Review of Publically Provided Literature from Scoping

The Forest Service received 749 unique comments by means of 98 unique letters, and 1,556 form letters. Four issues were determined to be relevant to alternative development or modification.

Methodology

The Forest Service provided the proposal for public review and comment for scoping from October 15 to November 15, 2014. Comments received before scoping were reviewed and considered during the development of the proposal and are not included in this disposition. Comments received after the end of the scoping period are being considered in the decision but not towards issue or alternative development.

Comments received during the scoping period were considered towards issue and alternative development. Comment documents were tracked upon receipt to assure all relevant comments were captured. All letters and attachments were logged in and scanned into an electronic file and made available in the project's public reading room for public review. Individual comments from within each comment document were identified and highlighted. Due to the amount of comments received, comments were categorized by subject area and like comments were grouped together into concern statements, as provided in appendix B of the draft environmental impact statement (EIS).

Issues are defined as points of discussion, dispute, or debate about the environmental effects of proposed actions. Relevant issues were defined as being concerns about the directed or indirect effects of the implementing the proposed action. Relevant issues were resolved through alternative development. See chapter 1 of the draft EIS for a list of issue statements developed from public scoping comments. See chapter 2 of the draft EIS for alternatives developed in response to scoping comments.

Other issues were not considered relevant for any of the following reasons:

- The issue was outside the scope of the purpose and need and is not related to the decision to be made.
- The issue was a procedural concern, which is already decided by law, regulation, policy, or direction (Forest Plan).
- The issue was a procedural concern, which is addressed through analysis.
- The issue is handled through project design.
- The issue is not supported by scientific or factual evidence.
- A general comment or question that did not meet the definition of an issue.

Some public comments included references and attachments of various articles and publications. References were filtered from further consideration if they were:

- cited but not provided by the commenter, including non-functioning hyperlinks;
- cited and provided but were not related to the comments from the commenter; or
- cited and provided but not a scientific study (e.g. opinion pieces).

References of scientific literature that were cited, provided, and tied to comments were reviewed by the appropriate interdisciplinary team member in order to determine whether or not the comment and reference were relevant to the actions being proposed and their potential effects. Literature was incorporated into analysis as appropriate. The attachments are available in the public reading room and in the project record.

Results

In response to public scoping comment, the Forest Service developed four relevant issues, four new action alternatives analyzed in detail, and ten alternatives considered but eliminated from detailed study. See chapters 1 and 2 for details. Other issues were raised by the public that are being addressed by alternative 1 (no action), alternative 2 (the refined proposed action), and/or are being handled through responses to public comment (appendix B of the draft EIS).

The following tables are included in this document:

- Table L-1: The Forest Service review of publically provided references from scoping.
- Table L-2: List of publically cited references that were either non-scientific in nature or unrelated to the project.
- Table L-3 Publically cited references that were either not provided or not accessible (e.g. broken website hyperlink).

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Table L- 1 . Review of publically cited and available references of scientific literature.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1651	10	Bennett, Victoria J.; Smith, Winston P.; Betts, Matthew G. 2011. Toward understanding the ecological impact of transportation corridors. Gen. Tech. Rep. PNW-GTR-846. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 40 p. 11	Understanding how road corridors influence the functional connectivity of landscapes is crucial if we are to effectively manage species of concern (Bennet, 2011).	Yes	Yes	The effects of any road construction will be analyzed.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	10	Beschta, R.L., J.J. Rhodes, J.B. Kauffman, R.E. Gresswell, G.W. Minshall, J.R. Karr, D.A. Perry, F.R. Haeur, and C.A. Frissell. 2004. Postfire management on forested public lands of the western United States. Conservation Biology 18: pages 957-967	Logging and associated roads carry a high risk of spreading nonindigenous, weedy species (CWWR 1996, Beschta et al. 2004).	Yes	Yes	Logging activities and associated roads do indeed carry a high risk of spreading non-indigenous, weedy plant species. The project area is already highly vulnerable to invasion and spread of non-native invasive species (NNIS) due to the high level of disturbance caused by the 2014 fires and suppression activities. Ground disturbing activities and increased vectors associated with project activities would increase the risk of introducing and spreading NNIS within the project area. Resource protection measures have been developed to reduce the risk of NNIS introduction and spread from project related activities and include: • Washing heavy equipment prior to and following off-road activities in the Project area; • Equipment and vehicle exclusion from high priority and large NNIS infestations within the Project area; • Management of infestations occurring on landings to prevent the spread of contaminated soils; • Requiring the use of State certified weed free materials; and • Requiring the inspection of materials for which certification does not exist. These mitigation measures are accepted weed prevention practices developed by public land management agencies and university cooperative extension offices and promoted by weed management organization across the nation (Sheley et al. 2002, USDA 2013). The above measures include those required in Forest Service Manual for activities related to timber harvest and roads (FSM 2903). Furthermore, the Forest Noxious Weed Detection and Treatment program will continue to survey for and treat new and existing high priority NNIS infestations on Forest lands. The BAER team also analyzed the project area and prescribed emergency treatments to help limit the introduction and spread of NNIS from the 2014 fires and suppression activities. Emergency treatments will take place in the first year following the fires (2015) and will include additional surveys for NNIS within the fire footprints and contingency areas as well subsequent hand removal of newly located infestations. This comment is not useful for my analysis. This comment was quoted directly from the introduction of a forum article intended to provide 10 management recommendations to avoid damage from salvage logging. Non-native species were not a focus of the article and project design features address relevant NNIS concerns from the paper.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	31	Beschta, R.L., J.J. Rhodes, J.B. Kauffman, R.E. Gresswell, G.W. Minshall, J.R. Karr, D.A. Perry, F.R. Haeur, and C.A. Frissell. 2004. Postfire management on forested public lands of the western United States. Conservation Biology 18: pages 957-967	Post-fire logging in naturally disturbed forest landscapes generally has no direct ecological benefits and many potential negative impacts (Beschta et al. 2004; Donato et al. 2006; Lindenmayer and Noss 2006).	Yes	Yes	The Forest Service acknowledges that the recently disturbed landscape is a unique and biologically rich environment. The project has been carefully designed to protect resources and minimize negative consequences. Only 7 % of the public land in the burned area will be salvage logged, thus much of the burned area will be left untreated and allowed to recovery naturally. The Forest Service understands that burned areas are sensitive and provide important habitat, thus requiring careful management. In recent history where salvage logging was not conducted, tens of thousands of acres of unsalvaged burned habitat exists across the Forest. If the treatment areas were left unplanted, much of the area would convert to shrub fields. This conversion has occurred nearby where past fires have occurred. While ceanothus is an important habitat for many species, it is a less than desirable species to have in the wildland urban interface. The plantations will provide large trees to the environment sooner than if left untreated. The project has been carefully designed with many protective design features to minimize negative impacts on aquatic and terrestrial habitat. These design features include snag and down log retention features that will allow the treated areas to continue to provide snag and down log habitat for wildlife into the future. This citation does not include any analysis or conclusion regarding slope stability. The geology report incorporates several citations that are relevant to landslide risk and post-fire loggings.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1651	20	Bond ML, DE Lee, RB Siegel, and JP Ward. 2009. Habitat use and selection by California spotted owls in a postfire landscape. Journal of Wildlife Management 73:1116-1124.	Results from the three radio-telemetry studies of spotted owls in post-fire landscapes indicate that spotted owls use forest stands that have been burned, but generally do not use stands that have been burned and logged. For example, California spotted owls tracked 4 years post-fire in burned, unlogged stands: (1) had 30 percent of their nonbreeding-season roost locations within the fire's perimeter (Bond et al. 2010); (2) selected low severity burned forests for roosting during the breeding season (Bond et al. 2009); and (3) selected low-, medium-, and high-severity burned forests for foraging within 1.5 km of the nest or roost site, with the strongest selection for high-severity burned forest (Bond et al. 2009).	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl
1073	10	Bond, M. L., D. E. Lee, R. B. Siegel, & J. P. Ward, Jr. 2009. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73:1116-1124.	Some predatory birds such as spotted owl prefer burned forest as foraging habitat (Bond et al. 2009, Clark 2007).	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl
1073	11	Bond, M. L., D. E. Lee, R. B. Siegel, & J. P. Ward, Jr. 2009. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73:1116-1124.	Bond and others (2010, 2009, 2002) found that spotted owls preferentially use severely burned forests for foraging due to favorable prey response as a result of fire-stimulated plant understory production.	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1073	11	Bond, M. L., D. E. Lee, R. B. Siegel, & J. P. Ward, Jr. 2009. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73:1116-1124.	Bond and others (2010, 2009, 2002) found that spotted owls preferentially use severely burned forests for foraging due to favorable prey response as a result of fire-stimulated plant understory production.	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl
1651	21	Bond, M. L., D. E. Lee, R. B. Siegel, & J. P. Ward, Jr. 2009. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73:1116-1124.	As referenced in the Recovery Plan, Bond (2009)15 shows that Northern spotted owls actively prefer and select burned over other unburned sites for foraging only four years after a fire.	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl
1651	22	Bond, M. L., D. E. Lee, R. B. Siegel, & J. P. Ward, Jr. 2009. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73:1116-1124.	Based on the best available science—The Revised Northern Spotted Owl Recovery Plan, Bond et al (2009), Lee et al. (2012), Lee et al (2013) and the recent Forest Service data on the Rim Fire—the following is clear: (1) Fire does not cause significant negative effects on owl occupancy; (2) Fire actually increases the foraging benefits in high severity fire areas near nests and roost; (3) Post-fire logging or "salvage" operations cause direct take of Northern spotted owls. In light of this information, NO alternative within the Westside Project should allow logging within at least 1.5km of Northern spotted owl nesting and roosting areas.	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl
1089	12 & 13	Bond, M.L., Gutierrez, R.J., Franklin, A.B., LaHaye, W.S., May, C.A., and M.E. Seamans. 2002. Short-term effects of wildfires on spotted owl survival, site fidelity, mate fidelity, and reproductive success. Wildlife Society Bulletin 30:1022-1028.	Attachment 18 is a study that was published in the Wildlife Society Bulletin in 2002 entitled "Short-term effects of wildfires on spotted owl survival, site fidelity, mate fidelity, and reproductive success" by Bond et. al.	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl

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1648	2	Cathy Whitlock, Jennifer Marlon, Christy Briles, Andrea Brunelle, Colin Long and Patrick Bartlein. 2008. International Journal of Wildland Fire 17: 72–83. http://www.publish.csiro.au/paper/WF07025.htm	Long-term relations among fire, fuel, and climate in the north-western US based on lake-sediment studies.	Yes	Yes	Thank you for providing scientific literature related to the project. Chapter 3 of the EIS describes the effects of each alternative and references the literature and monitoring information used during the analysis of the alternatives as does the Fire and Fuels resource report.
1073	10	Clark, D.A., R.G. Antony, and L.A. Andrews. 2013. Relationship between wildfire, salvage logging, and occupancy of nesting territories by northern spotted owls. Journal of Wildlife Management 77: 672-688.	Post-fire logging is known to change bird species composition in affected forests, reflecting effects of snag and large woody debris removal (Clark et al. 2013, Clark et al. 2011, Hutto and Gallo 2006, Smucker et al. 2005, Kotliar et al. 2002).	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl
1073	10	Clark, D.A., R.G. Antony, and L.A. Andrews. 2013. Relationship between wildfire, salvage logging, and occupancy of nesting territories by northern spotted owls. Journal of Wildlife Management 77: 672-688.	Post-fire logging is known to change bird species composition in affected forests, reflecting effects of snag and large woody debris removal (Clark et al. 2013, Clark et al. 2011, Hutto and Gallo 2006, Smucker et al. 2005, Kotliar et al. 2002).	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl
1073	11	Clark, D.A., R.G. Antony, and L.A. Andrews. 2013. Relationship between wildfire, salvage logging, and occupancy of nesting territories by northern spotted owls. Journal of Wildlife Management 77: 672-688.	Clark and others (2013) reported continued spotted owl use of established territories following severe fire, and uncertainty regarding long-term fire effects to fitness and site fidelity.	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl

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1073	11	Clark, D.A., R.G. Antony, and L.A. Andrews. 2013. Relationship between wildfire, salvage logging, and occupancy of nesting territories by northern spotted owls. Journal of Wildlife Management 77: 672-688.	This is a significant issue for analysis, especially given that Clark and colleagues (2013) recommend a 2.2-kilometer buffer around northern spotted owl nesting and roosting sites where the best available science recommends that post-fire salvage logging should be entirely avoided by public land managers.	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl
1089	12	Clark, D.A., R.G. Antony, and L.A. Andrews. 2013. Relationship between wildfire, salvage logging, and occupancy of nesting territories by northern spotted owls. Journal of Wildlife Management 77: 672-688.	Attachment 17b is a 2013 published paper in the Journal of Wildlife Management. Relationship Between Wildfire, Salvage Logging, and Occupancy of Nesting Territories by Northern Spotted Owls Darren A. Clark, Robert G. Anthony and Lawrence S. Andrews.	Yes	Yes	This article is considered in the Biological Assessment for the Northern Spotted Owl
1082	15	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #10 - "Vegetation management beyond the structure's immediate vicinity has little effect on structure ignitions. That is, vegetation management adjacent to the structure would prevent ignitions from flame exposure; but vegetation management away from the structure would not affect ignition from flame exposure and would not significantly reduce ignitions from firebrands." (Pg. 4) Source for quotes #10 to #12 above: Structure Ignition Assessment can Help Reduce Fire Damages in the WUI Published in Fire Management Notes, Volume 57 No. 4, 1997 http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.

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1082	15	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #11 - "Past reports and recommendations as well as experimental research and modeling suggest that W-UI fire-loss mitigation should concentrate on the residence and its immediate surroundings. Any strategy for effectively reducing the W-UI fire problem must initially focus on residential fire resistance." (Pg. 5 – Conclusion) Source for quotes #10 to #12 above: Structure Ignition Assessment can Help Reduce Fire Damages in the WUI Published in Fire Management Notes, Volume 57 No. 4, 1997 http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.
1082	16	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #12 - "Instead of all fire protection responsibilities residing with fire agencies, homeowners take responsibility for assuring fire wise conditions and the initial fire defense of their residences during wildland fires. The fire agencies become a community partner that provides information, coordinates and assists in meeting fire wise requirements, and provides fire suppression assistance." (Pg. 5) Source for quotes #10 to #12 above: Structure Ignition Assessment can Help Reduce Fire Damages in the WUI Published in Fire Management Notes, Volume 57 No. 4, 1997 http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.

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1082	11	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #2 - "A senior physicist at the Stanford Research Institute, C.P. Butler (1974), coined the term "urban-wildland interface" and described this fire problem as follows: "In its simplest terms, the fire interface is any point where the fuel feeding a wildfire changes from natural (wildland) fuel to man-made (urban) fuel." (Pg. 1) Source for quotes #2 to #9 above: Reducing the Wildland Fire Threat to Homes: Where and How Much? Presented as the Fire Economics Symposium in San Diego, California on April 12, 1999. http://www.fs.fed.us/rm/pubs_other/rmrs_1999_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.
1082	12	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #3 - "The results of the diverse analytical methods are congruent and consistently indicate that ignitions from flames occur over relatively short distances--tens of meters not hundreds of meters. The severe-case estimate of SIAM indicates distances of 40 meters or less. Experimental wood walls did not ignite at 10 meters when exposed to experimental crown fires. And, case studies found that vegetation clearance of at least 10 meters was associated with a high occurrence of home survival." (Pg. 4) Source for quotes #2 to #9 above: Reducing the Wildland Fire Threat to Homes: Where and How Much? Presented as the Fire Economics Symposium in San Diego, California on April 12, 1999. http://www.fs.fed.us/rm/pubs_other/rmrs_1999_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.

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1082	12	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #4 - "Analyses of southern California home losses done by the Stanford Research Institute for the 1961 Belair-Brentwood Fire (Howard and others 1973) and by the University of California, Berkeley, for the 1990 Painted Cave Fire (Foote and Gilless 1996) are consistent with SIAM estimates and the experimental crown fire data. Given nonflammable roofs, Stanford Research Institute (Howard and others 1973) found a 95 percent survival with a clearance of 10 to 18 meters and Foote and Gilless (1996) at Berkeley, found 86 percent home survival with a clearance of 10 meters or more." (Pgs. 3 and 4)	Yes	Yes	See Response to Cohen Letter 1082.
1082	12	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #5 - "Extensive wildland vegetation management does not effectively change home ignitability." (Pg. 5) Source for quotes #2 to #9 above: Reducing the Wildland Fire Threat to Homes: Where and How Much? Presented as the Fire Economics Symposium in San Diego, California on April 12, 1999. http://www.fs.fed.us/rm/pubs_other/rmrs_1999_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.

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1082	13	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #6 - "Home ignitability also dictates that effective mitigating actions focus on the home and its immediate surroundings rather than on extensive wildland fuel management. Because homeowners typically assert their authority for the home and its immediate surroundings, the responsibility for effectively reducing home ignitability can only reside with the property owner rather than wildland agencies." (Pg. 5) Source for quotes #2 to #9 above: Reducing the Wildland Fire Threat to Homes: Where and How Much? Presented as the Fire Economics Symposium in San Diego, California on April 12, 1999. http://www.fs.fed.us/rm/pubs_other/rmrs_1999_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.
1082	13	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #7 - "As stated, the evidence indicates that home ignitions depend on the home materials and design and only those flammables within a few tens of meters of the home (home ignitability). The wildland fuel characteristics beyond the home site have little if any significance to WUI home fire losses." (Pg. 5) Source for quotes #2 to #9 above: Reducing the Wildland Fire Threat to Homes: Where and How Much? Presented as the Fire Economics Symposium in San Diego, California on April 12, 1999. http://www.fs.fed.us/rm/pubs_other/rmrs_1999_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1082	14	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #8 - "Home ignitability implies that homeowners have the ultimate responsibility for WUI home fire loss potential. As shown, the ignition and flammability characteristics of a structure and its immediate surroundings determine the home fire loss potential. Thus, the home should not be considered a victim of wildland fire, but rather a potential participant in the continuation of the wildland fire. Home ignitability, i.e., the potential for WUI home fire loss, is the homeowner's choice and responsibility." (Pg. 5) Source for quotes #2 to #9 above: Reducing the Wildland Fire Threat to Homes: Where and How Much? Presented as the Fire Economics Symposium in San Diego, California on April 12, 1999. http://www.fs.fed.us/rm/pubs_other/rmrs_1999_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1082	14	Cohen, Jack and Jim Saveland. 1997. Structure Ignition assessment can help reduce fire damages in the WUI. Fire Management Notes 57 (4): 19-23. http://www.fs.fed.us/rm/pubs_other/rmrs_1997_cohen_j001.pdf	Dr. Cohen's opposing view #9 - "However, public and management perceptions may impede homeowners from taking principal responsibility. For example, the Federal Wildland Fire Management, Policy and Program Review (1995) observes, 'There is a widespread misconception by elected officials, agency managers, and the public that wildland/urban interface protection is solely a fire service concern.' In a Journal of Forestry article, Beebe and Omi (1993) concur, stating that, 'Public reaction to wildfire suggests that many Americans want competent professionals to manage fire flawlessly, reducing the risks to life, property, and public lands to nil.' These statements agree with Bradshaw's (1988) description of the societal roles in the WUI problem. He observes that homeowners expect that fire protection will be provided by others. Contrary to these expectations for fire protection, the fire services have neither the resources for effectively protecting highly ignitable homes during severe WUI fires, nor the authority to reduce home ignitability." (Pg. 6) Source for quotes #2 to #9 above: Reducing the Wildland Fire Threat to Homes: Where and How Much? Presented as the Fire Economics Symposium in San Diego, California on April 12, 1999. http://www.fs.fed.us/rm/pubs_other/rmrs_1999_cohen_j001.pdf	Yes	Yes	See Response to Cohen Letter 1082.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1651	43	Della Sala, Dominick A., Martin, Anne, Spivak, Randi, Schulke, Todd, Bird, Bryan, Criley, Marnie, van Daalen, Chris, Kreilick, Jake, Brown, Rick and Aplet, Greg. 2003. A Citizen's Call for Ecological Forest Restoration: Forest Restoration Principles and Criteria. Ecological Restoration 21:1. p.14-23	Such damaging activities have compacted soils, channelized streams, fragmented forests, suppressed natural fire, assisted the spread of some invasive species, and caused the loss of native species and their habitat (Noss and Cooperrider 1994, Heilman and others 2002). Della Sala 2003	Yes	No	This comment is a direct quote from the introduction of the referenced publication. However, the quote refers to the legacy effects of "decades of intensive logging, fire suppression, road building, livestock grazing, mining, and invasions by exotic species". The quote is not referencing effects of post-fire forest management activities. Nonetheless, we acknowledge that previous forest management has created legacy effects. Please refer to the project Hydrology report for detailed descriptions of watershed existing conditions, fire effects, and potential effects (both positive and negative) of proposed project action alternatives.
1651	18	DellaSala, Dominick A., Martin, Anne, Spivak, Randi, Schulke, Todd, Bird, Bryan, Criley, Marnie, van Daalen, Chris, Kreilick, Jake, Brown, Rick and Aplet, Greg. 2003. A Citizen's Call for Ecological Forest Restoration: Forest Restoration Principles and Criteria. Ecological Restoration 21:1. p.14-23	Agencies should develop fire management policies specific to different forest types (DellaSala et al. 2004) and support the efforts of the national, multiagency Fire Regime Condition Class (FRCC) program to develop science-based fire management policies for different forest types. (See http://www.frcc.gov/ for additional information.)	Yes	Yes	The Forest Service acknowledges that fire management policies should be developed to different forest types and support national and multiagency FRCC. The Klamath Forest Plan describes overarching standards and guidelines related to fire management along with refined standards and guidelines contained within each management area to meet desired conditions. Chapter 2 of the EIS describes the alternatives for the project. A combination of proposed treatments were developed along with Project Design Features which increases future fire management options to utilize planned prescribed fire ignitions as well as managing unplanned lightning caused fire ignition in the future. The Fire and Fuels Report describes the post fire affected environment and analyzes the effects of alternative related to future fire behavior, severity and suppression capabilities. The Forest Service is required to enter accomplished fuels treatments into the Forest Service Activity Tracking System (FACTS) which includes reporting information for National Fire Plan Operations and Reporting System (NFPORS), which feeds into FRCC.
1651	42	DellaSala, Dominick A., Martin, Anne, Spivak, Randi, Schulke, Todd, Bird, Bryan, Criley, Marnie, van Daalen, Chris, Kreilick, Jake, Brown, Rick and Aplet, Greg. 2003. A Citizen's Call for Ecological Forest Restoration: Forest Restoration Principles and Criteria. Ecological Restoration 21:1. p.14-23	Intact forest ecosystems provide the natural capital, including clean air and water, upon which all life and all human economies ultimately depend. DellaSala 2003	Yes	Yes	DellaSala et al. article is a set of principles and statements, one of which is to include non-market ecosystem services in the economic analysis of the effects of the project. There are no specifics on how this might be done or how to give economic value to these non-market services. The value of these services will discussed in the water (hydrology), wildlife, and aquatic species (includes fish) sections of chapter 3 of the DEIS but not in the economic analysis since no way to measure them is provided.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1073	2	Donato et al. 2006. Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk published in Sciencexpress, January 5, 2006.	The proposed action will therefore impair forest productivity and biological diversity over the long-term. Post-fire management, particularly "salvage" logging, is scientifically untenable as a means to achieve forest recovery after wildfire (Beschta et al. 2004, DellaSala et al. 2004, Donato et al. 2006, Lindenmayer et al. 2008, Noss et al. 2006).	Yes	Yes	All comments from Donato respond to this. The Forest Service acknowledges that the recently disturbed landscape is a unique and biologically rich environment. The project has been carefully designed to protect resources and minimize negative consequences. Only 7 % of the public land in the burned area will be salvage logged, thus much of the burned area will be left untreated and allowed to recovery naturally. The Forest Service understands that burned areas are sensitive and provide important habitat, thus requiring careful management. In recent history where salvage logging was not conducted, tens of thousands of acres of unsalvaged burned habitat exists across the Forest. If the treatment areas were left unplanted, much of the area would convert to shrub fields. This conversion has occurred nearby where past fires have occurred. While ceanothus is an important habitat for many species, it is a less than desirable species to have in the wildland urban interface. The plantations will provide large trees to the environment sooner than if left untreated. The project has been carefully designed with many protective design features to minimize negative impacts on aquatic and terrestrial habitat. These design features include snag and down log retention features that will allow the treated areas to continue to provide snag and down log habitat for wildlife into the future. The Forest Service agrees that natural regeneration can and will occur where a native seed source is in reasonable proximity to an opening. However, the intergenerational period required for conifer regeneration does not meet the standards and guidelines for the affected management areas. Seedling stocking and density can be quite variable and slow with natural regenerations. Planting seedlings from site-specific seed sources after a wildfire may hasten the return to a large-conifer dominated forest ecosystem by as much as 50 years (Sessions and others, 2003). Sessions also states that without planting and subsequent shrub control, it could take more than 100 years to even establish a conifer forest which, temporally, is outside the preferred threshold for providing future large green conifers and future large snags for the northern spotted owl.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1073	5	Donato et al. 2006. Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk published in Sciencexpress, January 5, 2006.	Plantations are far more susceptible to intense fire behavior and severe fire effects than unlogged, burned forests (Thompson et al. 2007, Weatherspoon and Skinner 1995), particularly where logging slash is not treated (Donato et al. 2006, Odion et al. 2004).	Yes	Yes	All comments from Donato respond to this. Chapter 3 of the EIS describes the effects of each alternative. We do not disagree with the comment; however, these articles assessed a variety of land management activities related to plantations and subsequent fire behavior and severity. Results from Weatherspoon and Skinner (1995) discuss the types of management activities which lead to higher canopy damage with 1987 fires on the Shasta Trinity NF, Hayfork Ranger District. Specifically, their results highlight that when thinning activities occur in combination with fuels reduction activities (broadcast burning, pile and burn, lop and scatter), less fire damage occurred comparatively to cutting with no post treatment fuels activities. Thompson et al (2007) states "We currently lack general conceptual models or simulation models that can help us understand the effects of salvage-logging on fire severity over large landscapes and long timeframes." Moreover, they concluded younger forests, whether naturally or artificially regenerated, may be vulnerable to future high severity fires creating more early successional vegetation and delaying or precluding the return to historical natural forest composition and structure. Lastly, "The patterns we observed apply to the particular conditions and history of post-Silver Fire management; they could change with shorter or longer intervals between fires." The refined proposed action (alternative 2) treats activity slash by a combination of activities (pile and burn, broadcast burn, lop and scatter and/or mastication) to modify fuel structure and reduce fuel loadings to < 7 tons/acre which is sufficient levels to maintain surface fire behavior characteristics.
1651	40	Donato, D.C., Fontaine, J.B., Robinson, W.D., Kauffman, J.B. and Law, B.E. (2009) Vegetation response to a short interval between high--severity wildfires in a mixed--evergreen forest. Journal of Ecology, 97 (1). pp. 142---154.	Attached is a paper entitled Vegetation Response to a Short Interval Between High- Severity Wildfires in a Mixed-Evergreen Forest by Donato et al in the Journal of Ecology. 2009, Volume 97. 142-154.	Yes	No	There is no comment associated with the project relative to this article. The Donato article did not mention plantation forestry or its relationship to increased fire behavior. However, his research suggests that in the absence of continued stand-replacing fires, succession may converge with that following a long-interval fire trending toward mature forest conditions. Forest Vegetation Simulator modeling of the project is consistent with this finding.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1073	1	Donato, D.C.; Fontaine, J.B.; Campbell, J.L.; Robinson, W.D.; Kauffman, J.B.; Law, B.E. 2006. "Post-wildfire logging hinders regeneration and increases fire risk". Science. 311: page 352.	Post-fire logging in naturally disturbed forest landscapes generally has no direct ecological benefits and many potential negative impacts (Beschta et al. 2004; Donato et al. 2006; Lindenmayer and Noss 2006).	Yes	Yes	All comments from Donato respond to this. Treated stands as well as some untreated stands will be planted and stocking exams will be conducted in later years, thus ensuring regeneration is successful. Previous fires have shown that if left untreated, brush fields become the dominant feature for an extended period of time. The overall goal of this project is to reduce fuels, hazards, and future fire severity, therefore, activity fuels and other fuels will be treated to reduce fire risk. The reforestation plan for this project considers the historic variability of spacing and species composition which will prevent the establishment of dense homogenous stands (See Silviculture Report).

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1073	3	Donato, D.C.; Fontaine, J.B.; Campbell, J.L.; Robinson, W.D.; Kauffman, J.B.; Law, B.E. 2006. "Post-wildfire logging hinders regeneration and increases fire risk". Science. 311: page 352.	According to Donato and others (2006: 352), Postfire logging alone was notably incongruent with fuel reduction goals. Fuel reduction treatments (prescribed burning or mechanical removal) are frequently intended following postfire logging […] but resources are often not allocated to complete them. Our study underscores that, after logging, mitigation of short-term fire risk is not possible without subsequent fuel reduction treatments. However, implementing these treatments is also problematic. Mechanical removal is generally precluded by its expense, leaving prescribed burning as the most feasible method. This will result in additional seedling mortality and potentially severe soil impacts due to long duration combustion of logging-generated fuel loads. Therefore, the lowest fire risk strategy may be to leave dead trees standing as long as possible (where they are less available to surface flames), allowing for aerial decay and slow, episodic input to surface fuel loads over decades.	Yes	Yes	The Forest disagrees with the statement reflecting endangering public safety in the long-term. Donato et al. makes no statements contending this fact. Moreover, the premise of this paper is reflected on short term fire behavior and subsequent fuel loadings from post fire logging. The Fire and Fuels report analyzes the effects of each alternative. As described in the report, within 10 years after wildfire, surface woody fuel loadings in unlogged stands exceed those of logged stands on average. These higher surface fuel loadings are likely to produce higher wildfire intensity and severity in unlogged than in logged stands (Peterson & Harrod, 2010). As large fuels decay, they increase their availability to ignition and consumption as greater surface areas are exposed; effectively large accumulations of fuels promote increased fire line intensities and long duration burning which can preheat overstory canopies causing crown fire initiation. Snags are receptors and emitters of fire brands which can increase spot fire activity lofting embers ¼ to over 1 mile in some circumstances and increase control problems. Alternative 2 is expected to reduce surface fuel loadings upon completion of activities and subsequently, reducing flame lengths (< 4') and fire line intensities (< 100btu/ft./sec) within 98% of the units proposed for treatment. Presence of coarse woody debris presents a hindrance to fire suppression (Brown, Reinhardt, & Kramer, 2003). Line production is significantly slowed where fire lines intersect large downed logs. Resistance to control is expected to be extreme to high taking no action. Comparatively, low resistance to control is anticipated with the removal of trees reducing future large fuel accumulations. The current environment contains high densities of snags which present significant exposure to fire line personnel engaged in fire suppression activities. Reduction in snags under the refined proposed action (alternative 2) will also allow additional fire management options of nighttime fire line operations allowing for opportunities to complete control lines when fire behavior is generally subdued. As stated in the fire and fuels report for the Westside Recovery Project, suppression capability increases due to the ability of fire resources to utilize direct fire line construction as a result of reduced surface fuel loadings and subsequent fire activity.

