OREGON WILD

28 Dec 2020

TO: William Conroy (Hebo District Ranger)
c/o Hannah Smith, Hannah.Smith@usda.gov
VIA: comments-pacificnorthwest-siuslaw-hebo@usda.gov

Subject: Sand Lake Restoration EA — comments

Please accept the following comments from Oregon Wild concerning the Sand Lake Restoration EA, https://www.fs.usda.gov/project/?project=53176. Oregon Wild represents 20,000 members and supporters who share our mission to protect and restore Oregon's wildlands, wildlife, and water as an enduring legacy. Our goal is to protect areas that remain intact while striving to restore areas that have been degraded. This can be accomplished by moving over-represented ecosystem elements (such as logged and roaded areas) toward characteristics that are currently under-represented (such as roadless areas and complex old forest).

The proposed action alternative involves:

Table 7. Comparison of Alternatives

Treatment	Project Element	Unit of Measure	Alternative 1	Alternative 2
Commercial Treatments (CT)	Commercial Thinning[1]	Acres	0	2,599
	Early Successional Treatments[2]	Acres	0	100
	Heavy Thinning[2]	Acres	0	136
	Habitat improvement thinning within the Sand Lake RNA[1]	Acres	0	32
	Ground-based yarding	Acres	0	585
	Skyline yarding with one-end suspension	Acres	0	1,712
	Helicopter yarding	Acres	0	0
	Number of skyline and ground landings	# of landings	0	127
	Number of helicopter landings	# of landings	0	0
	Estimated Volume Removed	MMBF	0	38
Non-Commercial Treatments (NCT)	Tree felling in Riparian Reserves	Units	0	309010, 309126, 309018, 309031, 309057
	Estimated Snag Creation	#	0	9,632
	Estimated Terrestrial Down wood (LWD) Creation	#	0	4,816

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Maintaining Forest Roads	New road (on System)	Miles	0	1.07
	New temporary road construction	Miles	0	1.7
	Temporary road reconstruction	Miles	0	8.65
	Road closed/stored	Miles	0	6
	Road decommissioning	Miles	0	3
	Road Maintenance	Miles	0	41
	Use and develop existing quarries	#	0	2

Oregon Wild generally supports careful variable thinning of dense young stands that are accessible from existing roads, and with proper mitigation for adverse effects to dead wood recruitment in riparian reserves and LSRs, marbled murrelet, northern spotted owl prey, etc. We urge the Siuslaw NF to strive for continual improvement in its thinning program. It's too easy to latch onto something that works and then stop pursuing ways to do it better.

Regen logging not appropriate in reserves

The EA says part of the purpose of early seral creation is for economic benefits. This is not appropriate in reserves. As noted in our scoping comments:

> *The identified needs include "design treatment to reflect a greater emphasis on providing economic benefits"* and *"Sell timber .. to help fund [restoration] actions."* This is not a valid purpose for which reserves were established. The Coast Range of Oregon is aggressively managed for economic gain. The Siuslaw Forest had vast wealth removed from it during the decades before the Northwest Forest Plan and it caused a lot of damage that now requires some investment of public resources, NOT more extraction for the sake of economics. The problem is that "economic benefits" are almost always in the form of exported tree boles which are also habitat. Heavy thinning comes at the expense of future habitat for wildlife that depend on snags and dead wood. The emphasis of the Northern Coast AMA is "Management for restoration and maintenance of late-successional forest habitat, consistent with marbled murrelet guidelines..." Economic goals are not part of the emphasis for this AMA. (See 1994 ROD, p D-15.)

We question whether there is really an ecological rationale for early seral creation given that the Oregon Coast Range has vast areas of non-federal lands with an overabundance of early seral conditions. In fact, the Sand Lake project area has more non-federal lands than federal lands. Even if those non-federal forests do not have much high quality early seral, they make up for low quality with high quantity, so those values are met. The more significant need in the Oregon Coast Range is to restore late successional habitat.

Natural processes (such as fire, wind, snow, ice, insects, and disease) are still operating in the Coast Range and still creating early seral conditions. The FS just needs to be patient. Artificial early seral creation is just not necessary. The FS already has the ability to provide some early seral benefits by doing heavy thinning on 3-10% of LSR thinning units.

If any early seral habitat is artificially created the FS should do it in the youngest stands that are farthest from late successional conditions. And the treatment should mimic natural processes by retaining relatively abundant live and/or dead trees.

The ecological need in riparian reserves is functional wood (and fewer roads).
The EA does not properly frame the purpose and need relative to the Aquatic Conservation Strategy. As noted in our scoping comments:

> *The identified needs include "recruitment of large woody debris and meet Aquatic Conservation Strategy objectives"* – This is not consistent with best available science regarding what streams need. Stream need functional wood (not necessarily large wood). In small streams, small wood can provide the desired functional values. Logging does not enhance production of large wood. Thinning captures and exports mortality. Any increase in very large wood caused by thinning comes at the expense of reduced recruitment of vast quantities of functional wood. See additional science excerpts attached. Put simply, if streams need functional wood, thinning will conflict with that goal, not meet that need.
>
> *The identified needs include "maintain or repair forest roads for safe public and commercial use."* This should be modified to recognize that the restoration emphasis for reserves land allocations, which indicates a need to reduce road density, reduce road/stream crossings, avoid winter log hauling, etc.

The erroneous thinking about large vs functional wood is carried forward to the EA discussion of desired future conditions. "The desired future condition would be fewer, larger trees per acre in order to restore the natural processes of large wood recruitment to streams." The DFC is more functional wood, not "fewer trees." That's sadly misleading and self-serving.

The error is carried through to the effects analysis (EA p 115) which describes the no action alternative, "Large wood recruitment potential to project area streams would remain low and may continue to decline given that no riparian release or planting treatments would occur to speed up near-stream conifer establishment and growth." It's a simple fact that the no action alternative will produce more functional pool-forming wood, and the logging alternative will produce less.

