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First name: Doug
Last name: Heiken
Organization:
Title:
Comments: Ten Cent CWPP Project - scoping comments

FROM: Doug Heiken, Oregon Wild | PO Box 11648, Eugene, OR 97440 | 541-344-0675 | dh@oregonwild.org <mailto:dh@oregonwild.org>
TO: comments-pacificnorthwest-umatilla-northfork-johnday@fs.fed.us <mailto:comments-pacificnorthwest-umatilla-northfork-johnday@fs.fed.us>
ATTN: Ian Reid, North Fork District Ranger
DATE: 6 Oct 2014
RE: Ten Cent Community Wildfire Protection Project - scoping comments

Please accept the following scoping comments from Oregon Wild regarding the proposed Ten Cent Community Wildfire Protection Project. Oregon Wild represents approximately 10,000 members and supporters who share our mission to protect and restore Oregon's wildlands, wildlife and waters as an enduring legacy.

This project includes about 10,000 acres of commercial logging, and a variety of other fuel reduction activities, including 40K acres of prescribed fire inside and outside wilderness. No "new" road construction is planned but closed roads and historic routes will be reopened.

A project of this scale should have a broad focus on ecological restoration, instead of a narrow focus on fuels.

It is a bit misleading calling this a community protection project. This project involves large scale vegetation management far from homes. Community protection should focus on the structure ignition zone within a few hundred feet of homes.

This is a large project with potentially significant environmental effects. Consider doing an EIS.

Portions of this project appear to be located in unroaded areas. See lavender polygons on the map below. Unroaded areas are ecologically critical and will be adversely affected by commercial logging. We urge the FS to focus on ecological restoration and use only non-commercial low-impact methods when treating unroaded areas >1,000 acres.

Recommendations for dry forest thinning/restoration

1. Oregon Wild will do it's best to maintain the torch that was carried for so long by the late Tim Lillebo who worked to protect and restore eastside forests for almost four decades. In Tim's office, we found the following concise summary of his recommendations for thinning dry forests containing old growth trees.

Old Growth stand thinning

My recommendation for thinning in OG stands is the same prescription we used for the Glaze Project where we thinned OG stands.
Basically,
-retain all OG trees of all species
-retain historic mix of species
-retain all snags and down logs, with safety exceptions
-retain 15-20% in wildlife leave patches from 1/4 - 5 acres
-In small trees thin in variable density 60-80 sq ft basal area, retaining the largest trees that will become the next generation of old growth. Larger trees carry higher basal areas of 100-140+.
-thin leaving clumps of 2-10 trees with 3-4 clumps per acre
-doughnut thin around old growth trees, but if available retain 1-2 good sized trees in the doughnut to become replacement old growth

A more detailed description of Tim's restoration concepts, vision, priorities, recommended prescriptions for eastside forests can be found in Oregon Wild's "Practical Guide for Ecological Restoration of Eastern Oregon's Dry Forests," http://www.oregonwild.org/sites/default/files/pdf-files/Eastside_Restoration_Handbook.pdf. In appropriate dry forest type please consider applying Tim's recommendations, including lessons for successful restoration, and recommendations for minimizing unintended consequences.

2. Additional dry forest restoration concepts can be found here: Franklin, J.F., Johnson, K.N., et al 2013. Restoration of Dry Forests in Eastern Oregon - A Field Guide. The Nature Conservancy, Portland, OR. 202 pp. http://nature.ly/dryforests (We have not had a chance to carefully review all of the recommendations in this field guide, but it does appear to have some good ideas. We are concerned about the proposed allowance to remove some old trees to make restoration economically viable. There are no clear criteria to ensure that the ecological benefits exceed the ecological costs.)

3. When conducting commercial thinning projects take the opportunity to implement other critical aspects of watershed restoration especially reducing the impacts of the road system and livestock grazing and establishing the ecological processes that foster recovery of hydrologic systems and fire regimes. See FEMAT 1993. Appendix V-J: Guidelines for Restoration Projects (unnumbered pages between V-96 and VI-1). Bradbury, Nehlsen et al 1995. Handbook for Prioritizing Salmon & Watershed Restoration. http://pacificrivers.org/science-research/resources-publications/handbook-for-prioritizing-watershed-protection-and-restoration-to-aid-recovery-of-native-salmon.

4. Don't waste too much effort restoring forest structure when doing so will require continuous expenditure of money and effort to maintain. Use scarce resources efficiently by striving to restore ecological processes that can be self-sustaining. Recognize that insects and disease are natural ecological processes that actually help improve landscape diversity. Recognize that tree mortality recruits valuable habitat structures and makes resources available which increase the vigor of surviving trees, thus accomplishing many of the objectives of mechanical density reduction projects. Don't focus too much on tree health, but think instead about forest ecosystem health. Use natural processes where it makes sense to do so. Fettig et al 2013 review draft. The Ecology and Management of Moist Mixed-Conifer Forests in Eastern Oregon and Washington; a Synthesis of the Relevant Science and Implications for Future Management ("[R]estoration should aim to re-establish the self-organizing, self-maintaining, and adaptive capacities of ecosystems. This is done by restoring ecological patterns and processes. In doing so, we can address the goal of 'healthier, more resistant, more resilient ecosystems, even if they are not exactly the same systems as before (USDA Forest Service).' The application of ad hoc, narrowly focused 'engineering' solutions (e.g., managing forest structure and composition to recover a specific stable state) is expensive, logistically challenging, and often incapable of achieving restoration goals. Engineered solutions can still have limited roles for particular sites, but creating healthy and resilient landscapes requires a more dynamic and process-based perspective.") Reed F Noss, Jerry F Franklin, William L Baker, Tania

