Data Submitted (UTC 11): 9/30/2019 6:00:00 AM
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Comments: Mud Creek project comments from Jeff Lonn 9-30-2019

I submit the following comments as part of the Mud Creek scoping process. A list of pertinent references follows each comment. I had earlier (October, 2018) submitted pre-scoping comments on the Mud Creek project, based on the October 12, 2018, public field trip to the Mud Creek project area and on my review of previous project results (Hayes Creek, Westside, and Como). Although p. 1 of the scoping letter states you are [ldquo]committed to providing an open, transparent, and inclusive process[rdquo], I do not see my comments nor any other pre-scoping comments available on the Mud Creek website. Please post public comments in a timely manner. Unfortunately, little additional information is available in the scoping, so many of my comments are similar to those of last year:

1. Change the approval/decision process so that scoping and the draft EA/EIS include details. You give no specific plans nor detailed information in the scoping information. This is the first project I have seen that gives no information on treatment units, treatments proposed for each unit, road construction, roads to be decommissioned, or proposed site-specific forest plan amendments. How are the interested public, other agencies, and collaborative groups supposed to submit substantive and meaningful comments if there are no details? The scoping letter, page 1, states that you are [ldquo]committed to providing an open, transparent, and inclusive process[rdquo]. This seems anything but. The next and final opportunity for public involvement is apparently the objection process for which [ldquo]substantive[rdquo] comments must have been previously submitted. It[rsquo]s as if you want prior approval for anything that you want to do. I imagine that this approach violates NEPA, and, in fact, a judge recently stopped a timber sale in the Tongass National Forest that appears to have followed a similar process. Release the project details, which I suspect you already have, before you proceed. You say we need to trust the Forest Service, but previous projects have earned you little trust.

2. Do an EIS, not an EA, to analyze this project. The enormous 45,000-acre size and the presence of or potential for ESA-listed species such as Bull Trout, Lynx, Wolverine, and Grizzly call for an EIS, not an EA. An EIS will also require that additional alternatives be developed in addition to No Action and potentially result in a better project.

3. Analyze the programmatic EHE forest plan amendment as a separate proposal. Your approach reminds me of a rider on a must-pass bill in Congress[mdash]it circumvents the review process. I suspect this proposal is in response to the objections to site-specific EHE amendments on virtually every previous timber project. However, it should not be attached to the Mud Creek project; it should be analyzed separately. In addition, BNF Wildlife Biologist Dave Lockman has previously commented that EHE is used to protect habitat of many other species: [ldquo]The EHE standard results in areas of secure habitat for a range of species including grizzly bears[rdquo]. (p. 10, Gold Butterfly Biological Assessment; p. 9 DLL 2 BA). Therefore, the amendment[rsquo]s effect on other species also needs to be analyzed.

4. Avoid the one-size-fits-all prescription to remove Doug Fir to favor Ponderosa Pine in all low elevation sites. Instead do careful site-specific analyses before recommending treatment. In the Westside project, almost all Doug Firs were removed from all commercial harvest units below 5,000 feet without regard for aspect, topography, or microclimate, even though in many areas the historic forest was a mixed Ponderosa Pine-Doug

Fir forest. This was most evident in the 20 acres of old growth logged, where every single large (marketable) Doug Fir was cut.

Many, if not most, were 150-250 years old. Ponderosa Pines were of similar age, so these two species apparently grew up together long before fire suppression or other settlement activities interfered with natural processes. This shows that both tree species were historical components in many sites. Therefore, your treatment design should be site-specific, taking into account aspect, topography, microclimate, and existing old species diversity. For example, 2018 field trip Stop 1 appeared to contain a few old Doug Firs mixed in with the Ponderosas; these Doug Firs should be retained.

5. Restrict commercial timber harvest to MA 1 and the CPZ. On both the Westside and Hayes Creek projects, commercial logging was done in open stands of healthy, mature, weed-free stands of Ponderosa that appeared to already meet desired conditions. In some areas, BNF fire risk maps showed only ground fire potential, and none of commercial harvest units had any potential for active crown fire. While I have no doubt that the Westside treatments were sound silvicultural ones, they were not sound ecological ones, suggesting that the real Purpose and Need was commercial logging. I realize you operate under a timber mandate, but please be honest about the Purpose and Need regarding this. Try to restrict commercial logging to MA 1 and to the community protection zone (CPZ) within [frac14] mile of residences. In other areas, emphasize forest ecology rather than silviculture in your plans.