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1073	3	Donato, D.C.; Fontaine, J.B.; Campbell, J.L.; Robinson, W.D.; Kauffman, J.B.; Law, B.E. 2006. "Post-wildfire logging hinders regeneration and increases fire risk". Science. 311: page 352.	Multiples lines of empirical research positively correlate post-fire logging with increased fire hazard and severity of later fire events (Donato et al. 2006, Odion et al. 2004, Thompson et al. 2007, Weatherspoon and Skinner 1995).	Yes	Yes	The Forest Service acknowledges literature which correlates post-fire logging with increased fire hazard and severity of later fire events. Chapter 2 of the EIS describes the refined proposed action (alternative 2) for the Westside Fire Recovery project along with Chapter 3 of the EIS describes the associated effects of the proposed activities. Alternative 2 reduces the density of snags within treated areas and subsequently reduces surface fuel loadings (or fire hazard) resulting in a decrease in potential fire behavior (flame lengths and fire line intensity). Results from Weatherspoon and Skinner (1995) discuss the types of management activities which lead to higher canopy damage with 1987 fires on the Shasta Trinity National Forest, Hayfork Ranger District. Specifically, their results highlight that when thinning activities occur in combination with fuels reduction activities (broadcast burning, pile and burn, lop and scatter), less fire damage occurred comparatively to cutting with no post treatment fuels activities. Odion et al. (2004) recognized that "Activity fuels left untreated after [Helicopter] logging could have contributed to the elevated fire severity in nonforest vegetation in the 1987 reburn compared with elsewhere. Within high severity fire areas proposed for treatment, predominate vegetation pattern is expected to consist mainly of shrubs and grasses. Intermixed between the reestablishing vegetation are high densities of snags that are projected to fall overtime contributing to surface fuel loading effectively increasing fire behavior including intensity, and spot fire production. Conversely, Alternative 2 is expected to reduce fuel loadings with proposed salvage and site preparation activities resulting in flame lengths < 4 feet, fire line intensities < 100 btu/ft./sec and decreased duration of burning as large fuels are considerably decreased.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1073	3	Donato, D.C.; Fontaine, J.B.; Campbell, J.L.; Robinson, W.D.; Kauffman, J.B.; Law, B.E. 2006. "Post-wildfire logging hinders regeneration and increases fire risk". Science. 311: page 352.	The action will increase fire hazard and endanger public safety in the long-term (Donato et al. 2006).	Yes	Yes	The Forest disagrees with the statement reflecting endangering public safety in the long-term. Donato et al. makes no statements contending this fact. Moreover, the premise of this paper is reflected on short term fire behavior and subsequent fuel loadings from post fire logging. The Fire and Fuels report analyzes the effects of each alternative. As described in the report, within 10 years after wildfire, surface woody fuel loadings in unlogged stands exceed those of logged stands on average. These higher surface fuel loadings are likely to produce higher wildfire intensity and severity in unlogged than in logged stands (Peterson & Harrod, 2010). As large fuels decay, they increase their availability to ignition and consumption as greater surface areas are exposed; effectively large accumulations of fuels promote increased fire line intensities and long duration burning which can preheat overstory canopies causing crown fire initiation. Snags are receptors and emitters of fire brands which can increase spot fire activity lofting embers ¼ to over 1 mile in some circumstances and increase control problems. Alternative 2 is expected to reduce surface fuel loadings upon completion of activities and subsequently, reducing flame lengths (< 4') and fire line intensities (< 100btu/ft./sec) within 98% of the units proposed for treatment. Presence of coarse woody debris presents a hindrance to fire suppression (Brown, Reinhardt, & Kramer, 2003). Line production is significantly slowed where fire lines intersect large downed logs. Resistance to control is expected to be extreme to high taking no action. Comparatively, low resistance to control is anticipated with the removal of trees reducing future large fuel accumulations. The current environment contains high densities of snags which present significant exposure to fire line personnel engaged in fire suppression activities. Reduction in snags under the refined proposed action (alternative 2) will also allow additional fire management options of nighttime fire line operations allowing for opportunities to complete control lines when fire behavior is generally subdued. As stated in the fire and fuels report for the Westside Recovery Project, suppression capability increases due to the ability of fire resources to utilize direct fire line construction as a result of reduced surface fuel loadings and subsequent fire activity.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1073	7	Donato, D.C.; Fontaine, J.B.; Campbell, J.L.; Robinson, W.D.; Kauffman, J.B.; Law, B.E. 2006. "Post-wildfire logging hinders regeneration and increases fire risk". Science. 311: page 352.	Live vegetation has greater moisture content and is less prone to ignite and carry fire than dead woody fuel (Reinhardt and Ryan 1998). Live and dead fuels in early-seral forest populated by standing snags, large downed logs and live vegetation (e.g., shrubs and grass) are less likely than slash-loaded sites occupied by even-age tree plantations, such as will be created by the refined proposed action (alternative 2), to feed intense fire behavior or a severe "reburn" (Odion et al. 2004, Weatherspoon and Skinner 1995). Moreover, post-fire logging has been observed to inhibit development of early-seral vegetation and create novel environments exhibiting low resilience to subsequent fire disturbance (Donato et al. 2006, Hanson and Stuart 2005, Reinhardt and Ryan 1998, Thompson et al. 2007).	Yes	Yes	We do not disagree with the comments provided. Residual slash left onsite would increase fire behavior in the short term. Chapter 3 of the EIS describes each alternative in detail. Chapter 3 provides the environmental consequences of each alternative. The refined proposed action (alternative 2) outlines follow up fuel treatment activities within salvaged areas to reduce fuel loadings prior to tree planting. As stated in the fuels report, fire behavior in all alternatives analyzed (including the No Action) would be expected to have similar fire behavior (< 4 foot Flame Lengths) from 1 to 5 years due to limited fuels to carry the fire. We are unable to verify that Reinhardt and Ryan (1998) claim "Live vegetation has greater moisture content and is less prone to ignite and carry fire than dead woody fuel". Their paper summarized methods available to help managers evaluate fuels and fire potential and expected to change over time within a forest stand. None the less, we agree that live vegetation has higher moisture contents than dead; however, in recently burned forest, herbaceous vegetation such as lupine emerge along with shrubs including ceanothus and manzanita. We recognize that uniform fuel beds can increase fire behavior. Over time shrub fuels become decadent, uniform and continuous with high fuel beds. Furthermore, throughout the summer dry period in the Klamath Mountains, these fuels lose moisture content to the point they readily ignite and can spread rapidly. The No Action alternative is expected to re-establish with shrubs and intermix with snags. Over time, fuel loadings are projected to increase to levels beyond historical loadings for the area and fire behavior is expected to increase across the project area with > 64% experiencing flame lengths > 4 feet. Fire suppression capability and management options of future activities in area are decreased as well as large downed material that decreases line production capabilities and associated resistance to control. Thompson et al (2007) states in their article, "We currently lack general conceptual models or simulation models that can help us understand the effects of salvage logging on fire severity over large landscapes and long time frames." Effects to vegetation and associated fire behavior potential over 50 years are discussed in the EIS. Both Donato et al (2006) and Thompson et al (2007) looked at salvage and plant areas only. These areas did not include any post logging fuel treatment activities. The refined proposed action (alternative 2) includes fuels reduction treatments prior to planting and emphasizes planting in clumps and leaving gaps similar to historic vegetation patterns of the Klamath Mountains and maintaining fuel loadings (of < 3" diameter) to less than 7 tons/acre.

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1089	31	Donato, D.C.; Fontaine, J.B.; Campbell, J.L.; Robinson, W.D.; Kauffman, J.B.; Law, B.E. 2006. "Post-wildfire logging hinders regeneration and increases fire risk". Science. 311: page 352.	Post-fire logging in naturally disturbed forest landscapes generally has no direct ecological benefits and many potential negative impacts (Beschta et al. 2004; Donato et al. 2006; Lindenmayer and Noss 2006).	Yes	Yes	Treated stands as well as some untreated stands will be planted and stocking exams will be conducted in later years, thus ensuring regeneration is successful. Previous fires have shown that if left untreated, brush fields become the dominant feature for an extended period of time. The overall goal of this project is to reduce fuels, hazards, and future fire severity, therefore, activity fuels and other fuels will be treated to reduce fire risk. The reforestation plan for this project considers the historic variability of spacing and species composition which will prevent the establishment of dense homogenous stands (See Silviculture Report).

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	29 & 30	Franklin, Jerry F. and K. Norman Johnson. 2012.A Restoration Framework for Federal Forests in the Pacific Northwest. Journal of Forestry 110(8):429–439.	Franklin and Johnson (2012) state on p. 431: "Theoretically, disturbances of either natural (e.g., wildfire) or human (e.g., timber harvest) origin are capable of generating this stage.	Yes	No	The Forest Service acknowledges that the recently disturbed landscape is a unique and biologically rich environment. The project has been carefully designed to protect resources and minimize negative consequences. Only 7 % of the public land in the burned area will be salvage logged, thus much of the burned area will be left untreated and allowed to recovery naturally. Approximately 80% of the project area that burned at moderate to high severity will remain intact as one of the most biologically diverse forest conditions that Noss mentions. The Forest Service understands that burned areas are sensitive and provide important habitat, thus requiring careful management. In recent history where salvage logging was not conducted, tens of thousands of acres of unsalvaged burned habitat exists across the Forest. If the treatment areas were left unplanted, much of the area would convert to shrub fields. This conversion has occurred nearby where past fires have occurred. While ceanothus is an important habitat for many species, it is a less than desirable species to have in the wildland urban interface. The plantations will provide large trees to the environment sooner than if left untreated. The project has been carefully designed with many protective design features to minimize negative impacts on aquatic and terrestrial habitat. These design features include snag and down log retention features that will allow the treated areas to continue to provide snag and down log habitat for wildlife into the future. The Forest Service agrees that natural regeneration can and will occur where a native seed source is in reasonable proximity to an opening. However, the intergenerational period required for conifer regeneration does not meet the standards and guidelines for the affected management areas. Seedling stocking and density can be quite variable and slow with natural regenerations. Planting seedlings from site-specific seed sources after a wildfire may hasten the return to a large-conifer dominated forest ecosystem by as much as 50 years (Sessions and others, 2003). Sessions also states that without planting and subsequent shrub control, it could take more than 100 years to even establish conifer forests which, temporally, are outside the preferred threshold for providing future large green conifers and future large snags for the northern spotted owl.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	1	Franklin, Jerry F. and K. Norman Johnson. 2012.A Restoration Framework for Federal Forests in the Pacific Northwest. Journal of Forestry 110(8):429–439.	"When wildfires do occur on federal lands they create an opportunity for development of high quality early successional ecosystems. Intensive salvage operations and associated site preparation and tree planting are not appropriate if a management goal is to utilize such events to provide for early successional ecosystems. Salvage and related activities can greatly reduce the potential for full development of early successional ecosystems by removing important legacies, eliminating important constituent species, and abridging the duration of early successional development."-Dr. Jerry Franklin and Dr. Norm Johnson, 2/15/12.	Yes	No	The Forest Service acknowledges that the recently disturbed landscape is a unique and biologically rich environment. The project has been carefully designed to protect resources and minimize negative consequences. Only 7 % of the public land in the burned area will be salvage logged, thus much of the burned area will be left untreated and allowed to recovery naturally. Approximately 80% of the project area that burned at moderate to high severity will remain intact as one of the most biologically diverse forest conditions that Noss mentions. The Forest Service understands that burned areas are sensitive and provide important habitat, thus requiring careful management. In recent history where salvage logging was not conducted, tens of thousands of acres of unsalvaged burned habitat exists across the Forest. If the treatment areas were left unplanted, much of the area would convert to shrub fields. This conversion has occurred nearby where past fires have occurred. While ceanothus is an important habitat for many species, it is a less than desirable species to have in the wildland urban interface. The plantations will provide large trees to the environment sooner than if left untreated. The project has been carefully designed with many protective design features to minimize negative impacts on aquatic and terrestrial habitat. These design features include snag and down log retention features that will allow the treated areas to continue to provide snag and down log habitat for wildlife into the future. The Forest Service agrees that natural regeneration can and will occur where a native seed source is in reasonable proximity to an opening. However, the intergenerational period required for conifer regeneration does not meet the standards and guidelines for the affected management areas. Seedling stocking and density can be quite variable and slow with natural regenerations. Planting seedlings from site-specific seed sources after a wildfire may hasten the return to a large-conifer dominated forest ecosystem by as much as 50 years (Sessions and others, 2003). Sessions also states that without planting and subsequent shrub control, it could take more than 100 years to even establish conifer forests which, temporally, are outside the preferred threshold for providing future large green conifers and future large snags for the northern spotted owl.

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1651	23	Hanson, C.T. 2013. Habitat use of Pacific fishers in a heterogeneous post-fire and unburned forest landscape on the Kern Plateau, Sierra Nevada, California. The Open Forest Science Journal 6:24-30	Pacific Fishers utilize post-fire landscape. As found by Hanson (2013),20 “The pattern of fisher detections did not evidence a categorical adverse response to large, mixed-severity wildland fires.	Yes	Yes	This article was used in the Biological Evaluation.
1648	2	Hanson, Chad T., Dennis C. Odion, Dominick A. Dellasala, and William L. Baker. 2009. Overestimation of Fire Risk in the Northern Spotted Owl Recovery Plan. Conservation Biology 23(5): 1314. http://onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2009.01265.x/abstract	Overestimation of Fire Risk in the Northern Spotted Owl Recovery Plan. CHAD T. HANSON, DENNIS C. ODION, DOMINICK A. DELLASALA, AND WILLIAM L. BAKER. Conservation Biology, 2009. DOI: 10.1111/j.1523-1739.2009.01265.x http://onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2009.01265.x/abstract	Yes	Yes	The authors of this article are disagreeing with the increasing trend of high severity fire occurring in NSO habitat as described by the US Fish and Wildlife. The authors are also claiming that fire affected NSO habitat will not necessarily reduce NSO habitat or occupancy. As a result, the authors are suggesting the need for adaptive management. The Westside Recovery Project is not contesting the trend of high severity fires and the effects of project actions on NSO will be analyzed in the Biological Assessment and Biological Evaluation using research.

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1082	29	http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #39 - "Given the right conditions, wildlands will inevitably burn. It is a misconception to think that treating fuels can ''fire-proof'' important areas. It would be virtually impossible to exclude fire from most temperate terrestrial ecosystems because ignition sources are prevalent and fuels cannot be eliminated. Ignition is rarely affected by fuel treatment." (Pg.1998) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	5	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	Attachment 5 is 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.	Yes	Yes	This was used in the MIS Report.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	26	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	And, fire-mediated conifer mortality attracts bark beetles and wood-boring beetles, some species of which have evolved infrared receptors capable of detecting burned forests from over 161 km away (Altman and Sallabanks 2000, Hutto 1995).	Yes	Yes	This was used in the MIS Report.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	26	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	Scientists have recently recommended that forest managers should ensure the maintenance of moderate and high severity fire patches to maintain populations of numerous native bird species positively associated with fire (Hutto 1995, Hutto 2006, Kotliar et al. 2002, Noss et al. 2006, Smucker et al. 2005).	Yes	Yes	This was used in the MIS Report.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	26	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	Woodpeckers excavate nest cavities in snags and feed upon bark beetle and wood-boring beetle larvae in dead trees; Mountain Bluebirds (Sialia currucoides) and other secondary cavity-nesting species use nest holes created the previous year by woodpeckers; granivores such as the Red Crossbill (Loxia curvirostra) feed upon seed release from cones following fire; shrub dwelling species like the Blue Grouse (Dendragapus obscurus) nest and forage within shrub growth scattered throughout high severity patches; while aerial insectivores such as the Olive-sided Flycatcher (Contopus cooperi) prey upon the bark beetles that are abundant in snag patches (Altman and Sallabanks 2000, Hutto 1995).	Yes	Yes	This was used in the MIS Report.

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1089	27	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	Fire-killed trees provide nesting and foraging habitat for numerous woodpecker species (Hutto 1995, Dixon and Saab 2000).	Yes	Yes	This was used in the MIS Report.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	27	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	Research has also indicated that numerous avian species, including several woodpecker species, exhibit a preference for burned conifer forest habitat (Bock and Lynch 1970, Dixon and Saab 2000, Murphy and Lehnhausen 1998, Granholm 1982, Hutto 1995, Saab et al. 2002, Saab et al. 2004).	Yes	Yes	This was used in the MIS Report.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	27	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	Studies have detected higher overall avian species richness in severely burned versus unburned forest in the western United States (Bock and Lynch 1970, Hutto 1995, Raphael and White 1984, Siegel and Wilkerson 2005).	Yes	Yes	This was used in the MIS Report.
1089	27	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	There is perhaps no vertebrate species more strongly representative of the snag forest habitat type than the Black-backed Woodpecker (Picoides arcticus) (Hanson 2007, Hutto 1995).	Yes	Yes	This was used in the MIS Report.
1089	27	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	Though Black-backed Woodpeckers are occasionally, but rarely, seen outside of stand-replacement burns, forests outside of snag forest habitat are believed to be “sink” habitats which do not support them (Hutto 1995, Dixon and Saab 2000).	Yes	Yes	This was used in the MIS Report.

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1089	31	Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: pages 1041–1058.	Finally, species dependent on habitat conditions created by high severity fire, with abundant standing dead trees, require substantial areas to be protected from post-fire logging (Hutto 1995)."	Yes	Yes	This was used in the MIS Report.
1073	10	Hutto, R. L. and S. M. Gallo. 2006. The effects of post-fire salvage logging on cavity-nesting birds. The Condor 108: pages 817–831.	For example, black-backed woodpecker consistently shows avoidance of, and negative responses to, post-fire logging (Tingley et al. 2014, Seavey et al. 2012, Hutto and Gallo 2006, Saab and Dudley 1998, Caton 1996, Hitchcox 1996, Hutto 1995).	Yes	Yes	This was used in the MIS Report.
1073	10	Hutto, R. L. and S. M. Gallo. 2006. The effects of post-fire salvage logging on cavity-nesting birds. The Condor 108: pages 817–831.	Post-fire logging is known to change bird species composition in affected forests, reflecting effects of snag and large woody debris removal (Clark et al. 2013, Clark et al. 2011, Hutto and Gallo 2006, Smucker et al. 2005, Kotliar et al. 2002).	Yes	Yes	This was used in the MIS Report.
1073	10	Hutto, R.L. 2006. Toward meaningful snag-management guidelines for postfire salvage logging in North American conifer forests. Conservation Biology 20: 984-993.	Food composition and breeding habitat in burned forests support unique bird communities with many species dependent on stand-replacement fires (Hutto 2006, Kotliar et al. 2007).	Yes	Yes	This article was used in the MIS Report.
1073	11	Hutto, R.L. 2006. Toward meaningful snag-management guidelines for postfire salvage logging in North American conifer forests. Conservation Biology 20: 984-993.	Standards and guidelines for coarse wood retention are predicated on the biological needs of species associated with unburned forest, and they are not meaningful in a post-fire environment (Lee et al. 2012, Hutto 2008, Hutto 2006).	Yes	Yes	This article was used in the MIS Report.

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1089	26	Hutto, R.L. 2006. Toward meaningful snag-management guidelines for postfire salvage logging in North American conifer forests. Conservation Biology 20: 984-993.	Scientists have recently recommended that forest managers should ensure the maintenance of moderate and high severity fire patches to maintain populations of numerous native bird species positively associated with fire (Hutto 1995, Hutto 2006, Kotliar et al. 2002, Noss et al. 2006, Smucker et al. 2005).	Yes	Yes	This was used in the MIS Report.
1073	1	Karr et al. 2004."The Effects of Postfire Salvage Logging on Aquatic Ecosystems in the American West" BioScience 54: 11	Third, in forests subjected to severe fire and post-fire logging, streams and other aquatic ecosystems will take longer to return to historical conditions or may switch to a different (and often less desirable) state altogether (Karr et al. 2004).	Yes	Yes	The Westside Fire Recovery project area covers approximately 215,000 acres in the Klamath Mountains in northern California. The study area was characterized by a broad range of stream and aquatic system existing conditions following the 2014 wildfires. Cumulative watershed effects (CWE) analysis has demonstrated that fire effects on hydrologic function will be measurable in 7th-Field watersheds with large areas burned in 2014. The CWE analysis also indicated hydrologic effects of the project Proposed Action are minor to indistinguishable when compared with 2014 fire effects at the 7th-Field watershed scale. In this regard stream and aquatic ecosystems are not expected to take longer (post-salvage) to return to historical conditions, or undergo type conversion. Further, restorative project activities such as fuels reduction and planting could shorten recovery time and guard against type-conversion.
1073	8	Karr et al. 2004."The Effects of Postfire Salvage Logging on Aquatic Ecosystems in the American West" BioScience 54: 11	More, inhibited plant regeneration may preclude stabilization of burned slopes and accelerate loss of topsoil and sedimentation of aquatic habitats compared to a scenario in which post-fire logging does not occur (Beschta et al. 2004, Karr et al. 2004, Noss et al. 2006).	Yes	Yes	This comment appears to refer to "inhibited plant regeneration" resulting from soil compaction/displacement following salvage or fuels reduction operations with ground-based mechanical yarding. The WFR project acknowledges these concerns. A primary means to prevent these impacts is to exclude salvage harvest units from all Riparian Reserves defined by streams and water bodies (so-called Hydrologic Riparian Reserves). While some Riparian Reserve areas did experience moderate- and high-severity fire in 2014, these areas will not be salvaged for timber production and thus not subject to soil disturbance from ground-based equipment. In addition, some Riparian Reserve areas are proposed for manual fuels reduction and lop-and-scatter treatment which will increase ground cover and reduce the risk of surface erosion.

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1073	9	Karr et al. 2004."The Effects of Postfire Salvage Logging on Aquatic Ecosystems in the American West" BioScience 54: 11	It is likely that roads contribute to degraded watershed hydrology and elevated sediment delivery in a post-fire environment similar to in unburned forest (Beschta et al. 2004, McIver and Starr 2000, Karr et al. 2004).	Yes	Yes	The WFR project acknowledges that forest roads can impact watershed hydrology and sediment delivery. Cumulative watershed effects (CWE) analysis included data for proposed project temporary roads to assess their effects. Temporary roads of highest concern were dropped from the Proposed Action and temporary roads were further reduced while developing project Alternative 4. Risk of impacts to hydrologic function and sediment production from temporary roads that are constructed will be minimized by adherence to project design features (PDFs) that align closely with USFS Region 5 Best Management Practices (BMPs). In addition, a considerable length of the Forest road network within the project area is scheduled for maintenance/upgrade as part of Burned Area Emergency Response (BAER) activities. Finally, the project area falls under requirements of three Total Maximum Daily Loads (TMDLs); the Middle Klamath, the Scott, and the Salmon Rivers. These TMDLs require address of legacy sediment sources on Forest lands. For the WFR project all action alternatives include treatment of legacy sediment sites in the Elk Creek priority watershed as a condition for approval of project activities by the North Coast Regional Water Quality Control Board.

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1089	31	Karr et al. 2004."The Effects of Postfire Salvage Logging on Aquatic Ecosystems in the American West" BioScience 54: 11	Third, in forests subjected to severe fire and post-fire logging, streams and other aquatic ecosystems will take longer to return to historical conditions or may switch to a different (and often less desirable) state altogether (Karr et al. 2004).	Yes	yes	This citation does not include any analysis or conclusion regarding slope stability. The geology report incorporates several citations that are relevant to landslide risk and post-fire loggings.

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1073	10	Karr et al. 2004."The Effects of Postfire Salvage Logging on Aquatic Ecosystems in the American West" BioScience 54: 11	Few studies have measured the combined effects of fire, timber harvest and road use in a context similar to the proposed action (but see, e.g., Beschta et al. 2004, Bisson et al. 2003, Karr et al. 2004).	Yes	Yes	The Forest Service acknowledges the negative impacts of salvage logging on soil functions and quantifies these impacts using monitoring and relevant science. Desired conditions for soil stability, soil organic matter, and soil structure will not be met on a small percentage of the project area due to activities including temporary road use, landing construction, and log skidding. The potential impact from these activities on aquatic resources is analyzed for the WSFR Project at both the watershed and site scale. For the action alternatives, implementation of PDFs will reduce the potential for negative effects from soil disturbing activities. Actions will be implemented post-project to effectively minimize the adverse effects to sediment and aquatic resources from roads until vegetative recovery can occur, including the following: following harvest activities, maintain at least 50 percent slash on temporary roads and block them after the harvest season (prior to the first winter after use); new temporary roads will be sub-soiled; all temporary roads will have the takeoffs from system roads obliterated or blocked to avoid unauthorized use; hydrologic stabilizations which may also include removal of culverts and fills at stream crossings, out-sloping of road surfaces and/or obliteration of temporary road segments; erosion and sedimentation control structure will be maintained and repaired per the guidance in the Forest Service Handbook 2409.15 R5 Supplement. While all of the action alternatives include PDFs that minimize impacts from salvage harvest and roads, Alternatives 4 fully minimizes effects from roads and landings in the most vulnerable watersheds (by limiting temporary road construction to short segments on ridgetops and precluding stream crossings).

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1073	10	Karr et al. 2004."The Effects of Postfire Salvage Logging on Aquatic Ecosystems in the American West" BioScience 54: 11	The combined effects of fire, suppression activities, salvage logging and road use to sensitive species could be significant if they reduce large wood input to riparian habitat, increase soil heating or thermal loading in streams, impair hydrologic recovery, or accelerate landslide movement or surface erosion (Beschta et al. 2004, Karr et al. 2004, Lindenmayer and Noss 2006).	Yes	Yes	The Forest Service acknowledges the combined effects of fire, suppression activities, salvage logging and road use on sensitive species and quantifies these impacts using monitoring and relevant science. The WSFR Project Aquatic Resources report provides an analysis of the combined effects of these disturbances through incorporation of the KNF's Cumulative Watershed Effects (CWE) model. The CWE model tracks watershed disturbance including pre- and post-fire and pre- and post-salvage, to assess all management activities in order to gauge the relative risk of impairing watershed functions that can then produce secondary off-site impacts including to fish habitat and other beneficial uses. The Aquatic Resources Report analyzes the potential effects of all of the WSFR Project actions, including salvage and roads, on large wood inputs to streams, thermal loading and impacts to water temperatures and changes to sediment supply and delivery to aquatic habitat.
1089	28	Kotliar, N.B., S.J. Hejl, R.L. Hutto, V. Saab, C.P. Melcher, and M.E. McFadzen. 2002. Effects of fire and post-fire salvage logging on avian communities in conifer-dominated forests of the western United States.	Heterogeneous fires are very important ecologically, since a number of species depend not only upon burned forest habitat in general, but also specifically upon particular levels of severity, with some requiring low or moderate severity burn patches and some requiring only patches of high severity burned forest (Smucker et al. 2005, Kotliar et al. 2007).	Yes	Yes	This was used in the MIS Report.
1089	26	Kotliar, N.B., S.J. Hejl, R.L. Hutto, V. Saab, C.P. Melcher, and M.E. McFadzen. 2002. Effects of fire and post-fire salvage logging on avian communities in conifer-dominated forests of the western United States. Studies in Avian Biology 25: 49-64.	Scientists have recently recommended that forest managers should ensure the maintenance of moderate and high severity fire patches to maintain populations of numerous native bird species positively associated with fire (Hutto 1995, Hutto 2006, Kotliar et al. 2002, Noss et al. 2006, Smucker et al. 2005).	Yes	Yes	This was used in the MIS Report.

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1089	27	Kotliar, N.B., S.J. Hejl, R.L. Hutto, V. Saab, C.P. Melcher, and M.E. McFadzen. 2002. Effects of fire and post-fire salvage logging on avian communities in conifer-dominated forests of the western United States. Studies in Avian Biology 25: 49-64.	Post-fire logging has been described as a threat to such species (Dixon and Saab 2000, Kotliar et al. 2002, Lindenmayer et al. 2004, Murphy and Lehnhausen 1998, Saab et al 2004).	Yes	Yes	This was used in the MIS Report.
1089	28	Lee DE, ML Bond, and RB Siegel. 2012. Dynamics of breeding-season site occupancy of the California spotted owl in burned forests. The Condor 114(4):792-802.	Attachment 24 is a peer-reviewed study conducted by Lee et al for the Institute for Bird Population published in The Condor 114(4): 792-802, The Cooper Ornithological Society 2012.	Yes	Yes	This article will be addressed in the Biological Assessment.
1651	22	Lee DE, ML Bond, and RB Siegel. 2012. Dynamics of breeding-season site occupancy of the California spotted owl in burned forests. The Condor 114(4):792-802.	Based on the best available science—The Revised Northern Spotted Owl Recovery Plan, Bond et al (2009), Lee et al. (2012), Lee et al (2013) and the recent Forest Service data on the Rim Fire—the following is clear: (1) Fire does not cause significant negative effects on owl occupancy; (2) Fire actually increases the foraging benefits in high severity fire areas near nests and roost; (3) Post-fire logging or “salvage” operations cause direct take of Northern spotted owls. In light of this information, NO alternative within the Westside Project should allow logging within at least 1.5km of Northern spotted owl nesting and roosting areas.	Yes	Yes	This article is addressed in the Biological Assessment.

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1651	21	Lee DE, ML Bond, MI Borchert, and R Tanner. 2013. Influence of fire and salvage logging on site occupancy of spotted owls in the San Bernardino and San Jacinto mountains of southern California. Journal of Wildlife Management. 77:1327-1341.	Logging post-fire forests or "salvage logging" only serves to harm Northern spotted owls by reducing the forest's habitat value. (See Lee et al. 2012;16 Lee et al. 2013).	Yes	Yes	This article is addressed in the Biological Assessment.
1651	22	Lee DE, ML Bond, MI Borchert, and R Tanner. 2013. Influence of fire and salvage logging on site occupancy of spotted owls in the San Bernardino and San Jacinto mountains of southern California. Journal of Wildlife Management. 77:1327-1341.	Based on the best available science—The Revised Northern Spotted Owl Recovery Plan, Bond et al (2009), Lee et al. (2012), Lee et al (2013) and the recent Forest Service data on the Rim Fire—the following is clear: (1) Fire does not cause significant negative effects on owl occupancy; (2) Fire actually increases the foraging benefits in high severity fire areas near nests and roost; (3) Post-fire logging or "salvage" operations cause direct take of Northern spotted owls. In light of this information, NO alternative within the Westside Project should allow logging within at least 1.5km of Northern spotted owl nesting and roosting areas.	Yes	Yes	This article is addressed in the Biological Assessment.
1089	31	Lindenmayer, D.B. and R.F. Noss. 2006. Salvage Logging, Ecosystem Processes, and Biodiversity Conservation. Conservation Biology. Volume 20. Issue 4. Pages 949-958.	Post-fire logging in naturally disturbed forest landscapes generally has no direct ecological benefits and many potential negative impacts (Beschta et al. 2004; Donato et al. 2006; Lindenmayer and Noss 2006).	Yes	Yes	The Project leaves approximately 80 % of the moderate to high severity burned areas untreated. These untreated areas will continue to provide habitat for snag dependent species and provide biologically diverse stands. In addition, large logs will be retained and recruited where necessary to achieve levels that provide habitat but will not exceed the desired fuel loading. These design features will ensure that biodiversity of burned stands will be maintained within the fire perimeter and within units proposed for treatment, in addition to the tens of thousands of acres of untreated stands that experienced stand-replacing disturbance.

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1651	32	Moisset, Ph.D. Beatriz, Buchmann, Ph.D. Stephen. Bee Basics-An Introduction to our Native Bees. USDA 2011.	Most cavity-nesters showed consistent patterns of decrease after logging, including the mountain bluebird and the black-backed, hairy, and three-toed woodpeckers; abundance of the Lewis' wood-pecker increased after logging and even native bees. (Please see Moisset 2011)	Yes	No	The article doesn't support the comment.
1651	29	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006	Scientists have recently recommended that forest managers should ensure the maintenance of moderate and high severity fire patches to maintain populations of numerous native bird species positively associated with fire (Hutto 1995, Hutto 2006, Kotliar et al. 2002, Noss et al. 2006, Smucker et al. 2005).	Yes	Yes	This article was used in the MIS report.
1651	30	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006	At the landscape level, high severity habitat (unlogged) is among the most underrepresented, and rarest, of forest habitat types (Noss et al. 2006).	Yes	Yes	This article was used in the MIS report.

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1651	30	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006	Peak biodiversity levels of higher plants and vertebrates are found in patches of snag forest habitat—areas where most or all of the trees are killed by fire (Noss et al. 2006), consistent with the principle that pyrodiversity enhances biodiversity, where mixed-severity fire effects occur (Chang 1996).	Yes	Yes	This article was used in the MIS report.
1651	31	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006.	Heterogeneous fires are very important ecologically, since a number of species depend not only upon burned forest habitat in general, but also specifically upon particular levels of severity, with some requiring low or moderate severity burn patches and some requiring only patches of high severity burned forest. It is the diversity of fire effects that facilitates and maximizes native biodiversity (Noss et al. 2006).	Yes	Yes	This article was used in the MIS report.

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1073	2	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006.	The proposed action will therefore impair forest productivity and biological diversity over the long-term. Post-fire management, particularly "salvage" logging, is scientifically untenable as a means to achieve forest recovery after wildfire (Beschta et al. 2004, DellaSala et al. 2004, Donato et al. 2006, Lindenmayer et al. 2008, Noss et al. 2006).	Yes		The Forest Service acknowledges that the recently disturbed landscape is a unique and biologically rich environment. The project has been carefully designed to protect resources and minimize negative consequences. Only 7 % of the public land in the burned area will be salvage logged, thus much of the burned area will be left untreated and allowed to recovery naturally. The Forest Service understands that burned areas are sensitive and provide important habitat, thus requiring careful management. In recent history where salvage logging was not conducted, tens of thousands of acres of unsalvaged burned habitat exists across the Forest. If the treatment areas were left unplanted, much of the area would convert to shrub fields. This conversion has occurred nearby where past fires have occurred. While ceanothus is an important habitat for many species, it is a less than desirable species to have in the wildland urban interface. The plantations will provide large trees to the environment sooner than if left untreated. The project has been carefully designed with many protective design features to minimize negative impacts on aquatic and terrestrial habitat. These design features include snag and down log retention features that will allow the treated areas to continue to provide snag and down log habitat for wildlife into the future. The Forest Service agrees that natural regeneration can and will occur where a native seed source is in reasonable proximity to an opening. However, the intergenerational period required for conifer regeneration does not meet the standards and guidelines for the affected management areas. Seedling stocking and density can be quite variable and slow with natural regenerations. Planting seedlings from site-specific seed sources after a wildfire may hasten the return to a large-conifer dominated forest ecosystem by as much as 50 years (Sessions and others, 2003). Sessions also states that without planting and subsequent shrub control, it could take more than 100 years to even establish conifer forests which, temporally, are outside the preferred threshold for providing future large green conifers and future large snags for the northern spotted owl.

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1073	8	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006.	More, inhibited plant regeneration may preclude stabilization of burned slopes and accelerate loss of topsoil and sedimentation of aquatic habitats compared to a scenario in which post-fire logging does not occur (Beschta et al. 2004, Karr et al. 2004, Noss et al. 2006).	Yes	Yes	This citation does not include any analysis or conclusion regarding slope stability. The geology report incorporates several citations that are relevant to landslide risk and post-fire loggings.
1089	9 & 10	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006.	Attachment 14 is a February 24, 2006 peer-reviewed paper presented to the Society for Conservation Biology by Reed Noss, Jerry Franklin and William Baker entitled "Ecology and Management of Fire-prone Forests of the Western United States."	Yes	Yes	The Forest Service agrees that natural regeneration can and will occur where a native seed source is in reasonable proximity to an opening. However, the intergenerational period required for conifer regeneration does not meet the standards and guidelines for the affected management areas. Seedling stocking and density can be quite variable and slow with natural regenerations. Planting seedlings from site-specific seed sources after a wildfire may hasten the return to a large-conifer dominated forest ecosystem by as much as 50 years (Sessions and others, 2003). There is, however, scientific research that timber salvage, ecologically, allows full sunlight to reach young seedlings, reduces future fuel loads and reduces potential additional tree death from insect attack, all of which hasten the regrowth and recovery of a complex forest (Sessions et al.,2004). Additionally, in the absence of salvage, significant portions of dead and dying trees in a largely shrub and hardwood plant community will leave the landscape susceptible to large, intense wildfires for at least 60 years into the future (Sessions et al., 2004). A recent study by Dodson, Ares and Puettmann (2012) suggests that with the increasing recognition that late successional reserves alone will not be sufficient to maintain species populations, the search for silvicultural techniques to create stands with late successional characteristics is paramount. Dodson's study revealed that silvicultural treatments, primarily thinning, can increase stand structural variability, move stands toward multilevel canopies and increase residual tree growth. The proposed action is being evaluated to consider the positive and negative impacts, and project design features have been developed to avoid negatively impacting ecosystem recovery.

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1651	40	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006.	Findings such as those by Noss et al in 2006 indicate that naturally disturbed, unsalvaged, early successional forests are often the most biologically diverse of all forest conditions and are both rarer and more imperiled than old-growth forests in many regions.	No	No	The attached article was not the one referenced in the comment letter, however, it was a summary of the citation provided. The article provides a general perspective of the complexities regarding management prescriptions within varying fire regimes. Overall, the Forest Service agrees that there are few universal principles for managing this ecosystem, but that one fundamental principle is that "managed forests should not only support the desired fire regime but also viable populations of native species in functional networks of habitats, (Noss et al., 2006)." Project design features incorporating habitat needs based on conditions on the landscape are being utilized to protect critical features within the project area. Approximately 80% of the project area that burned at moderate to high severity will remain intact as one of the most biologically diverse forest conditions that Noss mentions.
1651	40	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006.	Noss, Reed F., Jerry F. Franklin, William Baker, Tania Schoennagel, and Peter B. Moyle. 2006. Ecological Science Relevant to Management Policies for Fire-prone Forests of the Western United States. Society for Conservation Biology Scientific Panel on Fire in Western U.S. Forests. February 24, 2006.	No	No	No additional comments relative to the project were made.
1651	19	NSO Revised Recovery Plan	The agency must analyze and disclose accurate impacts to owls and consider the best available scientific information. In order to protect this federally threatened species, which is currently petitioned for up listing and also a California candidate species, the agency must follow recommendations of the NSO Revised Recovery Plan, particularly Recovery Action #12.	Yes	Yes	This article will be addressed in the Biological Assessment.