Schoennagel, and Peter B Moyle. 2006. Managing fire-prone forests in the western United States. Front Ecol Environ 2006; 4(9): 481-487. http://spot.colorado.edu/~schoenna/images/Nossetal2006Frontiers.pdf <http://spot.colorado.edu/~schoenna/images/Nossetal2006Frontiers.pdf> . Crist, M.R., T.H. DeLuca, B. Wilmer, and G.H. Aplet. 2009 Restoration of Low-Elevation Dry Forests of the Northern Rocky Mountains: A Holistic Approach. Washington, D.C.: The Wilderness Society. http://fedgycc.org/documents/WldrnsSociety_Restoration-Low-Elev-Dry-Forests-Rocky-Mtns.pdf <http://fedgycc.org/documents/WldrnsSociety_Restoration-Low-Elev-Dry-Forests-Rocky-Mtns.pdf> . Use projects as an opportunity to conduct monitoring and research on the effects of thinning. There are many information gaps that need filling. Every project should generate useful information to inform future projects.

5. Treated stands do not exist in isolation, so be sure to consider the effects of thinning on adjacent areas which may provide habitat for species of concern. Prepare a "risk map" based on proximity to different habitat types from high quality to non-habitat.

6. Only a small subset of needed restoration activities are "profitable," so we can't let logging economics determine restoration priorities. If we restore primarily those areas that have commercial-sized logs and fail to treat the thousands of acres of areas that need restoration but lack economic return, we will not be accomplishing real restoration which requires carefully and strategically choosing the subset of the landscape that can be treated to provide the greatest gain (both ecological and fire hazard reduction) for the least ecological "cost" in terms of soil, water, wildlife, carbon, and weeds. "Hoping to boost their economies and also restore these forests, local leaders are interested in the economic value of timber that might be available from thinning treatments on these lands. … [W]e found that on lands where active forestry is allowable, thinning of most densely stocked stands would not be economically viable." Rainville, Robert; White, Rachel; Barbour, Jamie, tech. eds. 2008. Assessment of timber availability from forest restoration within the Blue Mountains of Oregon. Gen. Tech. Rep. PNW-GTR-752. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 65 p. http://www.fs.fed.us/pnw/pubs/pnw_gtr752.pdf <http://www.fs.fed.us/pnw/pubs/pnw_gtr752.pdf> . Allowing economics to drive these choices will result in greater ecological impacts and lower ecological gains. The NEPA analysis must honestly disclose what optimum restoration treatments would look like versus what is actually being proposed, so the public can see what's being sacrificed.

7. Protect soil and water quality by avoiding ground-based logging and log hauling during the wet season.

8. Thinning should focus on areas accessible from existing roads. Building new roads will cause degradation that typically erases any alleged benefit of treatments. Inaccessible areas can be treated non-commercially or become part of the landscape mosaic that is untreated and serve important ecological values such as dense forest cover, carbon storage, and natural rates of snag recruitment.

9. Where road building is necessary, ensure that the realized restoration benefits far outweigh the adverse impacts of the road. Carefully consider the effects of roads on connectivity, especially at road/stream crossings, across ridge tops, and midslope hydrological processes (such as large wood delivery routes). The NEPA analysis should rank new road segments according to their relative costs (e.g. length, slope position, soil type, ease of rehabilitation, weed risk, native vegetation impacts, etc.) and benefits (e.g. acres of restoration facilitated), then use that ranking to consider dropping the roads with the lowest ratio of benefits to costs. Once the relative acres accessed per mile of road is determined, take the analysis one step further and determine the "effective road density" of each segment. In other words, extrapolate as if that much road were required to reach each acre of the planning area, then compare the resulting road density to RMP objectives for big game, fish conservation, cumulative hydrological impact, etc? For example, if a new spur road accesses thinning opportunities at a rate of 200 acres of forest per mile of road, then divide 640 acres per section by 200 acres per mile to determine the effective road density of 3.2 mi/mi2.

10. Use the historic range of variability as a guide, but don't just focus on seral stage. Consider also the historic

abundance of ecological attributes like large trees, large snags, the scale and distribution of patches of dense forest, roadless areas, etc. all of which have been severely reduced from historic norms. Also, consider the natural range of variability, which is the historic range of variability as modified by future climate change and fire suppression. James A. Harris, Richard J. Hobbs, Eric Higgs, and James Aronson. 2006. Ecological Restoration and Global Climate Change. Restoration Ecology Vol. 14, No. 2, pp. 170-176 JUNE 2006. http://www.globalrestorationnetwork.org/uploads/files/LiteratureAttachments/353_underlying-principles-of-restoration.pdf <http://www.globalrestorationnetwork.org/uploads/files/LiteratureAttachments/353_underlying-principles-of-restoration.pdf> .

