From: Jeff Lonn
[redacted]
April 7, 2019

appeals-northern-regional-office@fs.fed.us
Attn: Objections Reviewing Officer
Darby Lumber Lands—Phase 2 Project Objection
Responsible Official: Supervisor Matt Anderson
District Ranger: Eric Winthers
Darby/Sula Ranger District, Bitterroot National Forest

The following are my objections to the final EA and FONSI for the Darby Lumber Lands 2 (DLL2) project. The issues almost all concern the Vegetation Management and associated activities, and they are the same issues I raised in my Draft EA comments. My questions were answered inadequately, and no changes were made to the project based on those issues. My objections are in the same order as my Draft EA comments:

Issue 1

You failed to do an EIS for this project, despite the EA containing insufficient information to assess whether or not significant environmental impacts will occur. A FONSI is not supported by this incomplete analysis. This EA omits an analysis of visual quality standards, a field-based rare plant study, field based wildlife studies, an assessment of cumulative impacts of forest plan amendments, and numerous recent scientific papers that represent best available science. NEPA requires the use of best available science, and requires you to obtain information if it is "relevant to reasonably foreseeable significant adverse impacts, and if it is essential to a reasoned choice among alternatives, if the overall cost of obtaining it is not exorbitant" (40 CFR 1502.22). The Aug 1, 2017 IDT meeting agenda item (project file IDT 008) to "determine need for proposed action alterations or design features to get to FONSI" shows that a FONSI for DDL2 was predetermined. This flaunts the intent of NEPA to require environmental analysis first, and then, using that data, reach an informed decision. Here you appear to have reached a FONSI first and then written the EA to support it.

You fail to analyze all reasonable alternatives to meet the purpose and need as required by NEPA. For example, you did not consider alternatives to clearcutting mistletoe-infested Douglas Firs, even though your own publications state that mistletoe is not a concern unless timber harvest is the highest priority, which is not the case in MA 2 or MA 8b. You also fail to consider the alternative of prescribed burning only, without commercial timber harvest, in MA 8b even though Project File SILVI 001, page 18, states the project's MA8b sections "could be prescribed burned without commercial harvest since most of the area is predominantly within desired basal area."

Remedy: Analyze DLL2 in an EIS.

Issue 2

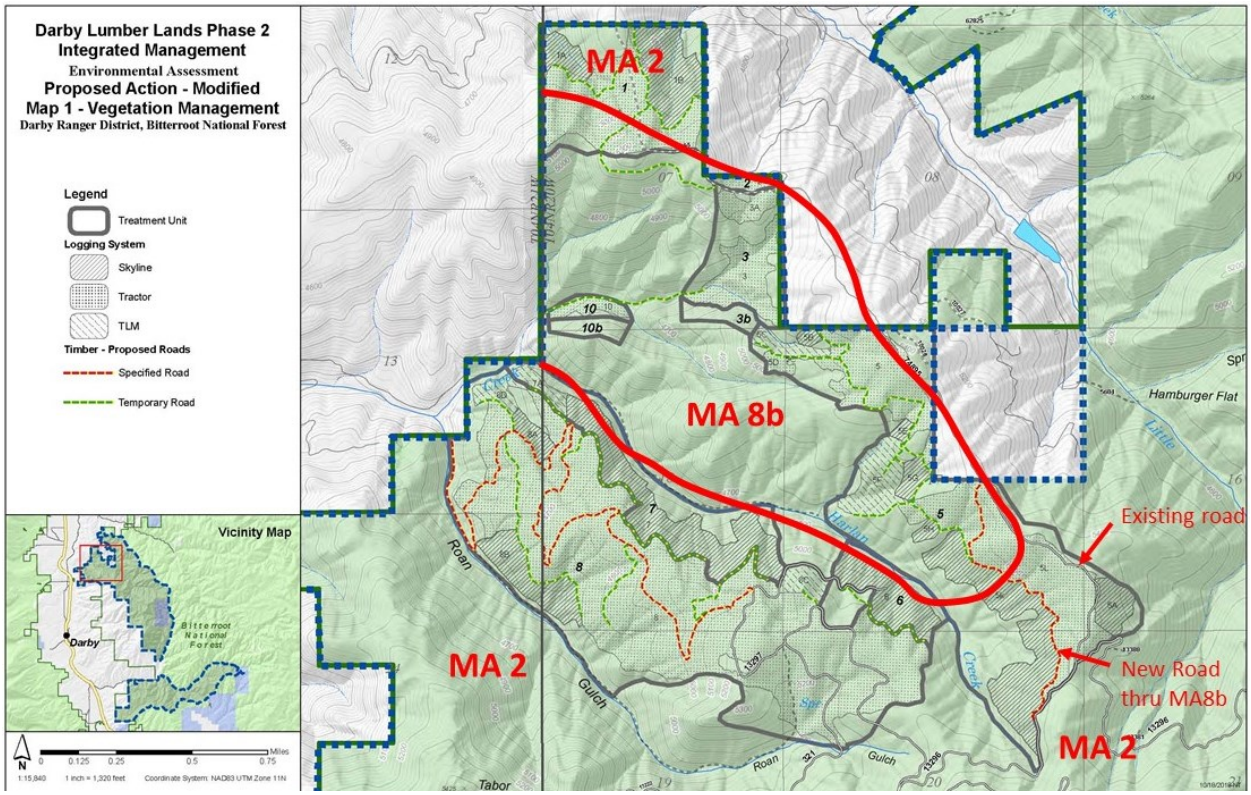
Timber harvest is prioritized over all other uses. EA, p 3, states "*Timber harvest activities were added to the project to provide timber to support the FS's multiple use mandate*." This project prioritizes timber harvest, using fire/fuels reduction and "forest health" as justification. It ignores the ecological and economic costs of fuel treatments and the ecological benefits of mixed severity wildfire. The timber harvest is planned for a unique geographic area that is an island of healthy forest in a sea of disturbance that provides a unique, low -elevation area for elk security that is difficult to access for both hunters and loggers alike. It appears that rather than supporting multiple use, you are prioritizing timber harvest over all other uses. The Forest Service's multiple use mandate does not require all uses be provided for on all Forest Service lands. In SEC. 4. ø16 U.S.C. 531¿ of the Multiple Use and Sustained Yield Act of 1960, Multiple Use is defined as: *" the management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources".* In Sec. 5 MULTIPLE-USE SUSTAINED-YIELD ACT OF 1960 10–4: "*coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output*". The vegetation management is in fact not required to support the multiple use mandate and therefore cannot be justified in this way. It is important to note that the Forest Plan (p. I-3) states: "*As valuable as the National Forest is for commercial products and recreation, its value to the public will become priceless as the expanse of open land between the towns and forest boundary is developed and the Forest becomes the only open land".*

