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8 June 2020

TO: Forest Supervisor, Reviewing Officer Umpqua National Forest

ATTN: Calf-Copeland Objections

VIA: [objections-pnw-umpqua@fs.fed.us](mailto:objections-pnw-umpqua@fs.fed.us)

**Subject: 36 CFR 218 objection of the Calf Copeland Project FEIS / draft ROD**

Dear Forest Service:

In accordance with 36 CFR 218, Oregon Wild hereby objects to the project described below.

**DOCUMENT TITLE**: Calf-Copeland Restoration Project draft Record of Decision and FEIS

**PROJECT DESCRIPTION**: The draft decision is to implement Alternative 3 proposes to commercially thin approximately 3,420 acres within the project area and would yield approximately 42 million board feet of timber. Approximately 607 acres would be treated using non-commercial treatments. Approximately 9 miles of temporary road construction would occur and approximately 138.9 miles of existing road would be maintained under Alternative 3. Additionally travel management activities would occur on approximately 27.2 miles of system roads.

Alternative 3 is much more aggressive and represents a more significant violation of the Northwest Forest Plan than the proposed action described in the DEIS.

**PROJECT LOCATION (Forest/District)**: North Umpqua and Diamond Lake Ranger Districts, Umpqua National Forest Douglas County, Oregon

**NAME AND TITLE OF RESPONSIBLE OFFICIAL**: Sherri L. Chambers, District Ranger, North Umpqua Ranger District

**REQUEST FOR MEETING TO DISCUSS RESOLUTION:** Oregon Wild hereby requests a meeting to discuss potential resolution of the issues raised in this objection.

**NARRATIVE DESCRIPTION OF THOSE ASPECTS OF THE PROPOSED DECISION ADDRESSED BY THE OBJECTION:**

We object to 1,729 acres of commercial logging in native forest stands over 80 years old and 6.5 miles of new temporary road construction because these activities violates the Northwest Forest Plan standards & guidelines for Late Successional Reserves. Commercial logging in native stands is neither needed to meet LSR objectives, nor will logging provide greater assurance that late successional habitat will be maintained.

We object to 2.5 acre gaps in LSRs because such large gaps do not enhance late successional conditions and violate the standards & guidelines for LSRs. The FS can plant pine and oak in existing openings created by wildfire.

We also object to the FS failure to consider alternatives that would meet LSR standards & guidelines and rationally harmonize LSR goals (e.g., spotted owls, wildlife cover, snags) and other goals such as sugar pine, fuels, and carbon storage.

We object to flawed assumptions underpinning the purpose and need.

We object to several serious flaws in the NEPA analysis.

**SUGGESTED REMEDIES THAT WOULD RESOLVE THE OBJECTION:**

Oregon Wild respectfully requests that the Forest Service withdraw the recommended project and —

1. Issue a clear decision that complies with the Northwest Forest Plan standards & guidelines, avoids commercial logging and road building in mature native stands in LSRs, riparian reserves, and unroaded areas >1,000 acres; or
2. Prepare a new EIS to address the significant impacts and unresolved conflicts and fully complies with the requirements of NEPA and the CEQ regulations and addresses the specific concerns expressed below.

Oregon Wild does NOT object to:

* careful variable thinning of dense young stands accessible from existing roads, with adequate stream buffers, and enough green tree retention to ensure long-term snag recruitment;
* killing some small, young shade-tolerant conifer trees that are encroaching within 20 feet and in direct competition with legacy pines and oaks in native stands (this does not require treating whole stands);
* shaded fuel breaks focused on young stands along roads;
* removal of small fuels within the structure-ignition-zone of the wildland urban interface;
* non-commercial thinning of small material, road closures, culvert removal/replacement, instream wood placement, prescribed fire;

**DESCRIBE HOW THE OBJECTIONS RELATE TO PRIOR COMMENTS:**

Oregon Wild provided detailed written comments on 30 Aug 2017 and

30 Sept 2019 specifically addressing the objection points raised herein.

**SPECIFIC ISSUES RELATED TO THE PROPOSED ACTION:**

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# The FEIS violates NEPA by failing to disclose how logging native stands in LSRs complies with substantive requirements

Logging in stands over 80 years old in an LSR is a big deal that has rarely been done, because it is almost always inconsistent with the carefully crafted standards & guidelines for Late Successional Reserves. This project attempts to squeeze through a narrow exemption for risk reduction activities in LSR stands over 80 years, but the FEIS does not adequately explain how this project specifically meets the prescriptive criteria for such projects. This is a NEPA violation.

This project deserves extra scrutiny because:

* this project is located in the West Cascades Province where risk reduction is not favored;
* this project will remove/downgrade/degrade owl habitat and exacerbate the adverse competitive interactions between spotted owls and barred owls (and there is no programmatic EIS covering projects in this context);
* this project will not comply with the requirement to survey and protect red tree voles, an important food for spotted owls,
* there is compelling evidence that LSRs can accommodate wildfire, including severe fires, that wildfires are not burning uncharacteristically, and recent wildfires are already providing benefits to LSR objectives.

The FEIS failed to provide a compelling explanation why logging is needed to meet LSR objectives (when fire is also entirely consistent with LSR objectives), and failed to provide quantitative analysis to showing that logging will provide greater assurance of LSR habitat maintenance. Instead of providing the required analysis, the EIS basically just says that REO concurred with our finding that logging is needed and will provide greater assurance. This is a NEPA violation. The FS cannot hide bind the REOs concurrence, when the FS has a duty under NEPA to disclose in the EIS how substantive forest plan requirements will be met.

Appendix C purportedly described compliance with laws and policies but it fails to disclose compliance with the Northwest Forest Plan standards & guidelines for risk reduction treatments in LSR as mandated by NFMA. The FEIS (p 467) just says “Proposed activities and project design features included in the Project were designed to ensure compliance with these Forest Plans’ standards and guidelines.” This is a problem because (1) scoping comments raised issues with respect to compliance with specific standards & guidelines, (2) the law requires disclosure of compliance with substantive requirements, (3) this project is precedent setting to the extent it involves extensive logging in LSR stands over 80 years old using loopholes that have not been tested.

The law is clear. All site-specific activities must comply with the governing forest plan. National Forest Management Act, 16 U.S.C. § 1604(i) (governing FS management of national forest lands). And the FS has a NEPA duty to disclose how its proposed decision complies with substantive legal requirements.

NEPA requires disclosure of information necessary to determine compliance with legal requirements such as the Endangered Species Act, Clean Water Act, National Forest Management Act, and applicable Forest Plan Standards & Guidelines. See 40 CFR 15087.27(b)(10) and NW Indian Cemetery Protective Association v. Peterson, 795 F2d 688 (9th Circ. 1986). In this G-O Road case, the NEPA document described water quality changes resulting from a road project in terms of 7-day average changes, whereas the applicable WQ standard was defined by daily peak changes. The court found this to be a NEPA violation.

The USDA Office of General Counsel agrees that project level analysis must document “Project Compliance With Other Laws.”

In addition to consistency with the LRMP each project must be in compliance with NEPA, CWA, CAA and other laws. Simply being consistent with the LRMP does not fulfill the site-specific requirements of Federal law. Project level analysis is to "determine findings for NFMA, to ensure compliance with NEPA, and to meet other appropriate laws and regulations." Forest Service Land and Resource Management Planning, FSM 1920 and Forest Service Handbook 1909.12, 5.31. 53 Fed. Reg. 26807, 26836 (July 15, 1988).

OGC, “Forest Plan and Project Level Decisionmaking— Overview of Forest Planning and Project Level Decisionmaking,” <http://web.archive.org/web/20030111060230/http://www.fs.fed.us/forum/nepa/decisionm/p4.html>

<http://web.archive.org/web/20060829000705/http://www.fs.fed.us/emc/nfma/includes/overview.pdf>

The CEQ NEPA regulations also require an analysis of legal requirements in order to determine whether an action may cause significant impacts on the environment. 40 CFR §1508.27(b)(10) (“*Significantly*, as used in NEPA, requires considerations of both context and intensity: … The following should be considered in evaluating intensity: … Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.” *Emphasis added.*) SAS v. Mosely 798 F.Supp. 1473 (W.D. Wash. May 1992) (“The FEIS has thus mentioned what appears to be a major consequence of the plan jeopardy to other species that live in the old growth forests without explaining the magnitude of the risk or attempting to justify a potential abandonment of conservation duties imposed by law. An EIS devoid of this information does not meet the requirements of NEPA.” *Emphasis added.*) Even for projects that are already determined likely to be significant, it makes no sense that they would not disclose this critical information.

The Forest Service NEPA Handbook also requires that Decision Notices explain complete[ly] and comprehensive[ly]” how the NEPA decision complies with applicable legal requirements including the LRMP land allocations and Standards & Guidelines.

FSH 1909.15 Chapter 40, 43.21 - **Format and Content**

Decision notices document the conclusions drawn and the decision(s) made based on the analysis in the EA. Decision notices should conform to the following format and content. While sections may be combined or rearranged in the interest of clarity and brevity, the information needs to be complete and comprehensive.

…

6. Findings required by other laws and regulations. Include any findings required by any other laws which apply to the decision being made. Cite the project record or environmental analysis document that contains the information being used to support the findings. Describe how the decision is consistent with applicable laws and regulations. For example, findings regarding consistency with the forest plan (allocation, and standards and guidelines), suitability for timber production, and vegetation management criteria required by the National Forest Management Act and 36 CFR part 219. (emphasis added)

<http://web.archive.org/web/20090118192937/http://www.fs.fed.us/im/directives/fsh/1909.15/1909.15_40.doc>

See also, Judge King's October 2003 Decision in ONRC Action v. U.S. Forest Service, CV. 03-613-KI (“The underlying EAs for the timber sales at issue did not properly frame the Forest Service’s survey and manage duties, they did not analyze a range of alternatives based upon these duties, they did not evaluate completed surveys, they did not demonstrate that the Forest Service had all of the proper information before it before allowing logging, and they did not provide for public influence over the decisions. For all of these reasons, the underlying EAs are legally deficient.” *Emphasis added.*) <http://web.archive.org/web/20041105214752/http://www.onrc.org/press/ONRCv.USFS.pdf>

And also Judge Hogan’s ruling in Klamath Siskiyou Wildlands Center v. Boody (D. Or. #03-3124-CO. May 18, 2004) where he held “plaintiffs have raised a serious question as to whether BLM violated NEPA in failing to disclose sufficient information in the EA to confirm compliance with … the RMP.” (Order at page 18).

The 9th Circuit has explicitly found that a EIS violates NEPA when it has an inaccurate or misleading description of forest plan requirements.

The Forest Service’s use of a hiding cover denominator in the EIS other than that allowed by the HNF Plan arbitrarily and capriciously skewed the EIS’s elk herd hiding cover percentage. Consequently, the Elkhorn project EIS did not provide a “full and fair” discussion of the potential effects of the project on elk hiding cover and did not “inform[ ] decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts” on the Sheep Creek elk herd. *Klamath-Siskiyou Wildlands Ctr.*, 387 F.3d at 993 (quoting 40 C.F.R. § 1502.1); *see also Animal Def. Council v. Hodel*, 840 F.2d 1432, 1439 (9th Cir. 1988) (“Where the information in the initial EIS was so incomplete or misleading that the decisionmaker and the public could not make an informed comparison of the alternatives, revision of an EIS may be necessary to provide a reasonable, good faith, and objective presentation of the subjects required by NEPA.”) (internal quotation marks omitted), *amended by* 867 F.2d 1244 (9th Cir. 1989).

…

The Elkhorn project EIS is inadequate under NEPA because, by using a hiding cover calculation denominator that is inconsistent with that required by the HNF plan, the agency did not take a “hard look” at the project’s true effect and failed to inform the public of the project’s environmental impact.

Native Ecosystems Council v. USFS. (9th Circuit August 11, 2005) <http://www.ntc.blm.gov/krc/uploads/194/2h%20-%20Native%20Ecosystems%20Council%20v%20US%20Forest%20Service%20--%20Jimtown.pdf>.

A recent case in Montana found legal error where the record cannot support a finding that legal standards were met. In this case the FS had a LRMP requirement to meet big game cover requirements based on *concealment*, but then the NEPA analysis analyzed big game cover using *canopy cover* instead of *concealment*.

The discussion of the method used does not mention the Forest Service definition of hiding cover, which requires timber to “conceal 90% or more of a standing elk at 200 feet.” AR F176 at 26. However, the method does seem to correlate with the definition used by the Montana FWP, which defines hiding cover as “[a] stand of coniferous trees having a crown closure of greater than 40%.” AR F176 at 26.  
...  
As in *Native Ecosystems Council*, the Court is not “able reasonably to ascertain from the record that the Forest Service is in compliance with the HNF Plan standard.” 418 F.3d at 963. First, it seems the Forest Service has modeled hiding cover based on the Montana FWP method using canopy cover. There is no discussion either in the document describing the methodology or in the EA whether measuring canopy cover percentages, as required by the FWP definition of hiding cover, is synonymous with the Forest Service definition of hiding cover. Consequently, it is impossible for the Court to determine whether the project will, in fact, comply with the Forest Service’s elk hiding cover standard.

HELENA HUNTER & ANGLERS v. TOM TIDWELL. Montana District Court. CV 08-162-M-DWM. July 29, 2009.

The 9th Circuit recently highlighted the connection between substantive requirements and NEPA.

[T]he Forest Service’s use of the nonexistent sage grouse as an MIS to assess the project’s impact on all sagebrush species’ diversity was flawed. As a result, its overall study of the sage grouse habitat throughout the Environmental Assessment was similarly deficient. Just as the methodology applied by the Forest Service to measure habitat conditions did not meet the NFMA requirements, its flawed methodology in the complete absence of a sage grouse population does not constitute the requisite “hard look” mandated by NEPA. See Native Ecosystems Council v. USFS, 418 F.3d 953, 964-65 (9th Cir. 2005) (recognizing that the Forest Service’s reliance on incorrect assumptions and/or data violated NFMA and did not meet the agency’s obligation to take a “hard look” under NEPA).

... We note that a revised environmental assessment considering the issues addressed above might come to a different conclusion than the original environmental assessment…

NATIVE ECOSYSTEMS COUNCIL v. TOM TIDWELL (9th Circ. March 9, 2010) <http://www.ca9.uscourts.gov/datastore/opinions/2010/03/09/06-35890.pdf>.

# The draft ROD violates NFMA because logging native forest stands over 80 years old violates standards & guidelines for Late Successional Reserves.

The Northwest Forest Plan ROD explicitly prohibits logging in stands over 80 years old in the West Cascades Province, but allows some risk reduction activities to occur in stands over 80 years old in the East Cascades and Klamath Provinces. This project is not located in those provinces, “The Middle North Umpqua watershed occurs in the Oregon portion of the West Cascades physiographic province,” FEIS (p 513) so the 80 year limitation should prevent logging in native stands. REO says this area is like the dryer provinces and risk reduction should be considered but that does not waive the LSR standards & guidelines entirely. In fact, they should be even more rigorously evaluated since they are being applied here in the moister West Cascades Province.

Even if risk reduction were allowed in this province, the proposed commercial logging in native stands does not come close to meeting the strict standards for such activities, because, as shown in great detail below:

1. logging native stands is *not needed* to meet LSR objectives, and
2. logging native stands will *not provide greater assurance* of maintaining late successional habitat.

In fact, providing greater assurance for late successional habitat is a near mathematical impossibility given the high probability that treatments will degrade late successional habitat, and the low probability that treatments will interact with fire at all, and the low probability that fire will adversely alter late successional habitat even if it does occur in untreated stands (since most fires are low and moderate severity and wildlife evolved with fire).

Late Successional Reserves were established for conservation of late successional habitat. Not log production. The FS cannot ignore the LSR standards & guidelines just because they are able to figure out how to do restoration without doing it as a timber sale. There is a high likelihood that logging will degrade rather than restore late successional habitat values. That is why the authors of the Northwest Forest Plan put strict limits on the allowable activities in LSRs and provided clear requirements to justify exceptions.

Northwest Forest Plan standards & guidelines for LSRs state:

“While risk-reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if: (1) the proposed management activities will **clearly result in greater assurance of long-term maintenance of habitat**, (2) the activities are **clearly needed** to reduce risks, and (3) the **activities will not prevent the Late-Successional Reserves from playing an effective role** in the objectives for which they were established.”

The NEPA analysis failed to explain how this standard is met. The terms “clearly needed” and “greater assurance” do not appear in the FEIS, except for a few references in Appendix K where public comment is paraphrased and inadequately addressed. The bolded standards are difficult to achieve with commercial logging. First, because logging to reduce fire effects has a higher probability to degrade late successional habitat than will fire. A probabilistic analysis will show that logging will reduce the assurance of habitat maintenance because logging will unavoidably degrade late successional habitat, and there is only a very small probability that these fuel treatments will actually experience fire during the period before fuels regrow. Second, fuel reduction activities are NOT clearly needed for many reasons, e.g., because the reserve system was designed to accommodate fire, late successional habitat is being recruited faster than it is being removed by wildfire, wildfire continues to produce a characteristic mix of mostly low and moderate fire effects. Third, fuel reduction at scale and repeated each time fuels regrow will likely prevent the LSR from playing its intended role in late successional habitat conservation. Fourth, FEIS Figures 71, 72, 75, 77, and 78 show that logging will suppress snag habitat for 40 years of more, resulting in the LSR failing to meet snag habitat objectives over several decades.

The REO Concurrence letter is unsupportable, because it relies on a deeply flawed analysis by the Forest Service that entirely fails to account for the probability of harm from logging versus fire. The analysis fails to recognize that it is CERTAIN that logging native stands WILL degrade late successional habitat, while there is a low probability that fire will degrade late successional habitat, and an even lower probability that logging will help.

The FEIS says the REO concurrence finds that

“the activities ‘1) are documented through fire modeling to increase both the torching and crowning indexes and make them less likely to experience high severity fire behavior post treatment, 2) the activities are clearly needed to reduce risk as the planning area has experienced recent wildfires within some and adjacent to other treatment units, and risk levels within stands remain high …’”

(FEIS p 579). First, recent wildfire in and near the project area has reduced fuels and shown that fire is operating within expected natural patterns, which makes logging treatments less necessary, not more. Second, the fire modelling appears to be based on a counter-factual assumption that there is a 100% chance that wildfire will occur after logging and before fuels regrow, when in reality there is a very small probability of fire during that period. *When LSR standards & guidelines demand a greater assurance of habitat benefits, they mean greater assurance in the real world, not in some fantasy world where wildfire magically appears at just the right time, in just the right place, at just the right intensity, to justify logging.*

Oregon Wild comments provided detailed refutation of the flawed analysis in the DEIS and the FEIS entirely failed to meaningfully address our comments, choosing instead to hide behind the REO’s concurrence. Meeting the LSR standard that treatments will clearly result in greater assurance of habitat benefits, requires a hard look that is NOT found in the FEIS, or the LSR consistency analysis, or the REO concurrence letter.

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

“To take the required ‘hard look’ at a proposed project’s effects, an agency may not rely on incorrect assumptions or data in an EIS.” Native Ecosystems Council v. USFS. (9th Circuit August 11, 2005) <http://www.elawreview.org/summaries/environmental_quality/nepa/native_ecosystems_council_v_u.html> *citing* 40 C.F.R. §§ 1500.1(b) and 1502.24.

The Calf-Copeland Restoration Project LSR Project-Level [Consistency Review](https://www.fs.usda.gov/nfs/11558/www/nepa/101686_FSPLT3_5242327.pdf) is deeply flawed. Pages 31-32 purport to explain how logging is *needed* and will *provide greater assurance of habitat maintenance* as required by the LSR standards & guidelines.

Page 21 of the consistency review says “The proposed management activities will clearly result in greater assurance of long-term maintenance of habitat. The proposed fuel treatments would have a direct effect on fire characteristics at the stand level. The results can be seen through increases in torching and crowning indexes (Figures 12 and 13). These treated stands would be less likely to experience high severity fire behavior.” This analysis based on fire models that assume a 100% chance that fire will occur after logging, when in reality there is a low probability that fire will occur. This vastly inflates the alleged benefits of fuel reduction logging.

And the consistency review (p 26) admits that “Short-term tradeoffs of doing thinning treatments in stands older than 80 years old include a downgrade in NRF habitat as well as removal of NRF and Dispersal habitat.” The analysis therefore fails to provide an analysis showing that the *certain* habitat loss from logging is offset by *speculative* habitat benefits from fire resiliency. The Forest Service failed to adjust the expected benefits of fuel reduction logging according to the low probability that such benefits will in fact be realized. [More on this below.]

# The draft ROD violates NFMA because logging native stands violates LSR standards & guidelines. Logging is NOT needed to meet LSR objectives. The purpose and need is based on flawed assumptions about the risk of fire and the efficacy of logging. Fire is not a problem to be fixed; it’s a natural process that provides ecological benefits to the LSR.

The purpose and need to increase forest resiliency to respond to uncharacteristic fire is based on several false assumptions: (1) that wildfires are burning uncharacteristically, (2) that wildfire is adverse to late successional habitat, and (3) that wildfires are effectively controlled by logging. The best evidence shows that wildfires continue to burn in a characteristic pattern of mostly low and moderate severity effects; late successional wildlife evolved with fire, so LSR conditions are not significantly degraded by low- and moderate severity fire; and that fire severity is predominantly controlled by weather, not fuels.

The question of whether fire is out-of-whack, whether it is interfering with LSR goals, goes directly to the issue of LSR standards & guidelines which require the FS to show that intervention is needed.

Jerry Franklin, a primary author of the Northwest Forest Plan, said in his January 20, 2004 comments on the Biscuit Fire Salvage DEIS that

The LSR network was designed to accommodate large, intense natural disturbances and allow for natural recovery processes. … The team that designed the LSR system was certain that large stand-replacing disturbances would impact LSRs and, therefore, that the LSR network needed to be able to accommodate such disturbances. The team had had numerous experiences with such disturbances, including the 1980 Mount St. Helens eruption and the 1988 Yellowstone Fires. Hence, the team built sufficient redundancy into the LSR system so that it could accommodate large disturbances and still remain viable as a regional network. This redundancy also allowed for natural recovery processes within impacted LSRs. Building reserve systems that will accommodate natural disturbance regimes is, of course, a first principle in conservation biology (Lindenmayer and Franklin 2003). … The point of the preceding two paragraphs is to document the basis for my assertion that the LSR system was designed with the capacity to be resilient, i.e. to accommodate significant loss and continue to function as an effective reserve system for old-growth related species.

This powerfully undermines the Forest Service assertion that logging is needed in the LSR. LSRs can tolerate both fire and the slow process of forest recovery after fire. The FS does not need to intervene to prevent fire or to rush things along after fire. In fact, if we do try to rush things it may be counter-productive. The purpose and need for this project should include conserving and perpetuating these unique ecological processes.

The FEIS failed to fully consider many relevant scientific findings:

* *Late successional habitat is being recruited faster than it is being lost to fire.* The purpose and need for this project and the NEPA analysis must keep fire impacts in perspective. The rate of habitat modification from fire is not the whole story. It’s the net effect of fire and habitat recruitment. The FEIS failed to consider that late successional habitat is being recruited faster than its being lost to fire, so there is not a need to intervene in the natural recovery process. The 20 Year LSOG Monitoring Report says “forest succession has compensated for losses from disturbance. The NWFP anticipated continued declines in older forests for the first few decades until the rate of forest succession exceeds the rate of losses. Losses of about 2.5% from wildfire and 2.5% from timber harvesting were expected each decade. Observed losses from wildfire were about what was expected (5% over two decades) …” <http://reo.gov/monitoring/reports/20yr-report/LSOG%2020yr%202pager%20-%20052915.pdf>. The 20 Year NSO Monitoring Report says “After two decades, nesting/roosting habitat on federal lands decreased from 9.09 million ac in 1993, to 8.95 (-1.5%). However, there are areas where recruitment and net gain of new habitat appears to be occurring (for example, Siuslaw National Forest). ... Range wide, the rate of habitat loss from wildfires was about what was expected when the NWFP was written, but higher in fire prone portions of the range. … The NWFP expected habitat to improve in the federally reserved network within 50 to 100 years. After 20 years, it is still in decline; but, given the timber harvesting history on federal lands … we will likely see habitat increase over the next few decades as old timber harvest units develop back into suitable habitat. “ <http://reo.gov/monitoring/reports/20yr-report/NSO%20HAB%2020yr%202pager%20for%20web%20final%20052915.pdf>
* *Wildfire is burning with a characteristic mix of mostly low- and moderate- severity effects.* Schwind, B. (compiler). 2008. MTBS: Monitoring Trends in Burn Severity: Report on the PNW & PSW Fires — 1984 to 2005. <https://web.archive.org/web/20130214220819/http://www.mtbs.gov/reports/MTBS_pnw-psw_final.pdf> (“MTBS data does not support the assumption that wildfires [in the PNW] are burning more severely in recent years. ... The majority of area burned falls within the unburned to low severity range, with relatively low annual variation in these severity classes. The high and moderate severity classes show higher relative variation between years, suggesting that these classes may be most influenced by variation in climate, weather, and seasonal fuel conditions.”)
* Law, B.E., Waring, R.H. 2015. Review and synthesis - Carbon implications of current and future effects of drought, fire and management on Pacific Northwest forests. Forest Ecology and Management 355 (2015) 4–14. <http://terraweb.forestry.oregonstate.edu/pubs/law.fmec.2015.pdf> (This study reported no significant trend in area burned, number of fires, or fire severity for the state of Oregon.)
* Ray Davis et al 2015. RMP Revisions for Western Oregon BLM DEIS. Appendix D – Modeling Wildfires and Fire Severity. <http://www.blm.gov/or/plans/rmpswesternoregon/files/draft/RMP_EIS_Volume3_appd.pdf>. (“… examined the MTBS data for any obvious temporal trends in wildfire severity [within the range of the spotted owl], but did not detect a strong signal (Figure D-6). Over the course of 25 years, there appears to be a slight increase in the percentage of area burned by low and moderate severity wildfire, and a slight decrease in the percent of area burned in high severity wildfire, although these trends are not statistically significant. …”)
* *Fire effects in mature native stands are not extreme or undesirable*. *Mature native stands are already resistant and resilient to wildfire*. Findings from the Umpqua National Forest show "The pattern of mortality in the unmanaged forest resembles historic stand-replacement patch size and shape." Page 64. Umpqua NF. Wildfire Effects Evaluation Project. March 2013. <http://web.archive.org/web/20041118062947/http://www.fs.fed.us/r6/umpqua/publications/weep/weep.html>.
* The 2013 BAER Report for the Douglas Complex Fires in the Umpqua Basin of SW Oregon said “While the severity varied throughout the fire area, young timber plantations carried the fire while *older stands tended to be more resistant*. This is mostly due young timber plantations having a high density of ground fuels.” HSG9 – Douglas Complex Fire Burned Area Emergency Rehabilitation Plan. BLM Douglas Complex BAER Team. Sept 5, 2013. (p 12).
* “Large blocks of old-growth forests – rather than large contiguous blocks of young growth or highly simplified forests – are the best scenario for reducing catastrophic wildfire.” Jerry Franklin, David Perry, Reed Noss, David Montgomery, Christopher Frissell. Simplified Forest Management To Achieve Watershed And Forest Health: A Critique. National Wildlife Federation. <http://www.coastrange.org/documents/forestreport.pdf>.
* Lesmeister, D. B., S. G. Sovern, R. J. Davis, D. M. Bell, M. J. Gregory, and J. C. Vogeler. 2019. Mixed-severity wildfire and habitat of an old-forest obligate. Ecosphere 10(4):e02696. 10.1002/ecs2.2696. <https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/ecs2.2696>. (“Pre-fire nesting/roosting habitat had lower probability of burning at moderate or high severity compared to other forest types under high burning conditions. Our results indicate that *northern spotted owl habitat can buffer the negative effects of climate change by enhancing biodiversity and resistance to high-severity fires*, which are predicted to increase in frequency and extent with climate change. Within this region, protecting large blocks of old forests could be an integral component of management plans that successfully maintain variability of forests in this mixed-ownership and mixedseverity fire regime landscape and enhance conservation of many species.”)
* Harold S. J. Zald, Christopher J. Dunn. 2018. Severe fire weather and intensive forest management increase fire severity in a multi‐ownership landscape. Ecological Applications. Online Version of Record before inclusion in an issue. 26 April 2018. <https://doi.org/10.1002/eap.1710>. Also, <https://phys.org/news/2018-04-high-wildfire-severity-young-plantation.html> (“[W]e believe our results have implications across a much broader geographic area. First, it *brings into question the conventional view that fire exclusion in older forests is the dominant driver of fire severity across landscapes.* … [I]n the landscape we studied, intensive plantation forestry appears to have a greater impact on fire severity than decades of fire exclusion … [P]ublic forests [in the Umpqua watershed] were dominated by older forests that tend to have greater variability in both tree size and spatial pattern vs. plantations (Naficy et al. 2010), arising from variable natural regeneration (Donato et al. 2011), post-disturbance biological legacies (Seidl et al. 2014), and developmental processes in later stages of stand development (Franklin et al. 2002). Fine-scale spatial patterns of fuels can significantly alter fire behavior, and the effects of spatial patterns on fire behavior may increase with the spatial scale of heterogeneity”).
* *Fire severity is controlled more by weather than by fuel levels.* Alisa Keyser and Anthony Westerling, 2017. Climate drives inter-annual variability in probability of high severity fire occurrence in the western United States, Environmental Research Letters. Accepted Manuscript online 4 April 2017 <https://doi.org/10.1088/1748-9326/aa6b10>. (“We tested trends for WUS [western United States], each state, and each month. We found no significant trend in WUS high severity fire occurrence over 1984-2014, except for Colorado (table S1). While some studies have shown increasing fire season length, we saw no significant increase in high severity fire occurrence by month, May through October (figure S1). We found no correlation between fraction of high severity fire and total fire size, meaning increasing large fires does not necessarily increase fractional high severity fire area.”)
* Harold S. J. Zald, Christopher J. Dunn. 2018. Severe fire weather and intensive forest management increase fire severity in a multi‐ownership landscape. Ecological Applications. *Online Version of Record before inclusion in an issue.* 26 April 2018. <https://doi.org/10.1002/eap.1710>. Also, <https://phys.org/news/2018-04-high-wildfire-severity-young-plantation.html>(“Fire weather was a strong top-down driver of fire severity, while bottom-up drivers such as topography and pre-fire biomass were less important. … [B]ottom-up drivers of fire severity can be overwhelmed by top-down climatic and weather conditions when fires burn during extreme weather conditions*”)*
* *The effects of fuel reduction are modest*. Even extensive fuel reduction reduces the extent of wildfire by less than 10 percent. See M. A. Cochrane, C. J. Moran, M. C. Wimberly, A. D. Baer, M. A. Finney, K. L. Beckendorf, J. Eidenshink, and Z. Zhu. 2012. Estimation of wildfire size and risk changes due to fuels treatments. International Journal of Wildland Fire.  <http://dx.doi.org/10.1071/WF11079>.  <http://www.publish.csiro.au/?act=view_file&file_id=WF11079.pdf>. Andrew Larson, a forest ecologist from the University of Montana said