11. Develop restoration treatments appropriate to each forest type or plant association group (PAG). Dry Ponderosa pine forests that have significant ingrowth due to fire exclusion are good candidates for thinning. Mixed-conifer forest types often included some dense forest patches, so they should be retained at appropriate scales. Lodgepole pine and subalpine forests have stand replacing fire regimes and generally do not need to be thinned or regenerated.

12. Prioritize treating stands that are already degraded by past logging, and place less priority on treating previously unlogged forests. See Naficy, Cameron, Anna Sala, Eric G. Keeling, Jon Graham, and Thomas H. DeLuca. 2010. Interactive effects of historical logging and fire exclusion on ponderosa pine forest structure in the northern Rockies. Ecological Applications 20:1851-1864. http://rintintin.colorado.edu/~cana4848/papers/Naficy_et_al_2010_Ecol_App.pdf ("We document that 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. Notably, the magnitude of the interactive effect of fire exclusion and historical logging substantially exceeds the effects of fire exclusion alone. These differences suggest that historically logged sites are more prone to severe wildfires and insect outbreaks than unlogged, fire-excluded forests and should be considered a high priority for fuels reduction treatments.")

13. Prioritize treating dry forest types at low elevation and on south slopes. Treatments in forests with naturally mixed-severity fire regimes should be carefully scrutinized to ensure those areas (i) are in fact outside of the HRV, and (ii) treatment will not remove scarce habitat for focal species that depend on dense forests, and (iii) treatments are in fact needed and (iv) proposed treatments will be effective. Treatments in mixed severity fire regimes should be more patchy and leave behind more structure, more snags and large dead wood.

14. New evidence indicates that far more of the "dry" forests, rather than being typified low severity fire regimes, were in fact dominated by mixed severity fire regimes (including significant areas of stand replacing fire), so mixed severity fire is an important part of the historic range of variability that should be restored. The goal should not be a uniform low severity fire regime, but rather a wide mix of tree densities in patches of varying sizes. This objective can often be met by allowing natural fire regimes to operate, or by leaving significant areas untreated when planning fuel reduction projects. Hessburg, Paul. Evidence for the Extent of Mixed Severity Fires in Pre-Management Era Dry Forests of the Inland Northwest. Proceedings: Mixed Severity Fire Regimes: Ecology and Management. November 17-19, 2004. Spokane, Washington. http://web.archive.org/web/20100713232718/http://www.sustainablenorthwest.org/bmfp/hessburg__salter__james_paper_11.pdf <http://web.archive.org/web/20100713232718/http:/www.sustainablenorthwest.org/bmfp/hessburg__salter__james_paper_11.pdf> ; Baker, W.L., T.T. Veblen and R.L. Sherriff (2006). Fire, fuels, and restoration of ponderosa pine-Douglas-fir forests in the Rocky Mountains, USA. Journal of Biogeography. 2006. http://www.humboldt.edu/geography/documents/BakerEtAl_FireFuelsPipo_JBiog2007.pdf; Odion, D.C. et al 2014. Examining Historical and Current Mixed-Severity Fire Regimes in Ponderosa Pine and Mixed-Conifer Forests of Western North America. PLOS One. February 2014 | Volume 9 | Issue 2 http://www.californiachaparral.org/images/Odion_et_al_Historical_Current_Fire_Regimes_mixed_conifer_2014.pdf. ("We compiled landscape-scale evidence of historical fire severity patterns in the ponderosa pine and mixed-

conifer forests from published literature sources and stand ages available from the Forest Inventory and Analysis program in the USA. The consensus from this evidence is that the traditional reference conditions of low-severity fire regimes are inaccurate for most forests of western North America. Instead, most forests appear to have been characterized by mixed-severity fire that included ecologically significant amounts of weather-driven, high-severity fire.")

15. Consider bifurcating the landscape along the area defining the "structure ignition zone" within 200 feet of homes and built structures. Inside the structure ignition zone, vegetation treatments can focus on modifying fuels to protect infrastructure. Outside the structure ignition zone, treatments should focus on ecological restoration, where fuel hazard is but one consideration. Do not define the wildland urban interface too broadly, because fire hazard can be reduced by treating the area immediately adjacent to structures and this "structure ignition zone" is usually on non-federal lands. Fire is an important ecological process that needs to be restored on public lands, so the WUI fire problem should be framed as a structure-ignition problem and the solution for that generally lies with the private property owners. Cohen 2008. The Wildland-Urban Interface Fire Problem - A Consequence Of The Fire Exclusion Paradigm. Forest History Today. Fall 2008. http://www.foresthistory.org/Publications/FHT/FHTFall2008/Cohen.pdf. Much more info here: http://www.fusee.org/community-fire-preparedness. Fuel treatments in the WUI should be coupled with efforts to make communities fire resilient, not just to facilitate fire suppression.