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1648	2	Odion, D. C., Frost, E. J., Stritholt, J. R., Hong, J. D., & Moritz, M. A. (2004). Patterns of Fire Severity and Forest Conditions in the Western Klamath Mountains. Conservation Biology, 927-936.	Effects of Fire and Commercial Thinning on Future Habitat of the Northern Spotted Owl, Dennis C. Odion1,*, Chad T. Hanson2, Dominick. A. DellaSala3, William L. Baker4 and Monica L. Bond, The Open Ecology Journal, 2014. http://www.californiachaparral.org/images/Odion_et_al_TOEJ_thinning_and_spotted_owls_2014.pdf	Yes	Yes	The authors of this article are disagreeing with the tradeoffs of commercial thinning treatments reducing future high severity fire versus the loss of NSO habitat as a result of treatment. Basically, the authors are claiming that the regeneration of NSO habitat exceeds the loss of habitat to fire. The effects of the Westside Fire Recovery project on NSO habitat using the research that is pertinent to the potential effects, but the fuels report describes the current fuels condition and describes the effects for each alternative.

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1089	11	Odion, D. C., Frost, E. J., Stritholt, J. R., Hong, J. D., & Moritz, M. A. (2004). Patterns of Fire Severity and Forest Conditions in the Western Klamath Mountains. Conservation Biology, 927-936.	By altering the character and condition of forest vegetation, salvage logging after a fire changes forest fuels and can increase the severity of subsequent fires (CWWR 1996, Odion et al. 2004).	Yes	yes	We do not disagree that salvage logging changes fuels and increases the severity of subsequent fires. As stated in the Fire and Fuels Report, a direct effect of logging is removing high densities of snags which reduce standing biomass that would otherwise contribute to surface fuel loading over time they fall. Within their study, Odion et al. (2004) recognized that "Activity fuels left untreated after [Helicopter] logging could have contributed to the elevated fire severity in nonforest vegetation in the 1987 reburn compared with elsewhere. Torching, crowning, and spotting, which contribute to large fire growth, are greater where large woody fuels have accumulated under a forest canopy and contribute to surface fire heat release (Brown, Reinhardt, & Kramer, 2003). The refined proposed action (alternative 2) outline in Chapter 2 of the EIS includes a combination of fuel treatment activities to reduce activity generated slash within areas that are salvaged logged. The Fire and Fuels report provides effects to surface fire behavior based on proposed activities. Activities that include a combination of salvage with follow up treatment will reduce flame lengths to < 4 feet across 98% of the units proposed for treatment. All action alternatives analyzed are anticipated to remove future accumulations of large woody material in the future and reduce fire behavior. Several peer reviewed literature supports post fire logging effects and reduction in fuel loadings both in the short- and long- term. Peterson, Dodson, and Harrod (2014) found that post-fire logging altered post-fire fuel succession by (1) greatly accelerating the deposition of surface woody fuels from logged snags, (2) reducing peak loadings of large diameter woody fuels, and (3) initiating the woody fuel decay earlier. Ritchie, Knapp and Skinner (2012), evaluated salvaged units following the Cone Fire on the Lassen National Forest. They found that after 4 years higher levels of surface fuel accumulations occurred in lower intensity salvage plots. The highest surface fuel accumulations occurred in unsalvaged plots 4 to 8 years after the fire; furthermore, the highest levels of large woody debris were associated with unsalvaged areas. A key finding observed by Ritchie, Knapp and Skinner (2012) was finding no support for the contention that post-fire salvage logging necessitates subsequent fuel treatment for elevated fuels.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	14	Odion, D. C., Frost, E. J., Stritholt, J. R., Hong, J. D., & Moritz, M. A. (2004). Patterns of Fire Severity and Forest Conditions in the Western Klamath Mountains. Conservation Biology, 927-936.	Tree plantations are more susceptible to intense fire behavior and severe fire effects than unlogged mature forests, including burned forests (DellaSala et al. 1995, Odion et al. 2004).	Yes	Yes	Chapter 3 of the EIS describes the effects of each alternative. We do not disagree with the comment; however, these articles assessed a variety of land management activities related to plantations and subsequent fire behavior and severity. Results from Weatherspoon and Skinner (1995) discuss the types of management activities which lead to higher canopy damage with 1987 fires on the Shasta Trinity NF, Hayfork Ranger District. Specifically, their results highlight that when thinning activities occur in combination with fuels reduction activities (broadcast burning, pile and burn, lop and scatter), less fire damage occurred comparatively to cutting with no post treatment fuels activities. Thompson et al (2007) states "We currently lack general conceptual models or simulation models that can help us understand the effects of salvage-logging on fire severity over large landscapes and long timeframes." Moreover, they concluded younger forests, whether naturally or artificially regenerated, may be vulnerable to future high severity fires creating more early successional vegetation and delaying or precluding the return to historical natural forest composition and structure. The refined proposed action (alternative 2) treats activity slash by a combination of activities (pile and burn, broadcast burn, lop and scatter and/or mastication) to modify fuel structure and reduce fuel loadings to < 7 tons/acre which is sufficient levels to maintain surface fire behavior characteristics.
1648	2	Odion, D. C., Frost, E. J., Stritholt, J. R., Hong, J. D., & Moritz, M. A. (2004). Patterns of Fire Severity and Forest Conditions in the Western Klamath Mountains. Conservation Biology, 927-936.	Patterns of Fire Severity and Forest Conditions in the Western Klamath Mountains, California. DENNIS C. ODION, EVAN J. FROST, JAMES R. STRITTHOLT, HONG JIANG, DOMINICK A. DELLASALA, AND MAX A. MORITZ. Conservation Biology, Pages 927–936. Volume 18, No. 4, August 2004. http://www.bie.berkeley.edu/moritzlab/docs/Odion_etal_2004.pdf	Yes	Yes	Thank you for providing scientific literature related to the project. Chapter 3 of the EIS describes the effects of each alternative and references the literature used during the analysis of the alternatives as does the Fire and Fuels resource report.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1651	35	Olson, David, DellaSala, Dominick A., Noss, Reed F., Strittholt, James R., Kass, Jamie, Koopman, Marni E. and Allnutt, Thomas F. Climate Change Refugia for Biodiversity in the Klamath-Siskiyou Ecoregion. Natural Areas Journal, 32(1):65-74. 2012.	It is imperative to retain dense stands and canopy on north and east facing slopes in regards to climate change as these areas will provide the highest amount of refugia for plant and animal species as described in these excerpts from Olsen 2012 (attached)48.	Yes	Yes	The project isn't proposing to green tree management.
1651	36	Olson, David, DellaSala, Dominick A., Noss, Reed F., Strittholt, James R., Kass, Jamie, Koopman, Marni E. and Allnutt, Thomas F. Climate Change Refugia for Biodiversity in the Klamath-Siskiyou Ecoregion. Natural Areas Journal, 32(1):65-74. 2012.	In temperate regions, terrain positions and habitat types that maintain persistent cool and moist conditions favorable for effective microrefugia are increasingly well defined (e.g., Dobrowski et al. 2010). (Olsen 2012)	Yes	no	This is a direct quote from the citation. The comment associated with this citation is concerning the removal of live trees. The Westside Fire Recovery project is focused on removing dead trees or trees with a high probability of dying.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1082	28	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #38 - "Many scientists and natural resource agencies suggest extensive fuel treatments to reduce the possibility of severe and intense wildfires that could damage ecosystems, destroy property, and take human life (USDA Forest Service, 2000; GAO, 2003a,b). However, there are a number of misconceptions and misunderstandings about fuel treatments and their use as a panacea for fire hazard reduction across the United States (Finney and Cohen, 2003; Franklin and Agee, 2003)." (Pg.1998) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	The Forest Service acknowledges the research of Mr. Cohen that has shown that individual homes can be adequately protected from wildfire by clearing fuels for a distance of approximately 100 yards around individual structures. In addition, we do not disagree with the suggestion that fuel reduction treatments surrounding communities do not adequately protect homeowners from wildfires by themselves. It is important to understand that the purpose of this project is not limited or directed to the protection of private residences. It should be understood that a substantial aspect of the need for this project is to reduce hazards to public and forest workers who utilize the Klamath National Forest to recreate and work. Chapter 2 of the EIS contains descriptions of the refined proposed action (alternative 2); chapter 1 provides an explanation of its Purpose and Need and descriptions of the Desired Conditions for the various affected land allocations within the proposed project area and the multiple resources benefits that are expected to be derived from the proposed treatments. The Klamath Forest Plan Standards and Guidelines for Fire Management include "Reduce unacceptable fuel buildup and potential acreage of future high intensity wildfires." The EIS (Chapter 3) provides analysis of the effects of salvage, site preparation, and fuels treatments in respect to reducing future fuel loading, high severity fire and increasing fire suppression capability (resistance to control) by reducing aerial hazards, and reducing snags which are an ember producer. Spotting and increased radiation make structures more difficult to defend from crown fire than surface fire (Cohen & Butler, 1996) (Scott & Reinhardt, 2001). More importantly, Cohen and Butler (1996) noted that the degree of structure survival "results from a complex, interactive sequence of events involving the ignition and burning of vegetation and structures accompanied by varying fire protection efforts by homeowners and firefighters." The Forest acknowledges that weather and topography both have an effect on fire behavior and severity. Extended drought, low humidity, high temperatures and high wind, and topographic features can increase fire spread and intensity. The purpose of the project in relations to fuels treatments is to reduce future large accumulations of fuels and reduce high densities of snags which jeopardize safety to public and firefighters engaged in fire management activities, and improve the resiliency of forest stands if a wildfire occurs within the landscape. Within the Klamath Mountains, mixed conifer forest fuels contribute to fire behavior and resulting fire severity. Project activities are intended to reduce fire severity during 90th percentile fire weather and decrease resistance to control, not fire ignitions within the project area. Funding of work on private property is not within the scope of this project.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1082	29	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #40 - "Treating fuels to facilitate suppression is an example in circular logic. If fuel treatment makes suppression more successful in general, then less area will be burned in the short run and more acreage will tend to burn under extreme conditions, when suppression is ineffective. The inevitable result is that more area is burned in fewer, more unmanageable events with greater consequences. In addition, fire suppression leads to continued fuel accumulation and, in turn, more difficult conditions for suppression. This phenomenon has been described as ''the wildland fire paradox'' (Brown and Arno, 1991). Rather than creating conditions where fire is easier to suppress, fuel treatments should strive to create conditions where fire can occur without the need for suppression." (Pg.1998) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1082	30	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #41 - "Bessie and Johnson (1995) show weather (fuel moisture and wind) is far more important than fuels in determining fire behavior; reducing fuels may have a limited impact on fire occurrence." (Pg.1999) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen above from Letter 1082 Pg. 28.
1082	30	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #42 - "Treating fuels to reduce fire occurrence, fire size, or amount of burned area is ultimately both futile and counter-productive." (Pg.1999) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1082	31	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #43 - "Since the home ignition zone largely occurs on private lands, most land management agencies do not have the authority to mitigate the WUI ignition potential directly (Cohen, 2000b). However, the opportunity exists to explicitly define responsibilities for the WUI fire potential (i.e. the home ignition zone) consistent with areas of jurisdiction and separately from ecological wildfire issues." (Pg.1999) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.
1082	31	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #44 - "It may not be necessary or effective to treat fuels in adjacent areas in order to suppress fires before they reach homes; rather, it is the treatment of the fuels immediately proximate to the residences, and the degree to which the residential structures themselves can ignite that determine if the residences are vulnerable." (Pg.1999) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1082	31	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #45 - "WUI fuel treatments can be designed such that an extreme wildfire can occur in the WUI without having a residential fire disaster. Although general wildfire control efforts may not benefit from fuel treatments during extreme fire behavior, fuel modifications can significantly change outcome of a wildfire within a treatment area. Research has shown that a home's characteristics and its immediate surroundings principally determine the WUI ignition potential during extreme wildfire behavior (Cohen, 2000a,c, 2003, 2004). The area that primarily determines WUI ignition potential is called the home ignition zone (Cohen, 2001). WUI fuel treatments can address the home ignition zone by removing flammable materials immediately adjacent to residences.")Pg. 1999) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1082	32	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #46 - "Treating fuels may not reduce suppression expenditures. It is a natural mistake to assume that a successful fuel treatment program will result in reduced suppression expenditures. Suppression expenditures rarely depend directly on fuel conditions, but rather on fire location and on what resources are allocated to suppression. The only certain way to reduce suppression expenditures is to make a decision to spend less money suppressing fires." (Pg. 2000) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.
1082	32	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #47 - "Thinning to reduce crown fire potential requires careful evaluation of the tradeoffs in treatment effects on potential surface fire behavior and crown fire behavior (Scott and Reinhardt, 2001). Thinning will often result in increased potential surface fire behavior, for several reasons. First, thinning reduces the moderating effects of the canopy on wind speed, so surface wind speed will increase (Graham et al., 2004). It also results in increased solar radiation on the forest floor, causing drier surface fuels. It may also cause an increase in flammable grassy and shrub fuels over time, due to the reduced tree competition." (Pg.2000) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.

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1082	33	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #48 - "Some viable fuel treatments may actually result in an increased rate of spread under many conditions (Lertzman et al., 1998; Agee et al., 2000). For example, thinning to reduce crown fire potential can result in surface litter becoming drier and more exposed to wind. It can also result in increased growth of grasses and understory shrubs which can foster a rapidly moving surface fire." (Pg.2000) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.
1082	33	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #49 - "Treating fuels may not improve ecosystem health. Ecosystem restoration treatment and fuel treatment are not synonymous. Some ecosystem restoration treatments reduce fuel hazard, but not all fuel treatments restore ecosystems. Ecosystem restoration treatments are often designed to recreate presettlement fire regimes, stand structures and species compositions while fuel treatment objectives are primarily to reduce fuels to lessen fire behavior or severity—this is known as ''hazard Reduction.'' Achieving fuel hazard reduction goals in the absence of ecosystem restoration is insufficient (Dombeck et al., 2004; Kauffman, 2004)." (Pg.2000) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1082	34	Reinhardt , Elizabeth D., Robert E. Keane, David E. Calkin, Jack D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management256 (2008): 1997–2006. http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Dr. Cohen's opposing view #50 - "Conversely, some fuels treatments can reduce fuels but create stands that are quite dissimilar from their historical analogs. Examples include mastication treatments that break, chip, or grind canopy and surface woody material into a compressed fuelbed and thinning treatments that remove the fire adapted species and leave shade-tolerant, late successional species." (Pg.2000) Source for quotes #38 to #50 above: Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States Published in Forest Ecology and Management 256, 2008 http://www.firewise.org/Information/Research-and-Guidance/WUI-Home-Ignition-Research/~/media/Firewise/Files/Pdfs/Research/CohenFuelTreatment.pdf	Yes	Yes	See Response to Cohen Letter 1082.
1089	14	Saab, V. A., Robin E. Russell, Jonathan G. Dudley. 2009. Nest-site selection by cavity-nesting birds in relation to postfire salvage logging. Forest Ecology and Management 257 (2009) 151–159	Attachment 21 consists of a peer-reviewed study by Saab et al that appeared in Forest Ecology and Management (2009) entitled Nest-site selection by cavity-nesting birds in relation to salvage logging.	Yes	Yes	This article was used in the MIS Report.
1073	10	Seavy, N.E., R.D. Burnett, P.J. Taille. 2012. Black-backed woodpecker nest-tree preference in burned forests of the Sierra Nevada, CA. Wildlife Society Bulletin 36(4): 722-728.	For example, black-backed woodpecker consistently shows avoidance of, and negative responses to, post-fire logging (Tingley et al. 2014, Seavey et al. 2012, Hutto and Gallo 2006, Saab and Dudley 1998, Caton 1996, Hitchcox 1996, Hutto 1995).	Yes	Yes	This article was used in the MIS Report.

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1089	19	Shatford, J.P.A.; Hibbs, D.E.; Puettmann, K.J. 2007. Journal of Forestry. Volume 105 (3): 139-146.	This is consistent with findings from other studies (Shatford et al. 2007).	Yes	No	The Forest Service agrees that natural regeneration can and will occur where a native seed source is in reasonable proximity to an opening. However, the intergenerational period required for conifer regeneration does not meet the standards and guidelines for the affected management areas. Seedling stocking and density can be quite variable and slow with natural regenerations. Planting seedlings from site-specific seed sources after a wildfire may hasten the return to a large-conifer dominated forest ecosystem by as much as 50 years (Sessions and others, 2003). Sessions also states that without planting and subsequent shrub control, it could take more than 100 years to even establish conifer forests which, temporally, are outside the preferred threshold for providing future large green conifers and future large snags for the northern spotted owl.
1089	20	Shatford, J.P.A.; Hibbs, D.E.; Puettmann, K.J. 2007. Journal of Forestry. Volume 105 (3): 139-146.	Attached to these scoping comments is another peer-reviewed paper regarding post-fire forest succession that the Forest Service may be interested in. Conifer Regeneration After Forest Fire in the Klamath Siskiyou's: How Much, How Soon? Shatford, J.P.A.; Hibbs, D.E.; Puettmann, K.J. Journal of Forestry. Volume 105, Number 3, April/May 2007, pp. 139-146(8).	Yes	Yes	The Forest Service agrees that natural regeneration can and will occur where a native seed source is in reasonable proximity to an opening. However, the intergenerational period required for conifer regeneration does not meet the standards and guidelines for the affected management areas. Seedling stocking and density can be quite variable and slow with natural regenerations. Planting seedlings from site-specific seed sources after a wildfire may hasten the return to a large-conifer dominated forest ecosystem by as much as 50 years (Sessions and others, 2003). Sessions also states that without planting and subsequent shrub control, it could take more than 100 years to even establish conifer forests which, temporally, are outside the preferred threshold for providing future large green conifers and future large snags for the northern spotted owl. Shatford's article states that extensive research has documented the advantage of planting conifers and controlling shrubs to increase tree density and growth over the early years of stand development (2007).

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1089	21	Shatford, J.P.A.; Hibbs, D.E.; Puettmann, K.J. 2007. Journal of Forestry. Volume 105 (3): 139-146.	The great majority of areas that burn at high severity naturally regenerate conifers vigorously--starting shortly after the fire. See Shatford et al. (2007) in Journal of Forestry on this.	Yes	Yes	The Forest Service agrees that natural regeneration can and will occur where a native seed source is in reasonable proximity to an opening. However, the intergenerational period required for conifer regeneration does not meet the standards and guidelines for the affected management areas. Seedling stocking and density can be quite variable a d slow with natural regenerations. Planting seedlings from site-specific seed sources after a wildfire may hasten the return to a large-conifer dominated forest ecosystem by as much as 50 years (Sessions and others, 2003). Sessions also states that without planting and subsequent shrub control, it could take more than 100 years to even establish conifer forests which, temporally, are outside the preferred threshold for providing future large green conifers and future large snags for the northern spotted owl.
1651	5	Skroch, Matthew. 2005. Ecosystem Management and Its Role in Linking Science, Policy, and Management. USDA Forest Service Proceedings RMRS-P-36.	Ecosystem Management and Its Role in Linking Science, Policy, and Management (Skroch 2005, attached)	Yes	No	This article does not directly pertain to any comments specific to the proposed action, however, its discussion on ecosystem management largely relates to the NEPA process in that collaboration and communication are essential components in promoting a more unified approach to managing landscapes on large spatial and temporal scales (Skroch, 2005).
1089	26	Smucker et. all, 2005. Changes in Bird Abundance After Wildfire: Importance of Fire Severity and Time Since Fire. Ecological Applications, 15(5), 2005, pp. 1535–1549 q 2005 by the Ecological Society of America.	Scientists have recently recommended that forest managers should ensure the maintenance of moderate and high severity fire patches to maintain populations of numerous native bird species positively associated with fire (Hutto 1995, Hutto 2006, Kotliar et al. 2002, Noss et al. 2006, Smucker et al. 2005).	Yes	Yes	This article was used in the MIS Report.
1089	28	Smucker et. all, 2005. Changes in Bird Abundance After Wildfire: Importance of Fire Severity and Time Since Fire. Ecological Applications, 15(5), 2005, pp. 1535–1549 q 2005 by the Ecological Society of America.	Heterogeneous fires are very important ecologically, since a number of species depend not only upon burned forest habitat in general, but also specifically upon particular levels of severity, with some requiring low or moderate severity burn patches and some requiring only patches of high severity burned forest (Smucker et al. 2005, Kotliar et al. 2007).	Yes	Yes	This article was used in the MIS Report.

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1651	8	State Wildlife Action Plan	The Forest Service should work with the Department and follow the recommendations in the State Wildlife Action Plan (attached).	Yes	Yes	The Forest Service will work with the department, as applicable.
1651	19	Swanson, M.E., J.F. Franklin, R.L. Beschta, C.M. Crisafulli, D.A. DellaSala, R.L. Hutto, D. Lindenmayer, and F.J. Swanson. 2010. The forgotten stage of forest succession: early-successional ecosystems on forest sites. Frontiers Ecology & Environment; doi:10.1890/090157.	The rate of successful dispersal of juvenile spotted owls (Strix caurina), for example, decreases in fragmented landscapes, thus influencing long-term population viability (Doak 1989; Miller et al. 1999). Swanson 2010	Yes	Yes	This article was used in the MIS Report.
1648	2	Taylor, A.H. & C.N. Skinner. 2003. Spatial patterns and controls on historical fire regimes and forest structure in the Klamath Mountains. Ecological Applications, 13(3):704-719. http://www.fs.fed.us/psw/programs/ecology_of_western_forests/publications/publications/2003-04-TaylorSkinner.pdf	Taylor, A.H. & C.N. Skinner. 2003. Spatial patterns and controls on historical fire regimes and forest structure in the Klamath Mountains. Ecological Applications, 13(3):704-719. http://www.fs.fed.us/psw/programs/ecology_of_western_forests/publications/publications/2003-04-TaylorSkinner.pdf	Yes	Yes	Thank you for providing scientific literature related to the project. Chapter 3 of the EIS describes the effects of each alternative and references the literature used during the analysis of the alternatives as does the Fire and Fuels resource report.
1651	5	The Klamath Basin Coalition. 2003. A Conservation Vision for the Klamath Basin.	There are decade's worth of volumes of scientific studies and conservation efforts supporting the protection and restoration of species and habitat, specifically in the Pacific Northwest forests of California, the Klamath Siskiyou Bioregion and the Klamath River Basin (See- A Conservation Vision for the Klamath Basin, 2000, attached), which are include the Klamath National Forest.	Yes	Yes	This article provides some basic recommendations that are generally followed through the use of the Forest Plan Standards and Guidelines. Note that the citation is for 2000, but the material provided is dated 2003.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1651	9, 38	Theobald David M., Crooks, Kevin R., Norman, John B. 2011. Assessing effects of land use on landscape connectivity: loss and fragmentation of western U.S. forests. Ecological Applications, 21(7): 2445–2458.	Please also see Theobald 2011 (attached) Assessing effects of land use on landscape connectivity: loss and fragmentation of western U.S. forests:	Yes	Yes	This article was used in the Biological Evaluation.
1073	3	Thompson, J. R., Spies, T. A., & Ganio, L. M. (2007). Reburn severity in managed and unmanaged vegetation in a large wildfire. Proceedings of the National Academy of Sciences, 10743-10748.	Multiples lines of empirical research positively correlate post-fire logging with increased fire hazard and severity of later fire events (Donato et al. 2006, Odion et al. 2004, Thompson et al. 2007, Weatherspoon and Skinner 1995).	Yes	Yes	We do not disagree with the literature which correlates post-fire logging with increased fire hazard and severity of later fire events. Chapter 2 of the EIS describes the refined proposed action (alternative 2) for the Westside Fire Recovery project along with Chapter 3 of the EIS which describes the associated effects of the proposed activities. Alternative 2 reduces the density of snags within treated areas and subsequently reduces surface fuel loadings (or fire hazard) resulting in a decrease in potential fire behavior (flame lengths and fire line intensity). Results from Weatherspoon and Skinner (1995) discuss the types of management activities which lead to higher canopy damage with 1987 fires on the Shasta Trinity National Forest, Hayfork Ranger District. Specifically, their results highlight that when thinning activities occur in combination with fuels reduction activities (broadcast burning, pile and burn, lop and scatter), less fire damage occurred comparatively to cutting with no post treatment fuels activities. Odion et al. (2004) recognized that “Activity fuels left untreated after [Helicopter] logging could have contributed to the elevated fire severity in nonforest vegetation in the 1987 reburn compared with elsewhere. Within high severity fire areas proposed for treatment, predominate vegetation pattern is expected to consist mainly of shrubs and grasses. Intermixed between the reestablishing vegetation are high densities of snags that are projected to fall overtime contributing to surface fuel loading effectively increasing fire behavior including intensity, and spot fire production. Conversely, Alternative 2 is expected to reduce fuel loadings with proposed salvage and site preparation activities resulting in flame lengths < 4 feet, fire line intensities < 100 btu/ft./sec and decreased duration of burning as large fuels are considerably decreased.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	4 & 5	Thompson, J. R., Spies, T. A., & Ganio, L. M. (2007). Reburn severity in managed and unmanaged vegetation in a large wildfire. Proceedings of the National Academy of Sciences, 10743-10748.	Attachment 4 is a peer-reviewed study by researchers from the Corvallis Forestry Sciences Lab who found that mixed-conifer and mixed evergreen-hardwood forests that were salvage logged (and planted) following the 1987 Silver Fire in the Siskiyou National Forest experienced higher severity re-burn in the 2002 Biscuit Fire than did stands in the Silver Fire (subsequently burned in the Biscuit Fire) that were not subject to salvage logging and artificial plantation establishment. Thompson, JR, TA Spies, LM Ganio, 2007. Reburn Severity in Managed and Unmanaged Vegetation in a Large Wildfire. Proceedings of the National Academy of Sciences.	Yes	Yes	We do not disagree with the results of the study regarding severity in managed and unmanaged forests. However, as the authors point out, "…young forests, whether naturally or artificially regenerated, may be vulnerable to positive feedback cycles of high severity fire, creating more early-successional vegetation and delaying or precluding the return of historical mature-forest composition and structure". Younger trees have thinner bark and low canopy base heights which make them susceptible to canopy damage and/or mortality in the advent of another fire in 12 years as was the case between the Silver and Biscuit Fire's. Thompson et al (2007) points out, "… many of the plantations examined in this analysis had lower conifer densities and a larger component of shrubs and hardwoods than would be found in typical intensively managed plantations of the same age (11-14 years)". As described these stands contained uniform and continuous fuel bed increasing fire hazard as young trees were connected with surface fuels, with high fuel bed depths, leading to an expected increase in fire behavior. The refined proposed action (alternative 2) incorporates fuels treatments within areas that are salvaged logged and reforested. Piling of activity slash, mastication, lop and scattering, chipping and prescribed burning will be utilized to meet desired surface fuel loading (< 7 tons/acre) conditions which minimize flame lengths to < 4 feet (Described in the Fire and Fuels Report). "The patterns we observed apply to the particular conditions and history of the post-Silver Fire management; they could change with shorter or longer intervals between fires…We are currently unable to examine the short- and long-term tradeoffs associated with different postfire management systems" (Thompson et al. 2007). Chapters 2 and 3 of the EIS describe in detail the refined proposed action (alternative 2) and address the environment consequences and associated effects of each alternative considered. All action alternatives are expected to reduce future surface fuel loading when compared to the no action, and reduce flame lengths and fire line intensities to levels which safe direct attack by fire suppression resources is attainable.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1073	5	Thompson, J.R., T.A. Spies, L.M. Ganio. 2007. Reburn Severity in Managed and Unmanaged Vegetation in a Large Wildfire. PNAS, 104 (25). Pages 10743-10748.	Plantations are far more susceptible to intense fire behavior and severe fire effects than unlogged, burned forests (Thompson et al. 2007, Weatherspoon and Skinner 1995), particularly where logging slash is not treated (Donato et al. 2006, Odion et al. 2004).	Yes	Yes	Chapter 3 of the EIS describes the effects of each alternative. We do not disagree with the comment; however, these articles assessed a variety of land management activities related to plantations and subsequent fire behavior and severity. Results from Weatherspoon and Skinner (1995) discuss the types of management activities which lead to higher canopy damage with 1987 fires on the Shasta Trinity NF, Hayfork Ranger District. Specifically, their results highlight that when thinning activities occur in combination with fuels reduction activities (broadcast burning, pile and burn, lop and scatter), less fire damage occurred comparatively to cutting with no post treatment fuels activities. Thompson et al (2007) states "We currently lack general conceptual models or simulation models that can help us understand the effects of salvage-logging on fire severity over large landscapes and long timeframes." Moreover, they concluded younger forests, whether naturally or artificially regenerated, may be vulnerable to future high severity fires creating more early successional vegetation and delaying or precluding the return to historical natural forest composition and structure. Lastly, "The patterns we observed apply to the particular conditions and history of post-Silver Fire management; they could change with shorter or longer intervals between fires." The refined proposed action (alternative 2) treats activity slash by a combination of activities (pile and burn, broadcast burn, lop and scatter and/or mastication) to modify fuel structure and reduce fuel loadings to < 7 tons/acre which is sufficient levels to maintain surface fire behavior characteristics.
1073	7	Thompson, J.R., T.A. Spies, L.M. Ganio. 2007. Reburn Severity in Managed and Unmanaged Vegetation in a Large Wildfire. PNAS, 104 (25). Pages 10743-10748.	Moreover, post-fire logging has been observed to inhibit development of early-seral vegetation and create novel environments exhibiting low resilience to subsequent fire disturbance (Donato et al. 2006, Hanson and Stuart 2005, Reinhardt and Ryan 1998, Thompson et al. 2007).	Yes		Combine with Column 32 in spreadsheet from same letter # Citation is Donato et al. 2006
1073	10	Tingley, M.W., R.L. Wilkerson, M.L. Bond, C.A. Howell, and R.B. Siegel. 2014b. Variation in home range size of black-backed woodpeckers. The Condor 116:325-340.	Black-backed woodpecker consistently shows avoidance of, and negative responses to, post-fire logging (Tingley et al. 2014, Seavey et al. 2012, Hutto and Gallo 2006, Saab and Dudley 1998, Caton 1996, Hitchcox 1996, Hutto 1995)	Yes	Yes	This article is addressed in the Biological Assessment for the Northern Spotted Owl.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1073	5	USDA Forest Service. Eini C. Lowell and James Cahill. 1996. Deterioration of fire-killed timber in southern Oregon and northern California. Western Journal of Applied Forestry 11(4): 125-123.	(1996: 128). On page 130, the same study reported: Blue stain probably causes the largest economic loss associated with the use of 1-yrdead pine saw timber. Most affected by stain are lumber products (Select, Shop, and Moulding lumber) that are graded for appearance (Fahey 1980) and typically manufactured from the outer portion (sapwood) of a log. Species used for these products or ones that have a high proportion of sapwood, such as ponderosa and sugar pine, will experience greater value losses. The sapwood in ponderosa pine makes up 50 to 75% of a tree's gross cubic volume and in sugar pine constitutes 25 to 70% of a tree's gross cubic volume (Kimmey 1955). In this study, the sapwood of sugar pine was almost entirely blue stained and that of ponderosa pine stained in a streaked pattern 1 yr. after fire kill. This was more than what Kimmey (1955) observed in sugar pine. Both this, and the Kimmey (1955) study, found no blue stain in true fir or Douglas-fir.	Yes		Forest Service direction from the Forest Service Handbook 2409.12, Chapter 20, states that rates of deterioration are dependent on climate, elevation, aspect, and in the case of fire killed trees, the intensity of fire (p. 20). Cull deduction guidelines are taken from either the PNW-GTR-292 (April 1992) or Lowell and Cahill's "Deterioration of Fire-Killed Timber in southern Oregon and Northern California" (1996) depending on the extent and variability of deterioration and professional judgment and observations. Lowell and Cahill's study addressed only the defects associated with fire damage and deterioration which would contribute to varying rates of merchantability. Lowell and Cahill state that there is high proportion of cull logs in logs from fire-killed trees 3 years after a fire, especially in ponderosa pine and true fir. The comment "Therefore the second stated purpose and need for action does not justify curtailment of environmental disclosure or public information procedures required by the National Environmental Policy Act," is not substantiated by the literature. The purpose and need to "obtain the maximum economic commodity and value from burned timber by offering a sale while the wood is still marketable" is supported by this research that shows the least amount of volume loss is within the first year of being killed by fire. The Forest Service is compliance with the National Environmental Policy Act.

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1073	5	USDA Forest Service. Eini C. Lowell and James Cahill. 1996. Deterioration of fire-killed timber in southern Oregon and northern California. Western Journal of Applied Forestry 11(4): 125-123.	Lowell and Cahill (1996) measured wood deterioration of fire-killed conifers at several sites in southern Oregon and northern California over a three-year period.	Yes	No	Forest Service direction from the Forest Service Handbook 2409.12, Chapter 20, states that rates of deterioration are dependent on climate, elevation, aspect, and in the case of fire killed trees, the intensity of fire (p. 20). Cull deduction guidelines are taken from either the PNW-GTR-292 (April 1992) or Lowell and Cahill's "Deterioration of Fire-Killed Timber in southern Oregon and Northern California" (1996) depending on the extent and variability of deterioration and professional judgment and observations. Lowell and Cahill's study addressed only the defects associated with fire damage and deterioration which would contribute to varying rates of merchantability. Lowell and Cahill state that there is high proportion of cull logs in logs from fire-killed trees 3 years after a fire, especially in ponderosa pine and true fir. The comment "Therefore the second stated purpose and need for action does not justify curtailment of environmental disclosure or public information procedures required by the National Environmental Policy Act," is not substantiated by the literature. The purpose and need to "obtain the maximum economic commodity and value from burned timber by offering a sale while the wood is still marketable" is supported by this research that shows the least amount of volume loss is within the first year of being killed by fire. The Forest Service is compliance with the National Environmental Policy Act.