6. Emphasize non-commercial thinning, and do commercial harvests in the winter. The soil disturbance that accompanies commercial logging is significant in many areas of previous projects, and has resulted in the replacement of the native ground cover with invasive weeds. Large areas of the Hayes Creek project still grow mostly knapweed, St Johns wort, and cheatgrass even 10 years after project completion. It was interesting that at 2018 field trip Stop 2, the area across the road had been treated for fuels reduction during a wildfire a few years ago to increase fire suppression potential. That area appeared to be much more ecologically sound than the commercial logging areas in previous projects--some hiding and thermal cover had been retained, some species diversity had been preserved, and the understory was relatively weed-free. The parameters that you used for the area across from Stop 2 should be the same ones you use in the WUI. Please de-emphasize the commercial harvest, and where it is planned, require it to be done in the winter. In the Westside project, there appears to be much less ground disturbance in the areas that were logged in the winter versus the summer.

7. Let insects and disease run their course; they naturally thin the forests, increase species diversity, and drive adaptation to climate change and other disturbances. In fact, the effects of USFS treatments to reduce insects and disease are largely unknown, and may actually be harmful to the forest ecosystem (Six et al., 2014, 2018). In other words, humans cannot select for the genetically fittest and most adaptive trees; only nature can do that. At Stop 3, small mistletoe-infected Doug Fir had been hand-thinned and piled, with the remaining forest being a mixed Doug Fir-Ponderosa Pine forest. Commercially logging the remaining mistletoe-infected Doug Fir was proposed as part of the Mud Creek project here, but I think it is unnecessary and undesirable. Even your own pamphlets (referenced below) state that mistletoe is not a concern unless timber harvest is your greatest priority, and that mistletoe is valuable in providing wildlife with habitat and a rich food source from the insects that live there. Timber production is the priority only in MA 1, so please restrict commercial logging for the purposes of controlling insects and disease to MA 1. A similar argument can be made for Spruce Budworm infested trees. How do you know that the Doug Firs most susceptible to Spruce Budworm (or Mistletoe) are not the same ones that will survive climate change (see Sthultz et al., 2009; McNulty et al., 2014; Carswell, 2016)?

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[ndash]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.

Hadfield, J.S., Mathiason, R.L., and Hawksworth, F.G., 2000, Douglas Fir Dwarf Mistletoe: Forest Insect and Disease Leaflet 54, USDA-FS, 10 p. Your own USFS pamphlet states [ldquo]it is a pest only where it interferes with management objectives, such as timber production[rdquo]. In other areas, it is important for wildlife habitat. It also states that spread rates are faster in open stands than dense stands.

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.

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., 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.

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.2018.00993Genetic differences that cannot be determined visually determine the variable susceptibility to bark beetles in lodgepole pine.

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

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

8. Restrict commercial logging and thinning for fuel reduction to the CPZ within [frac14] mile of structures. Jack Cohen[rsquo]s extensive studies on structure ignitions from wildfires show that whether or not a structure burns in a wildfire is determined by the composition of the structure itself and the conditions within 100 feet of the structure. Fuel reduction treatments more than a few hundred feet away have almost no effect. This is because most destructive wildfires are driven by extreme weather/climate conditions, with topography playing an important role as well. Fuels are a minor factor under these conditions. A good example was provided by the 2016 Roaring Lion fire, which seemed to defy all the rules. Open stands of large Ponderosas burned in some areas, while in others, thick stands of medium Doug Firs experienced only ground fires. Many recent studies have found that logging actually increases fire severity, especially over the long run (Bradley et al., 2016). Many also studies show no relationship, or even a negative, relationship, between fire severity/occurrence and insect-killed forests. Stop 5 on the 2018 field trip was a thinned Ponderosa forest that, impressively (and surprisingly) had no weeds. However, I am unsure of its ecological value: trees were evenly spaced with no clumping, coarse woody debris was almost completely absent, and it lacked hiding or thermal cover for wildlife. While this is probably as fireproof

as a forest can be, possibly the ecological costs outweigh the fire reduction benefits. The Fire and Fuels Specialist commented that he would like to see this treatment across the entire 1[frac12]-mile-wide WUI. I think this is not only unnecessary, but would also be an ecological disaster. Instead, a patchwork of treatment using the Hessburg et al. (2017) and Andrew Larson principles of heterogeneity would be more ecologically sound and would accomplish the same objective.