The EA contradicts itself later saying about the logging alternative "Although the total number of potential large wood recruitment trees may be reduced, the trees left uncut adjacent to streams would be expected to grow more quickly as a result of reduced competition for resources. When these larger trees all into a stream, they often provide more function and longevity than do smaller trees (Abbe and Montgomery, 1996). Therefore, the overall function of large wood in these streams with regards to gravel aggradation and scour may be equivalent to the function that would be provided if no trees were cut adjacent to these streams." (EA p 123-124). This seems to admit that logging will have adverse effects on wood recruitment, but if we wish hard enough maybe it won't. How can the EA say that no action will be clearly adverse to wood recruitment while also saying that the action alternative might also be adverse. The FS can answer this question by simply doing a stand simulation analysis showing the effects of logging on the number and size of trees available for recruitment.

The EA cites Benda et al (2015) to support the assertion that thinning is beneficial to wood recruitment, but the EA does not describe the numerous science sources showing that logging is adverse, e.g.,

- Pollock, M. M., T. J. Beechie, and H. Imaki. 2012. Using reference conditions in ecosystem restoration: an example for riparian conifer forests in the Pacific Northwest. Ecosphere 3(11):98. http://dx.doi.org/10.1890/ES12-00175.1;
- Roni, Philip, Timothy J. Beechie, Robert E. Bilby, Frank E. Leonetti, Michael M. Pollock, And George R. Pess. 2002. **A Review of Stream Restoration Techniques and a Hierarchical Strategy for Prioritizing Restoration in Pacific Northwest Watersheds.** *North American Journal of Fisheries Management* 22:1–20, 2002 American Fisheries Society 2002; http://www.crab.wa.gov/LibraryData/RESEARCH_and_REFERENCE_MATERIAL/Environmental/020923StreamRestoreTechPNW.pdf.
- Rosenfeld, J. S., and Huato, L. 2003. Relationship between LWD characteristics and pool formation in small coastal British Columbia streams. North American Journal of Fisheries Management 23:928–938. http://www3.telus.net/jordanrosenfeld/Home%20Page/Publications/Rosenfeld%20and%20Huato%202003.pdf;
- Mark A. Meleason, Stanley V. Gregory, And John P. Bolte. 2003. Implications Of Riparian Management Strategies On Wood In Streams Of The Pacific Northwest. Ecological Applications, 13(5), 2003, pp. 1212–1221. http://www.geo.oregonstate.edu/classes/geo582/week_5_1_wood_movement/Meleasonetalstrategies.pdf;
- Kim Kratz, Ph.D., Issue Paper for Western Oregon. NMFS, Oregon State Habitat Office. 7-23-2010. Appendix 1. page 38, https://www.blm.gov/or/districts/medford/forestrypilot/files/kswildetal-attach4.pdf;
- Curtis, Robert O.; Marshall, David D. 2009. Levels-of-growing-stock cooperative study in Douglas-fir: report no. 18—Rocky Brook, 1963–2006. Res. Pap. PNW-RP-578. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 91 p. http://www.fs.fed.us/pnw/pubs/pnw_rp578.pdf;
- NFMS 2005. Forest Practices on Non-Federal Lands and Pacific Salmon Conservation. Project Team Leader: Jeff Lockwood. Project Team Members: Steve Keller, Don Anderson, and Rick Edwards. NOAA/NMFS. January, 2005.

http://www.blm.gov/or/plans/wopr/pub_comments/paper_documents/Paper_1764-1924/WOPR_PAPER_01921.10001.pdf;

- Lee E. Benda, S. E. Litschert, Gordon Reeves, Robert Pabst. 2015. Thinning and in-stream wood recruitment in riparian second growth forests in coastal Oregon and the use of buffers and tree tipping as mitigation. J. For. Res. DOI 10.1007/s11676-015-0173-2. https://www.fs.fed.us/pnw/lwm/aem/docs/reeves/2015_benda_etal_tree_tipping.pdf;
- Beechie, T., G. Pess, P. Kennard, R. Bilby, and S. Bolton. 2000. Modeling Recovery Rates and Pathways for Woody Debris Recruitment in Northwestern Washington Streams. North American Journal of Fisheries Management. 20:436–452. ftp://frap.cdf.ca.gov/pub/incoming/TAC/ISOR%20references%201-139%20%20KIRSTEN/Beechie%20et%20al.%202000.pdf;
- Pollock, Michael M. and Timothy J. Beechie, 2014. Does Riparian Forest Restoration Thinning Enhance Biodiversity? The Ecological Importance of Large Wood. Journal of the American Water Resources Association (JAWRA) 50(3): 543-559. DOI: 10.1111/jawr.12206. http://oregon-stream-protection-coalition.com/wp-content/uploads/2014/07/Pollock-and-Beechie.-2014.-Riparian-thinning-and-biodiversity.pdf

The FS has a duty to manage reserves for the purposes for which they were established. The FS is twisting things a bit to produce timber instead of achieve forest plan objectives. To say that logging is beneficial to wood recruitment is like saying that a worker is better off if they are paid less money but in larger denominations.

Note: The EA needs to more clearly describe the proposed action. The width of no-cut stream buffers are not clearly described in the description of the action alternative or the PDCs. The EA says "the proposed minimum 30-foot no-cut buffer on each side of the stream for all perennial streams in the project area, and the more conservative 75-foot buffer proposed for fish-bearing streams." But this is found on page 98 of the EA in a discussion of water temperature, it is not found in the description of the proposed action and the PDCs where it belongs.

Effects of thinning on Wood Recruitment

The Forest Service continues to produce NEPA analyses that misconstrue the effects of commercial logging on wood recruitment that is so important in riparian reserves and Late Successional Reserves.

The NEPA analysis describes thinning as a way to produce large wood that serve as valuable large wood. However, the more significant effect of logging is to reduce wood recruitment by removing trees from the forest, preventing them from growing large, and eliminating any chance that they will serve as ecologically valuable large wood. Any slight acceleration in the growth of large trees is vastly outweighed by the reduction in the amount of large wood recruited over the long-term.

The EA describes logging as beneficial to wood recruitment and meeting the purpose and need. This is inaccurate and misleading. The proper analysis (that needs to be found in the EA) is a description of effects showing that logging reduces wood recruitment and interferes with meeting the purpose and need and retards attainment of the Aquatic Conservation Strategy.