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1073	5	USDA Forest Service. Eini C. Lowell and James Cahill. 1996. Deterioration of fire-killed timber in southern Oregon and northern California. Western Journal of Applied Forestry 11(4): 125-123.	One year after fire, wood deterioration among Douglas fir, ponderosa pine and sugar pine snags amounted to just 1 percent of standing volume (Lowell and Cahill 1996: 127, Table 4).	Yes	No	Forest Service direction from the Forest Service Handbook 2409.12, Chapter 20, states that rates of deterioration are dependent on climate, elevation, aspect, and in the case of fire killed trees, the intensity of fire (p. 20). Cull deduction guidelines are taken from either the PNW-GTR-292 (April 1992) or Lowell and Cahill's "Deterioration of Fire-Killed Timber in southern Oregon and Northern California" (1996) depending on the extent and variability of deterioration and professional judgment and observations. Lowell and Cahill's study addressed only the defects associated with fire damage and deterioration which would contribute to varying rates of merchantability. Lowell and Cahill state that there is high proportion of cull logs in logs from fire-killed trees 3 years after a fire, especially in ponderosa pine and true fir. The comment "Therefore the second stated purpose and need for action does not justify curtailment of environmental disclosure or public information procedures required by the National Environmental Policy Act," is not substantiated by the literature. The purpose and need to "obtain the maximum economic commodity and value from burned timber by offering a sale while the wood is still marketable" is supported by this research that shows the least amount of volume loss is within the first year of being killed by fire. The Forest Service is compliance with the National Environmental Policy Act.

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1073	6	USDA Forest Service. Eini C. Lowell and James Cahill. 1996. Deterioration of fire-killed timber in southern Oregon and northern California. Western Journal of Applied Forestry 11(4): 125-123.	Despite significant deterioration of wood utility in trees of smaller size classes, even three years after fire, “Most stands contained a majority of trees that would be suitable for lumber or veneer production with very little loss in yields” (Lowell and Cahill 1996: 130).	Yes	No	Forest Service direction from the Forest Service Handbook 2409.12, Chapter 20, states that rates of deterioration are dependent on climate, elevation, aspect, and in the case of fire killed trees, the intensity of fire (p. 20). Cull deduction guidelines are taken from either the PNW-GTR-292 (April 1992) or Lowell and Cahill's "Deterioration of Fire-Killed Timber in southern Oregon and Northern California" (1996) depending on the extent and variability of deterioration and professional judgment and observations. Lowell and Cahill's study addressed only the defects associated with fire damage and deterioration which would contribute to varying rates of merchantability. Lowell and Cahill state that there is high proportion of cull logs in logs from fire-killed trees 3 years after a fire, especially in ponderosa pine and true fir. The comment "Therefore the second stated purpose and need for action does not justify curtailment of environmental disclosure or public information procedures required by the National Environmental Policy Act," is not substantiated by the literature. The purpose and need to "obtain the maximum economic commodity and value from burned timber by offering a sale while the wood is still marketable" is supported by this research that shows the least amount of volume loss is within the first year of being killed by fire. The Forest Service is compliance with the National Environmental Policy Act.

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1073	6	USDA Forest Service. Eini C. Lowell and James Cahill. 1996. Deterioration of fire-killed timber in southern Oregon and northern California. Western Journal of Applied Forestry 11(4): 125-123.	In the second year post-fire, total wood volume deterioration in fire-killed snags was less than 10 percent for Douglas fir, ponderosa pine and sugar pine, respectively (Lowell and Cahill 1996: 129 – Figs. 4, 5).	Yes	No	Forest Service direction from the Forest Service Handbook 2409.12, Chapter 20, states that rates of deterioration are dependent on climate, elevation, aspect, and in the case of fire killed trees, the intensity of fire (p. 20). Cull deduction guidelines are taken from either the PNW-GTR-292 (April 1992) or Lowell and Cahill's "Deterioration of Fire-Killed Timber in southern Oregon and Northern California" (1996) depending on the extent and variability of deterioration and professional judgment and observations. Lowell and Cahill's study addressed only the defects associated with fire damage and deterioration which would contribute to varying rates of merchantability. Lowell and Cahill state that there is high proportion of cull logs in logs from fire-killed trees 3 years after a fire, especially in ponderosa pine and true fir. The comment "Therefore the second stated purpose and need for action does not justify curtailment of environmental disclosure or public information procedures required by the National Environmental Policy Act," is not substantiated by the literature. The purpose and need to "obtain the maximum economic commodity and value from burned timber by offering a sale while the wood is still marketable" is supported by this research that shows the least amount of volume loss is within the first year of being killed by fire. The Forest Service is compliance with the National Environmental Policy Act.

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1073	6	USDA Forest Service. Eini C. Lowell and James Cahill. 1996. Deterioration of fire-killed timber in southern Oregon and northern California. Western Journal of Applied Forestry 11(4): 125-123.	Nevertheless, the probability that a snag will be a cull log three years post-fire is less than 10 percent for stems larger than 20-inches diameter at breast height (129, Table 5).	Yes	No	Forest Service direction from the Forest Service Handbook 2409.12, Chapter 20, states that rates of deterioration are dependent on climate, elevation, aspect, and in the case of fire killed trees, the intensity of fire (p. 20). Cull deduction guidelines are taken from either the PNW-GTR-292 (April 1992) or Lowell and Cahill's "Deterioration of Fire-Killed Timber in southern Oregon and Northern California" (1996) depending on the extent and variability of deterioration and professional judgment and observations. Lowell and Cahill's study addressed only the defects associated with fire damage and deterioration which would contribute to varying rates of merchantability. Lowell and Cahill state that there is high proportion of cull logs in logs from fire-killed trees 3 years after a fire, especially in ponderosa pine and true fir. The comment "Therefore the second stated purpose and need for action does not justify curtailment of environmental disclosure or public information procedures required by the National Environmental Policy Act," is not substantiated by the literature. The purpose and need to "obtain the maximum economic commodity and value from burned timber by offering a sale while the wood is still marketable" is supported by this research that shows the least amount of volume loss is within the first year of being killed by fire. The Forest Service is compliance with the National Environmental Policy Act.
1651	39	USDA Forest Service. Kevin S. McKelvey, Rocky Mountain Research Station, Missoula MT; Roger W. Perry, Southern Research Station, Hot Springs, AR; L. Scott Mills, University of Montana, Missoula MT. 2013. The Effects of Climate Change on Mammals. Synthesis. On Webpage: http://www.fs.usda.gov/ccrc/topics/wildlife/mammals	Sink habitat = habitat that is currently occupied, but where populations cannot persist without external subsidies from organisms that emigrate from better quality areas. McKelvey 2013-USDA available at link below http://www.fs.fed.us/ccrc/topics/wildlife/mammals/index.shtml	Yes	No	This article doesn't support the comment.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1089	25	USDA Forest Service. Wright, Pamela, Mark Harmon,and Fred Swanson. 2002. Assessing the Effect of Fire Regime on Coarse Woody Debris. Gen. Tech. Rep. PSW-GTR-181. http://www.fs.fed.us/psw/publications/documents/gtr-181/047_Wright.pdf	The following linked research article found CWD mass to be "much higher in wildfire regenerated stands than in stands intensively managed for timber production" (also citing Spies and Cline 1988). http://www.fs.fed.us/psw/publications/documents/gtr-181/047_Wright.pdf	Yes	No	Secondary reference. "CWD mass is much higher in wildfire regenerated stands than in stands intensively managed for timber production (Spies and Cline 1988)."
1651	9	USDI Fish and Wildlife Service, NOAA Fisheries, and AFWA. 2012. National Fish, Wildlife and Plants Climate Adoption Draft Strategy	One of the primary keys to wildlife recovery and conservation, according to the number one goal of the National Fish, Wildlife and Plant Climate Adaption Strategy (attached) is conserving and connecting habitat.	Yes	Yes	This report identifies the importance of habitat connectivity in a theoretical sense, but it doesn't provide useful tools to analyze the effects at the project scale.
1651	36	USDI Fish and Wildlife Service, NOAA Fisheries, and AFWA. 2012. National Fish, Wildlife and Plants Climate Adoption Draft Strategy	The DEIS should incorporate and address the 2012 National Fish, Wildlife and Plants Climate Adoption Draft Strategy.	Yes	no	The project considers climate change in the manner directed by agency direction and the revised draft guidance for federal departments and agencies on consideration of greenhouse gas emissions and the effects of climate changes in NEPA reviews.
1651	37	USDI Fish and Wildlife Service, NOAA Fisheries, and AFWA. 2012. National Fish, Wildlife and Plants Climate Adoption Draft Strategy	Act now. Immediate planning and action are needed to better understand and address the impacts of climate change and to safeguard natural resources now and into the future. 2012 National Fish, Wildlife and Plants Climate Adoption Draft Strategy	Yes	no	This is a direct quote from the citation.
1651	20	USDOI Fish and Wildlife Service. 2011. Revised Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina). U.S. Fish and Wildlife Service, Portland, Oregon.	U.S. Fish and Wildlife Service. 2011. Revised Recovery Plan for the Northern Spotted Owl (Strix occidentalis caurina). U.S. Fish and Wildlife Service, Portland, Oregon. xvi + 258 pp.	Yes	Yes	This article will be addressed in the Biological Assessment.

Letter No.	Page No.	Citation	Comment excerpt	Reference provided/ accessible? Yes or No	Does literature support comments specific about project? Yes or No	FS Response
1651	23	USDOI Fish and Wildlife Service. 2014. Draft Species Report Fisher (Pekania pennanti), West Coast Population.	As explained in the 2014 Draft Species Report for the Pacific fisher: Determining an area is unoccupied by fishers is also difficult. Fishers within the analysis area tend to live in remote locations where they are seldom encountered, documented, or studied.	Yes	Yes	This article was used in the Biological Evaluation.
1651	23	USDOI Fish and Wildlife Service. 2014. Draft Species Report Fisher (Pekania pennanti), West Coast Population.	While positive fisher detections, using techniques such as sooted track plates and remotely triggered cameras, are conclusive, nondetections (inferred absence) are based on detection probability, which in turn, is strongly influenced by survey effort. (USFWS 2014).19	Yes	Yes	This article was used in the Biological Evaluation.
1651	24	USDOI Fish and Wildlife Service. 2014. Draft Species Report Fisher (Pekania pennanti), West Coast Population.	As found by the Report, “Fire suppression actions and post-fire management have the potential to exacerbate the effects of wildfire on fisher habitat.” (U.S.F.W.S. 2014).	Yes	Yes	This article was used in the Biological Evaluation.
1651	33	Wright, Pamela Harmon,Mark and Swanson, Fred. 2002. Assessing the Effect of Fire Regime on Coarse Woody Debris. USDA Forest Service Gen. Tech. Rep. PSW-GTR-181.	The attached research article by Wright 2002 found CWD mass to be "much higher in wildfire regenerated stands than in stands intensively managed for timber production."	Yes	No	Secondary reference. "CWD mass is much higher in wildfire regenerated stands than in stands intensively managed for timber production (Spies and Cline 1988)."
1651	9	Zielinski, W.J, R.L. Truex, J.R. Dunk and T. Gaman. 2006. Using forest inventory data to assess fisher resting habitat suitability in California. Ecological Applications 16: pages 1010-1025.	The designation of Late Successional Reserves was a good start but by itself does not ensure continued connectivity (Zelinski 2006, attached).	Yes	Yes	This article was used in the Biological Evaluation.

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1651	19	Zielinski, W.J, R.L. Truex, J.R. Dunk and T. Gaman. 2006. Using forest inventory data to assess fisher resting habitat suitability in California. Ecological Applications 16: pages 1010-1025.	Balancing the goals of geographic distribution of reserves, and selecting reserves to maintain populations of individual species of concern (e.g., fishers, spotted owls) may require that the current Late-Successional Reserves network be augmented with new priority areas in high-value habitat areas in the most productive low- to mid-elevation forests of the west-central portion of our study. Zielinski 2006	Yes	Yes	This article was used in the Biological Evaluation.
1651	19	Zielinski, W.J, R.L. Truex, J.R. Dunk and T. Gaman. 2006. Using forest inventory data to assess fisher resting habitat suitability in California. Ecological Applications 16: pages 1010-1025.	Given the public trust duties for wildlife, the federal lands play a unique role in protecting biodiversity, including providing habitat for the area-limited focal species such as the spotted owl and the fisher. Zielinski 2006	Yes	Yes	This article was used in the Biological Evaluation.
1651	19	Zielinski, W.J, R.L. Truex, J.R. Dunk and T. Gaman. 2006. Using forest inventory data to assess fisher resting habitat suitability in California. Ecological Applications 16: pages 1010-1025.	Zielinski, William J., et al., Using landscape suitability models to reconcile conservation planning for two key forest predators, Biological Conservation (2006)	Yes	Yes	This article was used in the Biological Evaluation.
1651	26	Zielinski, W.J., Truex, R.L., Schmidt, G., Schlexer, R., Barrett, R.H., 2004. Home range characteristics of fishers in California. Journal of Mammalogy 85, 649–657	Home range size varies; the abundance and availability of prey and the fisher's vulnerability to predation likely influence home range size. Zielinski et al. (2004)	Yes	Yes	This article was used in the Biological Evaluation.
1651	24	Zielinski, W.J., Truex, R.L., Schmidt, G., Schlexer, R., Barrett, R.H., 2004. Home range characteristics of fishers in California. Journal of Mammalogy 85:649–657	Where canopy cover above 60% still exists within the Action Area, the proposed logging/other treatments should not reduce canopy to below 60%. Zielinski et al (2004) shows that Pacific fishers greatly prefer habitat with dense canopy cover (60%+). Lower canopy cover increases the fisher's risk of predation.	Yes	Yes	This article was used in the Biological Evaluation.

Table L- 2. List of publically cited references that were either non-scientific in nature or unrelated to the project.

Letter No.	Citation	Citation Text
1082	http://www.emifpa.org/PDF/FactSheetUnderstandingFire.pdf	"Homeowners are their own first line of defense. Saving a home from wildfire depends primarily on two factors: roofing material and the quality of the "defensible space" surrounding it.8 Research Physical Scientist Jack Cohen noted after visiting homes that survived the Rodeo-Chediski Fire and those that were consumed, that had homeowners followed guidelines for creating defensible space—described as creating an area around a structure where fuels and vegetation are treated, cleared, or reduced to slow the spread of fire—more homes would have survived." Fact Sheet: Understanding Fire and Fire Behavior Ontario Aviation and Forest Fire Management http://www.emifpa.org/PDF/FactSheetUnderstandingFire.pdf
1651	6-25-2014 Letter to President	More than 75 scientists recently requested that the President direct his Secretary of Agriculture and Chief of the USFS to craft a National Old Growth Conservation Policy that fully protect the remaining old-growth forests on all national forests. The signatories include PhD professors from throughout the country and Canada, retired state and federal resource agency biologists and two former USFS Chiefs. We support their letter of request (attached). (See also Climate Change section and Crawford I and II Scoping)
1089	April 2006 Letter to Congress	Attachment 13 consists of an April 2006 open letter to Congress from an extremely long and impressive list of scientists contending that: No substantive evidence supports the idea that fire-adapted forests might be improved by logging after a fire. In fact, many carefully conducted studies have concluded just the opposite.
1089	Clark 2007	Attachment 17a consists of Darren Clark's 2007 Master's Thesis in Wildlife Science entitled "Demography and Habitat Selection of Northern Spotted Owls in Post-Fire Landscapes of Southwestern Oregon."
1089	DellaSala 2006	Attachment 16 consists of a September 2006 post-disturbance literature review by Dr. Dominick A. DellaSala, Ph.D. for the National Center for Conservation Science & Policy.

Letter No.	Citation	Citation Text
1089	Franklin 1/20/04	"Salvage logging of large snags and down boles does not contribute to recovery of late-successional forest habitat; in fact, the only activity more antithetical to the recovery process would be removal of surviving green trees from burned sites. Large snags and logs of decay resistant species, such as Douglas-fir and cedars, are critical as early and late successional wildlife habitat as well as for sustaining key ecological processes associated with nutrient, hydrologic, and energy cycles." -Dr. Jerry Franklin, 1/20/04
1089	Franklin 1/20/04	"Salvage logging of large snags and down boles does not contribute to recovery of late-successional forest habitat; in fact, the only activity more antithetical to the recovery process would be removal of surviving green trees from burned sites. Large snags and logs of decay resistant species, such as Douglas-fir and cedars, are critical as early and late successional wildlife habitat as well as for sustaining key ecological processes associated with nutrient, hydrologic, and energy cycles."-Dr. Jerry Franklin, 1/20/04
1082	http://www.battle-creek.net/docs/fire/Zoning.pdf	Dr. Cohen's opposing view #18 - "A home with its immediate surroundings (about 100-150 feet from the structure) is called the Home Ignition Zone. Many factors about the HIZ determine the potential for ignition during a wildland fire, such as flammable wood roofs and materials like trees, grass, decks, or adjacent structures leading up to a home." (Pg. 1) Source: Saving Homes from Wildfires: Regulating the Home Ignition Zone Published in Zoning News, May 2001 http://www.battle-creek.net/docs/fire/Zoning.pdf
1082	http://www.battle-creek.net/docs/fire/Zoning.pdf	Dr. Cohen's opposing view #18 - "A home with its immediate surroundings (about 100-150 feet from the structure) is called the Home Ignition Zone. Many factors about the HIZ determine the potential for ignition during a wildland fire, such as flammable wood roofs and materials like trees, grass, decks, or adjacent structures leading up to a home." (Pg. 1) Source: Saving Homes from Wildfires: Regulating the Home Ignition Zone Published in Zoning News, May 2001 http://www.battle-creek.net/docs/fire/Zoning.pdf
1089	http://www.blm.gov/or/districts/medford/plans/files/DoubledayFireSalvage.pdf	Please address the following conclusions from page 44 of the Doubleday Fire Salvage Environmental Assessment. March 2009. BLM-OR-MO50-0015-EA. Butte Falls Resource Area. Medford District BLM: http://www.blm.gov/or/districts/medford/plans/files/DoubledayFireSalvage.pdf

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1082	http://www.emifpa.org/PDF/FactSheetUnderstandingFire.pdf	"Homeowners are their own first line of defense. Saving a home from wildfire depends primarily on two factors: roofing material and the quality of the "defensible space" surrounding it.8 Research Physical Scientist Jack Cohen noted after visiting homes that survived the Rodeo-Chediski Fire and those that were consumed, that had homeowners followed guidelines for creating defensible space—described as creating an area around a structure where fuels and vegetation are treated, cleared, or reduced to slow the spread of fire—more homes would have survived." Fact Sheet: Understanding Fire and Fire Behavior Ontario Aviation and Forest Fire Management http://www.emifpa.org/PDF/FactSheetUnderstandingFire.pdf
1082	http://www.foresthistory.org/Publications/FHT/FHTFall2008/Cohen.pdf	Dr. Cohen's opposing view #14 - "The wildland fire management approach for preventing WUI fire disasters largely addresses the wildfire outside the home ignition zone rather than a home's ignition potential as determined by the conditions within the home ignition zone. Since 2000, agency fire management policy initiatives have emphasized fire suppression." (Pg. 24) Source for quotes #14 to #16 above: The Wildland-Urban Interface Fire Problem: A Consequence of the Fire Exclusion Paradigm Published in Forest History Today, Fall 2008 http://www.foresthistory.org/Publications/FHT/FHTFall2008/Cohen.pdf
1082	http://www.foresthistory.org/Publications/FHT/FHTFall2008/Cohen.pdf	Dr. Cohen's opposing view #15 - "Preventing WUI fire disasters requires that the problem be framed in terms of home ignition potential. Because this principally involves the home ignition zone, and the home ignition zone primarily falls within private ownership, the responsibility for preventing home ignitions largely falls within the authority of the property owner. Preventing wildfire disasters thus means fire agencies helping property owners mitigate the vulnerability of their structures. The continued fire management focus on fire suppression suggests the WUI fire problem persists largely as a consequence of framing the WUI fire problem primarily in terms of the fire exclusion paradigm." (Pg. 25) Source for quotes #14 to #16 above: The Wildland-Urban Interface Fire Problem: A Consequence of the Fire Exclusion Paradigm Published in Forest History Today, Fall 2008 http://www.foresthistory.org/Publications/FHT/FHTFall2008/Cohen.pdf
1082	http://www.foresthistory.org/Publications/FHT/FHTFall2008/Cohen.pdf	Dr. Cohen's opposing view #16 - "The continued focus on fire suppression largely to the exclusion of alternatives that address home ignition potential suggests a persistent inappropriate framing of the WUI fire problem in terms of the fire exclusion paradigm." (Pg. 25) Source for quotes #14 to #16 above: The Wildland-Urban Interface Fire Problem: A Consequence of the Fire Exclusion Paradigm Published in Forest History Today, Fall 2008 http://www.foresthistory.org/Publications/FHT/FHTFall2008/Cohen.pdf

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1651	https://www.wildlife.ca.gov/Conservation/Planning/Connectivity	https://www.wildlife.ca.gov/Conservation/Planning/Connectivity

Letter No.	Citation	Citation Text
1651	https://www.wildlife.ca.gov/Conservation/Planning/Connectivity/CEHC	https://www.wildlife.ca.gov/Conservation/Planning/Connectivity/CEHC
1651	Letter from Bond et al. to USFS 2014	Analyzing data from the Forest Service taken one year after the Rim Fire, the Center for Biological Diversity et al. found that "Individual site occupancy for at least a single owl after accounting for detection probability was 92% (±7.3%)." (Letter from Bond et al. to USFS 2014).
1089	October 2006 Letter	Attachment 9 is an October 6, 2006 letter that appeared in Science volume 314 from a number of scientists concluding that: The effects of post-disturbance logging require careful consideration of whether to log at all, and if so, how to conduct such logging to minimize negative consequences.
1089	October 2013 Letter to Congress	Attached to these scoping comments (attachment 26) is a 2013 letter to congress signed by 250 scientists asking that decision makers "consider what the science is telling us: that post-fire habitats created by fire, including patches of severe fire, are ecological treasures rather than ecological catastrophes, and that post-fire logging does far more harm than good to the nations public lands."
1651	Swanson 2005	Edge effects may also reduce the amount of area available in a landscape for organisms such as birds (Lehmkuhl and Ruggiero 1991), lichens (Rheault et al. 2003), certain understory plants (Nelson and Halpern 2005), and bryophytes (Nelson and Halpern 2005). Swanson 2005
1651	Swanson 2005	The loss of old-growth forests to timber harvest and land-use conversion has resulted in a condition of fragmentation, creating spatial isolation of remaining patches and significant reductions in interior habitat conditions required by certain organisms. Swanson 2005

Letter No.	Citation	Citation Text
1089	A Student's Forest Paper Sparks One Hot Debate, L.A. Times, June 11, 2006.	Attachment 19 consists of several news articles about the significant scientific controversy surrounding post-fire management. We incorporate these documents into our comments and into the administrative record for the Westside salvage timber sale. *In Fire's Wake, Logging Study Inflames Debate; University Study Challenges Cutting of Burnt Timber, The Washington Post, February, 2006, p.A3. *In Bed With Big Wood, Willamette Week, April 19, 2006. *Logging and Fire Debate Grows, Corvallis Gazette-Times, February 25, 2006 *Wildfire Logging Debate Heats Up, The Scientist, January 27, 2006. *Logging Study Sets Off Own Firestorm, The Oregonian, January 20, 2006. *A Student's Forest Paper Sparks One Hot Debate, L.A. Times, June 11, 2006.
1082	http://en.wikipedia.org/wiki/Biscuit_Fire_publication_controversy	Explain to the public why the USFS in 2006 tried unsuccessfully to prohibit Science magazine from publishing a research paper, written by Oregon State University graduate student Dan Donato and several colleagues called “Post-wildfire logging hinders regeneration and increases fire risk.” See: http://en.wikipedia.org/wiki/Biscuit_Fire_publication_controversy

Letter No.	Citation	Citation Text
1082	http://www.conservationnw.org/library/otherpub/document-2006-03-15-7573536098	"Many scientist-reviewed studies and syntheses (please see the selected citations appended to this letter) have recently come to this conclusion. For example, no substantive evidence supports the idea that fire-adapted forests might be improved by logging after a fire. In fact, many carefully conducted studies have concluded just the opposite. Most plants and animals in these forests are adapted to periodic fires and other natural disturbances. They have a remarkable way of recovering - literally rising from the ashes - because they have evolved with and even depend upon fire." "In testimony before the House Subcommittee on Resources (November 10, 2005), eminent forest ecologist and University of Washington Professor Jerry Franklin noted that logging dead trees often has greater negative impacts than logging of live trees. He concluded that "timber salvage is most appropriately viewed as a 'tax' on ecological recovery." Beyond those concerns, post-disturbance logging often intensifies the potential severity of future fires by concentrating the slash from logging at or near the ground. Rather than leaving plant material standing - and providing perching, nesting, and feeding sites for wildlife - such logging abruptly moves the material to the ground. Most of this material would naturally fall to the ground, adding important supplies of nutrients and energy to the forest floor and structure in the form of woody debris to stream channels. But this naturally happens over decades, not in the relatively short time associated with a logging operation." From an August 1, 2006 letter to members of Congress http://www.conservationnw.org/library/otherpub/document-2006-03-15-7573536098
1089	In Bed With Big Wood, Willamette Week, April 19, 2006.	Attachment 19 consists of several news articles about the significant scientific controversy surrounding post-fire management. We incorporate these documents into our comments and into the administrative record for the Westside salvage timber sale. *In Fire's Wake, Logging Study Inflames Debate; University Study Challenges Cutting of Burnt Timber, The Washington Post, February, 2006, p.A3. *In Bed With Big Wood, Willamette Week, April 19, 2006. *Logging and Fire Debate Grows, Corvallis Gazette-Times, February 25, 2006 *Wildfire Logging Debate Heats Up, The Scientist, January 27, 2006. *Logging Study Sets Off Own Firestorm, The Oregonian, January 20, 2006. *A Student's Forest Paper Sparks One Hot Debate, L.A. Times, June 11, 2006.

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1089	Kotliar et al 2002	Attachment 8 is Kotliar et al. 2002. Fire on the Mountain: Birds and Burns in the Rocky Mountains. USDA Forest Service Gen. Tech. Rep. PSW-GTR-191. 2005. A version of this paper was presented at the Third International Partners in Flight Conference, March 20-24, 2002, Asilomar Conference Grounds, California.
1089	Logging and Fire Debate Grows, Corvallis Gazette-Times, February 25, 2006	Attachment 19 consists of several news articles about the significant scientific controversy surrounding post-fire management. We incorporate these documents into our comments and into the administrative record for the Westside salvage timber sale. *In Fire's Wake, Logging Study Inflames Debate; University Study Challenges Cutting of Burnt Timber, The Washington Post, February, 2006, p.A3. *In Bed With Big Wood, Willamette Week, April 19, 2006. *Logging and Fire Debate Grows, Corvallis Gazette-Times, February 25, 2006 *Wildfire Logging Debate Heats Up, The Scientist, January 27, 2006. *Logging Study Sets Off Own Firestorm, The Oregonian, January 20, 2006. *A Student's Forest Paper Sparks One Hot Debate, L.A. Times, June 11, 2006.

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1651	Photo Document Folder B- Panther and Caribou	Please see Photo Document Folder B- Panther and Caribou
1651	Theobald 2011	Despite urgent calls to inform national, regional, and state planning efforts, there remains a critical need to develop practical approaches to identify where important lands are for landscape connectivity (i.e., linkages), where land use constrains connectivity, and which linkages are most important to maintain network-wide connectivity extents. Theobald 2011
1089	Wildfire Logging Debate Heats Up, The Scientist, January 27, 2006.	Attachment 19 consists of several news articles about the significant scientific controversy surrounding post-fire management. We incorporate these documents into our comments and into the administrative record for the Westside salvage timber sale. *In Fire's Wake, Logging Study Inflames Debate; University Study Challenges Cutting of Burnt Timber, The Washington Post, February, 2006, p.A3. *In Bed With Big Wood, Willamette Week, April 19, 2006. *Logging and Fire Debate Grows, Corvallis Gazette-Times, February 25, 2006 *Wildfire Logging Debate Heats Up, The Scientist, January 27, 2006. *Logging Study Sets Off Own Firestorm, The Oregonian, January 20, 2006. *A Student's Forest Paper Sparks One Hot Debate, L.A. Times, June 11, 2006.

Table L- 3. Publically cited references that were either not provided or not accessible (e.g. broken website hyperlink).

Letter No.	Citation Text	Citation
1073	Endicott (2008: 2) observed that road construction and maintenance at stream crossings "may involve point source discharges of dredged or fill material which may require a [Clean Water Act] section 404 … permit."	Endicott, D. 2008. National Level Assessment of Water Quality Impairments Related to Forest Roads and Their Prevention by Best Management Practices. Final report to U.S. Environmental Protection Agency, Contract No. EP-C-05-066, Task Order 002. Great Lakes Env. Ctr.: Traverse City, MI. December. 259 pp.
1073	Endicott (2008: 4) reported: Unpaved roads and stream crossings are the major source of erosion from forest lands (Anderson et al., 1976, Megahan and Kidd, 1972; Patric, 1976; Rothwell, 1983), contributing up to 90% of the total sediment production from forestry operations. Surface erosion rates from roads are typically at least an order of magnitude greater than rates from harvested areas, and as much as three orders of magnitude (1,000 times) greater than erosion rates from undisturbed forest soils (NCASI, 2001).	Endicott, D. 2008. National Level Assessment of Water Quality Impairments Related to Forest Roads and Their Prevention by Best Management Practices. Final report to U.S. Environmental Protection Agency, Contract No. EP-C-05-066, Task Order 002. Great Lakes Env. Ctr.: Traverse City, MI. December. 259 pp.
1073	For this reason, road-stream crossings have high potential to degrade water quality (Endicott 2008).	Endicott, D. 2008. National Level Assessment of Water Quality Impairments Related to Forest Roads and Their Prevention by Best Management Practices. Final report to U.S. Environmental Protection Agency, Contract No. EP-C-05-066, Task Order 002. Great Lakes Env. Ctr.: Traverse City, MI. December. 259 pp.