16. Prioritize treatment of the dense young stands that are most "plastic" and amenable to restoration. Another priority is to carefully plan and narrowly target treatments to protect specific groves of fire-resistant, old-growth trees that are threatened by ingrowth of small fuels, but don't focus on rigid density reduction targets. Leave all medium and large trees that show old-growth characteristics.

17. Thin from below, retaining the largest trees, or use "free thinning" with a diameter cap so that some trees of all size classes are retained. Retain all large trees and most medium sized trees so they can recruit into the larger classes of trees and snags.

18. Identify and retain all trees with old-growth characteristics even if they are less than 21" dbh. Some refer to these small-old trees as "Tillebo trees" because the late Tim Lillebo was a big advocate for protection of old trees regardless of size. Old growth characteristics include thick bark, colored bark, flat top, asymmetric crown, broken top, forked top, relatively large branches, etc. These trees have important habitat value and human values regardless whether they are 21" dbh. Allow natural processes of succession and mortality turn some of these medium and large trees into ecologically valuable snags and down wood. The agencies often use this technique to identify and retain old-growth juniper trees and the same can be used to protect old growth pine, larch, Douglas fir and other species. Van Pelt, R. 2008. Identifying Old Trees and Forests In Eastern Washington. Washington DNR. http://www.dnr.wa.gov/Publications/lm_hcp_east_old_growth_hires_part01.pdf <http://www.dnr.wa.gov/Publications/lm_hcp_east_old_growth_hires_part01.pdf> . We are generally comfortable with the use of the Van Pelt guidelines to identify tree age, but as science improves, we urge the agency to use the best available information and err on the side of caution to ensure that trees older than 150 years (regardless of size) are not inadvertently cut. A recent study supports the retention of slow growing old trees because they are relatively more resilient. The study found that slower-growing older trees tend to channel their energy into structural support and defense compounds to "maximize durability while minimizing … damage". Black, Colbert, & Pederson. 2008. Relationship between radial growth rates and lifespan within North American tree species. Ecoscience 15(3), 349-357 (2008). http://fate.nmfs.noaa.gov/documents/Publications/Black_et_al_2008_Ecoscience.pdf <http://fate.nmfs.noaa.gov/documents/Publications/Black_et_al_2008_Ecoscience.pdf> .. See also. Tobias Züst, Bindu Joseph, Kentaro K. Shimizu, Daniel J. Kliebenstein and Lindsay A. Turnbull, Using knockout mutants to reveal the growth costs of defensive traits, in: Proceedings of the Royal Society B, 2011, Jan. 26, doi:10.1098/rspb.2010.2475.

19. Use diameter limits as a management tool because it provides a useful means to prevent economic values from trumping ecological values. The public supports the use of diameter limits because it provides a means to prevent economic values from trumping ecological values. It is often appropriate to use smaller diameter limits for fire tolerant species like Ponderosa pine and Douglas fir, while using somewhat larger limits for fire intolerant species like grand fir/white fir. The exceptional circumstances in which diameter limits allegedly don't work, are more rare than the circumstances in which refusing to use diameter limits will lead to unintended consequences, including removal of ecologically valuable trees and lack of public trust.[1] <file:///C:/Users/Doug/Dropbox/Forms/!boilerplate.doc#_ftn1>

20. While the agency embarks on an ambitious effort to reduce fuels and reduce forest density, the agency must also conserve habitat for diverse wildlife that depend on dense forest canopy cover, complex understories, and dead wood. Carbon storage and watershed values are also enhanced when forest cover is maintained. We urge the agency to carefully consider whether there is enough habitat provided for these species, including goashawk, marten, fisher, and pileated woodpecker. The current distribution of recognized and protected habitat areas may be inadequate, especially considering the need for redundancy to account for expected habitat loss from fire, logging, fuel reduction, and natural forest succession. The fact that big game cover requirements need to be amended to accommodate many projects like this raises concerns not just for big game, but for the wide variety of other species that depend on canopy cover, complex understory, and dead wood. Before conducting large-scale density reduction efforts or amending big game cover standards, the agency should carefully consider all the other wildlife that were intended to be sheltered by the "umbrella" of big game cover standards in the RMP. The cover and forage requirements of big game is another lens through which to think about optimizing the mix of treated and untreated stands, as well as the scale and extent of skips and heavily-thinned "gaps" within treated stands. The NEPA analysis should consider alternatives with different mixes of treated and untreated areas for this purpose. The agency should use a state-and-transition model to project future dense forest habitat recruitment under a reasonable set of assumptions about disturbance and succession.