The graph below is from the Curran Junetta Thin EA (on the Cottage Grove Ranger District of the Umpqua NF). It shows that similar thinning prescriptions in similar stand types delays by more than 60 years the attainment of habitat objectives for large snags (i.e. mid-point of the gray band representing 30-80% tolerance level).

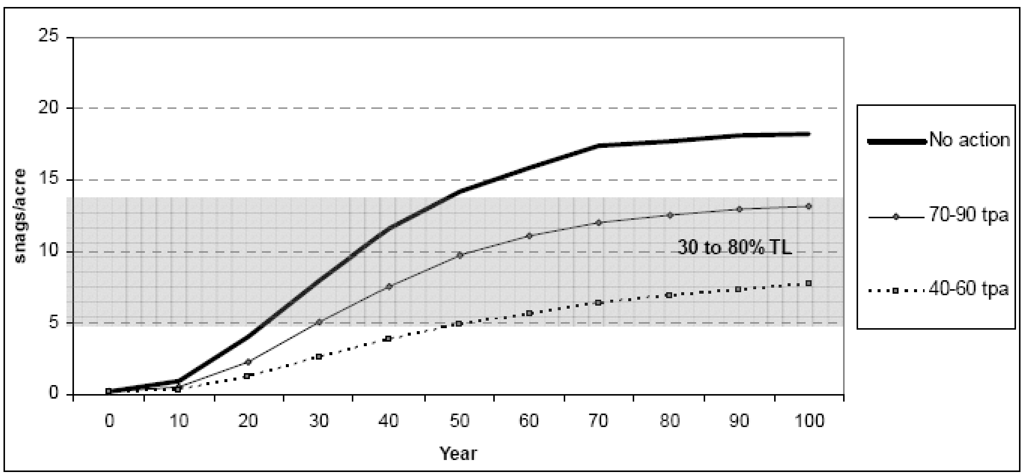


Figure 15. Short and long-term changes to ≥20" dbh snags.

http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/32805_FSPLT2_053506.pdf.

Rather than providing a wood recruitment benefit, logging causes an adverse effect that needs to be mitigated. Artificial wood recruitment is a short-term measure that does not fully mitigate for the long-term loss of wood that is removed from the site.

The PDC to retain 10% unthinned "skip" is not adequate mitigation. The FS need to conduct an analysis to determine what fraction of the landscape they can thin and what fraction needs to be left unthinned to meet snag and down wood objectives in LSR and riparian reserves. These wood recruitment objectives should be optimized in reserves, not just meeting some bare minimum as is done in matrix areas. The Fs should consult DecAID to determine the optimal levels of snags and wood recruitment, and retain enough green trees to meet those objectives.

Too Much Thinning and Roads in LSR Unacceptably Delays Late Successional Habitat Objectives for Snag Habitat

a. Snags are an important LSR characteristic.
b. Thinning has a long-term adverse effect on snag recruitment.
c. Proposed mitigation is inadequate.
d. Roads have long-term impacts that are not compatible with LSR objectives.

Thinning and roads therefore delays attainment of LSR objectives in violation of the RMP. The NEPA analysis needs to take a hard look at this issue.

The analysis needs to show that widespread thinning will cause long-term delay in attainment of desired levels of dead wood habitat. Creating some snags immediately after harvest is fine as far as mitigation for snags lost due to hazard tree removal, and short-term mitigation for reduced snag recruitment caused by thinning. However, a single pulse of dead wood is short-lived while the adverse effects of widespread commercial thinning on dead wood recruitment last many decades. Snags are in severe deficit as a result on widespread regen harvest in this area over the last 60 years. Every tree that is removed by logging is a forgone opportunity for snag habitat.

> "Two common consequences of conventional thinning practices have been increased uniformity of forest structure and composition, and removal or delay in the development of dead wood as snags or down wood to meet decadence and habitat functions. … Over the past several decades our ecological understanding of decadence and its importance to habitat and biogeochemical processes has increased substantially, but translation of the fundamental knowledge into coherent goals is lagging."

Paul D. Anderson 2013. Two Decades of Learning about Thinning in the Ecosystem Management Era. http://www.fs.fed.us/pnw/pubs/pnw_gtr880/pnw_gtr880_001.pdf in Density Management in the 21st Century: West Side Story PNW-GTR-880. http://www.treesearch.fs.fed.us/pubs/44695

> "Many species in the Pacific Northwest evolved to use large snags and logs that were historically abundant in the landscape. If snags and logs are lost, biodiversity can be affected and potentially cause a loss of some function in the landscape such as control of forest insects."

Mt Hood NF 2011. Huckleberry Thin EA. http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/59590_FSPLT2_034896.pdf.

> Many animals in Douglas fir forests are strongly associated with habitat features that are best developed in natural forest, such as large trees, snags, and downed logs. The diversity and density of cavity-nesting birds, for example, are positively correlated with

> the abundance of snags, especially tall and/or large-diameter snags (Nelson 1988, Zarnowitz and Manuwal 1985).
> …
> It is the cycle of structural development through plant growth, and the retention of structural complexity via legacy, that characterizes natural forests in the Coastal Northwest. Intensive wood production practices may alter this cycle both by truncating succession before large structures develop and by removing most existing structures during harvest. Planting and thinning may further promote uniformity in tree species, size, and spacing.
> …
> Studies in unmanaged forests teach us that natural disturbance maintains structural complexity within stands and that this complexity promotes plant and animal diversity.
> …
> Until it is clear that forests managed for wood production can be made suitable for native species, managers should consider retaining within managed forests representative tracts of all natural forest stages, not just old growth.