Letter No.	Citation Text	Citation
1073	Stream buffers will not effectively filter sediment where they are crossed by roads (Endicott 2008).	Endicott, D. 2008. National Level Assessment of Water Quality Impairments Related to Forest Roads and Their Prevention by Best Management Practices. Final report to U.S. Environmental Protection Agency, Contract No. EP-C-05-066, Task Order 002. Great Lakes Env. Ctr.: Traverse City, MI. December. 259 pp.
1067	Post-fire logging removes ecologically critical biological legacies from forests; organisms, organically derived structures (e.g. snags, downed wood, course woody debris) and spatial patchiness of tree mortality together constitute the biological legacies resulting from fire disturbance (Franklin et al. 2000).	Franklin et al. 2000
1067	A growing body of scientific evidence has clearly documented that biological legacies play key ecological roles in stimulating ecosystem recovery and revitalization following large-scale disturbance events such as high intensity wildfires (Lindenmayer and Noss 2006).	Lindenmayer and Noss 2006
1067	These ecological benefits include: enriching recovering vegetation (Hansen et al. 1991; Lindenmayer & McCarthy 2002), facilitating species survival in disturbed areas (Hutto 1995; Franklin & MacMahon 2000), providing habitat (Lindenmayer et al. 1997; Nappi et al. 2003), promoting recolonization of disturbed habitats by plants and animals (Whelen 1995), providing energy and nutrients to a variety of organisms (Perry 1994; Hutto 1995), and stabilizing environmental conditions of disturbed sites (Perry 1994; see Lindenmayer and Noss 2006 for full review).	Hansen et al. 1991

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1067	These ecological benefits include: enriching recovering vegetation (Hansen et al. 1991; Lindenmayer & McCarthy 2002), facilitating species survival in disturbed areas (Hutto 1995; Franklin & MacMahon 2000), providing habitat (Lindenmayer et al. 1997; Nappi et al. 2003), promoting recolonization of disturbed habitats by plants and animals (Whelen 1995), providing energy and nutrients to a variety of organisms (Perry 1994; Hutto 1995), and stabilizing environmental conditions of disturbed sites (Perry 1994; see Lindenmayer and Noss 2006 for full review).	Hutto 1995
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1067	These ecological benefits include: enriching recovering vegetation (Hansen et al. 1991; Lindenmayer & McCarthy 2002), facilitating species survival in disturbed areas (Hutto 1995; Franklin & MacMahon 2000), providing habitat (Lindenmayer et al. 1997; Nappi et al. 2003), promoting recolonization of disturbed habitats by plants and animals (Whelen 1995), providing energy and nutrients to a variety of organisms (Perry 1994; Hutto 1995), and stabilizing environmental conditions of disturbed sites (Perry 1994; see Lindenmayer and Noss 2006 for full review).	Lindenmayer et al. 1997

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1067	These ecological benefits include: enriching recovering vegetation (Hansen et al. 1991; Lindenmayer & McCarthy 2002), facilitating species survival in disturbed areas (Hutto 1995; Franklin & MacMahon 2000), providing habitat (Lindenmayer et al. 1997; Nappi et al. 2003), promoting recolonization of disturbed habitats by plants and animals (Whelen 1995), providing energy and nutrients to a variety of organisms (Perry 1994; Hutto 1995), and stabilizing environmental conditions of disturbed sites (Perry 1994; see Lindenmayer and Noss 2006 for full review).	Whelen 1995
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1067	Further contradicting the proposal's assertion, Donato et al. (2006) and Shatford et al. (2007) found that natural regeneration of conifers in the Klamath region was in fact inhibited by post-fire logging following the Biscuit fire of 2002.	Donato et al. (2006)
1067	Further contradicting the proposal's assertion, Donato et al. (2006) and Shatford et al. (2007) found that natural regeneration of conifers in the Klamath region was in fact inhibited by post-fire logging following the Biscuit fire of 2002.	Shatford et al. (2007)

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1067	Directly contradicting this assertion is an example from the neighboring Siskiyou National forest in southern Oregon where areas that were salvage-logged and planted after a 1987 burn, burned more severely during the subsequent 2002 Biscuit Fire than those left unmanaged (Thompson et al. 2007) and following the 2002 burn, salvage-logging and subsequent planting resulted in higher fuel loads (Donato et al. 2006).	Thompson et al. 2007
1067	Directly contradicting this assertion is an example from the neighboring Siskiyou National forest in southern Oregon where areas that were salvage-logged and planted after a 1987 burn, burned more severely during the subsequent 2002 Biscuit Fire than those left unmanaged (Thompson et al. 2007) and following the 2002 burn, salvage-logging and subsequent planting resulted in higher fuel loads (Donato et al. 2006).	Donato et al. 2006
1067	Compared with salvage-logged forests, post-fire non-salvaged mixed-conifer forests tend to have greater plant diversity, and habitat elements important for wildlife (DellaSala et al. 2014).	DellaSala et al. 2014
1067	Further, the common practice of herbicide application in post-fire planted stands compounds these impacts by promoting invasive species, such as cheat grass (Bromus tectorum) (McGinnis et al. 2010).	McGinnis et al. 2010
1067	For instance, salvaged areas tend to reflect early-successional habitats whereas unmanaged post-fire forests harbor forest-interior bird species that are largely responsible for late-successional tree and shrub seed distribution (Castro et al. 2010) and post-fire specialist bird species tend to be completely absent from burned forests that have been salvage logged (Hutto 2006).	Castro et al. 2010
1067	For instance, salvaged areas tend to reflect early-successional habitats whereas unmanaged post-fire forests harbor forest-interior bird species that are largely responsible for late-successional tree and shrub seed distribution (Castro et al. 2010) and post-fire specialist bird species tend to be completely absent from burned forests that have been salvage logged (Hutto 2006).	Hutto 2006

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1067	For instance, recent research (funded by the USDA Forest Service Lassen National Forest) demonstrated that in Sierran mixed-conifer forests, salvage logging treatments resulted in a significant reductions in total ecosystem carbon storage compared to non-salvaged post-fire forests (Powers et al. 2013).	Powers et al. 2013
1073	Second, post-fire (salvage) logging does not contribute to ecological recovery; rather, it negatively affects recovery processes, with the intensity of impacts depending upon the nature of the logging activity (Lindenmayer et al. 2004).	Lindenmayer et al. 2004
1073	Post-fire logging in naturally disturbed forest landscapes generally has no direct ecological benefits and many potential negative impacts (Beschta et al. 2004; Donato et al. 2006; Lindenmayer and Noss 2006).	Beschta et al. 2004
1073	Post-fire logging in naturally disturbed forest landscapes generally has no direct ecological benefits and many potential negative impacts (Beschta et al. 2004; Donato et al. 2006; Lindenmayer and Noss 2006).	Lindenmayer and Noss 2006
1073	Fourth, post-fire seeding of non-native plants is often ineffective at reducing soil erosion and generally damages natural ecological values, for example by reducing tree regeneration and the recovery of native plant cover and biodiversity (Beyers 2004).	Beyers 2004
1073	Non-native plants typically compete with native species, reducing both native plant diversity and cover (Keeley et al. 2006).	Keeley et al. 2006
1073	Finally, species dependent on habitat conditions created by high severity fire, with abundant standing dead trees, require substantial areas to be protected from post-fire logging (Hutto 1995).	Hutto 1995
1073	Post-fire logging will remove structural legacies of the pre-disturbance forest (Franklin et al. 2002, Franklin et al. 2000, Swanson et al. 2011) and physically disturb burned soils with high propensity for natural recovery (Klock 1975, McIver and McNeil 2006, McIver and Starr 2000).	Franklin et al. 2002
1073	Post-fire logging will remove structural legacies of the pre-disturbance forest (Franklin et al. 2002, Franklin et al. 2000, Swanson et al. 2011) and physically disturb burned soils with high propensity for natural recovery (Klock 1975, McIver and McNeil 2006, McIver and Starr 2000).	Franklin et al. 2000

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1073	The proposed action will therefore impair forest productivity and biological diversity over the long-term. Post-fire management, particularly “salvage” logging, is scientifically untenable as a means to achieve forest recovery after wildfire (Beschta et al. 2004, DellaSala et al. 2004, Donato et al. 2006, Lindenmayer et al. 2008, Noss et al. 2006).	Beschta et al. 2004
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1073	Cumulative effects of the Beaver Creek, Whites and Happy Camp Complex fires ("2014 fires"), related suppression actions (Backer et al. 2004), the proposed action, and past and foreseeable management will be significant because it will harm wildlife habitat.	Backer et al. 2004
1073	One- and 10-hour fuels that are most available for combustion increased from three-to-13 tons per hectare after post-fire logging (Duncan 2002).	Duncan 2002
1073	Those factors influence flame length, rate of fire spread and resistance to control (Albini 1977, Andrews 1986, Rothermel 1991).	Albini 1977
1073	Those factors influence flame length, rate of fire spread and resistance to control (Albini 1977, Andrews 1986, Rothermel 1991).	Andrews 1986
1073	Those factors influence flame length, rate of fire spread and resistance to control (Albini 1977, Andrews 1986, Rothermel 1991).	Rothermel 1991
1073	Deeper beds of uncompressed, fine (<10-hour) and dry fuels support longer flame lengths and more erratic fire behavior than shallower beds of relatively large and moist fuels (Burgan and Rothermel 1984).	Burgan and Rothermel 1984
1073	Those factors influence flame length, rate of fire spread and resistance to control (Albini 1977, Andrews 1986, Rothermel 1991).	Andrews and Rothermel 1982
1073	Those factors influence flame length, rate of fire spread and resistance to control (Albini 1977, Andrews 1986, Rothermel 1991).	Rothermel 1991
1073	Indeed, logging without treatment of slash fuel increases the duration and severity of wildfires more than any other forest management activity (Stephens 1998, van Wagtendonk 1996).	Stephens 1998
1073	Indeed, logging without treatment of slash fuel increases the duration and severity of wildfires more than any other forest management activity (Stephens 1998, van Wagtendonk 1996).	van Wagtendonk 1996
1073	Multiples lines of empirical research positively correlate post-fire logging with increased fire hazard and severity of later fire events (Donato et al. 2006, Odion et al. 2004, Thompson et al. 2007, Weatherspoon and Skinner 1995).	Odion et al. 2004

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1073	Multiples lines of empirical research positively correlate post-fire logging with increased fire hazard and severity of later fire events (Donato et al. 2006, Odion et al. 2004, Thompson et al. 2007, Weatherspoon and Skinner 1995).	Weatherspoon and Skinner 1995
1073	It also will increase the likelihood of severe soil heating with corresponding losses of productivity (Reinhardt and Ryan 1998).	Reinhardt and Ryan 1998
1073	Fire hazard and risk are further enhanced by a high density of existing roads in the action area where unplanned ignitions from human activity are most likely to occur (DellaSala and Frost 2001, USDA 2000).	DellaSala and Frost 2001
1073	Fire hazard and risk are further enhanced by a high density of existing roads in the action area where unplanned ignitions from human activity are most likely to occur (DellaSala and Frost 2001, USDA 2000).	USDA 2000
1073	The Forest Service should give a hard look to potentially significant effects of post-fire logging on public health and safety, including foreseeable wildland fire control efforts. It should disclose post-logging fuel load and fire hazard in the project area at the scale of each activity unit. Field data collection and “ground truthing” are fundamental standards of professional integrity (Weatherspoon and Skinner 1996: 1488): Mapping should utilize the best sampling strategies combining remote sensing imagery (perhaps at several scales) and ground truthing. The reliability of existing vegetation maps should be verified before they are incorporated into the database. Fire-relevant attributes of vegetation (including understory composition and structure, and vertical and horizontal continuity) need to be characterized adequately. Similarly, surface fuels should be described, utilizing field-verified vegetation/fuels correlations to the extent feasible.	Weatherspoon and Skinner 1996: 1488
1073	Planar intercept transects (Brown 1974) permit land managers to quickly and accurately quantify woody surface fuel, litter and duff.	Brown 1974
1073	Other common field methods facilitate accurate quantification of canopy fuel structure to inform analysis of potential slash loading (e.g., Lutes et al. 2006).	Lutes et al. 2006

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1073	Plantations created after logging feature accumulated slash that is more resistant to control than would occur in an unlogged, burned forest occupied by snags, live brush, forbs and grass, even with large downed logs accumulated on the ground (Amaranthus et al. 1989).	Amaranthus et al. 1989
1073	Plantations are far more susceptible to intense fire behavior and severe fire effects than unlogged, burned forests (Thompson et al. 2007, Weatherspoon and Skinner 1995), particularly where logging slash is not treated (Donato et al. 2006, Odion et al. 2004).	Weatherspoon and Skinner 1995
1073	Plantations are far more susceptible to intense fire behavior and severe fire effects than unlogged, burned forests (Thompson et al. 2007, Weatherspoon and Skinner 1995), particularly where logging slash is not treated (Donato et al. 2006, Odion et al. 2004).	Odion et al. 2004
1073	Tree plantations placed near roads are highly susceptible to elevated risk of unplanned ignition due to human activities (USDA 2000) and invasion by exotic grasses with poor resistance to fire (DellaSala and Frost 2001).	USDA 2000
1073	Tree plantations placed near roads are highly susceptible to elevated risk of unplanned ignition due to human activities (USDA 2000) and invasion by exotic grasses with poor resistance to fire (DellaSala and Frost 2001).	DellaSala and Frost 2001
1073	The distribution of even-aged tree plantations at a landscape scale has altered fire behavior and effects by creating “a self-reinforcing cycle of catastrophic fire” that is perpetuated by the proposed action (Perry 1995).	Perry 1995
1073	Indeed, portions of the Beaver Creek, Whites and Happy Camp Complex fires demonstrate this phenomenon. An impact statement should give a hard look to significant cumulative effects, and consider the degree to which forest recovery objectives may be met without tree planting (Shatford et al. 2007).	Shatford et al. 2007

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1073	(1996: 128). On page 130, the same study reported: Blue stain probably causes the largest economic loss associated with the use of 1-yrdead pine saw timber. Most affected by stain are lumber products (Select, Shop, and Moulding lumber) that are graded for appearance (Fahey 1980) and typically manufactured from the outer portion (sapwood) of a log. Species used for these products or ones that have a high proportion of sapwood, such as ponderosa and sugar pine, will experience greater value losses. The sapwood in ponderosa pine makes up 50 to 75% of a tree's gross cubic volume and in sugar pine constitutes 25 to 70% of a tree's gross cubic volume (Kimmey 1955). In this study, the sapwood of sugar pine was almost entirely blue stained and that of ponderosa pine stained in a streaked pattern 1 yr. after fire kill. This was more than what Kimmey (1955) observed in sugar pine. Both this, and the Kimmey (1955) study, found no blue stain in true fir or Douglas-fir.	Fahey 1980
1073	(1996: 128). On page 130, the same study reported: Blue stain probably causes the largest economic loss associated with the use of 1-yrdead pine saw timber. Most affected by stain are lumber products (Select, Shop, and Moulding lumber) that are graded for appearance (Fahey 1980) and typically manufactured from the outer portion (sapwood) of a log. Species used for these products or ones that have a high proportion of sapwood, such as ponderosa and sugar pine, will experience greater value losses. The sapwood in ponderosa pine makes up 50 to 75% of a tree's gross cubic volume and in sugar pine constitutes 25 to 70% of a tree's gross cubic volume (Kimmey 1955). In this study, the sapwood of sugar pine was almost entirely blue stained and that of ponderosa pine stained in a streaked pattern 1 yr. after fire kill. This was more than what Kimmey (1955) observed in sugar pine. Both this, and the Kimmey (1955) study, found no blue stain in true fir or Douglas-fir.	Kimmey 1955
1073	The Canadian Wood Council describes blue stain as a “benign discoloration” that “has little or no effect on the performance of construction lumber.” (Canadian Wood Council)	Canadian Wood Council
1073	Some people like the decorative look produced in wood by blue stain (USFS 2002).	USFS 2002

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1073	It will impair fire resilience of affected lands by removing snags that feature high surface area-to-volume ("S/V") ratios that limit the amount of oxygen feeding combustion and high water content that dampens fire intensity (Amaranthus et al. 1989, DellaSala et al. 2004).	Amaranthus et al. 1989
1073	It will impair fire resilience of affected lands by removing snags that feature high surface area-to-volume ("S/V") ratios that limit the amount of oxygen feeding combustion and high water content that dampens fire intensity (Amaranthus et al. 1989, DellaSala et al. 2004).	DellaSala et al. 2004
1073	Large standing snags and downed logs obstruct solar radiation, moderate ground surface temperature, elevate moisture content of surface fuels and regenerating vegetation, and reduce the speed and variability of surface winds, all of which inhibit extreme fire behavior and moderate the severity of fire effects compared to sites cleared of large woody structure by logging operations (Arno 2000, Countryman 1955, McIver and Starr 2000, Rothermel 1991, Sexton 1994).	Arno 2000
1073	Large standing snags and downed logs obstruct solar radiation, moderate ground surface temperature, elevate moisture content of surface fuels and regenerating vegetation, and reduce the speed and variability of surface winds, all of which inhibit extreme fire behavior and moderate the severity of fire effects compared to sites cleared of large woody structure by logging operations (Arno 2000, Countryman 1955, McIver and Starr 2000, Rothermel 1991, Sexton 1994).	Countryman 1955
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1073	Large standing snags and downed logs obstruct solar radiation, moderate ground surface temperature, elevate moisture content of surface fuels and regenerating vegetation, and reduce the speed and variability of surface winds, all of which inhibit extreme fire behavior and moderate the severity of fire effects compared to sites cleared of large woody structure by logging operations (Arno 2000, Countryman 1955, McIver and Starr 2000, Rothermel 1991, Sexton 1994).	Sexton 1994
1073	When snags fall to the ground, their relative flammability increases, but the time required for snags to fall is proportional to their size. It may take as long as 20 years for fire-killed ponderosa pines of relatively small (six-to-nine inches) diameter to fall, and Forest Service research suggests that larger ponderosa pines and Douglas-firs can remain standing for up to 80 years after fire (Harrod et al. 1998).	Harrod et al. 1998
1073	Once on the ground, larger (>9 inches diameter) logs do not readily ignite due to high S/V ratios and water content unless they are very dry and located in close proximity to each other – i.e., less than one log diameter apart (Albini and Reinhardt 1997).	Albini and Reinhardt 1997
1073	Smoldering combustion may cause severe fire effects to soil, but such effects are spatially localized to the soil underlying and adjacent to the burning log and are not widespread (Monsanto and Agee 2008).	Monsanto and Agee 2008
1073	Wildland fires burning in heavy (1000-hour) fuels such as large downed logs tend to move slowly and, depending on their spatial arrangement and moisture, the presence of such large woody fuels can dampen fire intensity (Rothermel 1991).	Rothermel 1991
1073	Indeed, the centers of large logs can be cool and moist even when the outer shell of a log is on fire (Amaranthus et al. 1989).	Amaranthus et al. 1989

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1073	Large downed logs are “fire shelters” that enable a number of wildlife species as well as fungi and other flora essential to post-fire recovery to survive and flourish after fire disturbance (Bull et al. 1997, Harrod et al. 1998, Maser et al. 1988).	Bull et al. 1997
1073	Large downed logs are “fire shelters” that enable a number of wildlife species as well as fungi and other flora essential to post-fire recovery to survive and flourish after fire disturbance (Bull et al. 1997, Harrod et al. 1998, Maser et al. 1988).	Harrod et al. 1998
1073	Large downed logs are “fire shelters” that enable a number of wildlife species as well as fungi and other flora essential to post-fire recovery to survive and flourish after fire disturbance (Bull et al. 1997, Harrod et al. 1998, Maser et al. 1988).	Maser et al. 1988
1073	Live vegetation has greater moisture content and is less prone to ignite and carry fire than dead woody fuel (Reinhardt and Ryan 1998).	Reinhardt and Ryan 1998
1073	Live and dead fuels in early-seral forest populated by standing snags, large downed logs and live vegetation (e.g., shrubs and grass) are less likely than slash-loaded sites occupied by even-age tree plantations, such as will be created by the proposed action, to feed intense fire behavior or a severe “reburn” (Odion et al. 2004, Weatherspoon and Skinner 1995).	Odion et al. 2004
1073	Live and dead fuels in early-seral forest populated by standing snags, large downed logs and live vegetation (e.g., shrubs and grass) are less likely than slash-loaded sites occupied by even-age tree plantations, such as will be created by the proposed action, to feed intense fire behavior or a severe “reburn” (Odion et al. 2004, Weatherspoon and Skinner 1995).	Weatherspoon and Skinner 1995
1073	Moreover, post-fire logging has been observed to inhibit development of early-seral vegetation and create novel environments exhibiting low resilience to subsequent fire disturbance (Donato et al. 2006, Hanson and Stuart 2005, Reinhardt and Ryan 1998, Thompson et al. 2007).	Hanson and Stuart 2005
1073	Moreover, post-fire logging has been observed to inhibit development of early-seral vegetation and create novel environments exhibiting low resilience to subsequent fire disturbance (Donato et al. 2006, Hanson and Stuart 2005, Reinhardt and Ryan 1998, Thompson et al. 2007).	Reinhardt and Ryan 1998

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1073	Fire-killed snags and large downed logs are moisture reservoirs and important sanctuaries and food for mychorrhizal fungi that fix nitrogen and stimulate forest recovery after fire (Amaranthus et al. 1989, DeBano et al. 1998, Wright and Bailey 1982).	Amaranthus et al. 1989
1073	Fire-killed snags and large downed logs are moisture reservoirs and important sanctuaries and food for mychorrhizal fungi that fix nitrogen and stimulate forest recovery after fire (Amaranthus et al. 1989, DeBano et al. 1998, Wright and Bailey 1982).	DeBano et al. 1998
1073	Fire-killed snags and large downed logs are moisture reservoirs and important sanctuaries and food for mychorrhizal fungi that fix nitrogen and stimulate forest recovery after fire (Amaranthus et al. 1989, DeBano et al. 1998, Wright and Bailey 1982).	Wright and Bailey 1982
1073	Perry and Amaranthus (1997) refer to those organisms as “keystone habitat elements.”	Perry and Amaranthus (1997)
1073	Nitrogen is the most limited nutrient in forest ecosystems (Wright and Bailey 1982).	Wright and Bailey 1982
1073	Combustion of significant quantities of organic matter, as occurred in the Oregon Gulch fire, can volatilize nitrogen and reduce its total supply in the ecosystem, making the fixation of available nitrogen by mychorrhizal fungi that are associated with downed logs fundamental to post-fire soil recovery and plant growth (DeBano et al. 1998).	DeBano et al. 1998
1073	“Losses of N during a fire could adversely affect long-term productivity of many ecosystems, particularly if N replenishment mechanisms are not provided during postfire management” (DeBano et al. 1998: 112).	DeBano et al. 1998: 112
1073	For these reasons, fire-killed snags, especially larger snags that can remain standing for many decades after fire, are disproportionately important to long-term forest recovery and productivity because they offer the best storage of organic matter and moisture in the ecosystem (Lindenmayer et al. 2008).	Lindenmayer et al. 2008

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1073	Movement of vehicles and logging equipment on burned soils increases the likelihood of exotic weed invasion with potentially significant effects to forest composition and recovery after fire disturbance (Brooks et al. 2004, Lindenmayer et al. 2008).	Brooks et al. 2004
1073	Movement of vehicles and logging equipment on burned soils increases the likelihood of exotic weed invasion with potentially significant effects to forest composition and recovery after fire disturbance (Brooks et al. 2004, Lindenmayer et al. 2008).	Lindenmayer et al. 2008
1073	Snag removal may impair regeneration of nitrogen-fixing shrub and forb species (Reinhardt and Ryan 1998), and untreated logging slash can inhibit plant growth (Hanson and Stuart 2005).	Reinhardt and Ryan 1998
1073	Snag removal may impair regeneration of nitrogen-fixing shrub and forb species (Reinhardt and Ryan 1998), and untreated logging slash can inhibit plant growth (Hanson and Stuart 2005).	Hanson and Stuart 2005
1073	Loss of soil productivity and its deleterious effect on tree growth is a costly impact of post-fire logging given planning directives to ensure sustained yield (Beschta et al. 2004, Lindenmayer et al. 2008).	Beschta et al. 2004
1073	Loss of soil productivity and its deleterious effect on tree growth is a costly impact of post-fire logging given planning directives to ensure sustained yield (Beschta et al. 2004, Lindenmayer et al. 2008).	Lindenmayer et al. 2008
1073	More, inhibited plant regeneration may preclude stabilization of burned slopes and accelerate loss of topsoil and sedimentation of aquatic habitats compared to a scenario in which post-fire logging does not occur (Beschta et al. 2004, Karr et al. 2004, Noss et al. 2006).	Beschta et al. 2004
1073	McIver and McNeil (2006) observed that ground-based logging on 84 hectares of severely burned forest in eastern Oregon using a D6 tractor crawler and rubber tired skidders on slopes averaging 15% outside of riparian areas caused significant and measurable soil erosion.	McIver and McNeil (2006)

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1073	No new roads were constructed in that study area and erosion control practices included: (1) spacing of skid trails at 30-meter intervals, (2) placement of water bars at 10-meter vertical spacing, and (3) grass seeding of skid trails (McIver and McNeil 2006: 125-26).	McIver and McNeil 2006: 125-26
1073	"Tree mortality was negatively correlated with the mass of forest floor remaining after the fire (Figure 2: r- 2 = 0.87; P <0.0001; n = 8) and was positively correlated with the percent mineral soil exposed for those units measured within one year after the fire" (128).	McIver and McNeil 2006: 128
1073	Table 4 (129) quantifies sediment measured at interception fences in the logged area: • 19.3 liters below a road drain dip at the bottom of a cutting unit. • 2.7 liters in a draw at the head of a scoured channel where skidding occurred. • 2.8 liters in a draw bottom where no skidding occurred.	McIver and McNeil 2006: Table 4 (129)
1073	The greatest amount of soil movement was observed where roads existed adjacent to downslope cutting units (129- 30).	McIver and McNeil 2006: 129- 30
1073	Measurements occurred in the summer after logging operations were completed and probably failed to record the main flush of sediment that occurred during logging operations (McIver and McNeil 2006: 123).	McIver and McNeil 2006: 123
1073	Therefore, quantities of observed sediment transport "should be considered as representative of the low end of the range that would be expected in a postfire tractor logging operation … under similar burn severity conditions" (123).	McIver and McNeil 2006: 123
1073	A key finding of McIver and McNeil (2006) is that "Changes in mean percent area displaced were highly correlated with changes in stem density (Figure 4: r-2 = 0.69; P < 0.001)."	McIver and McNeil 2006
1073	Swank and others (1989) estimated that while erosion after logging was seven times greater than in undisturbed areas, erosion rates on landings and roads were 100 times those of undisturbed areas.	Swank and others (1989)
1073	It is likely that roads contribute to degraded watershed hydrology and elevated sediment delivery in a post-fire environment similar to in unburned forest (Beschta et al. 2004, McIver and Starr 2000, Karr et al. 2004).	Beschta et al. 2004

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1073	Roads contribute more sediment to streams than any other anthropogenic feature on the landscape (Gibbons and Salo 1973, Meehan 1991).	Gibbons and Salo 1973
1073	Roads contribute more sediment to streams than any other anthropogenic feature on the landscape (Gibbons and Salo 1973, Meehan 1991).	Meehan 1991
1073	Road-stream crossings cause significant downstream sedimentation, largely resulting from channel fill around culverts and subsequent road crossing failures (Furniss et al. 1991, Trombulak and Frissell 2000).	Furniss et al. 1991
1073	Road-stream crossings cause significant downstream sedimentation, largely resulting from channel fill around culverts and subsequent road crossing failures (Furniss et al. 1991, Trombulak and Frissell 2000).	Trombulak and Frissell 2000
1073	Road-stream crossings create unnatural channel width, slope and streambed form both upstream and downstream from the crossings, and these alterations of channel morphology can persist for long periods (Heede 1980).	Heede 1980
1073	Channelized stream sections resulting from rip-rapping roads adjacent to stream channels are directly affected by sediment from side casting and road grading, and such activities can trigger fill slope erosion and failures (Gucinski et al. 2001).	Gucinski et al. 2001
1073	Endicott (2008: 4) reported: Unpaved roads and stream crossings are the major source of erosion from forest lands (Anderson et al., 1976, Megahan and Kidd, 1972; Patric, 1976; Rothwell, 1983), contributing up to 90% of the total sediment production from forestry operations. Surface erosion rates from roads are typically at least an order of magnitude greater than rates from harvested areas, and as much as three orders of magnitude (1,000 times) greater than erosion rates from undisturbed forest soils (NCASI, 2001).	Anderson et al., 1976

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1073	A large body of literature describes cumulative effects of timber harvest and forest roads to amphibians, fishes and aquatic mollusks (e.g., Karraker and Welsh 2006, Marsh and Beckman 2004, Semlitsch et al. 2009, Trombulak and Frissell 2000).	Karraker and Welsh 2006
1073	A large body of literature describes cumulative effects of timber harvest and forest roads to amphibians, fishes and aquatic mollusks (e.g., Karraker and Welsh 2006, Marsh and Beckman 2004, Semlitsch et al. 2009, Trombulak and Frissell 2000).	Marsh and Beckman 2004
1073	A large body of literature describes cumulative effects of timber harvest and forest roads to amphibians, fishes and aquatic mollusks (e.g., Karraker and Welsh 2006, Marsh and Beckman 2004, Semlitsch et al. 2009, Trombulak and Frissell 2000).	Semlitsch et al. 2009
1073	A large body of literature describes cumulative effects of timber harvest and forest roads to amphibians, fishes and aquatic mollusks (e.g., Karraker and Welsh 2006, Marsh and Beckman 2004, Semlitsch et al. 2009, Trombulak and Frissell 2000).	Trombulak and Frissell 2000
1073	Few studies have measured the combined effects of fire, timber harvest and road use in a context similar to the proposed action (but see, e.g., Beschta et al. 2004, Bisson et al. 2003, Karr et al. 2004).	Beschta et al. 2004
1073	Few studies have measured the combined effects of fire, timber harvest and road use in a context similar to the proposed action (but see, e.g., Beschta et al. 2004, Bisson et al. 2003, Karr et al. 2004).	Bisson et al. 2003
1073	The combined effects of fire, suppression activities, salvage logging and road use to sensitive species could be significant if they reduce large wood input to riparian habitat, increase soil heating or thermal loading in streams, impair hydrologic recovery, or accelerate landslide movement or surface erosion (Beschta et al. 2004, Karr et al. 2004, Lindenmayer and Noss 2006).	Beschta et al. 2004

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1073	Synergistic effects of fire, suppression activities, timber harvest and roads may be more pronounced for isolated populations of sensitive species that experience high physiological costs of dispersal or reduced likelihood of interaction with neighboring populations (Hossack and Pilliod 2011).	Hossack and Pilliod 2011
1073	Scientific controversy and uncertainty exist regarding the effectiveness of stream buffers at filtering overland flows and sediment delivery (Reeves et al. 2006).	Reeves et al. 2006
1073	Surface and subsurface hydrology are keys to accurate prediction of the effectiveness of riparian vegetation in trapping sediment (Gilliam 1994).	Gilliam 1994
1073	Sediment accumulation and trapping efficiency of stream buffers has not been modeled or monitored in the action area (Dillaha and Inamdar 1996).	Dillaha and Inamdar 1996
1073	Food composition and breeding habitat in burned forests support unique bird communities with many species dependent on stand-replacement fires (Hutto 2006, Kotliar et al. 2007).	Kotliar et al. 2007
1073	Some predatory birds such as spotted owl prefer burned forest as foraging habitat (Bond et al. 2009, Clark 2007).	Clark 2007
1073	Post-fire logging is known to change bird species composition in affected forests, reflecting effects of snag and large woody debris removal (Clark et al. 2013, Clark et al. 2011, Hutto and Gallo 2006, Smucker et al. 2005, Kotliar et al. 2002).	Smucker et al. 2005
1073	Post-fire logging is known to change bird species composition in affected forests, reflecting effects of snag and large woody debris removal (Clark et al. 2013, Clark et al. 2011, Hutto and Gallo 2006, Smucker et al. 2005, Kotliar et al. 2002).	Kotliar et al. 2002
1073	For example, black-backed woodpecker consistently shows avoidance of, and negative responses to, post-fire logging (Tingley et al. 2014, Seavey et al. 2012, Hutto and Gallo 2006, Saab and Dudley 1998, Caton 1996, Hitchcox 1996, Hutto 1995).	Saab and Dudley 1998

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1073	Bond and others (2010, 2009, 2002) found that spotted owls preferentially use severely burned forests for foraging due to favorable prey response as a result of fire-stimulated plant understory production.	Bond and others (2002)
1073	“Retaining large diameter snags surrounded by higher basal area of live and/or dead trees should help retain fire-killed snags longer” (Chambers and Mast 2005: 238).	Chambers and Mast 2005: 238
1073	Russell and others (2006: 186) reported, “Postfire salvage logging increased the rates at which snags fell and shortened the time span for providing suitable cavity-nesting bird habitat.”	Russell and others (2006: 186)
1073	Standards and guidelines for coarse wood retention are predicated on the biological needs of species associated with unburned forest, and they are not meaningful in a post-fire environment (Lee et al. 2012, Hutto 2008, Hutto 2006).	Lee et al. 2012
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1073	A substantial body of literature identifies livestock grazing as a major factor in the alteration of historic fire regimes (Arnold 1950, Rummell 1951, Cooper 1960, Madany and West 1983, Savage and Swetnam 1994, Belsky and Blumenthal 1997, Brooks et al. 2004).	Arnold 1950
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1073	A substantial body of literature identifies livestock grazing as a major factor in the alteration of historic fire regimes (Arnold 1950, Rummell 1951, Cooper 1960, Madany and West 1983, Savage and Swetnam 1994, Belsky and Blumenthal 1997, Brooks et al. 2004).	Cooper 1960
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1073	A substantial body of literature identifies livestock grazing as a major factor in the alteration of historic fire regimes (Arnold 1950, Rummell 1951, Cooper 1960, Madany and West 1983, Savage and Swetnam 1994, Belsky and Blumenthal 1997, Brooks et al. 2004).	Belsky and Blumenthal 1997
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1073	Exotic grasses can displace native species because the latter are not adapted to frequent and close grazing (Mack and Thompson 1982, Belsky and Blumenthal 1997).	Mack and Thompson 1982

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1073	Exotic grasses can displace native species because the latter are not adapted to frequent and close grazing (Mack and Thompson 1982, Belsky and Blumenthal 1997).	Belsky and Blumenthal 1997
1073	Foreseeable grazing in the action area may cause significant cumulative effects to burned soil, plant reproduction and community composition, wildlife forage and fire regime (Bradley 2009).	Bradley 2009
1073	Long-term implications for natural communities in fire-adapted ecosystems are profound (Billings 1990, Brooks et al. 2004, Cooper 1960, Mack 1981).	Billings 1990
1073	Long-term implications for natural communities in fire-adapted ecosystems are profound (Billings 1990, Brooks et al. 2004, Cooper 1960, Mack 1981).	Brooks et al. 2004
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1073	Long-term implications for natural communities in fire-adapted ecosystems are profound (Billings 1990, Brooks et al. 2004, Cooper 1960, Mack 1981).	Mack 1981
1073	Backer and others (2004) described numerous environmental effects that may be significant in this context including: • Soil damage from emergency road, fire line or helispot construction. • Hydrologic impacts caused by roads, fire lines and artificial clearings, which disrupt soil infiltration by water and route overland water flow. • Chemical pollution of water and soil from aerial flame retardant drops. • Destruction of snags and other ecologically significant large woody debris. • Spread of highly flammable exotic plants.	Backer and others (2004)
1089	"Prioritize land allocations: emphasize work that can be done on matrix lands and those along existing roads." -American Forest Resources Council Westside Fire Recovery Project Scoping Comments, 10/30/14. Page 2.	American Forest Resources Council Westside Fire Recovery Project Scoping Comments, 10/30/14 Page 2
1089	Attachment 2 is a peer-reviewed study conducted by Odion et al. entitled Fire Severity in Conifer Forests in the Sierra Nevada, California published in Ecosystems, 2006, 9, 1177-1189.	Odion et al 2006

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1089	In: George, T.L. and D.S. Dobkin. Effects of habitat fragmentation on birds in western landscapes: contrasts with paradigms from the eastern United States. Studies in Avian Biology No. 25. Camarillo, CA: Cooper Ornithological Society. p. 49-64.	George & Dobkin
1089	Postfire salvage logging generally damages soils by compacting them, by removing vital organic material, and by increasing the amount and duration of topsoil erosion and runoff (Kattleman 1996), which in turn harms aquatic ecosystems.	Kattleman 1996
1089	The removal of burned trees that provide shade may hamper tree regeneration, especially on high-elevation or dry sites (Perry et al.1989).	Perry et al.1989
1089	The loss of future soil organic matter is likely to translate into soils that are less able to hold moisture (Jenny 1980), with implications for soil biota, plant growth (Rose et al.2001, Brown et al. 2003),, and stream flow (Waring and Schlesinger 1985).	Jenny 1980
1089	The loss of future soil organic matter is likely to translate into soils that are less able to hold moisture (Jenny 1980), with implications for soil biota, plant growth (Rose et al.2001, Brown et al. 2003),, and stream flow (Waring and Schlesinger 1985).	Rose et al.2001
1089	The loss of future soil organic matter is likely to translate into soils that are less able to hold moisture (Jenny 1980), with implications for soil biota, plant growth (Rose et al.2001, Brown et al. 2003),, and stream flow (Waring and Schlesinger 1985).	Brown et al. 2003
1089	The loss of future soil organic matter is likely to translate into soils that are less able to hold moisture (Jenny 1980), with implications for soil biota, plant growth (Rose et al.2001, Brown et al. 2003),, and stream flow (Waring and Schlesinger 1985).	Waring and Schlesinger 1985
1089	Logging and associated roads carry a high risk of spreading nonindigenous, weedy species (CWWR 1996, Beschta et al. 2004).	CWWR 1996
1089	These changes alter the character of river channels and harm aquatic species ranging from invertebrates to fishes (Waters 1995).	Waters 1995

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1089	By altering the character and condition of forest vegetation, salvage logging after a fire changes forest fuels and can increase the severity of subsequent fires (CWWR 1996, Odion et al. 2004).	CWWR 1996
1089	Attachment 20 is a 2009 peer-reviewed article by Bond et al that appeared in the Journal of Wildlife Management entitled Habitat Use and Selection by California Spotted Owls in a Postfire Landscape.	Bond et al 2009
1089	"Plantations are extremely flammable because of high crown to trunk ratio and because crowns are very close to the ground." -Upper South Fork Trinity River Happy Camp Creek Watershed Analysis, Shasta-Trinity National Forest at page 21.	
1089	Tree plantations are more susceptible to intense fire behavior and severe fire effects than unlogged mature forests, including burned forests (DellaSala et al. 1995, Odion et al. 2004).	DellaSala et al. 1995
1089	Structural characteristics, such as fine and interlocking branch structures situated low to the ground, which facilitate high heat energy output by fire and rapid fire spread (Sapsis and Brandow 1997).	Sapsis and Brandow 1997
1089	Warm, windy and dry microclimates compared to what would exist in an unlogged burned forest that possessed more structural diversity, ground shading and barriers to lateral wind movement (Countryman 1955, van Wagtendonk 1996).	Countryman 1955
1089	Warm, windy and dry microclimates compared to what would exist in an unlogged burned forest that possessed more structural diversity, ground shading and barriers to lateral wind movement (Countryman 1955, van Wagtendonk 1996).	van Wagtendonk 1996
1089	Accumulations of large volumes of fine logging slash on the ground surface (Weatherspoon and Skinner 1995).	Weatherspoon and Skinner 1995
1089	The number and distribution of even-age tree plantations resulting from industrial timber management has altered fire behavior and effects at both stand and landscape scales in the Siskiyou National Forest and Grants Pass Resource Area (Frost and Sweeny 2000, Hann et al. 1997, Huff et al. 1995).	Frost and Sweeny 2000