The timber harvest will also result in the loss of hunter opportunity, a violation of Forest Plan standards for protecting elk security and habitat. Hunting access will be compromised by proposed logging in the area due to its close proximity to private land and the creation of new roads. The proposed logging area is prime elk habitat, providing forage, security, thermal cover, and calving habitat. Building roads and removing this habitat will force animals onto nearby private land, thus compromising hunting opportunity. This is in conflict with the Forest Plan (USDA Forest Service 1987a, II-5, II-7).

Remedy: Remove the vegetation management portion from the project.

Issue 3

Road building in MA8b is in violation of the Forest Plan. Temporary roads proposed for construction into Units 10, 3, and parts of 5 do not access an adjacent MA and are therefore not allowed under the Forest Plan. Temp roads **are** roads, just as TLM and Skid trails are, according to DLL2–Appendix A—Table A-1. The permanent road in MA 8b also violates the Forest Plan because it is **not required** to access adjacent management areas.



The map above shows the existing permanent road in MA 2 that "does not meet specs" and the new permanent road proposed to replace it in MA 8b and MA 2. No justification is given for moving the road out of MA 2 and into MA 8b. The existing road could be brought up to specs with reconstruction or a modified alignment that would keep it in MA 2, and therefore the road through MA 8b is **not required** to access adjacent MAs. It is a violation of the Forest Plan.

Remedy: Build no roads in MA 8b, and remove MA 8b from any vegetation management activities.

Issue 4

You fail to demonstrate that timber harvest in MA 8b will increase winter range forage production. The Forest Plan (p. III-63) states "*timber harvest is only permitted in MA 8b to improve winter range forage production"*. Yet the EA states: "*timber treatments would potentially increase livestock grazing pressure on the 1,294 acres of proposed units that are within the boundaries of grazing allotments. Increased grazing pressure may negatively influence the forage abundance and occupancy by elk and other big game".* This suggests that improved winter range forage may not result, placing the MA 8b timber harvest in violation of the Forest Plan.

Remedy: Remove MA 8b from any vegetation management activities.

Issue 5

The EA response to many public comments is simply to state that Best Management Practices and design criteria will be used. These are inadequate to address detrimental impacts. For example, the

design features you incorporate to mitigate weeds have been largely ineffective on other projects because the real problem is the soil disturbance. Results on the Hayes Creek project of a decade ago provide a good example of the ineffectiveness of these design features. Many areas there—10 years later--have a ground cover almost entirely comprised of knapweed, St Johns Wort, and cheatgrass. It probably did not help that no monitoring or reclamation was ever done there. Without funding guarantees for post-project reclamation on DDL2, the results will probably be similar.

Remedy: Do an EIS for DLL2.

Issue 6

Best available science has not been used, and it does not justify the methods proposed to meet the purpose and need #2: **Improve forest health and stand resilience, restore historic structure in dry pine stands and reduce potential fire severity.** Most recent science shows that commercial logging with its associated road building does just the opposite. In my scoping comments, I asked you for a review of scientific papers not included in the Draft EA, and you responded with Project File LIT-003. I have attached LIT-003 with my comments (rebuttals) to your responses (PF LIT-003 scientific literature Lonn comments). You missed or avoided the point of most of those papers, essentially ignoring them in the EA.