"Even after you go and thin a forest, when it's dry like it is now, it's still going to carry a fire, it's still going to generate smoke. So, in terms of day to day life, the experience we have during the fire season, we need to not get our hopes up," Larson says. "You can anticipate more smoke. Even if we were to double, triple, increase the amount of area logged or thinned by a factor of ten or 20, we're still going have smoke, we're not going to stop the fires. We may change how they burn, and that's an important outcome, it's something that a lot of my research is directed at. But we need to make sure people don't get their hopes up and expect something that the forestry profession, that managers in the Forest Service, the Department of Interior, can't deliver on."

ERIC WHITNEY 2017. Forest Ecologist Comments On Senator Daines' Fire Call. Montana Public Radio. Sept 14, 2017. <http://mtpr.org/post/forest-ecologist-comments-senator-daines-fire-call>. Also, Hurteau et al (2019) found that “fuel availability and flammability only reduced the cumulative area burned in the Sierra by about 7.5 percent over the course of the century ... because vegetation re-growth

happens with sufcient speed that the fuel limitation efects from fre are short-lived.” Matthew D. Hurteau, Shuang Liang, A. LeRoy Westerling & Christine Wiedinmyer 2019. Vegetation-fire feedback reduces projected area burned under climate change. Scientific Reports, volume 9, Article number: 2838 (2019), <https://www.nature.com/articles/s41598-019-39284-1>; <https://doi.org/10.1038/s41598-019-39284-1>; <https://news.ucmerced.edu/news/2019/scientists-simulate-forest-fire-dynamics-understand-area-burn-future-wildfires>

* *Commercial logging will often make fire hazard worse, not better*. Reducing the forest canopy will make the stand hotter, drier, and windier, produce more activity fuels, and stimulate the growth of ladder fuels. Professor Char Miller said “… decades of data show that intense logging creates more destructive fires than the ones that burn through roadless areas, parkland and wilderness.” Char Miller. 2017. Op-Ed: What the Trump administration doesn't understand about wildfires. LA Times. Oct 1, 2017. <http://www.latimes.com/opinion/op-ed/la-oe-miller-zinke-fire-memo-20171001-story.html>. See also, Jain, Theresa B.; Battaglia, Mike A.; Han, Han-Sup; Graham, Russell T.; Keyes, Christopher R.; Fried, Jeremy S.; Sandquist, Jonathan E. 2012. A comprehensive guide to fuel management practices for dry mixed conifer forests in the northwestern United States. USDA Forest Service Gen. Tech. Rep. RMRS-GTR-292. 2012 <http://www.firescience.gov/projects/09-2-01-16/project/09-2-01-16_09-2-01-16_rmrs_gtr292web.pdf>. A meta-analysi of the effects of partial cutting showed that understory growth was stimulated in all cases. D. Zhou, S. Q. Zhao, S. Liu, and J. Oeding. 2013. A meta-analysis on the impacts of partial cutting on forest structure and carbon storage. Biogeosciences, 10, 3691–3703, 2013. <https://www.biogeosciences.net/10/3691/2013/bg-10-3691-2013.pdf>. (“Understory C was stimulated significantly by partial cutting in all of the studies. This stimulation can be mostly attributed to an increase in the availability of light, water, and nutrients to the understory because of tree removal (Aussenac, 2000; Kleintjes et al., 2004; Deal, 2007)”) Removing commercial sized logs as part of fuel reduction degrades habitat while doing little to modify fire behavior. If conducted at large scales, the effects of commercial logging for fuel reduction will be socially and ecologically unacceptable. Lehmkuhl, John; Gaines, William; Peterson, Dave W.; Bailey, John; Youngblood, Andrew, tech. eds. 2015. Silviculture and monitoring guidelines for integrating restoration of dry mixed-conifer forest and spotted owl habitat management in the eastern Cascade Range. Gen. Tech. Rep. PNW-GTR-915. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 158 p. ​<http://www.fs.fed.us/pnw/pubs/pnw_gtr915.pdf>. (“Tradeoffs between fire resistance and NSO habitat quality are real.Our results demonstrate that balancing the goals of increasing fire resilience while maintaining habitat function, especially nesting and roosting, for the NSO in the same individual stand is a difficult, if not an impossible, task. Even lighter thinning treatments typically reduce canopy cover below 40 percent. The reality is that nesting and roosting NSO habitat is by definition very susceptible to high-severity fire; owl habitat value and fire risk are in direct conflict on any given acre. …”). Montana Public Radio reported on Senator Daines statement that “’radical environmentalists’ would try to stop efforts to remove dead trees from Montana forests. [Ecologist Andrew Larson said] "That's an attitude that I'm always kind of disappointed to encounter," Larson said, "because a healthy forest has dead trees and dead wood. The snags — standing dead trees — and dead logs are some of the most important habitat features for biodiversity. You can't have an intact, healthy wildlife community without dead wood in your forest." ERIC WHITNEY 2017. Forest Ecologist Comments On Senator Daines' Fire Call. Montana Public Radio. Sept 14, 2017. <http://mtpr.org/post/forest-ecologist-comments-senator-daines-fire-call>;
* *Retaining mature forest canopy is more fire resilient than most logged sites*. Canopy removal via thinning not only makes the forest hotter, drier, and windier, it also stimulates the growth of shrubs and create the very conditions that favor more severe crown damage during fire. This challenges the very popular notion that dense forests are a fire hazard. A meta-analysis of the effects of partial cutting showed that understory growth was stimulated in all cases. D. Zhou, S. Q. Zhao, S. Liu, and J. Oeding. 2013. A meta-analysis on the impacts of partial cutting on forest structure and carbon storage. Biogeosciences, 10, 3691–3703, 2013. <https://www.biogeosciences.net/10/3691/2013/bg-10-3691-2013.pdf>. (“Understory C was stimulated significantly by partial cutting in all of the studies. This stimulation can be mostly attributed to an increase in the availability of light, water, and nutrients to the understory because of tree removal (Aussenac, 2000; Kleintjes et al., 2004; Deal, 2007)”). “Thinning is most effective when it removes understory trees, because larger overstory trees are more resistant to heat injury (Agee and Skinner 2005). In addition, shade and competition from larger trees slows the recruitment of younger trees in the understory.” Keeley, J.E.; Aplet, G.H.; Christensen, N.L.; Conard, S.C.; Johnson, E.A.; Omi, P.N.; Peterson, D.L.; Swetnam, T.W. 2009. Ecological foundations for fire management in North American forest and shrubland ecosystems. Gen. Tech. Rep. PNW-GTR-779. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 92 p. <http://www.fs.fed.us/pnw/pubs/pnw_gtr779.pdf>. Zald & Dunn (2018) looked at fire severity in a mixed ownership landscape and found that stand age was inversely related to fire severity suggesting that older forests are more resistant and resilient to fire and that time-since-fire has the opposite of the assumed effect on fire hazard. “**…we found daily fire weather was the most important predictor of fire severity, followed by stand age and ownership, followed by topographic features. Estimates of pre‐fire forest biomass were not an important predictor of fire severity.** Adjusting for all other predictor variables in a general least squares model incorporating spatial autocorrelation, mean predicted RdNBR was higher on private industrial forests (RdNBR 521.85 ± 18.67 [mean ± SE]) vs. BLM forests (398.87 ± 18.23) with a much greater proportion of older forests. **Our findings suggest intensive plantation forestry characterized by young forests and spatially homogenized fuels, rather than pre‐fire biomass, were significant drivers of wildfire severity.** This has implications for perceptions of wildfire risk, shared fire management responsibilities, and developing fire resilience for multiple objectives in multi‐owner landscapes.” Harold S. J. Zald, Christopher J. Dunn. 2018. Severe fire weather and intensive forest management increase fire severity in a multi‐ownership landscape. Ecological Applications. *Online Version of Record before inclusion in an issue.* 26 April 2018. <https://doi.org/10.1002/eap.1710>. Also, <https://phys.org/news/2018-04-high-wildfire-severity-young-plantation.html>
* *There is a relatively low probability that fuel treatments will interact with wildfire before fuels regrow and render the fuel reduction effort ineffective*. Tania Schoennagel highlights the problem of removing fuels from a vast forest landscape that has a low annual probability of burning by saying that forest fuel reduction “is like trying to scoop water out of the ocean to make it less wet.” “A recent study conducted by researchers at the University of Montana found that only about 7 percent of fuel-reduction treatment areas in the entire United States were subsequently hit by wildfires since 1999. … If someone had the magical ability to predict, within the past decade, that a major fire was going to strike that particular portion of the 240,000-acre Scapegoat Wilderness, then thinning and logging theoretically could have helped. But it doesn’t work that way, and fires are sparked in random places by lightning and humans, and they are pushed by erratic winds and weather. … According to Tania Schoennagel, a forest landscape ecologist and fire researcher at the University of Colorado, … ‘it’s little bit of a crapshoot probability game whether the treatment you put in is going to encounter wildfire in the 10 to 15 years it remains effective in reducing fire severity. Simply because forests in the West are so vast, the chance of burning in a place we’ve pre-treated is so low. It’s not a very effective lever. We don’t know where fires are going to happen.’” David Erickson (2017). Experts: More logging and thinning to battle wildfires might just burn taxpayer dollars. CREDIT: MISSOULIAN.COM. Oct 1, 2017. <http://www.america.easybranches.com/montana/Experts--More-logging-and-thinning-to-battle-wildfires-might-just-burn-taxpayer-dollars-152776> *citing* Kevin Barnett, Sean A. Parks, Carol Miller, and Helen T. Naughton. 2016. Beyond Fuel Treatment Effectiveness: Characterizing Interactions between Fire and Treatments in the US. Forests [open access] 2016, 7, 237; doi:10.3390/f7100237. <http://www.mdpi.com/1999-4907/7/10/237>. See also, William L. Baker, Jonathan J. Rhodes. 2008. Fire Probability, Fuel Treatment Effectiveness and Ecological Tradeoffs in Western U.S. Public Forests. pp.1-7 (7). The Open Forest Science Journal, Volume 1. 2008. [http://api.ning.com/files/1kp0vDW\*F1cqOeO4-GdXE1AHOATghmIAN2x9qLpH3aA\_/FireandFuelTreatments.pdf](http://api.ning.com/files/1kp0vDW*F1cqOeO4-GdXE1AHOATghmIAN2x9qLpH3aA_/FireandFuelTreatments.pdf); “According to a recent analysis, annually less than one percent of U.S. Forest Service fuel reduction treatments in forested areas subsequently burned, on average. From 2000 to 2015, almost 17 million acres of federal land were treated for fuels reduction, equating to approximately four percent of U.S. Forest Service and Bureau of Land Management lands. During the same time period, more than 93 million acres burned. The odds of putting fuel treatments in the wrong place are extremely high.” Pohl, Kelly 2019. “For communities, land use planning is more effective than logging on federal lands to reduce future wildfire disasters.” <https://headwaterseconomics.org/wildfire/solutions/land-use-planning-is-more-effective/>. Also, “In real landscapes treatments are static, restricted to a small portion of the landscape and against a background of stochastic fire and dynamic vegetation, thus the likelihood of fire encountering a treatment during the period treatments remain effective is small. ... Allocating priorities to treat based on merchantable timber (THIN), vegetation departure (VDEP), area suitable for prescribed fire and restoration wildfire (FIRE) and conditional flame length (CFL) had similar or lower success odds than random allocation ... [S]uccess odds declined sharply as desired success levels increased suggesting that fuel management goals need to be tempered to consider the stochastic nature of wildfire.” Barros, Ana M. G.; Ager, A. A.; Day, M. A.; Palaiologou, P. 2019. Improving long-term fuel treatment effectiveness in the National Forest System through quantitative prioritization. Forest Ecology and Management. 433: 514-527. <https://www.fs.fed.us/rm/pubs_journals/2019/rmrs_2019_barros_a001.pdf>.

The purpose and need for this project is overly concerned about the adverse effects of future fire but a fire recently burned in the project area and it did not fulfill our worst fears about fire, not even close. The fire burned mostly in a mixed-severity mosaic that provides significant ecological benefits including habitat diversity, density reduction, and fuel heterogeneity/ reduction. We question whether thousands of acres of commercial logging is needed to enhance fire resiliency when fire is still operating characteristically.

The FEIS puts too much emphasis on fuel reduction without putting fire risk in perspective. Put fires in perspective. The rate of habitat modification from fire is not the whole story. It’s the net effect of fire and habitat recruitment. Is LSOG being recruited faster than its being lost to fire? The 20 Year LSOG Monitoring Report says “forest succession has compensated for losses from disturbance. The NWFP anticipated continued declines in older forests for the first few decades until the rate of forest succession exceeds the rate of losses. Losses of about 2.5% from wildfire and 2.5% from timber harvesting were expected each decade. Observed losses from wildfire were about what was expected (5% over two decades) …” <http://reo.gov/monitoring/reports/20yr-report/LSOG%2020yr%202pager%20-%20052915.pdf>. The 20 Year NSO Monitoring Report says “After two decades, nesting/roosting habitat on federal lands decreased from 9.09 million ac in 1993, to 8.95 (-1.5%). However, there are areas where recruitment and net gain of new habitat appears to be occurring (for example, Siuslaw National Forest). ... Range wide, the rate of habitat loss from wildfires was about what was expected when the NWFP was written, but higher in fire prone portions of the range. … The NWFP expected habitat to improve in the federally reserved network within 50 to 100 years. After 20 years, it is still in decline; but, given the timber harvesting history on federal lands … we will likely see habitat increase over the next few decades as old timber harvest units develop back into suitable habitat. “ <http://reo.gov/monitoring/reports/20yr-report/NSO%20HAB%2020yr%202pager%20for%20web%20final%20052915.pdf>.

If the goal is to protect habitat from fire, the analysis must account for the fact that the adverse effects of density-reduction logging, plus the unavoidable effects of wildfire, are likely to be worse than the effects of wildfire alone. The best available science indicates that logging to reduce fire effects has much greater adverse effects on spotted owls and LSR objectives than does wildfire. In other words, late successional wildlife that prefer to live in forests with dense canopy and abundant dead wood would rather take their chance with fire, rather than logging to reduce fire. See Heiken, D. 2010. Log it to save it? The search for an ecological rationale for fuel reduction logging in Spotted Owl habitat. Oregon Wild. v 1.0. May 2010. <http://dl.dropbox.com/u/47741/Heiken_Log_it_to_Save_it_v.1.0.pdf>. It does not appear that the FEIS or the South Cascades LSR Assessment considered this probabilistic risk framework. This is a major oversight. NEPA decisions are arbitrary and capricious when they fail to take into account important considerations like this, especially when the missing information has a direct bearing on compliance with the LSR standards & guidelines for risk reduction in stands over 80 years old. See supporting narrative attached to DEIS comments under “Let Fire and Other Natural Processes Do the Ecological Work, Rather Than Rely on Commercial Logging for Fuel Reduction” and “Logging habitat to save it from fire.” These analyses directly relate to project compliance with LSR standards & guidelines for risk reduction in stands over 80 years old. Logging to reduce fuels is unlikely to interact with wildfire and therefore unlikely to provide habitat benefits from fire modification, but logging is highly likely to degrade habitat related to canopy cover, microclimate, and dead wood habitat, therefore “the proposed management activities will **[NOT] clearly result in greater assurance of long-term maintenance of habitat**, (2) the activities are **clearly [NOT] needed** to reduce risks,...”

Given that fuels are also habitat for late successional wildlife, how can this aggressive fuel goal be reconciled with the goal of maintaining late successional habitat? Due to the loss of old forest from logging, the NWFP recognized that we might need to maintain forests with higher-than-desired fuel loads in order to mitigate for past logging and fragmentation of old forests. How has that been factored into this plan?

All fuels are not created equal. Surface and ladder fuels are worse than canopy fuels. Surface fuels are where fire moves across the landscape. Ladder fuels are how surface fire get into the canopy. “High overstory density can be resilient” when ladder fuel are absent and there is a gap between surface and canopy fuels. Terrie Jain (2009) Logic Paths for Approaching Restoration: A Scientist's Perspective, *from* Workshop: Restoring Westside Dry Forests - Planning and Analysis for Restoring Westside Cascade Dry Forest Ecosystems: A focus on Systems Dominated by Douglas-fir, Ponderosa Pine, Incense Cedar, and so on. May 28, 2009. <http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/workshops/restoring-westside-dry-forests/>. Canopy fuels are not only important habitat but they also help moderate fire in several ways - by maintain cool moist conditions, reducing production of slash, and suppressing growth of future surface and ladder fuels. Thinning the canopy might make fire hazard worse by making the stand hotter, dryer, windier, and by stimulating the growth of ladder fuels. This pattern is corroborated in SW Oregon forest types. E.g., Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the western Klamath Mountains, California. Conservation Biology 18(4): 927-936.<http://nature.berkeley.edu/moritzlab/docs/Odion_etal_2004.pdf>. And Jonathan R. Thompson, Thomas A. Spies, and Lisa M. Ganio. 2007. Reburn severity in managed and unmanaged vegetation in a large wildfire. Proceedings of the National Academy of Sciences. PNAS published online Jun 11, 2007.<http://www.fs.fed.us/pnw/pubs/journals/pnw_2007_thompson001.pdf>. “Areas unaffected by the initial fire tended to burn at the lowest severities in 2002.” OSU Media Release. Salvage Logging, Replanting Increased Biscuit Fire Severity. 06-11-07 [http://web.archive.org/web/20090115201823/http://oregonstate.edu/dept/ncs/newsarch/2007/Jun07/fireseverity.html](http://web.archive.org/web/20090115201823/http:/oregonstate.edu/dept/ncs/newsarch/2007/Jun07/fireseverity.html). These studies indicate that canopy development in response to fire exclusion might actually help reduce severe fire.

# The draft ROD violates NFMA because logging native forests violates the LSR standards & guidelines. Logging will NOT provide greater assurance of habitat maintenance. The FEIS failed to disclose that logging to protect spotted owl habitat is folly because the risk of harm from logging vastly exceeds the risk of harm from fire.

When logging intended to benefit habitat will also reduce the quality of habitat, the NEPA analysis must include some evaluation of ecological costs and benefits — e.g., the probability that logging will degrade habitat vs. the probability that fuel reduction treatments will interact favorably with fire and thus benefit habitat. This evaluation requires an estimate of the probability of future wildfire. To assume, as many analyses do, a 100% chance of future wildfire over-estimates the likelihood of treatments will interact with fire, thus over-estimating the ecological value of fuel treatments, and under-estimating the ecological effects of logging on habitat. See Heiken, D. 2010. Log it to save it? The search for an ecological rationale for fuel reduction logging in Spotted Owl habitat. Oregon Wild. v 1.0. May 2010. <https://www.dropbox.com/s/pi15rap4nvwxhtt/Heiken_Log_it_to_save_it_v.1.0.pdf?dl=0>.

This goes directly to the question of whether this project complies with the LSR standard requiring that risk reduction logging is clearly needed and logging will clearly result in greater assurance of long-term maintenance of habitat.

An insurance analogy might help. People buy fire insurance for their homes because they can pay a small amount in order to receive benefits in the improbable event of fire. Fuel reduction logging is like an insurance policy that hedges against the chance that fire might occur, but instead of paying with money we are paying with late successional habitat units (because logging late successional habitat to reduce fuels unavoidably degrades and removes habitat). We are also expecting benefits in habitat units. This means the FS can conduct an analysis to show whether the fire insurance payments are worth it from a habitat perspective. The FS can quantify whether logging results in a greater assurance of habitat maintenance. Unfortunately, they failed to do so. When this analysis is conducted it is clear that fuel reduction logging is just not worth it, because, simply put, the price of insurance is far too high. Commercial logging for fuel reduction will degrade habitat across many acres that will never experience any benefits from modified wildfire. Fuel reduction logging in suitable spotted owl habitat is like paying 100 habitat units for insurance and receiving 10 habitat units of benefits. (Note: One could argue that thinning plantations or non-commercial thinning of shaded-fuel breaks along roads might be an insurance policy worth buying, because the adverse trade-offs are so much smaller compared to commercial logging in currently suitable spotted owl habitat.)

There is a strong interest among the federal land management agencies to conduct widespread logging in suitable spotted owl habitat in order to reduce the effect of fire. The agencies view fuel reduction logging as beneficial to owl habitat because some modeling shows that fire behavior is moderated by fuel reduction, but proponents never seem to conduct a careful evaluation of the relative probability, and the relative harms, of logging versus wildfire. A careful analysis shows that logging to control fire and expecting to benefit spotted owl habitat is analogous to rolling a die and expecting to roll a six every time.

This is an example of the “base rate fallacy” or “neglecting priors” from Bayesian statistics. The probability of a forest stand NOT burning are far greater than the probability of a forest stand burning. Attempts to address a problem that is unlikely to occur, such as by thinning a forest that is unlikely to burn, runs a high risk that unintended negatives effects will overwhelm beneficial effects. <https://en.wikipedia.org/wiki/Base_rate_fallacy> Tips for avoiding the pitfalls ignoring Bayesian thinking include:

1. Remember prior/background probability of events/contingencies.
2. Imagine your theory of the situation is wrong. How would the world look different? Consider the no action alternative.
3. Update incrementally. New data points should lead to small changes in thinking not wholesale reversals

<https://youtu.be/BrK7X_XlGB8>

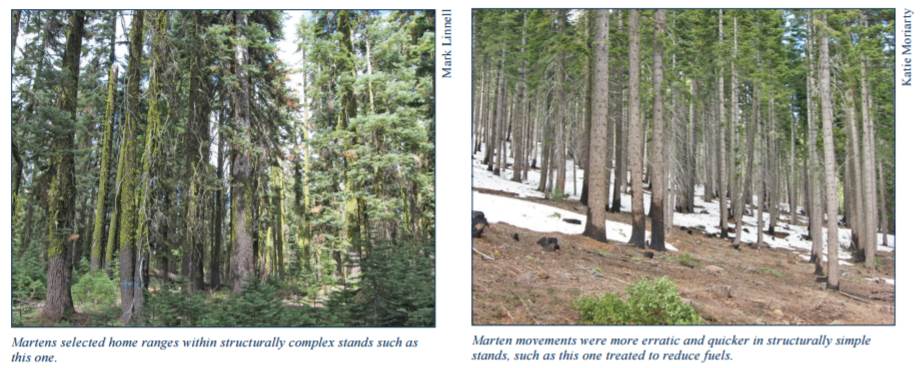
Strangely, the probabilistic aspects of this issue have been largely ignored in the owl science literature, but recently explored in the forest-carbon literature which recently showed that although thinning can modify fire behavior, logging to reduce fire effects is likely to remove more carbon by logging than will be saved by modifying fire. Mitchell, Harmon, O'Connell. 2009. Forest fuel reduction alters fire severity and long-term carbon storage in three Pacific Northwest ecosystems. Ecological Applications. 19(3), 2009, pp. 643–655 <http://www.fs.fed.us/pnw/pubs/journals/pnw_2009_mitchell001.pdf>. The reason for this seemingly counterintuitive outcome is a result of the “law of averages.” As explained by Cathcart et al 2009 —

The question is—if the implementation of fuels treatments within the Drews Creek watershed had the beneficial effect of reducing the likelihood of wildfire intensity and extent as simulated in this study, why is the expected carbon offset from fuels treatment so negative? The answer lies in the probabilistic nature of wildfire. Fuels treatment comes with a carbon loss from biomass removal and prescribed fire with a probability of 1. In contrast, the benefit of avoided wildfire emissions is probabilistic. The law of averages is heavily influenced that given a wildfire ignition somewhere within the watershed, the probability that a stand is not burned by the corresponding wildfire is 0.98 (1 minus the average overall conditional burn probability …

Thus, the expected benefit of avoided wildfire emissions is an average that includes the predominant scenario that no wildfire reaches the stand. And if the predominate scenario for each stand is that the fire never reaches it, there is no avoided CO2 emissions benefit to be had from treatment. So even though severe wildfire can be a significant CO2 emissions event, its chance of occurring and reaching a given stand relative to where the wildfire started is still very low, with or without fuel treatments on the landscape.