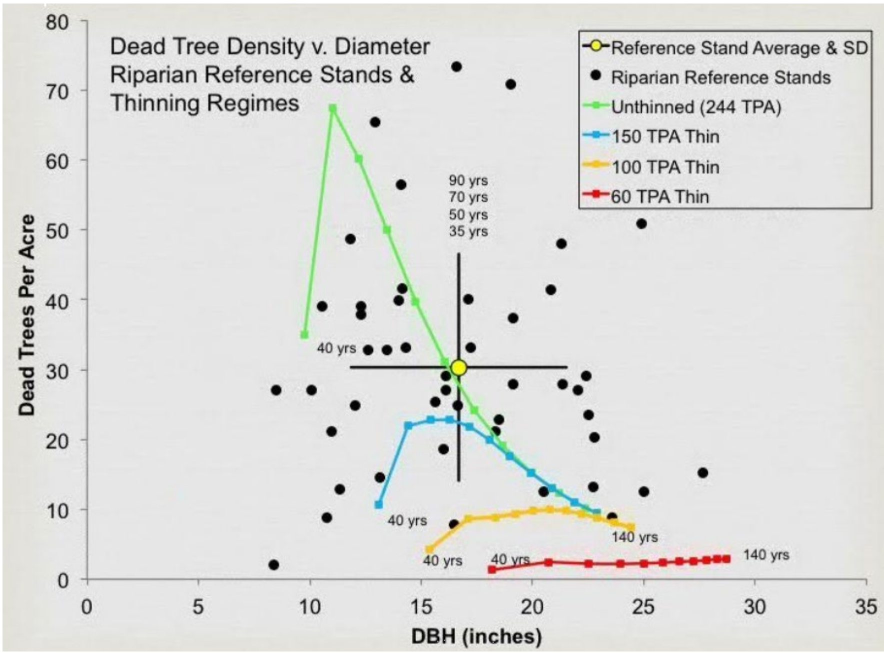
Hansen, A. J.; Spies, T. A.; Swanson, F. J.; Ohmann, T. L. 1991. Conserving biodiversity in managed forests - Lessons from natural forests. BioScience 41(6):382- 392. http://www.montana.edu/hansen/documents/downloadables/hansenetal1991.pdf.

"Dead wood in the form of snags and downed logs is generally common or abundant. Although a notable part of old-growth stands, such material is actually common in unmanaged stands in all successional stages in the Douglas-fir region." Franklin & Spies 1983. CHARACTERISTICS OF OLD-GROWTH DOUGLAS-FIR FORESTS. Reprinted New Forests for a Changing World. Proceedings of the 1983 SAF National Convention http://andrewsforest.oregonstate.edu/pubs/pdf/pub120.pdf

> Many natural young and mature stands have some of the attributes of old-growth stands that may not be present in young, managed stands. Perhaps the greatest difference between natural and managed stands is the lower number and volume of large snags and logs in managed plantations (Spies and Cline 1988). Many young natural forests less than 80 years old have high amounts of carry-over of woody debris...

Thomas A. Spies and Jerry F. Franklin 1991. The Structure of Natural Young, Mature, and Old-Growth Douglas-Fir Forests in Oregon and Washington *in* Leonard F. Ruggiero, Keith B. Aubry, Andrew B. Carey, and Mark H. Huff, technical editors 1991. Wildlife and Vegetation of Unmanaged Douglas-Fir Forests. General Technical Report PNW-GTR-285. http://www.fs.fed.us/pnw/pubs/gtr285/.

The NEPA analysis needs to provide evidence to show that treatments would not preclude or delay the development of late successional habitat. The figure below, from Pollock et al (2012), shows that tree removal through thinning can lead to stand development trajectories that miss the reference condition for dead wood. We point this out to highlight one of the trade-offs involved in thinning, and to encourage careful thinking about mitigation. Leaving unthinned patches within treated stands is a good mid-to-long-term mitigation.



Pollock, M. M., T. J. Beechie, and H. Imaki. 2012. Using reference conditions in ecosystem restoration: an example for riparian conifer forests in the Pacific Northwest. Ecosphere 3(11):98. http://dx.doi.org/10.1890/ES12-00175.1

The analysis needs to show that leaving 10% untreated skips will not adequately mitigate for the long-term effects of reduced snag recruitment. The agency cannot tier to the programmatic EIS for this issue because the PEIS does not show that leaving 10% skips will meet LSR objectives over the long-term. Analysis of this issue is important because so many late successional wildlife rely on dead wood and prefer abundant dead wood. Rose, et al. 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://web.archive.org/web/20060708035905/http://www.nwhi.org/inc/data/GISdata/docs/chapter24.pdf And because widespread commercial thinning makes it almost impossible to attain abundant down wood for 5 decades or more. Taking care of dead wood habitat is particularly critical in this landscape because there are very few mature, unmanaged stands in the area to mitigate for the proposed widespread thinning.

The agency needs to consider an alternative that leaves much larger areas untreated, such as areas inaccessible from existing roads. Leaving inaccessible areas unthinned will provide several complementary benefits to LSR objectives. Less fragmentation, less edge effects, more optimal levels of snag recruitment over the long-term, more rapid attainment of LSR objectives. This alternative needs to be fully considered.

Road construction impacts are not compatible with reserve objectives. BLM should consider doing non-commercial thinning or prescribed fire in stands that are not accessible from existing roads.

The EA analysis needs to show that roads retard attainment of LSR objectives in several ways – by causing fragmentation and edge effects, by diminishing site productivity, and by forgoing the opportunity to leave optimal untreated skips that recruit desired levels of dead wood and to mitigate for the adverse effects of widespread thinning on dead wood recruitment.

Alternatives

We really wish the Forest Service would consider and compare more alternatives. Considering only one action alternative, plus not action, undermines a core purpose of NEPA which is to identify and consider alternatives that might better achieve objectives, such as not building new roads, providing wider no-cut buffers for streams (and marbled murrelet habitat), retaining larger "skips" within units where natural processes can recruit dead wood to mitigate for the effects of widespread thinning.

Environmental analysis documents must "[r]igorously explore and objectively evaluate all reasonable alternatives" to the project. 40 C.F.R. § 1502.14(a). The Council on Environmental Quality (CEQ), which promulgated the regulations implementing NEPA, characterizes the discussion of alternatives as "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. A decisionmaker must explore alternatives in sufficient enough detail to "sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public." *Id*. § 1502.14. All reasonable alternatives must receive a "rigorous exploration and objective evaluation... , particularly those that might enhance environmental quality or avoid some or all of the adverse environmental effects." *Id*. § 1500.8(a)(4). The analysis of the alternatives must be "sufficiently detailed to reveal the agency's comparative evaluation of the environmental benefits, costs and risks of the proposed action and each reasonable alternative." *Id*.