My own observations in the area also call into question your purpose and need #2. For example, I took the two photos below in cutting unit 8b, scheduled for “improvement harvest”. Do you really think you can, or should, improve on this area of widely spaced, large Ponderosa pines with scattered large Doug Fir? Is it really at high risk for severe wildfire? You provided no map of potential fire severity for the cutting units, even though you justify the logging on this basis. You only ran some models on flame length and then applied them uniformly to the area. In addition, I saw no evidence of active MPB in this area.

Remedy: Re-assess the purpose and need, and analyze all alternatives in an EIS.

Issue 7

You violated NEPA in your failure to analyze the cumulative effects of the EHE amendments together with all EHE amendments that have been granted for many other timber projects in the BNF. The BNF has used this amendment in the previous 8 timber projects, including DLL I. Site-specific amendments are meant to address unique characteristics of a particular forest area; they are not to be used repeatedly to address conditions that are common throughout an entire forest or region. The Forest Service has applied this amendment for many projects because these standards are no longer workable for the forest as a *whole*, and therefore must be proposed as a forest-wide Forest Plan amendment. NFMA requires proposed forest plan amendments be evaluated for whether they would constitute a significant change in the long-term goods, outputs, and services projected for an entire National Forest, and undergo review. There is guidance in the Forest Service Manual 1926.51 that describes non-significant amendments. There is also guidance in the Forest Service Planning Handbook. An assessment of a proposed amendment's significance in the context of the larger forest plan is crucial (36 C.F.R. § 219.10(f), FSH 1922.5).

Remedy: Analyze the cumulative effects of all EHE amendments on Bitterroot National Forest.

Issue 8

Wildlife studies were inadequate, with data mostly obtained from the Montana Natural Heritage Program (MNHP) database or from remote sensing, with little field study. The conclusions reached from these cursory studies are highly speculative.

Remedy: Perform field based studies and analyze results using a long-range (both spatially and temporally) view.

Issue 9

You fail to disclose the haul route to be used. Is it Harlan Gulch or Rye Creek? And which haul route was used for the economic analysis of the timber sale (PF ECON-001)? This is new information provided in the Final EA and PF ECON-001.

Remedy: Disclose the haul route and re-analyze all economic implications.

Issue 10

In a final display of your lack of integrity, on the last page of the EA (p. 65), you list the Bitterroot Restoration Committee under **Persons and Agencies Consulted**. As a BRC member, I know that the BRC declined to examine DDL2 due to a lack of time and resources, and did not contribute to or support DLL2 in any way. It is misleading to list the BRC here.

Remedy: Remove the BRC from this list.

Sincerely,

Jeff Lonn
[redacted]

Project File LIT-003 is Consideration of Science and Literature Submitted by the Public that was not included in the DLL2 EA. Project File LIT-003 reviewed and responded to these papers. However, it appears that the Forest Service missed the point of many of them. Below are the papers, the FS response, followed by Jeff Lonn's comments on the FS responses.

Aquatics/Fisheries

Malison, R.L., and C.V. Baxter. 2010. The fire pulse: wildfire stimulates flux of aquatic prey to terrestrial habitats driving increases in riparian consumers. Canadian Journal of Fisheries and Aquatic Sciences 67: 570-579. *In ponderosa pine and Douglas-fir forests of Idaho at 5-10 years post-fire, levels of aquatic insects emerging from streams were two and a half times greater in high-intensity fire areas than in unburned mature/old forest, and bats were nearly 5 times more abundant in riparian areas with high-intensity fire than in unburned mature/old forest.*

Sestrich, C.M., T.E. McMahon, and M.K. Young. 2011. Influence of fire on native and nonnative salmonid populations and habitat in a western Montana basin. Transactions of the American Fisheries Society 140: 136-146. *Native Bull and Cutthroat trout tended to increase with higher fire intensity, particularly where debris flows occurred. Nonnative brook trout did not increase.*

Response: Both papers are similar as they address research that shows that high severity fire does have some positive effects on native trout species (bull trout and westslope cutthroat trout) and their aquatic insect food base.

The issue of high severity fire having positive effects on fish and aquatic insects, although valid, is generally not relevant to the Darby Lumber Lands Phase II Project. This is because the areas proposed for timber harvest in the Phase II project are located in non-fish bearing watersheds (Harlan Creek, Roan Gulch, McKinney Gulch). So, even if those areas are not harvested and do happen to burn at high severity, the fire and its after effects would convey no positive benefits to the nearest fish populations in the Bitterroot River, which are well downstream from the project area and mostly hydrologically disconnected from the project area.