Jim Cathcart, Alan A. Ager, Andrew McMahan, Mark Finney, and Brian Watt 2009. Carbon Benefits from Fuel Treatments. USDA Forest Service Proceedings RMRS-P-61. 2010. <http://www.fs.fed.us/rm/pubs/rmrs_p061/rmrs_p061_061_079.pdf>.

Both carbon and spotted owl habitat tend to accumulate in relatively dense forests with intermediate or longer fire return intervals. Thus, we can likely read these studies and replace the word "carbon" with the word "spotted owl habitat" and the results will likely hold.  
  
In an effort to advance the discussion and help the agencies conduct better risk assessments in the NEPA context we have prepared a white paper in an attempt to clarify the critical considerations in a probabilistic risk assessment that compares the risk of logging versus wildfire. Heiken, D. 2010. Log it to save it? The search for an ecological rationale for fuel reduction logging in Spotted Owl habitat. Oregon Wild. v 1.0. May 2010. <https://www.dropbox.com/s/pi15rap4nvwxhtt/Heiken_Log_it_to_save_it_v.1.0.pdf?dl=0>. This report is most relevant in SW Oregon but the proposed evaluative framework is applicable in the east Cascades, northern California, and elsewhere. This report focuses on studies that have so far focused on carbon and spotted owl habitat, but the analysis is relevant for any species or forest value that requires relatively dense forest cover, such as American marten, Pacific fisher, pileated woodpecker, northern goshawk, etc. See for instance, Aubry et al 2013. Meta-Analyses of Habitat Selection by Fishers at Resting Sites in the Paciﬁc Coastal Region. The Journal of Wildlife Management 77(5):965–974; 2013; DOI: 10.1002/jwmg.563. See also, Moriarty, K. M., Epps, C. W. and Zielinski, W. J. (2016), Forest thinning changes movement patterns and habitat use by Pacific marten. The Journal of Wildlife Management. doi: 10.1002/jwmg.1060. <https://www.fs.fed.us/pnw/pubs/journals/pnw_2016_moriarty001.pdf>. (Abstract: “martens avoided stands with simplified structure, and the altered patterns of movement we observed in those stands suggested that such treatments may negatively affect the ability of martens to forage without increased risk of predation. Fuel treatments that simplify stand structure negatively affected marten movements and habitat connectivity. Given these risks, and because treating fuels is less justified in high elevation forests, the risks can be minimized by applying treatments below the elevations where martens typically occur.”) And see, Katie M. Moriarty 2014. Ph.D. Dissertation. Habitat Use and Movement Behavior of Pacific Marten (*Martes caurina*) in Response to Forest Management Practices in Lassen National Forest, California. November 21, 2014. <https://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/54574/141203_Moriarty_OSU_Dissertation_FINAL.pdf>. And see: Kirkland, J. 2016. Science Findings #192. Striving for Balance: Maintaining Marten Habitat While Reducing Fuels. Dec 2016. <https://www.fs.fed.us/pnw/sciencef/scifi192.pdf> (“[R]esearchers fitted martens with GPS collars and tracked their behavior to learn how the animals responded in forest stands that differed in structural complexity-variability in tree size, depth and overlap of crowns, and distance and uniformity of spacing among trees. The martens traveled several miles a day in search of food, but they avoided open areas and thinned stands (forest areas where small-diameter trees and understory have been removed), most likely because they were more vulnerable to predators in those spaces. They thrived in forests with complex canopies and connected stands, which allowed them to move more freely in search of food with less risk of predation.”)



To justify such fuel reduction logging in suitable owl habitat on ecological grounds requires several findings: (1) that wildfire is highly likely to occur at the site of the treatment, (2) that if fire does occur it is likely to be a severe stand-replacing event, and (3) that spotted owls are more likely to be harmed and imperiled by wildfire than by logging at a scale necessary to reduce fire hazard. Available evidence does not support any of these findings, which raises serious questions about the need for and efficacy of logging to reduce fuels in western Oregon and other forests lacking frequent fire return intervals.   
  
The probabilistic element of the risk equation demands careful consideration. Both logging and fire have meaningful consequences, so the issue really boils down to a comparative probabilistic risk assessment where risk is characterized by two quantities: (1) the magnitude (severity) of the possible adverse consequence(s), and (2) the likelihood (probability) of occurrence of each consequence.

|  |  |  |  |
| --- | --- | --- | --- |
| **Framework for Assessing the Risk of Wildfire vs Fuel Reduction Logging** | | | |
|  | Likelihood of event | Magnitude of harm | Net Benefit |
| Wildfire | LOW: Stand replacing wildfire is not common in western Oregon. Fire suppression policy prevails. The chance that any given acre of forest will experience wildfire is low. | LOW: The majority of wildfire effects are not stand replacing. Fire is a natural process to which native wildlife are adapted. There is still a deficit of natural fire processes on the landscape. | Fire is likely less harmful to habitat than fuel reduction logging. |
| Logging | HIGH: To be effective in controlling fire, logging must be very extensive, and sustained. Many more acres would need to be logged than would burn. | HIGH: Widespread logging will have significant impacts on canopy, microclimate, understory vegetation, down wood, and long-term effects on recruitment of large trees and snags. | Fuel reduction logging is likely more harmful to habitat than wildfire. |

The white paper is organized around these risk evaluation parameters.

In spite of what we often hear, federal forests are not at imminent risk of destruction by wildfire. Fire return intervals remain relatively long, due to both natural factors and active fire suppression policies. Wildfire severity also remains moderate. Most wildfires are NOT stand replacing. Most fires are in fact low and moderate severity.

The location, timing, and severity of future fire events cannot be predicted making it difficult to determine which forests will benefit from treatment - consequently fuel treatments must be extensive and many stands will be treated unnecessarily, thus incurring all the costs of fuel logging, but receiving none of the beneficial effects on fire behavior.

Furthermore, logging for purposes of fuel reduction has impacts on owl and prey habitat that remain under-appreciated, especially the reduction of complex woody structure, and the long-term reduction in recruitment of large snags and dead wood. Fuel reduction logging also has complex effects on fire hazard with potential to increase fire hazard, especially when fuel reduction efforts involve removal of canopy trees. Ganey et al (2017) said “Existing studies on the effects of fuels reduction treatments on spotted owls universally suggest negative effects from these treatments (Meiman et al. 2003, Seamans and Gutiérrez 2007, Stephens et al. 2014a, Tempel et al. 2014).” Ganey, J.L., H.Y. Wan, S.A. Cushman, and C.D. Vojta. 2017. Conflicting perspectives on spotted owls, wildfire, and forest restoration. Fire Ecology 13(3): 146–165. doi: 10.4996/ fireecology.130318020. <http://fireecologyjournal.org/docs/Journal/pdf/Volume13/Issue03/ganey-318.pdf>

BLM admits that “The treatment of a stand to improve its fire resiliency commonly reduces the immediate value of the stand for northern spotted owls.” BLM 2016. PRMP and FEIS for the Resource Management Plans in Western Oregon. Appendix W - Response to Comments, p 1985. <http://www.blm.gov/or/plans/rmpswesternoregon/files/prmp/RMPWO_Vol_4_Appendix_W.pdf>

It is important to recognize that forest wildlife evolved in ecosystems with fire so wildfire may not be adverse to wildlife. Bond (2016) reports changing evidence about the effects of fire on the three subspecies of spotted owls.

As spotted owls are associated with dense, late-successional forests, biologists typically assumed that fires that burned at high intensity were similar to clearcut logging and had a negative impact on long-term survival of the species. Many land managers now believe that high-severity fires pose the greatest natural risk to owl habitat (Davis et al., 2016). Fire, however, is a different type of disturbance than logging. Before data were collected from spotted owls in burned forests, it was not unreasonable to assume that high-severity fire might eliminate habitat because it reduces canopy cover, kills trees, and consumes coarse woody debris—all of which comprise important structure for owls and their prey—but current research is revealing that a surprising number of spotted owl sites continue to be occupied and reproductively successful after experiencing fires of all intensities and that populations are quite resilient to fire. Further, spotted owls utilize complex early seral forests for foraging, providing evidence that severely burned forests can benefit spotted owls depending upon its extent and configuration (Bond et al., 2009; Comfort et al., 2016). Spotted owls evolved in landscapes where severe fire was an important component historically (Baker, 2015) …

One reason why spotted owls remain in burned territories is that fire enhances habitat for some of their primary prey species. … Many small mammal species are more abundant in shrub- and herb-dominated habitats, vegetation typical of recently burned complex early seral forests.

…

**Conclusions: An Emerging New Paradigm About Spotted Owls and Severe Wildfire**

• Most spotted owl pairs generally survive and continue to reproduce in breeding sites that experienced severe fire across the range of the three owl subspecies.

• Lower-quality sites (often vacant and nonreproductive) have lower occupancy with increasing amounts of severe fire, whereas higher-quality sites (occupied and reproductive before fire) remain occupied at similar rates as long-unburned forests, regardless of amount of severe fire.

• Spotted owls nest and roost in forested stands with high canopy cover (unburned/low burned) even in burned landscapes.

• Spotted owls forage in severely burned stands.

• Home-range sizes are similar in burned and unburned landscapes.

• Postfire logging is correlated with site abandonment and reduces survival.

• Studies of spotted owls in burned forests not subjected to postfire logging are necessary in order to separate and understand the relative influence of each disturbance.

Contrary to current perceptions and recovery efforts for the spotted owl (USFWS, 2011, 2012), high-severity fire does not appear to be an immediate, dire threat to owl populations that requires massive landscape-level fuel-reduction treatments to mitigate fire effects (see, eg, Hanson et al., 2009). Empirical studies conducted from 1 to 15 years after fires demonstrate that most burned sites occupied by spotted owl pairs remain occupied and reproductive at the same rates as long-unburned sites, regardless of the amount of high-severity fire in core areas. Burned sites where owls are not detected immediately after fire are often recolonized later, demonstrating the folly of concluding those sites permanently “lost” to spotted owls.

…

Harvesting timber to lower risk of fire has adverse effects on spotted owls (eg, Tempel et al., 2014), whereas fire itself has both costs and benefits depending on many factors. It is important to critically weigh these costs and benefits, especially since spotted owls evolved in landscapes shaped by wildfires (Baker, 2015). Odion et al. (2014) simulated changes in northern spotted owl habitat over a 40-year period following fire and the type of thinning typically proposed by federal land managers. The simulation showed that thinning over large landscapes would remove 3.4–6.0 times more late-successional forest over time in the Klamath and dry Cascades than forest fires would, even given a future increase in the amount of high-severity fire.

Bond, M.L. 2016. The Heat Is On: Spotted Owls and Wildfire. Reference Module in Earth Systems and Environmental Sciences<http://dx.doi.org/10.1016/B978-0-12-409548-9.10014-4>.

Another recent study showed that suitable spotted owl habitat is relatively resilient to fire effects.

Pre-fire nesting/roosting habitat had lower probability of burning at moderate or high severity compared to other forest types under high burning conditions. Our results indicate that northern spotted owl habitat can buffer the negative effects of climate change by enhancing biodiversity and resistance to high-severity fires, which are predicted to increase in frequency and extent with climate change. Within this region, protecting large blocks of old forests could be an integral component of management plans that successfully maintain variability of forests in this mixed-ownership and mixedseverity fire regime landscape and enhance conservation of many species.

Lesmeister, D. B., S. G. Sovern, R. J. Davis, D. M. Bell, M. J. Gregory, and J. C. Vogeler. 2019. Mixed-severity wildfire and habitat of an old-forest obligate. Ecosphere 10(4):e02696. 10.1002/ecs2.2696. <https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/ecs2.2696>.

When all this evidence is put together, it becomes clear that "saving" the spotted owl by logging its habitat to reduce fuels often does not make any sense.

Similar conclusions were reached is several studies, reviews, and expert commentaries, such as:

Lehmkuhl et al. (2015) found -

3. **Tradeoffs between fire resistance and NSO habitat quality are real.**Our results demonstrate that balancing the goals of increasing fire resilience while maintaining habitat function, especially nesting and roosting, for the NSO in the same individual stand is a difficult, if not an impossible, task. Even lighter thinning treatments typically reduce canopy cover below 40 percent. The reality is that nesting and roosting NSO habitat is by definition very susceptible to high-severity fire; owl habitat value and fire risk are in direct conflict on any given acre. …

Lehmkuhl, John; Gaines, William; Peterson, Dave W.; Bailey, John; Youngblood, Andrew, tech. eds. 2015. Silviculture and monitoring guidelines for integrating restoration of dry mixed-conifer forest and spotted owl habitat management in the eastern Cascade Range. Gen. Tech. Rep. PNW-GTR-915. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 158 p. ​<http://www.fs.fed.us/pnw/pubs/pnw_gtr915.pdf>. The authors, however, made no meaningful attempt to resolve these trade-offs.

Odion et al. 2014, who looked at the relative effects of fire versus thinning and fire on spotted owl habitat in two regions of interest: the Klamath and dry Cascades --

Using empirical data, we calculated the future amount of spotted owl habitat that may be maintained with these rates of high-severity fire and ongoing forest regrowth rates with and without commercial thinning. Over 40 years, habitat loss would be far greater than with no thinning because, under a “best case” scenario, thinning reduced 3.4 and 6.0 times more dense, late-successional forest than it prevented from burning in high-severity fire in the Klamath and dry Cascades, respectively. Even if rates of fire increase substantially, the requirement that the long-term benefits of commercial thinning clearly outweigh adverse impacts is not attainable with commercial thinning in spotted owl habitat. It is also becoming increasingly recognized that exclusion of high-severity fire may not benefit spotted owls in areas where owls evolved with reoccurring fires in the landscape.

…

We found that the habitat recruitment rate exceeded the rate of severe fire by a factor of 4.5 in the Klamath and 10 in the dry Cascades, leading to a deterministic increase in dense forest habitat over time, assuming no other disturbance events. In contrast, previous published assessments of fire on spotted owls have not explicitly considered fire and forest regrowth rates (Wilson and Baker 1998, Lee and Irwin 2005, Roloff et al. 2005, 2012, Calkin et al. 2005, Hummel and Calkin 2005, Ager et al. 2007, Lehmkuhl et al. 2007). Not including the probability of high-severity fire, which is low, leads to highly inflated projections of the effects of thinning versus not thinning on high-severity fire (Rhodes and Baker 2008, Campbell et al. 2012).

Our calculations of thinning effects included rates of forest regrowth along with high-severity fire. The calculations illustrate how the requirement that the long-term benefits of thinning clearly outweigh adverse impacts (USFWS 2011) is not attainable as long as treatments have adverse impacts on spotted owl habitat. This is because the amount of dense, late-successional forest that might be prevented from burning severely would be a fraction of the area that would be thinned.

…

This would not be a concern if thinning effects were neutral, but the commercial thinning prescriptions being implemented call for forests with basal area reduced by nearly half to 13.5-27.5 m2/ha, which is mostly well below the minimum level known to function as nesting and roosting habitat (ca. 23 m2/ha) (Buchanan et al. 1995, 1998). … Even an immediate doubling of fire rates due to climate change or other factors would result in far less habitat affected by highseverity fire than thinning. In addition, much of the highseverity fire might occur regardless of thinning, especially if the efficacy of thinning in reducing high-severity fire is reduced as fire becomes more controlled by climate and weather (Cruz and Alexander 2010). Clearly, the strategy of trying to maintain more dense, late-successional forest habitat by reducing fire does not work if the method for reducing fire adversely affects far more of this forest habitat than would high-severity fire, and the high-severity fire might occur anyway because it is largely controlled by climate and weather.

…

While much of the concern about fire and thinning in dry forests of the Pacific Northwest has focused on spotted owls, it may also apply to other biota associated with dense, old forests, including species of conservation concern, such as Pacific fisher (*Martes pennanti pacifica*), which research indicates may benefit from mixed-severity fire (Hanson 2013), the Northern Goshawk (*Accipiter gentilis*), and, following fire, the Black-backed Woodpecker (*Picoides arcticus*), … Our findings highlight the need to be cautious about conclusions that thinning treatments are needed for species found in dense forest and that they will not have unintended consequences (e.g., Stephens et al.2012) until long-term, cumulative impacts are better understood. As we found with spotted owls, long-term and unintended consequences may be substantial for species that rely on dense, late-successional forests,

Dennis C. Odion, Chad T. Hanson, Dominick. A. DellaSala, William L. Baker, and Monica L. Bond. 2014. Effects of Fire and Commercial Thinning on Future Habitat of the Northern Spotted Owl. The Open Ecology Journal, 2014, 7, 37-51 37. <http://benthamopen.com/toecolj/articles/V007/37TOECOLJ.pdf>

The Wildlife Society (TWS) peer review of the 2010 Draft Recovery Plan for the Spotted Owl. The draft plan called for extensive logging to reduce fire hazard (“inaction is not an option”). TWS used state-and-transition model to evaluate the effects of opening dry forests to reduce fire hazard versus the effects of wildfire.

The results of running the model with 2/3rds of the landscape treated leads to open forest becoming predominant after a couple of decades, occupying 51 percent of the forested landscape, while mature, closed forest drops to 29 and 24 percent of the Klamath and dry Cascades forests, respectively (Appendix A, Figure 5, shows the Cascades). Treatments that maintain open forests in 2/3rds of the landscape put such a limit on the amount of closed forest that can occur, even if high severity fires were to be completely eliminated under this scenario, there would only be 35 percent of the landscape occupied by closed forests. In contrast, to the extensive treatment scenario, treating only 20 percent of the landscape reduces mature, closed canopy forest by about 11 percent (Appendix A, Figure 6).

One justification for the extensive treatment scenario promoted in the 2010 DRRP is that it is needed because of increased fire hypothesized to occur under climate change. By doubling the rate of high severity fire by 2050 with 2/3rds of the landscape treated, closed canopy forest is reduced to 25 percent in the Klamath compared to 60 percent without treatment and 23 percent in the dry Cascades compared to 54 percent without treatment.

Under what scenario might treatments that open forest canopies lead to more closed canopy spotted owl habitat? The direct cost to close forests with treatments that open them is simply equal to the proportion of the landscape that is treated. This reduction in closed canopy forest can only be offset over time if the ratio of forest regrowth to stand-replacing fire is below 1 (5-8 times more fire than today), and shifts to above 1 with the treatments (and most or all stand replacing fire in treated sites is eliminated, as modeled here). Another scenario that allows closed forests to increase would be if treating small areas eliminated essentially all future stand replacing fire, not only in treated areas, but across the entire landscape. This scenario obviously relies on substantially greater control over fire than is currently feasible, and it would increase impacts of fire exclusion if effective.

…

In sum, to recognize effects of fire and treatments on future amounts of closed forest habitat, it is necessary to explicitly and simultaneously consider the rates of fire, forest recruitment, and forest treatment over time, which has not yet been done by the Service.

…

The potential impacts of fuel treatments on spotted owls are not considered. … We also know little about the impacts of fire, yet this has been treated as a major threat, leading to proposing more fuel treatments. However, it is uncertain at this time which is a bigger threats, fires or treatments to reduce risk of fires. … If the plan intends to use the best available science to describe ongoing impacts to spotted owl habitat, information and literature about disturbances to reduce fuels should be included.

… there has been no formal accounting of how closed canopy forests can be maintained with the widespread treatments that are being proposed.

The Wildlife Society 2010. Peer Review of the Draft Revised Recovery Plan for Northern Spotted Owl. November 15, 2010. <http://www.fws.gov/oregonfwo/Species/Data/NorthernSpottedOwl/Recovery/Library/Documents/TWSDraftRPReview.pdf>.

This analysis is consistent with the findings of Raphael et al (2013) used a state-and-transition model to explore the effects of landscape fuel reduction logging on spotted owls and found:

Active fuel reduction activities in moderate habitat contributed to substantial short-term (simulation years 0 to 30) population declines under the larger area, higher intensity scenarios. … The combination of BDOW interactions and high-intensity, larger-area treatments contributed to the most substantial NSO population bottlenecks. The combined effects of aggressive fuel reduction treatment approaches and interactions with BDOWs have the potential to contribute to increased extinction risk for NSOs in both analysis areas. … It appears that management regimes that take out owl habitat through treatments (either current or potential future) do not reduce the amount of habitat that is lost to wildfire enough to make up for the habitats lost through treatments.

Principle Investigator: Dr. Martin G. Raphael. Project Title: Assessing the Compatibility of Fuel Treatments, Wildfire Risk, and Conservation of Northern Spotted Owl Habitats and Populations in the Eastern Cascades: A Multi-scale Analysis. JFSP 09-1-08-31 Final Report, Page 19. <http://www.firescience.gov/projects/09-1-08-31/project/09-1-08-31_final_report.pdf>. This study also highlights the fact that natural landscapes (under the influence of natural forces like climate, photosynthesis, and natural disturbance) have a lot of ecological inertia, and well-intentioned management interventions are unlikely to significantly change the trajectory.

In early 2012, FWS released their proposed rules for spotted owl critical habitat and an announcement of their intention to encourage widespread “active management” within suitable, critical habitat. Fed. Reg. March 8, 2012. <http://www.gpo.gov/fdsys/pkg/FR-2012-03-08/pdf/2012-5042.pdf>. This brought out critics in the scientific community who call for more rigorous analysis of the consequences before widespread adoption of logging as a means of habitat management.

[W]e are concerned that the decision to move forward with untested “active management” of federally owned forest lands at the landscape level prior to validation through the scientific peer-review process represents a potentially serious lapse in the application of the scientific process. This decision may conflict with the DOI’s scientific integrity policy as well as the mandates of several environmental laws …

…

The Department of the Interior’s Fish and Wildlife Service (FWS) considers active forest management as including those techniques that involve aggressive forest thinning and associated forest canopy reductions in dry forests and modified regeneration harvests in mature moist forests. Given that the primary driver of the spotted owl’s decline has been the destruction of old-growth forest habitat by logging, which will be the means used to achieve the anticipated forest thinning and regeneration harvests, we are especially concerned about the potential habitat impacts of adopting untested “active management” forestry technique. Accordingly, we request that the DOI prepare an Environmental Impact Statement (EIS) under NEPA to provide a rational, scientific approach for the testing of active management forestry in order to ensure that such techniques are validated through the peer-review process prior to their utilization at any commercial or landscape scale in the spotted owl’s critical habitat.

…

The Presidential Memorandum accompanying the proposed critical habitat designation also noted: “on the basis of extensive scientific analysis, areas identified as critical habitat should be subject to active management, including logging in order to produce the variety of stands of trees required for healthy forests. The proposal rejects the more conservative view among conservation biologists that land managers should take a ‘hands off’ approach to such forest habitat in order to promote this species’ health.” We are concerned that this memorandum overstates the quality and quantity of scientific research on the potential benefits of active forest management, especially in the Pacific Northwest on a federally threatened species. In particular, we are unaware of any substantial or significant scientific literature that demonstrates that active forest management enhances the recovery of spotted owls.

…

after a full scientific peer-review of the data collected, the FWS and DOI would be able to make a fully informed decision regarding short- and long-term management of critical habitat. We believe that such an approach is clearly warranted given that the spotted owl is a closed canopy dependent species and active management may degrade habitat for the owl and encourage further expansion of the barred owl. Notably, recent evidence has shown spotted owl extirpation rates related to barred owl invasions are highest for spotted owls with low levels of old growth habitat in nesting areas or high levels of forest fragmentation[fn]. Scaling up logging activities throughout the Pacific Northwest, particularly on BLM lands in western Oregon where “active management” is ostensibly going to be integral to pending resource management plan revisions, is therefore premature and not representative of the best available science.

Society for Conservation Biology, The Wildlife Society, American Ornithologists Union. 4-2-2012 letter to Secretary of Interior Salazar. <http://www.eenews.net/assets/2012/04/02/document_gw_01.pdf> [fn] *citing* Dugger, K.M., R.G. Anthony, and L.S. Andrews. 2012. Transit dynamics of invasive competition: barred owls, spotted owls, habitat, and the demons of competition present. Ecological Applications (2011) Volume: 21: 2459-2468.

Part of the problem is that modifying fire behavior requires fuel modification (and habitat modification) across large areas. Charnely et al 2015 said –

… large areas (thousands of acres) must be treated to change fire behavior and reduce its spread and intensity. Randomly-located fuels treatments begin to affect fire behavior when 20 to 30 percent of the landscape is treated (Finney et al. 2007). ... The entire landscape does not need to be treated to reduce wildfire risk, but a significant portion does.

​Charnley, S., Poe, M., Ager, A., Spies, T., Platt, E., Olsen, K.O. 2015. “A Burning Problem: Social Dynamics of Disaster Risk Reduction through Wildfire Mitigation.” Human Organization 74 (4): 329–40. doi:http://dx.doi.org/10.17730/0018-7259-74.4.329.​

<http://www.fs.fed.us/pnw/pubs/journals/pnw_2015_charnley003.pdf> Fuel treatments must be repeated as the fuels grow back, so this is not a one-time entry. Repeated landscape fuel treatments at this scale will have significant unavoidable effects on owl populations.

Even back in 1990 scientists were calling for research to determine if logging was compatible with owl conservation. That research has not been done. The Interagency Scientific Committee said “Allow silvicultural treatments that have been tested or demonstrated through experimentation to facilitate the development of suitable habitat, such as planting trees.” 1990 ISC Report, p 325.

Also, in 2011 the GEOS Institute submitted a draft white paper to the FWS which was attached to their comments on Appendix C of the Owl Recovery Plan, which found ….

the FIA data illustrate a broad pattern of forest resilience to current fire regimes in the Pacific Northwest. In fact, forests would have to experience a more than threefold increase in fire in the Klamath and nearly an eightfold increase in the Cascades before positive net growth in relation to fire would cease.

The rapid regrowth rate of forests makes them resilient to substantially enhanced rates of burning. In addition, forest growth rates are increasing in the Pacific Northwest (Latta et al 2010), while fire trends are unclear … Because so much more fire would need to occur before net forest loss would begin to occur, managers have more time to monitor long-term fire and climate trends and test long-term treatment impacts in an adaptive management context.