Cohen, J.D. 1999. Reducing the wildland fire threat to homes: Where and how much? PSW-GTR- 173. 189-195. [0863]

Cohen, J.D. 2000.What is the wildland fire threat to homes? Presented as the Thompson Memorial Lecture, School of Forestry, Northern Arizona University, Flagstaff, AZ; April 10, 2000. [http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf [0502]

Cohen, J.D. 2002.Wildland-urban fire: A different Approach. [1611] [http://www.firelab.org/]

Cohen, J.D. 2003a. An examination of the Summerhaven, Arizona home destruction related to the local wildland fire behavior during the June 2003 Aspen Fire. [1715] http://www.tucsonfirefoundation.com/wp-content/uploads/2012/07/2003- Summerhaven-Ho-Dest.pdf

Cohen, J.D. 2003b. Structure ignition assessment model (SIAM). USDA Forest Service General Technical Report PSW-GTR-158, 1995. An abbreviated version of this paper was presented at the Biswell Symposium: Fire Issues and Solutions in Urban Interface and Wildland Ecosystems, February 15[minus]17, 1994,Walnut Creek, CA. [1716] [http://www.fs.fed.us/psw/publications/documents/psw_gtr158/psw_gtr158_05_cohe n.pdf]

Cohen, J.D. 2003c. Thoughts on the wildland-urban interface fire problem. Published inWildfire Magazine and International Journal ofWildland Fire. http://www.nps.gov/fire/download/pub_pub_wildurbaninterface.pdf

Cohen, J.D. and J. Saveland. 1997. Structure ignition assessment can help reduce fire damages in the WUI. [1717] https://www.firelab.org/

Donato, D.C., B.J. Harvey, W.H. Romme, M. Simard, and M.G. Turner. 2013. Bark beetle effects on fuel profiles across a range of stand structures in Douglas-fir forests of Greater Yellowstone. Ecological Applications 23: 3-20. Fire potential is less, particularly for crown fires, after Doug Fir bark beetle mortality. Formerly dense DF forests became more open parklands, which is one of your goals.

Hart, S.J., Schoennagel, T., Veblen, T.T., and Chapman, T.B., 2014, Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks: Proceedings of the National Academy of Sciences (PNAS), v. 112, n. 14. Trees killed by mountain pine beetles have had no effect on the areas subsequent wildfires have burned.

Hessburg, P.F., et al., 2015, Restoring fire-prone Inland Pacific landscapes: seven core principles: Landscape Ecology, v. 30, p, 1805[ndash]1835. DOI 10.1007/s10980-015-0218-0

Kulakowski,D., Daniel Jarvis, D., 2011, The influence of mountain pine beetle outbreaks and drought on severe wildfires in northwestern Colorado and southern Wyoming: A look at the past century: Forest Ecology and Management, v. 262, p. 1686[ndash]1696. Found no detectable increase in fire severity following MPB mortality in lodgepole forests. Climate appears to be a much more important factor in fire severity than fuels.

Meigs, G. W., J. L. Campbell, H. S. J. Zald, J. D. Bailey, D. C. Shaw, and R. E. Kennedy. 2015. Does wildfire likelihood increase following insect outbreaks in conifer forests? Ecosphere v. 6(7), article 118, 24 p. Wildfire likelihood does not increase in insect-killed conifer forests.

Meigs, G.W., J.D. Zald, H.S. Campbell, W.S. Keeton, and R.E. Kennedy, 2016, Do insect outbreaks reduce the severity of subsequent forest fires? Environ. Research Letters 11, 045008, doi:10.1088/1748-9326/11/4/045008.Both WPB and MPB mortality decrease the severity of subsequent fire.

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[ndash]1864. [rdquo]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 forest over the long term.

Simard, M., Reese, W.H., Griffin, J.M., Turner, M.G., 2011, Do mountain pine beetle outbreaks change the probability of active crown fire in lodgepole pine forests? Ecological Monographs, 81(1), 2011, p. 3[ndash]24. MPB outbreaks in Lodgepole Pine reduce the likelihood of crown fires.