The portions of the project area where only watershed improvement activities would occur (Rye Creek, North Rye Creek, Little Sleeping Child Creek, and Robbins Gulch watersheds) had large portions of their watersheds burned by high/moderate severity fire in 2000. As a result, the aquatic benefits mentioned in Malison and Baxter (2010) and Sestrich et al. (2011) already occurred in those watersheds back in 2001-2010. Because of the vast extent of the high/moderate severity fire that occurred across the Rye, North Rye, Little Sleeping Child, and Robbins watersheds in 2000, there is low risk of that type of fire revisiting the project area at the current time.

Lonn comments: These papers emphasize the point that your goal of reducing mixed and high severity fires is not an ecologically sound one.

Carbon Storage and Climate Change

Campbell, J.L., Harmon, M.E., Mitchell, S.R., 2011, Can fuel reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? Frontiers in Ecology and Environment, doi:10.1890/110057. *No evidence that thinning will decrease CO2 emissions in the long or short term; in fact it may be the opposite.*

Law, B.E., and Waring, R.H., 2015, Carbon implications of current and future effects of drought, fire, and management on Pacific Northwest forests: Forest Ecology and Management, v. 355, p. 4-14.

Law, B.E., Hudibug, T.W., Berner, L.T., Kent, J.J., Buotte, P.C., and Harmon, M.E., 2017, Land use strategies to mitigate climate change in carbon-dense temperate forests: PNAS, www.pnas.org/cgi/doi/10.1073/pnas.1720064115. *Logging is Oregon's biggestCO2 polluter, much more so than wildfire.*

Segerstrom, C., 2018, Timber is Oregon's biggest carbon polluter: High Country News, May 16, 2018.

Response: These papers all address the issue of climate change, either through carbon storage or CO2 emissions from logging. Campbell et al. examines the issue that wildfires may leave more carbon stored than mechanical fuel treatments. The paper concludes that fuel treatments do not have an additional benefit of increasing carbon storage. The Law et al papers conclude that longer rotations between harvests or selection harvests in Pacific NW forests would maximize carbon sequestration. Segerstrom discusses the research in the Law papers and that logging practices in Oregon are the largest contributor to CO2 emissions in the state, more so than wildfires. This paper is specific to logging practices in Oregon, where rotation between harvests is shorter and timber from private lands accounts for 63% of timber produced.

The DLL II project is not a primary contributor of global greenhouse gas emissions nor is it similar to the primary human activities exerting negative pressure on the carbon sink that currently exists in U.S. forests, namely land use conversion. The affected forests will remain forests, not converted to other land uses, and long-term forest services and benefits will be maintained. In lieu of the ability to dramatically alter climatic trends (at least in the short term), and with the inherent uncertainty regarding what specific long-term climatic changes may be, treatments proposed in this project may be one of the best options to maintain intact, healthy, functioning forests that can provide for a variety of future resource and social needs.

Lonn comments: These papers agree that logging is an overall carbon emitter, so even if it is not as significant as fossil fuel burning, for example, it is still deleterious. The best way to limit climate change is to limit ***all*** *carbon dioxide emissions. This needs to be discussed in your EIS.*

Fire and Fuels

Baker WL (2017) Restoring and managing low-severity fire in dry-forest landscapes of the western USA. PLoS ONE 12(2): e0172288. https://doi.org/10.1371/journal.pone.0172288. *Frequent low severity fire rates have been overestimated in dry forests, meaning that understory shrubs and small trees could fully recover between low severity fires. Therefore less restoration treatment (thinning) is needed before reintroduction of fire.*

Baker, W.L., T.T. Veblen, and Sherriff, R.L. 2007. Fire, fuels and restoration of ponderosa pine Douglas-fir forests in the Rocky Mountains, USA. Journal of Biogeography, 34: 251-269. *"Exclusion of fire has not clearly and uniformly increased fuels or shifted the fire type from low- to high-severity fires. However, logging and livestock grazing have increased tree densities and risk of high-severity fires in some areas. Restoration is likely to be most effective which seeks to (1) restore variability of fire, (2) reverse changes brought about by livestock grazing and logging, 3) ensure that degradation is not repeated.*"

Response: These two papers examine fire return intervals in in dry ponderosa pine and Douglas-fir ecosystems and the effects of fire exclusion to these systems. The 2017 paper concludes that the fire return interval is likely greater than 25 years (the current commonly used time period) depending on the location of the ecosystem. The 2007 paper discusses that grazing and past forest management activities have shaped fuels greater than fire exclusion. Both papers acknowledge there is still a need for restoration in these ecosystems, and depending on the current condition of the areas prescribed for treatment, options could include a more passive, prescribed fire only option or active options, such as thinning and re-introduction of fire.

Lonn comments: The restoration that they advocate is to "restore the variability of fire, reverse changes brought about by livestock grazing and logging, and ensure that degradation is not repeated." DLL2 is designed to do none of these. A better approach would be to apply prescribed burns without commercial logging ahead of time.