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1089	The number and distribution of even-age tree plantations resulting from industrial timber management has altered fire behavior and effects at both stand and landscape scales in the Siskiyou National Forest and Grants Pass Resource Area (Frost and Sweeny 2000, Hann et al. 1997, Huff et al. 1995).	Hann et al. 1997
1089	The number and distribution of even-age tree plantations resulting from industrial timber management has altered fire behavior and effects at both stand and landscape scales in the Siskiyou National Forest and Grants Pass Resource Area (Frost and Sweeny 2000, Hann et al. 1997, Huff et al. 1995).	Huff et al. 1995
1089	Perry (1995) suggests that the existence of sufficient young tree patches on a forest landscape creates the potential for “a self-reinforcing cycle of catastrophic fires.”	Perry (1995)
1089	Most plantations occur near roads (DellaSala and Frost 2001), which presents an added risk of human-caused ignitions during hot and dry conditions (USDA 2000).	DellaSala and Frost 2001
1089	Most plantations occur near roads (DellaSala and Frost 2001), which presents an added risk of human-caused ignitions during hot and dry conditions (USDA 2000).	USDA 2000
1089	In the project area, where post-fire fuel loading is currently low, logging without timely slash treatment is likely to be the single most important factor that will contribute to an increase in potential wildfire severity (Weatherspoon 1996).	Weatherspoon 1996
1089	There is no scientific, empirical evidence to prove that the presence of large-diameter standing or downed fuels translates into high fire hazard. Besechta et al. (1995) stated, "We are aware of no evidence supporting the contention that leaving large dead woody material significantly increases the probability of reburn" (p. 11).	Besechta et al. (1995)
1089	The Besechta Report prompted responses by agency scientists. These included Everett (1995): "There is no support in the scientific literature that the probability of reburn is greater in post-fire tree retention areas than in salvage logged sites…The authors are correct that the intense reburn concept is not reported in the literature" (p. 4).	Everett (1995)

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1089	The Forest Service's Pacific Northwest Research Station reviewed the scientific literature and concurred that, "Following Besechta and others (1995) and Everett (1995), we found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged" (McIver and Starr 2000).	Besechta and others (1995)
1089	The Forest Service's Pacific Northwest Research Station reviewed the scientific literature and concurred that, "Following Besechta and others (1995) and Everett (1995), we found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged" (McIver and Starr 2000).	Everett (1995)
1089	The Forest Service's Pacific Northwest Research Station reviewed the scientific literature and concurred that, "Following Besechta and others (1995) and Everett (1995), we found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged" (McIver and Starr 2000).	McIver and Starr 2000
1089	This issue is highly significant because other federal land agencies have acknowledged in NEPA documents that fine woody material up to three inches in diameter, such as the tops of trees, has the greatest influence on the rate of spread and flame length of a fire, which has direct impacts on fire suppression efforts (e.g., USDI 2002, USDA 1994).	USDI 2002
1089	This issue is highly significant because other federal land agencies have acknowledged in NEPA documents that fine woody material up to three inches in diameter, such as the tops of trees, has the greatest influence on the rate of spread and flame length of a fire, which has direct impacts on fire suppression efforts (e.g., USDI 2002, USDA 1994).	USDA 1994
1089	With this immediate change in the project area's fuel model, higher rates of fire spread and greater flame lengths would occur (Rothermel 1991).	Rothermel 1991
1089	Compaction reduces soil productivity through a reduction in root growth, tree height, and timber volume (Greacen and Sands 1980; Froehlich and McNabb 1984) and may be produced by a single pass of logging equipment across a site (Wronski 1984).	Greacen and Sands 1980

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1089	Compaction reduces soil productivity through a reduction in root growth, tree height, and timber volume (Greacen and Sands 1980; Froehlich and McNabb 1984) and may be produced by a single pass of logging equipment across a site (Wronski 1984).	Wronski 1984
1089	Productivity losses have been documented for whole sites (West and Thomas 1981) and for individual trees (Froehlich 1979, Helms and Hipkin 1986).	West and Thomas 1981
1089	Productivity losses have been documented for whole sites (West and Thomas 1981) and for individual trees (Froehlich 1979, Helms and Hipkin 1986).	Froehlich 1979
1089	Productivity losses have been documented for whole sites (West and Thomas 1981) and for individual trees (Froehlich 1979, Helms and Hipkin 1986).	Helms and Hipkin 1986
1089	Decreases in important microbial populations have also been observed in compacted soils (Amaranthus et al. 1996.)	Amaranthus et al. 1996
1089	Soil compaction may also increase surface runoff because of reducing infiltration (Graecen and Sands 1980.)	Graecen and Sands 1980
1089	Removal of the loose, organic surface materials promotes surface sealing and crusting that decreases infiltration capacity and may increase erosion (Child et. Al. 1989.)	Child et al 1989
1089	Soil displacement also results in a loss of important soil biota, such as mycorrhizal fungi, which facilitates nutrient uptake by plants (Amaranthus et al. 1989 and 1996.)	Amaranthus et al. 1989
1089	Soil displacement also results in a loss of important soil biota, such as mycorrhizal fungi, which facilitates nutrient uptake by plants (Amaranthus et al. 1989 and 1996.)	Amaranthus et al 1996

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1089	The Forest Service's apparent assumption that higher-intensity fire areas will not naturally regenerate with conifers effectively is not supported by any citation to scientific literature, and is directly contradicted by Forest Service data regarding natural post-fire conifer regeneration in large high-intensity fire patches (Collins et al. 2010).	Collins et al. 2010
1089	Specifically, the Forest Service found vigorous natural post-fire forest regeneration, dominated mostly by pines and oaks for trees over 1 centimeter in diameter at breast height (Collins et al. 2010, Table 5), and hundreds of trees per acre overall, within several years to about a decade after high-intensity fire, even where native shrub cover was 90- 100% (Collins et al. 2010, Tables 5 and 6).	Collins et al. 2010, Table 5
1089	Specifically, the Forest Service found vigorous natural post-fire forest regeneration, dominated mostly by pines and oaks for trees over 1 centimeter in diameter at breast height (Collins et al. 2010, Table 5), and hundreds of trees per acre overall, within several years to about a decade after high-intensity fire, even where native shrub cover was 90- 100% (Collins et al. 2010, Tables 5 and 6).	Collins et al. 2010, Tables 5 and 6
1089	And, while a more recent report from Collins et al. (Plumas Lassen Study 2011 Annual Report) claims to find little natural conifer regeneration in many high-severity fire areas this is misleading in light of the fact that nearly half of the area surveyed had been subjected to intensive post-fire logging, which damages soils and removes or destroys natural seed sources—and many of the areas that were not post-fire salvage logged were pre-fire clearcut.	Plumas Lassen Study 2011 Annual Report
1089	Further, the results of Collins et al. (2010 [Table 5]), who found and reported substantial natural conifer regeneration—especially ponderosa pine and sugar pine—in high intensity fire patches, excluded salvage logged areas, unlike Collins et al. (2011).	Collins et al. (2010 [Table 5])
1089	Further, the results of Collins et al. (2010 [Table 5]), who found and reported substantial natural conifer regeneration—especially ponderosa pine and sugar pine—in high intensity fire patches, excluded salvage logged areas, unlike Collins et al. (2011).	Collins et al. (2011)

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1089	Collins et al. (2010) state that "some areas within each of these fires experienced post-fire management, ranging from post fire salvage logging, tree release and weed management.	Collins et al. (2010)
1089	Specifically, Collins et al. (2010 [Table 5]) found 158 ponderosa pine and sugar pine conifers per acre regenerating in high-intensity fire patches in the Storrie fire—68% of the total natural conifer regeneration by species.	Collins et al. (2010 [Table 5])
1089	Moreover, the plots in Collins et al. (2011 [see map]) within the Storrie fire area were concentrated at the edge of the fire in the areas subjected to extensive salvage logging and roadside hazard tree logging, which removes conifer (including pine) seed sources and tramples natural conifer regeneration with ground based machinery (thus, even the plots that technically had not been post-fire logged were often adjacent to logged areas).	Collins et al. (2011 [see map])
1089	Extensive natural conifer regeneration surveys deeper into the Storrie fire, at seven years post-fire, revealed abundant natural conifer regeneration, especially pine (Hanson 2007b [Tables 1 through 4, and Appendix A]).	(Hanson 2007b [Tables 1 through 4, and Appendix A])
1089	In addition, over 95% of the conifer regeneration in Collins et al. (2010, 2011) was under 0.1 cm in diameter at breast height (Collins et al. 2010); the plots used to determine the density of conifers of this size covered only 9 square meters of area per plot, and many high-intensity fire patches in the study only had 3-5 plots for an entire high-intensity fire patch (Collins et al. 2011).	Collins et al. (2010)
1089	In addition, over 95% of the conifer regeneration in Collins et al. (2010, 2011) was under 0.1 cm in diameter at breast height (Collins et al. 2010); the plots used to determine the density of conifers of this size covered only 9 square meters of area per plot, and many high-intensity fire patches in the study only had 3-5 plots for an entire high-intensity fire patch (Collins et al. 2011).	Collins et al. (2011)
1089	Siegel et al. (2011) concluded that native fire-following shrubs are vitally important to biodiversity in complex early seral forest (CESF) created by high-intensity fire: "Many more species occur at high burn severity sites starting several years post-fire, however, and these include the majority of ground and shrub nesters as well as many cavity nesters.	Siegel et al. (2011)

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1089	Similarly, Burnett et al. have found that shrub dominated landscapes are critically important wildlife habitat: "while some snag associated species (e.g. black-backed woodpecker) decline five or six years after a fire [and move on to find more recent fire areas], [species] associated with understory plant communities take [the woodpeckers'] place resulting in similar avian diversity three and eleven years after fire (e.g. Moonlight and Storrie)."	Burnett et al
1089	Similarly, Burnett et al. have found that shrub dominated landscapes are critically important wildlife habitat: "while some snag associated species (e.g. black-backed woodpecker) decline five or six years after a fire [and move on to find more recent fire areas], [species] associated with understory plant communities take [the woodpeckers'] place resulting in similar avian diversity three and eleven years after fire (e.g. Moonlight and Storrie)."	Moonlight and Storrie
1089	(Burnett et al. 2012). Burnett et al. (2012) also noted that "there is a five year lag before dense shrub habitats form that maximize densities of species such as Fox Sparrow, Dusky Flycatcher, and MacGillivray's Warbler. This suggests early successional shrub habitats in burned areas provide high quality habitat for shrub dependent species well beyond a decade after fire." (Burnett et al. 2012).	Burnett et al. 2012
1089	Attachment 23 to these scoping comments is a paper entitled Vegetation Response to a Short Interval Between High-Severity Wildfires in a Mixed-Evergreen Forest by Donato et al in the Journal of Ecology. 2009, Volume 97. 142-154.	Donato et al 2009
1089	A proper consideration of the cumulative impacts of a project requires "some quantified or detailed information;…general statements about possible effects and some risk do not constitute a hard look absent a justifications regarding why more definitive information could not be provided." Ocean Advocates, 361 F.3d at 1128 (quoting Neighbors of Cuddy Mountain v. US Forest Service, 137 F.3d 1372, 1379-80 (9th Cir. 1998)).	Neighbors of Cuddy Mountain v. US Forest Service, 137 F.3d 1372, 1379-80 (9th Cir. 1998)
1089	The analysis "must be more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects." Id. -KS Wild v. BLM 387 F 3d. 15269 (9th Cir. 2004).	KS Wild v. BLM 387 F 3d. 15269 (9th Cir. 2004)

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1089	One of the specific requirements under NEPA is that an agency must consider the effects of the proposed action in the context of all relevant circumstances, such that where "several actions have a cumulative…environmental effect, this consequence must be considered in an EIS." Neighbors of Cutty Mountain v. US Forest Service., 137 F3d 1372, 1378 (9th Cir. 1998) quoting City of Tenakee Springs v. Clough, 915 F.2d 1308, 1312 (9th Cir. 1990)).	Neighbors of Cutty Mountain v. US Forest Service., 137 F3d 1372, 1378 (9th Cir. 1998)
1089	One of the specific requirements under NEPA is that an agency must consider the effects of the proposed action in the context of all relevant circumstances, such that where "several actions have a cumulative…environmental effect, this consequence must be considered in an EIS." Neighbors of Cutty Mountain v. US Forest Service., 137 F3d 1372, 1378 (9th Cir. 1998) quoting City of Tenakee Springs v. Clough, 915 F.2d 1308, 1312 (9th Cir. 1990)).	City of Tenakee Springs v. Clough, 915 F.2d 1308, 1312 (9th Cir. 1990)
1089	Our cases firmly establish that a cumulative effects analysis "must be more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects." Klamath Siskiyou Wildlands Center v. BLM, 387, F.3d 989, 993 (9th Cir. 2004).	Klamath Siskiyou Wildlands Center v. BLM, 387, F.3d 989, 993 (9th Cir. 2004).
1089	See Lands Council v. Powell, 395 F.3d 1019, 1028 (9th Cir. 2005) (holding a cumulative effects analysis violated NEPA because it failed to provide adequate data of the time, place, and scale" and did not explain in detail "how different project plans and harvest methods affects the environment").	Lands Council v. Powell, 395 F.3d 1019, 1028 (9th Cir. 2005)
1089	See Klamath Siskiyou Wildlands Center, 387 F 3d at 996 (finding a cumulative effects analysis inadequate when "it only considers the effects of the very project at issue" and does not "take into account the combined effects that can be expected as a result of undertaking" multiple projects).	Klamath Siskiyou Wildlands Center, 387 F 3d at 996
1089	Oregon Natural Resources Council et al. v. Brong. 9th Circuit. July 24, 2007	Oregon Natural Resources Council et al. v. Brong. 9th Circuit. July 24, 2007

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1089	Backer and others (2004) described numerous potentially significant adverse effects on the environment resulting from the suppression of fire including: • Direct soil damage resulting from emergency road, fire line, and helispot construction. • Hydrological impacts caused by fire lines, which route overland water flow and disrupt soil infiltration. • Chemical pollution of water and soil from aerial flame retardant drops. • Destruction of snags and other ecologically significant large woody debris. • Spread of highly flammable exotic plants.	Backer and others (2004)
1089	The amount of what is NOT known and lack of research is huge as summarized by a 2006 publication at: http://www.frames.gov/rcs/ttrs/19000/19900.html	http://www.frames.gov/rcs/ttrs/19000/19900.html
1089	Scientists have recently recommended that forest managers should ensure the maintenance of moderate and high severity fire patches to maintain populations of numerous native bird species positively associated with fire (Hutto 1995, Hutto 2006, Kotliar et al. 2002, Noss et al. 2006, Smucker et al. 2005).	Noss et al. 2006
1089	At the landscape level, high severity habitat (unlogged) is among the most underrepresented, and rarest, of forest habitat types (Noss et al. 2006).	Noss et al. 2006
1089	Indeed, the current annual spatial extent of wildland fire in California's forests is about one tenth of what it was prior to fire suppression (Medler 2006).	Medler 2006
1089	Forests experiencing high severity burns, or "snag forests", are often incorrectly assumed by land managers to be "damaged" (USDA 2004).	USDA 2004
1089	Peak biodiversity levels of higher plants and vertebrates are found in patches of snag forest habitat—areas where most or all of the trees are killed by fire (Noss et al. 2006), consistent with the principle that pyrodiversity enhances biodiversity, where mixed-severity fire effects occur (Chang 1996).	Noss et al. 2006
1089	Peak biodiversity levels of higher plants and vertebrates are found in patches of snag forest habitat—areas where most or all of the trees are killed by fire (Noss et al. 2006), consistent with the principle that pyrodiversity enhances biodiversity, where mixed-severity fire effects occur (Chang 1996).	Chang 1996

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1089	Fire-induced heterogeneity, including a mix of low, moderate, and high severity patches, leads to higher post-fire understory plant species richness compared to homogeneous low severity fire effects (Chang 1996, Rocca 2004).	Chang 1996
1089	Fire-induced heterogeneity, including a mix of low, moderate, and high severity patches, leads to higher post-fire understory plant species richness compared to homogeneous low severity fire effects (Chang 1996, Rocca 2004).	Rocca 2004
1089	Mixed-severity fire, meaning a heterogeneous mix of high, moderate, and low severity effects, facilitates reproduction of numerous native herbaceous and shrub species (Chang 1996, Rocca 2004), the germination of many of which is triggered by fire-induced heat, charate, or smoke (Biswell 1974, Chang 1996).	Chang 1996
1089	Mixed-severity fire, meaning a heterogeneous mix of high, moderate, and low severity effects, facilitates reproduction of numerous native herbaceous and shrub species (Chang 1996, Rocca 2004), the germination of many of which is triggered by fire-induced heat, charate, or smoke (Biswell 1974, Chang 1996).	Rocca 2004
1089	Mixed-severity fire, meaning a heterogeneous mix of high, moderate, and low severity effects, facilitates reproduction of numerous native herbaceous and shrub species (Chang 1996, Rocca 2004), the germination of many of which is triggered by fire-induced heat, charate, or smoke (Biswell 1974, Chang 1996).	Biswell 1974
1089	And, fire-mediated conifer mortality attracts bark beetles and wood-boring beetles, some species of which have evolved infrared receptors capable of detecting burned forests from over 161 km away (Altman and Sallabanks 2000, Hutto 1995).	Altman and Sallabanks 2000
1089	Other insect species are attracted by the smoke from fires (Smith 2000).	Smith 2000

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1089	Woodpeckers excavate nest cavities in snags and feed upon bark beetle and wood-boring beetle larvae in dead trees; Mountain Bluebirds (Sialia currucoides) and other secondary cavity-nesting species use nest holes created the previous year by woodpeckers; granivores such as the Red Crossbill (Loxia curvirostra) feed upon seed release from cones following fire; shrub-dwelling species like the Blue Grouse (Dendragapus obscurus) nest and forage within shrub growth scattered throughout high severity patches; while aerial insectivores such as the Olive-sided Flycatcher (Contopus cooperi) prey upon the bark beetles that are abundant in snag patches (Altman and Sallabanks 2000, Hutto 1995).	Altman and Sallabanks 2000
1089	The Olive-sided Flycatcher is listed by the U.S. Forest Service as a Species at Risk, meaning that there is significant concern about the viability of its populations due to habitat scarcity and loss (USFS 2001).	USFS 2001
1089	Populations of small mammals experience overall increases shortly after high severity fire, and amphibians are positively associated with the large woody material that gradually accumulates in the decades following such fire effects (Smith 2000).	Smith 2000
1089	As well, ungulates forage upon post-fire flora, and large predators frequently seek their prey in burned patches (Smith 2000).	Smith 2000
1089	Studies have detected higher overall avian species richness in severely burned versus unburned forest in the western United States (Bock and Lynch 1970, Hutto 1995, Raphael and White 1984, Siegel and Wilkerson 2005).	Bock and Lynch 1970
1089	Studies have detected higher overall avian species richness in severely burned versus unburned forest in the western United States (Bock and Lynch 1970, Hutto 1995, Raphael and White 1984, Siegel and Wilkerson 2005).	Raphael and White 1984
1089	Studies have detected higher overall avian species richness in severely burned versus unburned forest in the western United States (Bock and Lynch 1970, Hutto 1995, Raphael and White 1984, Siegel and Wilkerson 2005).	Siegel and Wilkerson 2005
1089	In one snag forest area resulting from the Manter Fire of 2000 in the southern Sierra Nevada, a total of 111 bird species were observed (Siegel and Wilkerson 2005).	Siegel and Wilkerson 2005

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1089	Following the 60,000 ha McNally Fire of 2002 in Sequoia National Forest, Olive-sided Flycatchers were found in the burn area (Siegel and Wilkerson 2005).	Siegel and Wilkerson 2005
1089	This species had previously been considered to be extirpated from Sequoia National Forest, possibly since 1930 (Altman and Sallabanks 2000).	Altman and Sallabanks 2000
1089	Research has also indicated that numerous avian species, including several woodpecker species, exhibit a preference for burned conifer forest habitat (Bock and Lynch 1970, Dixon and Saab 2000, Murphy and Lehnhausen 1998, Granholm 1982, Hutto 1995, Saab et al. 2002, Saab et al. 2004).	Bock and Lynch 1970
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1089	Fire-killed trees provide nesting and foraging habitat for numerous woodpecker species (Hutto 1995, Dixon and Saab 2000).	Dixon and Saab 2000

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1089	Post-fire logging has been described as a threat to such species (Dixon and Saab 2000, Kotliar et al. 2002, Lindenmayer et al. 2004, Murphy and Lehnhausen 1998, Saab et al 2004).	Dixon and Saab 2000
1089	Post-fire logging has been described as a threat to such species (Dixon and Saab 2000, Kotliar et al. 2002, Lindenmayer et al. 2004, Murphy and Lehnhausen 1998, Saab et al 2004).	Lindenmayer et al. 2004
1089	Post-fire logging has been described as a threat to such species (Dixon and Saab 2000, Kotliar et al. 2002, Lindenmayer et al. 2004, Murphy and Lehnhausen 1998, Saab et al 2004).	Murphy and Lehnhausen 1998
1089	Post-fire logging has been described as a threat to such species (Dixon and Saab 2000, Kotliar et al. 2002, Lindenmayer et al. 2004, Murphy and Lehnhausen 1998, Saab et al 2004).	Saab et al 2004
1089	To conserve populations of species which prefer heavily burned forest patches in the eastern Cascades, Altman (2000) recommended that: at least 2% of the forested landscape be maintained in early post-fire habitat; at least 40-50% of such burned stands be retained in an unlogged state; and, where salvage logging does occur, all snags (fire-killed trees) > 51 cm (20 inches) dbh and half of all snags 30-51 cm (12-20 inches) dbh should be retained.	Altman (2000)
1089	There is perhaps no vertebrate species more strongly representative of the snag forest habitat type than the Black-backed Woodpecker (Picoides arcticus) (Hanson 2007, Hutto 1995).	Hanson 2007
1089	This species is a designated Management Indicator Species, acting as a bellwether for the viability of dozens of other species associated with snag forests (USDA 2004).	USDA 2004
1089	One of only two woodpecker species globally with three toes instead of four, the Black-backed Woodpecker is able to deliver exceptionally hard blows due to added heel mobility resulting from the lack of a fourth toe and, as a consequence, it can reach beetle larvae that other woodpecker species cannot (Dixon and Saab 2000).	Dixon and Saab 2000

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1089	One bird eats an astounding 13,500 beetle larvae per year (Hutto, unpublished data). From behind, the all black coloring of this species confers excellent camouflage against the charred bark of a fire-killed tree.	Hutto, unpublished data
1089	Though Black-backed Woodpeckers are occasionally, but rarely, seen outside of stand-replacement burns, forests outside of snag forest habitat are believed to be "sink" habitats which do not support them (Hutto 1995, Dixon and Saab 2000).	Dixon and Saab 2000
1089	Indeed, a recent scientific study of the northern Sierra Nevada and southern Cascades by the Forest Service scientists concluded that: "…it is clear from the scientific data that burned forest, including stand replacing burns [high severity fire patches], provide important bird habitat. The abundance and diversity of woodpecker species generally reaches a peak in recently burned forest. The Black-backed Woodpecker, a rare resident of the northern Sierra forest, predominantly occurs in recently burned forest. Olive-sided Flycatcher, a species declining throughout the Sierra Nevada, has been shown to be strongly associated with burned forest as well. Thus we promote the view that burned forest is important wildlife habitat." (USFS 2006)	USFS 2006
1089	It is the diversity of fire effects that facilitates and maximizes native biodiversity (Connell 1978, Noss et al. 2006).	Connell 1978
1089	It is the diversity of fire effects that facilitates and maximizes native biodiversity (Connell 1978, Noss et al. 2006).	Noss et al. 2006
1089	Please note that Bond 2009 (attached to these scoping comments) recommends forgoing salvage logging activities within 1.5 km of NSO nest sites.	Bond 2009
1089	Large natural disturbances often produce high-quality early seral ecosystems provided they are not intensively salvaged and replanted (Swanson et al. 2011), but such disturbances are poorly distributed in time and space.	Swanson et al. 2011
1089	For example, less than 1% of suitable NSO habitat (complex forest) was transformed by wildfire into early successional habitat between 1996 and 2006 in MF-dominated provinces of the Northwest Forest Plan (NWFP; USDI Fish and Wildlife Service 2011).	NWFP; USDI Fish and Wildlife Service 2011

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1089	First, few or no structures from the pre-harvest stand (e.g., live trees, snags, and logs) are retained on intensively managed sites but are abundant after severe natural disturbances (Swanson et al. 2011).	Swanson et al. 2011
1089	Additionally, intensive site preparation and reforestation efforts limit both the diversity and the duration of early seral organisms, which may also be actively eliminated by use of herbicides or other treatments (Swanson et al. 2011).	Swanson et al. 2011
1089	Consequently, many MF landscapes currently lack sufficient representation of high-quality early seral ecosystems because of harvest, reforestation, and fire suppression policies on both private and public lands (Spies et al. 2007, Swanson et al. 2011)	Spies et al. 2007
1089	Consequently, many MF landscapes currently lack sufficient representation of high-quality early seral ecosystems because of harvest, reforestation, and fire suppression policies on both private and public lands (Spies et al. 2007, Swanson et al. 2011)	Swanson et al. 2011
1089	Our organizations hereby propose that the Forest Service include analysis of an alternative based upon all of the post-fire management recommendations contained in the peer-reviewed 1995 Bestcha paper provided as an attachment to these scoping comments.	1995 Bestcha
1089	Second, post-fire (salvage) logging does not contribute to ecological recovery; rather, it negatively affects recovery processes, with the intensity of impacts depending upon the nature of the logging activity (Lindenmayer et al. 2004).	Lindenmayer et al. 2004
1089	Fourth, post-fire seeding of non-native plants is often ineffective at reducing soil erosion and generally damages natural ecological values, for example by reducing tree regeneration and the recovery of native plant cover and biodiversity (Beyers 2004).	Beyers 2004
1089	Non-native plants typically compete with native species, reducing both native plant diversity and cover (Keeley et al. 2006).	Keeley et al. 2006
1089	Noss and others, Frontiers in Ecology & Environment (2006:485-86)	Noss et al 2006
1089	Besechta et al. (1995) warned that even temporary road construction should be prohibited on burned landscapes.	Besechta et al. (1995)

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1089	The construction of landings also causes erosion at elevated levels and contributes sediment over considerable distances. (Detcheson and Megehan 1996) The increased sedimentation should be considered in light of all past, present and foreseeable future activities in the watershed.	Detcheson and Megehan 1996
1089	Firman et al. 2011 found that reduced road densities was positively correlated with increased adult Coho spawners.	Firman et al. 2011
1148	After numerous communications we feel it necessary to reaffirm our definition of what constitutes culturally significant resources as stated in our Draft Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan (06-05-10); "Culturally significant resources are not simply artifacts and anthropological histories. They encompass a wide range of physical, social and spiritual characteristics. The physical resources include, but are not limited to food resources such as deer, elk, salmon, lamprey eels, acorns, berries, and mushrooms.	Draft Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan (06-05-10)
1148	The spiritual nature behind cultural resources not only validates the cultural principle that humans are the stewards of natural processes, but shows that everything in nature is at some level a significant cultural resource (Holmlund 2006).	Holmlund 2006
1148	In a recent review, (Lindenmayer, D. B. & R.F. Noss. 2006. Salvage Logging, Ecosystem Processes, and Biodiversity Conservation. Conservation Biology 20(4):949—958) it was indicated that medium- and large-scale salvage logging operations can; • reduce or eliminate biological legacies such as large trees with cavities and large logs and coarse woody debris; • modify or destroy rare post-disturbance wildlife habitats; • influence populations of some species and alter community composition;• impair natural vegetation recovery; • facilitate the colonization of alien and/or invasive species;• alter soil properties and nutrient levels and increase erosion; • modify hydrological regimes and aquatic ecosystems, and • alter patterns of landscape heterogeneity.	Lindenmayer, D. B. & R.F. Noss. 2006

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1148	Finally, the USFS Region 5--Ecological Restoration Leadership Intent (2011) p.3 states: "Ensure that vegetation and fire management efforts are grounded in concern for biodiversity and ecological processes both before and after disturbances like fire."	USFS Region 5--Ecological Restoration Leadership Intent (2011) p.3
1148	Current available best-science suggests that the combined influence from a pulse input of surface fuels resulting from salvage-logging (Mclver et al 2007), Donato et al 2006) followed by the establishment of uniform young plantations may increase susceptibility to severe reburns in the early stages of forest development.	Mclver et al 2007
1148		Donato et al 2006
1148	A similar conclusion is areas that were salvage-logged and planted after the initial fire burned more severely than comparable unmanaged areas, suggesting that fuel conditions in conifer plantations can increase fire severity despite removal of large woody fuels (Thompson et al 2007).	Thompson et al 2007
1148	Lastly, a Literature Review of post-fire logging studies, completed by the Forest Service's Pacific Northwest Research Station in 2000, "found no studies documenting a reduction in fire intensity in a stand that had previously burned and then been logged." (Mclver and Starr, 2000).	Mclver and Starr, 2000
1148	These concerns are based upon a 1998 report of general findings by USFS Geologists which states that "Watersheds de-vegetated by a combination of wildfire and timber harvest experienced high rates of landslides and debris flows, particularly on de-vegetated sensitive geomorphic terranes." (de la Fuente, et al 1997)	de la Fuente, et al 1997
1148	Karuk ethno-botany is more representative of grassland and mixed hardwood-conifer forests than conifer dominated forests (Davis and Hendryx 2004, Schenck, and Gifford. 1952).	Davis and Hendryx 2004
1148		Schenck, and Gifford. 1952
1148	Open forests consisting of grass, fire resistant pine, oaks and other hardwoods dominated south and west facing slopes (Weislander 1930 mapping in Kelly et al. 2008).	Kelly et al. 2008

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1148	Lower elevations were covered by scattered groups of hardwoods and conifers with an understory dominated by chaparral, grasses and forbs (Frost and Sweeney 2000).	Frost and Sweeney 2000
1148	All these vegetation zones, habitats and unique plant communities were utilized, managed, and culturally important to the Karuk People (Schenck and Gifford 1952, Baker 1981, Davis and Hendryx 1992).	Schenck and Gifford 1952
1148		Baker 1981
1148		Davis and Hendryx 1992
1148	Ecological diversity and processes are also important for the perpetuation of subsistence food resources, medicines, and materials critical to maintaining the integrity of Karuk Culture (Draft Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan).	Draft Karuk Tribe Department of Natural Resources Eco-Cultural Resources Management Plan
1148	There is rarely either an ecological or economic necessity to replant trees after fire, and natural regeneration after fire is preferable from an ecological standpoint (Franklin and Agee 2003, Government Accountability Office 2005, Lindenmayer et al. 2008).	Franklin and Agee 2003
1148		Government Accountability Office 2005
1148		Lindenmayer et al. 2008
1148	Given the uncertainty surrounding the effectiveness of current silvicultural treatments in providing or protecting structural diversity (USDA Forest Service 2001a, Volume 4, p. E-48), it is critical to not perpetuate the simplification of habitat through the post-fire removal of legacy trees and the replanting of homogeneous tree plantations.	USDA Forest Service 2001a, Volume 4, p. E-48
1148	The Forest Service continues to struggle with the reforestation issue. A Government Accountability Office (GAO) report commissioned by Congress confirmed that the Forest Service in Regions 5 and 6 (California and Oregon) failed to move beyond outdated management standards for reforestation (GAO 2005).	GAO 2005

Letter No.	Citation Text	Citation
1148	Baker, M. A. 1981. The Ethnobotany of the Yurok, Tolowa, and Karok Indians of Northwest California. Master Thesis. Humboldt State University	Baker 1981
1148	Davis, B. and M. Hendryx, 1992. Plants and the People: The Ethnobotany of the Karuk Tribe. Museum Series No. 5 Yreka, California, Siskiyou Country Museum.	Davis, B. and M. Hendryx, 1992
1148	de la Fuente, Juan, and Elder, Don, 1997. The Flood of 1997 Klamath National Forest Phase 1 Final Report: November 24, 1998 USDA Forest Service Klamath National Forest, Internal Document. PROCEEDINGS of the Eighth Federal Interagency Sedimentation Conference (8thFISC), April 2-6, 2006, Reno, NV, USA JFIC, 2006 http://pubs.usgs.gov/misc/F1SC1947-2006/pdf/lst-7thFISCs-CD/8thFISC/Poster_de_la_Fuente.pdf	de la Fuente, Juan, and Elder, Don, 1997
1148	Donato DC, Fontaine JB, Campbell JL, Robinson WD, Kauffman JB, Law BE (2006) Science 3 11:352.	Donato et al 2006
1148	Franklin, J. F. and Agee, J. K. 2003. Forging a science-based National Forest policy. Issues in Science and Technology, University of Texas at Dallas. Available online at: http://www.issues.org/20.1/frank1in.html	Franklin & Agee 2003
1148	Franklin, J. F. 2004. Comments on DEIS for Biscuit Fire Recovery. Dr. Franklin is Professor of Ecosystem Analysis, University of Washington, Seattle, WA.	Franklin 2004
1148	Government Accounting Office 2005. Forest Service's Reforestation and Timber Stand Improvement Needs. GAO-05-374, Report to Congress, Washington, D.C. Holmiund, Croy Robert 2006. Fish, Forests, Fire, and Freedom: Infringements of Karuk Religious Freedom Through Federal Natural Resource Management. Humboldt State Master Thesis	GAO 2005
1148	Lindenmayer, D. B, Burton, P., and Franklin, J. 2008. Salvage Logging and Its Ecological Consequences. Island. Press. 227 pgs.	Lindenmayer et al 2008
1148	McIver JD, Ottmar R 2007. Forest Ecology Manage 238:268—279.	McIver JD, Ottmar R 2007
1148	McIver JD, Starr Lynn 2000. Environmental Effects of Postfire Logging: Literature Review and Annotated Bibliography General Technical Report PNW-GTR-486 January 2000	McIver JD, Starr Lynn 2000