As long as net growth of forests outpaces losses to high-severity fire, treatments that cause habitat to be downgraded will diminish habitat for closed, late-successional species, such as spotted owls, even if treated areas experience no high-severity fire. Habitat loss or degradation is expected to add to effects of barred owl on spotted owls and vice versa (Dugger et al., in press). Habitat impacts will also be greater than modeled here if thinned forests burn, if mid-successional forests do not transition to late successional forests in 20 years, and if it takes longer for recruitment of large snags, down logs and mid canopy trees, and following regeneration patch cuts proposed (e.g., Johnson & Franklin 2009) to restore habitat contiguity. These tradeoffs with maintaining closed forest habitat features often have not been recognized by advocates of widespread fuel treatments (e.g., Stephens & Ruth 2005, Agee & Skinner 2005) …

The no-treatment scenario, which produced the most future late-successional habitat, would likely increase late-successional forests more than our results indicate. Late-successional forests may increase more because mid-successional forests may not have twice the high-severity fire rate found in late-successional forest, as we assumed for our model. Also, our assumption that no high-severity fire would occur in treated areas is unlikely. There is currently a low probability that treated stands will burn at all (Rhodes & Baker 2008); however, if these stands do burn, treatments would not be effective in reducing wind-driven fire under extreme conditions (Finney et al 2003, Cruz & Alexander 2010), …

… Where maintaining late-successional forests for this species is paramount, especially with barred owl invasion, forests will currently need to be protected from active management that causes habitat to be lost or downgraded at least until monitoring of spotted owls in response to such activities on smaller scales is available. Options involving no-regrets active and passive management that offer habitat improvements, protection from human-caused fire and post-fire logging, and accommodation of naturally occurring fire, can, however, be safely implemented to pursue goals of maintaining habitat for the spotted owl (Hanson et al 2010).

Odion, Hanson et al 2011. “Effects of Fire and Forest Treatments on Future Habitat of the Northern Spotted Owl: A White Paper Produced by the Geos Institute.” (draft). <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=85305>, later published as Dennis C. Odion, Chad T. Hanson, Dominick. A. DellaSala, William L. Baker, and Monica L. Bond. 2014. Effects of Fire and Commercial Thinning on Future Habitat of the Northern Spotted Owl. The Open Ecology Journal, 2014, 7, 37-51 37. <http://benthamopen.com/toecolj/articles/V007/37TOECOLJ.pdf>

William Baker has told the FWS …

Recent decadal estimates of high-severity fire rotations are long … Ratios of old-forest recruitment to high-severity area are currently high … Thus, dramatic increase in high-severity fire (e.g., 5-10 times as many huge fires per decade) would need to occur for net declines in old forest to begin. … [Reserveless strategy in the 2008 Recovery Plan is] based on incorrect fire-risk estimates. Fire risk, if anything, is currently low, and dynamism rather slow. Fuel treatments on up to 65-70% of dry forests premature and incompatible with recent science. Widespread fuel treatments based on incorrect notion that forests were generally open and park-like because of low-severity fires (see Hessburg et al. 2007, Williams and Baker, for evidence that this is incorrect).

Baker W. [undated] Fire Risk and Northern Spotted Owl Recovery in Dry Forests. <http://www.fws.gov/OregonFWO/Species/Data/NorthernSpottedOwl/Recovery/Library/Documents/DryForestPresentations/Baker_fire_risk_and_NSO.pdf>. Wildfire severity does not appear to be increasing as so often assumed. “[O]n the four national forests of northwestern California … we found no temporal trend in the percentage of high-severity fire during 1987–2008.” Miller, J. D.; Skinner, Carl; Safford, H. D.; Knapp, Eric E.; Ramirez, C. M. 2012. Trends and causes of severity, size, and number of fires in northwestern California, USA. Ecological Applications, 22(1), 2012, pp. 184–203. <http://www.fs.fed.us/psw/publications/skinner/psw_2012_skinner001.pdf>.

Now there is support for Mitchell and Harmon (2009) from Alan Ager and the WESTCARB Project:

… [A] team of researchers tried to quantify how removing smaller fuels from forests and conducting prescribed burns helps stave off intense wildfires and reduces greenhouse gas emissions. …  
 "The take-home message is we could not find a greenhouse gas benefit from treating forests to reduce the risk of fire," said John Kadyszewski, the principal investigator for the terrestrial sequestration projects of the West Coast Regional Carbon Sequestration Partnership. WESTCARB,...  
 As part of Kadyszewski's work, his team directly compared the carbon stocks in about 6,000 acres of forests in Shasta County, Calif., and Lake County, Ore., before and after applying forest management treatments to reduce the risk of severe wildfires, such as prescribed burns and thinning. Then, based on modeled projections, they found that if a wildfire ignited on treated lands rather than untreated lands, there would generally be lower emissions. That was the good news.  
 But there was a catch: knowing where fires might happen.  
 Since there is a relatively low risk of fire at any one site, large areas need to be treated -- which release their own emissions in the treatment process. The researchers have concluded that the expected emissions from treatments to reduce fire risk exceed the projected emissions benefits of treatment for individual projects.

Dina Fine Maron 2010. FORESTS: Researchers find carbon offsets aren't justified for removing understory (E&E Report 08/19/2010).

The reason for this seemingly counterintuitive outcome is a result of the “law of averages.” As explained by Cathcart et al (2009) —

The question is—if the implementation of fuels treatments within the Drews Creek watershed had the beneficial effect of reducing the likelihood of wildfire intensity and extent as simulated in this study, why is the expected carbon offset from fuels treatment so negative? The answer lies in the probabilistic nature of wildfire. Fuels treatment comes with a carbon loss from biomass removal and prescribed fire with a probability of 1. In contrast, the benefit of avoided wildfire emissions is probabilistic. The law of averages is heavily influenced that given a wildfire ignition somewhere within the watershed, the probability that a stand is not burned by the corresponding wildfire is 0.98 (1 minus the average overall conditional burn probability …

Thus, the expected benefit of avoided wildfire emissions is an average that includes the predominant scenario that no wildfire reaches the stand. And if the predominate scenario for each stand is that the fire never reaches it, there is no avoided CO2 emissions benefit to be had from treatment. So even though severe wildfire can be a significant CO2 emissions event, its chance of occurring and reaching a given stand relative to where the wildfire started is still very low, with or without fuel treatments on the landscape.

Jim Cathcart, Alan A. Ager, Andrew McMahan, Mark Finney, and Brian Watt 2009. Carbon Benefits from Fuel Treatments. USDA Forest Service Proceedings RMRS-P-61. 2010. <http://www.fs.fed.us/rm/pubs/rmrs_p061/rmrs_p061_061_079.pdf>. See also, Restaino, Joseph C.; Peterson, David L. 2013. Wildfire and fuel treatment effects on forest carbon dynamics in the western United States. Forest Ecology and Management 303:46-60. (“Studies at large spatial and temporal scales suggest that there is a low likelihood of high-severity wildfire events interacting with treated forests, negating any expected C benefit from fuels reduction.”) <http://www.fs.fed.us/pnw/pubs/journals/pnw_2013_restiano001.pdf>

And we can reliably replace the word "carbon" with virtually any other forest value that depends on dense forests with relatively high accumulations of dead wood, e.g. spotted owls, flying squirrels, goshawk, marten, pileated woodpecker, etc. and we get the same result. To wit...

"Since there is a relatively low risk of fire at any one site, large areas need to be treated -- which *[degrades habitat values for dense forests and dead wood]* in the treatment process. The researchers have concluded that the expected *[habitat loss]* from treatments to reduce fire risk exceed the projected *[habitat]* benefits of treatment for individual projects."

A newly published article on Pacific Fishers highlights the fact that wildlife that prefer dense forest habitat are more threatened by logging than fire. The agency often assumes logging/thinning will help protect wildlife habitat from fire. The agency is wrong to assume that fires must be bad for forest habitat, even though fire is a natural part of the forest ecosystem. Contrary to the common assumption, Chad Hanson’s 2013 publication about fishers found abundant evidence of fishers inhabiting post-fire forests. In fact, in areas on the border between burned and unburned forest, the fishers preferentially selected the burned forest side. Another important finding of the study was that the fisher detections were primarily in dense forests, both burned and unburned. This is important because logging proposals are often based on the claim that thinning the forest (density reduction) will benefit wildlife, such as fishers and spotted owl. But the Hanson study shows that thinned forests, either burned or unburned, are not preferable habitat for fishers. Hanson 2013 also cites another recent study that found that mechanical thinning is a threat to fishers. In other words, it is the Forest Service’s attempts to log to reduce forest density and fire that are actually detrimental to fishers. See Chad T. Hanson 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, 2013, 6, 24-30. <http://www.benthamscience.com/open/tofscij/articles/V006/24TOFSCIJ.pdf> Hanson (2015) found that fishers are tolerant of natural processes like stand replacing fire. Hanson, C. T. (2015), Use of higher severity fire areas by female Pacific fishers on the Kern Plateau, Sierra Nevada, California, USA. Wildlife Society Bulletin, 39: 497–502. doi: 10.1002/wsb.560. <http://onlinelibrary.wiley.com/doi/10.1002/wsb.560/abstract> (“female fishers used the large, intense McNally fire area significantly more than unburned forest (n = 12 scats). Female fishers were detected at multiple locations >250 m into the interior of a very large (>5,000 ha), unlogged higher severity fire patch. These results indicate unlogged higher severity fire areas are suitable habitat for fishers, especially female fishers, and suggest a need to revisit current management direction, which emphasizes extensive commercial thinning and postfire logging to reduce fuels and control fire.”)

Another study showed that even relatively small-scale fuel treatments are adverse to wildlife, as evidenced by “ … avoidance of DFPZs [defensible fuel profile zones] by foraging owls, larger owl home ranges associated with increasing amounts of treatment within the home ranges, and a 43% decline in the number of territorial CSO sites…” The study noted that effective fire control will require much larger landscape fuel treatments, presumably with even greater adverse effects on wildlife. Stephens, S.L.; Bigelow, S.W.; Burnett, R.D.; Collins, B.M.; Gallagher, C.V.; Keane, J.; Kelt, D.A.; North, M.P.; Roberts, L.J.; Stine, P.A.; Van Vuren, D.H. 2014. California spotted owl, songbird, and small mammal responses to landscape fuel treatments. BioScience. 64(10): 893-906. <http://www.fs.fed.us/psw/publications/bigelow/psw_2014_bigelow001_stephens.pdf> This study highlighted some of the trade-offs and suggested alternatives:

[A]lthough mechanical treatments retain these live features, they often remove snags for operator safety and fuel objectives; reduce tree density and canopy layering; reduce canopy cover to the minimum level (around 40%) considered to function as owl foraging habitat; and simplify the ground structure through a reduction of logs and small trees. Furthermore, DFPZ treatments are often uniformly implemented over large areas along roads, which results in extensive patches of simplified stand structure with regularly spaced trees. Another concern is that treatment size and placement are determined by land-use constraints (gentle slopes, access to roads) … Our ability to optimize heterogeneity at large scales may be more effectively achieved with prescribed and managed fires that are allowed to burn under moderate weather conditions. This type of burn often produces variable forest conditions that mimic historic patterns (Collins et al. 2011) to which this fauna, including the CSO, has adapted. Alternatively, mechanical treatments that produce the complex forest structure and composition that more closely mimic the patterns generated under a more active fire regime (North et al. 2009) may provide habitat conditions to support CSOs and a diverse fauna superior to those of the DFPZ and group-selection treatments implemented …

# Building Roads in Reserves to facilitate logging will violate LSR standards & guidelines

The FEIS never tested the effects of road construction against the standards for managing LSRs. Roads are adverse to virtually every aspect of LSR objectives. The edge created by roads will stimulate growth of ladder fuels and make stands less resilient to fire.

“An extensive road system is in conflict with LSR objectives. The road network creates contrasting edges of forest habitat, fragments connecting habitat, creates barriers to species movement, and provides access and opportunities for humans to extract natural resources.” Hehe LSR Thin Decision Notice. Willamette National Forest. October 31, 2007. <http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5050106.pdf>

Avoid unnecessary construction of temporary roads. If young stand thinning requires construction of temporary roads, the agency should do an analysis that illuminates how many acres of thinning are reached by each road segment so that we can distinguish between short segments of spur that allow access to large areas (big benefit, small cost) and long spurs that access small areas (small benefit, big cost). This can help inform the decision-maker’s balancing of the costs and benefits of thinning and roading.

The 1994 NWFP ROD (p 68) says “Standards and guidelines for Alternative 9 require that new road construction be substantially limited. Any road construction associated with silvicultural treatments inside late-successional reserve would be subject to the overall ‘beneficial’ requirement for such activities. That is, if the value of a thinning was negated by the habitat lost through road construction to the thinning, the activity should not proceed.”

The Coos Bay BLM’s Brummit Creek Density Management EA (2005) includes a useful table showing the length of each road (new, renovated, improved), the unit acres that are accessed by each road, and the acres of unit per mile of road. This is a useful way to evaluate and prioritize road work relative the expected benefits of thinning.

Temporary roads still cause serious adverse impacts to soil, water and wildlife, and spread weeds. Decommissioning such roads is not entirely successful and the soil compaction effects can last for decades. The agency should consider avoiding building spurs by treating some areas non-commercially (e.g. thin lightly, create lots of snags, and leave the material on site).

We urge the agency to avoid road construction, including temporary road construction. The ecological costs of road construction almost always outweigh any benefits of the associated commercial logging activity. Since an optimal landscape restoration plan includes a mix of treated and untreated areas, the agency can easily avoid road construction by co-locating untreated areas and inaccessible areas.

Temporary roads have many of the same impacts as permanent roads, including complete vegetation removal, severe soil disturbance and compaction, severe modification of the flow of water and air through the soil, impairment of soil biological activity, wildlife habitat fragmentation (especially for microfauna), and wildlife cover loss. In spite of the fact that some roads may only be used by heavy equipment on a temporary basis, the biophysical effects of temporary roads can be long-lasting. The FS may even come back and use these temporary roads for future vegetation management or fire management. The temporal effects of temp roads can also be extended by legal or illegal use by off highway vehicles, woodcutters, hunters, mushroom collectors, etc.

The November 2000 National Forest Roadless Area Conservation FEIS p 3-30 says that temporary roads are not designed and constructed to the same standard as classified roads and therefore result in a “higher risk of environmental impacts.” The NEPA analysis must account for this increased risk of temporary roads compared to permanent roads.

The Roadless FEIS also says:

Temporary roads present most of the same risks posed by permanent roads, although some may be of shorter duration. Many of these roads are designed to lower standards than permanent roads, are typically not maintained to the same standards, and are associated with additional ground disturbance during their removal. Also, use of temporary roads in a watershed to support timber harvest or other activities often involves construction of multiple roads over time, providing a more continuous disturbance to the watershed than a single, well-designed, maintained, and use-regulated road. While temporary roads may be used temporarily, for periods ranging up to 10 years before decommissioning, their short- and long-term effects on aquatic species and habitats can be extensive. [The FEIS has similar disclosures citing extensive impacts to terrestrial species and habitats, and rare plant populations.]

Roadless Area Conservation FEIS — Specialist Report for Terrestrial and Aquatic Habitats and Species prepared by Seona Brown and Ron Archuleta, EIS Team Biologists <http://web.archive.org/web/20040515020554/http://roadless.fs.fed.us/documents/feis/specrep/xbio_spec_rpt.pdf>.

For the semi-permanent roads that will be tilled, BLM’s own soils scientist has little faith in the restorative value of this technique. He says: “What I have seen so far have been nothing more than modified rock rippers and little lateral fracture of the soil occurs and the extent of de-compacting is very limited.” Coos Bay BLM, Big Creek Analysis file, section F, Soils Report. page 4.

The agency assumes that temporary and semi-permanent new roads will have no effect because they are temporary. The agency has shown no scientific evidence for this assumption. In fact, scientific research has shown exactly the opposite. Effectiveness of Road Ripping in Restoring Infiltration Capacity of Forest Roads. Charles H. Luce, USDA Forest Service Intermountain Research Station, 1221 S. Main, Moscow, ID 83843. September 1996. Restoration Ecology, Vol. 5, No. 3. page 268.

Please consider George Wuerthner’s summary of the many problems with so-called temporary roads. George Wuerthner 2009. Temporary Roads Are Like Low Fat Ice Cream, NewWest. 3-17-09. <http://www.newwest.net/topic/article/temporary_roads_are_like_low_fat_ice_cream/C564/L564/> (“The problem is that temporary roads have most of the same environmental impacts as regular roads.”)

Research results, published in *Restoration Ecology,* shows there is nothing temporary about temporary roads, and that ripping out a road is NOT equal to never building a road to begin with. The saturated hydraulic conductivity of a ripped road following three rainfall events was significantly greater than that of the road surface before ripping... most saturated hydraulic conductivities after the third rainfall event on a ripped road were in the range of 22 to 35 mm/hr for the belt series and 7 to 25 mm/hr for the granitics. These conductivities are modest compared to the saturated hydraulic conductivity of a lightly disturbed forest soil of 60 to 80 mm/hr.” id. Even this poor showing of restoring pre-road hydrologic effects worsened with repeated rainfall. “Hydraulic conductivity values for the ripped treatment on the granitic soil decreased about 50% with added rainfall (p(K1=K2)=0.0015). This corresponded to field observations of soil settlement and large clods of soil created by the fracture of the road surface dissolving under the rainfall... The saturated hydraulic conductivity of the ripped belt series soils also dropped from its initial value. Initially, and for much of the first event, the ripped plots on the belt series soil showed no runoff. During these periods, run-off from higher areas flowed to low areas and into macropores.... Erosion of fine sediment and small gravel eventually clogged these macropores... Anecdotal observations of roads ripped in earlier years revealed that after one winter, the surfaces were nearly as solid and dense as the original road surfaces.” Id. Even though ripped roads increase water infiltration over un-ripped roads, it does not restore the forest to a pre-road condition. “These increases do not represent ‘hydrologic recovery’ for the treated areas, however, and a risk of erosion and concentration of water into unstable areas still exists.” Luce, C.H., 1997. Effectiveness of Road Ripping in Restoring Infiltration Capacity of Forest Roads, Restoration Ecology; 5(3):265-270. <http://library.eri.nau.edu/gsdl/collect/erilibra/import/Luce.1997.EffectivenessOfRoadRippingIn.pdf>.

The Rogue River-Siskiyou National Forest’s Rustler EA (2010) says:

Temporary roads are also expected to have an irretrievable reduction in soil productivity since they are bladed (soil is mixed and displaced) and compacted. Even once rehabilitated, the soil profile is modified to a degree that may take many years to return to the productive state of the undisturbed forest soils adjacent to it.

# Logging native stands over 80 years is inconsistent with the South Cascades LSR Assessment criteria for appropriate silvicultural treatments beneficial to creation of late successional forest conditions.

LSR assessments are required to include “criteria for developing appropriate treatments [and] identification of specific areas that could be treated under those criteria” (NWFP S&G p C-11). Treatments that do not meet these criteria are not appropriate.

The South Cascades LSR Assessment does not endorse commercial logging whole stands of native forest to reduce fire hazard, nor does it endorse road construction or 2.5 acre gaps. These are not an appropriate treatments, per the LSRA.

The Assessment for South Cascades LSR 222 contemplates prescribed fire and culturing of individual pine trees, but not stand-scale logging, in LSR stands over 80 years. “Stand Criteria … Remove competing vegetation, as needed, up to 24” diameter to the drip line plus 20 feet. In those situations where risk of mortality is caused predominantly by trees greater than 24” diameter, individual trees may be killed and left standing.” LSRA p 165.

LSRA (p 152) recommends against fragmenting large stands with fuel breaks “Implementation of fuel breaks within late seral stands would result in habitat degradation within the fuel breaks and increase the amount of edge in cases where the fuel breaks go through intact stands. This impact would not be as great in cases where the fuel breaks go along existing edges of intact stands. Therefore, avoid locations which would split large blocks of late seral habitat.“

LSRA (p 153) says “Attempt to locate fuel breaks on the landscape near concentrations of early or mid-seral stands.”

LSRA recommends de-interlacing canopies within fire breaks. Is this really necessary? Every tree does not need to be isolated from every other tree. Groups of large trees can be treated as a single tree and isolated from adjacent groups of trees. This might result on group torching but that is entirely consistent with natural fire behavior and LSR objectives.

# The Forest Service failed to validate assumptions in the South Cascades LSR Assessment.

The REO [concurrence letter](https://www.fs.usda.gov/nfs/11558/www/nepa/101686_FSPLT3_5242328.pdf) seems to imply that since risk reduction was contemplated in the South Cascades LSR Assessment, then it’s pre-approved and does not require detailed analysis. First, we don’t think that logging whole stands was identified in the LSRA as an appropriate treatment. Second, the LSR Assessment was never subject to NEPA review and cannot be used to justify logging that violates LSR standards & guidelines. There is a need to validate some of the assumptions of the LSR Assessment, such as the idea that logging can be effectively used to save spotted owl habitat from fire. If the goal is to protect habitat from fire, the analysis must account for the fact that the adverse effects of density-reduction logging, plus the unavoidable effects of wildfire, are likely to be worse than the effects of wildfire alone. In other words, late successional wildlife that prefer to live in forests with dense canopy and abundant dead wood would rather take their chance with fire, rather than logging to reduce fire. See Heiken, D. 2010. Log it to save it? The search for an ecological rationale for fuel reduction logging in Spotted Owl habitat. Oregon Wild. v 1.0. May 2010. <http://dl.dropbox.com/u/47741/Heiken_Log_it_to_Save_it_v.1.0.pdf> It does not appear that the South Cascades LSR Assessment considered this Bayesian probabilistic analysis.

# The FEIS failed to consider alternatives that meet LSR standards & guidelines and properly harmonize diverse objectives.

Land management involves trade-offs and NEPA is intended to highlight those trade-offs in a search for less damaging ways of achieving objectives in a complex decision-space. The EIS did not fulfill this core purpose of NEPA. For instance, the EIS considered alternatives that treat fuel more aggressively than the proposed action but not less aggressively. Less aggressive logging would help mitigate adverse trade-offs and harmonize objectives. Retaining more trees would help maintain late successional habitat in LSR and riparian reserves; maintain and increase carbon storage; enhance recruitment of snags and dead wood habitat (beneficial to both upland and riparian objectives) over multiple time scales; help meet fuel objectives by reducing slash production, maintaining a cool/moist/less windy microclimate, and maintain canopy that helps suppress growth of ladder fuels.

When the agency uses commercial logging to meet restoration goals, the NEPA analysis needs to clearly disclose to what extent optimal restoration outcomes are being sacrificed in order to “make units pencil out,” ensure “operational feasibility,” and/or produce timber volume. It is often the case that optimal restoration calls for retention of more trees, especially commercial-sized trees, that serve a variety of ecosystem services. Retaining optimal levels of medium and large trees –

* Provides habitat for wildlife that depend on (i) relatively dense forests and/or (ii) abundant snags and dead wood;
* Stores carbon that helps moderate global climate change;
* Enhances recreational/scenic values;
* Suppresses the growth of weeds and hazardous ladder fuels and reduces future maintenance costs associated with removing non-commercial in-growth; and
* Provides cool/moist microclimate buffering that benefits wildlife, recreation, and moderates fire hazard;

Removing trees to meet non-restoration objectives sacrifices all these values. The agency needs to carefully disclose the extent to which these public values are sacrificed in order to achieve timber volume objectives. Clearly disclosing such trade-offs helps the public provide informed comment, and helps achieve the informed decision-making requirements of NEPA. It also furthers the requirements of NEPA related to:

* “... To determine the scope of environmental impact statements, agencies shall consider ... 3 types of alternatives, .... They include: ... (b) Alternatives, which include: (1) No action alternative. (2) Other reasonable courses of actions. (3) Mitigation measures (not in the proposed action).” 40 CFR §1508.25.
* “Federal agencies shall to the fullest extent possible: ... (e) Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment. (f) Use all practicable means, consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment.” 40 CFR §1500.2.
* “Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.” 40 CFR §§1501.2(c), 1507.2(d), 42 USC § 4332(2)(E).
* “The discussion [of environmental consequences] will include the environmental impacts of the alternatives including the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented”40 CFR §1502.16, 42 USC § 4332(2)(C). <https://www.energy.gov/sites/prod/files/NEPA-40CFR1500_1508.pdf>

It is the job of the agency, not the public to develop and explore all reasonable alternatives, but Oregon Wild scoping comments made several suggestions that should have been incorporated into a more conservative alternatives, including:

* Clear smaller circles around sugar pine and retain old growth replacement trees within the cleared area;
* Retaining wider stream buffers;
* Focus on areas accessible from existing roads, so as to avoid adverse trade-offs from road building;
* Avoid logging in unroaded areas larger than 1,000 acres;
* Focus shaded fuels breaks on young stands within 100 feet of roads, remove small trees <7” dbh, and retain some “skips” to provide some hiding cover and enhance connectivity;
* Follow the requirements for surveying and buffering red tree voles in the LSR;

We are very concerned that the Forest Service put too much emphasis on sugar pine and fuel reduction, while downplaying other important goals for this landscape. This caused the Forest Service to overlook reasonable alternatives that would advance sugar pine and fuel reduction, while better mitigating adverse effects on late successional habitat, spotted owl habitat and prey habitat, carbon storage, snags and down wood.

We also urge the Forest Service to consider using a smaller diameter limit such as 18 inches. Using a 24” dbh limit for thinning will result in removal of significant numbers of ecologically valuable large trees, future giant trees, future large snags, and down wood, carbon emissions, late successional habitat loss, etc. These effects can be mitigated by using a smaller diameter limit.

Gaps that are 2.5 acres are too large, especially in reserves. Sugar pine does not need to be artificially regenerated. The FS can just wait for wildfire, then take steps to ensure that sugar pine gets established. Such a fire just occurred and the Forest Service has ample opportunity to plant sugar pine in appropriate sites without sacrificing late successional habitat development and LSR objectives.

Following the reasonable, conservative approach described above, multiple conflicting goals can be harmonized, such as retaining late-successional habitat, maintaining greater carbon storage, reduced slash production, greater canopy to provide late successional forest cover and help suppress the growth of ladder fuels, watershed integrity, etc.

# Large gaps violate the standards & guidelines for LSRs.

LSRs are set aside for restoration of late successional habitat. Creating gaps to plant trees is not consistent with LSR standards & guidelines. The NWFP ROD says “**Objectives -** Late-Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem.” Creating unnatural, structure-deprived, gaps in LSRs is not consistent with these objectives.

The FEIS failed to consider alternatives that better meet LSR objectives, such as planting sugar pine and oak in appropriate natural openings created by natural disturbance, such as fire.

“The purpose of these silvicultural treatments is to benefit the creation and maintenance of late-successional forest conditions.” NWFP S&G, page C-12. Gaps are mini-clearcuts and are not late successional habitat conditions. Natural gaps would have abundant structural legacies retained. And with this project, the agency is actively trying to avoid creation of gaps from natural disturbance, which is an admission that gap creation is adverse to LSR objectives.

The NWFP ROD uses thinning in even aged stands as an example of a silvicultural practice that might be appropriate in LSRs, but the purpose of thinning is to “hastening transition to a forest with mature characteristics.” A 2.5 acre clearcut is not “hastening mature forest conditions.”

# The NEPA analysis is flawed.

# The FEIS failed to take a hard look at the flawed process for identifying and protecting High Quality Spotted Owl Habitat.

The remote-sensing process used by the Forest Service to identify high quality spotted owl habitat is prone to false negatives that are not ground-truthed. This will unavoidably lead to the destruction of high quality habitat in violation of Recovery Action 32.