Bradley, C. M., C. T. Hanson, and D. A. DellaSala, 2016, Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? Ecosphere 7(10):e01492. 10.1002/ecs2.1492. *Reviewed 1500 fires larger than 1000 acres in the western US and found that decreasing fire intensity corresponded to increased forest protection (prohibitions on logging). It questions your (and HFRA's—written by politicians, not scientists) whole premise.*

Response: This paper assesses whether active management of forests results in lower fire severity. It concludes that areas that are protected from logging burn the least severe. The authors maintain allowing more wildfires to burn under safe conditions can be an effective restoration tool. The researchers also acknowledge they could not rule out that low-intensity management could decrease the occurrence high-severity fires.

Lonn comments: By "low intensity management" the authors did not advocate commercial logging, but instead they argue for prescribed burning alone and brush management immediately surrounding structures.

Dellasala, D.A., Ingalsbee, T., and Hanson C.T, Everything you wanted to know about wildland fires in forests but were afraid to ask: Lessons learned, ways forward: https://forestlegacies.org/images/projects/wildfire-report-2018.pdf *Comprehensive summary of historical wildfire compared to modern conditions, ecological benefits of wildfire, best practices for home protection.*

Response: This paper addresses a number of issues and its key findings conclude that large wildfires lead to higher levels of biodiversity, today's wildfires are driven by climate change, human-caused ignitions, and forest type conversion, post-fire logging is damaging to forests and aquatic ecosystems, thinning small trees and prescribed burning can lower fire intensity (but is nuanced), and a number of new strategies are needed to address the WUI. DLL II was designed with several objectives, none of which include post-fire logging or forest type conversion. Treatments were planned to help with resilience to forest health related issues and climate change considerations.

Lonn comments: The paper gives evidence of the ecological benefits of mixed-severity fires, shows that those fires are not outside of historic norms, and suggests that the best way to protect homes is to address the home itself and lands within 100 feet of the structure. Logging the wildlands has net negative effects.

Nacify, C., Sala, A., Keeling, E.G., Graham, J., Deluca, T.H., 2010, Interactive effects of historical logging and fire exclusion on ponderosa pine forest structure in the northern Rockies Ecological Applications, 20(7), 2010, pp. 1851–1864. *"Fire-excluded ponderosa pine forests of the northern Rocky Mountains logged prior to 1960 have much higher average stand density, greater homogeneity of stand structure, more standing dead trees and increased abundance of fire-intolerant trees than paired fire-excluded, unlogged counterparts. In other words, logging increases fuel loads and produces the densest, least diverse forest over the long term.*

Response: This paper discusses the effects of logging and fire exclusion in the northern Rocky Mountains. The conclusion of this paper shows that forests that were logged and had fire suppression are denser, less diverse, and less fire tolerant than similar unlogged and fire suppressed stands. The authors emphasize that forest health treatments should focus on stands that were previously logged and roaded and are located near communities. Stands that are previously unlogged and fire-excluded may not require as of intense management prescriptions.

Lonn comments: The DLL2 timber harvest is proposed for areas that have been undisturbed for a long time, and are mature forests. In addition, the area is mostly unroaded, but will require extensive new road building for timber harvest. This paper suggests that the timber harvest in DLL2 will have deleterious effects in the long run—higher stand density, more homogeneity, more roads, and higher fuel loads.

Odion D.C., Hanson C.T., Arsenault A., Baker W.L., DellaSala D.A., Hutto R.L., Klenner W., Moritz M.A., Sherriff R.L., Veblen T.T., Williams M.A. 2014. Examining historical and current mixed-severity fire regimes in ponderosa pine and mixed-conifer forests of western North America. PLoS ONE 9: e87852. *"Our findings suggest that ecological management goals that incorporate successional diversity created*

by fire may support characteristic biodiversity, whereas current attempts to ‘‘restore’’ forests to open, low-severity fire conditions may not align with historical reference conditions in most ponderosa pine and mixed-conifer forests of western North America."

Response: This paper recommends a variety of management practices to restore resilience to stands and landscapes including providing for open stands, age class diversity, and retention of fire-tolerant trees through a variety of mechanical and prescribed burning treatments. Project-wide conditions in the DLL II project area allow for a range of successional diversity. Treatments are not designed to convert every square inch of the project area to an open forest. The proposed vegetation management activities will treat approximately 5 percent of the area, helping create a landscape with a diversity of stand conditions in various successional stages.

Lonn comments: The 5% of the area being treated is misleading because the majority of the "project area" has been previously burned or clearcut or both. You are actually treating (logging) the majority of the undisturbed forest left in the area. This paper concludes that Ponderosa and mixed conifer forest in western North America, including the northern Rockies, were not historically dominated by low/moderate severity fire, but instead by mixed-severity fires that included much high severity fire even in Ponderosa forests. So, it challenges your perception that the low-elevation northern Rockies forests were dominated by frequent low severity fires. This paper recommends "incorporating historical mixed-severity fire into management goals. However, focusing fire risk reduction activities adjacent to homes is needed to protect communities [123], and this may expand opportunities for managed wildland fire–away from towns–for ecological benefits of fire-dependent biota. However, a major challenge lies with the transfer of information needed to move the public and decision-makers from the current perspective–that the effects of contemporary mixed-severity fire events are unnatural, harmful, inappropriate and more extensive due to fire exclusion–to embrace a different paradigm."