21. Recognize that thinning affects fire hazard in complex ways, including some tendencies to make fire hazard worse. The agency must address the fact that thinning creates slash; moves fine fuels from the canopy to the ground (increasing their availability for combustion); thinning increases ignition risk (by increasing human access and human activities, including spark-generating machinery); thinning makes the forest hotter-dryer-windier; and makes site resources available to stimulate the growth of future surface and ladder fuels. Amy E.M. Waltz, Peter Z. Fulé, W. Wallace Covington, and Margaret M. Moore. 2003. Diversity in Ponderosa Pine Forest Structure Following Ecological Restoration Treatments. Forest Science 49(6) 2003. http://www.globalrestorationnetwork.org/uploads/files/LiteratureAttachments/91_diversity-in-ponderosa-pine-forest-structure-following-ecological-restoration-treatments.pdf <http://www.globalrestorationnetwork.org/uploads/files/LiteratureAttachments/91_diversity-in-ponderosa-pine-forest-structure-following-ecological-restoration-treatments.pdf> (Kaufmann M.R., G.H. Aplet, M. Babler, W.L. Baker, B. Bentz, M. Harrington, B.C. Hawkes, L. Stroh Huckaby, M.J. Jenkins, D.M. Kashian, R.E. Keane, D. Kulakowski, C. McHugh, J. Negron, J. Popp, W.H. Romme, T. Schoennagel, W. Shepperd, F.W. Smith, E. Kennedy Sutherland, D. Tinker, and T.T. Veblen. 2008. The status of our scientific understanding of lodgepole pine and mountain pine beetles - a focus on forest ecology and fire behavior. The Nature Conservancy, Arlington, VA. GFI technical report 2008-2. http://csfs.colostate.edu/pdfs/LPP_scientific-LS-www.pdf <http://csfs.colostate.edu/pdfs/LPP_scientific-LS-www.pdf> . Fuel reduction must find the "sweet spot," by removing enough of the small surface and ladder fuels while retaining enough of the medium and large trees to maintain canopy cover for purposes of microclimate, habitat, hydrology, suppression of ingrowth, etc. The agency should consider alternative canopy treatments that are small and patchy, instead of extensive and continuous. Selective pruning of lower branches should also be considered as a viable canopy treatment.

22. Fire-regime condition-class may not be an accurate predictor of fire hazard, because it assumes incorrectly that time-since-fire is an accurate indicator of fire hazard. There is compelling evidence that time-since-fire has exactly the opposite of the assumed effect, that is, fires may burn more severely in early seral vegetation, and

burn less severely in closed canopy forests. This may be related to the fact that closed canopy forests maintain a cool-moist microclimate that helps retain higher fuel moisture and more favorable fire behavior. Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the western Klamath Mountains, California. Conservation Biology 18(4): 927-936. http://nature.berkeley.edu/moritzlab/docs/Odion_etal_2004.pdf <http://nature.berkeley.edu/moritzlab/docs/Odion_etal_2004.pdf> . Canopy cover also helps suppress the growth of ladder fuels. The practical significance of this is that thinning projects should retain more canopy variability across the stand, and need not focus on treatment of canopy fuels except to provide some well-distributed "escape hatches" for hot gases generated by surface fires. Credible models of post-thinning fire behavior, must account for both fuel structure and microclimate effects of thinning.

23. There is growing evidence that in order to be effective, mechanical treatments must be followed by prescribed fire. But the effects of such fires must also be carefully considered. Fuel treatments without regular follow-up treatments might be worse than doing nothing at all because thinning can be expected to stimulate the growth of future surface and ladder fuels. Crystal L. Raymond. 2004. The Effects of Fuel Treatments on Fire Severity in a Mixed-Evergreen Forest of Southwestern Oregon. MS Thesis. http://depts.washington.edu/nwfire/publication/Raymond_2004.pdf <http://depts.washington.edu/nwfire/publication/Raymond_2004.pdf> ; Jonathan R. Thompson, Thomas A. Spies 2009. Vegetation and weather explain variation in crown damage within a large mixed-severity wildfire. Forest Ecology and Management 258 (2009) 1684-1694. Therefore retain plenty of canopy cover to suppress the growth of those future fuels and as insurance against the very real possibility that follow-up fuel treatments may not be adequately funded and implemented.

24. Don't thin to uniform spacing. Use variable density thinning techniques to establish a variety of microhabitats, break up fuel continuity, create discontinuities to disrupt the spread of other contagious disturbances such as disease, bugs, weeds, fire, etc. Retain patchy clumps of trees which is the natural pattern for many species.

25. Be creative in establishing diversity and complexity both within and between stands. "Patchy, gappy, and clumpy" is often use to describe the distribution of trees in dry forests. Use skips and gaps within units to help achieve diversity. Gaps should be small, while skips should be a little larger. Landings do not make good gaps because they are clearcut, highly compacted and disturbed, more likely subject to repeated disturbance, and directly associated with roads. Gaps should be located away from roads and should not be clearcut but rather should retain some residual structure in the form of live or dead trees. Methods of implementing spatial variability in restoration treatments are described by Churchill, D.J., M.C. Dalhgreen, A.J. Larson, and J.F. Franklin. 2013. The ICO approach to restoring spatial pattern in dry forests: Implementation guide. Version 1.0. Stewardship Forestry, Vashon, Washington, USA. http://www.cfc.umt.edu/ForestEcology/files/ICO_Manager_Guide.pdf <http://www.cfc.umt.edu/ForestEcology/files/ICO_Manager_Guide.pdf> and Derek J. Churchill, Andrew J. Larson, Matthew C. Dahlgreen, Jerry F. Franklin, Paul F. Hessburg, and James A. Lutz. 2013. Restoring forest resilience: From reference spatial patterns to silvicultural prescriptions and monitoring. Forest Ecology and Management 291 (2013) 442-457.