The FEIS (pp 501-502) says “the forest worked with habitat modeling experts to identify” areas of RA 32 habitat.

A habitat model was developed using stand exams and Lidar to create a GIS layer of potential high quality spotted habitat. The model identified areas that were over 25 acres in size and contained more than 8 trees per acre with trees over 160 years old, which were over 30 in DBH and had a canopy cover greater than 60 percent. These stand characteristics are typical in mature or old growth stands within the project area and had a high likelihood of containing RA-32 structures.

We are concerned that the methodology is prone to errors, especially false negatives. The methodology may fail to identify an area that is in fact RA 32 habitat, and there is not a mechanism to ensure that these RA32 areas are subsequently identified and protected from logging. This methodology focuses on areas with a “high likelihood” of being RA32, but there may be lots of RA32 habitat patches that would only be identified on-the-ground, or using a more inclusive filter capturing low- and moderate- likelihood of RA32. This methodology also failed to look at stands less than 25 acres. This violates RA32 which is supposed to protect smaller patches of RA32.

The analysis of effects to spotted owls (FEIS p 248) is based on unsupported premise that fire is adverse to spotted owls and that logging will meaningfully change fire effects --

Habitat loss and fragmentation due to wildfire have been identified within the spotted owl recovery plan as one of the largest contributors to the decline of spotted owls across its range. Spotted owls ability to continue using habitat following a fire is largely dependent on the severity of the burn (USFWS 2011). Although spotted owls can benefit from edge effects of mixed severity fire effects, Clark et al. (2007) found that spotted owls did not use large patches of high severity burns. Indirectly, this alternative would leave spotted owl habitat within the project area at an elevated risk of uncharacteristic wildfire and habitat fragmentation due to high severity fire effects.

This is misleading because (1) spotted owls evolved and persisted in a fire-dependent ecosystem; (2) wildfires are still burning with a characteristic mix of mostly low- and moderate-severity effects, (3) there is a low probability that treatments will interact with fire and produce beneficial effects, (4) even if treatments do interact, the effects on fire extent and behavior will be modest. See supporting narrative attached to DEIS comments.

# The FEIS failed to take a hard look at the effects of logging on carbon emissions, carbon storage, and climate change.

We are facing a global climate crisis caused in part by logging carbon rich forests and transferring carbon from the forest to the atmosphere, including past and present logging on the Umpqua National Forest and logging in this project area. Management of forests can be part of the problem, if we keep logging them, or part of the solution, by conserving them and letting them grow and absorb atmospheric carbon via photosynthesis.

The FS has not meaningfully acknowledged the climate crisis and their role in causing it and their potential role in solving it. Commercial logging across thousands of acres as part of this project will remove more carbon from the forest and transfer it to the atmosphere and make a bad situation worse for the climate. This effect could be mitigated by retaining more green trees, such as by focusing on sugar pine release and non-commercial thinning, but not commercially thinning whole stands just because that’s what the FS is in the habit of doing.

The EIS blames climate change for posing an elevated risk of uncharacteristic fire, but the EIS does not admit that logging to reduce fire hazard will actually emit more carbon and make that problem worse.

The analysis of the no action alternative on climate change (FEIS p 15) just says “no impact.” This is misleading and inaccurate. Forests are not static. The analysis fails to recognize that letting trees grow will allow trees to do more to absorb carbon and reduce the effects of climate change. The no action alternative has tremendous climate benefits that are not describe in the EIS. This is a NEPA violation.

The analysis of the action alternatives (FEIS p 15) fails to distinguish between the effects of alternatives 3 & 4 with more logging vs alternatives 2 with less logging, which fails to disclose that alternatives with more logging will emit more greenhouse gases. The FEIS also failed to consider mitigation alternatives that better harmonize competing objectives by retaining more green trees which will store more carbon reducing the effects of climate change (as well as conserving owl habitat and meeting other LSR objectives).

The FEIS says the logging alternatives “might contribute an extremely small quantity of

GHG emissions relative to national and global emissions. Any carbon initially emitted from project implementation to have a temporary influence on atmospheric GHG... ” This ignores the cumulative nature of the GHG emissions problem, ignores that carbon emissions have long-lasting effect on atmospheric GHG concentrations. And importantly, the EIS never quantifies the amount of carbon emissions or the temporal duration of effects so that effects can be assessed using proxies such as social cost of carbon dioxide emissions.

The climate change analysis is misleading when it says “Forest management activities such as harvests and hazardous fuels reduction have characteristics similar to disturbances that reduce stand density and promote regrowth ...” This fails to recognize that fire tends to effect small fuels and consumes very little carbon at the stand level compared to logging that selectively targets for removal large wood carbon stores, and there is a lot of collateral carbon emissions generated in the process. As a general rule, there is more carbon left in the forest after fire, than after commercial logging.

We are very disappointed that the Forest Service continues to rely on the deeply flawed and misleading regional office boilerplate language regard carbon and climate change. As explained below, the Forest Service’s boilerplate NEPA analysis regarding carbon and climate fails to take a hard look that NEPA requires. The analysis makes several highly misleading statements about forest carbon and climate change. The analysis inappropriately mischaracterizes the role of individual logging projects in the cumulative problem of global GHG emissions. The analysis misstates the effects of logging related carbon emissions that are not related to “deforestation.” The analysis grossly misstates the climate effects of logging intended to reduce disturbance. The analysis misleadingly implies that logging benefits the climate by increasing forest productivity.

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

* Must recognize the cumulative nature of the GHG emissions and climate problems. It does not matter that this project is small in the global scheme because all emissions matter when the causation is global and cumulative;
* Cannot credibly assert that this project is harmless because it’s not causing deforestation. This is immaterial. All GHG emissions, regardless of the source or how it is labelled, are part of the problem and cause the same climate impacts.
* Cannot credibly assert that thinning for forest health justifies or mitigates emissions from logging. Logging does not increase the capacity for growing trees. To the contrary, logging harms soil and reduces site productivity.
* Must not compare carbon *before and after* logging. That is an improper framework for NEPA analysis. The proper NEPA framework is to compare the effects of different alternatives (over time), so the agency must describe the carbon emissions and carbon storage in the forest over time *with* logging and *without* logging.
* Logging to reduce fire effects does not result in a net increase in forest carbon storage. The agency cannot predict the location, timing, or severity of future wildfires, so most fuel treatments will cause carbon emissions without any offsetting benefits from modified fire behavior. Studies clearly show that the total carbon emissions from logging (plus unavoidable wildfire) are greater than carbon emissions from fire alone.
* Cannot credibly assert that carbon storage in wood products is a useful climate strategy. Logging kills trees, stops photosynthesis, and initiates decay and combustion, with the end result being a significant transfer of carbon from the forest to the atmosphere. In stark contrast, an unlogged forest continues to grow and transfer more carbon from the atmosphere to the forest. Carbon emissions caused by logging far exceed the small fraction of carbon transferred to wood products. Carbon accounting methods that attempt to account for *substitution* of wood for other high-carbon building materials are fraught with uncertainty and too often represent maximum potential substitution effects rather than lower realistic estimates.

The project purpose and need should also be adjusted to address the unmet need for increased carbon storage The agency says one of the purposes of this project is provide a supply of wood products to the public. The agency should reconsider timber targets in light of the fact that the public *needs* carbon storage to reduce global climate change much more than they *need* wood products. The NEPA analysis also needs to account for the fact that managing forests for water quality, water quantity, quality of life, and carbon storage for a stable climate will contribute far more to community stability than propping up the timber boom-bust industry with subsidized logging.

The agency must recognize that wood products are already under-priced and over-supplied due to “externalities” (costs that are not included in the price of wood, so they are shifted from wood product producers and consumers to the general public who suffer the consequences of climate change without compensation from those who profit from logging related GHG emissions). Ecosystem carbon storage on the other hand is under-supplied because there is not a functioning market for carbon storage and climate services. The FS is in a position to address these market imperfections by focusing on unmet demand for carbon storage instead of offering wood products that are already oversupplied.

# The FEIS failed to take a hard look at the disproportionate adverse effects of logging on the significant ecological values provided by large (>1,000 acres) unroaded areas.

Oregon Wild comments on the DEIS provided a map of potentially unroaded areas in the project area and offered significant new information about the disproportionate ecological values provided by large (>1,000 acre) unroaded areas that were not inventoried for wilderness, and we asked for an analysis of the effects of logging on these values.

In a 1997 letter to President Clinton, 136 scientists said:

There is a growing consensus among academic and agency scientists that existing roadless areas–irrespective of size–contribute substantially to maintaining biodiversity and ecological integrity on the national forests. The Eastside Forests Scientific Societies Panel, including representatives from the American Fisheries Society, American Ornithologists’ Union, Ecological Society of America, Society for Conservation Biology, and The Wildlife Society, recommended a prohibition on the construction of new roads and logging within existing (1) roadless regions larger than 1,000 acres, and (2) roadless regions smaller than 1,000 acres that are biologically significant…. Other scientists have also recommended protection of all roadless areas greater than 1,000 acres, at least until landscapes degraded by past management have recovered…. As you have acknowledged, a national policy prohibiting road building and other forms of development in roadless areas represents a major step towards balancing sustainable forest management with conserving environmental values on federal lands. In our view, a scientifically based policy for roadless areas on public lands should, at a minimum, protect from development all roadless areas larger than 1,000 acres and those smaller areas that have special ecological significance because of their contributions to regional landscapes.

Letter to President Clinton from 136 scientists (Dec. 10, 1997).

<https://docs.google.com/open?id=0B4L_-RD-MJwrRzhFcm5QcFR0MHM>

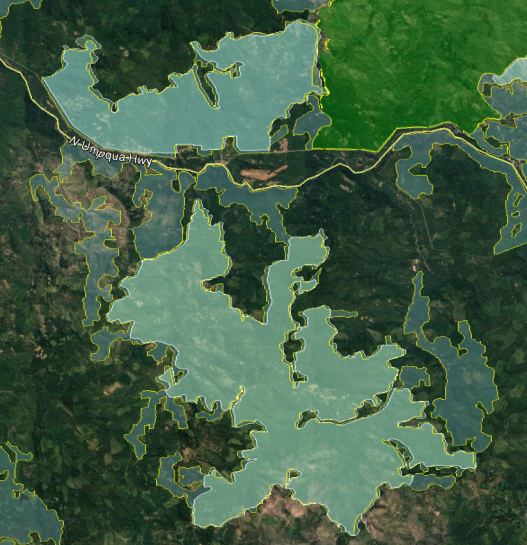
The FEIS failed to take a hard look at this issue.

Unroaded area are important building blocks for restoration of reserves which were established to conserve populations of wildlife that evolved with natural processes operating in much larger blocks of unfragmented habitat compared to the current landscape. Moving the system toward the desired range of landscape conditions requires conserving existing blocks of unmanaged habitat >1,000 acres.

Large intact expanses of habitat were once quite common but are now rare. Species evolved in the context of the large habitat patches that result from the natural disturbance regime. As just one important example, big game need large patches of security cover which is best provided by large unroaded areas. New science confirms that roads and logging tend to be contagious on the landscape (managed areas beget more management until little remains unmanaged), so to conserve the habitat values associated with wild places we have to prevent the first intrusions. The purpose and need for this project should include protecting and restoring large unroaded areas consistent with the natural range of variability.

We are perplexed why the FS refused to consider effects on unroaded areas between 1,000-5,000 acres. These are an ecologically significant part of the historic range of variability. By limiting the analysis to wilderness and inventoried roadless area >5,000 acres the FEIS failed to consider important effects.

The map below shows roadless areas in the project area. Wilderness is shown in bright green, inventoried roadless areas (in lighter blue-green polygons with yellow borders), and uninventoried roadless areas (in darker grey-green polygons with yellow borders).



The agency cannot limit its analysis of roadless areas to inventoried areas >5,000 acres, because smaller roadless areas that were not inventoried are ecologically relevant and potentially significant. The NEPA analysis must reflect the growing scientific evidence (see below, and attached narrative) indicating the significant value of roadless areas smaller than 5,000 acres and larger than 1,000 acres. Recent scientific literature emphasizes the importance of unroaded areas greater than 1,000 acres as strongholds for the production of fish and other aquatic and terrestrial species, as well as sources of high quality water. Commercial logging and/or road building within large unroaded areas threatens these significant ecological values.

The FEIS failed to clearly consider both wilderness values AND other unique values provided disproportionately by large unroaded/unmanaged areas.

An international group of scientists has identified a diverse array of important values provided by roadless areas, including:

**ROADLESS AREAS - biodiversity conservation**

* Preservation of native biodiversity
* Barrier against invasive species
* Preservation of genetic resources
* Maintenance of ecosystem connectivity and integrity
* Ensure habitat for viability of populations
* Provide migration corridors and stopovers

**ROADLESS AREAS - ecosystem services**

* Water regulation and supply
* Erosion control
* Air quality
* Climate regulation
* Disease control (e.g. Lyme disease)
* Pollination of crops
* High resilience to pest outbreak
* Recreation
* Education and scientific value

**ROADLESS AREAS - climate change**

* High resilience and buffering capacity
* Protection against catastrophic events (e.g. fires, landslides, floods)
* Carbon sequestration and decrease of greenhouse gases effects
* Support species adaptation

<http://www.roadless.online/roadless-areas/> And conserving roadless areas is an efficient and economical way to meet many of these goals. <http://www.roadless.online/wp-content/download/docs/Press%20Release%20Protecting%20Roadless%20Areas%20COP11%20CBD.pdf>. Impacts to these values should be carefully evaluated before logging, road building, or using heavy equipment in roadless areas.

The agency has a duty to accurately described the character of the landscape as part of the *“affected environment”* section of the NEPA analysis. This includes the existence of unroaded areas >1,000 acres and the significant ecological values provided by such unroaded. areas. The agency also has a responsibility to accurately disclose the potentially significant environmental *effects* of building roads and logging in those unroaded areas.

Wilderness is just one among many reasons to protect unroaded areas. The FS needs to recognize that unroaded areas provide disproportionate public values such as clean water, biodiversity, carbon storage, recreation, and scenery. Watson et al (2018) –

summarize published evidence that intact forests support an exceptional confluence of globally significant environmental values relative to forests that have experienced those damaging human actions. We show that intact forests are indispensable not only for addressing rapid anthropogenic climate change, but also for confronting the planet’s biodiversity crisis, providing critical ecosystem services and supporting the maintenance of human health. We then show that the relative value of intact forests is likely to become magnified as already-degraded forests experience further intensified pressures (including anthropogenic climate change).

… [I]ntact forest protection can typically secure very high environmental values with often relatively low implementation and opportunity costs, which serves to reinforce the need for their direct inclusion in global environmental accords. …

… **The increasing significance of intact forests**

The differences in important environmental and social values of intact forests relative to degraded forests are likely to become magnified in the future due to two negative processes in degraded areas: progressive anthropogenic damage and reduced resilience to environmental change.

…

Retaining the integrity of intact forest ecosystems should be a central component of proactive global and national environmental strategies, alongside current efforts aimed at halting deforestation and promoting reforestation.

… An essential first step towards greater success is achieving widespread recognition that rapid loss of forest intactness represents a major threat to sustainable development and human well-being. Policymakers need to understand the challenge that the loss of forest intactness represents for achieving strategic goals outlined in key multilateral environmental agreements, including the Convention of Biological Diversity, the UNFCCC and the UN Sustainable Development Goals139,143, and this recognition needs to be translated into meaningful changes on the ground.

A fundamental constraint to progress is the fact that international definitions of forests have not differentiated among types of forest and, in most policy settings, they treat all forests, regardless of their condition, as equivalent1,144. As such, international policy processes seldom acknowledge the special qualities and benefits that flow from intact ecosystems as compared with those that are

degraded.

… There is evidence that the designation of ‘roadless areas’ in the USA, for example, has led to an effective expansion in the degree of ecoregional representation under protection and increases in the number of areas big enough to provide refugia for species needing large tracts relatively undisturbed by people.

…

**Conclusion**

There are still significant tracts of forest that are free from the damaging impacts of large-scale human activities. These intact forests typically provide more environmental and social values than forests that have been degraded by human activities. … The practical tools required to address this challenge are generally well understood and include well-located and managed protected areas, indigenous territories that exemplify sound stewardship regulatory controls and responsible behaviour by logging, mining, and agricultural companies and consumers, and targeted restoration. Currently these tools are insufficiently applied, and inadequately supported by governance, policy and financial arrangements designed to incentivize conservation. Losing the remaining intact forests would exacerbate climate change effects through huge carbon emissions and the decline of a crucial, under-appreciated carbon sink. It would also result in the extinction of many species, harm communities worldwide by disrupting regional weather and hydrology, and devastate the cultures of many indigenous communities. Increased awareness of the scale and urgency of this problem is a necessary pre-condition for more effective conservation efforts across a wide range of spatial scales.

Watson, Evans, Venter et al 2018. The exceptional value of intact forest ecosystems. Nature Ecology & Evolution (2018) <https://www.nature.com/articles/s41559-018-0490-x>

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Watson et al (2018).

By failing to address the disproportionate value of unroaded areas and the disproportionate impacts of logging such areas, the FEIS is blurring the distinction between the effect of logging on roaded areas and unroaded areas. The effect of logging unroaded areas is qualitatively different and more significant than logging areas previously affected by roads and logging. The NEPA analysis must clearly disclose the fact that water quality, habitat, scenic values, soil quality, and carbon storage are all better in unroaded areas than roaded areas, and logging will have disproportionately adverse effects on those values.

In a recent case the 9th Circuit held the NEPA analysis of wilderness values insufficient when the agency argued that wilderness issues was adequately addressed in the totality of other resource analyses.

"BLM provides a laundry list of other resource values that it did consider, ranging from animal habitat quality to visual resources. Although it does not argue that its analysis of these other resources was identical to an analysis of wilderness characteristics, it contends that the analysis had the "incidental benefit of capturing the [Southeast Oregon Plan's] effects on many 'wilderness characteristics.' " The BLM supposes, apparently, that members of the public and government decision-makers might be able to piece together a wilderness characteristics analysis from what the Bureau did say. The BLM is wrong in several regards.  
  
First, the BLM never advanced such a position in the EIS itself. While interpretations that are "first articulated in a legal brief [are] not categorically 'unworthy of deference,' " the BLM's argument is simply a " 'post hoc rationalization advanced... to defend past agency action against attack.' "...  
  
Moreover, the premises of the argument are wrong. Although the BLM suggests that "wilderness characteristics" is a nebulous term, capable of being addressed simply by generally examining resources having to do with nature, that is not so. As we have discussed at length, "wilderness characteristics" is a carefully-defined statutory concept, originating in the Wilderness Act, incorporated into the BLM's mandate by the FLPMA, and used by the BLM in its own Handbook...... Even had the BLM professed in the EIS to use such a consideration-by-proxy approach, it is far from clear that it would have provided adequate disclosure of any wilderness values potentially in the planning area. And, in any event, the BLM never purported to have developed such a proxy methodology, by which consideration of other resource types could be melded together to produce an analysis of wilderness characteristics.....  
  
Finally, this appeal does not, as the BLM contends, concern an issue of agency methodology.... no question of methodology with regard to the treatment of wilderness values on non-WSA lands in the planning area is before us. Here, the BLM used no method to analyze or plan for the management of such values. We cannot defer to a void.

*ONDA v. BLM* (9th Circ. July 2008)   
<http://www.ca9.uscourts.gov/datastore/opinions/2008/07/14/0535931.pdf>.

# The FEIS failed to take a hard look at the adverse effects of logging on the need for abundant snags within reserves.

Logging will adversely affect snag habitat in all commercial logging units, including plantation thinning. The FEIS failed to take a hard look at these adverse effects on snag habitat and related LSR objectives. This is particularly concerning because the FS snag standards are scientifically discredited and the agency lacks new standards to ensure that biologically adequate levels of snags are being recruited over time to met the needs of wildlife and other ecological functions.

The ecological importance of dead wood cannot be understated. The Northwest Forest Plan reserves must retain abundant dead wood habitat to mitigate for severe shortage of dead wood across the managed landscape on both public and private lands. If reserves do not retain and recruit optimal levels of dead wood, then no place will. The following science describes the ecological importance of dead wood habitat:

1. Franklin, J.F., Lindenmayer, D., MacMahon, J.A., McKee, A., Magnuson, J., Perry, D.A., Waide, R., and Foster, D. 2000. Threads of Continuity. Conservation Biology in Practice. [Malden, MA] Blackwell Science, Inc. 1(1) pp9-16.
2. William F. Laudenslayer, Jr., Patrick J. Shea, Bradley E. Valentine, C. Phillip Weatherspoon, and Thomas E. Lisle *Technical Coordinators.* Proceedings of the Symposium on the Ecology and Management of Dead Wood in Western Forests. PSW-GTR-181. <http://www.fs.fed.us/psw/publications/documents/gtr-181/>.
3. Lofroth, Eric. 1998. The dead wood cycle. In: Conservation biology principles for forested landscapes. Edited by J. Voller and S. Harrison. UBC Press, Vancouver, B.C. pp. 185-214. 243 p. <http://www.for.gov.bc.ca/hre/deadwood/DTrol.htm>.
4. Rose, C.L., Marcot, B.G., Mellen, T.K., Ohmann, J.L., Waddell, K.L., Lindely, D.L., and B. Schrieber. 2001. Decaying Wood in Pacific Northwest Forests: Concepts and Tools for Habitat Management, Chapter 24 *in* ***Wildlife-Habitat Relationships in Oregon and Washington*** (Johnson, D. H. and T. A. O'Neil. OSU Press. 2001) <http://www.fs.fed.us/wildecology/decaid/decaid_background/chapter24cwb.pdf>
5. Stevens, Victoria. 1997. The ecological role of coarse woody debris: an overview of the ecological importance of CWD in B.C. forests. Res. Br., B.C. Min. For., Victoria, B.C. Work. Pap. 30/1997. <http://www.for.gov.bc.ca/hfd/pubs/docs/Wp/Wp30.pdf>.
6. Hagar, Joan, 2007, Assessment and management of dead-wood habitat: USGS Administrative Report 20071054, pp. 1-32. <http://pubs.usgs.gov/of/2007/1054/pdf/ofr20071054.pdf>
7. Bruce G. Marcot 2017. Ecosystem Processes Related to Wood Decay. PNW Research Note 576. <https://www.fs.fed.us/pnw/pubs/pnw_rn576.pdf>
8. Jennie Sandström et al. 2019. Impacts of dead wood manipulation on the biodiversity of temperate and boreal forests. A systematic review, Journal of Applied Ecology (2019). DOI: 10.1111/1365-2664.13395. <https://besjournals.onlinelibrary.wiley.com/doi/pdf/10.1111/1365-2664.13395>

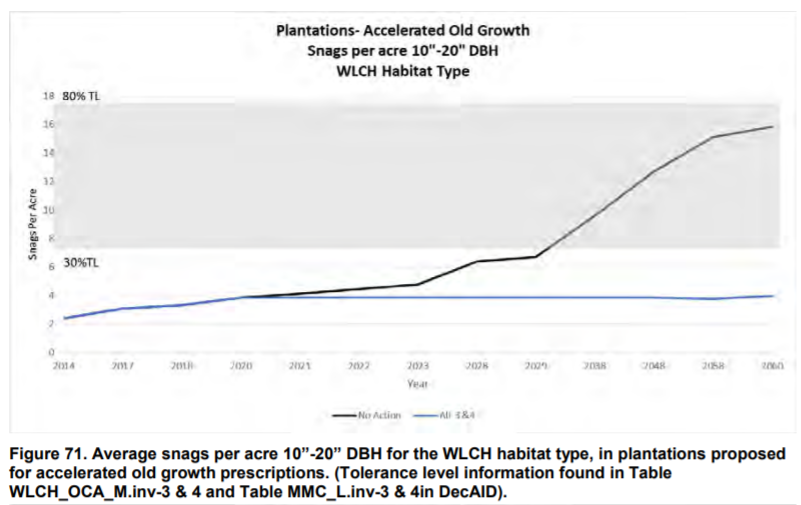
Snags and dead wood are critically important features of late successional forests which have been severely depleted across the landscape as a result of past logging including within LSRs. Recent fires increase concerns about long-term snag recruitment in the LSR because fires represent a short-term pulse and a long-term gap in snag recruitment. This is due to the fact that fires kill so many green trees that are no longer part of the recruitment pool and it takes a very long time to grow new large trees to replace those that have died. Several decades after wildfire there is a period of snag shortage, which occurs after most of the snags from recent fires have fallen down and before new large trees grow and die to replace them. In Congressional testimony in July 2004, Jerry Franklin said:

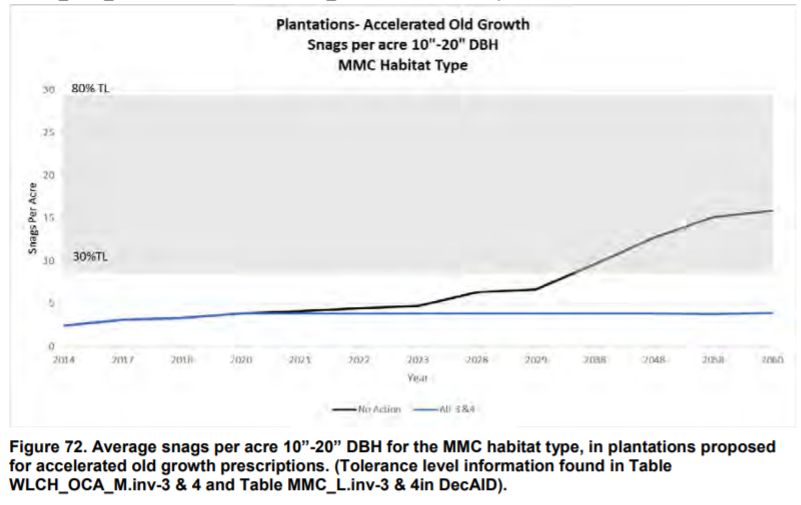
It is sometimes argued that following a stand-replacement fire in an old-growth forest that snags and logs are present in “excess” of the needs of the site, in terms of ecosystem recovery. In fact, the large pulse of dead wood created by the disturbance is the only significant input of woody debris that the site is going to get for the next 50 to 150 years—the ecosystem has to “live” off of this woody debris until the forest matures to the point where it has again produced the large trees that can become the source for new snags and logs (Maser et al. 1988).

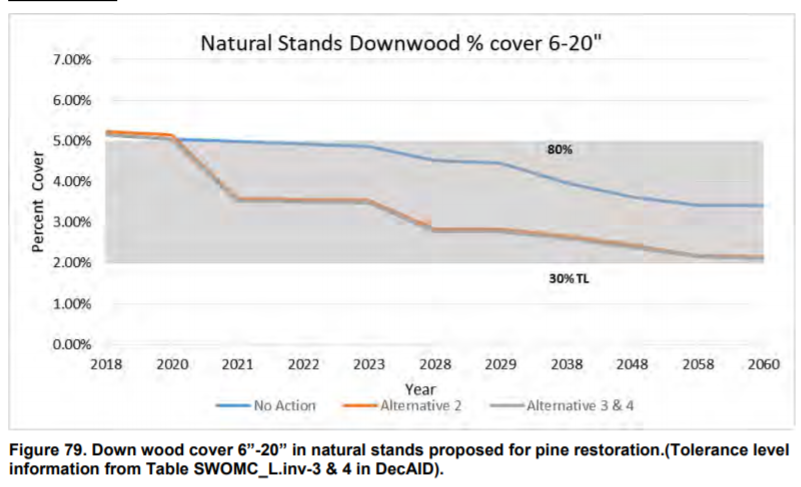
Dr. Jerry F. Franklin, Professor of Ecosystem Studies, College of Forest Resources, University of Washington. July 15, 2004. TESTIMONY FOR THE RECORD ON OVERSIGHT HEARING ON “RESTORING FORESTS AFTER CATASTROPHIC EVENTS” BY HOUSE COMMITTEE ON RESOURCES, SUBCOMMITTEE ON FOREST AND FOREST HEALTH. <http://www.signaloflove.org/clearcutting/reports/fire3/Franklin%20Jerry%20July%202004%20testimony.pdf>.