*Your previous treatments (Hayes Creek, Como, and Westside) resulted in open, evenly spaced P-Pine stands, in effect a pine plantation with **less** diversity. It is doubtful that DLL 2 will be any different.*

Rhodes, J.J.; Baker, W.L. 2008. Fire probability, fuel treatment effectiveness and ecological tradeoffs in western U.S. public forests. The Open Forest Science Journal 1: 1-7. *Fuel treatments have a 2.0-7.9% chance of being encountered by wildfire over their 20 year lifespan. This benefit does not counterbalance the adverse effects of fuel treatments.*

Response: This paper examines the probability that a treated area will encounter a wildfire within 20 years of treatment. The results are for the entire Western US and the authors caution that they should not be applied at a smaller analysis area scale. The results can be used to help with assessments of risk to watersheds and help with evaluating trade-offs. Fuel treatments allow fire managers a wider range of management efforts than would be viable if fuels treatments had not occurred, providing more options to address fire on a broader scale.

*Lonn comments: The paper did not state that results **should not** be applied at a smaller scale, but rather that it is "not applicable to **all** smaller analysis areas". The study did examine Ponderosa forests*

separately, finding "that in 92.1-98.0% of treated areas, fuel treatment impacts on watershed processes are not likely to be counterbalanced by a reduction in higher-severity fire".

Rogers, G., Hann, W., Martin, C., Nicolet, T., Pence, M., 2008. Fuel treatment effects on fire behavior, suppression effectiveness, and structure ignition. Grass Valley Fire, San Bernardino Forest. USDA Forest Service, Pacific Southwest Region, R5-TP-026b. *Mixed brushland and pine forests. While fuel treatments concentrated in the CPZ slowed the fire, many homes burned anyway, ignited by firebrands. Homes burned, while surrounding vegetation did not, suggesting that the homes themselves provided the main fuel source, and not the vegetation.*

Response: This citation is specific to the southwestern U.S. where vegetation conditions (chaparral) are much different than the northern Rockies and those landscapes burn under much different conditions. The DLL II project does have fuels management objectives and all units are located within the WUI, however, treatments were not developed specifically to prevent structures from burning in the event of a wildfire.

Lonn comments: The neighborhoods burned in this fire were dominated by Jeffery Pine, similar to Ponderosa, not chaparral. The hot, dry, windy weather was similar to the conditions under which the northern Rockies "catastrophic" fires occur (like the Roaring Lion Fire). My point is that logging in the wildlands away from homes will do little or nothing to protect those homes, despite the fact the the WUI officially extends 1.5 miles from the forest boundary. WUI boundaries were established by politicians, not scientists. You can use the WUI to justify this logging, but it demonstrates a lack of scientific integrity.

Williams, M.A., W.L. Baker. 2012. Comparison of the higher-severity fire regime in historical (A.D. 1800s) and modern (A.D. 1984-2009) montane forests across 624,156 ha of the Colorado Front Range. Ecosystems 15: 832-847. *Recent high severity fires in Ponderosa-Doug Fir forests in Colorado are not outside historical (1800s) averages.*

Response: This paper is specific to the Front Range in Colorado. Steve Arno's extensive work in the Bitterroot, cited in FIRE-001, found an average fire-free interval of 11-16 years in ponderosa and Douglas-fir and 16-27 years in Douglas-fir, lodgepole pine dominated sites.

Lonn comments: The study examined Ponderosa-Doug Fir forests in Colorado that are akin to those in DLL 2. Similar conclusions were reached for the northern Rockies Ponderosa-Doug Fir forests by Odion et al. (2014) and Baker et al. (2007); both are discussed above.

Invasives

Dodson, EK., and Fiedler, C.E., 2006, Impacts of restoration treatments on alien plant invasion in Pinus ponderosa forests, Montana, USA: Journal of Applied Ecology, v. 43, p. 887-897. *Thin and burn had most weeds, then thin only, followed by burn only, and then control.*

Response: This paper discusses different restoration treatments in ponderosa pine and the resultant invasive species that come in post-treatment. Research showed that active restoration treatments (thinning, burning or both) led to increase in the abundance of invasive species. The control plots, areas

that received no treatment, also had an increase in invasive species but at a lesser rate. The study also found that the percentage of total plant cover by invasive species was less than what might occur after a wildfire. The intent of this paper is to help land managers recognize there are trade-offs to restoration treatments. As stated on p. 894, "because of the multiple benefits that accrue with this treatment, which include killing fire-vulnerable Douglas-fir seedlings and saplings, reducing unnaturally high fuel build-ups, recycling nutrients bound in slash and down woody material and increasing the sprouting of important wildlife forage species. Land managers must weigh the benefits of restoration treatments against unwanted side-effects relative to their specific situations and management objectives."