Swetnam, T.W., Allen, C.D., and Betancourt, J.L., 1999, Applied historical ecology: Using the past to manage for the future: Ecological Applicationis, v. 9(4), p. 1189-1206. Found that weather has been more important than fuels in driving fires in southwestern forests.

Zald, S.J., and Dunn, C.J., 2018, Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape: Ecological Applications, v. 28 (4), p. 1068[ndash] 1080. Found that [ldquo]daily fire weather was the most important predictor of fire severity, followed by stand age and ownership, followed by topographic features. Estimates of pre-fire forest biomass were not an important predictor of fire severity[rdquo]. Demonstrated that managed forests burn more severely and that fuels are not an important factor.

9. Consider introducing prescribed fire to Ponderosa Pine-Doug Fir forests without as much pretreatment. Many newer studies have found that fire-frequency in the northern Rockies has been overestimated and that mixed severity fires were historically common in dry, low elevation forests. They make the case for reintroducing fire without first doing extensive fuel treatments. And your goal of eliminating all mixed and high severity wildfires is not ecologically sound. Many wildlife biologists have written papers on the benefits of these fires for wildlife, even for fisheries (some examples are given below). They shed doubt on the claim that we need to make forests more resilient to wildfire.

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., and Ehle, D., 2001, Uncertainty in surface-fire history: the case of ponderosa pine forests in the western United States: Canadian Journal of Forest Research. V. 31, p. 1205[ndash]1226. DOI: 10.1139/cjfr-31-7-1205. Examines the biases in fire scar studies, and finds that average fire return interval is much longer than previously thought.

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. [ldquo]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 degredation is not repeated.[rdquo]

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.

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[ndash]1058.

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.

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. [ldquo]Our findings suggest that ecological management goals that incorporate successional diversity created by fire may support characteristic biodiversity, whereas current attempts to [lsquo][lsquo]restore[rsquo][rsquo] 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.[rdquo]

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.

Swetnam, T.W., and Baisan, C.H., 1996, Historical Fire Regime Patterns in the Southwestern United States Since AD 1700, in CD Allen (ed), Fire Effects in Southwestern Forest: Proceedings of the 2nd La Mesa Fire Symposium, p. 11-32: USDA Forest Service, Rocky Mountain Research Station, General Technical Report RM-GTR-286. Elevation and forest type were often weak determinants of fire frequency. Some of the variations in fire interval distributions between similar elevation or forest types were probably due to unique site characteristics, such as landscape connectivity (Le., ability of fires to spread into the sites), and land-use history. Differences in the sizes of sampled areas and fire- scar collections among the sites also limit ability to compare and interpret fire interval summary statistics.

Williams, M.A., W.L. Baker. 2012b. 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.

10. Do not treat areas that historically had infrequent mixed and high severity fires, such as steep north-facing slopes and riparian areas. We viewed and discussed examples of both at 2019 field trip Stop 2. Treatment of these areas would actually take them farther from historic conditions, rather than closer.

11. Use up-to-date science in planning your treatments as required by NEPA and HFRA. Consider new ideas. Too often, USFS EAs and EISs cherry-pick outdated science to support their treatments. While science is rarely [ldquo]settled[rdquo], the fact that many studies refute the validity of some USFS procedures should encourage the IDT to take a closer look at their methods. My comments reference many scientific studies that should be considered.

12. Do not construct any new roads. New roads include temporary roads, and re-construction of undetermined roads as well as system roads. Roads fragment habitat, increase stream sedimentation, cause visual scars, increase human visitation, and remove land from forest production. The historical forest included no roads, so roads have no place in restoration activities. BNF already has about 3,000 miles worth, and a look at the map of the Mud Creek project shows that it is already heavily roaded. And most BNF roads are in complete disrepair, suffering from a multi-million dollar maintenance backlog. On the Westside project, the majority of new roads were pushed into the unroaded area around the popular, non-motorized Coyote Coulee trail. This special area had been recovering well after being left alone for 100 years, but now it is just another logged-over area bisected by roads. This was a violation of the Forest Plan, which states [ldquo]roads and logging will not be readily visible from major trail corridors[rdquo].

13. Please do not log or build roads adjacent to existing trails. The Westside project considerably degraded the popular non-motorized Coyote Coulee trail by logging and building roads across and along the trail. See comment #12 above.