The purpose of the multiple alternative analysis requirement is to insist that no major federal project be undertaken without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means. *Environmental Defense Fund v. Corps of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974); *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810 (9th Cir. 1987), *rev'd on other grounds*, 490 U.S. 332 (1989) (agency must consider alternative sites for a project). The Ninth Circuit has concluded that "the existence of a viable but unexamined alternative renders an environmental impact statement inadequate." *Alaska Wilderness Recreation & Tourism v. Morrison*, 67 F.3d 723, 729 (9th Cir.1995).

It is not enough to consider just one action alternative as BLM often does. The CEQ regulations specifically require that Environmental Assessments shall follow the alternatives language in NEPA.

> 40 CFR § 1508.9
> "Environmental Assessment":
> …
> (b) Shall include brief discussions of the need for the proposal, of **alternatives as required by sec. 102(2)(E)**, of the environmental impacts of the proposed action and alternatives …"

The "alternatives provision" of 42 U.S.C. § 4332(2)(E) applies whether an agency is preparing an EIS or an EA and requires the agency to give full and meaningful consideration to all reasonable alternatives. *Native Ecosystems Council v. U.S. Forest Service,* 428 F.3d 1233, 1245 (9th Cir. 2005); *see Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir. 1988) (The alternatives requirement is triggered where unresolved conflicts as to the proper use of resources exist, whether or not an EIS is required). *Te-Moak Tribe v. Interior, 608 F.3d 592, 601-602 (9th Cir. 2010)* ("Agencies are required to consider alternatives in both EISs and EAs and must give full and meaningful consideration to all reasonable alternatives.")

Weigh the trade-offs associated with logging in riparian reserves.

It's already been made clear that logging is a subtractive endeavor that is adverse to recruitment of dead wood. So, the agency often claims that logging in riparian reserves is necessary to improve attributes other than large wood. However, these benefits are often minor and transitory, and do not outweigh the significant long-term adverse effect of logging on recruitment of dead wood. The agency must focus on the most significant contributions of vegetation toward ACS objectives and the most significant effects of logging on the ACS objectives.

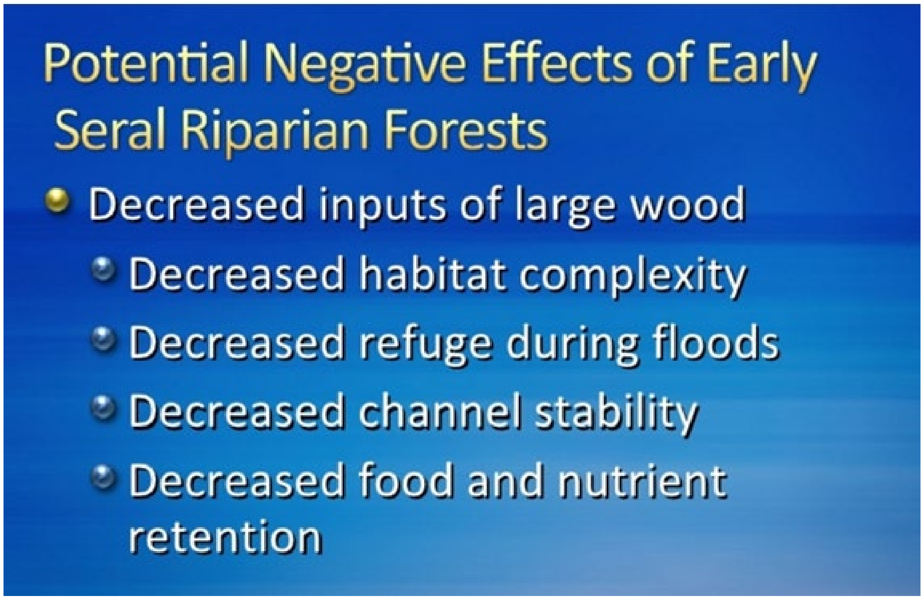
If the agency intends to log in riparian reserves to increase some nebulous goal like "vegetation diversity and complexity," then please explain why the biophysical indicators for the ACS objectives (set forth below) do not include any mention of vegetation diversity or complexity. See the Jazz Thinning Preliminary Analysis, 2011. http://bark-out.org/sites/default/files/bark-docs/Jazz_PA_0.pdf.

Aquatic Conservation Strategy Objectives and Related Indicators.

	Aquatic Conservation Strategy Objectives								
Indicators	**#1**	**#2**	**#3**	**#4**	**#5**	**#6**	**#7**	**#8**	**#9**
Temperature		X		X				X	X
Sediment				X	X	X		X	X
Chemical Contamination				X				X	X
Physical Barriers	X	X						X	X
Substrate			X		X	X			X
Large Woody Debris			X					X	X
Pool Frequency			X						X
Pool Quality			X						X
Off-Channel Habitat	X	X	X						X
Refugia	X	X						X	X
Width/Depth Ratio			X					X	X
Streambank Condition			X			X		X	X
Floodplain Connectivity	X	X	X				X	X	X
Peak/base Flows					X	X	X		
Drainage Network Increase					X	X	X		
Riparian Reserves	X	X	X	X	X	X		X	X

The Northwest Forest Plan and its supporting documentation make clear that the primary value of riparian vegetation is as a source of large wood and shade, not vegetation diversity and canopy layering, as often asserted by the agency to justify logging in riparian reserves. BLM admits "The primary function of Riparian Reserves is to provide shade and a source of large wood inputs to stream channels." Medford BLM 2013. Pilot Thompson EA, p 3-76. http://www.blm.gov/or/districts/medford/plans/files/PT_EA_ForWeb.pdf

Stan Gregory notes the following trade-offs associated with logging riparian reserves to enhance early seral vegetation:



Gregory, Stan 2010. What About Riparian Systems: Who Benefits From an Early Seral Forest Condition. Workshop - Early Seral Forest - We know we need it -- How do we get it? Presentation sponsored by the Central Cascades Adaptive Management Partnership and NW Oregon Ecology Group http://ecoshare.info/2010/07/06/what-about-riparian-systems-who-benefits-from-an-early-seral-forest-condition-gregory/

The Northwest Forest Plan Aquatic Conservation Strategy Objectives (1994 ROD p B-11) enumerates specific purposes for "Maintain[ing] and restor[ing] the species composition and structural diversity of plant communities in riparian areas and wetlands" that is -

> "to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability."