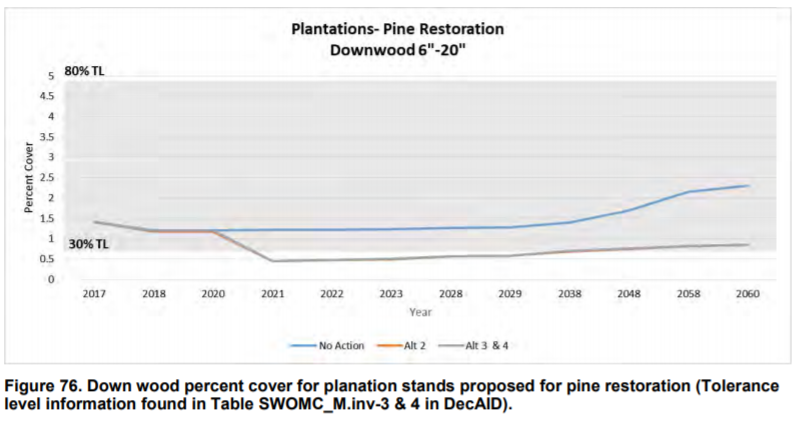
Commercial logging across thousands of acres as part of this project will remove more green trees and make a bad situation worse for snag habitat. This effect could be mitigated by retaining more green trees, such as by focusing on sugar pine release and non-commercial thinning, but not commercially thinning whole stands just because that’s what the FS is in the habit of doing.

The FEIS analysis of dead wood habitat reveals that logging will result in a snag habitat condition that fail to meet objectives for reserves. Figures 71, 72, 79, 76 (FEIS pp 320-324) show that logging will suppress the recruitment of snag and down wood habitat so that it fails to reach even the 30% tolerance level for the next 40 years.









This is a violation of the LSR standards & guidelines, in particular the requirement that “proposed management activities will **clearly result in greater assurance of long-term maintenance of habitat**, ... and (3) the **activities will not prevent the Late-Successional Reserves from playing an effective role** in the objectives for which they were established.” Suppressing snag habitat will result in a lower assurance of snag habitat maintenance, and will prevent the LSR from meeting late successional habitat objectives. Note, small snags are just as much a part of the historic range of variability as large snags. The FS cannot say that large snags matter and small snags do not. That is ecological non-sense.

The effects analysis for large snags in natural stands is highly perplexing. It seems to show that logging would produce more snags, even though not logging would retain far more green trees making the recruitment pool much larger under the no action alternative. The analysis seems to assume that more trees will die and remain on-site under the action alternatives, but fails to carry the effects analysis out far enough into the future to reveal the full effects of logging and the benefits of retaining more green trees. The effects analysis contradicts the findings of the 2017 Science Synthesis for the NW Forest Plan which says partial cutting in older forests will “strongly impact dead wood amounts, and the accompanying road and harvest system will add additional impacts.”

The EIS analysis is also too short, temporally. Analysis of other projects show that the adverse effects of logging on snag habitat recruitment can persist for 100 years of more. See attached narrative. The DEIS admitted that it’s analysis period may be too short to reveal effects, e.g., “it is difficult to accurately estimate how quickly snags in this size class would accumulate in a relatively short time scale for vegetation modeling (40 years).” (DEIS p 316). The analysis should be designed to reveal effects, not hide them. The FEIS seems to have removed this admission but it nonetheless remains true.

Before relying on DecAID, the agency must prepare a comprehensive NEPA analysis to consider alternative ways of ensuring viability of all species dependent upon snags and dead wood. While it is true that the “potential population” or “habitat capability” method is no longer considered scientifically valid, the agency has not yet considered a full range of alternative methods to replace the habitat capability method mandated in the forest plans.

While it is true that the new DecAID tolerance levels cannot be directly translated to “potential population” requirements in the LRMP and Eastside Screens, it should be obvious that 100% potential population is much more like “high” assurance than moderate or low assurance, so the Forest Service should be striving to meet 80% DecAID tolerance levels which provide a high level of assurance of meeting the needs of primary cavity excavators consistent with the Eastside Screens requirement to maintain enough snags to support 100% potential populations.

Before using DecAID, the agency must establish a rational link between the tolerance levels in DecAID and the relevant management requirements in the applicable resource management plan. For instance, since the Northwest Forest Plan and the Eastside Screens require maintenance of 100% potential population of at least some cavity-dependent species, the agency must explain why that does not translate into maintaining *100% of the potential tolerance level*. If the site is capable of supporting 80% tolerance levels, the agency should not be able to manage for 30-50% tolerance levels and still meet the 100% potential population requirement.

DecAID does not replace the discredited forest plan standards because DecAID is informational only. DecAID does not specify management objectives. The agency must specify the management objective based on project objectives, objectives for the land allocation and based on natural “range of variation.” DecAID does not advise the agencies to manage for any particular tolerance level. DecAID is just information. The agency has to decide what tolerance level to manage for, but making that selection is a plan amendment requiring compliance with both NEPA and NFMA. See ONRC and HCPC v. Forsgren, (CV 02-368-BR) (Oregon District Court 2003). <http://maps.wildrockies.org/ecosystem_defense/Resources_Species_Topics/Lynx/lynx%20NW%20Decision.pdf>. Since large snags are outside the natural range of variability across the landscape, the agency must retain all large snags to start moving the landscape toward the natural range of variability, or the agency must carefully justify in the NEPA analysis every large snag it proposes to remove. See Jerome J. Korol, Miles A. Hemstrom, Wendel J. Hann, and Rebecca A. Gravenmier. 2002. *Snags and Down Wood in the Interior Columbia Basin Ecosystem Management Project.* PNW-GTR-181. <http://www.fs.fed.us/psw/publications/documents/gtr-181/049_Korol.pdf>. This paper estimates that even if we apply enlightened forest management on federal lands for the next 100 years, we will still reach only 75% of the historic large snag abundance measured across the interior Columbia Basin, and most of the increase in large snags will occur in roadless and wilderness areas.

DecAID snag levels for “unharvested” stands represent snags levels from a world where disturbances (e.g. fire, insects, disease) are artificially suppressed. The goal should not be to conduct a disturbance (such as thinning) that results in snag levels similar to an undisturbed stand. That makes no sense. Natural stands have periodic disturbances and pulses of snags that go along with those disturbances. The agencies need to get creative and learn to mimic natural disturbance which would always leave behind lots of dead trees. Logging that leaves behind only a few snags per acre is an UNusual disturbance event. The agencies need to learn to share the bounty of the forest with the forest itself.

The agency should not use “average” snag levels (e.g. 50% tolerance level) as a management objective within treatment areas, because treatments are essentially displacing natural disturbance events which would normally create and retain large numbers of snags, so disturbance areas should have abundant snags, not average levels of snags. It would be inconsistent with current science and current management direction to manage only for the mid-points and low points. The agency should manage for the full natural range dead wood levels, including the peaks of snag abundance that follow disturbance.

# The FEIS failed to take a hard look at the value of retaining canopy cover and the adverse effects of removing canopy cover.

Before embarking on an aggressive strategy of crown fuel reduction, the agency must address the responsible opposing viewpoints regarding the manifold values of retaining more canopy to retain cooler temperatures and moisture. Responsible opposing experts say that reducing ground fuels and ladder fuels should be the first priority and reducing canopy fuels a lesser priority.

All fuels are not created equal. Surface and ladder fuels are worse than canopy fuels. Surface fuels are where fire moves across the landscape. Ladder fuels are how surface fire get into the canopy. “High overstory density can be resilient” when ladder fuel are absent and there is a gap between surface and canopy fuels. Terrie Jain (2009) Logic Paths for Approaching Restoration: A Scientist's Perspective, *from* Workshop: Restoring Westside Dry Forests - Planning and Analysis for Restoring Westside Cascade Dry Forest Ecosystems: A focus on Systems Dominated by Douglas-fir, Ponderosa Pine, Incense Cedar, and so on. May 28, 2009. <http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/workshops/restoring-westside-dry-forests/>

Canopy fuels are not only important habitat but they also help moderate fire in several ways - by helping to maintain cool-moist-less-windy conditions, reducing production of slash, and suppressing growth of future surface and ladder fuels. Thinning the canopy might make fire hazard worse by making the stand hotter, dryer, windier, and by stimulating the growth of ladder fuels. This pattern is corroborated in SW Oregon forest types. E.g., Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the western Klamath Mountains, California. Conservation Biology 18(4): 927-936.<http://nature.berkeley.edu/moritzlab/docs/Odion_etal_2004.pdf>. And Jonathan R. Thompson, Thomas A. Spies, and Lisa M. Ganio. 2007. Reburn severity in managed and unmanaged vegetation in a large wildfire. Proceedings of the National Academy of Sciences. PNAS published online Jun 11, 2007.<http://www.fs.fed.us/pnw/pubs/journals/pnw_2007_thompson001.pdf>. “Areas unaffected by the initial fire tended to burn at the lowest severities in 2002.” OSU Media Release. Salvage Logging, Replanting Increased Biscuit Fire Severity. 06-11-07<http://web.archive.org/web/20090115201823/http://oregonstate.edu/dept/ncs/newsarch/2007/Jun07/fireseverity.html>. These studies indicate that canopy development in response to fire exclusion might actually help reduce severe fire.

Forests with relatively high canopy cover (especially mature native forests) provide many important benefits, including: moderating extreme weather events, providing late successional habitat (large trees, large snags, hiding cover, favorable microclimate, etc), providing high carbon storage, and suppressing the growth of ladder fuels thus reducing fire hazard. Logging mature native forests and reducing canopy cover adversely affects all of these values, the FEIS failed to take a hard look at these trade-offs. In particular, logging to reduce canopy cover will stimulate the growth of ladder fuels and make these forests less resilient to contagious fire which is contrary to the purpose and need for this project.

Omi and Martinson (2012) prepared a review of the literature for managers and concluded —

That no relationship (r2<0.06) was found between canopy fuel variables and the effectiveness of either surface reduction treatments without thinning or thinning treatments without subsequent slash treatment supports the assertion that surface fuel reduction is of primary importance in influencing treatment effectiveness.

Omi & Martinson 2012. Effectiveness of Fuel Treatments for Mitigating Wildfire Severity: A Manager-Focused Review and Synthesis. Joint Fire Science Program. Final Report. JFSP Project Number 08-2-1-09 <http://www.firescience.gov/projects/08-2-1-09/project/08-2-1-09_finalreport08-2-1-09.pdf>

Opening up the stand significantly will dry surface fuels due to increased light levels, surface winds and temperatures. This may increase surface fire intensity and rate of spread unless total surface fuel loading is reduced. In addition, thinning that allows significant light to reach the forest floor may result in the regrowth of small trees and shrubs, which over time become new ladder fuels.

Stephen Fitzgerald and Max Bennett. 2013. A Land Manager’s Guide for Creating Fire-Resistant Forests. EM 9087. OSU Extension. <http://www.nwfirescience.org/sites/default/files/publications/A%20Land%20Managers%20Guide%20for%20Creating%20Fire-resistant%20Forests%20.pdf>

The agencies must also recognize that most large fires are climate driven, not fuel driven. “Within forests, annual burned area correlated at least as strongly with spring–summer vapour pressure deficit (VPD) as with 14 other drought-related metrics, including more complex metrics that explicitly represent fuel moisture. Particularly strong correlations with VPD arise partly because this term dictates the atmospheric moisture demand.” A. Park Williams, Richard Seager al 2014. Correlations between components of the water balance and burned area reveal new insights for predicting forest fire area in the southwest United States. International Journal of Wildland Fire 24(1) 14-26 <http://dx.doi.org/10.1071/WF14023> <http://www.publish.csiro.au/?paper=WF14023>

“Our analyses indicate that year-of-fire climate is the strongest influence on area burned in forested ecosystems, but fire size may be limited secondarily by fuel continuity between or within forest stands (Rollins et al. 2002). For example, continuity may be less limiting for fire regimes in which crown fires are the dominant mechanism than in lower-elevation forests characterized by surface fires,...” JEREMY S. LITTELL, DONALD MCKENZIE, DAVID L. PETERSON, AND ANTHONY L. WESTERLING. 2009. Climate and wildfire area burned in western U.S. ecoprovinces, 1916–2003. Ecological Applications, 19(4), 2009, pp. 1003–1021.

[R]elationships described in Westerling et al. (2006) hold for more of the 20th century than previously shown.... These relationships all support our claim that drying of fuels is the primary mechanism for large WFAB [Wild fire area burned] in the higher-elevation and northern mountainous ecoprovinces. Wild fire area burned in these ecoprovinces thus appears to be limited by climate rather than fuel availability, …

…

Our analyses indicate that year-of-fire climate is the strongest influence on area burned in forested ecosystems, but fire size may be limited secondarily by fuel continuity between or within forest stands (Rollins et al. 2002). For example, continuity may be less limiting for fire regimes in which crown fires are the dominant mechanism than in lower-elevation forests characterized by surface fires, …

…

Climate controls on the area burned by wildfire in the western United States are strong, even during the dominant period of fire suppression and exclusion in the last two-thirds of the 20th century. Roughly 39% (1916–2003) to 64% (1977–2003) of the fire area burned can be related directly to climate. The variance explained by climate implies that fuel treatments, for example, might be tailored to specific ecosystems and climate–fire relationships. Recognizing that most ecoprovinces have significant ecological variability, climate-limited ecoprovinces may be less influenced by fuel treatment than fuel-limited ecoprovinces (at least for area burned, if not fire severity).

Jeremy S. Littell, Donald McKenzie, David L. Peterson, Anthony L. Westerling (2009) Climate and wildfire area burned in western U.S. ecoprovinces, 1916–2003. Ecological Applications: Vol. 19, No. 4, pp. 1003-1021. <http://naldc.nal.usda.gov/download/34676/PDF>.

“[P]otential shrub responses to reduction in stand densities must be considered. Some dry mixed-conifer plant associations have the potential to develop dense shrubby understories when light and moisture are made available by tree thinning; … Such understories can provide significant ground fuels for wildfires, thereby negating some of the positive effects of thinning on fire behavior. The potential for development of shrubby understories can initially be assessed on the basis of plant association; i.e., plant associations vary significantly in potential understory responses. Current stand conditions provide another important measure. Hence, the potential for developing undesirable levels of understory fuels needs to be assessed on a stand-by-stand basis and prescriptions adjusted so as to reduce the risk of undesirable understory responses. Indeed, in some cases it may be desirable to maintain essentially full overstory cover, treating only ladder fuels, and leaving all dominant and co-dominant canopy trees in place rather than risk enhancing ground fuels (e.g., grasses or shrubs). … The Tanoak plant associations of the Siskiyou Mountains have a robust shrub understory that may quickly develop when stands are opened up, potentially defeating the use of thinning to reduce fuel accumulation… ”

Johnson K.N., Franklin, J.F. 2009. Restoration of Federal Forests in the Pacific Northwest: Strategies and Management Implications.

Crown fire is usually a *passive* crown fire which relies on the preheating of canopy fuels by burning from below. When surface and ladder fuels are adequately treated *active* crown fire becomes an unlikely outcome except on very steep slopes where preheating is driven by the other crowns burning below. Active crown fire is such a rare event that it should not drive forest management objectives, and the agencies should instead focus on reducing surface and ladder fuels and retaining canopy to help create a cool moist microclimate and to help suppress the growth of surface and ladder fuels.

Removing canopy fuels creates canopy gaps and thus “radiation reaching the forest floor and air movement beneath the residual live tree canopy are increased, and both contribute to fuel drying. More open canopies also contribute to greater understory vegetation growth. The consequences of these changes on fire behavior are not fully understood, but such conditions may favor ignition and spread of fire more readily than in forests having few canopy gaps …” Kaufmann M.R., G.H. Aplet, M. Babler, W.L. Baker, B. Bentz, M. Harrington, B.C. Hawkes, L. Stroh Huckaby, M.J. Jenkins, D.M. Kashian, R.E. Keane, D. Kulakowski, C. McHugh, J. Negron, J. Popp, W.H. Romme, T. Schoennagel, W. Shepperd, F.W. Smith, E. Kennedy Sutherland, D. Tinker, and T.T. Veblen. 2008. The status of our scientific understanding of lodgepole pine and mountain pine beetles – a focus on forest ecology and fire behavior. The Nature Conservancy, Arlington, VA. GFI technical report 2008-2. <http://csfs.colostate.edu/pdfs/LPP_scientific-LS-www.pdf>.

“Thinning is most effective when it removes understory trees, because larger overstory trees are more resistant to heat injury (Agee and Skinner 2005). In addition, shade and competition from larger trees slows the recruitment of younger trees in the understory.” Keeley, J.E.; Aplet, G.H.; Christensen, N.L.; Conard, S.C.; Johnson, E.A.; Omi, P.N.; Peterson, D.L.; Swetnam, T.W. 2009. Ecological foundations for fire management in North American forest and shrubland ecosystems. Gen. Tech. Rep. PNW-GTR-779. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 92 p. <http://www.fs.fed.us/pnw/pubs/pnw_gtr779.pdf>.

“Removing approximately half of the basal area of a mature stand of lodgepole pine in southeastern British Columbia, by thinning from below to uniform 4 m inter-tree spacing, resulted in decreased canopy interception of rainfall and increased within-stand solar radiation, windspeed, and nearsurface air temperature.” Whitehead, R.J. G. Russo, B.C. Hawkes, S.W. Taylor, B.N. Brown, H.J. Barclay, and R.A. Benton. 2006. Effect of a spaced thinning in mature lodgepole pine on within-stand microclimate and fine fuel moisture content. In P.L. Andrews and B.W. Butler (compilers). Fuels Management - How to Measure Success. USDA Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado, Proceedings RMRS-P-41. Pp. 523-536. <http://www.fs.fed.us/rm/pubs/rmrs_p041.html>.

A recent study of crown damage related to the Biscuit fire showed that

The most important predictors of total crown damage were the percentage of pre-fire shrub-stratum vegetation cover and average daily temperature. … The median level of damage was 32% within large conifer cover and 62% within small conifer cover. Open tree canopies with high levels of shrub-stratum cover were associated with the highest levels of tree crown damage, while closed canopy forests with high levels of large conifer cover were associated with the lowest levels of tree crown damage.

…

[Random forest analysis] RFA explained 45% of variation in total crown damage. Shrubstratum cover was, by far, the most important predictor variable (Fig. 4); increasing shrub-stratum cover was associated with increasing crown damage (Fig. 5). Average temperature and burn period were similarly important and were ranked second and third, respectively. Large conifer cover was ranked fourth and was associated with decreasing total damage.

…

Furthermore, the ability of conifers to resist fire damage increases with age, as the height to the base of the crown rises and the insulating capacity of the bark increases. This is consistent with the fact that, within the Biscuit Fire, median crown damage within large conifer cover was 32%, compared to 62% within small conifer cover.

…

In addition, mixed-sized conifer cover experienced levels of damage that were intermediate between small and large (median = 52%), which suggests that multi-storied conifer stands did not increase the level of damage by increasing vertical fuel continuity. Instead, it seems likely that the small tree component of the mixed-sized stands was damaged, while the large tree component was not.

Jonathan R. Thompson, Thomas A. Spies 2009. Vegetation and weather explain variation in crown damage within a large mixed-severity wildfire. Forest Ecology and Management 258 (2009) 1684–1694. See also, Jonathan R. Thompson. 2008. Patterns of Crown Damage within a Large Wildfire in the Klamath-Siskiyou Bioregion. PhD dissertation. <http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/9025/Thompson_Dissertation_FINAL.pdf>.

In areas with relatively high productivity that can support shrubs, canopy removal via thinning is very likely to stimulate the proliferation of shrubs and create the very conditions that favor more severe crown damage during fire. This study also challenges the very popular notion that dense forests are a fire hazard.

Johnson et al (2009) simulated thinning in a densely stocked stand of Ponderosa pine with an understory of Douglas-fir and grand fir.

The predicted fire type after treatment is surface fire for all thinning options, but the more open stands are characterized predominantly by fuel model 2, so flame lengths increase and potential BA mortality remains above 20 percent regardless of surface fuel treatment. The 200 and 300 TPA... treatments have a more closed canopy and fire behavior is influenced less by grass fuels, so flame lengths and potential BA mortality are lower than the more open stands.  
...  
The 200 TPA treatment has the greatest long-term effect on crown fire potential, with a predicted surface fire type for 50 years with pile-and burn or no surface fuel treatment and 40 years with prescribed fire treatment. The 50 TPA (124 TPH) treatment had the most short-lived effect on crown fire potential, with regeneration causing a drop in canopy base height in 30 years regardless of surface fuel treatment.

Morris Johnson, David L. Peterson, and Crystal Raymond 2009. Fuel treatment guidebook: illustrating treatment effects on Fire hazard. Fire Management Today 69(2)  
[http://www.fs.fed.us/fire/fmt/fmt\_pdfs/FMT69-2.pdf](http://www.fs.fed.us/fire/fmt/fmt_pdfs/FMT69-2.pdf#_blank) p 32-33.

Models show that maintaining canopy cover is a useful way to reduced fire hazard, while removing canopy increases fire hazard.

Compared with the original conditions, a closed canopy would result in a 10 percent reduction in the area of high or extreme fireline intensity. In contrast, an open canopy has the opposite effect, increasing the area exposed to high or extreme fireline intensity by 36 percent. Though it may appear counterintuitive, when all else is equal open canopies lead to reduced fuel moisture and increased midflame windspeed, which increase potential fireline intensity.

Rutherford V. Platt, Thomas T. Veblen, and Rosemary L. Sherriff. 2006. Are Wildfire Mitigation and Restoration of Historic Forest Structure Compatible? A Spatial Modeling Assessment. Annals of the Association of American Geographers, 96(3), 2006, pp. 455–470. <http://www.colorado.edu/geography/class_homepages/geog_4430_f10/Platt%20et%20al_Wildfire%20Mitigatnion_AnAAG_2006.PDF>. See also, Jim Agee. Risk Assessment for Decision-making Related to Uncharacteristic Wildfire, Conference Portland, Oregon Nov 17-20, 2003 <http://www.docstoc.com/docs/37210605/Risk-Assessment-for-Decision-Making-Related-to-Uncharacteristic>. (“Reduce Crown Density • Important to address once surface fire and torching are addressed. • DON’T START HERE!!!!! … Treatments that reduced surface fuels, treated ladder fuels, and kept the big trees fared best.”) An EIS is needed to respond to opposing viewpoints and consider the consequences of alternative approaches to fuel reduction. <http://www.fws.gov/oregonfwo/ExternalAffairs/Topics/DryForestWorkshop/Documents/2005/PowerPoints/Agee%20NSO-Bend-Agee.ppt>.

Sierra Club v. Eubanks, 335 F.Supp.2d 1070 at 1081 (E.D. Cal. 2004) ["Defendants have failed to take the ‘hard look’ required by NEPA at scientific studies which suggest that the timber removal proposed actually increases, not reduces, fire risk."]

Mark Finney and Warren Cohen also emphasize the three step approach to fuel reduction that places reduced emphasis on canopy fuel reduction.

Thus, Van Wagner’s (1977) relationships suggest that fuel management prescriptions can limit crown fire activity by first reducing surface fuels to limit fireline intensity, then thinning the smallest trees or pruning to elevate the base of aerial fuels from the ground surface. A final measure may involve crown thinning (removal of some canopy level trees) to make difficult the transition to active crowning.

Finney and Cohen. 2003. Expectation and Evaluation of Fuel Management Objectives. USDA Forest Service Proceedings RMRS-P-29. <http://www.fs.fed.us/rm/pubs/rmrs_p029/rmrs_p029_351_366.pdf>.

Modeling shows that canopy fuel reduction is accomplished at the expense of increasing surface fire intensity.

Modifying canopy fuels as prescribed in this method may lead to increased surface fire intensity and spread rate under the same environmental conditions, even if surface fuels are the same before and after canopy treatment. Reducing CBD to preclude crown fire leads to increases in the wind adjustment factor (the proportion of 20-ft windspeed that reaches midflame height). Also, a more open canopy may lead to lower fine dead fuel moisture content. These factors increase surface fire intensity and spread rate. Therefore, canopy fuel treatments reduce the potential for crown fire at the expense of slightly increased surface fire spread rate and intensity.

Scott, Joe. 2003. Canopy Fuel Treatment Standards for the Wildland-Urban Interface. USDA Forest Service Proceedings RMRS-P-29. 2003. <http://www.fs.fed.us/rm/pubs/rmrs_p029/rmrs_p029_029_038.pdf>.

Calculations of crown bulk density (CBD) are oversimplified. Typical calculations of CBD “carries the implicit assumption that canopy biomass is distributed uniformly within the stand canopy, which is unlikely to be true even in stands with very simple structures; multi-storied stands are probably even more poorly represented by this procedure.” (NEXUS software help files). Canopy fuels are not uniform horizontally or vertically, so the risk of spreading crown fire may be over-estimated by these methods.

In the open, solar radiation impinges directly on the earth’s surface. Because both the earth and the air above it are poor conductors, heat is concentrated at the surface and in the layer of air next to it. Ground fuels can thus become superheated … A mature, closed stand has a fire climate strikingly different from that in the open. Here nearly all of the solar radiation is intercepted by the crowns … Because of the lower temperature and higher humidity, fuels within closed stands are more moist than those in the open under ordinary weather conditions … [F]irebrands that do not contain enough heat to start a fire in a closed stand may readily start one in the open. Fires starting in the open also burn more intensely and build up to conflagration proportions more quickly since less of the heat produced by the fire is used in evaporating water from the drier fuels.

Countryman, C.M. 1955. Old-growth conversion also converts fire climate. *Fire Control Notes* 17(4): 15-19.

The BLM admits that there is “conflicting opinion regarding logging, canopy closure, and fire risk” and scientific disagreement about the appropriate fuel reduction tools and the extent of crown thinning needed to achieve desired conditions. Medford BLM, South Deer LMP Decision Record. Sept. 1, 2005 (p 24).

Most structures that are burned by wildfire as ignited by surface fires as opposed to canopy fires. U.S. Dep’t of Agriculture Forest Service Rocky Mountain Research Station, FOURMILE CANYON PRELIMINARY FINDINGS 69, 90 (Oct. 2011), available at <http://www.scribd.com/doc/68850263/Fourmile-Canyon-Fire-Prelim-Report> (83% of the homes that burned were ignited by surface fire as opposed to crown fire. This indicates that the “survival or loss of homes exposed to wildfire flames and firebrands (lofted burning embers) is not determined by the overall fire behavior or distance of firebrand lofting but rather, the condition of the Home Ignition Zone (HIZ) – the design, materials and maintenance of the home in relation to its immediate surroundings within 100 feet.”)