14. Please provide at least two alternatives in addition to the no-action alternative. Both the Westside and DLL 2 projects offered only the option of action and no-action, giving the project the all-or-nothing feel of an ultimatum.

15. Do a thorough inventory of old growth, and do not do any commercial logging or road building in old growth. On the Westside project, the old growth inventory was incomplete and at least 20 acres of old growth was logged. In this old growth area, every single large Doug Fir was cut; most were between 150 and 250 years old. Clearly, they had not encroached on the Ponderosa (called [ldquo]crop trees[rdquo] by the silviculturist), but they were cut anyway under the one-size-fits-all prescription discussed in Point 1 above. The ground disturbance in this area was astounding, with ruts up to 3 feet deep and churned up soil covering 50% of the area. There is more to old growth than the trees[mdash]it is the entire ecological community that is important, and the old growth attributes of this area are now gone. If you feel that old growth is threatened by fire, in those instances you could do some non-commercial thinning similar to that being done on the Canyon Creek project. But also take a look at the southeast side of Ward Mountain, where an old growth Ponderosa forest mostly survived the Roaring Lion fire even though moderate-sized Doug Fir had invaded. These Doug Fir, many with low-hanging mistletoe, were killed but did not burn. According to the formula, this area with abundant ladder fuels and thick encroaching Doug Fir, should have experienced severe fire, but it did not. It suggests again that fuels are not as important as other factors (Point 9 above).

16. Consider the public[rsquo]s comments and make compromises. On the Westside, Darby Lumber Lands 2, and Gold Butterfly projects, you did not make any significant changes even though the majority of comments asked you to do so. Collaboration with the public is required by both NEPA.

17. Analyze the project[rsquo]s effects on climate change. This project is a long way from both the workforce

and any mills, and will require large amounts of fossil fuel. In addition, there is a growing body of evidence that logging and thinning are big carbon dioxide emitters, more so than any type of wildfire, and that logged forests sequester less carbon than untreated forests. Will the project exacerbate climate change, resulting in even more wildfires?

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.

Harris, N.L., and 6 others, 2016, Attribution of net carbon change by disturbance type across forest lands of the conterminous United States: Carbon Balance Management, v. 11, 24 p. DOI 10.1186/s13021-016-0066-5. Timber harvest in western forests resulted in 4 times more carbon storage loss than wildfire.

Law, B.E., and Waring, R.H., 2015, Carbon implications of surrent 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[rsquo]s biggestCO2 polluter, much more so than wildfire.

Reinhardt, E., and Holsinger, L, 2010, Effects of fuel treatments on carbon-disturbance relationships in forests of the northern Rocky Mountains: Forest Ecology and Management, v. 259, p. 1427[ndash]1435. Modeling indicated that fuel treatments decreased fire severity and crown fire occurrence and reduced subsequent wildfire emissions, but did not increase post-wildfire carbon stored on-site. Conversely, untreated stands had greater wildfire emissions but stored more carbon.

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

1. Include money in the budget for post-project monitoring, restoration, and road maintenance. Typically this money has to later be found elsewhere (Westside, Gold Butterfly). This results in unacceptable outcomes, like the weed-infested Hayes Creek project. I do not think BNF personnel have even visited the Hayes Creek area since project completion, let alone tried to do restoration.
2. Do a thorough and honest economic analysis of the project. Include project preparation costs and post-project monitoring, reclamation and maintenance costs. These are not normally included, but should be. If you are going to speculate on indirect positive economic effects on Ravalli County, then also speculate on the negative economic impacts that will result from the project. Otherwise, stick to the costs and benefits of the project to the BNF and USFS.
3. Stay out of the Blue Joint WSA. By law, WSAs are to be managed to retain their wilderness character, precluding active management treatments including prescribed burning.
4. Do no commercial logging in IRAs. Hand thinning and prescribed burning are acceptable, but should be concentrated in the Community Protection Zone.
5. Do extensive field surveys. Your planned schedule indicates you have little time for this, and the scoping letter states that treatments are being developing using modeling and remote sensing. These are no substitute for on-the-ground work. Modeling can often be summed up by the statement: garbage in-garbage out.

I suggest that, if you are truly trying to improve forest health, you follow the same rule that human health workers do: first, do no harm. You will be far ahead of other projects if you just do this.

And if your goal is just to get the cut out, please be honest about that. Sincerely,

Jeff Lonn