26. Thin heavy enough to stimulate development of some patches of understory vegetation, but don't thin so heavy that future development of a uniform understory of ladder fuels becomes a more significant problem than the one being addressed by the current project. 15-20 years after thinning and prescribed fire, the Umpqua NF found "considerable development of less fire tolerant understory vegetation …. Continued stand development … will result in increased understory density and and fuel laddering into the dominant fire tolerant overstory…" Umqua NF, Diamond Lake RD, Lemolo Pine Health Maintenance Burn Project, June 1, 2010 scoping notice.

27. The scale of patches in variable density thinning regimes is important. Ideally variability should be implemented at numerous scales ranging from small to large, including: the scale of tree fall events; pockets of variably contagious disturbance from insects, disease, and mixed-severity fire; soil-property heterogeneity;

topographic discontinuities; the imprint of natural historical events; etc.

28. Retain and protect under-represented species of conifer and non-conifer trees and shrubs. Retain patches of dense young stands as wildlife cover and pools for recruitment of future forests.

29. View native insects and disease in an ecological context. They are part of the natural processes that diversify and enrich our forests. They are best viewed as solutions, rather than problems. In particular, mistletoe brooms and seeds (and the large trees that mistletoe often live on) provide many ecological benefits, and treatment efforts are typically ineffective. So mistletoe, insect, and disease treatments have many costs and few benefits.

30. Recognize that thinning captures mortality and that most stands (especially plantations) are already lacking critical values from dead wood due to the unnatural stand history of logging, planting, and disrupted natural processes.[2] <file:///C:/Users/Doug/Dropbox/Forms/!boilerplate.doc#_ftn2> To inform the decision, please conduct a stand simulation model showing that long term snag recruitment (after logging) will still meet DecAID 50-80% tolerance levels.

31. Retain abundant snags and course wood and green trees for future recruitment of snags and wood. Retention should be both distributed and in clumps so that thinning mimics natural disturbance. Retention of dead wood should generally be proportional to the intensity of the thinning, e.g., heavy thinning should leave behind more snags not less. Retain wildlife trees such as hollows, forked tops, broken tops, leaning trees, etc. Think not only about existing snags but more importantly about the processes the recruit snags, including: a large pool of green trees from which to recruit snags and the existence of competition and other mortality processes. Logging will significantly harm both of these snag recruitment factors. Recognize that thinning captures mortality. To inform the NEPA decision, please conduct a stand simulation model to fully disclose the adverse effects of logging on dead wood, especially long-term recruitment of large snags >20" dbh, and then mitigate for these adverse effects by identifying areas within treated stands and across the landscape that will remain permanently untreated so they can recruit adequate large snags and dead wood to meet DecAID 50-80% tolerance levels as soon as possible and over the long-term.

32. If using techniques such as whole tree yarding or yarding with tops attached to control fuels, the agency should top a portion of the trees and leave the greens in the forest in order to retain nutrients on site.

33. Avoid impacts to raptor nests and enhance habitat for diverse prey species. Train marking crews and cutting crews to look up and avoid cutting trees with nests of any sort and trees with defects.

34. Take proactive steps to avoid the spread of weeds. Avoid and minimize soil disturbance. Retain canopy cover and native ground cover to suppress weeds.

35. Buffer streams from the effects of heavy equipment and loss of bank trees and trees that shade streams. Mitigate for the loss of LWD input by retaining extra snags and wood in riparian areas. Recognize that thinning captures mortality that is not necessarily compensated by future growth.[3] <file:///C:/Users/Doug/Dropbox/Forms/!boilerplate.doc#_ftn3>

36. Protect soils by avoiding road construction, minimizing ground-based logging, and avoiding numerous large burn piles. Mitigate the adverse soil impacts from burn piles by inoculating affected sites after burning (with living soil and native plant seeds, Julie E. Korb, Nancy C. Johnson, and W. W. Covington. 2004. Slash Pile Burning Effects on Soil Biotic and Chemical Properties and Plant Establishment: Recommendations for Amelioration. Restoration Ecology Vol. 12 No. 1, pp. 52-62 March 2004). Rank new road segments according to their relative costs (e.g. length, slope position, soil type, ease of rehabilitation, weed risk, native vegetation impacts, etc.) and benefits (e.g. acres of restoration facilitated), then use that ranking to consider dropping the roads with the lowest

ratio of benefits to costs. Once you have determined the relative acres accessed per mile of road construction, you can take the analysis one step further, to determine the "effective road density" of each segment? In other words, extrapolate as if that much road were required to reach each acre of the planning area, then compare the resulting road density to standards for big game, cumulative hydrological impact, etc? For example, if a new spur road accesses thinning opportunities at a rate of 200 acres of forest per mile of road, then divide 640 acres per section by 200 acres per mile to determine the effective road density of 3.2 mi/mi2. Where road building is deemed necessary, ensure that the realized restoration benefits far outweigh the adverse impacts of the road, build the roads to the absolute minimum standard necessary to accomplish the job, and remove the road as soon as possible to avoid firewood theft, OHV trespass, and certainly before the next rainy season to avoid stormwater pollution. Do not allow log hauling during the wet season.