Lonn comments: This paper did not actually find that total invasive species cover was less than after a wildfire; it cited another paper that stated that conclusion, without any specifics. This paper studied only the impacts of thinning, burning, or both as compared to untreated forest. It states that the costs of increasing invasive weeds should be considered along with the benefits of vegetation treatments, something the DLL2 EA has not done. The paper concludes does that (p, 892) "the active restoration treatments in our study (thinning, burning or both) increased the abundance of alien and transformer species. A response was evident even though these species were very minor constituents of the understory community initially. Our results are consistent with those from studies in ponderosa pine forests of other regions where invasion was facilitated by management treatments." Because burn-only treatments resulted in much less weed invasion than thin and burn treatments, DLL2 should consider using only the prescribed burn option. In not doing so, you have not considered all reasonable alternatives, and therefore violated NEPA.

Merriam, K.E., Keeley, J.E., Beyers, J.L., 2006, The role of fuel breaks in the invasion of non-native plants: U.S. Geological Survey Scientific Investigations Report 2006-5185. *A significant impact of all fuel treatments is the increase in invasive weeds, primarily due to soil disturbance.*

Response: This paper discusses the relationship between fuel reduction treatments, specifically fuel breaks, and the invasion of nonnative plants. The treatments evaluated in this paper are fuel breaks in California. They refer to fuel breaks with a number of different terms, such as shaded fuel breaks, defensible fuel reduction zones, defensible fuel profile zones, fuel reduction projects, fuel management zones, wildfire protection zones, and community protection zones. These types of treatments are not what is being prescribed in the DLL II project.

Lonn comments: In this paper (p. 1), all fuel reduction treatments are "collectively referred to as fuel breaks". It is disingenuous, therefore, to separate the fuel reduction treatments proposed in DLL2 from the results of this paper. The goal of fuel reduction is stated over and over in the DLL2 EA and the Fire and Fuels project files. While this paper examined projects In California, it included several sites of Ponderosa and mixed conifer forests. It concluded that "nonnatives were significantly more abundant on fuel breaks in all vegetation types". My own observations of BNF's Hayes Creek, Como, and Westside projects confirm these findings. BMPs will not solve the invasive weed problem in commercially logged areas.

Genetics

Bailey, J.K., Deckert, R., Scheitzer, J.A., Rehill, B.J., Lindroth, R.L., Gehring, C., and Whitham, T.G., 2005, Host plant genetics affect hidden ecological players: links among Populus, condensed tannins, and fungal endophyte infection: Canadian Journal of Botany, v. 83, p. 356–361 (2005) doi: 10.1139/B05-008. *Genetic differences in Cottonwoods that cannot be visually determined have profound effects on the forest ecosystem.*

Carswell, C., 2016, Genetic research lays foundation for bold conservation strategies: High Country News, June 8, 2016. *Pinyon pines susceptible to moths turn out to be the most drought resistant and survive over healthy appearing ones.*

McNulty, S.G., Boggs, J.L., and Sun, G., 2014, The rise of the mediocre forest: why chronically stressed trees may better survive extreme episodic climate variability: New Forests, v. 45, p. 403-415. *Finds that the healthy looking trees are not the ones that best survive climate change due to slower growth and higher root to foliage ratios. You cannot select for adaptive trees; only nature can do that.*

Six, D.L., Vergobbi, C. and Cutter, M., 2018, Are survivors different? Genetic-based selection of trees by mountain pine beetle during a climate-change-driven outbreak in a high-elevation pine forest: Plant Science, Plant Sci., 23 July 2018 | https://doi.org/10.3389/fpls.2018.00993 G*enetic differences that cannot be determined visually determine the variable susceptibility to bark beetles in lodgepole pine.*

Six, D.L., Biber, E., and Long, E., 2014, Management for Mountain Pine Beetle Outbreak Suppression: Does Relevant Science Support Current Policy? Forests, v. 5, p. 103-133, doi:10.3390/f5010103. *Thinning results in less live trees afterwards than just letting MPB go their course. You may actually be selecting the wrong (genetically less resistant) trees by thinning.*

Sthultz, C.M., Gehring, C.A., and Whitam, 2009, Deadly combination of genes and drought: increased mortality of herbivore-resistant trees in a foundation species: Global Change Biology, v. 15, 1949–1961, doi: 10.1111/j.1365-2486.2009.01901.x *The least vigorous pinyon pines, with their growth slowed by moth caterpillars, had much greater survival rates during drought than the healthy-appearing trees.*

Response: These papers all discuss genetic variations in different tree species. They discuss how the outward appearance of a tree is not always the best indicator of its ability to survive a disturbance. Some trees may appear unhealthy but have a genetic trait that makes them actually better adapted to survive a drought or insect outbreak. Several of the articles are specific to cottonwoods or piñon pine, which are not being treated or are not present in the DLL II project. Dr. Six's research is the most relevant to the treatments proposed in DLL II. Both of those papers recognize there is still a need for forest management and more research around this issue is needed moving forward in selecting how to manage for mountain pine beetle.