Tim Ingalsbee summarizes Jack Cohen’s recommendations about protecting homes:

**Key Points of Jack Cohen's Research Paper**

* Home ignitability, rather than wildland fuels, is the principal cause of home losses during wildland/urban interface fires. Key items are flammable roofing materials (e.g. cedar shingles) and the presence of burnable vegetation (e.g. ornamental trees, shrubs, wood piles) immediately adjacent to homes.
* Cohen's Structure Ignition Assessment Model (SIAM) indicates that intense flame fronts (e.g. crown fires) will not ignite wooden walls at distances greater than 40 meters (approx. 130 feet) away. Field tests of experimental crown fires revealed that wooden walls can successfully survive intense flame fronts from as close as 10 meters (approx. 30 feet) away!
* Current strategies for wildland fuel reduction may be inefficient and ineffective for reducing home losses, for extensive wildland fuel reduction on public lands does not effectively reduce home ignitability on private lands.
* The so-called "wildland/urban interface zone" overgeneralizes and misrepresents the zone of prime fire risk and fuel hazards: the home and its adjacent vegetation.
* Opportunities to use prescribed fire for the sake of ecosystem restoration may be greatly enhanced in wildland/urban interface areas if home ignitability is reduced.
* The primary and ultimate responsibility for home wildfire protection lies with private homeowners, not public land management agencies (or taxpayers).
* Given nonflammable roofs, Stanford Research Institute found that 95 percent of homes survived where vegetation clearance of 10 to 18 meters was maintained around the homes.

*Citing* Jack D. Cohen, Ph.D. 1999. Reducing the Wildland Fire Threat to Homes: Where and How Much? presented the paper below at the Fire Economics Symposium in San Diego, California on April 12, 1999.

# The FEIS failed to address significant new information on Spotted owls (and Barred owls)

Logging suitable spotted owl habitat in LSRs raises serious concerns about meeting the important goals of LSRs to function as refugia and recovery sites for spotted owls. The invasion of the barred owl means that a lot of suitable owl habitat is occupied and defended by barred owls to the detriment of spotted owls. The NWFP standards allowing suitable habitat degradation for “risk reduction” treatment may need to be reconsidered in light of these new threats. At a minimum, the standards requiring “great assurance of habitat maintenance” should be strictly followed, instead of brushed aside with sleight of hand as has been done here. The FEIS failed to quantify spotted owl habitat losses and gains from logging and wildfire to show that logging is needed and will provide greater assurance of habitat.

New information on the Threatened northern spotted owl indicates that there are significant new uncertainties for the owl that have not been fully considered at the regional or local scale. As recognized by the spotted owl status review, all existing suitable habitat could be critical to the survival of the spotted owl. These new concerns include:

* The **barred owl** is dramatically increasing in numbers throughout the range of the spotted owl and causing Competition and displacement of the spotted owl. The Northwest Forest Plan does not account for the effects of barred owls which compete with spotted owls and exclude spotted owls from otherwise suitable habitat. The barred owl is barely mentioned in the 1994 SEIS. The invasion of the barred owl undermines a critical assumption underlying the Northwest Forest Plan - that all *suitable*owl habitat is *available*to spotted owls. Tens of thousands of acres old forest owl habitat (which was in short supply before the barred owl arrived) are now occupied and defended by barred owls to the exclusion of spotted owls. The logical response now is to protect and restore more habitat to reach spotted owl population goals. **Implications:** Based on well-established species/area relationships the agencies need to protect more suitable owl habitat is needed to ensure that these two owl species can co-exist, and to decrease the likelihood of competitive exclusion. This is corroborated by FWS’ Final Recovery Plan for the Northern Spotted Owl, which recommends protection of "substantially all of the older and more structurally complex multi-layered conifer forest" outside of reserves (as well as on non-federal lands). "These forests are characterized as having large diameter trees, high amounts of canopy cover, and decadence components such as broken-topped live trees, mistletoe, cavities, large snags, and fallen trees." See Recovery Action 32. This recovery action is intended to reduce competitive pressures between spotted and barred owls, but unfortunately RA 32 only applies to a subset of all the suitable habitat that could be conserved to further co-existence between the two competing owls, and an analysis has not been done to show *how much* additional habitat needs to be protected to ensure recovery of the spotted owl, and the USFS and BLM have not taken steps to amend their LRMPs to implement this recovery plan element.
* The effects of **West Nile Virus** which is fatal to the spotted owl; **Implications**: A larger population may be better able to survive the stochastic pressures of this disease. It may be important to avoid any further "take" of birds or habitat at least until the disease has run its course. Isolated stands of old-growth may also be important because they may be drier and have fewer mosquito vectors. Geographic isolation might also help protect them from the contagious spread of the disease.
* **Avian malaria** that was recently discovered in spotted owls. Ishak HD, Dumbacher JP, Anderson NL, Keane JJ, Valkiūnas G, et al. (2008) Blood Parasites in Owls with Conservation Implications for the Spotted Owl (*Strix occidentalis*). PLoS ONE 3(5): e2304. doi:10.1371/journal.pone.0002304 <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0002304>. **Implications**: Malaria weakens the owl and likely reduces reproductive success. Providing habitat to support a larger overall population of spotted owls can help mitigate for reduced reproductive success. When owls are facing multiple stresses, the additional stress from avian malaria can be somewhat mitigated by reducing other stresses such as habitat loss from logging.
* The potential loss of habitat from **Sudden Oak Death** syndrome; **Implications**: Loss of habitat to SOD, makes remaining habitat more valuable than previously considered in any programmatic NEPA document.
* Greater than expected **loss of habitat to wildfire** over the last several years; **Implications**: Loss of habitat to fire and the risk of more such losses, makes all remaining habitat more valuable than previously considered in any programmatic NEPA document.
* The potential effect of **climate change** in terms of longer fire seasons; larger and more intense fires; increased tree mortality from fire, insects, and drought stress, consequently altered regional vegetation patterns and climate patterns; and maybe most significantly, *uncertainty whether suitable habitat can be regrown from altered young stands in an altered climate regime*. Climate change also brings uncertainty in terms of the frequency and duration of inclement weather during the owl breeding season. Franklin et al. (2000) observed that spotted owl populations could decline due solely to weather effects.[[1]](#footnote-1) **Implications**: Uncertainty in the weather creates uncertainty for the owl. This uncertainty can be mitigated by maintaining a larger population which is more resilient to climatic variations. Under a new climate regime, the average age of forests will likely decline, forest establishment will likely become more difficult; we may not be able to regrow new owl habitat in the reserves as assumed in the NW Forest Plan. Existing old forests are relatively resilient to climate change. It is risky to be conducting regen harvest and expect to be able grow new owl habitat in the reserves under an uncertain climate regime. Global climate change also affects local and regional weather. Spotted owl are known to be sensitive to cold and rain during the nesting season. If inclement weather increases during nesting season, spotted owl nesting success will likely be adversely affected. Dense forests provide owls more protection from inclement weather. “Given that natural resource managers cannot control climate variation and barred owls are likely to persist and increase in the range of the northern spotted owl, maintaining sufficient high quality habitat on the landscape remains the most important management strategy for the conservation of this subspecies.” <http://www.naturaloregon.org/2010/08/03/osu-climate-change-may-be-hurting-the-spotted-owl-in-oregon/>;.
* **Fuel reduction objectives conflict with owl habitat objectives**. Under the false premises of the Healthy Forest Restoration Act, the USFS and BLM are aggressively logging owl habitat to save it from fire. Fuel reduction efforts adversely affect spotted owl habitat characteristics. “Research conducted within and adjacent to the South Cascades LSR network indicates that spotted owls avoid suitable NRF that has been ‘degraded’. This effect appears to last for decades.” South Cascades LSR Assessment. Scientific support is lacking for fuel reduction logging to benefit species like spotted owls that prefer to live in dense forests - a fuel rich environment. *Surface fuels* provide habitat for owl prey; *ladder fuels* provide owl roosting sites; and *canopy fuels* provide owl nesting habitat; thus, fuel reduction treatments in owl habitat will almost unavoidably degrade or downgrade some existing owl habitat (or put that habitat at greater risk of fire or barred owl invasion). This means that the remaining owl habitat throughout the owls range becomes more important than previously considered in any programmatic NEPA document. For more information, see Heiken, D. 2010. Log it to save it? The search for an ecological rationale for fuel reduction logging in Spotted Owl habitat. Oregon Wild. v 1.0. May 2010. <https://www.dropbox.com/s/pi15rap4nvwxhtt/Heiken_Log_it_to_save_it_v.1.0.pdf?dl=0>. The authors of the Northwest Forest Plan expected that 80% of the reserves will become late successional habitat after a period of restoration and recovery.[[2]](#footnote-2) In addition, “[m]eeting the habitat needs of the owl will probably require maintaining a higher proportion of dense, multilayered, old-growth forests than would have occurred historically in many of the dry provinces.”[[3]](#footnote-3) However, recent “Science Findings” from PNW Research reveals that in the dry provinces, “requiring landscape treatments to earn a profit negatively impacted both habitat and fire objectives” and fuel reduction objectives are only compatible with owl habitat objectives, if the owl habitat objective is maintained at 40% (half the target of the NWFP). PNW Research Station. 2006. Seeing The Bigger Picture: Landscape Silviculture May Offer Compatible Solutions To Conflicting Objectives. Science Findings. July 2006. <http://www.fs.fed.us/pnw/sciencef/scifi85.pdf>. **Implications:** The agencies should re-evaluate whether logging in reserves and in owl habitat is compatible with spotted owl conservation; whether the 40% suitable habitat threshold is sufficient to maintain viable populations of owls in the dry provinces, and whether the reserve system should be expanded to ensure that a 40% slice of a bigger pie might better ensure recovery of the owl.
* The 9th Circuit ruled in Gifford Pinchot Task Force v. USFWS, 378 F.3d at 1062, that **avoiding jeopardy is not enough, that critical habitat is intended for recovery**. The Gifford Pinchot case invalidated the FWS’s regulatory definition of Adverse Modification of Critical Habitat and found that FWS’s application of the erroneous standard in the relevant Biological Opinions was not harmless error. The Gifford Pinchot case also held that FWS could not rely on the presence of suitable owl habitat in the late successional reserve network to find that the loss of critical habitat was not “destruction or adverse modification.”. **Implications:** The decision to approve logging must be based on correct legal standard that advances owl recovery. A change in information, requiring NEPA supplementation "need not be strictly environmental... ; the test is whether the new information so alters the project's character that a new 'hard-look' at the environmental consequences is needed."... [I]nformation "that does not seriously change the environmental picture, but that nevertheless affects, or could affect, the decision making process, is subject to the procedural requirements of NEPA." Natural Resources Defense Council v. Lujan, 768 F. Supp. 870, 886-87 (D.D.C. 1991).
* There has also been a continuous **loss of suitable owl habitat on non-federal lands** that should be considered as a cumulative impact on the viability of the species. There have been almost twice as many acres of owl habitat lost due to stand replacing timber harvest on non-federal lands than that caused by fire on all land allocation combined with logging on federal land allocations. According to Raphael et al (2006) 583,500 acres of owl habitat “losses” can be attributed to “regeneration harvest” on non-federal forest lands from 1994 to 2004.[[4]](#footnote-4) **Implications:** Continued loss of habitat on private lands renders remaining suitable habitat on federal land more valuable than it was in 1994 when there was more owl habitat on all ownerships. See WOPR DEIS page 195.
* Greater caution is warranted before logging suitable owl habitat in SW Oregon because recent information indicates that the owl population is declining more than previously realized. Davis et al. (2014) reports that:

“Although the number of sites surveyed during this period has remained relatively constant, the number of pairs detected at sites has declined and the number of unoccupied sites has increased. While the recent meta-analysis (Forsman et al, 2011a) indicated that survival on the KSA was stable through 2006, the most recent data [2005-2012] regarding occupancy has shown a steady and rapid decline, which suggests the stability of the survival rate may no longer be valid.”

Davis, R., R. Horn, P. Caldwell, R. Crutchley, K. Fukuda, T. Kaufmann, C. Larson, and H. Wise. 2013. Demographic characteristics of northern spotted owls (Strix occidentalis caurina) in the Klamath Mountain Province of Oregon, 1990-2013. Annual research report for 2013. USDA Forest Service, Pacific Northwest Research Station, Corvallis, OR and Dept. of Fish and Wildlife, Oregon State Univ., Corvallis, OR. 20p. (p. 7-8) <http://www.reo.gov/monitoring/reports/nso/KLA%20nso%20demog%20annual%20report%202013.pdf>

* **BLM RMP Revisions** - The success of the entire Northwest Forest Plan is premised on the existence of the network of reserves that span the landscape from BLM to Forest Service lands. BLM has revised its six RMPs in western Oregon to significantly modify and reduce large block reserves, riparian reserves, and mitigations for logging. Increased logging will cause further loss of suitable habitat and will have long-term consequences. It is arbitrary and capricious to allow implementation of a plan premised on the existence of reserves if those reserves are going away.[[5]](#footnote-5) One of the biggest problems with the RMP Revisions relates to reduced protection for streams that were intended to benefit spotted owl demography and dispersal. New information now indicates that complex riparian forests are one of the places that spotted owls and barred owls are more tolerant of each other so conservation of these areas is more important than ever. See Wiens, D.J. 2012. Dietary Overlap between Northern Spotted Owls and Barred Owls in Western Oregon, *workshop* What’s for Dinner: Spotted Owl Prey 2012 <http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/workshops/spotted-owl/>; <http://ecoshare.info/wp-content/uploads/2012/08/Barred-compared-to-spotted-Owl-diets.ppt>. **Implications:** Although the WOPR has been withdrawn by the Secretary of Interior, the timber industry has sued to reinstate the WOPR, and a federal judge has questioned the process used by the Secretary to withdraw the RODs.If there is a chance that NWFP reserves on BLM lands will no longer be protected as part of the interagency reserve strategy, then all remaining suitable habitat must be protected to retain options for the conservation of the Threatened spotted owl, marbled murrelet, and SONC Coho salmon. The spotted owl cumulative effects analysis in the 1994 SEIS is no longer valid and must be reconsidered at the regional scale. No project-level NEPA document can rely on the 1994 effects analysis because the publication of the WOPR NOI, FEIS, and RODs means that elimination of the reserves is a "reasonably foreseeable" action.
* **Fragmentation has gotten worse** not better since the NWFP was adopted. The Northwest Forest Plan was supposed to reduce fragmentation and enhance large blocks of owl habitat, but "Trends in most Washington and Oregon provinces, since 1994, indicate slight increases in habitat fragmentation [from stand-replacing timber harvest and wildfires] based on landscape division indices. The Oregon Coast Range province shows the most increase in fragmentation since 1994, based on the splitting index."[[6]](#footnote-6) Data from 2001 to 2006 show that fragmentation and loss of interior forest conditions within the range of the spotted owl continues to be a concern.[[7]](#footnote-7) **Implications:** To reduce fragmentation and improve habitat conditions for the spotted owl as anticipated by the Northwest Forest Plan, existing mature & old-growth forests should be protected from harvest, and regeneration harvest should be disfavored.
* **New counterpart consultation regulations** allow theaction agencies to bypass FWS’ regulatory oversight and self-consult. An example is the Umpqua NF, where the planning team for the D-Bug DEIS abused its discretion under the self-consultation regulations to radically redefine suitable owl habitat to exclude any habitat within 410 meters of roads. This had the effect of eliminating NEPA disclosure and NEPA analysis for 2,000 acres of logging activities in otherwise suitable habitat near roads. **Implications**: Reduced oversight and accountability usually leads to abuse of discretion. IN this case, since the action agencies have a conflict of interest which biases the agencies in favor logging and against habitat conservation, the discretion provided by the self-consultation regulations will likely lead to continued loss of owl habitat. The counterpart regulations are inconsistent with the plain language of the ESA and should not be relied upon.
* **New information indicates that spotted owl dispersal habitat should be managed for “at least 80%” canopy cover**. See Stan G. Sovern, Eric D. Forsman, Katie M. Dugger, Margaret Taylor. 2015. Roosting Habitat Use and Selection By Northern Spotted Owls During Natal Dispersal. The Journal of Wildlife Management 79(2):254–262; 2015; DOI: 10.1002/jwmg.834. <http://agsci-labs.oregonstate.edu/duggerka/files/2016/09/Sovern-et-al.-2015.pdf>. (“**Roost Site Selection**. In contrast to the assumption that stands with relatively open canopies provide suitable dispersal habitat for spotted owls, our results suggest that dispersing juveniles selected stands for roosting that had relatively high canopy closure (x = 66 + 2%). … Two hypotheses could explain why dispersing owls selected closed-canopy stands. First, several researchers (Barrows 1981, Forsman et al. 1984, Weathers et al. 2001) have shown that temperature and precipitation appear to influence selection for roost trees and attributes within a roost tree, such as perch height and percent overhead cover. … Second, juvenile northern spotted owls may have selected for closed-canopy forest because their preferred prey were most abundant … **Landscape Scale Selection**. … [O]ur mean estimate of canopy closure from plots at roosts (66%), which was likely an underestimate of canopy cover, was considerably higher than the minimum values recommended by Thomas et al. (1990) [i.e. 50-11-40]. …**Management Implications**. … Based on our study, we recommend that managers should pursue a strategy that exceeds the canopy cover guidelines recommended by Thomas et al. (1990) when managing dispersal habitat for spotted owls. Based on our estimate of mean canopy closure (66%), and our estimate of mean canopy cover from overlaying a dot grid on the same areas (approx. 14% larger), we recommend that the target for canopy cover in stands managed for dispersing spotted owls should be at least 80%.”)

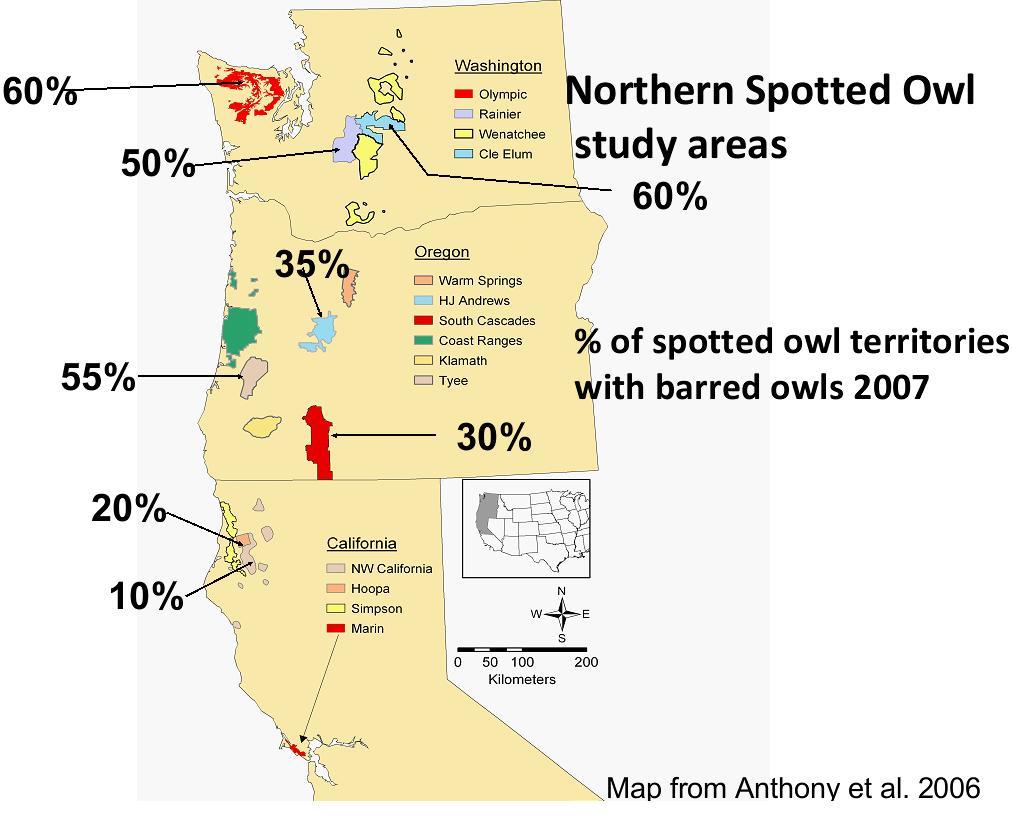
The FY2014 Annual Report On Northern Spotted Owl Monitoring states:

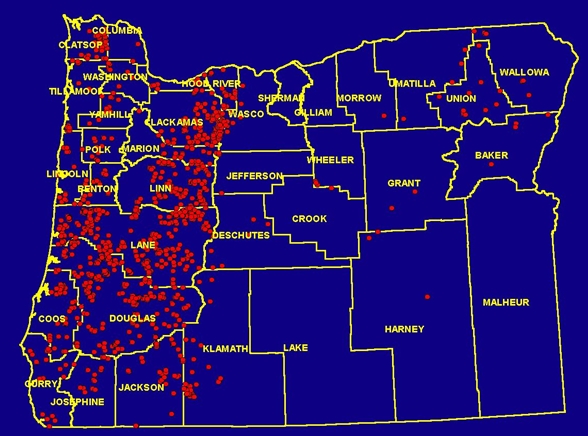
There is mounting evidence that barred owls may be negatively impacting the spotted owl population within the KSA [Klamath Study Area]. This is illustrated by several apparent population trends: (1) spotted owl detections have been steadily decreasing (Figure 6) and reached the lowest point in 2014, when barred owl detections reached their highest level; (2) fecundity rates appear to be declining (Figure 8) and in only 2 of the previous 10 years was the rate above the 25 year average; and (3) the fecundity rate for sites with known barred owl presence was lower than at other sites and is continuing to decline. Forsman et al. (2011a) noted that the consistency of the negative associations between spotted owl demographic rates and the presence of barred owls supports the conclusion that barred owls are having a negative effect on spotted owl populations. The recent KSA data, with the combination of decreasing occupancy and reduced fecundity, appears to reinforce this conclusion.

Hollen, Horn, et al 2015. Demographic characteristics of northern spotted owls (*Strix occidentalis caurina*) in the Klamath Mountain Province of Oregon, 1990-2014. <http://www.reo.gov/monitoring/reports/nso/KLA%20nso%20demog%20annual%20report%202014.pdf>

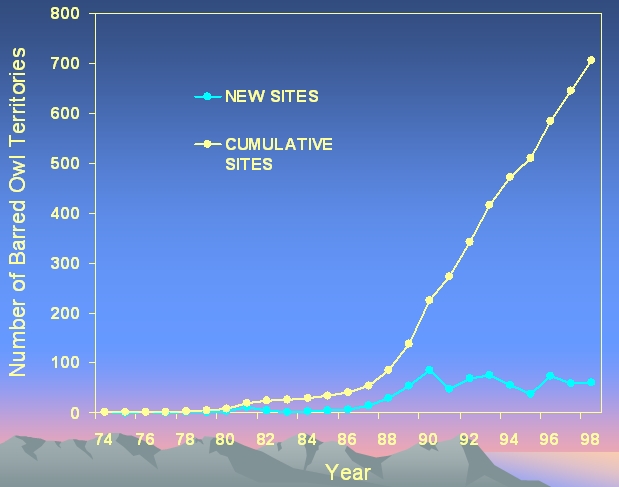
The agencies have no NEPA analysis to tier to that addresses (on a range-wide scale) how to mitigate the adverse competitive interactions between spotted owls and barred owls. Before the agencies degrade any more suitable owl habitat they must consider a range of NEPA alternative that protects more than just the "structurally complex older forest" in order to increase the chances that spotted owls and barred owls can co-exist.

Barred owls now occupy a large number of spotted owl sites and the agencies need to protect additional habitat to mitigate for this loss of available habitat.

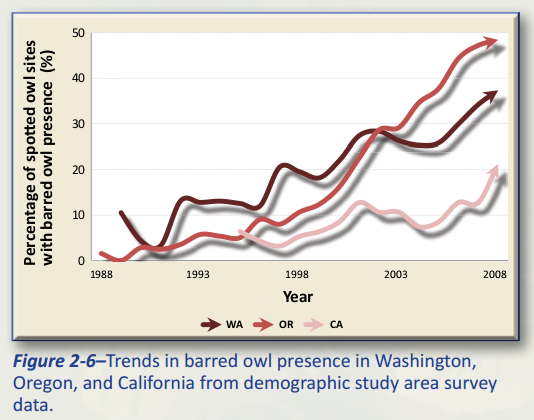




[Map of barred owl locations documented from 1974-1998]

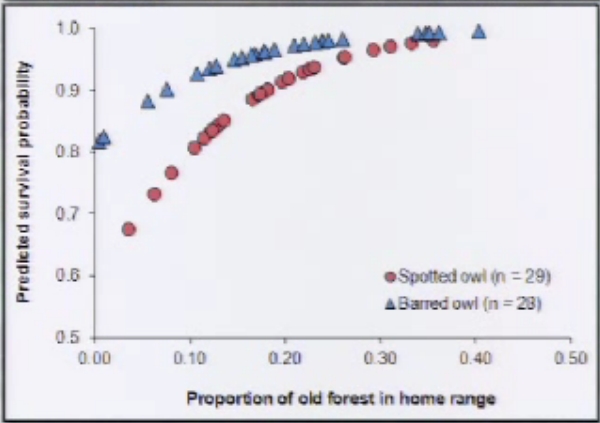


[Increase in barred owl territories on the Coast Range Study Area in Oregon]

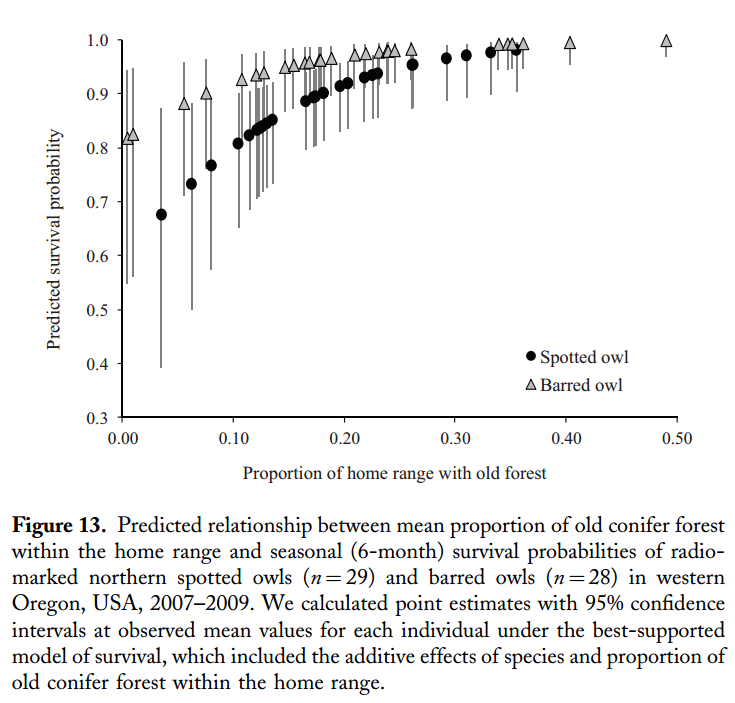


<http://reo.gov/monitoring/reports/15yr-report/NWFP%2015%20Year%20Report%20-%20Executive%20Summary%20Web.pdf>.