37. There is a carbon cost associated with thinning that must be disclosed and considered. As stands develop from young to mature to old, they continuously recruit carbon-rich material from the live tree pool to the dead wood pool. Some of that wood gets incorporated into the soil or falls in fire refugia where it can accumulate. Logging, even thinning, can dramatically affect the accumulation of carbon in the dead wood pool by capturing mortality, diverting it from the forest, and accelerating the transfer of carbon to the atmosphere. Carbon stays out of the atmosphere much longer if it remains in the forest as live and/or dead trees, instead of being converted to wood products and industrial and consumer waste.

38. If this project involves biomass utilization, the impacts need to be clearly disclosed. How will the biomass be moved from the remote corners of the treatment areas to the landings? Will there be extra passes made by heavy equipment? Will the landings be enlarged to make room for grinders, chip vans, and other equipment? Can the local forest roads accommodate chip vans? Will the roads be modified to make them passable by chip vans? What are the impacts of that? What are the direct, indirect, and cumulative impacts on soil, water, wildlife, and weeds?

39. Provide clear and detailed descriptions of silvicultural prescriptions and marking guides in the NEPA document.

40. Recognize that federal fuel reduction efforts likely have adverse unintended effects on human behavior and land use and fire hazard. "This project has explored the hypothesis that public fire suppression in fire-prone areas acts as a subsidy to landowners, incentivizing conversion of land to residential and commercial development. Landowners do not bear the full cost of their choice to build on land in fire-prone areas, since they do not pay for suppression, though they reap all of the benefits, potentially resulting in economically inefficient levels of development. … Results suggest that when federal suppression efforts intensify on public lands, private development accelerates nearby. The main paper produced by the funded research thus shows that public investment in reducing the damages from fire in the short run causes unintended long-run behavioral responses, which may increase future hazard exposure." Sheila Olmstead (PI), Carolyn Kousky (co-PI), Roger Sedjo (co-PI) 2013. Final Report to the Joint Fire Science Program Wildland Fire Suppression and Land Development in the Wildland/Urban Interface. http://www.firescience.gov/projects/10-3-01-33/project/10-3-01-33_final_report.pdf <http://www.firescience.gov/projects/10-3-01-33/project/10-3-01-33_final_report.pdf>

41. Acknowledge and consider the following potentially significant issues in the NEPA analysis:

a. Removing commercial sized logs, and associated roads and slash disposal, often conflicts with other resource values such as soil, water, weeds, wildlife habitat, fire hazard, and carbon storage;

b. Removal of commercial sized logs can make the stand hotter, dryer, and windier, making fire hazard worse instead of better;

c. Commercial logging tends to present significant risks of weed infestations because of soil disturbance and canopy reduction;

d. Removal of commercial logs necessitates road related impacts on soil and water resources. Machine piling and pile burning tend to cause significant adverse impacts on soil and water, especially when combined with road impacts and other logging disturbances.

e. "Capturing mortality" reduces future snag habitat that is already deficient. Increasing vigor via thinning delays recruitment of snag habitat that is already deficient;

f. The unavoidable adverse impacts of logging and roads must be balanced against the rather uncertain benefits of fuel reduction. Fuel reduction has little or no beneficial effect on low severity fires (controlled by favorable weather conditions) or on high severity fires (controlled by unfavorable weather conditions). There is actually a very low probability that moderate intensity fire will affect any given stand during the relatively brief time period that fuel hazard is alleged to be reduced. Please disclose the realistic probability that desired outcomes will occur based on (1) whether fire is likely to occur when the fuel treatments are likely to be effective, and (2) if fire does occur, whether there will be a good match between (A) the actual forest type and fuel treatment type, and (B) the actual probability of favorable weather conditions and fire conditions for that forest type and treatment type. Depending on these variables, fuel treatments may have little influence on both low intensity fire and extreme high intensity fire, leaving only a small subset of well-matched fuel treatments and fires, and a low probability that the proposed treatments will have ecological benefit s that exceed ecological impacts.

g. The effects of forest health thinning are very complex with many feedback loops. There is still a fair amount of scientific uncertainty about several critical factors relevant to a decision about fuel reduction, including: (A) uncertain rates of tree mortality and how many young trees need to be retained to ensure proper recruitment of future stands of old trees and large snags; (B) uncertainty about how much the canopy can be reduced without making the stand hotter, dryer, and windier (and exacerbating fire hazard); (C) uncertainty whether logging has any significant beneficial effect on controlling insects and diseases like mistletoe.

