest it would seem to work contrary to fuel reduction goals.

It is located between the Mount Washington and Three Sisters Wilderness, visible to hikers in both and to those heading that direction (e.g. Deer Butte trailhead).

2080

What is going on with this? How can it be worth it to slice a new road along the hilltop, to harvest a tiny volume of timber?

2010

This 132 year-old unit stands out for heavy exploitation, with a lot of road construction and intense proposed harvest.

Fuel Reduction Along roads – Southeast

Please explain the logic of doing fuel breaks along the logging roads to the south, rather than along the Scott Creek road (2649), which is more of a mainstem road. If that is meant to be a safe ingress/egress route in the event of wildfire, how does it make sense to veer off only smaller logging roads at unit 2010?

360

We visited parts of this unit several times, in fall of 2018, and twice in spring of 2020. As indicated in the text above, we are open to thinning in this unit but are concerned that it be able to occur without undue damage to soils and special habitats. It is very steep—we measured in the range of 50-55. Sedimentation and stability will be particular concerns.

The road intercepts water flow for about 200’ at the north side of the unit. Please ensure adequate drainage here to avoid sediment to the creek, or harm to the road.

The bigleaf maples here are an asset that should be preserved, in light of an apparent lack of hardwoods on the landscape.

1870

We agree that a light thin of this Creekside unit could be a long-term benefit. Please take special care to evaluate soil impacts and impacting the stream (image below)

Unit 1300 – Swampy Meadows

This unit along Anderson Creek has become a special place to the Cascadia WildCAT fieldchecking crew (March 14, 2020 pictured below). We appreciate the work the agency has done to delineate buffers, RA32 habitat and riparian areas here, but even with a perfect implementation this unit just does not seem worth the cost.

This unit stands out as confounding the “stand age” metric, containing many very large old trees, snags and down wood. It is not indicated as one of the units with legacy tree either, which seems impossible in light of the many very large, old trees.

Please evaluate the RA32 habitat delineation to ensure that all high-quality habitat areas are captured.

The soil in this unit is very soft, with wetlands and seeps and riparian areas throughout. Even the most stable soil would be damaged by heavy equipment, as is readily observed walking to the adjacent, recently-thinned harvest unit adjacent to the east. There, in direct and dramatic contrast with the native stand, the ground was compacted and there is little down wood. (*see* picture below). We are concerned especially upslope of Anderson Creek, and trust that the agency IDT will take all precautions to ensure that no sediment from this project escapes to Anderson Creek. There are many factors, each of which is minimal and hard to measure, that could add up to a particularly high negative impact here, especially to Bull Trout and caddisflies.

This unit also seems particularly abundant and diverse in terms of fungal diversity. It would seem to be at very high odds to contain sensitive fungal species, which weren't surveyed for, and which without question would be destroyed by logging.

Unit 1400

Volunteers visited this unit on September 27, 2018, and suspect that the characterization of this unit as 109 years old could be wrong, as many of the trees seemed to be much older. We found a big patch of legacy trees here, which hopefully is being buffered. The EIS also indicates RA32 habitat was found here, so it should be a target for further investigation to avoid impact to owls.

Unit 300

We visited this unit in October of 2018. We noticed old-growth cedar and a class IV stream in this grove, which the EIS lists as 149 years old, and targets for shelterwood harvest. Why is the Forest Service running right up to and over the edge of a return to clearcutting old-growth? Please drop this unit, or limit logging to a light thin that can be yarded from the road.

Unit 1590

This is 102 year-old stand is targeted for 9 acres of gaps and 14 acres of thinning, across a 44-acre "unit." This is an example of a unit where the lack of unit layouts makes specific commenting impossible. The DEIS does recognize it contains RA32 habitat, and it is one of the locations for fall-and-leave in riparian areas.

Please clarify the logic of the fall-and-leave treatment.

1650

We visited this unit in 2018 and flagged it as being a fuel concern and appropriate for thinning. The DEIS suggests shelterwood harvest, leaving only 18 tpa. Please consider a less damaging, lighter thin that would reduce fire hazard.

Unit 1720

We visited and enjoyed this Wilderness-adjacent, 144 year-old unit on October 4, 2018. The DEIS wants to do 11 acres of heavy thinning and 6 acres of gaps. The negative impact to recreation trail and Wilderness, possibility of invasive species, and loss of old, native forest habitat is not even close to worth the tradeoff. Please drop this unit.

Unit 2130

We visited this in October, 2018 and enjoyed several legacy old-growth trees. Another 149 year-old grove, the DEIS proposes 32 acres of thinning and 12 acres of gaps. This unit is across the road from another young plantation, so cumulative effects are a special concern.

Thank you for thoughtfully considering these comments.

Sincerely,

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