Letter No.	Citation Text	Citation
1148	Jonathan R. Thompson, Thomas A. Spies, and Lisa M. Ganio 2007. Reburn severity in managed and unmanaged vegetation in a large wildfire	Thompson et al 2007
1148	USDA Forest Service 2001a. Sierra Nevada Forest Plan Amendment, Final Environmental Impact Statement. Pacific Southwest Region. January 2001.	USFS 2001
1698	Undamaged or partially fire damaged stands provide disproportionately important roles in ecological recovery and refugia for the survival of particular biota. (Lindenmeyer & Franklin 2008 p.140)	Lindenmeyer & Franklin 2008
1698	Emphasize the retention of biological legacies such as large live trees, large snags, coarse woody debris, and intact thickets of unburned vegetation. These features should be retained in falling and yarding operations. (Lindenmeyer & Franklin 2008 p.29-34 & 143-146)	Lindenmeyer & Franklin 2008
1698	The impact of salvage logging can often accelerate wind throw and attrition in snag fields. (Lindenmeyer & Franklin 2008 p. 143-144)	Lindenmeyer & Franklin 2008
1698	Downed logs have also been associated with truffle production, the main food source of northern flying squirrels, and a primary prey base for the spotted owl. (Maser 1989)	Maser 1989
1698	There is not a single forest township either on the westside or the eastside of the range in which timber is not more or less fire marked." (FEIS AFR Project, RRNF P.9)	FEIS AFR Project, RRNF
1698	The whole of this wide landscape was bathed in smoky vapor, and the mountains faded in at no great distance"(Thompson/Seiad/ Grider EA).	Thompson/Seiad/ Grider EA
1698	In a recent literature review conducted by J.D McIver and L. Starr, over twenty-one separate scientific papers studying the effects of salvage logging found these activities to contribute to fire and fuel risks. James Strittholt and H. Rustigian found in their 2004 study of the Biscuit Fire and the proposed salvage logging by the Siskiyou National Forest, that "there is no scientific evidence that supports the claims that post fire salvage and replanting of conifers reduces the intensity or severity of subsequent fires. On the contrary, post fire salvage logging has been shown to actually increase future fire risks because of the buildup of fine combustible fuels in the short term" (Strittholt, 2004, P. 6).	Strittholt, 2004

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1698	If the KNF has science to prove otherwise, this science must be disclosed in the upcoming NEPA documentation. A study of post fire logging in Oregon found salvage without slash treatment increased fire fuels by 3-13 tons per hectare. (Duncan, 2002)	Duncan, 2002
1698	In a study conducted in the Biscuit Fire Area researchers found the following key findings: 1) Salvage logging does not reduce reburn potential 2) Severe re-burn is driven by the structure of young vegetation and regeneration not by residual woody material from previous fire. (Donato, 2008)	Donato, 2008
1698	Yet, treating this slash in the post-fire landscape has been shown to effect plant succession and thus delay forest regeneration. (Strittholt, 2004 P. 19)	Strittholt, 2004
1698	Likewise, treating logging slash in recently burned areas can increase erosion. (Strittholt, 2004 P. 26)	Strittholt, 2004
1698	On the contrary, when salvage logging occurs a “pulse input of surface fuels resulting from salvage logging…may increase susceptibility to severe reburns in the early stages of forest development.” (Spies, 2007)	Spies, 2007
1698	This study showed that plantations—the same structure created by salvage logging—were much more likely to burn with intensity. 65% of “managed” stands experienced high severity impacts while only 25% of unmanaged stands were similarly impacted. (Perry 1994, 1995, USDA FS, 1988)	Perry 1994
	This study showed that plantations—the same structure created by salvage logging—were much more likely to burn with intensity. 65% of “managed” stands experienced high severity impacts while only 25% of unmanaged stands were similarly impacted. (Perry 1994, 1995, USDA FS, 1988)	Perry 1995
	This study showed that plantations—the same structure created by salvage logging—were much more likely to burn with intensity. 65% of “managed” stands experienced high severity impacts while only 25% of unmanaged stands were similarly impacted. (Perry 1994, 1995, USDA FS, 1988)	USDA FS 1988
1698	In fact, one researcher stated that once unmanaged stands were mixed with a patchwork of plantation stands “the potential exists for a self-reinforcing cycle of catastrophic fires.” (Perry, 1995 b)	Perry, 1995

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1698	An unpublished study of the Biscuit Fire found that areas salvage logged after the 1987 Silver Fire burned with twice as much high severity fire than in unsalvaged stands (Harma, 2003 P.82).	Harma, 2003
1698	He found this to be true even in stands that were salvage logged and broadcast burned; this is due to the vegetative diversity and small gaps found in naturally recovering forests. (Spies, 2007)	Spies, 2007
1698	A similar conclusion was found by Donato (2008) who determined that residual dead wood does not influence reburn potential as significantly as does the structure of regenerating forest.	Donato (2008)
1698	In the KNF, research into the 1987 fires showed that “plantations were uniformly destroyed with few exceptions…the vast majority suffered complete mortality.” (USDA FS, 1988)	USDA FS, 1988
1698	Examination of the spatial pattern created by the 1987 KNF fires showed that tree plantations had twice as much crown fire as unmanaged stands. (Odion)	Odion
1698	Plantations also created conditions that encouraged adjacent unlogged stands to burn with high severity and possibly encourage fire spread into areas that may not have otherwise burned. (Key, 2000)	Key, 2000
1698	Likewise, other authors agree that “reforestation goals should avoid establishing dense, uncharacteristic, “fully stocked” forests, thereby perpetuating the potential for uncharacteristic fire.” (Franklin, 2009 P.68)	Franklin, 2009
1698	Weatherspoon and Skinner came to similar conclusions in their study of the 1987 Hayfork Fires. (Weatherspoon/Skinner, 1995)	Weatherspoon/Skinner, 1995
1698	The avoidance of degradation is far easier than trying to rehabilitate degraded lands.” (Beschta, 2004)	Beschta, 2004
1698	Salvage logging negatively effects nutrient replenishment by damaging, compacting, and eroding soil resources when falling and yarding trees. Salvage logging can also cause “onsite impacts to early successional native plant species…where species are nitrogen fixers, (salvage) can significantly affect a major pathway of nutrient replenishment.” (Beschta, 2004)	Beschta, 2004

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1698	These snags and the large downed wood they provide have been identified as "keystone species" providing habitat, building soil, holding moisture, stabilizing soils, harboring regeneration, providing microclimate, and protecting against temperature and climate extremes. (Perry 1997)	Perry 1997
1698	Large dead wood is one of the most obvious structural legacies of a natural disturbance, and a major reason why clearcuts are not the ecological equivalent of natural disturbance." (Perry 1007)	Perry 1007
1698	Removal of large amounts of organic material may result in difficult reforestation of these thin, droughty, and infertile sites." (Amaranthus, 1990 SNF)	Amaranthus, 1990 SNF
1698	The loss of large downed wood can be especially critical in the context of a stand replacing disturbance because "the pulse of large wood after the stand replacing disturbance is all the large wood that the recovering ecosystem is going to get for many decades or even a century…some of the deadwood legacy from the stand replacing disturbance will persist and fulfill important functional roles in the recovering forest from many decades and in the case of the largest and most decay resistant material for well over a century." (Johnson/Franklin, 2009)	Johnson/Franklin, 2009
1698	This is especially true because "Relatively few large areas have been allowed to recover without major intervention after fire, limiting availability of "control" areas in ecological research. This is a particularly acute need in low elevation ponderosa pine forests" (Beschta, 2004, P.9).	Beschta, 2004
1698	Scientific evidence suggests that salvage logging can have long term impacts to riparian areas, "Salvage logging conducted in or near riparian zones and streams diminishes the source of large wood…post fire wood inputs are important in creating physical habitat, recycling nutrients, and providing structural components during stream and riparian recovery." (Bestcha, 2004 P.6)	Bestcha, 2004
1698	In research conducted after the 1987 Silver Fire it was shown that "57% of post fire shade was provided by dead vegetation, removal of dead vegetation from riparian reserves by timber salvage or other post fire activities should be carefully considered where water temperatures reach critical levels for fish," (Amaranthus, 1990) as they do each summer in the Klamath River.	Amaranthus, 1990

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1698	According to the National Wildfire Coordinating Group, in their review titled Wildland firefighter fatalities in the United States: 1990-2006 aircraft fatalities account for 23.3% of all wildfire related fatalities and represent "the leading cause of fatalities during wildfire operations." (NWCG, 2007 P.22)	NWCG, 2007
1698	According to the report, Wildland Fire Fatalities By Type Accident published in 2008, not a single firefighter has been killed by falling snags in the KNF (NWCG, 2008), and only five firefighters have been killed by snags in the State of California since 1910. (NWCG, 2011) In total, 324 firefighters have lost their lives while suppressing wildfires in the state of California, the five who were killed by falling snags amounts to .02% of the state's fatalities. (NWCG 2011)	NWCG 2011
1698	If the agency is serious about firefighter safety it will look hard at the events that enabled such a scenario to occur. Burnovers account for 20.6% of all fatalities nationwide. (NWCG, 2007)	NWCG, 2007
1698	The Lower Scott Ecosystem Analysis states that "the health of the stand appears low," and that little regeneration of foxtail pine exists in the botanical area, with more regeneration found to the north and east outside the designated botanical area (Lower Scott River EA 2000, p.3-44).	Lower Scott River EA
1698	Mountain hemlock communities have been relatively minimally impacted by fire suppression due to these long fire return intervals (Agee 1993, p.278).	Agee 1993
1698	Amaranthus, M. 1990a. "Decaying logs as moisture reservoirs after drought and wildfire" SNF Wildfire and recovery monitoring	Amaranthus, M. 1990
1698	Amaranthus, M. 1990b. " Stream shading, summer stream flow and maximum water temperature following intense wildfire in headwaters streams" SNF Wildfire and Recovery Monitoring	Amaranthus, M. 1990
1698	Bestcha, R. (et al) 2004. "Post Fire Management on Forested Public Lands of the Western United States." Conservation Biology Vol. 18 No. 4	Bestcha, R. (et al) 2004
1698	Brown, J.K, Reinhart, Kramer, K.A. 2003. "Coarse Woody Debris: Managing Benefits and Fire Hazard in the Recovering Forest." United States Forest Service General Technical Report RMRSGTR-105 (Ogden, Utah. US Forest Service Rocky Mountain Research Station.)	Brown, J.K, Reinhart, Kramer, K.A. 2003

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1698	Donato, D and Fontaine, J. 2008 “Mixed Fire Regime of the Klamath-Siskiyou: New Post Fire Potentials”	Donato, D and Fontaine, J. 2008
1698	Duncan, S. 2000. “Post Fire Logging: Is It Beneficial to a Forest?” Science Findings 47 (Portland, Oregon) United States Forest Service. Pacific Northwest Research Station October 2002	Duncan, S. 2000
1698	Franklin, J. and Johnson, N. 2009. “Restoration of Federal Forests in the Pacific Northwest: Strategies and Management Implications.” August 2009	Franklin, J. and Johnson, N. 2009
1698	Frost, E. and Sweeney, R. 2000. “Fire Regimes, Fire History, and Forest Conditions in the Klamath-Siskiyou Region: An Overview and Synthesis of Knowledge.” WWF Klamath-Siskiyou Ecoregion Program	Frost, E. and Sweeney, R. 2000
1698	Halofsky, J.E. (et al) 2011 “Mixed severity fire regime: Lessons and hypotheses from the Klamath-Siskiyou Region” Ecosphere Journal Vol. 2(4) Article 40	Halofsky, J.E. (et al) 2011
1698	Harma, K., Morrison, P. 2003 “Analysis of Vegetation Mortality and Prior Landscape Condition, 2002 Biscuit Fire Complex.” Unpublished Report. Pacific Biodiversity Institute. Winthrop, WA.	Harma, K., Morrison, P. 2003
1698	Keys, J. 2000. “Effects of Clear-cuts and Site Preparation on Fire Severity, Dillion Creek Fire 1994.” Master’s Thesis: Humboldt State University. Arcata, Ca.	Keys, J. 2000
1698	Lindenmeyer, D.B., Burton, P.J., Franklin, J.F. 2008 “ Salvage Logging and its Ecological Consequences” Island Press. Covelo, CA	Lindenmeyer, D.B., Burton, P.J., Franklin, J.F. 2008
1698	Maser, C. 1989 “Forest Primevil: The Natural History of an Ancient Forest” Sierra Club Books	Maser, C. 1989
1698	McIver, J.D. and Starr, L. 2000. “Environmental Effects of Post Fire Logging: Literature Review and Annotated Bibliography.” US Forest Service General Technical Report PNW-GTR-486 (Portland, Oregon,: US Forest Service, Pacific Northwest Research Station, 2000.	McIver, J.D. and Starr, L. 2000
1698	Odion, D.C., E.F. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala, and M.A. Moritz. In Review. Patterns of fire severity and forest conditions in the Klamath Mountains, northwestern California, U.S.A. Conservation Biology.	Odion, D.C., E.F. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala, and M.A. Moritz
1698	Perry, D.A. 1994 “Forest Ecosystems.” The John Hopkins Press. Baltimore, MD	Perry, D.A. 1994

Letter No.	Citation Text	Citation
1698	Perry, D.A. 1995a. Landscapes, humans, and other ecosystem-level considerations: a Discourse on ecstasy and laundry. In R.L. Everett and D.M. Baumgartner, eds. Symposium Proceedings: Ecosystem Management in Western Interior Forests. May 3-5, 1994, Spokane, WA. Washington State University Cooperative Extension, Pullman, WA Pp. 177-192.	Perry, D.A. 1995
1698	Perry, D.A. 1994 “Forest Ecosystems.” The John Hopkins Press. Baltimore, MD	Perry, D.A. 1994
1698	Perry, D.A. 1995a. Landscapes, humans, and other ecosystem-level considerations: a Discourse on ecstasy and laundry. In R.L. Everett and D.M. Baumgartner, eds. Symposium Proceedings: Ecosystem Management in Western Interior Forests. May 3-5, 1994, Spokane, WA. Washington State University Cooperative Extension, Pullman, WA Pp. 177-192.	Perry, D.A. 1995
1698	Perry, D.A. 1995b “Self Organizing Systems Across Scales.” Trends in Ecology and Evolution 10: 241-244.	Perry, D.A. 1995
1698	Perry, D.A. and Amaranthus, M. 1997 “Disturbance, Recovery, and Stability” Creating a Forestry for the 21st Century: The Science of Ecosystem Management. Island Press Covelo, CA	Perry, D.A. and Amaranthus, M. 1997
1698	Spies, T., Thompson, J. and Ganio, L. 2007 “Reburn Severity in Managed and Unmanaged Vegetation in a Large Wildfire.” Proceedings from the National Academy of Sciences of the United States of America June 11, 2007	Spies, T., Thompson, J. and Ganio, L. 2007
1698	Strittholt, J. and Rustigian, H. 2002. “Ecological Issues Underlying Proposals to Conduct Salvage Logging in Areas Burned in the Biscuit Fire.” Conservation Biology Institute January 2004	Strittholt, J. and Rustigian, H. 2002
1698	Taylor, A. and Skinner, C. 2003 “Spatial Patterns and Controls on Historical Fire Regimes and Forest Structure in the Klamath Mountains” Ecological Applications 13 (3) PP. 204-219	Taylor, A. and Skinner, C. 2003
1698	USDA Forest Service. 1994. “Final Environmental Impact Statement for the Land and Resource Management Plan, KNF. Siskiyou County, CA and Jackson County, OR.	USDA Forest Service. 1994
1651	The Northwest Forest Plan offered what appeared to be a modest improvement in conservation status, but it has not lead to substantive protection of many key areas and biological values. Noss 1999.	Noss 1999

Letter No.	Citation Text	Citation
1651	Many of these values are not conducive to prudent management of ecosystems. Noss 1999-A Citizen's Guide to Ecosystem Management	Noss 1999
1651	In an ecosystem approach to management, particular attention needs to be paid to conservation of keystone species since the health of the ecosystems well as the viability of many other species is dependent upon these species...Identification and careful management of keystone areas is a critical component of a comprehensive conservation program. Cooperrider 1995	Cooperrider 1995
1651	A Conservation Assessment and Science-Based Plan for the Klamath-Siskiyou Ecoregion (Strittholt 1999, attached)	Strittholt 1999
1651	Because this assessment no longer reflects current conditions, it cannot effectively guide Forest Service actions in order to "protect and enhance conditions of late successional and old-growth forest ecosystems," as the Northwest Forest Plan requires. (see Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, Attachment A, age A-4).	Northwest Forest Plan, Attachment A, page A-4
1651	The Forest Service should update the Late Successional Reserves Assessment prior to designing or implementing habitat manipulation activities. (see Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, Attachment A, page C-11).	Northwest Forest Plan, Attachment A, page C-11
1651	Regional managers should be aware and incorporate the information completed in the Essential Habitat Connectivity Report quoted below (attached).	Essential Habitat Connectivity Report
1651	The Aquatic Conservation Strategy (ACS) allows treatment in Riparian Reserves only when it is required to attain ACS objectives ("Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting if required to attain Aquatic Conservation Strategy objectives." Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, Attachment A, page C-32).	The Aquatic Conservation Strategy Attachment A, page C-32

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1651	Additionally, the ACS allows salvage logging in Riparian Reserves "only when watershed analysis determines that present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected." (Standards and Guidelines for Management of Habitat for Late-Successional and Old- Growth Forest Related Species Within the Range of the Northern Spotted Owl, Attachment A, page C-32).	The Aquatic Conservation Strategy Attachment A, page C-32
1651	The Aquatic Conservation Strategy (ACS) in the Northwest Forest Plan requires watershed analysis for Key Watersheds prior to determining how proposed land management activities meet ACS objectives. (Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, Attachment A, B-20).	The Aquatic Conservation Strategy Attachment A, page B-20
1651	Watershed analyses are meant to play a critical role in protecting aquatic and riparian habitat by "enabl[ing] watershed planning that achieves Aquatic Conservation Strategy objectives." (Id., at B-12).	The Aquatic Conservation Strategy Attachment A, page B-12
1651	The Forest Service may only yard timber if the activity will be "carried out in a manner consistent with the protection of soil." 16 USC §1604(g)(3)(F)(v); 36 CFR §219.27(c)(6).	16 USC §1604(g)(3)(F)(v)
1651	The Forest Service may only yard timber if the activity will be "carried out in a manner consistent with the protection of soil." 16 USC §1604(g)(3)(F)(v); 36 CFR §219.27(c)(6).	36 CFR §219.27(c)(6)
1651	Management plans and projects must "insure that timber will be harvested from National Forest System lands only where-soil, slope, or other watershed conditions will not be irreversibly damaged." 16 USC § 1604(g)(3)(E)(i).	16 USC § 1604(g)(3)(E)(i)
1651	Lacy, 2001 examines the importance of soils for ecosystem functioning and points out the failure of most regulatory mechanisms to adequately address the soils issue.	Lacy 2001
1651	The problems Lacy (2001) identifies of regulatory mechanisms exist in Regional and Forest-level standards and other guidance applicable for the proposed project.	Lacy 2001

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1651	The Salmon Salvage EA, for example, states that, “stream sediment is expected to increase due to the Salmon Complex fire” (EA, page 65).	The Salmon Salvage EA page 65
1651	The preferred alternative in the proposed Jess Project will further degrade watersheds, for example by causing a10% increase sediment in the Jessup’s Gulch-North Fork Salmon River. (Jess Project DEIS, page 85).	Jess Project DEIS, page 85
1651	Management Practices limit the damage to streams and rivers caused by these practices, they do not completely prevent this damage. For example, “Effects of Forest Management on Streamflow, Sediment Yield, and Erosion, Caspar Creek Experimental Watersheds” (Keppeler et al. 2003)10 states at page 5: Timber harvest and road building affect runoff processes, sediment yields, and erosion.	Keppeler et al. 2003
1651	Additionally, “The incidence and role of gullies after logging in a coastal redwood forest” (Reid et al. 2010)11 states at page 1: Correlations between suspended sediment yields and indices of gully erosion suggest that in-channel erosion associated with hydrologic change is an important source of post-logging sediment at Caspar Creek. Common sediment-control measures, such as use of riparian buffer strips and reduction of road surface erosion, would not be effective for reducing sediment input from this source.	Reid et al. 2010
1651	The Klamath National Forest 2012 BMPEP Report, page 4, reported that BMPs were effective 87% of the time in 2012.	The Klamath National Forest 2012 BMPEP Report, page 4
1651	According to conservation status rankings developed by Natural Heritage programs across the United States, 23 percent of at-risk amphibian species in the United States are found in California, 29 percent of at-risk reptiles, 19 percent of at-risk birds, 41 percent of at-risk mammals, and 10 percent of at-risk freshwater fishes. In terms of overall biological diversity (including both plants and animals), California ranks second among the states for the percent of its species that are at risk (Stein et al. 2000).	Stein et al. 2000
1651	The rate of successful dispersal of juvenile spotted owls (Strix caurina), for example, decreases in fragmented landscapes, thus influencing long-term population viability (Doak 1989; Miller et al. 1999). Swanson 2010	Doak 1989

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1651	The rate of successful dispersal of juvenile spotted owls (Strix caurina), for example, decreases in fragmented landscapes, thus influencing long-term population viability (Doak 1989; Miller et al. 1999). Swanson 2010	Miller et al. 1999
1651	Future environmental review and future consultation under the Endangered Species Act must include these emergency measures in any future environmental baseline calculation. See 50 C.F.R. § 402.02.	50 C.F.R. § 402.02
1651	Results from the three radio-telemetry studies of spotted owls in post-fire landscapes indicate that spotted owls use forest stands that have been burned, but generally do not use stands that have been burned and logged. For example, California spotted owls tracked 4 years post-fire in burned, unlogged stands: (1) had 30 percent of their nonbreeding-season roost locations within the fire's perimeter (Bond et al. 2010); (2) selected low severity burned forests for roosting during the breeding season (Bond et al. 2009); and (3) selected low-, medium-, and high-severity burned forests for foraging within 1.5 km of the nest or roost site, with the strongest selection for high-severity burned forest (Bond et al. 2009).	Bond et al. 2010
1651	However, for spotted owls in stands that had been harvested post-fire: (1) infrequent foraging in stands burned with low-, medium-, and high severity fires was restricted to areas with live trees such as those in riparian areas (Clark 2007), and (2) use shifted away from burned stands during 3 years postfire (King et al. 1998).	Clark 2007
1651	However, for spotted owls in stands that had been harvested post-fire: (1) infrequent foraging in stands burned with low-, medium-, and high severity fires was restricted to areas with live trees such as those in riparian areas (Clark 2007), and (2) use shifted away from burned stands during 3 years postfire (King et al. 1998).	King et al. 1998
1651	Such management should include retention of large trees and defective trees, rehabilitation of roads and fire lines, and planting of native species (Beschta et al. 2004, Hutto 2006, Peterson et al. 2009).	Beschta et al. 2004

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1651	Such management should include retention of large trees and defective trees, rehabilitation of roads and fire lines, and planting of native species (Beschta et al. 2004, Hutto 2006, Peterson et al. 2009).	Hutto 2006
1651	Such management should include retention of large trees and defective trees, rehabilitation of roads and fire lines, and planting of native species (Beschta et al. 2004, Hutto 2006, Peterson et al. 2009).	Peterson et al. 2009
1651	Many researchers supported the need to maintain habitat for spotted owl prey. For example, Lemkuhl et al. (2006) confirmed the importance of maintaining snags, downed wood, canopy cover, and mistletoe to support populations of spotted owl prey species. Gomez et al. (2005) noted the importance of fungal sporocarps which were positively associated with large downed wood retained on site postharvest.	Lemkuhl et al. (2006)
1651	Many researchers supported the need to maintain habitat for spotted owl prey. For example, Lemkuhl et al. (2006) confirmed the importance of maintaining snags, downed wood, canopy cover, and mistletoe to support populations of spotted owl prey species. Gomez et al. (2005) noted the importance of fungal sporocarps which were positively associated with large downed wood retained on site postharvest.	Gomez et al. (2005)
1651	Carey et al. (1991) and Carey (1995) noted the importance of at least 10 to 15 percent cover of downed wood to benefit prey. (Emphasis added).	Carey et al. (1991)
1651	Carey et al. (1991) and Carey (1995) noted the importance of at least 10 to 15 percent cover of downed wood to benefit prey. (Emphasis added).	Carey (1995)

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1651	Based on their findings, Bond et al recommended "that burned forests within 1.5 km of nests or roosts of California spotted owls not be salvage-logged until long-term effects of fire on spotted owls and their prey are understood more fully." See also Conservation Cong. v. United States Forest Serv., No. CIV. S-13-0832 LKK/DAD, 2013 WL 4829320, 2013 U.S. Dist. LEXIS 127671, *20 (E.D. Cal. Sept. 6, 2013) ("Bond, in the cited papers, specifically recommended that 'post-fire logging be avoided within 1.5 kilometers (at least) of Spotted Owl nest sites.' . . . Also, [the Forest Service] identifies no literature that indicates that it would be appropriate to log within 1.5 km from the nest site.") In short, when left unlogged, post-fire forests will provide habitat for Northern spotted owl.	Conservation Cong. v. United States Forest Serv., No. CIV. S-13-0832 LKK/DAD, 2013 WL 4829320, 2013 U.S. Dist. LEXIS 127671, *20 (E.D. Cal. Sept. 6, 2013)
1651	On October 7, 2014 the U.S. Fish and Wildlife Service proposed listing the Pacific Fisher as "threatened" under the Endangered Species Act. (See 79 Fed. Reg. 60419.) According to the FWS, "preliminary analyses indicate West Coast fisher populations . . . may be at significant risk of extinction." (Id. At 18789).	79 Fed. Reg. 60419
1651	That is, the Forest Service should consult with the U.S. Fish and Wildlife Service on Westside's impact and ways to mitigate impacts. Furthermore, as the Forest Service is aware, should the fisher be listed as threatened, the Forest Service would be obliged to reinitiate consultation for any ongoing projects and would likely need to draft a supplemental EIS. (See 50 C.F.R. § 402.16 23; 50 C.F.R. § 771.130).	50 C.F.R. § 402.16 23
1651	That is, the Forest Service should consult with the U.S. Fish and Wildlife Service on Westside's impact and ways to mitigate impacts. Furthermore, as the Forest Service is aware, should the fisher be listed as threatened, the Forest Service would be obliged to reinitiate consultation for any ongoing projects and would likely need to draft a supplemental EIS. (See 50 C.F.R. § 402.16 23; 50 C.F.R. § 771.130).	50 C.F.R. § 771.130

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1651	They are territorial and require expansive areas of forested habitat for each individual, meaning large areas may be occupied by just a few individuals, thus reducing the likelihood of detecting them. In addition, many mobile species are difficult to detect in the wild because of morphological features (such as camouflaged appearance) or elusive behavioral characteristics (such as nocturnal activity) (Peterson and Bayley 2004, pp. 173, 175).	Peterson and Bayley 2004, pp. 173, 175
1651	Fragmentation of populations is a significant threat to the fisher. (U.S.F.W.S. 2010).	U.S.F.W.S. 2010
1651	Average summer home range for adult males in northwestern Alaska was 242 mi^2 (626 km^2). (Luensmann 2008 (internal citations omitted)).	Luensmann 2008
1651	In a study of American martens in northeastern Oregon, the average home range for males was 10.5 miles2 and for females was 5.5 miles2. (Bull et al. 2001).	Bull et al. 2001
1651	This information is not new to the Forest Service; indeed the Service has elsewhere extensively reviewed literature concerning home ranges. (See Stone 2010).	Stone 2010
1651	American marten utilize areas after post-fire. A review of the available science by Stone (2010) found that marten readily use burned over areas: Fire may result in a short-term loss of cover through consumption of woody structures and/or reduction of canopy cover. However, fire may also create structures used for cover; many sources suggest that American marten use of burned areas is related to postfire structural diversity, including abundant snags, downed wood, and dense herbaceous growth. Postfire activity may be concentrated around deadfall, as was documented in southwestern Yukon 25 years after a high-severity wildfire.	Stone (2010)
1651	The Forest Service cannot rely on non-NEPA documents to significantly amend the Northwest Forest Plan and the LRMP so-as to expedite regeneration logging. See KS Wild v. Boody, 9th Cir 2006. No. 06-35214 (CV 03-3124, District of Oregon).	KS Wild v. Boody, 9th Cir 2006. No. 06-35214 (CV 03-3124, District of Oregon)
1651	EPIC v. Blackwell, No. Civ. S-04-1027 WBS GGH, Memorandum and Order, May 4, 2005.	EPIC v. Blackwell, No. Civ. S-04-1027 WBS GGH, Memorandum and Order, May 4, 2005.

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1651	Please see Ament (1997) in terms of fire policy and Forest Planning: Many adverse consequences to soil, ecological processes, wildlife, and other elements of the natural environment are associated with logging, including thinning. (Ercelawn, 1999; Ercelawn, 2000.)	Ament (1997)
1651	Please see Ament (1997) in terms of fire policy and Forest Planning: Many adverse consequences to soil, ecological processes, wildlife, and other elements of the natural environment are associated with logging, including thinning. (Ercelawn, 1999; Ercelawn, 2000.)	Ercelawn 1999
1651	Please see Ament (1997) in terms of fire policy and Forest Planning: Many adverse consequences to soil, ecological processes, wildlife, and other elements of the natural environment are associated with logging, including thinning. (Ercelawn, 1999; Ercelawn, 2000.)	Ercelawn 2000
1651	For example: "Salvage or thinning operations that remove dead or decayed trees or coarse woody debris on the ground will reduce the availability of forest structures used by fishers and lynx." (Bull et al., 2001.)	Bull et al., 2001
1651	The National Forest Management Act (NFMA) imparts on the Forest Service a substantive duty to provide for the diversity of plant and animal communities on National Forests. 16 U.S.C. § 1604(g)(3).	16 U.S.C. § 1604(g)(3)
1651	To achieve this goal, the regulations implementing NFMA specify that the agency ensure that viable populations of native animals are maintained by monitoring the impacts of the Forest Plans on selected MIS. 36 C.F.R. § 219.19(a)(6).	36 C.F.R. § 219.19(a)(6)
1651	The findings must provide the decision maker and the public with enough information to conclusively know that the project will have no significant effect on threatened, sensitive, and management indicator wildlife species. 40 C.F.R. § 1508.27.	40 C.F.R. § 1508.27
1651	"Population trends of management indicator species will be monitored." 36 C.F.R. § 219.19(a)(6).	36 C.F.R. § 219.19(a)(6)

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1651	The FS may wish to familiarize itself with the holding in KS Wild v. USFS, Eastern District of California 2004, (which is binding precedent for this project) in which the federal district court held that the Klamath National Forest violated its LRMP, and NFMA, by failing to monitor and survey for snag associated MIS species.	KS Wild v. USFS, Eastern District of California 2004
1651	The 2005 report from the Klamath Bird Observatory entitled Local and Regional Trends in Breeding and Migratory Bird Populations in the Klamath and Rogue River Valleys: Monitoring Results for 1993-2003 indicates that several species on songbirds are suffering declining population trends at the regional level.	2005 report from the Klamath Bird Observatory entitled Local and Regional Trends in Breeding and Migratory Bird Populations in the Klamath and Rogue River Valleys: Monitoring Results for 1993-2003
1651	The Northwest Forest Plan (NFP) at C-45-46, "White-headed Woodpecker, Black-backed Wood Pecker, Pygmy nuthatch and Flammulated Owl- These species will not be sufficiently aided by application of mitigation measures for riparian habitat protection or for marbled murrelets alone."	Northwest Forest Plan (NFP) at C-45-46
1651	Scientists have recently recommended that forest managers should ensure the maintenance of moderate and high severity fire patches to maintain populations of numerous native bird species positively associated with fire (Hutto 1995, Hutto 2006, Kotliar et al. 2002, Noss et al. 2006, Smucker et al. 2005).	Hutto 1995
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1651	Scientists have recently recommended that forest managers should ensure the maintenance of moderate and high severity fire patches to maintain populations of numerous native bird species positively associated with fire (Hutto 1995, Hutto 2006, Kotliar et al. 2002, Noss et al. 2006, Smucker et al. 2005).	Kotliar et al. 2002

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1651	Indeed, the current annual spatial extent of wildland fire in California's forests is about one tenth of what it was prior to fire suppression (Medler 2006).	Medler 2006
1651	Peak biodiversity levels of higher plants and vertebrates are found in patches of snag forest habitat—areas where most or all of the trees are killed by fire (Noss et al. 2006), consistent with the principle that pyrodiversity enhances biodiversity, where mixed-severity fire effects occur (Chang 1996).	Chang 1996
1651	Fire- induced heterogeneity, including a mix of low, moderate, and high severity patches, leads to higher post-fire understory plant species richness compared to homogeneous low severity fire effects (Chang 1996, Rocca 2004).	Chang 1996
1651	Fire- induced heterogeneity, including a mix of low, moderate, and high severity patches, leads to higher post-fire understory plant species richness compared to homogeneous low severity fire effects (Chang 1996, Rocca 2004).	Rocca 2004
1651	Mixed-severity fire, meaning a heterogeneous mix of high, moderate, and low severity effects, facilitates reproduction of numerous native herbaceous and shrub species (Chang 1996, Rocca 2004), the germination of many of which is triggered by fire-induced heat, charate, or smoke (Biswell 1974).	Biswell 1974
1651	And, fire-mediated conifer mortality attracts bark beetles and wood-boring beetles, some species of which have evolved infrared receptors capable of detecting burned forests from over 161 km away (Altman and Sallabanks 2000).	Altman and Sallabanks 2000