h. The agency must test the assumption that fire (and insect) risk reduction is compatible with ecological restoration objectives. This test must be spatial, probabilistic, and use reasonable assumptions about weather, fire frequency, fire suppression, and historic conditions in areas with variable-severity fire regimes. Sensitivity analysis should test the robustness of assumptions and conclusions. Example analyses can be found in the literature, e.g. Rutherford V. Platt, Thomas T. Veblen, and Rosemary L. Sherriff. 2006. Are Wildfire Mitigation and Restoration of Historic Forest Structure Compatible? A Spatial Modeling Assessment. Annals of the Association of American Geographers, 96(3), 2006, pp. 455-470.
http://www.colorado.edu/geography/class_homepages/geog_4430_f10/Platt%20et%20al_Wildfire%20Mitigatnion_AnAAG_2006.PDF , and R. V. Platt, T. T. Veblen, and R. L. Sherriff. 2008. Spatial Model of Forest Management Strategies and Outcomes in the Wildland-Urban Interface Natural Hazards Review, Vol. 9, No. 4, November 1, 2008. DOI:10.1061/(ASCE)1527-6988(2008)9:4(199)
http://public.gettysburg.edu/~rplatt/Platt%20et%20al._NatHazReview08.pdf ("The results point toward several ways to guide current management practices in the study area. First, prioritizing land at the lowest elevations leads to the selection of the most land where both wildfire mitigation and restoration of historical forest conditions are needed. When thinning is restricted to Forest Service land, less land is selected where both goals are needed under all parameter scenarios. This is because Forest Service land tends to be at higher elevations and comprises forest types that are within the HRV. … Prioritizing the stands with the highest canopy cover decreases the percentage of selected land where both outcomes are needed…. Many of the stands where restoration of historical forest conditions is needed are open canopy and located on south facing slopes and at lower elevations. In contrast, many closed canopy stands are often located at higher elevations and on north-facing slopes where restoration of historical forest conditions is not needed.")

i. Focus the analysis on "trade-offs" related to logging. All logging, including thinning, includes some adverse impacts and trade-offs. Some impacts of logging are unavoidable, so there is no such thing as a logging operation that is 100% beneficial. Depending on how thinning is done, it can have adverse impacts such as soil disturbance, habitat disturbance, carbon removal, spreading weeds, reduced recruitment of snags; road-related impacts on soil, water, site productivity, and habitat; moving fuels from the canopy to the ground, hotter-dryer-windier microclimate that is favorable to greater flame lengths and rate of fire spread, etc. Some of these negative effects are fundamentally unavoidable, therefore all thinning has negative effects that must be compensated by beneficial effects such as reducing competition between trees so that some can grow larger faster, increased resistance drought stress and insects, possible increasing species and structural diversity, possible fire hazard reduction, etc. The NEPA analysis should elucidate and weigh these trade-offs and attempt to display net ecological effects.

Sincerely,

/s/

Doug Heiken, Oregon Wild
PO Box 11648, Eugene OR 97440
dh@oregonwild.org <mailto:dh@oregonwild.org> , 541.344.0675

[1] <file:///C:/Users/Doug/Dropbox/Forms/!boilerplate.doc#_ftnref1> The Deschutes National Forest used a sensible approach on the Lava Cast Project using a 21" diameter cap for lodgepole, 18" diameter cap for white fir, a 16" diameter cap for Ponderosa pine where the average diameter is the stand is below 12", and 18" diameter cap for Ponderosa pine where the average diameter of the stand is larger than 12 inches. Lava Cast DN. Feb 2007.

[2] <file:///C:/Users/Doug/Dropbox/Forms/!boilerplate.doc#_ftnref2> Tom Spies made some useful observations in the Northwest Forest Plan Monitoring Synthesis Report: "Certainly, the growth of trees into larger diameter classes will increase as stand density declines (Tappeiner and others 1997). At some point, however, the effect of thinning on tree diameter growth levels off and, if thinning is too heavy, the density of large trees later in succession may be eventually be lower than what is observed in current old-growth stands. In some cases, opening the stand up too much can also create a dense layer of regeneration that could become a relatively homogenous and dominating stratum in the stand. Furthermore, if residual densities are too low, the production of dead trees may be reduced (Garman and others 2003). Thinning should allow for future mortality in the canopy trees." http://web.archive.org/web/20070808101639/http://www.reo.gov/monitoring/10yr-report/documents/synthesis-reports/index.html <http://web.archive.org/web/20070808101639/http:/www.reo.gov/monitoring/10yr-report/documents/synthesis-reports/index.html>

[3] <file:///C:/Users/Doug/Dropbox/Forms/!boilerplate.doc#_ftnref3> "[T]he data have not supported early expectations of 'bonus' volume from thinned stands compared with unthinned. … [T]hinnings that are late or

heavy can actually decrease harvest volume considerably." Talbert and Marshall. 2005. Plantation Productivity in the Douglas-fir Region Under Intensive Silvicultural Practices: Results From Research And Operations. Journal of Forestry. March 2005. pp 65-70. citing Curtis and Marshall. 1997. LOGS: A Pioneering Example of Silvicultural Research in Coastal Douglas-fir. Journal of Forestry 95(7):19-25.