A telemetry study showed that in fragmented landscapes barred owls have a survival advantage relative to spotted owls, but that survival advantage diminishes in landscapes with a higher proportion of older forest. In other words, conservation of mature & old-growth forest should be favored because spotted owls are able to compete nearly equally with barred owls in landscapes with a high proportion of old forest.



See Wiens, D. 2012. Presentation to The Wildlife Society. <http://tws.sclivelearningcenter.com/index.aspx?PID=6893&SID=163551> (at 1:12).



Wiens, J.D., Anthony, R.G., and E.D. Forsman. 2014: Competitive Interactions and Resource Partitioning Between Northern Spotted Owls and Barred Owls in Western Oregon. Wildlife Monographs 185:1–50; 2014; DOI: 10.1002/wmon.1009. <https://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/48214/AnthonyRobertFisheriesWildlifeCompetitiveInteractions.pdf>

David Wiens has conducted the most thorough research on the influence of barred owls on spotted owls and concluded -

**Conservation Implications**

* Results emphasize the importance of old conifer forest and moist streamside habitats to resource partitioning.
* Additional loss of older forest can further constrain both species to a common set of limiting resources, thereby increasing competitive pressure

Wiens, D.J. 2012. Dietary Overlap between Northern Spotted Owls and Barred Owls in Western Oregon, *workshop* What’s for Dinner: Spotted Owl Prey 2012 <http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/workshops/spotted-owl/>; <http://ecoshare.info/wp-content/uploads/2012/08/Barred-compared-to-spotted-Owl-diets.ppt>

The final Recovery Plan for the Northern Spotted Owl has partially addressed the barred owl issue by adopting Recovery Action 32 which urges the FS and BLM to “Maintain substantially all of the older and more structurally complex multi-layered conifer forests on Federal lands outside of MOCAs…” based on the idea that “protecting these forests will not further exacerbate competitive interactions between spotted owls and barred owls as would occur if the amount of shared resources were decreased.” (FRP p 34). The revised critical habitat for the northern spotted owl was also expanded to “… increase the likelihood that spotted owls would be able to persist in areas where barred owls are also present. … [A]dditional critical habitat may allow for coexistence of the two species, potentially reducing competition (Dugger et al. 2011; Forsman et al. 2011).” FWS 2012. CHU draft EA, p 53, 62. <http://www.fws.gov/oregonfwo/Species/Data/NorthernSpottedOwl/Documents/CH_DRAFTEnvAssmnt_6.1.12.pdf>. In considering this recommendation the agencies must prepare NEPA analysis which considers the full potential of suitable habitat quantity and quality and its mediating influence on the interactions between spotted owls and barred owls. Maintaining a subset of suitable habitat as recommended by the recovery plan is one option, but the agencies must consider the full benefits of protecting all suitable habitat, not just a subset, and providing additional mitigation in matrix areas such as managing the matrix to enhance habitat for owl prey species. The recovery plan is not a NEPA document and FWS was not required to consider all reasonable alternatives. Action agencies like the FS and BLM on the other hand are required to fully consider alternatives. It would be wise to do so at a range-wide level, but until that is done, the agencies should not adversely modify any suitable habitat. Protection of additional suitable habitat in order to reduce competitive interactions between the two owls is now a recognized tool in the toolbox and represents significant new information about *any* proposal to modify suitable habitat regardless of how far the planning process may have proceeded.

A 2010 Draft report “Population Demography of Northern Spotted Owls” corroborates the need to protect more than just the highest quality spotted owl habitat as contemplated in the draft Recovery Action 32.

We also found a negative relationship between recruitment rates and the presence of Barred Owls and a positive relationship between recruitment and the amount of suitable owl habitat in the study areas. Recruitment was higher on federal lands where the amount of suitable owl habitat was generally highest. [p 96] …

While our observational results do not demonstrate cause-effect relationships, they provide support for the hypothesis that the invasion of the range of the Spotted Owl by Barred Owls is at least partly the cause for the continued decline of Spotted Owls on federal lands. Our results also suggest that Barred Owl encroachment into western forests may make it difficult to insure the continued persistence of Northern Spotted Owls (see also Olson et al. 2004). The fact that Barred Owls are increasing and becoming an escalating threat to the persistence of Spotted Owls does not diminish the importance of habitat conservation for Spotted Owls and their prey. In fact, the existence of a new and potential competitor like the Barred Owl makes the protection of habitat even more important, since any loss of habitat will likely increase competitive pressure and result in further reductions in Spotted Owl populations (Horn and MacArthur 1972, Olson et al. 2004, Carrete et al. 2005). [pp 97-98] …

Our results and those of others referenced above consistently identify loss of habitat and Barred Owls as important stressors on populations of Northern spotted Owls. In view of the continued decline of Spotted Owls in most study areas, it would be wise to **preserve as much high quality habitat in late-successional forests for Spotted Owls as possible**, distributed over as large an area as possible. This recommendation is comparable to one of the recovery goals in the final recovery plan for the Northern Spotted Owl (USDI Fish and Wildlife Service 2008), but **we believe that a more inclusive definition of high quality habitat is needed** than the rather vague definition provided in the 2008 recovery plan. Much of the habitat occupied by Northern Spotted Owls and their prey does not fit the classical definition of “old-growth” as defined by Franklin and Spies (1991), and a narrow definition of habitat based on the Franklin and Spies criteria would exclude many areas currently occupied by Northern Spotted Owls. [p 99]...

Eric D. Forsman, Robert G. Anthony, Katie M. Dugger, Elizabeth M. Glenn, Alan B. Franklin, Gary C. White, Carl J. Schwarz, Kenneth P. Burnham, David R. Anderson, James D. Nichols, James E. Hines, Joseph B. Lint, Raymond J. Davis, Steven H. Ackers, Lawrence S. Andrews, Brian L. Biswell, Peter C. Carlson, Lowell V. Diller, Scott A.Gremel, Dale R. Herter, J. Mark Higley, Robert B. Horn, Janice A. Reid, Jeremy Rockweit, Jim Schaberl, Thomas J. Snetsinger, and Stan G. Sovern. “Population Demography of Northern Spotted Owls.” DRAFT COPY 17 December 2010. This draft manuscript is in press at the University of California Press with a projected publication date of July 2011. It will be No. 40 in Studies In Avian Biology, which is published by the Cooper Ornithological Society. [http://www.reo.gov/monitoring/reports/nso/FORSMANetal\_draft\_17\_Dec\_2010.pdf](http://www.reo.gov/monitoring/reports/nso/FORSMANetal_draft_17_Dec_2010.pdf#_blank).

A well-known axiom of the species-area relationship from island biogeography holds that as habitat area increases, the number of cohabiting species also increases. See especially, Part III - Competition in a Spatial World *in* Tilman, D. and P. Karieva, Eds. 1997. Spatial Ecology: The Role of Space in Population Dynamics and Interspecific Interactions. Monographs in Population Biology, Princeton University Press. 368 pp.

“The major causes of population and species extinction worldwide are habitat loss and interactions among species. … The most robust generalization that we can make about population extinction is that small populations face a particularly high risk of extinction. … [E]mpirical support for the extinction-proneness of small populations has been found practically wherever this issue has been examined. … The loss of habitat reduced population size …. Larger habitat patches have larger expected population sizes than smaller patches. Therefore, other things being equal, we could expect large habitat patches to have populations with a lower risk of extinction than populations in small patches. … More generally, the relationship between patch size and extinction risk provides a key rule of thumb for conservation: other things being equal it is better to conserve a large than a small patch of habitat or to preserve as much of a particular patch as possible. … [T]here are likely to be many complementary reasons why large patches have populations with low risk of extinction. ”

Oscar E. Gaggiotti and Ilkka Hanski. 2004. Chapter 14 - Mechanisms of Population Extinction. *In* Ecology, Genetics, and Evolution of Metapopulations. Elsevier. 2004. <http://web.archive.org/web/20070612211945/http://www.eeb.cornell.edu/sdv2/Readings/Gaggiotti&Hanski.pdf>

The effects of habitat availability on competing species was explored by expert wildlife population modelers who found —

The territorial occupancy model developed by Lande (1987), extended here to include two competing species, represents a useful tool for evaluating how equilibrium breeding numbers could be affected by changes in habitat availability, demographic parameters, dispersal behavior and interspecific competition … Its application shows that **increases in the exclusive suitable habitat of each species is the best option to maintain viable populations of territorial competitors** in a same area, given that it reduces competition for territories. Increases in habitat overlap by reducing the exclusive habitat available for one species strongly affected the outcome of competition, resulting in extinction of the species for which exclusive habitat had been eliminated.

Martina Carrete, Jose´ A. Sa´nchez-Zapata, Jose´ F. Calvo and Russell Lande. Demography and habitat availability in territorial occupancy of two competing species. OIKOS 108: 125-136, 2005 [http://www.ebd.csic.es/carnivoros/personal/carrete/martina/recursos/13.%20carrete%20et%20al%20%282005%29%20oikos%20108-125.pdf](http://www.ebd.csic.es/carnivoros/personal/carrete/martina/recursos/13.%20carrete%20et%20al%20(2005)%20oikos%20108-125.pdf).

From these ecological foundations, one can see that the barred owl, by invading, occupying suitable habitat and excluding spotted owls, has reduced the effective size of the reserves that were established in 1994, and thereby reduces the potential population of spotted owls. Extinction risk is increased by this loss of habitat and smaller population. If we provide more suitable habitat, the population potential increases, and the risk of extinction decreases. The most rational way to respond is to protect remaining suitable habitat, expand and restore the reserve system to provide more suitable habitat to increase the likelihood that the two owl species can co-exist.[[8]](#footnote-8)

This view is corroborated by owl biologist David Wiens who was interviewed on the Lehrer NewsHour. He said: “The more habitat you protect, the more you're going to alleviate the competitive pressure between the species. Rather than reducing it and increasing the competitive pressure between these two species, we need to provide as much habitat as possible for them.” DAVID WIENS. NewsHour interview. “Biologists Struggle to Save the Spotted Owl.” December 18, 2007. <http://www.pbs.org/newshour/bb/science/july-dec07/owl_12-18.html>. Robert Anthony agrees, “If you start cutting habitat for either bird, you just increase competitive pressure.” Welch, Craig. 2009. The Spotted Owl’s New Nemesis. Smithsonian Magazine. January 2009. <http://www.smithsonianmag.com/science-nature/The-Spotted-Owls-New-Nemesis.html?c=y&page=2> And in the same article Eric Forsman added "You could shoot barred owls until you're blue in the face," he said. "But unless you're willing to do it forever, it's just not going to work."

The book "Signs of Life: How Complexity Pervades Biology" by Sole and Goodwin has an interesting discussion that immediately brings to mind the barred owl/spotted owl issue. Chapter 7 of the book describes work being done by a Japanese researcher named Kaneko who developed and explored a modeling concept called "coupled map lattices." The lesson from these models is that when habitat is abundant, competing species operate within the "coexistence regime" but when habitat becomes scarce the model switches to a new attractor and operates in the "exclusion regime.” This model strongly supports the idea that retaining more habitat increases the likelihood that spotted and barred owls can coexist, and if we eliminate reserves or continue to log suitable habitat in the matrix, then barred owl may competitively exclude and extirpate the spotted owls. Similar results are demonstrated in resource competition models described by Tilman, Lehman, and Thompson. 1997. Plant diversity and ecosystem productivity: theoretical considerations. Proceedings of the National Academy of Sciences. 94:1857-1861. <http://www.cedarcreek.umn.edu/biblio/fulltext/t1694.pdf>. See also, Tilman, D. and P. Karieva, Eds. 1997. Spatial Ecology: The Role of Space in Population Dynamics and Interspecific Interactions. Monographs in Population Biology, Princeton University Press. 368 pp. and Valenti D., Fiasconaro A., Spagnolo B. Pattern formation and spatial correlation induced by the noise in two competing species [http://arxiv.org/PS\_cache/cond-mat/pdf/0401/0401424v1.pdf](http://arxiv.org/PS_cache/cond-mat/pdf/0401/0401424v1.pdf#_blank).

# The FEIS failed to adequately consider and protect spotted owl prey species such as red tree vole.

This project will waive requirements for surveying and protecting red tree voles, an important spotted owl prey species, even though this is an LSR where owl conservation is important.

Only 35% of the range of the red tree vole is on federal land and only 17% of the red tree vole range is in reserved land allocations. FEMAT Table IV-C-9 (last page of Chapter IV). Plus, the LSRs do not represent red tree vole habitat very well, mostly because the reserves are skewed to the higher elevations, and red tree vole prefers lower elevations. See RTV 2003 ASR step-two review.

Protection of healthy well-distributed populations of red tree vole may be important for conservation of the spotted owl because they are an arboreal species and spotted owls may have a competitive advantage in obtaining RTVs relative to barred owls which seem to forage and hunt more on the ground. “Red tree voles are important prey in mesic forests, especially in coastal regions of southwest Oregon.” Forsman, E. 2012. Regional, Local And Annual Variation In Diets Of Spotted Owls. workshop. What’s for Dinner: Spotted Owl Prey 2012. <http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/workshops/spotted-owl/>; <http://ecoshare.info/wp-content/uploads/2012/08/Spotted-Owl-Diets.ppt>

The inactive Red tree vole nests should be fully buffered because Red tree vole are known to frequently reoccupy previously inactive nests. Until more is known about the status and life needs of the Red tree vole, protecting this species requires buffering all active and inactive nests.

The limited size of fragmented old-growth stands may be a limiting factor for red tree voles. Andy Carey.1991. PNW-GTR-276. <http://web.archive.org/web/20030406073837/http://www.fs.fed.us/pnw/pubs/gtr276.pdf>. There is evidence that red tree vole populations may require 100 acre minimum buffers to remain stable. See Step 2 Worksheet, 2003 Annual Species Review, Red Tree Vole, April 2003 pages 23-24. The NEPA analysis must consider alternatives that include larger buffers (100 acres or larger per the science) and smaller buffers (10 acres per the RTV Management Recommendations) and describe the consequences of each. The agencies must also prepare a NEPA document to consider the consequences of alternative survey protocols, e.g. ground transects vs. tree climbing.

Our results also indicated that, in some areas, there are relatively high densities of tree voles in young forests. In areas where old forests have been largely eliminated, young forests may play a critical role in the persistence of tree voles. Thus, we think there is much to learn about the relative suitability of young and old forests as habitat for tree voles.

James Kerr Swingle. 2005. Daily Activity Patterns, Survival, and Movements of Red Tree Voles (*Arborimus longicaudus*) in Western Oregon. OSU Masters Thesis Presented November 29, 2005.

Several other considerations indicate continued concern for the viability of red tree voles:

SEVEN REASONS RED TREE VOLES MAY NOT PERSIST

1) Red tree vole receive zero protection on private lands, which represent some fo the best potential habitat in the state.

2) BLM adopted new RMPs which no longer require surveys or protection for red tree voles.

3) Both the Forest Service and the BLM routinely apply non-high priority status for voles in sixteen different watersheds in Oregon, and log their occupied habitat.

4) Before logging, the Forest Service and BLM only survey for red tree vole nest sites if stands meet certain criteria (per the survey protocol), but those survey criteria exclude many occupied stands from surveys. This means many occupied stands are logged without surveys or protection buffers.

5) Survey and Manage protects documented populations: it does not protect habitat. When viable habitat is surveyed and found unoccupied, it is logged, even though voles could reoccupy those stands over time periods much shorter than it takes the habitat to regrow. Since the inception of the Northwest Forest Plan, vole habitat in Oregon has been constantly and incrementally shrinking, and that process is going on year after year.

6) Red tree vole habitat is severely fragmented across the species' range. According to a recent study by leading scientists Forsman and Swingle, the average size of a red tree vole habitat block is just two percent of what it was one hundred years ago. Most red tree vole populations today exist in small isolated patches of older forest, and have limited opportunities for genetic exchange and dispersal.

7) Even in blocks of suitable habitat, vole populations may be spotty or nonexistent. In a recent survey effort by citizen surveyors near Breitenbush Hot Springs, 71 old-growth trees were climbed, and only one nest was discovered.

8) Climate change is expected to increase forest fires.

9) Barred owls are a new predator that may increase pressure on red tree vole populations.

Similar consideration of NEPA alternatives is required for other special management species as well.

**RTV disclosure and protection is required not just by S&M but also by NEPA and ESA.**

Red tree voles should be surveyed. Red tree voles are an uncommon yet important species. They make up an important part of the prey base of Threatened spotted owls. The agency should conduct surveys to determine (with a high degree of confidence) the presence or absence of red tree voles and the extent of red tree vole sites which should be fully protected with 100 acre buffers. The agencies should carefully survey for red tree voles.

Since the red tree vole is important prey for Threatened spotted owls, the agency should disclose the presence or absence of red tree vole in order to comply with NEPA and the ESA. The agency cannot make an informed decision on how this project affects spotted owls survival and recovery without knowing if red tree vole population may be killed by this project.

We also urge the agency to fulfill the NEPA mandate for informed decision-making by surveying for red tree vole, and we urge the agency to fulfill the ESA mandate to conserve Threatened spotted owls by buffering and protecting red tree voles sites (i.e. spotted owl prey).

**The agencies lack sufficient information to remove protection for red tree voles.**

The 2003 Annual Species Review was completely unjustified in removing protection for red tree voles in the central *mesic* portion of its range because they lack sufficient information on red tree vole biology and ecology to ensure species viability and persistence.

In the 2001 ROD, the agencies rejected Alternative 2, which would have removed Survey and Manage protections for the vole in the year 2006. "Given our limited knowledge of the red tree vole population dynamics and ecology, the 5-year timeframe is not likely to be sufficient for completion of the studies necessary to make an informed recommendation to the species future disposition." 2000 FSEIS Survey and Manage at 392. "Information on the genetic variation between these small isolated populations, combined with studies of red tree vole population trend, longevity, demographics, and population densities, require collection of data over several generations of red tree voles (more than 5 years)." Id. at 392-93.

Before we can prioritize RTV sites the following information is necessary (as noted on pages 261 and 263 of the 2000 DSEIS):

1. quantitative species abundance;

2. relative abundance at known sites;

3. spatial extent at known sites;

4. population trend (the DSEIS notes that population numbers at

many known sites my be declining);

5. other demographic information, such as reproductive potential;

6. which historic sites are extant;

7. distribution of the species in the reserves;

8. genetic variation within and between populations;

9. dispersal capabilities;

10. the necessary scale of protected sites to ensure persistence at the site;

11. connectivity among sites and subpopulations; and

12. risk and consequences from catastrophic events such as fire.

We object to the failure to protect known sites and comply with survey and manage requirements.

The agency must evaluate how the BLM's western Oregon plan revision and the elimination of survey and manage for voles has impacted the species and the FS’ duty to ensure persistence.

The NFP required vole protections in the matrix as an assurance of persistence. Did that initial analysis account for non-high priority status designations? Please reanalyze the likelihood of persistence based on the current policies, including BLM’s elimination of survey and manage and elimination of protection of known sites, and liberal use of the non-high priority designations. The NEPA analysis should include a cumulative impacts analysis that discloses how many non-high priority sites have been designated, how many requests have been made region wide and how many have been granted.

The NHP designation are a *de facto* plan amendment that separately require careful analysis per NEPA and NFMA.

# The FEIS failed to adequately respond to comments.

Appendix L shows that few public comments resulted in significant changes to the final EIS. Appendix K fails to respond to numerous substantive comments relating to: compliance with the LSR standards & guidelines, carbon and climate change, fuel reduction, purpose and need, snag habitat, LSR conditions, efficacy of risk reduction treatments, impacts to significant values associated with unroaded areas, etc.

The Forest Service’s notice-comment-objection regulations state unambiguously “Consideration of comments. (1) The responsible official shall consider all written comments submitted in compliance with paragraph (a) of this section.” [36 CFR 218.25 (b)](https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=2b4ea4f5bef9d8ad732f14f1146fb9bb&ty=HTML&h=L&r=PART&n=36y2.0.1.1.8). The rules define “*Specific written comments”* as –

Written comments are those submitted to the responsible official or designee during a designated opportunity for public participation (§218.5(a)) provided for a proposed project. Written comments can include submission of transcriptions or other notes from oral statements or presentation. For the purposes of this rule, specific written comments should be within the scope of the proposed action, have a direct relationship to the proposed action, and must include supporting reasons for the responsible official to consider.”

[36 CFR 218.2](https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=2b4ea4f5bef9d8ad732f14f1146fb9bb&ty=HTML&h=L&r=PART&n=36y2.0.1.1.8).

In order to assure compliance with the requirements to “consider” comments, it is only logical that the Forest Service must document in writing its fulfillment of the requirement. Without a record of the consideration of comments, administrative and judicial review of these requirements would be impossible, rendering these requirements meaningless.

In addition, NEPA has a separate requirement that federal agencies must respond to comments on NEPA documents. “An agency preparing a final environmental impact statement shall assess and consider comments both individually and collectively, and shall respond by one or more of the means listed below, stating its response in the final statement. …” 40 CFR 1503.4(a).

This section is addressed to EISs, but the CEQ regs are in fact applicable to EAs as well. “These regulations, unlike the predecessor guidelines, are not confined to sec. 102(2)(C) (environmental impact statements).” 40 CFR 1500.3.

In City of Davis v. Coleman, 521 F.2d 661 (9th Cit., 1975) the court said that in a statute requiring the social and environmental effects of projects be considered — “considered means to investigate and analyze; ‘consideration’ encompasses an affirmative duty to investigate and compile data, and a further duty to incorporate that data into a detailed reasoned analysis…”

Finally, independent of NEPA, the APA also requires agencies to adequately respond to all significant public comment as a “fundamental tenet of administrative law” *NRDC v. EPA,* 859 F.2d 156, 188 (D.C. Cir. 1988); *see also ACLU v. FCC,* 823 F.2d 1554, 1581 (D.C. Cir. 1987); *Sierra Club v. EPA,* 353 F.3d 976, 986 (D.C. Cir. 2004); *Am. Iron & Steel Inst. V. EPA,* 115 F.3d 979, 1005 (D.C. Cir. 1997). This principle ensures that agencies consider all material points raised by the public. *NRDC,* 859 F.2d at 188. Failure to respond to public comment can be grounds for invalidation of a decision as arbitrary and capricious. *Id.* A comment is “significant” when “if true, [it] raise[s] points relevant to the agency’s decision and which, if adopted, would require a change in an agency’s proposed rule.” *Home Box Office Inc. v. FCC,* 567 F.2d 9, 35, n.58 (D.C. Cir. 1977). The comment must “step over a threshold requirement of materiality” by explaining why the agency’s error is relevant and not “merely stat[ing] that a particular mistake was made.” *Portland Cement Ass’n v. Ruckelshaus,* 486 F2d 375, 394 (D.C.Cir. 1973).

Sincerely,



Doug Heiken

**Attached:**

Heiken, D. 2010. Log it to save it? The search for an ecological rationale for fuel reduction logging in Spotted Owl habitat. Oregon Wild. V 1.0. May 2010.

Doug Heiken 2009. The Case for Protecting Both Old Growth and Mature Forests. Version 1.8 April 2009.

2012 Dead wood slides

1. Franklin AB, Anderson DR, Gutierrez RJ, Burnham KP (2000) Climate, habitat quality, and fitness in northern spotted owl populations in northwestern California. Ecol Monogr 70:539–590. See also, DISSERTATION OF Elizabeth M. Glenn. 2009. Local Weather, Regional Climate, and Population Dynamics of Northern Spotted Owls in Washington and Oregon. <http://ir.library.oregonstate.edu/jspui/bitstream/1957/11326/1/EGlennDisseration2009.pdf>. <http://www.naturaloregon.org/2010/08/03/osu-climate-change-may-be-hurting-the-spotted-owl-in-oregon/> (“Climate change models predict Oregon and the Pacific Northwest will experience warmer and drier summers, as well as warmer and wetter winters, because of global warming. Lead researcher Betsy Glenn says both of those trends make it harder spotted owls to survive, but in different ways.

   \* Unusually dry summers reduce the food supply for spotted owls. That’s when you’re mostly likely to see big declines in the numbers of northern flying squirrels and other small mammals that spotted owls like to eat. Glenn says less food means lower survival rates for adults and owls won’t expand into areas when there’s not enough to eat.

   \* If the spring time nesting season is colder and wetter than normal, Glenn says it hurts the survival chances of owl fledglings.”) [↑](#footnote-ref-1)
2. FEMAT p IV-55. [↑](#footnote-ref-2)
3. Spies, Thomas A.; Hemstrom, Miles A.; Youngblood, Andrew; Hummel, Susan. 2006. Conserving old-growth forest diversity in disturbance-prone landscapes. Conservation Biology. 20(2): 351-362. <http://www.fs.fed.us/pnw/pubs/journals/pnw_2006_spies001.pdf>. [↑](#footnote-ref-3)
4. Raphael, M.G. (2006). Conservation of listed species: the northern spotted owl and marbled murrelet. Chapter 7 in R.W. Haynes, B.T. Bormann, D.C. Lee, and J.R. Martin (technical editors), Northwest Forest Plan—the first 10 Years (1994–2003): synthesis of monitoring and research results. Gen. Tech. Rep. PNW-GTR. USDA Forest Service, Pacific Northwest Research Station, Portland, Oregon. <http://www.fs.fed.us/pnw/publications/gtr651/> p 121. [↑](#footnote-ref-4)
5. The BLM Planning Handbook 1601-1 provides, “During the amendment or revision process, the BLM should review all proposed implementation actions through the NEPA process to determine whether approval of a proposed action would harm resource values so as to limit the choice of reasonable alternative actions relative to the land use plan decisions being reexamined. Even though the current land use plan may allow an action, the BLM manager has the discretion to defer or modify proposed implementation-level actions and require appropriate conditions of approval, stipulations, relocations, or redesigns to reduce the effect of the action on the values being considered through the amendment or revision process.” [↑](#footnote-ref-5)
6. Raymond Davis and Joseph Lint. 2005. Chapter 3: Habitat Status and Trend. in Northwest Forest Plan—the First 10 Years (1994–2003): Status and Trends of Northern Spotted Owl Populations and Habitat. PNW-GTR-648. <http://www.fs.fed.us/pnw/publications/pnw_gtr648/pnw-gtr648b.pdf> (8/9/12) [↑](#footnote-ref-6)
7. Riitters, K.H. & Wickham, J.D. (2012) Decline of forest interior conditions in the conterminous United States. Sci. Rep. 2, 653; DOI:10.1038/srep00653. <https://www.srs.fs.fed.us/pubs/ja/2012/ja_2012_riitters_002.pdf>. [↑](#footnote-ref-7)
8. Put another way, when threatened with extinction, “the best defense is a strong offense” that is, species are more likely to persist if they have a large, well-distributed population size and if we minimize all manageable threats. Dunham, Jason. 2008. Bull trout habitat requirements and factors most at risk from climate change. <http://www.fs.fed.us/rm/boise/AWAE/projects/bull_trout/bt_Dunham.html> [↑](#footnote-ref-8)