All these values are provided as well or better by unthinned riparian stands.

The effects of logging on dead wood are significant and long term, adversely affecting a core function of the reserves, while the purported benefits to vegetation diversity are minor and transitory, and affect secondary purposes of the reserves.

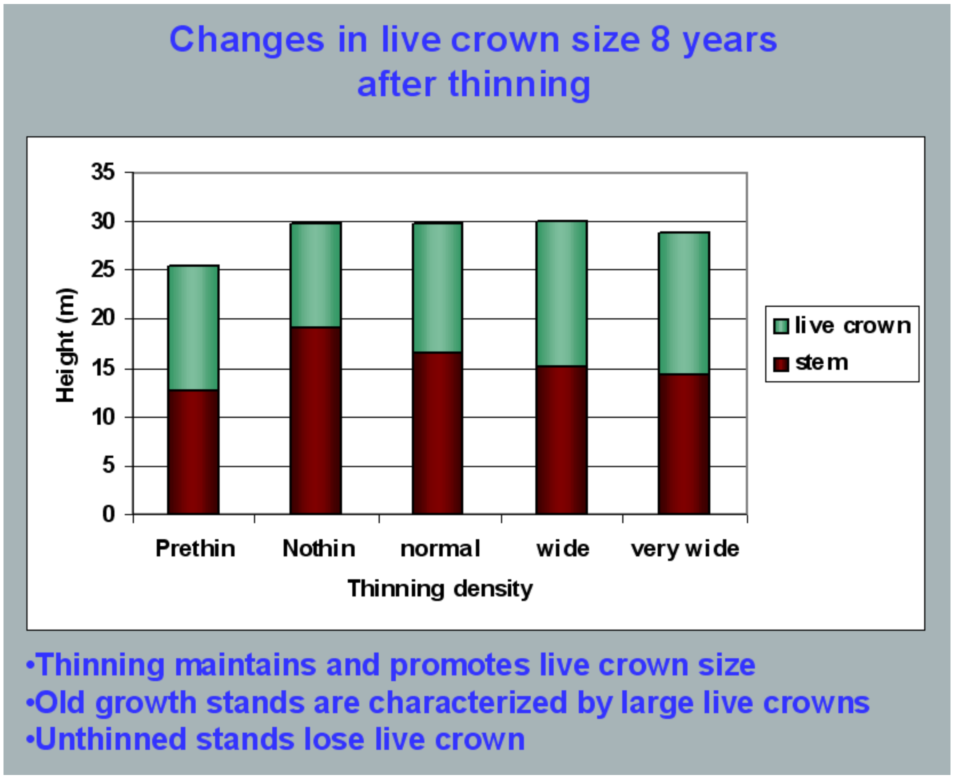
Large Wood

Large quantities of downed trees are a functionally important component of many streams (Swanson et al. 1976; Sedell and Luchessa, 1982; Sedell and Froggat, 1984; Harmon et al. 1986; Bisson et al. 1987; Maser et al. 1988; Naiman et al. 1992). Large woody debris influences channel morphology by affecting longitudinal profile, pool formation, channel pattern and position, and channel geometry (Bisson et al. 1987). Downstream transport rates of sediment and organic matter are controlled in part by

> storage of this material behind large wood (Betscha 1979). Large wood affects the formation and distribution of habitat units, provides cover and complexity, and acts as a substrate for biological activity (Swanson et al. 1982; Bisson et al. 1987). Wood enters streams inhabited by fish either directly from the adjacent riparian zone from tributaries that may not be inhabited by fish, or hillslopes (Naiman et al. 1992).
>
> Large wood in streams has been reduced due to a variety of past and present timber harvesting practices and associated activities. Many riparian management areas on federal lands are inadequate as long term sources of wood.
>
> …
>
> **Riparian Ecosystem Components**
>
> …
>
> Riparian vegetation regulates the exchange of nutrients and material from upland forests to streams (Swanson et al. 1982; Gregory et al. 1991). Fully functional riparian ecosystems have a suite of characteristics which are summarized below. Large conifers or a mixture of large conifers and hardwoods are found in riparian zones along all streams in the watershed, including those not inhabited by fish (Naiman et al. 1992). Riparian zone-stream interactions are a major determinant of large woody debris loading (House and Boehne 1987; Bisson et al. 1987; Sullivan et al. 1987). Stream temperatures and light levels that influence ecological processes are moderated by riparian vegetation (Agee 1988; Gregory et al. 1991). Streambanks are vegetated with shrubs and other low-growing woody vegetation. Root systems in streambanks of the active channel stabilize banks, allow development and maintenance of undercut banks, and protect banks during large storm flows (Sedell and Beschta 1991). Riparian vegetation contributes leaves, twigs, and other forms of fine litter that are an important component of the aquatic ecosystem food base (Vannote et al. 1980).

1993 FEMAT Report, pp V-13, V-25.

The effects of thinning on crown development are not very significant.