Lonn comments: These papers suggest that the outward appearance of a tree is not the best indicator of "resilience". Yet, outward appearance is exactly how you do select survivors. I realize that cottonwoods and pinon pine are not being treated (!), but the concepts presented in these papers do have application to all plants. Six et al.'s work (2014, 2018) certainly supports the application of these genetic concepts to the pine forests of western Montana. And while both papers recognize the need for more research, DLL 2

is a logging project, not a research project. Six et al. (2014) concluded that the policies of the USFS to reduce beetle epidemics were not at all justified.

Mistletoe

Geils, B.W., Tovar, J.C., and Moody, B., 2002, Mistletoes of North American Conifers: Gen. Tech. Rep. RMRS-GTR-98, USDA Forest Service, 123 p. https://www.fs.fed.us/rm/pubs/rmrs_gtr098.pdf *Points out that some individuals are genetically resistant to mistletoe infection, but they are impossible to identify.*

Hoffman, J.T., 2004, Management of Dwarf Mistletoe, 2004, USDA-FS https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5187427.pdf *Gives strategies for management when commercial timber production is the goal.*

Watson, D.M., and Herring, M., 2012, Mistletoe as a keystone resource: an experimental test: Proceedings of the Royal Society, v. 279, p. 3853-3860.. R. Soc. B (2012) 279, 3853-3860 doi:10.1098/rspb.2012.0856 *Mistletoe is an important part of the forest ecosystem, providing many benefits that are not entirely known yet.*

Worrall, J., 2013, Dwarf Mistletoes: Ecology and Management in the Rocky Mountain Region: Forest Health Management, Rocky Mountain Region, USDS Forest Service, 48 p. https://www.researchgate.net/publication/260968803_Dwarf_Mistletoes_Ecology_and_Management_in_the_Rocky_Mountain_Region

Response: These papers all discuss mistletoe and management of forests with mistletoe. The DLL II project does propose management activities to help manage mistletoe in the project area, however, the project was not designed to fully eradicate mistletoe from the project area. Treatments are intended to reduce mistletoe spread. The Silviculture report (SILV-001) states on p. 16, "We recognize that eradication of dwarf mistletoe is not possible or desirable."

Lonn comments: You left out several important references that I cited. Pollock and Suckling (1995) state: "dwarf mistletoe control projects have traditionally been pursued by the Forest Service in order to maximize timber production at the expense of ecosystem health". Hadfield et al. (2000), a USFS publication states that mistletoe "is a pest only where it interferes with management objectives, such as timber production". In other areas, it is important for wildlife habitat. It also states that spread rates are faster in open stands than dense stands. In neither MA 2 or MA 8b is timber production the priority; instead these Mas are to be managed for the benefit of wildlife as their first priority. If you want to slow mistletoe spread, then you should follow the guidelines supported by Bull et al. (1997), Worrell (2013), and Pollock and Suckling (1995), and create a "donut" 30 feet wide around the infected area, and thereby preserve ecosystem health. The science states that clearcuts are unnecessary and ecologically unsound. The science indicates there are alternatives to clearcutting, and you did not consider all reasonable alternatives in the EA as required by NEPA.

Wildlife

Bull EL, Parks CG, Torgerson TR. 1997. Trees and logs important to wildlife in the interior Columbia River basin. General Technical Report PNW-GTR-391. Portland, OR: US Dept. of Agriculture Forest Service, Pacific Northwest Research Station. 55 p.

Response: This document focuses on the importance of living trees with decayed parts, trees with hollow chambers, trees with brooms, dead trees, and logs and the value of these structures to wildlife. The DLL II project will retain snags and downed woody debris, where possible, within treatment units.

Lonn comments: "Where possible" is one point of disagreement. Your goals to reduce wildfire, reduce insects and disease, and harvest (remove) as much timber as possible conflict with the ecological value of leaving hollow trees, trees with brooms, dead trees, and logs. Their value to wildlife is completely disregarded.

Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests: Conservation Biology 9: 1041–1058.

Response: Hutto (1995) surveyed recently burned areas in western Montana and northern Wyoming and determined that 15 bird species are generally more abundant in early post-fire communities than in any other major cover type occurring in the northern Rockies. He also stated that one species, the black-backed woodpecker, seems nearly restricted in its habitat distribution to standing dead forests created by stand-replacement fires. Hutto recommends that public land managers "leave an adequate amount of standing, dead trees after a fire because of the species that depend on that forest element." DLL II project is not a post-fire salvage logging project.

Lonn comments: You missed my point: that severe burns have immense ecological benefits, and so to justify DLL2 on the basis of preventing severe wildfires is not ecologically sound. I realize that DLL2 is not a post-fire salvage project.