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1651	Woodpeckers excavate nest cavities in snags and feed upon larvae in dead trees; Mountain Bluebirds (Sialia currucoides) and other secondary cavity-nesting species use nest holes created the previous year by woodpeckers; granivores feed upon seed release from cones following fire; shrub- dwelling species nest and forage within shrub growth scattered throughout high severity patches; while aerial insectivores prey upon the insects that are abundant in snag patches (Altman and Sallabanks 2000, Hutto 1995).	Altman and Sallabanks 2000
1651	Woodpeckers excavate nest cavities in snags and feed upon larvae in dead trees; Mountain Bluebirds (Sialia currucoides) and other secondary cavity-nesting species use nest holes created the previous year by woodpeckers; granivores feed upon seed release from cones following fire; shrub- dwelling species nest and forage within shrub growth scattered throughout high severity patches; while aerial insectivores prey upon the insects that are abundant in snag patches (Altman and Sallabanks 2000, Hutto 1995).	Hutto 1995
1651	Populations of small mammals experience overall increases shortly after high severity fire, and amphibians are positively associated with the large woody material that gradually accumulates in the decades following such fire effects (Smith 2000).	Smith 2000
1651	As well, ungulates forage upon post-fire flora, and large predators frequently seek their prey in burned patches (Smith 2000).	Smith 2000
1651	Studies have detected higher overall avian species richness in severely burned versus unburned forest in the western United States (Bock and Lynch 1970, Hutto 1995, Raphael and White 1984, Siegel and Wilkerson 2005).	Bock and Lynch 1970
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1651	In one snag forest area resulting from the Manter Fire of 2000 in the southern Sierra Nevada, a total of 111 bird species were observed (Siegel and Wilkerson 2005).	Siegel and Wilkerson 2005
1651	Several authors point out that on a landscape scale, wildfire creates patches of highly attractive habitat for a distinct array of species (Hutto 1995).	Hutto 1995
1651	To maintain healthy metapopulations of these species over the landscape, post-fire patches should be managed with great care (Saab and Dudley 1998).	Saab and Dudley 1998
1651	In four recent independent studies conducted in the intermountain West, post-fire logging caused significant changes in abundance and nest density of cavity-nesting birds, although the effect differed somewhat by location (Caton 1996, Hejl and McFadzen 1998, Hitchcox 1996, Saab and Dudley 1998).	Caton 1996
1651	In four recent independent studies conducted in the intermountain West, post-fire logging caused significant changes in abundance and nest density of cavity nesting birds, although the effect differed somewhat by location (Caton 1996, Hejl and McFadzen 1998, Hitchcox 1996, Saab and Dudley 1998).	Hejl and McFadzen 1998
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1651	Because of the important role of dead wood in late-successional and old-growth forest ecosystems, and because there is much to learn about the role of dead wood in the development of forests, only limited salvage is appropriate in Late-Successional Reserves . . . The Final Draft Recovery Plan [for the NSO] would allow removal of small-diameter snags and logs, but would also require retention of snags and logs likely to persist until the new stand begins to contribute significant quantities of coarse woody debris."-FEMAT 1993, p. IV-37	FEMAT 1993, p. IV-37
1651	Accordingly, following stand-replacing disturbances, management should focus on retaining snags that are likely to persist until late-successional conditions have developed and the new stand is again producing large snags." -FEMAT 1993, p. III-37	FEMAT 1993, p. III-37
1651	The ability of the Region's forestlands to sequester and store carbon has become a matter of national and international significance. Region 5 Ecological Restoration Implementation Plan (ERIP) p.2	Region 5 Ecological Restoration Implementation Plan (ERIP) p.2
1651	The Klamath-Siskiyou Ecoregion (KSE) contains globally important biodiversity– only five other temperate forests regions are as diverse or home to as many endemic species and ancient lineages (e.g., Caucasus, Southwestern China, Southeastern United States, Coastal Plain/Southern Appalachians, Valdivia rainforests of Chile and Argentina; Olson et al. 2001; Tecklin et al. 2011).	Olson et al. 2001
1651	The Klamath-Siskiyou Ecoregion (KSE) contains globally important biodiversity– only five other temperate forests regions are as diverse or home to as many endemic species and ancient lineages (e.g., Caucasus, Southwestern China, Southeastern United States, Coastal Plain/Southern Appalachians, Valdivia rainforests of Chile and Argentina; Olson et al. 2001; Tecklin et al. 2011).	Tecklin et al. 2011
1651	The special location (latitude and coastal proximity), rugged terrain, climatic stability, and complexity of soils and microclimates have allowed the region to act as a refuge from past climatic changes for species and natural communities requiring cool and moist conditions (Whittaker 1960, 1961; Stebbins and Major 1965; Wagner 1997; Coleman and Kruckeberg 1999; Sawyer 2007).	Whittaker 1960

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1651	The special location (latitude and coastal proximity), rugged terrain, climatic stability, and complexity of soils and microclimates have allowed the region to act as a refuge from past climatic changes for species and natural communities requiring cool and moist conditions (Whittaker 1960, 1961; Stebbins and Major 1965; Wagner 1997; Coleman and Kruckeberg 1999; Sawyer 2007).	Whittaker 1961
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1651	The special location (latitude and coastal proximity), rugged terrain, climatic stability, and complexity of soils and microclimates have allowed the region to act as a refuge from past climatic changes for species and natural communities requiring cool and moist conditions (Whittaker 1960, 1961; Stebbins and Major 1965; Wagner 1997; Coleman and Kruckeberg 1999; Sawyer 2007).	Sawyer 2007

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1651	In the KSE, over a century of land use activities (e.g., logging, mining, livestock grazing, damming of rivers, mining, and human-caused alterations of fire) have resulted in loss or degradation of mesic habitats (DellaSala et al. 1999) that may have previously functioned as refugia over millennia. Impacts include loss of contiguous habitat along intact elevational and other environmental gradients that may facilitate climate-related shifts in natural communities and loss and degradation of most of the mature and old-growth forests (e.g., only about 28% of the historic old- growth forests remain; Strittholt et al. 2006), particularly mesic lowland and mid- elevation habitats (Staus et al. 2002).	DellaSala et al. 1999
1651	In the KSE, over a century of land use activities (e.g., logging, mining, livestock grazing, damming of rivers, mining, and human-caused alterations of fire) have resulted in loss or degradation of mesic habitats (DellaSala et al. 1999) that may have previously functioned as refugia over millennia. Impacts include loss of contiguous habitat along intact elevational and other environmental gradients that may facilitate climate-related shifts in natural communities and loss and degradation of most of the mature and old-growth forests (e.g., only about 28% of the historic old- growth forests remain; Strittholt et al. 2006), particularly mesic lowland and mid- elevation habitats (Staus et al. 2002).	Strittholt et al. 2006
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1651	Increasing prevalence of invasive plants and pathogens facilitated by road building and land use practices poses an additional threat to native species and communities (DellaSala et al. 1999).	DellaSala et al. 1999

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1651	The existing protected area system (i.e., National and State Parks, Wilderness Areas, National Monuments, Botanical Areas) is inadequate for ensuring the persistence of most of the ecoregion's vulnerable biodiversity (DellaSala et al. 1999; Noss et al. 1999; Carroll et al. 2010).	DellaSala et al. 1999
1651	The existing protected area system (i.e., National and State Parks, Wilderness Areas, National Monuments, Botanical Areas) is inadequate for ensuring the persistence of most of the ecoregion's vulnerable biodiversity (DellaSala et al. 1999; Noss et al. 1999; Carroll et al. 2010).	Noss et al. 1999
1651	The existing protected area system (i.e., National and State Parks, Wilderness Areas, National Monuments, Botanical Areas) is inadequate for ensuring the persistence of most of the ecoregion's vulnerable biodiversity (DellaSala et al. 1999; Noss et al. 1999; Carroll et al. 2010).	Carroll et al. 2010
1651	The importance of microrefugia for the long-term persistence of species that are sensitive to climate change is increasingly being recognized (Noss 2001; Loarie et al. 2008, 2009; Rull 2009, 2010; Ashcroft 2010; Dobrowski et al. 2010).	Noss 2001
1651	The importance of microrefugia for the long-term persistence of species that are sensitive to climate change is increasingly being recognized (Noss 2001; Loarie et al. 2008, 2009; Rull 2009, 2010; Ashcroft 2010; Dobrowski et al. 2010).	Loarie et al. 2008
1651	The importance of microrefugia for the long-term persistence of species that are sensitive to climate change is increasingly being recognized (Noss 2001; Loarie et al. 2008, 2009; Rull 2009, 2010; Ashcroft 2010; Dobrowski et al. 2010).	Loarie et al. 2009
1651	The importance of microrefugia for the long-term persistence of species that are sensitive to climate change is increasingly being recognized (Noss 2001; Loarie et al. 2008, 2009; Rull 2009, 2010; Ashcroft 2010; Dobrowski et al. 2010).	Rull 2009
1651	The importance of microrefugia for the long-term persistence of species that are sensitive to climate change is increasingly being recognized (Noss 2001; Loarie et al. 2008, 2009; Rull 2009, 2010; Ashcroft 2010; Dobrowski et al. 2010).	Rull 2010

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1651	The importance of microrefugia for the long-term persistence of species that are sensitive to climate change is increasingly being recognized (Noss 2001; Loarie et al. 2008, 2009; Rull 2009, 2010; Ashcroft 2010; Dobrowski et al. 2010).	Ashcroft 2010
1651	The importance of microrefugia for the long-term persistence of species that are sensitive to climate change is increasingly being recognized (Noss 2001; Loarie et al. 2008, 2009; Rull 2009, 2010; Ashcroft 2010; Dobrowski et al. 2010).	Dobrowski et al. 2010
1651	In temperate regions, terrain positions and habitat types that maintain persistent cool and moist conditions favorable for effective microrefugia are increasingly well defined (e.g., Dobrowski et al. 2010). (Olsen 2012)	Dobrowski et al. 2010
1651	Salvage logging decreased carbon in snags and downed wood. Bradford et al. 2012	Bradford et al. 2012
1651	As for carbon, recent data shows that the highest biomass (and carbon) levels are maintained by periodic high-intensity fire, due to the combined biomass of the snags and logs from the previous fire and the vigorous natural tree regeneration spurred by the fire and the nutrient cycling resulting from the fire (Keith et al. 2009).	Keith et al. 2009
1651	The Keith et al. 2009 study was conducted in fire-adapted forests in Australia, but the authors made clear that their results are applicable to other fire-adapted temperate forests, including western U.S. conifer forests.	Keith et al. 2009
1651	Vigorous natural conifer regeneration is the rule, not the exception, in high-intensity fire areas in Northern California (with no salvage logging, replanting, or herbicide application). Shatford 2007 further discusses regeneration.	Shatford 2007
1651	Donato D.C., J.B. Fontaine, L.L. Campbell, W.D. Robinson, J.B. Kauffman, B.E. Law. 2006. Post- Wildfire Logging Hinders Regeneration and Increases Fire Risk. Science January 5, 2006.	Donato et al 2006
1651	Please note that the NEPA regulations promulgated by the CEQ require the Forest Service to “insure the professional integrity, including scientific integrity, of the discussions and analyses” in the NEPA documents that it prepares. 40 C.F.R. § 502.24	40 C.F.R. § 502.24

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1651	Furthermore, the Forest Service must disclose the extent to which the impact of the proposed action is scientifically controversial. See id. §§ 1508.27(b)(4), 1508.27(b)(5).	id. §§ 1508.27(b)(4), 1508.27(b)(5).
1651	Ensure the retention and sustainability of forests, forest resources, and forest carbon over the long term, even as climates change. Region 5 ERIP pg. 3	Region 5 ERIP pg. 3
1651	Certain epiphytic lichens, such as the nitrogen-fixing Lobaria oregana, encounter dispersal problems across early-successional habitats, a primary reason why they predominantly occur in old-growth forests (Sillett et al. 2000).	Sillett et al. 2000
1651	Edge effects may also reduce the amount of area available in a landscape for organisms such as birds (Lehmkuhl and Ruggiero 1991), lichens (Rheault et al. 2003), certain understory plants (Nelson and Halpern 2005), and bryophytes (Nelson and Halpern 2005). Swanson 2005	Lehmkuhl and Ruggiero 1991
1651	Edge effects may also reduce the amount of area available in a landscape for organisms such as birds (Lehmkuhl and Ruggiero 1991), lichens (Rheault et al. 2003), certain understory plants (Nelson and Halpern 2005), and bryophytes (Nelson and Halpern 2005). Swanson 2005	Rheault et al. 2003
1651	Edge effects may also reduce the amount of area available in a landscape for organisms such as birds (Lehmkuhl and Ruggiero 1991), lichens (Rheault et al. 2003), certain understory plants (Nelson and Halpern 2005), and bryophytes (Nelson and Halpern 2005). Swanson 2005	Nelson and Halpern 2005
1651	Decision makers, scientists, and the interested public now recognize that there is an urgent need to restore forest ecosystems after decades of intensive logging, fire suppression, road building, live- stock grazing, mining, and invasions by exotic species (see Noss and Cooperrider 1994, Ricketts and others 1999, Pimmentel and others 2000 for reviews).	Noss and Cooperrider 1994
1651	Decision makers, scientists, and the interested public now recognize that there is an urgent need to restore forest ecosystems after decades of intensive logging, fire suppression, road building, live- stock grazing, mining, and invasions by exotic species (see Noss and Cooperrider 1994, Ricketts and others 1999, Pimmentel and others 2000 for reviews).	Ricketts and others 1999

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1651	Decision makers, scientists, and the interested public now recognize that there is an urgent need to restore forest ecosystems after decades of intensive logging, fire suppression, road building, live- stock grazing, mining, and invasions by exotic species (see Noss and Cooperrider 1994, Ricketts and others 1999, Pimmentel and others 2000 for reviews).	Pimmentel and others 2000
1651	Such damaging activities have compacted soils, channelized streams, fragmented forests, suppressed natural fire, assisted the spread of some invasive species, and caused the loss of native species and their habitat (Noss and Cooperrider 1994, Heilman and others 2002). DellaSala 2003	Noss and Cooperrider 1994
1651	Such damaging activities have compacted soils, channelized streams, fragmented forests, suppressed natural fire, assisted the spread of some invasive species, and caused the loss of native species and their habitat (Noss and Cooperrider 1994, Heilman and others 2002). DellaSala 2003	Heilman and others 2002
1651	Noss, Reed, Ph. D., Strittholt, James, Ph. D, Vance-Borland, Ken M.S., Carroll, Carlos, M.S., Frost, Pamela, M.S. A Conservation Plan for the Klamath Siskiyou Ecoregion. Natural Areas Journal 19;392-411, Volume, 1999.	A Conservation Plan for the Klamath Siskiyou Ecoregion. Natural Areas Journal 19;392-411, Volume, 1999.
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1651	Keith, H., B.G. Mackey, and D.B. Lindenmayer. 2009. Re-evaluation of forest biomass carbon stocks and lessons from the world's most carbon-dense forests. Proceedings of the National Academy of Sciences 106: 11635-11640	Keith et al. 2009
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1082	Dr. Cohen's opposing view #1 - "Research results indicate that the home and its immediate surroundings within 100-200 feet (30-60 meters) principally determines the home ignition potential during severe wildland-urban fires. Research has also established that fire is an intrinsic ecological process of nearly all North American ecosystems. Together, this understanding forms the basis for a compelling argument for a different approach to addressing the wildland-urban fire problem." (Pg. 1 – abstract) Source: Wildland-Urban Fire—A different approach http://www.nps.gov/fire/download/pub_pub_wildlandurbanfire.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandurbanfire.pdf

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1082	Dr. Cohen's opposing view #13 - "My examination suggests that the abundance and ubiquity of pine needles, dead leaves, cured vegetation, flammable shrubs, wood piles, etc. adjacent to, touching and or covering the homes principally contributed to the residential losses." (Pg. 4) Source: Examination of the Home Destruction in Los Alamos Associated with the Cerro Grande Fire July 10, 2000 Source: USDA Forest Service, Rocky Mountain Research Station, Missoula, Montana, 2000. http://www.fusee.org/docs/Preparedness/Cohen_examlosalamos%20copy.pdf	http://www.fusee.org/docs/Preparedness/Cohen_examlosalamos%20copy.pdf
1082	Dr. Cohen's opposing view #17 - "For the same reason, mitigating home ignition potential during extreme wildland fires must focus activities within and immediate to the residential area, i.e. the home ignition zone. But the home ignition zone largely corresponds to private property. Thus, with minor exception, the authority for effectively reducing the home ignition potential belongs to homeowners. Public land management agencies can facilitate homeowner mitigations and these agencies may be able to reduce fire intensities and the extent of burning around communities. But these agencies cannot accomplish the necessary and sufficient actions necessary to prevent residential fire disasters during extreme fire conditions by treating beyond the home ignition zone." (Pg. 2) Source: Thoughts on the Wildland-Urban Interface Fire Problem, June 2003 http://www.nps.gov/fire/download/pub_pub_wildurbaninterface.pdf	http://www.nps.gov/fire/download/pub_pub_wildurbaninterface.pdf
1082	Dr. Cohen's opposing view #19 - "SIAM calculations indicate that large wildland flame fronts (e.g., forest crown fires) will not result in piloted wood ignitions (e.g., the typical variety of exterior wood walls) at distances greater than 40 meters (Cohen and Butler [In press])." (Pg. 4) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf

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1082	Dr. Cohen's opposing view #20 - "Field studies conducted during the International Crown Fire Modeling Experiment (Alexander et al. 1998) provided measured data for comparisons with SIAM model estimates. Total heat transfer (radiation and convection) and ignition data were obtained from heat flux sensors placed in wooden wall sections. The instrumented walls were located on flat, cleared terrain at 10, 20, and 30 meters downwind from the edge of the forested plots. The forest was variably composed of an overstory of jack pine (Pinus banksiana) about 13 meters high with an understory of black spruce (Picea mariana). The spreading crown fire produced flames approximately 20 meters high." (Pg. 5) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #21 - "Five burns were conducted where wall sections were exposed to a spreading crown fire. As the crown fires reached the downwind edge of the plot, turbulent flames extended into the clearing beyond the forest edge. In two of the five burns, flames extended beyond 10 meters to make contact with the wall section placed at 10 meters from the forest edge. When flame contact occurred, the walls ignited; however, without flame contact, only scorch occurred. The wooden panels at 20 and 30 meters never ignited and the panel at 30 meters never scorched." (Pg. 6) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf

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1082	Dr. Cohen's opposing view #22 - "Case studies of actual W-UI fires provide an independent comparison with SIAM and the crown fire experiments. The actual fires incorporate a wide range of fire exposures. The case studies chosen examine significant factors related to home survival for two fires that destroyed hundreds of homes. The Bel Air fire resulted in 484 homes destroyed (Howard et al. 1973) and the Painted Cave fire destroyed 479 homes (Foote 1994). Analyses of both fires indicate that home ignitions depend on the characteristics of a home and its immediate surroundings. Howard et al. (1973) observed 95 percent survival for homes with nonflammable roofs and a vegetation clearance of 10 to 18 meters. Foote (1994) observed 86 percent survival for homes with nonflammable roofs and a clearance of 10 meters or more." (Pg. 7) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #23 - "The high survival rate for homes with nonflammable roofs and 10-20 meter vegetation clearances included firebrands as an ignition factor, thus indicating that firebrand ignitions also depend on the ignition characteristics of the home and the adjacent flammable materials." (Pg. 8) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #24 - "Wildland fuel reduction beyond the home ignition zone does not necessarily change home ignitability; therefore, wildland fuel reduction does not necessarily mitigate the W-UI fire loss problem." (Pg. 9) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf

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1082	Dr. Cohen's opposing view #25 - "Effective landscape fuel reduction does not necessarily prevent W-UI home fire destruction." (Pg. 10) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #26 - "Fire losses depend on home ignitions and home ignitions depend on home ignitability. Thus, home ignitability, being limited to a home and its immediate surroundings, offers us the opportunity to separate the W-UI structure fire loss problem from other landscape-scale fire management issues. This conclusion has significant implications for the actions and responsibilities of homeowners and fire agencies, such as identifying and mapping the potential for W-UI residential fire destruction, identifying appropriate and effective mitigating actions, and determining who should take responsibility for home ignitability." (Pg. 10) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #27 - "Thus, wildland fuel reduction that is effective for reducing the wildland fire intensity might be insufficient for reducing the destruction of highly ignitable homes. In contrast, a low home ignition potential reduces the chances of fire destruction without extensive wildland fuel reduction. These findings indicate that the W-UI home fire loss problem is a home ignitability issue largely independent of landscape fuel reduction issues." (Pg. 10) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf

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1082	Dr. Cohen's opposing view #28 - "The extent of the home ignition zone corresponds more to specific home and community ownership than to the landscapes of federal, state and local land management agencies. This suggests a corresponding responsibility for W-UI home fire loss potential residing with homeowners and communities. Thus, the home should not be considered a victim of wildland fire, but rather a potential participant in the continuation of the wildland fire. Home ignitability, i.e., the potential for W-UI home fire loss, is a homeowner and community choice and responsibility." (Pg. 11) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #29 - "Model results indicate that ignitions from flame radiation are unlikely to occur from burning vegetation beyond 40 meters of a structure. Thinning vegetation within 40 meters has a significant ignition mitigation effect." (Pg. 81) Source for quotes #29 and #30 above: Modeling Potential Structure Ignitions from Flame Radiation Exposure with Implications for Wildland/Urban Interface Fire Management Presented at the 13th Fire and Forest Meteorology Conference. Lorne, Australia, 1996 http://www.firewise.org/resources/files/WUI_HIR/Modelingpotentialignitions.pdf	http://www.firewise.org/resources/files/WUI_HIR/Modelingpotentialignitions.pdf
1082	Dr. Cohen's opposing view #30 - "Vegetation management to prevent ignitions from radiation does not require extensive vegetation removal hundreds of meters from a structure. Our analysis indicated that 40 meters was sufficient for a 20 meter flame height." (Pg. 86 – Conclusions) Source for quotes #29 and #30 above: Modeling Potential Structure Ignitions from Flame Radiation Exposure with Implications for Wildland/Urban Interface Fire Management Presented at the 13th Fire and Forest Meteorology Conference. Lorne, Australia, 1996 http://www.firewise.org/resources/files/WUI_HIR/Modelingpotentialignitions.pdf	http://www.firewise.org/resources/files/WUI_HIR/Modelingpotentialignitions.pdf

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1082	Dr. Cohen's opposing view #31 - "Miracles aside, the characteristics of the surviving home and its immediate surroundings greatly influenced its survival." (Pg. 15) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1082	Dr. Cohen's opposing view #32 - "Based on severe-case assumptions of flame radiation and exposure time, SIAM calculations indicate that wild-land flame fronts comparable to crowning and torching trees (flames 20 meters high and 50 meters wide) will not ignite wood surfaces at distances greater than 40 meters (Cohen and Butler, in press). Figure 2 shows the radiant heat a wall would receive from flames depending on its distance from the fire. The incident radiant heat flux, defined as the rate of radiant energy per unit area received at an exposed surface, decreases as the distance increases." (Pg. 17) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1082	Dr. Cohen's opposing view #33 - "Analyses of both fires indicate that home ignitions depend on the characteristics of a structure and its immediate surroundings. Howard et al. (1973) observed 86 percent survival for homes with nonflammable roofs and a clearance of 10 meters or more." (Pg. 19) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf

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1082	Dr. Cohen's opposing view #34 - "Using the model results as guidance with the concurrence of experiments and case studies, we can conclude that home ignitions are not likely unless flames and firebrand ignitions occur within 40 meters of the structure. This finding indicates that the spatial scale determining home ignitions corresponds more to specific home and community sites than to the landscape scales of wildland fire management. Thus, the W-UI fire loss problem primarily depends on the home and its immediate site." (Pg.20) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1082	Dr. Cohen's opposing view #35 - "Thus, the W-UI fire loss problem can be defined as a home ignitability issue largely independent of wildland fuel management issues. This conclusion has significant implications for the actions and responsibilities of homeowners and fire agencies, such as defining and locating potential W-UI fire problems (for example, hazard assessment and mapping), identifying appropriate mitigating actions, and determining who must take responsibility for home ignitability." (Pg.20) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1082	Dr. Cohen's opposing view #36 - "The W-UI fire case studies indicated approximately 90 percent survival with a vegetation clearance on the order of 10 to 20 meters for homes with nonflammable roofs. Thus, the case studies support the general flame-to-structure distance range of 10 to 40 meters as found through modeling and experiments." (Pg.20) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf

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1082	Dr. Cohen's opposing view #37 - "A change needs to take place in the relationship between homeowners and the fire services. Instead of home-related presuppression and fire protection responsibilities residing solely with fire agencies, homeowners must take the principal responsibility for ensuring adequately low home ignitability." (Pg.21) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1082	Dr. Cohen's opposing view #1 - "Research results indicate that the home and its immediate surroundings within 100-200 feet (30-60 meters) principally determines the home ignition potential during severe wildland-urban fires. Research has also established that fire is an intrinsic ecological process of nearly all North American ecosystems. Together, this understanding forms the basis for a compelling argument for a different approach to addressing the wildland-urban fire problem." (Pg. 1 – abstract) Source: Wildland-Urban Fire—A different approach http://www.nps.gov/fire/download/pub_pub_wildlandurbanfire.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandurbanfire.pdf
1082	Dr. Cohen's opposing view #13 - "My examination suggests that the abundance and ubiquity of pine needles, dead leaves, cured vegetation, flammable shrubs, wood piles, etc. adjacent to, touching and or covering the homes principally contributed to the residential losses." (Pg. 4) Source: Examination of the Home Destruction in Los Alamos Associated with the Cerro Grande Fire July 10, 2000 Source: USDA Forest Service, Rocky Mountain Research Station, Missoula, Montana, 2000. http://www.fusee.org/docs/Preparedness/Cohen_examlosalamos%20copy.pdf	http://www.fusee.org/docs/Preparedness/Cohen_examlosalamos%20copy.pdf

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1082	Dr. Cohen's opposing view #17 - "For the same reason, mitigating home ignition potential during extreme wildland fires must focus activities within and immediate to the residential area, i.e. the home ignition zone. But the home ignition zone largely corresponds to private property. Thus, with minor exception, the authority for effectively reducing the home ignition potential belongs to homeowners. Public land management agencies can facilitate homeowner mitigations and these agencies may be able to reduce fire intensities and the extent of burning around communities. But these agencies cannot accomplish the necessary and sufficient actions necessary to prevent residential fire disasters during extreme fire conditions by treating beyond the home ignition zone." (Pg. 2) Source: Thoughts on the Wildland-Urban Interface Fire Problem, June 2003 http://www.nps.gov/fire/download/pub_pub_wildurbaninterface.pdf	http://www.nps.gov/fire/download/pub_pub_wildurbaninterface.pdf
1082	Dr. Cohen's opposing view #19 - "SIAM calculations indicate that large wildland flame fronts (e.g., forest crown fires) will not result in piloted wood ignitions (e.g., the typical variety of exterior wood walls) at distances greater than 40 meters (Cohen and Butler [In press])." (Pg. 4) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #20 - "Field studies conducted during the International Crown Fire Modeling Experiment (Alexander et al. 1998) provided measured data for comparisons with SIAM model estimates. Total heat transfer (radiation and convection) and ignition data were obtained from heat flux sensors placed in wooden wall sections. The instrumented walls were located on flat, cleared terrain at 10, 20, and 30 meters downwind from the edge of the forested plots. The forest was variably composed of an overstory of jack pine (Pinus banksiana) about 13 meters high with an understory of black spruce (Picea mariana). The spreading crown fire produced flames approximately 20 meters high." (Pg. 5) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf

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1082	Dr. Cohen's opposing view #21 - "Five burns were conducted where wall sections were exposed to a spreading crown fire. As the crown fires reached the downwind edge of the plot, turbulent flames extended into the clearing beyond the forest edge. In two of the five burns, flames extended beyond 10 meters to make contact with the wall section placed at 10 meters from the forest edge. When flame contact occurred, the walls ignited; however, without flame contact, only scorch occurred. The wooden panels at 20 and 30 meters never ignited and the panel at 30 meters never scorched." (Pg. 6) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #22 - "Case studies of actual W-UI fires provide an independent comparison with SIAM and the crown fire experiments. The actual fires incorporate a wide range of fire exposures. The case studies chosen examine significant factors related to home survival for two fires that destroyed hundreds of homes. The Bel Air fire resulted in 484 homes destroyed (Howard et al. 1973) and the Painted Cave fire destroyed 479 homes (Foote 1994). Analyses of both fires indicate that home ignitions depend on the characteristics of a home and its immediate surroundings. Howard et al. (1973) observed 95 percent survival for homes with nonflammable roofs and a vegetation clearance of 10 to 18 meters. Foote (1994) observed 86 percent survival for homes with nonflammable roofs and a clearance of 10 meters or more." (Pg. 7) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf

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1082	Dr. Cohen's opposing view #23 - "The high survival rate for homes with nonflammable roofs and 10-20 meter vegetation clearances included firebrands as an ignition factor, thus indicating that firebrand ignitions also depend on the ignition characteristics of the home and the adjacent flammable materials." (Pg. 8) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #24 - "Wildland fuel reduction beyond the home ignition zone does not necessarily change home ignitability; therefore, wildland fuel reduction does not necessarily mitigate the W-UI fire loss problem." (Pg. 9) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #25 - "Effective landscape fuel reduction does not necessarily prevent W-UI home fire destruction." (Pg. 10) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #26 - "Fire losses depend on home ignitions and home ignitions depend on home ignitability. Thus, home ignitability, being limited to a home and its immediate surroundings, offers us the opportunity to separate the W-UI structure fire loss problem from other landscape-scale fire management issues. This conclusion has significant implications for the actions and responsibilities of homeowners and fire agencies, such as identifying and mapping the potential for W-UI residential fire destruction, identifying appropriate and effective mitigating actions, and determining who should take responsibility for home ignitability." (Pg. 10) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf

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1082	Dr. Cohen's opposing view #27 - "Thus, wildland fuel reduction that is effective for reducing the wildland fire intensity might be insufficient for reducing the destruction of highly ignitable homes. In contrast, a low home ignition potential reduces the chances of fire destruction without extensive wildland fuel reduction. These findings indicate that the W-UI home fire loss problem is a home ignitability issue largely independent of landscape fuel reduction issues." (Pg. 10) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #28 - "The extent of the home ignition zone corresponds more to specific home and community ownership than to the landscapes of federal, state and local land management agencies. This suggests a corresponding responsibility for W-UI home fire loss potential residing with homeowners and communities. Thus, the home should not be considered a victim of wildland fire, but rather a potential participant in the continuation of the wildland fire. Home ignitability, i.e., the potential for W-UI home fire loss, is a homeowner and community choice and responsibility." (Pg. 11) Source for quotes #19 to #28 above: What is the Wildland Fire Threat to Homes? Presented as the Thompson Memorial Lecture, April 10, 2000 http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf	http://www.nps.gov/fire/download/pub_pub_wildlandfirethreat.pdf
1082	Dr. Cohen's opposing view #29 - "Model results indicate that ignitions from flame radiation are unlikely to occur from burning vegetation beyond 40 meters of a structure. Thinning vegetation within 40 meters has a significant ignition mitigation effect." (Pg. 81) Source for quotes #29 and #30 above: Modeling Potential Structure Ignitions from Flame Radiation Exposure with Implications for Wildland/Urban Interface Fire Management Presented at the 13th Fire and Forest Meteorology Conference. Lorne, Australia, 1996 http://www.firewise.org/resources/files/WUI_HIR/Modelingpotentialignitions.pdf	http://www.firewise.org/resources/files/WUI_HIR/Modelingpotentialignitions.pdf

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1082	Dr. Cohen's opposing view #30 - "Vegetation management to prevent ignitions from radiation does not require extensive vegetation removal hundreds of meters from a structure. Our analysis indicated that 40 meters was sufficient for a 20 meter flame height." (Pg. 86 – Conclusions) Source for quotes #29 and #30 above: Modeling Potential Structure Ignitions from Flame Radiation Exposure with Implications for Wildland/Urban Interface Fire Management Presented at the 13th Fire and Forest Meteorology Conference. Lorne, Australia, 1996 http://www.firewise.org/resources/files/WUI_HIR/Modelingpotentialignitions.pdf	http://www.firewise.org/resources/files/WUI_HIR/Modelingpotentialignitions.pdf
1082	Dr. Cohen's opposing view #31 - "Miracles aside, the characteristics of the surviving home and its immediate surroundings greatly influenced its survival." (Pg. 15) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1082	Dr. Cohen's opposing view #32 - "Based on severe-case assumptions of flame radiation and exposure time, SIAM calculations indicate that wild-land flame fronts comparable to crowning and torching trees (flames 20 meters high and 50 meters wide) will not ignite wood surfaces at distances greater than 40 meters (Cohen and Butler, in press). Figure 2 shows the radiant heat a wall would receive from flames depending on its distance from the fire. The incident radiant heat flux, defined as the rate of radiant energy per unit area received at an exposed surface, decreases as the distance increases." (Pg. 17) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1082	Dr. Cohen's opposing view #33 - "Analyses of both fires indicate that home ignitions depend on the characteristics of a structure and its immediate surroundings. Howard et al. (1973) observed 86 percent survival for homes with nonflammable roofs and a clearance of 10 meters or more." (Pg. 19) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf

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1082	Dr. Cohen's opposing view #34 - "Using the model results as guidance with the concurrence of experiments and case studies, we can conclude that home ignitions are not likely unless flames and firebrand ignitions occur within 40 meters of the structure. This finding indicates that the spatial scale determining home ignitions corresponds more to specific home and community sites than to the landscape scales of wildland fire management. Thus, the W-UI fire loss problem primarily depends on the home and its immediate site." (Pg.20) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1082	Dr. Cohen's opposing view #35 - "Thus, the W-UI fire loss problem can be defined as a home ignitability issue largely independent of wildland fuel management issues. This conclusion has significant implications for the actions and responsibilities of homeowners and fire agencies, such as defining and locating potential W-UI fire problems (for example, hazard assessment and mapping), identifying appropriate mitigating actions, and determining who must take responsibility for home ignitability." (Pg.20) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1082	Dr. Cohen's opposing view #36 - "The W-UI fire case studies indicated approximately 90 percent survival with a vegetation clearance on the order of 10 to 20 meters for homes with nonflammable roofs. Thus, the case studies support the general flame-to-structure distance range of 10 to 40 meters as found through modeling and experiments." (Pg.20) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf

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1082	Dr. Cohen's opposing view #37 - "A change needs to take place in the relationship between homeowners and the fire services. Instead of home-related pre-suppression and fire protection responsibilities residing solely with fire agencies, homeowners must take the principal responsibility for ensuring adequately low home ignitability." (Pg.21) Source for quotes #31 to #37 above: Preventing Disaster Home ignitability in the Wildland-Urban Interface Published in the Journal of Forestry 98(3): 15-21, 2000 http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf	http://www.nps.gov/fire/download/pub_pub_preventingdisaster.pdf
1651	Please see this article written by 10 fire scientists published in Science Magazine (Attached) from April 2008: Post-Fire Logging Debate Ignores Many Issues	Science Magazine April 2008