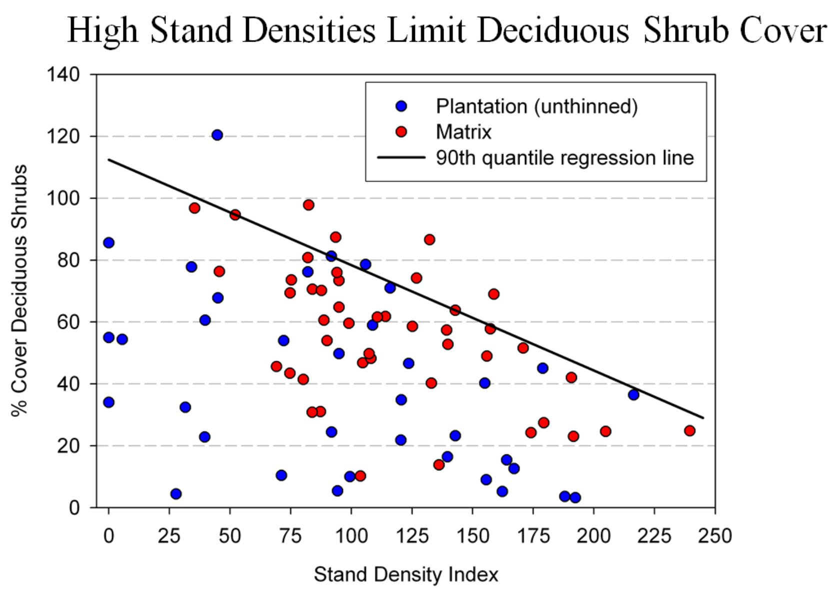
Aquatic/Riparian Ecosystem Dynamics and Associated Management Implications - Recent Findings. Powerpoint, 32.6M. This topic was presented at the Regional Interagency Executive Committee meeting on January 7, 2003. https://web.archive.org/web/20161221100307/http://www.reo.gov/library/presentations/Szaro_present_Aquatic_Rip_Final.ppt.

Stimulating the development of a diverse understory is often used as a justification for thinning, but this may not be justified in stands older than about 40 years. A systematic review of 917 Forest Inventory and Analysis (FIA) plots in western Oregon (mostly on non-federal lands) found,

> Contrary to expectations of canopy closure, mean canopy cover by age class rarely exceeded 85 percent, even in unthinned productive young conifer forests. Possibly as a result, effects of stand age on understory vegetation were minimal, except for low levels of forbs found in 20- to 40-year-old wet conifer stands. … Although heavily thinned stands had lower total cover, canopy structure did not differ dramatically between thinned and unthinned stands. Our findings suggest potential limitations of simple stand succession models that may not account for the range of forest types, site conditions, and developmental mechanisms found across western Oregon.

McIntosh, Anne C.S.; Gray, Andrew N.; Garman, Steven L. 2009. Canopy structure on forest lands in western Oregon: differences among forest types and stand ages. Gen. Tech. Rep. PNW-GTR-794. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 35 p. http://www.fs.fed.us/pnw/pubs/pnw_gtr794.pdf. This seems to indicate that the benefits of thinning may be best realized in dense stands younger than 40 years old. This study also showed that in wet conifer stands the mean Canopy Height Diversity Index and the mean Simpson's Diversity Index of tree heights leveled off at about age 65. This study also looked at canopy conditions after three levels of thinning intensities (heavy, light, and none). "Mean cover of the lower canopy layer was nominal for all three thinning intensities. … There were no evident trends between understory cover and thinning history; both shrub and forb cover were fairly similar among the three thinning intensities. … The lack of a strong effect of crown closure on understory cover may be related to our finding that mean crown cover did not exceed 85 percent. … We expected greater cover of understory vegetation in thinned than in unthinned stands but did not detect significant differences in this analysis."

While one can generalize that vegetation diversity is more likely to flourish when conifer density is lower, there are data showing a wide range of conifer density can support a wide range of deciduous shrub cover. Thinning is not always necessary. The NEPA analysis should carefully document the site-specific "need" for thinning.



Spies, T. 2008. Powerpoint: Assumptions behind thinning young stands to create late successional riparian habitat. Presented at Riparian Thinning: Logic Paths for Silvicultural Prescriptions -- March 20, 2008. https://ecoshare.info/projects/central-cascade-adaptive-management-partnership/workshops/riparian-thinning-logic-paths/

It is also worth noting that where understories are well-stocked, midstory development can be enhanced by focusing on treating the understory itself rather than killing canopy trees.

> [R]esults show that individual understory trees can be selectively favored for increased growth into the midstory by being released from competing saplings in the understory cohort. …Our results suggest that understory release treatments can be used to target individual saplings for increased growth, thereby recruiting a shade tolerant midstory

> cohort and accelerating the development of vertical foliar connectivity and a multi-layered stand structure. Abundance of non-coniferous understory vegetation is also augmented by this treatment. … [Note] The extent to which released understory trees collectively form a cohesive midstory canopy stratum is dependent on the density and horizontal arrangement of those released individuals. … . Inducing spatial variability within the midstory tree cohort would emulate the finescale disturbances of natural stands that create gaps and patches.

Taylor, Andrew 2016. : Understory Vegetation Dynamics and Midstory Development Following Understory Release Treatments in Northwest Oregon Thinned Douglas-fir Stands. OSU MS Professional Paper.

Anderson (2007) looked at the effects of thinning in young Douglas fir forests and found –

> [T]hinning treatments … had little impact on the abundance, size, or diversity of understory vegetation. Disturbance resulted in short-term decreases in understory vegetation cover, particularly tall shrubs. However, within five years of treatment, understory vegetation abundance returned to approximate pretreatment condition. … The general lack of understory vegetation response to the thinning treatments was likely due to the inherent resistance and resilience of the plant communities to disturbance, as well as the low intensity of disturbance attributable to the treatments.

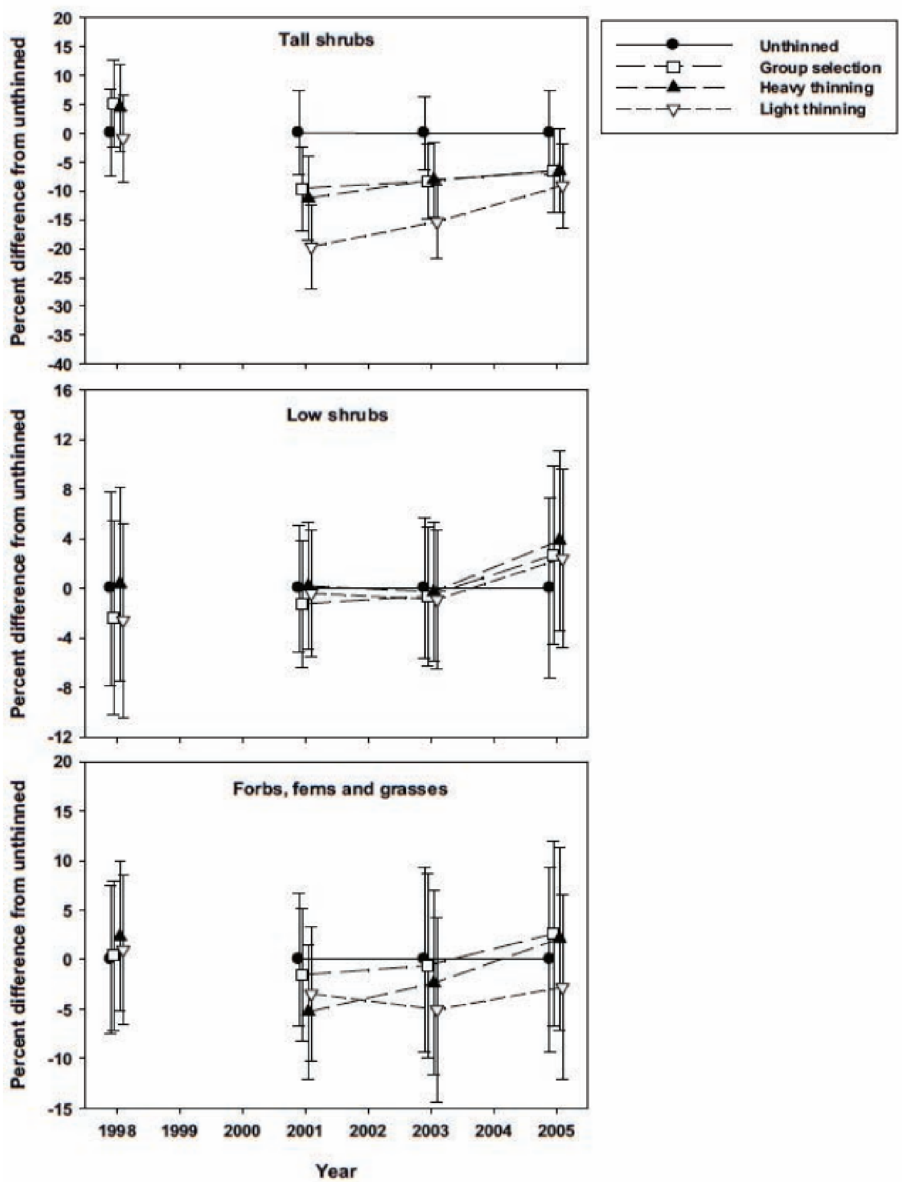


Figure 2 — Cover of tall shrubs, low shrubs, and forbs, ferns and grass vegetation strata by treatment expressed as a difference from the unthinned treatment. Error bars represent one standard error about the mean of n=four replications.

[Four years after thinning] tall shrub cover that was approximately four to nine percent less than the unthinned treatment … [C]over by low shrub species was unchanged by the harvest activity … Forbs, ferns, and grasses [experienced] little difference in cover between thinned and unthinned stands. … [F]ollowing treatment, the mean number of species declined somewhat, [then] return[ed] to pretreatment levels… [T]he evenness component of diversity did not differ among treatments or vary over time …. [T]here was little evidence of substantial alterations of understory shrub and herbaceous vegetation. This lack of strong understory vegetation response in terms of composition, abundance, or size is consistent with several studies of thinning in Douglas-fir. In a recent review of seven operational-scale silviculture experiments, Wilson and Puettmann (2007) report that percent cover by shrubs and percent cover by herbs, one to seven years following thinning showed little difference across a wide range of residual basal area.

Paul D. Anderson 2007. Understory Vegetation Responses to Initial Thinning of Douglas-fir Plantations Undergoing Conversion to Uneven-Age Management. Proceedings of the 2007 National Silviculture Workshop. http://www.fs.fed.us/pnw/publications/gtr733/PNW_GTR_733_4.pdf This paper was published in: Deal, R.L., tech. ed. 2008. Integrated restoration of forested ecosystems to achieve multi-resource benefits: proceedings of the 2007 national silviculture workshop. Gen. Tech. Rep. PNW-GTR-733. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 306 p.

> [W]hile specific structural attributes of forest ecosystems have been correlated with certain species, it is uncertain how such species will respond to treatments designed to recreate these features. There is always the possibility that in our attempt to create a structural attribute we think is important, we eliminate another attribute that is equally important, but unrecognized. One example is that attempts to restore spotted owl habitat by heavily thinning to accelerate the development of large diameter nesting trees could actually delay spotted owl recovery by reducing production of the large down wood utilized by the species it preys upon (Forsman et al., 1984; Carey, 1995; North et al., 1999). Similarly, heavily thinning stands to accelerate the development of marbled murrelet nesting trees also create open stands with a dense understory that is ideal habitat for a number of corvid species that prey on marbled murrelet nest eggs (USFWS, 2010). Riparian thinning efforts to create long-term supplies of very large diameter instream wood that can initiate complex wood jam formation (e.g., key pieces) are also likely to reduce the supply of large diameter wood that will create pools (Beechie and Sibley, 1997; Beechie et al., 2000; Fox and Bolton, 2007). Thus, we suggest that any efforts to actively restore riparian forests for the benefit of certain species should be treated as scientific experiments and proceed cautiously, skeptically, and with robust pre- and post-treatment data collection efforts. Hypothesized effects of thinning on riparian forest structure and the use of that structure by targeted species should be tested against empirical data.

Pollock, Michael M. and Timothy J. Beechie, 2014. Does Riparian Forest Restoration Thinning Enhance Biodiversity? The Ecological Importance of Large Wood. Journal of the American Water Resources Association (JAWRA) 50(3): 543-559. DOI: 10.1111/jawr.12206. http://oregon-stream-protection-coalition.com/wp-content/uploads/2014/07/Pollock-and-Beechie.-2014.-Riparian-thinning-and-biodiversity.pdf.

Each substantive issue discussed in these comments should be (i) incorporated into the purpose and need for the project, (ii) used to develop NEPA alternatives that balance tradeoffs in different ways, (iii) carefully analyzed and documented as part of the effects analysis, and (iv) considered for mitigation.

Note: If any of these web links in this document are dead, they may be resurrected using the Wayback Machine at Archive.org. http://wayback.archive.org/web/

Sincerely,

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